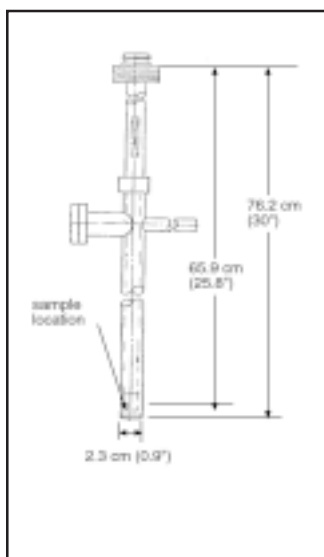


High Temperature Oven – Model 73034



The High Temperature Oven Assembly enables the Model 7300 VSM system to be used in investigating the magnetic properties of materials at high temperature. This accessory consists of an electrically heated outer tube assembly with efficient thermal insulation to permit sample-zone temperature from 100 °C to 1000 °C. Temperatures from 30 °C to 1000 °C are also possible; however, below 100 °C, measurement time increases.

The inner sample zone chamber is lined with a special heat-resistant and intrinsically non-magnetic material. A sample holder is provided which consists of a quartz tube extension attached to a boron-nitride sample cup. The oven can be installed by removing the standard outer tubing assembly, the only special consideration being that the air gap between the coils must accommodate the 0.9 inch outside diameter of the oven. A mechanical vacuum pump, capable of maintaining inlet pressures down to 50 microns, must be supplied by the user.

This accessory features efficient thermal insulation, consisting of an evacuation outer chamber with multiple reflective heat shields. Ample zone temperatures as high as 1000 °C are attained with a power consumption of approximately 61 watts. Even at the highest operating temperature the outer case temperature does not exceed 200 °C. Two results of the low power consumption are minimal magnetic interference and increased temperature uniformity in the sample zone. The oven is particularly well suited to measuring Curie temperatures of ferromagnetic or ferrimagnetic materials at temperatures up to 1000 °C. The inherent sensitivity of the Model 7300 Magnetometer permits Curie temperature determinations at relatively low field intensities. The resulting steeper change in magnetic moment significantly increases the accuracy of the determination.

At room temperature and above, measurements may be performed on samples contained in a controlled atmosphere. This permits oxidation-reduction or catalytic reactions to be studied magnetically. Nonmagnetic mass changes of a sample do not affect the measurement. This is particularly important at high temperatures where moisture may be driven from a sample.

Specifications

- Temp. range:** 30 °C to 1000 °C (303 K to 1273 K).
 - Temp. stability:** ± 0.1 K.
 - Ramp rate:** 80 °C/ minute at maximum heating rate of 80 watts.
 - Bore size:** 7.1 mm (0.28").
 - Sample holders:** Boron nitride
Powder 3 mm (0.13") dia. x 6.35 mm (0.25")
Thin-film bottom 6.35 mm (0.25") diameter.
 - *Crated size:** 101.6 cm (40") x 22.86 cm (9") x 17.78 cm (7")
 - *Crated weight:** 9 kg (20 lbs.).
 - Installation:** Replaces the standard outer tubing assembly of the Model 7300. No modification of the magnetometer is required for serial numbers 730535 and higher.
 - Heater:** Integral heater coil with a nominal resistance of 20 ohms (±20%).
 - Power requirements:** 0 to 2.0 A (max) of dc.
Nominally 61 watts is required to maintain maximum rated temperature.
 - Insulation:** Vacuum plus multiple reflective shields. Outer shell temperature will not exceed 200°C at highest operating temperature. Vacuum pump not included.
 - Temperature measurement and control:** Chromel-Alumel thermocouple is provided which is cabled to the system for automatic temperature measurement and control.
 - Sample environment:** Provision for evacuating the sample zone by pumping through the head.
 - Cooling rate:** A function of temperature and pressure, the nominal cooling time constant is 1800 sec with a 25 micron vacuum applied.
 - Sample zone dimensions:** Inside diameter - 9/32 inch; outside diameter inch (at signal coils).
 - Vacuum connection:** 3/8 inch OD tube for attachment of flexible hose to vacuum pump.
 - Heater connection:** Hermetically sealed electrical receptacle. Matching cable furnished with unit.
 - Sample rod extension:** Special sample rod subassembly for attachment to standard Model 7300 inner rod by threaded fitting. Subassembly consists of fused quartz extension with high-purity boron-nitride guides and sample holder.
- *If option is ordered with a system, it will be shipped in the instrument console crate.

Ordering Information

- Model 73034** Oven and Model 730902 quartz tail section and sample holder assembly includes standard oven sample cup (thin film oven sample holders must be ordered separately).
Filter and tubing for connecting to vacuum pump.
Operational software for measurements up to 1000 °C. Lake Shore Model 340 Temperature controller and 3464 Thermocouple card sold separately.
Associated cabling.
- Model 340** Temperature controller with two sensor inputs (diodes and NTC/PTC resistance sensors) for use with high temperature oven.
- Model 3464** Input card with two thermocouple sensor inputs.
- Model 730902** Quartz tail section and sample holder assembly.
- Model 730913** Sample rod guide, lower.
- Model 730937** Quartz sample holder assembly.
- Model 730938** Thin film sample holder, side mount.
- Model 730939** Thin film sample holder, bottom mount.

Additional equipment required for Model 73034

1. Mechanical vacuum pump capable of achieving a blanked-off pressure of 50 microns or lower (with supplied filter), or a cold trap to prevent contamination.
2. Gas supply fittings.
3. Temperature controller ordered separately.



Oven is available for use with older VSM Models 155 and 4500. Requires Model 340 Temperature Controller.