# भारतीय प्रौद्योगिकी संस्थान (भारतीय खनि विद्यापीठ), धनबाद

धनबाद, झारखण्ड, भारत, पिन-826004

INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES), DHANBAD

DHANBAD, JHARKHAND, INDIA, PIN-826004

(An Institute of National Importance under Ministry of H.R.D., Govt. of India)

STORES & PURCHASE SECTION Phone:(0326) 2235678 || Email : drps@ismdhanbad.ac.in || Website : www.iitism.ac.in


No. Mech-500545-2016-17 Date: April 5, 2017

## NOTICE INVITING TENDER

**Subject: Supply & Installation of Settling Chamber for roots blower 1000 cfm air discharge at 0.6 bar back pressure along with flow measuring device and Supply & Installation of Settling Chamber for roots blower 1000 cfm air discharge at 0.5 bar back pressure along with flow measuring device**

Indian Institute of Technology (Indian School of Mines), Dhanbad invites quotations for the following to be supplied and delivered in Mech Department.

| S No | Full Description of items/ store | Qty | Delivery |
|---|---|---|---|
| 1 | **Supply & Installation of Settling Chamber for roots blower 1000 cfm air discharge at 0.6 bar back pressure along with flow measuring device** (Detailed Specification is given in Annexure – I ) | 01 No | At the Earliest /Ex-Stock |
| 2 | **Supply & Installation of Settling Chamber for roots blower 1000 cfm air discharge at 0.5 bar back pressure along with flow measuring device** Detailed Specification is given in Annexure – II ) | 01 No | |

**Tender Schedule**

| Particulars | Date & Time |
|---|---|
| Last date for seeking clarification/s (if any) | **19.04.2017 at 3:00 P.M.** |
| Last date and time for submission of tenders | **25.04.2017 at 3:00 P.M.** |
| Date and time of opening of tenders | **25.04.2017 at 4.00 P.M.** |

1. You are requested to quote your lowest rates for the supply of above items in the attached format for Financial Bid (Annexure – III)
2. Clarification(s) sought after the prescribed date shall not be entertained.
3. You may send your representative in the office of the undersigned at the scheduled date and time of opening of tender.
4. Tender should be submitted in sealed cover only superscribed with Enquiry No. and due date at the following address only:

*The Deputy Registrar (P&S)*
*Indian Institute of Technology (Indian School of Mines),*
*Dhanbad – 826 004 Jharkhand*
*P: 0326-2235612*
*E: drps@ismdhanbad.ac.in*

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**Terms & Conditions**

1) The rates should be quoted for each item separately.
2) Conditional offer will not be accepted.
3) IIT (ISM) does not issue any Form 'C' or 'D' towards sales tax concessional rate. Hence, full rate of sales tax/VAT applicable should be quoted.
4) ***Educational discount,*** if any, should be clearly mentioned.
5) You are requested to submit your quotation strictly as per the specifications mentioned in the NIT.
6) Your tender must be valid for **minimum 90 days** from the date of opening of tender.
7) Please mention warranty/ guarantee in your offer clearly. Material/ equipment to be supplied must have minimum warranty/guarantee of **12 months.**
8) *Each page in the bid document must be numbered properly* and duly signed & sealed by the bidder on every page of the bid.
9) **The items/ materials shall be required to be delivered at Mech Department/ Section through Purchase & Store Section, IIT (ISM) Dhanbad** at the risk and cost of the tenderer.
10) Unloading and installation shall be the complete responsibility of the supplier.
11) The stores are required to be delivered within 30 days. Late delivery may not be accepted.
12) The items offered should be of good quality confirming to BIS standards, wherever applicable.
13) ***Advance payment is not admissible.*** Payment shall normally be made within 3-4 weeks subject to receipt and acceptance & installation (as per Purchase Order Terms) of the ordered materials/items.
14) In the event date on which the tender is opened for acceptance is declared to be a holiday, the tenders shall be deemed to remain open for acceptance till the next working day.
15) Please send your offer by Regd.Post/ Speed Post/ Courier along with Courier receipt. Tender/ quotation will be received during IIT (ISM) working hours only (i.e. Monday to Friday). *Late or delayed tenders shall be summarily rejected.*
16) Any other information that you may like to obtain, you are free to contact IIT (ISM) before submission of tender.
17) IIT (ISM) reserves the right to accept and/or to reject any/ all tenders without assigning any reason.

