

**Indian Institute of Technology, Kanpur**  
**Civil Engineering Department**

**Request for Proposal**

The Director, Indian Institute of Technology Kanpur (IITK) invites proposal in single 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, Testing, Supply, Guarantee, Documentation and Delivery of Control Valves and accessories as per Scope of supply covered in Part-I and Technical specifications covered in Part-II of this document for National Aerosol Facility at IIT, Kanpur	Rs. 15000/-	18.05.2018 upto 1700 Hrs  <b>Revised Date</b> <b>28.05.2018</b> <b>upto 1700 Hrs</b>  <b>Re-revised Date</b> <b>04.06.2018</b> <b>upto 1700 Hrs</b>	19.05.2018 at 1500 Hrs  <b>Revised Date</b> <b>29.05.2018</b> <b>upto 1700 Hrs</b>  <b>Re-revised Date</b> <b>05.06.2018</b> <b>upto 1700 Hrs</b>

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 18.05.18 (**revised date of submission 28.05.2018 up to 1700 hrs**), **Re-revised date of submission is 04.06.2018 up to 1700 hrs**. The tender document with eligibility criteria and other details may be downloaded from [www.iitk.ac.in](http://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/2017-18/0301, dated: 25.04.2018**

**Dr. S.N. Tripathi,**  
**Civil Engineering Department,**  
**Indian Institute of Technology Kanpur.**  
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**Phone: 0512-259 7845**

## **SPECIFICATIONS FOR CONTROL VALVES**

### **PART-I: SCOPE OF SUPPLY:**

Design, manufacture, inspection, testing, delivery and guarantee of Control Valves with necessary accessories (Positioner, air set etc..) as follows. Each valve shall be supplied with individual detailed test reports, operating & maintenance manuals.

Sl. No.	ITEM	QUANTITY
1	Helium Flow Control Valve (size 15NB) (FCV-0101)	1
2	Helium Flow Control Valve (size 25NB) (FCV-0102)	1
3	Air Flow Control Valve (size 25NB) (FCV-0104)	1
4	Steam Flow Control Valve (size 25NB) (FCV-0105)	1
5	Helium Pressure Control Valve (size 25NB) (PCV-0101A)	1
6	Helium Pressure Control Valve (size 15NB) (PCV-0101B)	1
7	Air Pressure Control Valve (size 25NB) (PCV-0104)	1
8	Steam Pressure Control Valve (size 25NB) (PCV-0105)	1
9	Argon Pressure Control Valve (size 25NB) (PCV-0106)	1
10	Gas Mixture Pressure Control Valve (size 25NB) (PCV-0161)	1

## **PART-II: TECHNICAL SPECIFICATIONS**

### **1. GENERAL:**

This specification, together with the associated valve specification sheets describes the technical requirements for the design, manufacture, inspection and testing of Control Valves needed for an aerosol facility.

### **2. REQUIREMENTS FOR VALVES:**

#### **2.1 GENERAL:**

The valves specified herein shall be designed and fabricated in accordance with the provisions of ASME Sec VIII. When specific requirements are mentioned against any particular valve, the manufacturer shall take these things into account in designing that valve.

The design and construction of the valves shall be appropriate for long life and trouble free power plant service for the conditions listed on the pertinent valve specification sheets.

Materials and standard parts which are specifically designated herein shall be of good quality and in accordance with the best practice in the manufacture of valves and operators.

Workmanship shall be in accordance with the best practice, adequate to ensure satisfactory operation, service life and ease of maintenance so as to meet the requirements of this specification.

All materials shall be selected by the contractor to appropriate ASTM Specifications except that propriety materials may be used for special items such as valve trim, subject to approval by the purchaser. The specific requirements and service conditions for each application shall be as defined in appropriate valve specification sheets.

These valves will handle steam, Helium, Argon and Air services.

#### **2.1.1 VALVE BODIES & BONNETS**

The rating shall be as specified on the appropriate valve specification sheet and in accordance with ASME Sec. VIII and ANSI B 16.5. Minimum wall thickness for all standard pressure rated valves shall be as per ASME Sec. VIII or ANSI B-16.5.

For valves under this specification having butt welding ends, the end to end dimensions shall not exceed those defined in ANSI B16.10.

The following materials are considered suitable by the purchaser for valve bodies and bonnets.

- a. CARBON STEEL - ASTM A216 Grade WCB or ASTM A105. Tests shall be performed to ensure that residual elements do not exceed the limits stated in Table I of ASTM A216
- b. STAINLESS STEEL – ASTM A182 Grade F304 or ASTM A351 Grade CF8.

Any welds in pressure containing parts of the valve or extensions thereto, other than repair welds in casting and forging, shall be full penetration butt welds. All welds, including repair welds to castings and forgings, shall be performed in accordance with part UW, section VIII of the ASME boiler and pressure vessel code. The general requirements of all relevant sub-paragraphs shall apply with the following additional requirements and deviations.

- a. Reference to inspection procedures shall be supplemented by those specified in Section 3 herein.
- b. The maximum radial off-set at the inner surfaces of butt welds shall not exceed the max. Off-set valves given in part UW-33 of ASME Sec VIII.

The closure at the joint between the body and the bonnet or other similar openings shall meet the design requirements of part UW of ASME Sec. VIII and can be either bolted type with metallic gaskets (ring joint, retained flexitallic gaskets or similar types) or any other special or patented type provided the requirements of part UW of ASME Sec. VIII are fully met.

The bidder shall clearly describe the proposed method of closure. Alternative to those listed above shall be subject to the approval of purchaser. The finish on all unmachined internal and external surfaces shall be 10 micrometers RMS or better.

### **2.1.2 VALVE TRIM**

The design and materials for the valve trim shall provide maximum protection against the effects of corrosion, erosion, galling and leakage. The trim material shall be SS 316 & stellited for surface hardness of >RC40. Valve seats (including back-seat), plugs, discs shall be hard faced.

