

Indian Institute of Technology, Kanpur
Civil Engineering Department

Request for Proposal

The Director, Indian Institute of Technology Kanpur (IITK) invites proposal in two bid (technical & financial) format from reputed firms as follows: -

Sl. No.	Name of Work	Bid Security	Last Date and Time for submission of tender	Date and Time for opening of Technical Bid
1.	Design, manufacturing, inspection, testing at manufacturer's works, supply, installation at site, commissioning and performance guarantee of indoor type, vertical floor mounting, electric, gas/steam heater packages as per Technical Specification covered in Part-I and Terms and Conditions covered in Part-II of this tender document for National Aerosol Facility at IIT, Kanpur	Rs. 10,000/-	03.01.2018 upto 1700 Hrs Revised 17.01.2018 upto 1700 Hrs	04.01.2018 at 1500 Hrs Revised 18.01.2018 at 1500 Hrs

The firms with at least three years relevant experience in above said work are eligible to participate. The proposal duly completed in all respect should be submitted in sealed cover duly marked, so as to reach undersigned on or before 1700hrs on 03.01.18 (**Revised up to 01.01.2018**). The tender document with eligibility criteria and other details may be downloaded from www.iitk.ac.in. The Institute reserves the right to accept or reject any offer or all the offers without assigning any reasons thereto.

No. CE/NAF/2017-18/0242, dated: 15.12.2017

Dr. SN Tripathi,
Civil Engineering Department,
Indian Institute of Technology Kanpur.
Email: snt@iitk.ac.in

Phone: 0512-259 7845

National Aerosol Facility

Technical Specification for Gas/Steam Pre-heaters/Super-heaters

PART-I

Technical Specification

Gas/Steam Pre-heaters/Super-heaters

1.0 Scope of work:

Design, manufacturing, inspection, testing at manufacturer's works, supply, installation at site, commissioning and performance guarantee of indoor type, vertical floor mounting, electric, gas/steam heater package. The heater package shall be supplied with all accessories and peripherals to achieve the desired heating characteristics as mentioned in the technical requirement. The heater package will be installed at the National Aerosol Facility, IIT Kanpur.

This specification may not cover fully all the aspects of design and fabrication of the heaters. However, supplier shall be thoroughly conversant with the specified requirements, high quality and standards in engineering and workmanship for satisfactory and trouble free operation of the heater packages throughout the guaranteed life time.

The scope of work for contractor includes:

- a) Preparation of design and fabrication drawings and getting it approved from the purchaser.
- b) Procurement of materials and fabrication of heater package.
- c) Heater Package shall comprise of following accessories and auxiliaries as specified herein, for including, but not limited to the following.
 - Heating vessels, pipe line, valves etc.
 - Inlet flange, Outlet flange and blind flanges for maintenance.
 - Temperature measurement, indication and control with sensors and control cabling within battery limits.
 - Electric protection and control devices, including power and control cabling.
 - Control panel with gauges, indications, meters and control devices, installed on the package.
 - Structural frame for installation of heater package on the floor.
 - Foundation drawing and details for the installation of the equipment.
 - Testing (functional trials) of heater package at supplier's works.
 - Painting, thermal insulation and aluminium cladding of the heater unit.
 - Packing & safe transportation of the heater package to site.
 - Loading, unloading and safe storage at site.
 - Installation, commissioning and testing of heater package at site.
 - Spare parts necessary for start-up, commissioning along with priced list of spares for two years operation
 - Any special tools required for maintenance
 - Documentation requested in this specification
 - Guarantee for the system as specified below.

2.0 Schedule of Quantity:

Sr. No.	Description	Qty.
1.	Vertical floor mounted, electric gas/steam heater package with necessary instrumentation and other accessories.	02 Set

3.0 Applicable codes/Documents:

System shall conform to the latest edition of relevant sections of the codes, standards and regulations as per the requirements of this specification. All materials used shall be of sound quality and shall conform to latest relevant standards as given below:

IS:4159-2002	Specification for mineral filled sheathed heating elements
IS: 302-1981	General & safety requirements for household & similar electrical appliances
IS: 9080 (part-II/sec-2)	Safety requirement in electro-heat installations
ASME Section-VIII Div.-I	Boiler and Pressure Vessel Code
ASME BPVC Section IX	Welding and Brazing Qualifications
ASTM A106	Specification for Seamless Carbon Steel Pipe for High Temperatures
IS: 2062	Hot Rolled Low medium and high Tensile Structural Steel.
IEC:60947	Low Voltage Switchgear and Control Gear
IS: 13947	Low-Voltage Switchgear and Control gear
IS: 13703	Specification for low-voltage fuses for voltages not exceeding 1000 v ac or 1500 v dc
IS:1554	PVC insulated (Heavy duty) electric cables.
BS: 6195:2006	Electric cables. Rubber or silicone rubber insulated flexible cables and cords for coil end leads.
IS:1364	Hexagon Head Bolts, Screws and Nuts of Product Grades A and B
IS:3063-1994	Fasteners - Single coil rectangular section spring lock washers - specification
IS: 7358 : 1984	Specification for thermocouples
IS:3043	Code of practice for earthing
IS: 14254	Programmable controllers