5/9/17

Assistant Registrar

Annexure – 1

# Specifications of Settling chamber setup:

1. **Plenum Chamber:**
   - i) Made up of Mild Steel in Cylindrical shape to handle high pressure (5 bar or more) and High Temperature (200'C. or more)
   - ii) 1 $m^3$ Capacity
   - iii) Semi Sphere ends for uniform flow
   - iv) Fitted with digital Pressure Gauge, Temperature Gauge of established make
   - v) Stand with Shock Absorber
   - vi) Suitable inlet and outlet
2. **Settling Chamber**
   - i) Conical Diffuser and Effuser made up of Mild Steel sheet
   - ii) Turbulence Intensity should be less than 0.05% (supporting mathematical calculations & simulation results etc. needs to be provided)
   - iii) Honey Comb structure made up of Silicon Composites of 200mm thick and 6mm dia hole to work between -5'C to 200'C.
   - iv) Appropriate stainless steel wire mesh sections
3. Velocity Measurement
   - i) Digital Anemometer to measure the velocity more than 100m/s at temperature more than 100'C with accuracy ±0.08% or better
   - ii) Software with USB cable to acquire the data and plot graph
4. Test Section
   - i) Test section should have 4 divisions of dia 40mm with honey comb structure
   - ii) The flow must be uniform with turbulence intensity less than 0.05%
   - iii) Facility to measure the velocity and temperature in 4sections

**SPECIFICATIONS OF FLOW MEASURING DEVICE/Digital Anemometer**

**Accuracy (Combined Linearity, Hysteresis and Repeatability):** ±0.08% BSL or better
**Storage Temperature:** -40 to 108°C (-40 to 226°F) or better
**Operating Temperature:** -18 to 120°C (0 to 248°F) or better
**Thermal Effects (Over Operating Range):**
**Zero Balance:**
**Ranges 10 inH2O to 1 psi:** ±1% span
**Ranges >1 psi:** °0.5% span
**Span:**
**Ranges 10 inH2O to 1 psi:** ±1% span
**Ranges >1 psi:** ±0.5% span
**Minimum Resistance Between Transducer Body and Any Wire:** 100M Ω @ 50 Vdc
**Pressure Cycles:** 1 million min
**Long Term Stability (1-Yr.):** ±0.1% FS or better
**Analog Output:** User selectable 0 to 5 Vdc, 0 to 10 Vdc or 4 to 20 mA (with external 24 Vdc power supply)
**Note:** Analog output is independently scalable
**Analog Output Cable:** more than 2.7m with ferrite core

**Analog Output Accuracy:** 0.08% typical (0.15% max in RF field @ 10V/m
**Range/Static Pressure:** 500 psi max applied to both sides simultaneouly
**Display:** 4-digit LCD with user selectable backlighting
**Sample/Display Rate:** User selectable from 0.25 to 10 sec (preset to 1/sec)
**Computer Interface:** UBS connection for set-up with suitable cable
**Enclosure Material:** 316 Stainless Steel and ABS center gasket
**Enclosure Environmental Rating:** Weatherproof, NEMA 4X (IP65)
**Sensor Wetted Parts:** 316L Stainless Steel
**Pressure Connection:** ¼-18 NPT male
**Connection Location:** Lower

**Front Panel Functions:**
**Backlight:** Manually turns backlight on/off
**Min/Max:** Recalls min/max values
**Zero/Clear:** Zeros display or clears min/max
**Software Settings (via USB)**
**Update Rate:** 4 options, 10, 5, 2, 1 times per second
**Units:** psi, inHg, inH2O, bar, mbar, hPa; must be specified at time of order
**Lock:** Allows the lock-out of front panel functions
**Alarms:** User selectable "High" and "Low" alarm limits (open collector)
**Analog Output:** User Selectable 0 to 5 Vdc, 0 to 10 Vdc, or 4 to 20 mA
**Backlight:** On/Off, 10 sec, 30 sec, 1 min, 5 min
**Wireless Transmitter:** Channel number, transmission rate, alarms, sensor offset, chart recording, data logging
**Calibrate:** Zero and span
**Overrange Indication:** "_ _ _ _"
**WIRELESS OPTION**
**Transmit Sample Rate:** User programmable from 1 sample/2 min to 1 sample/2 sec
**Radio Frequency (RF)**
**Transceiver Carrier:** ISM 2.4 GHz
**RF Output:** 10 dBm (10 mW)
**Range of RF Link:** Up to 120 m (400') outdoors (line of sight); Up to 40 m (130') indoors/urban
**Internal Battery:** Two 3.6V lithium 8.4 Ah capacity (C-cell) included
**Data Transmission to Host:** Pressure reading, ambient temperature reading, RF transmit strength and battery level