The stems shall be chromium plated or hardened to a hardness approved by purchaser. The surface finish on the stem shall be 0.8 micrometers RMS or better. The materials for other trim components shall be selected by the contractor for the particular service conditions shown on the valve specification sheet.

Where a special plug form is required, this is shown on the appropriate valve specification sheet.

### **2.1.3 VALVE STEM SEALING ARRANGEMENT**

For all control valves, the stem gland packing shall be either as listed in respective datasheets or approved equal.

### **2.1.4 BACK SEATS**

When seated on the valve specification sheet, valves shall be provided with back seats.

### **2.1.5 THREADED FASTENERS**

The materials used for all pressure bearing threaded fasteners shall confirm to the following:

- a. Bolts and studs- ASTM A193, Grade 87
- b. Nuts- ASTM A194, Grade 2H

All threads shall be unified series screw threads and shall confirm to ANSI B1.1. All threaded pressure retaining fasteners shall be provided with corrosion resistant devices; frictional locking devices are not acceptable. Standard metric threads are also acceptable.

## **2.2 VALVE POSITION INDICATORS**

All valves shall be provided with a valve position indicator marked to show open and shut positions. For valves with operators the position indicator may be provided on the operator only.

## **2.3 INTERCHANGEABILITY**

Components and spare parts of valves and operators shall be interchangeable among valves of one size, and elsewhere to the maximum practical extent.

## **2.4 VALVE MARKING AND IDENTIFICATION**

Valve marking and identification shall be in accordance with part UG of ASME Sec. VIII.

The purchaser shall provide an identification tag number for each valve. The contractor shall provide metallic tags and securely attach this identification tag to the valve with corrosion resistant wire after inscribing the appropriate tag number on it.

If any operator is packaged or shipped disassembled from the valve, the contractor shall tag the operator with the same identification number as the valve.

## **2.5 REQUIREMENTS FOR PNEUMATIC ACTUATOR**

### **2.5.1 GENERAL**

All actuators shall be suitable for long life. The general arrangement of the valve and the operator shall be suitable for handling fluids at the temperature specified on the valve specification sheets. The available air supply provides clean, oil free, dry air (-40°C dew point). The supply air pressure of each valve is stated on the individual specification sheet.

The design and selection of individual operators will be such as to ensure:

a. For spring and diaphragm type:

1. That the valve will fully stroke with a pressure of not more than 50% of the supply pressure, namely 7 Kg/cm<sup>2</sup> in the direction requiring increasing pressure and

2. that the valve will fully stroke with a pressure of not less than 15% of supply pressure, in the direction requiring decreasing pressure.

b. For valves supplied with positioners, the requirements of 'a' above shall be met without being limited by the positioners.

Notwithstanding the foregoing, the intent is to provide actuators as small and compact as possible. All pneumatic actuators shall be capable of withstanding full supply air pressure (7 Kg/cm<sup>2</sup>).

All actuators shall be sized to open or close the valve with a differential pressure across the valve equal to the specified maximum pressure at inlet unless stated otherwise on the valve specification sheet. The contractor shall state the actual actuator pressures required for each valve on the pertinent valve drawings, submitted as required for approval by the purchaser.

The actuator action shall be as indicated on the valve specification sheet (air-to-close, or double acting).

When indicated on the valve specification sheet, the contractor shall supply a suitable filter and/or pressure regulator to suit the air pressure selected or specified for the actuator.

A steam travel indicator with open and close indication shall be provided on each pneumatic actuator.

The valve stem extension and/or the push-rod from the actuator shall be guided or otherwise fixed to prevent rotation.

Each diaphragm actuator shall have provision for mounting solenoid pilot valves. This shall consist of two suitable holes in the operator frame or yoke to which a bracket with the solenoid valves may be attached using 6mm bolts.

### **2.5.2 PNEUMATIC DIAPHRAGM ACTUATORS**

Pneumatic Diaphragm actuators shall conform to all the general requirements of section 2.5.1 above. Diaphragm material shall be subject to approval by the purchaser.

### **2.5.3 LIMIT SWITCHES FOR VALVE POSITION INDICATORS**

When called for on the valve specification sheet, adjustable limit switch contacts shall be provided as follows:

1 - Form C contact to actuate in the region of the closed position- contact actuation to be adjustable from fully closed to at least half-open.

1 - Form C contact to actuate in the region of the closed position –contact actuation to be adjustable from fully open to at least half-closed.

The above limit switches shall be suitable for 1 ampere (resistive) at 240 Volt AC or 48 Volt DC. Switches shall be enclosed in weatherproof NEMA 3 enclosures.

The mounting of the limit switches or of the limit switch actuating mechanism shall be such as to permit smooth continuous adjustment and the exact fixing of the switch actuating point. The design of the actuating mechanism shall be such as to permit the use of calibration blocks to confirm actuating points by a “go, no-go” test and to confirm the adequacy of switch over-travel without moving the valve.

## **2.6 REQUIREMENTS FOR VALVE POSITIONERS**

All control valves shall be equipped with pneumatic positioners unless specifically exempted on the valve specification sheet. The positioner shall be selected, supplied, and mounted by the contractor to suit the requirements listed below.

Where input signal 0.2 to 1 Kg/cm<sup>2</sup> to positioner is expressed in percentage on valve specification sheets, this is to be taken as percent of signal span, where span is defined under section 2.8.

The bidder shall provide and mount the positioner and necessary interconnections. Tubing connections shall be made using 6 mm or 10mm copper tubing and compression fittings. The contractor shall calibrate the computing assembly.

Where indicated on the valve Specification Sheet control valves shall be characterized to provide the required valve stem position to input output relationship. The characterizing may be done by shaping the internal valve trim and/or a characterizing positioner.

## **2.7 STATIC PERFORMANCE REQUIREMENTS**

All control valves, with or without positioner, shall meet the following requirements.