4.0 Description of the heater package:

The heater package shall be for indoor application, vertical floor mounted type and self-contained unit, for ready use at site. The heater package shall comprise of two electric heater units as per the technical requirement given below. One electric heater unit shall be used to heat the flowing stream of air/argon from 20°C to 200°C and other electric heater unit to heat the flowing stream of air-steam/argon-steam mixture from 200°C to 400°C. The electric heating system shall comprise of heating elements suitable for air/gas/steam environment with adequate power density, including temperature controller and protection devices for each unit. The gas mass-based mixture composition to be considered for the design of the system as given in the data sheet.

The heating elements shall be mounted on a removable flange which in turn would be connected to a vessel with required internals like baffles etc. The heater units shall be

provided with adequate numbers of temperature sensors (*Thermocouples*) to indicate and control the heater surface temperature as well as to control the output air/steam temperature. The heater package shall be provided with control panels (one for each unit) having protection devices, digital meters etc. and instrumentation for temperature measurement, indication and heater trip from the main control room of the facility.

At least 30% heating element shall be kept as spare while finalizing the capacity so that required heating can be achieved even with disconnecting that many heating element. The cold length of the heating element should be sufficient to terminate the connections in a terminal box.

Vendor should design the heater as per the technical requirements and design calculation should be submitted to the purchaser before fabrication. All the schematics, drawings and documents are required to be submitted to the purchaser for approval before fabrication.

The vendor shall supply heater package as per process parameters given in the technical requirements. Proposed schematic of the package is provided in *Annexure I*.

Termination Points:

Heater-1:

- **Process:** Gas/Steam Inlet at inlet flange of heater Unit - 1
- **Process:** Gas/Steam outlet at outlet flange of heater Unit- 1
- Electric Power Supply: Power at main isolator of Control panel.
- Control signals: Terminal blacks of the Control panel.

Heater-2:

- **Process:** Gas/Steam Inlet at inlet flange of heater Unit - 2
- **Process:** Gas/Steam outlet at outlet flange of heater Unit- 2
- Electric Power Supply: Power at main isolator of Control panel.
- Control signals: Terminal blacks of the Control panel.

5.0 Technical Requirement:

A. Air/ Argon/Helium/Mixture Gas electric Heater Unit - 1						
Equipment Tag No.		GH-1401				
Fluid Service:		Air/ Argon/ Helium/ Mixture				
Location:		Indoor				
Service Description:		Gas pre-heater for heating air or argon or helium or its mixture from ambient temp to 250°C Continuously				
Process Parameters				CASE 1	CASE 2	CASE 3
1	Gas to be heated			Air	Helium	Argon
2	Operating Pressure	Min/Norm/Max	kg/cm ² .g	1.0 to 7.0	1.0 to 7.0	1.0 to 7.0
3	Operating Temperature	Min/Norm/Max	°C	20-250	20-250	20-250
4	Design Pressure		kg/cm ² .g	9.0 (to be confirmed by Vendor)		

5	Design Temperature		°C	to be provided by Vendor		
6	Flow rate	Min/Max	kg/hr	0-100	0-30	0-100
Equipment Details: Vessel						
1	Mounting position:			Floor, Vertical (<i>for Heater Unit</i>)		
2	Shell Diameter (ID):		mm	to be provided by Vendor		
3	Shell tan to tan length:		mm	to be provided by Vendor		
4	Shell Thickness:		mm	to be provided by Vendor		
5	Pressure Rating:			to be provided by Vendor		
6	Vessel Material:			SS304 (<i>to be confirmed by Vendor</i>)		
7	Inlet & Outlet size:		mm	40/40		
12	Circulation type (Baffled/ Non baffled)			Baffled-SS304 (<i>to be confirmed by Vendor</i>)		
13	Coil type Removable / Non-Removable			Removable (<i>Repairable</i>)		
8	Insulation & Cladding:			Mineral Wool/Aluminium		
Equipment details: Heating Element						
1	Heating Element material			to be provided by Vendor		
2	Heater sheath Material			to be provided by Vendor		
3	Electrical Insulation material			to be provided by Vendor		
4	Heating Element Dia./Length		mm	to be provided by Vendor		
Electrical Data:						
1	kW rating		kW	to be provided by Vendor		
2	Voltage		Volts	415V±10%, AC, 50Hz		
3	Phase			3-Phase, 4-Wire		
4	Heating Elements (No. & Rating per element)			to be provided by Vendor		
5	Overheat protection			Thermocouple, Temp. Controller		
6	Electric system protection			Short Circuit/Earth Fault/ OV		
7	Control Panel			IP-54, 1.6-2mm Sheet Thickness, Powder Coated, Floor Mounting		