Annexure – II

# Specifications of Settling chamber setup:

1. **Plenum Chamber:**
   - i) Made up of Mild Steel in Cylindrical shape to handle high pressure (5 bar or more) and High Temperature (200'C. or more)
   - ii) 1 $m^3$ Capacity
   - iii) Semi Sphere ends for uniform flow
   - iv) Fitted with digital Pressure Gauge, Temperature Gauge of established make
   - v) Stand with Shock Absorber
   - vi) Suitable inlet and outlet
2. **Settling Chamber**
   - i) Conical Diffuser and Effuser made up of Mild Steel sheet
   - ii) Turbulence Intensity should be less than 0.05% (supporting mathematical calculations & simulation results etc. needs to be provided)
   - iii) Honey Comb structure made up of Silicon Composites of 200mm thick and 6mm dia hole to work between -5'C to 200'C.
   - iv) Appropriate stainless steel wire mesh sections
3. Velocity Measurement
   - i) Digital Anemometer to measure the velocity more than 100m/s at temperature more than 100'C with accuracy ±0.08% or better
   - ii) Software with USB cable to acquire the data and plot graph

**SPECIFICATIONS OF FLOW MEASURING DEVICE/Digital Anemometer**

**Accuracy (Combined Linearity, Hysteresis and Repeatability):** ±0.08% BSL or better
**Storage Temperature:** -40 to 108°C (-40 to 226°F) or better
**Operating Temperature:** -18 to 120°C (0 to 248°F) or better
**Thermal Effects (Over Operating Range):**
**Zero Balance:**
**Ranges 10 inH2O to 1 psi:** ±1% span
**Ranges >1 psi:** °0.5% span
**Span:**
**Ranges 10 inH2O to 1 psi:** ±1% span
**Ranges >1 psi:** ±0.5% span
**Minimum Resistance Between Transducer Body and Any Wire:** 100M Ω @ 50 Vdc
**Pressure Cycles:** 1 million min
**Long Term Stability (1-Yr.):** ±0.1% FS or better
**Analog Output:** User selectable 0 to 5 Vdc, 0 to 10 Vdc or 4 to 20 mA (with external 24 Vdc power supply)
**Note:** Analog output is independently scalable
**Analog Output Cable:** more than 2.7m with ferrite core
**Analog Output Accuracy:** 0.08% typical (0.15% max in RF field @ 10V/m
**Line/Static Pressure:** 500 psi max applied to both sides simultaneouly
**Display:** 4-digit LCD with user selectable backlighting
**Sample/Display Rate:** User selectable from 0.25 to 10 sec (preset to 1/sec)
**Computer Interface:** UBS connection for set-up with suitable cable

**ure Material:** 316 Stainless Steel and ABS center gasket
**sure Environmental Rating:** Weatherproof, NEMA 4X (IP65)
**or Wetted Parts:** 316L Stainless Steel
**Pressure Connection:** ¼-18 NPT male
**Connection Location:** Lower

**Front Panel Functions:**
**Backlight:** Manually turns backlight on/off
**Min/Max:** Recalls min/max values
**Zero/Clear:** Zeros display or clears min/max
**Software Settings (via USB)**
**Update Rate:** 4 options, 10, 5, 2, 1 times per second
**Units:** psi, inHg, inH2O, bar, mbar, hPa; must be specified at time of order
**Lock:** Allows the lock-out of front panel functions
**Alarms:** User selectable "High" and "Low" alarm limits (open collector)
**Analog Output:** User Selectable 0 to 5 Vdc, 0 to 10 Vdc, or 4 to 20 mA
**Backlight:** On/Off, 10 sec, 30 sec, 1 min, 5 min
**Wireless Transmitter:** Channel number, transmission rate, alarms, sensor offset, chart recording, data logging
**Calibrate:** Zero and span
**Overrange Indication:** "_ _ _ _"
**WIRELESS OPTION**
**Transmit Sample Rate:** User programmable from 1 sample/2 min to 1 sample/2 sec
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**Transceiver Carrier:** ISM 2.4 GHz
**RF Output:** 10 dBm (10 mW)
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*Annexure - III*

**Format for Financial Bid**

NIT No.: Mech-500545-2016-17 Dated:

Bidders Ref: No. Dated:

**Subject: Supply & Installation of Settling Chamber for roots blower 1000 cfm air discharge at 0.6 bar back pressure along with flow measuring device and Supply & Installation of Settling Chamber for roots blower 1000 cfm air discharge at 0.5 bar back pressure along with flow measuring device**

| Sl. No. | Full Description of Items | Qty. | Rate | Amount |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | Packing & Forwarding (if any) | | |
| | | **Total** | | |
| | | CST/VAT (if any) | | |
| | | Freight (if any) | | |
| | | Installation (if any) | | |
| Amount should be in figure as well as word | | **Grand Total** | | |

**Note:**
1) All the details must be provided as per prescribed format only
2) Prices quoted by the bidders should include all local taxes, VAT, service tax, duties, livies, transportation cost and insurance costs etc. if any
3) All the rates must be quoted in Indian Rupees.