



**Department of Mechanical Engineering
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Subject: Web Enquiry

We have to purchase an electrically heated high temperature tubular furnace with Hydrogen and Nitrogen gas purging environment with digital temperature controller in the working temperature range RT to 1200°C with accuracy $\pm 1^\circ\text{C}$, control facility to burn out exhaust hydrogen gas and water cooling facility to control the cooling cycle.

Working tube specifications and size are as follows:

- 150 mm I.D., 1200 mm length, both end open 80% re-crystallized high Alumina tube.
- A separate closure set-up for keeping the samples, along with connecting flange and tubes is required to generate vacuum.
- Heating zone: 150 mm I.D. and 300 mm length heating zone.
- Sample holding tray along with metallic sample remover.

Specific requirements:

- Mass Flow Controller for Hydrogen, Range 0-200 SCCM, duly calibrated for Hydrogen and other non-corrosive gases.
- Digital flow measurement system for Hydrogen
- Provision for leak detection. (Inlet as well as outlet)
- Silicon carbide heating element.
- Suitable thermocouples one for calibration purpose and one for PID controller.
- Appropriate power drive for long life and safe guard heating element with soft start.
- Pre- determined temperature rising rate by the programmer and normal raising rate by the controller. (0.5 – 15 deg C).
- Water cooling facility (good quality chiller) along with pumping system.
- Suitable fan/blower to control cooling rate and help decrease skin temperature.
- Adequate number of high temperature sealing rubber gaskets.
- Stainless Steel gas flow/vacuum flanges for vacuum tight fitting.
- LED indicator lamp, FRC Fuse, on/off rotary switch, magnetic contractor etc.
- Necessary Hydrogen handling/ leakage safety detection system.
- Gas purification set-up for removing moisture content.
- Non-returnable Hydrogen safety valve.
- FREE two-day training of furnace operation must be included.
- TWO YEAR warranty mandatory against manufacturing defects and against other break-downs.

- Service/repair to be carried out within a week of filing complaint (either over phone or email).

Additional scope of supply:

- A hydrogen and nitrogen gas-cylinder.
- Extra heating elements.
- Extra (calibrated) thermocouple J/K/R type.

Successful installation and demonstration up to 1200°C and calibration after installation is mandatory.

The offer must clearly mention (point wise) the instrument's capability against tender requirement. The offer must mention the deliverable/optional accessories with the basic instrument. Such accessories for the betterment of device safety and analysis should be quoted separately with the price (if any). Nonetheless, ALL REQUIRED ITEMS MUST BE PROVIDED SO THE INSTRUMENT WORKS AND IS SELF SUSTAINING.

OTHERS (MANDATORY):

1. Must have supplied similar furnace to other IITs, NITs or CFTIs. Please provide installation certificates.
2. Installation of furnace within 2-3 weeks of delivery.
3. Provide safety certificate (proper insulation and fire retardation).
4. The heating elements, accessories, and services MUST be provided for the next 5 years after the installation of the furnace.
5. Payment 90% against delivery and 10% after successful installation of the items.

Corrections may be included after satisfactory technical approval of the instrument, as per existing Government of India norms.

Note: GST for research items is now 5% and we will provide GST concession certificate from our institute.

Technical and financial offers MUST be packed separately (Two-bid process).

The offer may be submitted in response to this advertisement before March 26, 2018, containing the usual terms and conditions of supply, tax, freight charges, offer validity, warranty, maximum educational discount, and delivery period etc. at the address given below.

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