- a. The dead band shall be less than 2% of the input span
- b. The hysteresis shall be less than 2% of the output span

Input span, above, is that range of input signal to the positioner (or the valve if no positioner is used) over which the valve moves in the closed position to fully open position or vice-versa

## **2.8 VALVE STEM PACKING ADJUSTMENT**

Under the service conditions specified on the specification sheet, say for the stem packing adjusted to satisfy the hydrostatic test and seat leak test required by section 3.3 all control valves shall satisfy the static and dynamic requirements specified by sections 2.7 and 2.8 above.

No adjustment shall be made to the stem packing adjustment of control valves after the satisfactory completion of tests. Exposed threads of gland studs and the adjacent surfaces of nuts for gland adjustment shall be sealed temporarily by the liberal application of an adhesive material such as Loktite or silicone rubber paint. Each packing gland shall be fitted with a durable metal or plastic tag, wired-on with corrosion resistant wire, bearing inscription in block capitals "DO NOT ADJUST PACKING GLAND". This tag shall be supplied by the contractor.

### **3. INSPECTION AND TESTING**

#### **3.1 GENERAL**

The materials, components and completed valve assemblies shall be inspected and tested as defined below.

The bidder shall be responsible for and shall provide for and perform all the inspection and testing specified herein. Inspection and testing shall be conducted in a manner satisfactory to and shall be subject to approval by the purchaser. Detailed procedure for all tests shall be submitted to the purchaser for approval prior to actual testing.

The purchaser and his authorized agencies shall have access to the contractor's premises at all reasonable times to the extent necessary to assess compliance with the provisions of this specification. The purchaser shall also have the right to conduct at his own expense any additional inspection or testing he seems necessary.

#### **3.2 INSPECTION ON TEST FAILURE**

In the event of failure of the valve or any part thereof to meet fully any inspection or test requirements specified herein, the contractor shall obtain permission from the purchaser before repair or subsequent use of each equipment or part. If the repairs including redesign are likely to affect the results of tests or work previously completed, appropriate re-inspection and re-testing shall be conducted.

Permission from the purchaser is not required to perform weld repairs on castings. However, a report shall be made on casting repairs describing the location and extent of repairs to each casting.

#### **3.3 HYDROSTATIC TEST**

A shell hydrostatic test and disc hydrostatic test shall be carried out on each valve in accordance with the code requirements.

The temperature of water used for hydrostatic test shall be as per ASME Section VIII. For disc hydrostatic test the differential pressure and the test time shall be as per the provisions of the code.

Hydrostatic test pressure shall be maintained a minimum of 15 min. For each inch of design minimum wall thickness but for not less than 10 min. The hydrostatic shall be performed before painting the valve.

In addition to the above tests, a seat (including back seat) leakage test shall be carried out on each valve as per the procedure outlined in the document no.FCI-70-2, (Quality control standards for control valve seat leakage) of Fluid Controls Institute Inc. The allowable leakage rate shall be that of Class IV of the above document. The duration of the tests shall not be less than 5 min.

### **3.4 FUNCTIONAL TEST REQUIREMENTS**

#### **3.4.1 STATIC PERFORMANCE TEST**

The fully assembled control valve shall be tested to demonstrate conformity with the requirements of Section 2.7 with the stem packing adjusted to satisfy simultaneously Section 2.9 & 3.3.

The test procedure shall be submitted by the contractor and shall be subject to approval by the purchaser prior to its use. The contractor shall notify the purchaser and the authorized inspection agency of the date and location of the test sufficiently in advance to enable either or both to be present.

### **3.5 EXAMINATION OF PRODUCT**

The completed valve shall be examined to determine its conformance with this specification with respect to material, workmanship, finish, markings and dimensions and to assess its conformance with other requirements stated or reasonably implied and not covered by specific tests.

## **4. DOCUMENTATION:**

The contractor shall submit following documentation to the purchaser.

- a. Mill Test Reports of chemical analysis and physical properties. Reports for casting shall be identified with the heat and item number of the particular casting.
- b. Copies of Radiography Test Reports accompanied by radiographic film and casting defect chart or drawing identifying film locations. These reports shall also be identified with the item number of the particular casting.
- c. A copy of welding operators and welding procedure records of qualification.
- d. Reports of heat treatment including furnace charts, and for castings, identification of the item number of the particular components.
- e. Reports of Magnetic particle and Dye Penetrant inspection identified with particular components.
- f. Test reports of hydrostatic and seat leak tests.
- g. Instruction & service manuals covering installation, operation and maintenance of valves & operators.
- h. Assembly & component drawing.
- i. Inspection history docket.

## PART-III

### NOTES TO THE BIDDERS

1. **Range-ability of various control valves:** The desired flow ranges are given in the attached datasheets for respective valves. However, the vendor must specify if the valve(s) being offered can cater to a wider flow range without altering the cost. The wider range suggested for each valve should be mentioned. Vendor offering valves with higher range-ability will be preferred.
2. Only manufacturers of valves shall quote. The supplier shall give the quotation in the same format as given in the compliance statement. The compliance statement for individual quoted valves shall be filled in all respects, failing this quotation will not be considered for evaluation.
3. The bidder must comment point by point on acceptability or otherwise each of the clause of specification. Any deviation between specification and offered product should refer to compliance statement and are to be clearly brought out.
4. The bidder shall indicate in his quotation the delivery schedule in terms of weeks from the date of placement of the order.
5. The prices shall be quoted on Ex-works basis and shall be inclusive of packaging charges. Taxes, duties, insurance, P&F etc. shall be clearly mentioned in the bid for all the items quoted.
6. The bidder should specify the guarantee period of the instrument.
7. The bidders should quote for the accessories separately. They should also give a list of recommended spare parts for efficient use of the instrument for about 5years and separately quote for the same.
8. Bidder should also mention all the existing test facilities available with them in their bid.
9. The bidder shall arrange for predispatch inspection at his premises, by the purchaser or his authorized representative for functional & performance verification as specified in Annexure-I of this document. Unless the material is released for shipment by the purchaser or his authorized representative after inspection, the material should not be shipped.
10. Purchaser reserves the option to place the order for all the items or part of it. The bidder should confirm whether the prices quoted are valid for part order also.
11. *Foreign* bidders are requested to quote in *foreign exchange* as well as in *Indian Rupees* for all the items.
12. Documentation:
  - a. The bidder should provide detailed Catalog of specified type/specification sheets etc. along with the quotation.
  - b. The bidder should provide along with each instrument an operation and maintenance manual giving construction details and test certificates.

