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**DEPARTMENT OF FACTORIES & BOILERS**

**No.A3/4124/F&B/2015**

“SURAKSHA BHAVAN”  
OFFICE OF THE DIRECTOR OF  
FACTORIES AND BOILERS,  
MEDICAL COLLEGE P.O.,  
THIRUVANANTHAPURAM,  
DATED: 28. 01.2016  
PHONE:0471– 2441597,2440974.

**e-TENDER NOTICE**

Online tenders are invited from the manufactures and authorized dealers for the supply and installation of the following high quality branded equipments separately.

Sl. No.	Item	Quantity	Estimate Amount	EMD	Cost of Tender Form
1	Sound level meter	2	2 Lakh	1 % of the cost of Item	Rs.420
2	Personal Sampler	5	5 Lakh	“ “	Rs.1050
3	Atomic Abortion spectrometer	1	40 Lakh	“ “	Rs.6300
4	Radiation detection meter	1	1 Lakh	“ “	Rs.420
5	Personal heat stress monitor	1	6 Lakh	“ “	Rs.1260
6	Vertical elutriator cotton dust sampler	2	2 Lakh	“ “	Rs.420
7	Intrinsically Safe Digital Multimeter	2	2 Lakh	“ “	Rs.420
8	Infrared irradiance meter	1	1 Lakh	“ “	Rs.420
9	Multi Gas Detector	1	5 Lakh	“ “	Rs.1050

Last date for the receipt of filled up Tenders : 4 PM on 10-2-2016  
Opening Tender : 10 AM on 15-2-2016

Tender and other details also available from the Director of Factories & Boilers, Thiruvananthapuram on all working days till 10-2-2016, 4 PM. The under signed reserves the right to reject the tender without assigning any reason thereof. The tender notification is also available in the official Website: [www.fabkerala.gov.in](http://www.fabkerala.gov.in). Tender Form and Terms & Conditions may be downloaded from [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in).

SD/-

DIRECTOR OF FACTORIES & BOILERS

## Specifications

### 1. Sound level meter

- Hand-held instrument for sound pressure level (SPL) measurements
- integrating type
- 1/1 or 1/3 octave band filters/analysers
- A/C weighting
- Fast/Slow response
- LCD display
- Easy key pad operation
- Battery operated
- USB port
- **Measurement range:** 40 to 130 dB
- Exchange rate: 3 dB
- **Displayed Data/Values:** SPL, Max, Min, Leq, Run time

#### **Accessories**

- Windscreen for microphone
- USB cable
- Calibrator adapter
- Calibrator

### 2. Personal Sampler

- For sampling of airborne dust, fumes, vapours or gases with respect to industrial hygiene aspects
- Suitable for use with adsorbent tubes, filter cassettes, size-selective cyclones and impingers
- Adjustable flow rate: 0.5 – 2 Litre/minute
- Able to display sampling flow rate.
- Portable, small and light weight
- Rechargeable battery operated
- At least 8 hour operation on fully charged batteries
- Belt clip/harness for carrying of instrument on person
- **Single sampler Kit includes:**  
Rechargeable battery pack, battery charger and convenient carry case

#### **ACCESSORIES**

- Cyclone for respirable dust sampling
- Filter cassette Holder for 25 mm and 37 mm filter (1 each with each sampler kit)
- 25mm & 37mm glass fibre and membrane filter papers (1 box each with each sampler kit)
- Adsorbent tubes for sampling VOCs/PAHs/Solvents/vapours/gases (desirable)
- Tubings for connecting filter holder/cyclone/sorbent tube to sampler

### 3. Atomic Absorption Spectrometer (AAS)

- External PC controlled AAS with graphite furnace and auto sampler.
- Fitted with 4 lamp fixed position. True Double beam system.
- For the analysis of metals like Fe, Mn, Pb, Cr, Hg, As, Ni, Cd, Cu, Al, Co, Sn from various airborne samples.