B. Process Data Sheet for Air/ Argon/Helium/Steam/Mixture Gas electric Heater Unit - 2							
Equipment Tag No.		GH-1402					
Fluid Service:		Air/ Argon/ Helium/Steam/Mixture					
Location:		Indoor					
Service Description:		Gas pre-heater for heating air or argon or helium or steam or its mixture from 200°C to 400°C. Continuously					
Process Parameters				CASE 1	CASE 2	CASE 3	CASE 4
1	Gas to be heated			Air	Helium	Steam	Argon
2	Operating Pressure	Min/Norm/Max	kg/cm ² .g	1.0 to 7.0	1.0 to 7.0	1.0 to 7.0	1.0 to 7.0

3	Operating Temperature	Min/Norm/Max	°C	200-400	200-400	200-400	200-400
4	Design Pressure		kg/cm ² .g	9.0 (to be confirmed by Vendor)			
5	Design Temperature		°C	to be provided by Vendor			
6	Flow rate	Min/Max	kg/hr	0-100	0-30	0-100	0-100
Equipment Details: Vessel							
1	Mounting position:			Floor, Vertical (for Heating Unit)			
2	Shell Diameter (ID):		mm	to be provided by Vendor			
3	Shell tan to tan length:		mm	to be provided by Vendor			
4	Shell Thickness:		mm	to be provided by Vendor			
5	Pressure Rating:			to be provided by Vendor			
6	Vessel Material:			SS304 (to be confirmed by Vendor)			
7	Inlet & Outlet size:		mm	40/40			
12	Circulation type (Baffled/ Non baffled)			Baffled-SS304 (to be confirmed by Vendor)			
13	Coil type Removable / Non-Removable			Removable (Repairable)			
8	Insulation & Cladding:			Mineral Wool/Aluminium			
Equipment Details: Heating Element							
1	Heating Element material			to be provided by Vendor			
2	Heater sheath Material			to be provided by Vendor			
3	Electrical Insulation material			to be provided by Vendor			
4	Heating Element Dia./Length		mm	to be provided by Vendor			
Electrical Data:							
1	kW rating		kW	to be provided by Vendor			
2	Voltage		Volts	415V±10%, AC, 50Hz			
3	Phase			3-Phase, 4-wire			
4	Heating Elements (No. & Rating per element)			to be provided by Vendor			
5	Overheat protection			Thermocouple, Temp. Controller			
6	Electric system protection			Short Circuit/Earth Fault/ OV			
7	Control Panel			IP-54, 1.6-2mm Sheet Thickness, Powder Coated, Floor Mounting			

6.0 Electrical, Instrumentation and Control requirements:

6.1 Components:

(a) Thermocouple.

Adequate number of thermocouple shall be provided for the control of the heater units and protection of heating elements. The thermocouple shall be stainless steel sheathed, ungrounded, 1mm OD, Mineral Insulated, K-Type meeting the requirement of IEC-584 (Class-I) of Chromel-Alumel material (as per ANSI/MC 96.1-1982).

(b) Temperature control:

The panel mounted compact digital temperature controller for the display, control and monitoring of temperature shall be provided (each) for heater units. The controller shall have a multi-function input, for configuration and setting of the sensor input. An alarm output for monitoring the actual value shall also be available as standard.

Following parameters shall have alarms and trips as a minimum requirement for the safe operation of the heater package. The necessary signal initiating devices, relays, flashers and other accessories for the operation of equipment shall be provided for following conditions.

- (i) Heater pin temperature
- (ii) Heater pin failure
- (iii) Gas temperature at outlet of the individual heater units (heater-1 & heater-2)

For remote indication of above parameters in the main control room of the facility, 4-20 mA current output is required to be provided as per above. This will enable indication and various parameters in the control room and ON/OFF/Trip operation of the heater package from the main control room.

The Vendor will be responsible ONLY for the provision of contact points on the package as per the requirements mentioned in this section. Connection from the contact point to the main control room of the facility, including cabling etc. is NOT IN THE SCOPE of this tender.

(c) Switches/MCB/Fuse:

The switches, fuses, MCBs shall be manufactured and tested as per applicable IS & codes. They shall be capable of breaking specified full capacity currents. The panel door shall be interlocked such that it cannot be opened unless the incomer is in OFF position. It should be equipped with mechanical and electrical indicators for indicating ON and OFF positions.

(d) Indication and Meters:

The indicating lamps shall be LED type. Power 'ON' indication lamps for all three phases in corresponding colour codes shall be provided on incomer. The multi-function meters (*Socomec/Secure/Siemens*) shall be digital multi-function meter of square type (96X96mm) suitable for 3-Phase, 4-wire system with 230V AC auxiliary shall be provided on incomer for indicating system parameters.