## PART-IV: GENERAL & FINANCIAL TERMS & CONDITIONS

### **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 debarring 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](mailto: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, IIT Kanpur, 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.**
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.**

**DATASHEET FOR CONTROL VALVE: FCV- 0104**

1. Tag No. FCV-0104					ACCESSORIES	
2. Application : Air Flow Control Valve					POSITIONER	Smart Positioner
3. Design Type : Globe - Control					32. Type	I/P Positioner
OPERATING CONDITIONS					33. Input Range	0.2 to 1 Kg/Sq.Cm
4. Fluid : Air					INDICATION	34. Continuous position indication 35. Air Supply Status Indication
5. Design Pressure: 10 bar(g), Design Temperature:100°C					AIR SET	Yes Required
Unit Max Nor Min					LIMIT SWITCH	Required 1) Open (1 Nos.) 2) Close (1 Nos.)
6. Flow	Kg/Hr	80		1.9	BOOSTER RELAY	*
7. Inlet Press	Bar (g)	4.0		0.0		
8.Outlet Press	Bar (g)	4.0		0.0		
9. Press Drop	Bar				HAND WHEEL	----
10. Temp	°C	60		5	36. Tube connector Size	6 mm
11. MW		28.96			37. Paint Color	Blue/Grey
12. % Flow		*	*	*	38. Mech. Stopper	Yes
13. Cv Value		*			OPERATING TIME	* (not more than 5 secs)
14. Shut Off Pressure		10 Bar			TESTS	Required
VALVE BODY					39. Hydrostatic (Shell)	
15. Size- Class	25 NB, ANSI 150 #				40. Seat Leakage	Class IV
16. Material	ASTM A 216 Gr. WCB (**)				41. Non Destructive	Radiographic & Ultrasonic Tests Required
17. Style	Globe				42. Other Tests	Cv, Actuator tests
18. Seating	Single Seating				TEST SET UP AVAILABLE WITH BIDDER:	
19. End Connections & Rating	Flanged for 25NB Sch 40 Pipe. Rating ANSI 150 #				1. Cv Measurement Facility <input type="checkbox"/> Y / N	
VALVE BONNET					2. Characteristic Measurement Facility <input type="checkbox"/> Y / N	
20. Type	Standard				NOTES: 1. The Valves are to conform to all applicable requirements of specification given in Tender Technical Specification & Class II of ASME Sec III. 2. Characteristic curves required. 3. Back seat required 4. * Manufacturer to specify 5. ** Vendor may suggest alternative if any.	
21. Material	Same as body					
22. Stem Packing	PTFE					
VALVE TRIM						
23. Type/Size	Contour, Solid/*					
24. Travel (mm)	*					
25. Flow Direction	Under seat					
26. Material	SS 316L					
27. Characteristics	Equal %					
ACTUATOR						
28. Type	Diaphragm					
29. Action	Spring to close					
30. Supply	2.8 Kg/sq .cm					
31. Supply Failure Position	Air to open Air fail to close					

**DATASHEET FOR CONTROL VALVE: PCV- 0104**

1. Tag No. PCV-0104					ACCESSORIES	
2. Application : Air Pressure Control					POSITIONER	Smart Positioner
3. Design Type : Globe - Control					32. Type	I/P positioner
OPERATING CONDITIONS					33. Input Range	0.2 to 1 Kg/Sq.Cm
4. Fluid : Air					INDICATION	34. Continuous position indication 35. Air Supply Status Indication
5. Design Pressure:10 bar(g), Design Temperature:100°C						
Unit Max Nor Min					AIR SET	Yes Required
6. Flow	Kg/Hr	80		2.3	LIMIT SWITCH	Required 1) Open (1 Nos.) 2) Close (1 Nos.)
7. Inlet Press	Bar (g)	6.5		4.0		
8.Outlet Press	Bar (g)	4.0		0.0		
9. Press Drop	Bar				BOOSTER RELAY	*
					HAND WHEEL	----
10. Temp	°C	60		5		
11. MW		28.96			36. Tube connector Size	6 mm
12. % Flow		*	*	*	37. Paint Color	Blue/Grey
13. Cv Value		*			38. Mech. Stopper	Yes
14. Shut Off Pressure		10 Bar			OPERATING TIME	* (not more than 5 secs)
VALVE BODY					TESTS	
15. Size- Class		25 NB, ANSI 150 #			39. Hydrostatic (Shell)	Required
16. Material		ASTM A 216 Gr. WCB (**)			40. Seat Leakage	Class IV
17. Style		Globe			41. Non Destructive	Radiographic & Ultrasonic Tests Required
18. Seating		Single Seating			42. Other Tests	Cv, Actuator tests
19. End Connections and Rating		Flanged for 25 NB Sch 40 Pipe, ANSI 150 #			TEST SET UP AVAILABLE WITH BIDDER:	
VALVE BONNET					1. Cv Measurement Facility <input type="checkbox"/> Y / N	
20. Type		Standard			2. Characteristic Measurement Facility <input type="checkbox"/> Y / N	
21. Material		Same as body				
22. Stem Packing		PTFE				
VALVE TRIM					NOTES:	
23. Type/Size		Contour, Solid/*			1. The Valves are to conform to all applicable requirements of specification given in Tender Technical Specification & Class II of ASME Sec III.	
24. Travel (mm)		*			2. Characteristic curves required.	
25. Flow Direction		Under seat			3. Back seat required	
26. Material		SS 316L			4. * Manufacturer to specify	
27. Characteristics		Equal %			5. ** Vendor may suggest alternative if any.	
ACTUATOR						
28. Type		Diaphragm				
29. Action		Spring to close				
30. Supply		2.8 Kg/sq .cm				
31. Supply Failure Position		Air to open Air fail to close				