- Wave length range 185-900nm.
- Automatic lamp selection, Automatic wavelength and slit selection.
- Fast Sequential capability using hollow cathode lamps, where all the elements (as mounted in the lamp holder) in a sample can be analysed in a single aspiration. Lamps automatically switched off at the end of analysis. Automated pre warming of next lamp in sequence.
- Automated 250mm Czerny turner monochromatic with computer controlled wave length Selection and peaking.
- Automated slit selection with multiple slits of minimum 3 slits (band width).
- Holographic diffraction grating with 1200 lines/mm blazed or better at 240nm and Wavelength Repeatability:  $\pm 0.04\text{nm/min}$  or better.
- Wide range Photo multiplier tube covering full wavelength range.
- High intensity deuterium background corrector 2.5ms response.
- Automatic Gas control.
- Separate ignite/flame off buttons. Safety interlocks monitor burner type, burner Correctly fitted, liquid trap, pressure relief bung, flame sealed, flame operation, mains Power and Oxidant pressure within safety reservoir and internal gas connection made Automatically Upper and lower flames shields and a chimney protect against head and UV-radiation. External adjustment of all burner and spray chamber controls.
- Fluorinated high density polyethylene for aqueous and organic solutions.
- Adjustable Nebulizer with inert platinum/iridium capillary and peek ventury for Corrosion Resistance.
- Air/Acetylene and Nitrous oxide Burners. Automated burner adjuster.
- Sensitivity of  $> 0.9$  abs with precision of 0.5% RSD from 5 second integration for 5ppm Cu solution. (substantiate with proper technical data sheet/certificates)
- System should be supplied with following hallow cathode lamps( Single Element Lamps and Standards ): Fe, Mn, Pb, Cr, Hg, As, Ni, Cd, Cu, Al, Co, Sn
- SS exhaust fume hood with insert centrifugal blower
- Cylinders for Acetylene, Nitrous oxide and Argon with regulators as per AAS grade.
- Air compressor, air filter, should be included
- Suitable PC, with LCD Monitor, Laser Printer to be included in the offer
- The software should be windows based multitasking with a provision of calibration, recalibration, data storage, data manipulation, reslope, post data run, display of recommended condition, graphs, curves, absorption peaks, background correction inter elemental correction including fault / error finding diagnostic features, statistical parameters and all necessary features.
- Graphite furnace:
  - 1) Fully automated constant temperature zone graphite furnace
  - 2) Temperature Control with cooling water temperature compensation for enhanced temperature accuracy without external sensors. Up to 20 temperature steps per program with temperature programmable from 40-3000 °C.
  - 3) Heating rate is software controlled with maximum ramp rate of 2000 °C/s. Choice of two inert gases with PC-controlled flows and maximum corrosion resistance.
  - 4) Comprehensive safety interlocks for gases, water flow and temp, tube and transformer temperatures.
  - 5) Suitable Chiller from the original manufacturer should be provided.
- Auto Sampler (in built) for Graphite Furnace Operation:

1. Must provide min. sample capacity of 100 solutions with ability to exchange carousels during analysis to extend capacity up to 999 samples
  2. Dispensing volume variable from 1–70  $\mu\text{L}$  with  $< 1\%$  repeatability (5–70  $\mu\text{L}$ ). Flow through capillary rinse after each injection. Sample Dispenser provides capacity for up to 50 samples in 2 mL microvials
- Fully PC controlled Hydride Generation Assembly for analysis of hydride forming elements. Continuous vapour generator system for the estimation of hydride forming elements in sub ppb levels, should have peristaltic pump and flow cell to mix reactant and sample.
  - Installation and Familiarization: Installation and training to users should be given at our laboratory by a trained Application engineer.
  - Warranty: 3 years

#### 4. Radiation detection meter

- Portable instrument for detecting radiation dangers from materials, equipment, surfaces or environments in industries to ascertain worker safety
- For contamination-detection, general radiation area metering, radiation-level monitoring, and hazardous materials assessment
- Battery operated
- LCD display
- Operating range: 0 – 50 mR/h

#### 5. Personal heat stress monitor

- Personal heat stress monitor for directly detecting physiological heat response of industrial workers exposed to wide range of heat exposure.
- User-selected alarm trip points to provide an audio alert to elevated core temperatures.
- To monitor personal heat stress levels and to create heat stress measures that can minimize risk.
- Compact size combined with belt or pocket attachment for convenient personal monitoring.
- Ear canal sensor for measurement and warning of dangerous deep body core temperatures.
- Data logging for documentation of personal heat exposure.
- Intrinsic safety certification for monitoring in potentially hazardous locations where heat is often extreme (desirable).