6.2 Construction of Control Panel

(a) Sheet metal work & painting

The panel shall be flush, front operated enclosed by 16/14SWG CRCA

sheet steel cubicle, floor mounting & freestanding type. The design shall be completely dust tight & vermin proof. Gaskets of superior quality shall be used beneath all covers to render the joints effectively dust proof. The degree of protection of the total panel shall be minimum IP 54 with closed doors and minimum IP 20 with open door. The doors shall be manufactured using 2mm CRCA sheet steel. The panel shall be provided with sheet steel hinged door with superior quality silicon rubber gaskets & locking arrangement (spanner locks). The door shall have concealed hinges and shall be easy to operate. The compartment door shall be so interlocked such that it shall not be possible to open the door with switch in 'ON' position. It shall be possible for an authorized person to do away with this interlock using a specific tool. (Defeat mechanism).

(b) Power & Control Wiring

The internal control wiring shall be carried out with 1.5mm² (minimum) multi-strand, tinned copper conductor, FRLS insulated wire suitable for 750V. Current transformer secondary leads shall be of 2.5 mm² (minimum) size. Wiring shall be continuous without splices in conductors. To accommodate and support the control and auxiliary wiring, for relatively long runs, covered plastic (U-PVC) channel shall be used. Conductor shall never be mounted direct to metal. Not more than 75% of the capacity of channel shall be used. Wire carrying different voltages shall be segregated (*i.e.* power and control wiring shall be segregated and run separately in the cubicle). Wires shall be ferruled at both ends for identification (as per relevant standards). Identification of all wires shall be achieved by the use of permanently embossed wire markers of the slip-on type. Wrap-around adhesive type markers shall not be used. The internal wiring within a cubicle shall be numbered such that each wire end has the number of the device and/or the terminal to which it is connected. The internal power wiring shall be carried out by using appropriate size (de-rating as per enclosure), 1100V grade, tinned copper conductor, multi-strand, EBXL, FRLS insulated, un-armoured cables. Power cables shall be properly colour coded to indicate R, Y, B phases and control cables shall be of grey colour. The cable shall be terminated with copper lugs of relevant size. The panel shall be designed to facilitate FRLS insulated, aluminium/copper conductor, and armoured cable entry from the top or bottom of panel. The cables leading to external connections shall be brought out to the cable alley/marshalling box, through appropriate rubber bushes and be terminated to the terminals (Melamine TB only) of proper capacity. Power cables shall be terminated in colour coded terminals of appropriate size. For all connections insulated cable lugs shall be used and terminals blocks shall be shrouded appropriately.

Earthing

The earthing of the panel shall be provided throughout the length of panel along with two terminal lugs at ends for grounding purposes. All metallic non-current carrying components of the panel shall be connected to the earth terminal through suitable size of copper strip/wire.

(c) Labeling

Label shall be made of a corrosion resistant weatherproof material such as anodized aluminium with white letters (minimum height 10 mm) on a black background. The label shall be fixed with stainless steel screws or riveted to sheet steel. Nameplates shall be in accordance with detail drawing supplied by purchaser.

7.0 Inspection and testing:

As soon as purchase order is received, manufacturing procedure has to be submitted for approval. The supplier shall give advance intimation regarding various fabrication and inspection activities (QAP). Mill test certificate for the flange, pipe material and *Ni-Cr* element shall be submitted as per the ASTM standards. Mill test certificate for the flange and pipe material shall confirm the mechanical properties and chemical composition. The supplier shall be responsible for providing necessary arrangements & facilities for inspection and performing all the inspection and testing specified in this specification. Inspection and testing shall be conducted in a manner satisfactory to and shall be subjected to approval of purchaser. The purchaser and his authorized agencies shall have access to the supplier's premises at all reasonable times to the extent necessary to access compliance with the provisions of this specification.

Testing of Heating Element:

Heating elements shall be tested for the following. All tests shall be conducted as per relevant IS or equivalent international standards:

- (i) All the heaters will be visually inspected for uniformity in swaging process. No dents, cracks or irregularities shall be present on the heater tube surface.
- (ii) All the heaters will be dimensionally checked (diameter, length, Sheath thickness etc.) as per the drawing.
- (iii) Liquid penetrant Examination: This shall be performed in accordance with ASTM E-165 on bent surfaces and at the terminal ends of all the tubes.
- (iv) Resistance test: Resistance of the heating element will be measured for all the heater pins.
- (v) Electrical insulation & leakage current: All the heater elements shall be subjected to insulation resistance test (IR test) by meggering at 500V. This test will be done twice. First the test will be done under initial as manufactured condition. Then all the heaters will be immersed (with its terminals outside) in water for 24 hours. Again the IR test will be done. There should not be any reduction in the IR value. The minimum IR value in all cases shall be 100 MΩ.
- (vi) High Voltage Test: All the heaters shall be tested for high voltage test in which each heater pin shall withstand 1500V AC supply of 50 Hz for one minute when applied between terminals and earth (sheath).
- (vii) Concentricity of heater coil (by radiography): The sample heater (01 No. Heater Pin) shall be subjected to industrial radiography test to confirm the concentricity of the heating coil element in the sheath.