**DATASHEET FOR CONTROL VALVE: PCV- 0106**

1. Tag No. PCV-0106					ACCESSORIES	
2. Application : Argon Pressure Control					POSITIONER	Smart Positioner
3. Design Type : Globe - Control					32. Type	I/P positioner
OPERATING CONDITIONS					33. Input Range	0.2 to 1 Kg/Sq.Cm
4. Fluid : Argon***					INDICATION	34. Continuous position indication 35. Air Supply Status Indication
5. Design Pressure: 10 bar(g), Design Temperature: 100°C						
Unit      Max      Nor      Min					AIR SET	Yes Required
6. Flow***	Kg/Hr	10		0.5	LIMIT SWITCH	Required 1) Open (1 Nos.) 2) Close (1 Nos.)
7. Inlet Press	Bar (g)	6.5		4.0		
8.Outlet Press	Bar (g)	4.0		0.0	BOOSTER RELAY	*
9. Press Drop	Bar				HAND WHEEL	----
10. Temp	°C	45		5		
11. MW		40			36. Tube connector Size	6 mm
12. % Flow		*	*	*	37. Paint Color	Blue/Grey
13. Cv Value		*			38. Mech. Stopper	Yes
14. Shut Off Pressure		10 Bar			OPERATING TIME	* (not more than 5 secs)
VALVE BODY					TESTS	Required
15. Size- Class		25 NB, ANSI 150 #			39. Hydrostatic (Shell)	
16. Material		ASTM A 216 Gr. WCB (**)			40. Seat Leakage	Class IV
17. Style		Globe			41. Non Destructive	Radiographic & Ultrasonic Tests Required
18. Seating		Single Seating			42. Other Tests	Cv, Actuator tests
19. End Connections and Rating		Flanged for 25 NB Sch 40 Pipe, ANSI 150 #			TEST SET UP AVAILABLE WITH BIDDER:	
VALVE BONNET					1. Cv Measurement Facility <input type="checkbox"/> Y / N	
20. Type		Standard			2. Characteristic Measurement Facility <input type="checkbox"/> Y / N	
21. Material		Same as body				
22. Stem Packing		PTFE			<u>NOTES:</u>	
VALVE TRIM					1. The Valves are to conform to all applicable requirements of specification given in Tender Technical Specification & Class II of ASME Sec III. 2. Characteristic curves required. 3. Back seat required 4. * Manufacturer to specify 5. ** Vendor may suggest alternative if any. 6. ***If the same valve is to be used for Helium, please provide the flow rangeability for the same.	
23. Type/Size		Contour, Solid/*				
24. Travel (mm)		*				
25. Flow Direction		Under seat				
26. Material		SS 316L				
27. Characteristics		Equal %				
ACTUATOR						
28. Type		Diaphragm				
29. Action		Spring to close				
30. Supply		2.8 Kg/sq .cm				
31. Supply Failure Position		Air to open Air fail to close				

**DATASHEET FOR CONTROL VALVE: PCV- 0161**

1. Tag No. PCV-0161					ACCESSORIES		
2. Application: Scrubber Pressure Control Valve					POSITIONER	Smart Positioner	
3. Design Type : Globe - Control					32. Type	I/P positioner	
OPERATING CONDITIONS					33. Input Range	0.2 to 1 Kg/Sq.Cm	
4.Fluid:Helium/Air/Steam/any two mixture***					INDICATION	34. Continuous position indication 35. Air Supply Status Indication	
5. Design Pressure: 10 bar (g) Temperature: 400 °C							
Unit Max Nor Min					AIR SET	Yes Required	
6. Flow	Kg/Hr	***		***	LIMIT SWITCH	Required 1) Open (1 Nos.) 2) Close (1 Nos.)	
7. Inlet Press	Bar (g)	4.0		0.0			
8.Outlet Press	Bar (g)	0.0		0.0			
9. Press Drop	Bar				BOOSTER RELAY	*	
10. Temp	°C	350		5	HAND WHEEL	----	
11. MW		***			36. Tube connector Size	6 mm	
12. % Flow		*	*	*	37. Paint Color	Blue/Grey	
13. Cv Value		*			38. Mech. Stopper	Yes	
14. Shut Off Pressure		10 Bar			OPERATING TIME	* (not more than 5 secs)	
VALVE BODY					TESTS	Required	
15. Size	25 NB, ANSI 300 #				39. Hydrostatic (Shell)		
16. Material	ASTM A 216 Gr. WCB (**)				40. Seat Leakage	Class IV	
17. Style	Globe				41. Non Destructive	Radiographic & Ultrasonic Tests Required	
18. Seating	Single Seating				42. Other Tests	Cv, Actuator tests	
19.End Connections and Rating	Flange for 25 mm NB Sch 40 Pipe, ANSI 300 #				TEST SET UP AVAILABLE WITH BIDDER:		
VALVE BONNET						1. Cv Measurement Facility <input type="checkbox"/> Y / N	
20. Type	Standard				2. Characteristic Measurement Facility <input type="checkbox"/> Y / N		
21. Material	Same as body						
22. Stem Packing	Grafoil						
VALVE TRIM						NOTES:	
23. Type/Size	Contour, Solid/*				1. The Valves are to conform to all applicable requirements of specification given in Tender Technical Specification & Class II of ASME Sec III.		
24. Travel (mm)	*				2. Characteristic curves required.		
25. Flow Direction	Under seat				3. Back seat required		
26. Material	SS 316L				4. * Manufacturer to specify		
27. Characteristics	Equal %				5. ** Vendor may suggest alternative if any.		
ACTUATOR						6. *** Please refer to the table - I enclosed for fluid combination and condition.	
28. Type	Diaphragm						
29. Action	Spring to open						
30. Supply	2.8 Kg/sq .cm						
31. Supply Failure Position	Air to close Air fail to open						