##### **SENSOR:**

##### **Thermistor Temperature Sensor**

Accuracy and ranges:  $\pm 0.1^\circ\text{C}$  from  $32^\circ\text{C}$  to  $40^\circ\text{C}$

##### **MEASUREMENT PARAMETERS:**

Temperature reading:  $^\circ\text{Celsius}$

10 second data logging intervals

Overall summary data

Detailed time history data

**MECHANICAL DESIGN:**

Water & dust ingress protection rating

**Light Weight** Housing & Ear sensor assembly

**OPERATING TEMPERATURE RANGE:**

Unit: 0° C to 70° C

**OPERATING HUMIDITY:**

0% to 95% (non-condensing)

**DATA MANAGEMENT SOFTWARE TO BE PROVIDED**

**OUTPUT:**

Printer / computer interface

Audio Alert

**POWER SOURCE:**

Rechargeable or disposable batteries

**6. Vertical elutriator cotton dust sampler**

- Cotton Dust Sampler with a tripod stand and alternatively provision for mounting on the columns or walls of the work place.
- The sampler shall consist of ;
- **vertical elutriator**,
- a three-piece plastic 37mm filter cassette,
- critical orifice for regulating the flow rate at  $7.4 \pm 0.2$  lpm,
- low maintenance vacuum pump with mounting brackets,
- 0 to 30" Hg vacuum gauge,
- tubings, fittings and filter jar.

**Specifications**

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Flow Rate	7.4 lpm
Particle Cut-Point	15 $\mu$ @ 7.4 lpm
Filter Cassette	Plastic (polystyrene); for 37mm membrane filter with back-up pad; three-piece design
Filter Media	Polyvinylchloride (PVC) filter media with 5-micron pore size, 37mm diameter
Vacuum Gauge	0 to 30"Hg
Vacuum Pump	Oil-Less Rotary Vane, 1/10 HP, 1.25 cfm (35 lpm) free-flow
Vertical Elutriator	Over-all dimensions - 6-inch (15 cm)

O.D. x 28-inch (71 cm) L; weight:  
7.25 lbs. (3.3 kg) max.

Power 220-230V AC, 50-60Hz

## 7. Intrinsically Safe Digital Multimeter

- For resistance and continuity tests of earthings and bondings in petroleum, chemical, petrochemical, solvent handling industries etc.
- Intrinsically safe for Ex-rated areas
- Waterproof, dust-proof and drop-proof
- Ex certifications from the world's leading certification bodies
- Backlit LCD display for increased visibility in poor lit areas
  
- **Measuring range**  
Resistance 0.1  $\Omega$  to 50  $\Omega$
  
- **Power** Alkaline batteries or rechargeable batteries with battery charger

## 8. Infrared irradiance meter

- Measures to Infrared irradiance form various industrial sources.
- Hand held meter
- Measurement unit: mW/cm<sup>2</sup> or W/m<sup>2</sup>
- Interference filter to eliminate all other unwanted radiation or non sensitive to other radiations
- Carrying case
- Battery operated (with battery pack and charger, if rechargeable batteries).
- LCD display
- USB and Serial Interface to PC with software (desirable).
- **Measurement range:**  
IR irradiance: 10 – 1000 mW/cm<sup>2</sup> or (100 -10000 W/m<sup>2</sup>)

## 9. Multi gas Detector

For detection of VOCs, Combustible gases, Oxygen, Carbon Monoxide (CO), CH<sub>4</sub>, H<sub>2</sub>S in factory work environments.

### Description

Portable, lightweight, intrinsically safe multi gas detector effective for simultaneous detection of VOCs, Combustible gases/vapours, oxygen, carbon monoxide, methane and hydrogen sulphide in industrial health and safety tests; atmospheric conditions; confined spaces; etc. with respect to industrial hygiene aspects only.

- Suitable for mobile or fixed position operation.
- Easy key pad operation
- Data logging facility in the PC through USB interface
- Low Bat indication on the LCD display
- Gas concentration display in % V/V or % LEL or PPM.
- Low, High, TWA, STEL configurable alarms with Audio & Visual alerts

- suitable rechargeable battery pack with charger.
- Large easy to read backlit LCD display
- RFI/EMI shielding and intrinsically safe

**Detection Range:**

Combustible Gases	0-100% LEL
Methane	0-10% Vol.
Oxygen (O <sub>2</sub> )	0-25%Vol.
Hydrogen Sulfide (H <sub>2</sub> S)	0-100 ppm
Carbon Monoxide (CO)	0-500 ppm
VOC	0-1000 ppm
Accuracy	±1% of reading

Accessories: Operating Manual, Battery Charger, battery pack, carrying case, Belt Clip/Wrist strap, Sample draw hoses, Datalogging software

Instrument Warranty: 3 Years