Testing of Electric Gas Heater Units:

- (i) Physical and visual inspection of the system as per approved QAP and drawings to verify the construction and workmanship of heater unit.
- (ii) Leak detection Test: The heater unit (in fully assembled) shall be subjected to leak detection test as per applicable standard. Necessary arrangement and jig shall be arranged and fabricated by the supplier, to carry out the test at supplier premises.
- (iii) The functional tests as per the process requirement will be carried out at supplier's premises
- (iv) The interlocking of the sensors and control system shall be checked to verify the trip and alarm system of the unit
- (v) The parameter display as per calibration certificate will be checked and verified at supplier's premises.

8.0 Marking or Nameplate:

Heater package shall be provided with a stainless steel nameplate securely attached to the system with clear visibility. The following information shall be added to the name plate:

- Equipment Tag No.
- Manufacturer's Name, address
- Manufacturer's Serial No.
- Date of Manufacture
- Operating parameters
- Max. Allowable Working Temperature (°C)
- Rated power etc.

Individual heating elements shall be marked for its rated voltage and capacity by etching process. No engraving or punching is permitted on the sheath.

9.0 Packaging & transportation:

All the equipment and instruments shall be suitably packed to avoid damage during transportation. *If any*, insurance is required; it may be arranged by the vendor. The shipment shall be carried only after the shipping release has been issued by the purchaser or his authorized representative to the vendor. The packaging and transportation is in the vendor scope. All the material need to supplied to **National Aerosol Facility, IIT Kanpur.**

10.0 Painting & Insulation:

The painting of support structures, heater units and other components shall be carried out as per the approved QAP and colour shade. Vendor shall provide all the necessary and adequate thickness of thermal insulations over the heater units and piping, which shall be clad with aluminium sheet for safe and efficient operation of the heater package, as per applicable code, standard and approved design.

11.0 Installation & Commissioning:

All the installation and commissioning work required for heater operation is in the scope of vendor *excluding foundation if required.*

The vendor may depute his personnel for site assessment, before installation of

system at site. The site layout drawings, procedure and plan shall be prepared by the vendor and submitted to purchaser for his approval, before initiating the site preparation and installation work. The installation of the system shall be carried out as per approved drawing and procedure with safety and security of the system and personnel. *If any* foundation is required vendor should give the drawing and details of the same, well in advance, to enable IITK to construct the same on time. The installed system shall be connected to the existing inlet and outlet pipeline available site. The required hardware shall be in the scope of supplier. *The supply, laying, termination and connection of power and control cables to the existing switches and Instrument Junction Box are in the scope of supplier.*

The supplier shall carry out all the pre-commissioning checks as per the approved QAP and checklist (*viz.* insulation resistance, earthing connection, protection system etc.). The commissioning of the system shall be carried out as per the approved QAP with complete control system. The commissioning documents shall be prepared and the same shall be handed over to the purchaser.

12.0 Documentation:

Documents required with the offer:

The following information is the minimum requirement:

- (i). Foundation design load / weight data
- (ii). Foundation details. Foundation drawing and details for the installation of all the equipment shall be submitted by the vendor well in advance to facilitate construction of the foundation before the installation of the equipment at site.
- (iii). Process and Instrumentation Diagram (PID)
- (iv). Plan, layout, and Installation (general arrangement) drawing.
- (v). Preliminary layout drawing of the heaters and its auxiliaries.
- (vi). Completed data sheets
- (vii). Bill of Material (BOM)
- (viii). A price schedule and guarantees.
- (ix). An extent of supply and termination points list.
- (x). Utilities requirement of electricity, water, compressed air, fuel etc. for the package.

Post Order Documents:

- (i). A certified foundation drawing with loads, dimensions and holding- down bolt details shall be submitted within three weeks of order.
- (ii). Certified General Arrangement drawing giving all termination point details shall be submitted within three weeks of order. *Facility Layout will be provided to the successful bidder.*
- (iii). Control system specifications and control circuit drawings with Bill of Material (BOM)
- (iv). Other submissions (e.g. materials and test certificates, electrical and instrumentation details etc.) shall be submitted prior to inspection at shop.
- (v). Operating and Maintenance manuals shall be provided in triplicate at least two weeks before the delivery of the heater package. These manuals shall contain operation and maintenance information on ALL items of equipment

supplied with the Heater Package together with detailed drawings and spare part list sufficient to enable identification and ordering of spares.

- (vi). An Installation and Erection manual.
- (vii). As-built General Arrangement and detail drawings of the Heater Package and auxiliaries shall also be provided in triplicate, with the above manuals.