**Table – I: PCV – 0161, Process Fluid Combinations & Flow Ranges**

Tag No.	Line No.	Operation	Gas Composition (mass %)	Service Type	MW	Flow Rates (kg/hr)
PCV-0161	3"-CG-0181-A1K	Upstream Pressure Control	Helium- 100%	Gas+Aerosol	4	0.6 to 11
			Air-100%	Gas+Aerosol	28.96	2.5 to 80
			Steam-100%	Steam+Aerosol	18	1.5 to 48
			Helium- Steam: 50:50	Gas+Steam+Aerosol	6.55	0.65 to 9
			Helium- Steam: 20:80	Gas+Steam+Aerosol	10.59	0.8 to 14
			Helium- Steam: 5:95	Gas+Steam+Aerosol	15.32	1.2 to 32
			Air-Steam: 20:80	Gas+Steam+Aerosol	19.46	1.25 to 36

**DATASHEET FOR CONTROL VALVE: FCV- 0101**

1. Tag No. FCV-0101					ACCESSORIES	
2. Application : Helium Flow Control Valve					POSITIONER	Smart Positioner
3. Design Type : Globe - Control					32. Type	I/P positioner
OPERATING CONDITIONS					33. Input Range	0.2 to 1 Kg/Sq.Cm
4. Fluid : Helium***					INDICATION	34. Continuous position indication
5. Design Pressure: 10 bar (g) Design Temperature: 100 °C						35. Air Supply Status Indication
Unit Max Nor Min					AIR SET	Yes Required
6. Flow***	Kg/Hr	0.45		0.06	LIMIT SWITCH	Required 1) Open (1 Nos.) 2) Close (1 Nos.)
7. Inlet Press	Bar (g)	4.0		0.0		
8.Outlet Press	Bar (g)	4.0		0.0	BOOSTER RELAY	*
9. Press Drop	Bar				HAND WHEEL	----
10. Temp	°C	45		5		
11. MW		4			36. Tube connector Size	6 mm
12. % Flow		*	*	*	37. Paint Color	Blue/Grey
13. Cv Value		*			38. Mech. Stopper	Yes
14. Shut Off Pressure		10 Bar			OPERATING TIME	* (not more than 5 secs)
VALVE BODY					TESTS	
15. Size- Class		15 NB, ANSI 150 #			39. Hydrostatic (Shell)	Required
16. Material		ASTM A 216 Gr. WCB (**)			40. Seat Leakage	Class IV
17. Style		Globe			41. Non Destructive	Radiographic & Ultrasonic Tests Required
18. Seating		Single Seating			42. Other Tests	Cv, Actuator tests
19. End Connections & Rating		Flanged for 25 NB Sch 40 Pipe, ANSI 150 #			TEST SET UP AVAILABLE WITH BIDDER:	
VALVE BONNET					1. Cv Measurement Facility <input type="checkbox"/> Y / N	
20. Type		Standard			2. Characteristic Measurement Facility <input type="checkbox"/> Y / N	
21. Material		Same as body				
22. Stem Packing		PTFE			<u>NOTES:</u>	
VALVE TRIM					1. The Valves are to conform to all applicable requirements of specification given in Tender Technical Specification & Class II of ASME Sec III.	
23. Type/Size		Contour, Solid/*			2. Characteristic curves required.	
24. Travel (mm)		*			3. Back seat required	
25. Flow Direction		Under seat			4. * Manufacturer to specify	
26. Material		SS 316L			5. ** Vendor may suggest alternative if any.	
27. Characteristics		Equal %			6. ***If the same valve is to be used for air, please provide the flow rangeability for the same.	
ACTUATOR						
28. Type		Diaphragm				
29. Action		Spring to close				
30. Supply		2.8 Kg/sq .cm				
31. Supply Failure Position		Air to open Air fail to close				

**DATASHEET FOR CONTROL VALVE: FCV- 0102**

1. Tag No. FCV-0102A					ACCESSORIES		
2. Application : Helium Flow Control Valve					POSITIONER	Smart Positioner	
3. Design Type : Globe - Control					32. Type	I/P positioner	
OPERATING CONDITIONS					33. Input Range	0.2 to 1 Kg/Sq.Cm	
4. Fluid : Helium					INDICATION	34. Continuous position indication 35. Air Supply Status Indication	
5. Design Pressure: 10 bar (g) Design Temperature: 100 °C							
Unit Max Nor Min					AIR SET	Yes Required	
6. Flow	Kg/Hr	11		0.3	LIMIT SWITCH	Required 1) Open (1 Nos.) 2) Close (1 Nos.)	
7. Inlet Press	Bar (g)	4.0		0.0			
8.Outlet Press	Bar (g)	4.0		0.0			
9. Press Drop	Bar				BOOSTER RELAY	*	
					HAND WHEEL	----	
10. Temp	°C	45		5			
11. MW		4			36. Tube connector Size	6 mm	
12. % Flow		*	*	*	37. Paint Color	Blue/Grey	
13. Cv Value		*			38. Mech. Stopper	Yes	
14. Shut Off Pressure		10 Bar			OPERATING TIME	* (not more than 5 secs)	
VALVE BODY					TESTS		
15. Size- Class	25 NB, ANSI 150 #				39. Hydrostatic (Shell)	Required	
16. Material	ASTM A 216 Gr. WCB (**)				40. Seat Leakage	Class IV	
17. Style	Globe				41. Non Destructive	Radiographic & Ultrasonic Tests Required	
18. Seating	Single Seating				42. Other Tests	Cv, Actuator tests	
19. End Connections & Rating	Flanged for 25 mm NB Sch 40 Pipe. ANSI 150 #				TEST SET UP AVAILABLE WITH BIDDER:		
VALVE BONNET						1. Cv Measurement Facility <input type="checkbox"/> Y / N	
20. Type	Standard				2. Characteristic Measurement Facility <input type="checkbox"/> Y / N		
21. Material	Same as body						
22. Stem Packing	PTFE						
VALVE TRIM						NOTES:	
23. Type/Size	Contour, Solid/*				1. The Valves are to conform to all applicable requirements of specification given in Tender Technical Specification & Class II of ASME Sec III.		
24. Travel (mm)	*				2. Characteristic curves required.		
25. Flow Direction	Under seat				3. Back seat required		
26. Material	SS 316L				4. * Manufacturer to specify		
27. Characteristics	Equal %				5. ** Vendor may suggest alternative if any.		
ACTUATOR							
28. Type	Diaphragm						
29. Action	Spring to close						
30. Supply	2.8 Kg/sq .cm						
31. Supply Failure Position	Air to open Air fail to close						

