

Bharat Heavy Electricals Limited
Ramachandrapuram : : Hyderabad – 502032
M&S – DIVISION
SCOPE OF WORK (ANNEXURE-I)

Tender No.: M&S/P&S/2022/63, dt. 26.11.2022

Name of Work: Validation of Vacuum Furnace (Asset No. 03-1002).

Furnace Details:

Make: Hind High Vacuum Company Pvt. Ltd.

Hot Zone (Job Loading Area) = Size 1200mm(W) X 1200mm(H) X 1200mm(D)

Hot Zone (Actual) = Size 1850mm Dia. X 1550mm Depth,

No. of Hot Zone = 3 No's, Max temperature is 1320°C

Normal Cycle Temperature = 1175 °C

Maximum Charge Weight = 1200Kgs

Work includes:

Calibration / Tests for validation of vacuum furnace machine.

All tests should be as per standard AMS 2750D and NABL Certified.

Calibration / Tests:

1. Thermocouple Calibration
2. Recorder Calibration
3. Temperature Controllers Calibration
4. Furnace Temperature Uniformity Survey(TUS)
5. System Accuracy Test (SAT)
6. Calibration of Vacuum Gauge Controller with one penning sensor

1. Thermocouple Calibration (Quantity: 6 No's)

Range: 0 to 1450° C,

Type: Platinum-Platinum Vs Rhodium recrystallized alumina sheathed S type)

Accuracy: $\pm 2.2^{\circ}\text{C}$ or 0.75% RDG whichever is greater.

2. Recorder Calibration (Yokogawa Model UP550) (Quantity: 1 No's)

Range: 0.0 to 1700° C

Type: 6 Channels, 2Type

Accuracy: $\pm 0.15\% \pm 1$ digit of instrument range

3. Temperature Controllers Calibration (Quantity: 6 No's)

Range: Max 1320°

Accuracy: $\pm 5^{\circ}\text{C}$

4. Furnace Temperature Uniformity Survey (TUS) (Quantity: 1 No's)
No of the Thermocouples required: 9No.s
Length of Thermocouples: 6 Meter
Range of Thermocouples: 50°C to 1200°C
Accuracy of Thermocouples: $\pm 2.2^\circ\text{C}$ or 0.75% RDG whichever is greater.
Number of channels in the recorder: 18
Accuracy of recorder: 0.05°C
4 Temperatures Points (600°C, 820°C, 1080°C, 1200°C).

5. System Accuracy Test (SAT) Temperature Points (Quantity: 1 No's)
No of the Thermocouples required: One thermocouple per zone
Length of Thermocouples: 6 meter
Range of Thermocouples: 50°C to 1200°C
Accuracy of Thermocouples: $\pm 2.2^\circ\text{C}$ or 0.75% RDG whichever is greater
Number of channels in the recorder: 18
Accuracy of recorder: 0.05°C
4 Temperatures Points (600°C, 820°C, 1080°C, 1200°C).

6. Calibration of Vacuum Gauge Controller with one penning sensor (Quantity: 1 No's)
Make: INFICON
Range: Range 1000 m .bar to 10^{-6}m.ba
Note: To and fro Courier charges for in-house calibration of 'Vacuum Gauge Controller with one penning sensor' shall be borne by the vendor.