13.0 Spare parts:

- The Contractor shall provide parts for initial start-up and commissioning.
- A recommended parts list for two year's operation shall also be submitted and the price for the same should be mentioned separately.
- List shall include part number, part description, serial number and delivery lead time.
- All spare parts furnished by Contractor shall be packaged properly.
- Spare parts shall be clearly marked "Spare Parts" and properly tagged and coded.
- "Spare Parts" shall be shipped along with the equipment.
- Package list shall be furnished so that the parts can be handled without uncrating if required.

14.0 Training:

Vendor shall give training to the purchaser's engineers, regarding operation and maintenance of the heater package and its associated equipment.

15.0 Quotation:

Quotation for the complete heater package shall include: basic cost of the equipment, packaging & freight/transport charges and taxes (*as applicable*), installation and commissioning (at IITK) charges etc. The vendor must provide a complete break-up of the various cost components as mentioned above. The offer shall be submitted along with design calculations, scheme, GA drawing, bill of material considered (with make), technical literature etc. for evaluation of the offer.

Note: The bidders shall provide the full details of technical specifications of items offered, along with product information catalogues showing model, make, type, constructional details, materials etc. (*if applicable*) to facilitate speedy evaluation of the quotation. Without this information the purchaser reserves full right to reject the offer for evaluation.

16.0 Deviations / Exclusions

Deviations (*if any*) from the specifications should be clearly specified in the offer. Any equipment/parts/system required to make the heater package complete and safe and meet design parameters shall be supplied by the supplier.

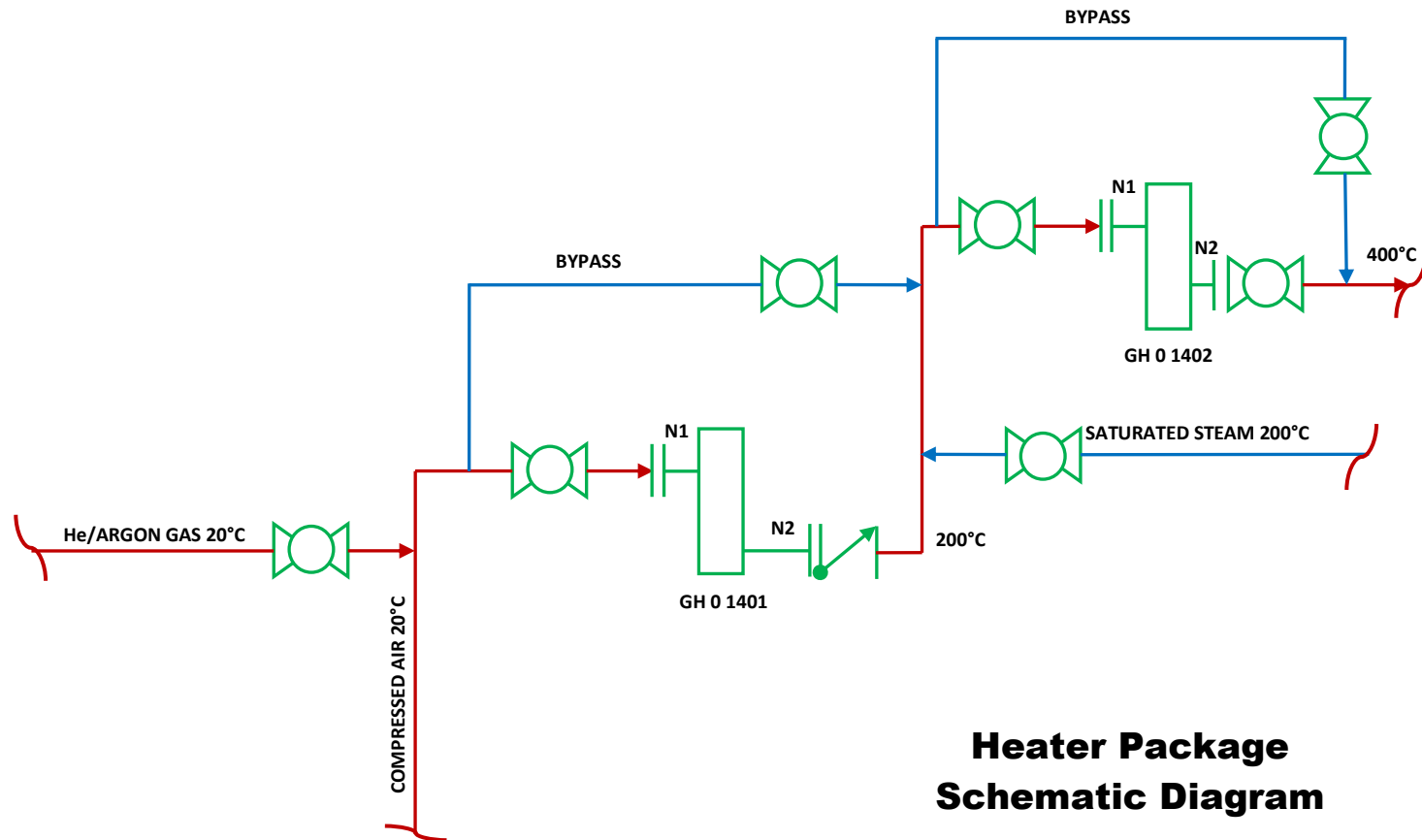
Any exclusion, (*if any*) needs to be specified separately. Vendor giving complete package will only be preferred. Vendor can quote optional price if required for certain items and shall supply the same if order is placed for the same.