**DATASHEET FOR CONTROL VALVE: PCV-0101A**

1. Tag No. PCV-0101A					ACCESSORIES	
2. Application : Helium Pressure Control					POSITIONER	Smart Positioner
3. Design Type : Globe - Control					32. Type	I/P positioner
OPERATING CONDITIONS					33. Input Range	0.2 to 1 Kg/Sq.Cm
4. Fluid : Helium					INDICATION	34. Continuous position indication 35. Air Supply Status Indication
5. Design Pressure: 10 bar (g) Design Temperature: 100 °C						
Unit    Max    Nor    Min					AIR SET	Yes Required
6. Flow	Kg/Hr	11		0.4	LIMIT SWITCH	Required 1) Open (1 Nos.) 2) Close (1 Nos.)
7. Inlet Press	Bar (g)	6.5		4.0		
8.Outlet Press	Bar (g)	4.0		0.0	BOOSTER RELAY	*
9. Press Drop	Bar				HAND WHEEL	----
10. Temp	°C	45		5	36. Tube Connector Size	6 mm
11. MW		4				
12. % Flow		*	*	*	37. Paint Color	Blue/Grey
13. Cv Value		*			38. Mech. Stopper	Yes
14. Shut Off Pressure		10 Bar			OPERATING TIME	* (not more than 5 secs)
VALVE BODY					TESTS	
15. Size- Class		25 NB, ANSI 150 #			39. Hydrostatic (Shell)	Required
16. Material		ASTM A 216 Gr. WCB (**)			40. Seat Leakage	Class IV
17. Style		Globe			41. Non Destructive	Radiographic & Ultrasonic Tests Required
18. Seating		Single Seating			42. Other Tests	Cv, Actuator tests
19. End Connections and Rating		Flanged for 25 mm NB Sch 40 Pipe., ANSI 150 #			TEST SET UP AVAILABLE WITH BIDDER:	
VALVE BONNET					1. Cv Measurement Facility <input type="checkbox"/> Y / N	
20. Type		Standard			2. Characteristic Measurement Facility <input type="checkbox"/> Y / N	
21. Material		Same as body				
22. Stem Packing		PTFE				
VALVE TRIM		Contour, Solid/*			NOTES:	
23. Type/Size					1. The Valves are to conform to all applicable requirements of specification given in Tender Technical Specification & Class II of ASME Sec III.	
24. Travel (mm)		*			2. Characteristic curves required.	
25. Flow Direction		Under seat			3. Back seat required	
26. Material		SS 316L			4. * Manufacturer to specify	
27. Characteristics		Equal %			5. ** Vendor may suggest alternative if any.	
ACTUATOR						
28. Type		Diaphragm				
29. Action		Spring to close				
30. Supply		2.8 Kg/sq .cm				
31. Supply Failure Position		Air to open Air fail to close				

**DATASHEET FOR CONTROL VALVE: PCV-0101B**

1. Tag No. PCV-0101B				ACCESSORIES	
2. Application : Helium Pressure Control				POSITIONER	Smart Positioner
3. Design Type : Globe - Control				32. Type	I/P positioner
OPERATING CONDITIONS				33. Input Range	0.2 to 1 Kg/Sq.Cm
4. Fluid : Helium				INDICATION	34. Continuous position indication
5. Design Pressure: 10 bar (g) Design Temperature: 100 °C					35. Air Supply Status Indication
Unit Max Nor Min				AIR SET	Yes Required
6. Flow	Kg/Hr	0.45		0.06	LIMIT SWITCH Required 1) Open (1 Nos.) 2) Close (1 Nos.)
7. Inlet Press	Bar (g)	6.5		4.0	
8.Outlet Press	Bar (g)	4.0		0.0	BOOSTER RELAY
9. Press Drop	Bar				*
10. Temp	°C	45		5	HAND WHEEL
11. MW		4			36. Tube Connector Size
12. % Flow		*	*	*	37. Paint Color
13. Cv Value		*			38. Mech. Stopper
14. Shut Off Pressure		10 Bar			OPERATING TIME
VALVE BODY					TESTS
15. Size- Class		15 NB, ANSI 150 #			39. Hydrostatic (Shell)
16. Material		ASTM A 216 Gr. WCB (**)			40. Seat Leakage
17. Style		Globe			41. Non Destructive
18. Seating		Single Seating			42. Other Tests
19. End Connection & Rating		Flanged for 15 NB Sch 40 Pipe., ANSI 150 #		TEST SET UP AVAILABLE WITH BIDDER:	
VALVE BONNET		Standard		1. Cv Measurement Facility <input type="checkbox"/> Y / N	
20. Type				2. Characteristic Measurement Facility <input type="checkbox"/> Y / N	
21. Material		Same as body			
22. Stem Packing		PTFE			
VALVE TRIM				NOTES:	
23. Type/Size		Contour, Solid/*		1. The Valves are to conform to all applicable requirements of specification given in Tender Technical Specification & Class II of ASME Sec III.	
24. Travel (mm)		*		2. Characteristic curves required.	
25. Flow Direction		Under seat		3. Back seat required	
26. Material		SS 316L		4. * Manufacturer to specify	
27. Characteristics		Equal %		5. ** Vendor may suggest alternative if any.	
ACTUATOR					
28. Type		Diaphragm			
29. Action		Spring to close			
30. Supply		2.8 Kg/sq .cm			
31. Supply Failure Position		Air to open Air fail to close			

**DATASHEET FOR CONTROL VALVE: FCV- 0105**

1. Tag No. FCV-0105					ACCESSORIES	
2. Application : Steam Flow Control Valve					POSITIONER	Smart Positioner
3. Design Type : Globe - Control					32. Type	I/P positioner
OPERATING CONDITIONS					33. Input Range	0.2 to 1 Kg/Sq.Cm
4. Fluid : Saturated Steam					INDICATION	34. Continuous position indication 35. Air Supply Status Indication
5. Design Pressure: 10 bar (g) Design Temperature: 270°C						
Unit Max Nor Min					AIR SET	Yes Required
6. Flow	Kg/Hr	48		1.2	LIMIT SWITCH	Required 1) Open (1 Nos.) 2) Close (1 Nos.)
7. Inlet Press	Bar (g)	4.0		0.0		
8.Outlet Press	Bar (g)	4.0		0.0	BOOSTER RELAY	*
9. Press Drop	Bar				HAND WHEEL	----
10. Temp	°C	220		100		
11. MW		18			36. Tube connector Size	6 mm
12. % Flow		*	*	*	37. Paint Color	Blue/Grey
13. Cv Value		*			38. Mech. Stopper	Yes
14. Shut Off Pressure		10 Bar			OPERATING TIME	* (not more than 5 secs)
VALVE BODY					TESTS	
15. Size- Class		25 NB, ANSI 150 #			39. Hydrostatic (Shell)	Required
16. Material		ASTM A 216 Gr. WCB (**)			40. Seat Leakage	Class IV
17. Style		Globe			41. Non Destructive	Radiographic & Ultrasonic Tests Required
18. Seating		Single Seating			42. Other Tests	Cv, Actuator tests
19. End Connections & Rating		Flanged for 25 mm NB Sch 40 Pipe., ANSI 150 #			TEST SET UP AVAILABLE WITH BIDDER:	
VALVE BONNET					1. Cv Measurement Facility <input type="checkbox"/> Y / N	
20. Type		Standard			2. Characteristic Measurement Facility <input type="checkbox"/> Y / N	
21. Material		Same as body				
22. Stem Packing		Grafoil				
VALVE TRIM					NOTES:	
23. Type/Size		Contour, Solid/*			1. The Valves are to conform to all applicable requirements of specification given in Tender Technical Specification & Class II of ASME Sec III.	
24. Travel (mm)		*			2. Characteristic curves required.	
25. Flow Direction		Under seat			3. Back seat required	
26. Material		SS 316L			4. * Manufacturer to specify	
27. Characteristics		Equal %			5. ** Vendor may suggest alternative if any.	
ACTUATOR						
28. Type		Diaphragm				
29. Action		Spring to close				
30. Supply		2.8 Kg/sq .cm				
31. Supply Failure Position		Air to open Air fail to close				

**DATASHEET FOR CONTROL VALVE: PCV- 0105**

1. Tag No. PCV-0105					ACCESSORIES	
2. Application : Steam Pressure Control Valve					POSITIONER	Smart Positioner
3. Design Type : Globe - Control					32. Type	I/P positioner
OPERATING CONDITIONS					33. Input Range	0.2 to 1 Kg/Sq.Cm
4. Fluid : Saturated Steam					INDICATION	34. Continuous position indication 35. Air Supply Status Indication
5. Design Pressure: 10 bar (g) Design Temperature: 270 °C						
Unit Max Nor Min					AIR SET	Yes Required
6. Flow	Kg/Hr	48		1.2	LIMIT SWITCH	Required 1) Open (1 Nos.) 2) Close (1 Nos.)
7. Inlet Press	Bar (g)	6.5		4.0		
8.Outlet Press	Bar (g)	4.0		0.0		
9. Press Drop	Bar				BOOSTER RELAY	*
					HAND WHEEL	----
10. Temp	°C	220		100		
11. MW		18			36. Tube connector Size	6 mm
12. % Flow		*	*	*	37. Paint Color	Blue/Grey
13. Cv Value		*			38. Mech. Stopper	Yes
14. Shut Off Pressure		10 Bar			OPERATING TIME	* (not more than 5 secs)
VALVE BODY					TESTS	
15. Size- Class		25 NB, ANSI 150 #			39. Hydrostatic (Shell)	Required
16. Material		ASTM A 216 Gr. WCB (**)			40. Seat Leakage	Class IV
17. Style		Globe			41. Non Destructive	Radiographic & Ultrasonic Tests Required
18. Seating		Single Seating			42. Other Tests	Cv, Actuator tests
19. End Connections & Rating		Flanged for 25 mm NB Sch 40 Pipe., ANSI 150 #			TEST SET UP AVAILABLE WITH BIDDER:	
VALVE BONNET					1. Cv Measurement Facility <input type="checkbox"/> Y / N	
20. Type		Standard			2. Characteristic Measurement Facility <input type="checkbox"/> Y / N	
21. Material		Same as body				
22. Stem Packing		Graphite				
VALVE TRIM					NOTES:	
23. Type/Size		Contour, Solid/*			1. The Valves are to conform to all applicable requirements of specification given in Tender Technical Specification & Class II of ASME Sec III.	
24. Travel (mm)		*			2. Characteristic curves required.	
25. Flow Direction		Under seat			3. Back seat required	
26. Material		SS 316L			4. * Manufacturer to specify	
27. Characteristics		Equal %			5. ** Vendor may suggest alternative if any.	
ACTUATOR						
28. Type		Diaphragm				
29. Action		Spring to close				
30. Supply		2.8 Kg/sq .cm				
31. Supply Failure Position		Air to open Air fail to close				