Any deviations from this specification shall be clearly given in writing at the tendering stage. Absence of such comment, assumes full compliance. Any subsequently discovered short-falls will be rectified at no extra cost to the Purchaser.

17.0 Warranty:

Vendor shall give warranty for all the equipment and instruments supplied under this tender for **18 months from date of supply or 12 months from date of acceptance at site**. Vendor shall have total responsibility for the design and performance of all the equipment furnished during the warranty period. Vendor shall warrant that the equipment furnished and the performance of the said equipment is in accordance with this specification and general codes.

Annexure-I



**Heater Package
Schematic Diagram**

National Aerosol Facility

Terms & Conditions (General & Financial)

PART-II

General terms and conditions:

1. The Bidder shall bear all costs associated with the preparation and submission of its bid, and in any case IIT, Kanpur (IITK) will not be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.
2. It is in the bidder's interest to visit the site and understand the local conditions. IITK shall not be held responsible for any cost implications because of local conditions or for bidder not visiting site.
3. The bid prepared by the bidder and all correspondence and documents relating to the bid exchanged by the Bidder and IITK shall be written in English language.
4. Bidder is advised to submit the technical and price bid in a sealed envelope. Both the documents will be opened at the same time.
5. The bid and all attached documents should be signed by the bidder as a token of acceptance.
6. IITK has to finalize its purchase within a limited time schedule. Therefore, it may not be feasible for IITK to seek clarifications in respect of incomplete offers. Prospective bidders are advised to ensure that their bids are complete in all respects and fulfil IITK's terms, conditions and bid evaluation criteria of the tender. Bids not complying with IITK's requirement may be rejected without seeking any clarification.
7. Bidder has to sign a **Non-Disclosure Agreement** with IITK. Any technical document, drawings in the form of soft or hard copy shall not be disclosed to anybody outside the working team. All the hard copies shall be destroyed immediately after the use.
8. The bidder should **submit a declaration** to the effect that neither the bidder themselves, nor any of its allied concerns, partners or associates or directors or proprietors involved in any capacity, are currently serving any banning orders issued by IITK debaring them from carrying on business dealings with IITK.
9. Bidders should quote prices in Indian rupee only. Prices quoted in any other currency shall not be considered.
10. The **Bid shall be valid for acceptance for the period of 90 Days** and shall not be withdrawn on or after the opening of bids till the expiration of the validity period or any extension agreed thereof.
11. **The earliest period by which the job can be executed in total should be clearly stated in the quotation and such period should be strictly adhered to in the event of a work-order.**
12. Bids qualified by vague and indefinite expressions such as "Subject to availability" etc. will not be considered.
13. The bid along with all technical details, appendices and copies of documents should be submitted to IITK. The Technical bid shall contain all details required as per the specifications.
14. In case the bidder needs to clarify and/or understand the full scope of his work before submitting the quotation, he may do so by taking prior appointment or by writing email to **Prof. S. N. Tripathi, CE Dept., IIT Kanpur** (e-mail id snt@iitk.ac.in). The Client will respond by email to such requests and copies of the response (including an explanation of

query but without identifying the source of enquiry) will be sent to all invited bidders who intend to submit the proposal, and also posted at Tenders link of IITK website (if found necessary).

15. The successful bidder shall be responsible for the correctness and accuracy of the drawings, documents and reports prepared by him. Approval of the drawings and documents by IITK/their representative shall not relieve him of his responsibility for correctness and accuracy of such drawings and documents. No compensation or extra payment shall be made by IITK for any correction or changes made in the execution work.
16. Bidders should ensure that they qualify for all the items of the assignment. The bidders shall have experience and expertise in the scope of work as detailed in this tender.
17. Bidder must have at least three similar jobs executed, and the name of the organization for which the works were carried out should be furnished with the Bid. Copy of Completion Certificate may be furnished.
18. The acceptance of bids will rest with Director, IITK who does not bind himself to accept the lowest bid and reserves to himself the authority to reject any or all the bids received without assignment of any reason. Also, Director, IITK reserves to himself the right to accept the whole or any part of the bid and the bidder shall be bound to perform the same at the rate quoted.

Commercial terms & conditions:

1. The bids will be evaluated on the basis of technical suitability and financial quotation.
2. Technical and price bids should be submitted in a single sealed envelope along with all the relevant details and documents. The reference of our enquiry should be clearly written on the top of the envelope. The bid should be addressed to **Prof. S. N. Tripathi**, Department of Civil Engineering, IITKanpur, Kanpur-208016 and should reach IIT Kanpur on **or before the due date as mentioned in the cover page.**
3. Price bids should clearly mention the detailed price break-up of scope of work as given in Part-I of tender and taxes separately for supply and installation jobs. **If the tax value differs for different items, these shall be mentioned separately.**
4. Technical evaluation will be based on the criteria detailed in the General Terms and Conditions and the scope of work as given in Technical Specifications. If required, evaluation of the bidder's resources would be undertaken by the client by visiting the bidder's premises.
5. IITK is partially/fully exempted from payment of customs/excise duty, if applicable. As the above statutory provisions are frequently reviewed by the Govt., the bidders are advised to check the latest position in their own interest and IITK will not bear any responsibility for any incorrect assessment of the statutory levies by any bidder.

6. Government of India's guidelines on **GST** shall be complied.
7. The Bid Security is required to protect the IITK against the risk of Bidder's conduct which would warrant the security's forfeiture. **The value of bid security is mentioned in the cover page.**
8. Central Government Departments and Central Public Sector Undertakings are exempted from payment of Bid Security. MSEs units (and not their dealers/distributors) who are themselves manufacturer of the items/ provider of services, they intend to quote which are themselves registered with District Industry Centers or Khadi and Village Industries Commission or Khadi and Village Industries Board or Coir Board or National Small Industries Corporation or Directorate of Handicrafts and Handloom or any other body specified by Ministry of MSME are also exempted from payment of Bid Security irrespective of monetary limit mentioned in their registration certificate provided they are registered for the Services they intend to quote.
9. The Bid Security shall be acceptable in the following form: Bank Draft in favour of '**REGISTRAR, IIT Kanpur**', payable at Kanpur.
10. The bidders shall submit Bank draft / Bank Guarantee from any scheduled bank incorporated in India.
11. The Bid Security shall be forfeited by IITK in the following events:
 - 11.1. If Bid is withdrawn during the validity period or any extension thereof duly agreed by the Bidder.
 - 11.2. If Bid is varied or modified in a manner not acceptable to IITK during the validity period or any extension of the validity duly agreed by the Bidder.
 - 11.3. If a Bidder, having been notified of the acceptance of its bid, fails to furnish **Performance Bank Guarantee (PBG)** within 30 days of notification of such acceptance.
 - 11.4. In case at any stage of tendering process, it is established that bidder has submitted forged documents/certificates/information towards fulfilment of any of the tender/contract conditions.
12. The Bid Security of unsuccessful Bidders will be returned after finalization of the bid.
13. The Bid Security of successful bidder will be returned on receipt of **Performance Bank Guarantee (PBG)**. **The validity of PBG would cover the period starting from the acceptance of the contract to the end of the warranty period.**
14. If the contract is awarded, the bidder shall furnish the **Performance Bank Guarantee (PBG) for the value of 10% of the overall cost (excluding taxes) to IIT, Kanpur.** This

PBG will be released after the guarantee period is over by IITK based on the satisfactory performance of supplied system/item.

15. **80% funds (installation and commissioning cost excluded) may be released** after delivery of items and balance **20% on completion of the scope of work**. All the payments for installation & commissioning will be paid **only at the completion of the job**.
16. IITK shall make payments only through Electronic Payment mechanism (viz. NEFT/RTGS/ECS). A successful Bidder should invariably provide the required bank details as and when required by IITK.

General Notes to Bidder/Supplier:

1. **Pre-dispatch inspection at supplier's factory is needed. Post supply inspection is not permitted.**
2. The facility for pre-dispatch inspection / testing for the indented item shall be available with the supplier. Inspection of all the items ordered shall be carried out in presence of purchaser's representative at the supplier's factory. The inspector shall approve the test results, after witnessing the test. This includes the tests for all the requirements mentioned in the indent specifications. Supplier shall provide all the inspection, testing facilities and test reports.
3. Shipping clearance will be issued only after the satisfactory test results.
4. All the relevant catalogues, manufacturer's test certificates in standard format and Operation & Maintenance Manual shall be submitted along with the material.
5. The material shall conform strictly to the relevant specifications and standards.
6. The supplier shall submit a certificate for guarantee of the material/service against any defects **for 18 months from the date of supply or 12 months from the date of installation.**
7. The material shall be properly packed to avoid damage of any kind during transit. IITK is not responsible for any damage during transit. The safe door delivery at IITK is in the scope of supplier.
8. All the work mentioned in the tender document shall be executed at **National Aerosol Facility (NAF), IIT-Kanpur, Kanpur-208016, UP.**