

ProboStat™

Base Unit Heating System

Prevents water condensation or carbon precipitation in the internal ProboStat™ gas lines.

Base unit heating is an optional feature for ProboStat™ stainless steel sample holders. With this option the base unit is divided into two compartments separating the gas lines to one compartment and the electrical connectors and switches in another compartment. Heater and heat sensors are added into the compartment with the gas lines, allowing the gas lines to be heated up to maximum 165°C. The system also includes a simple power supply.

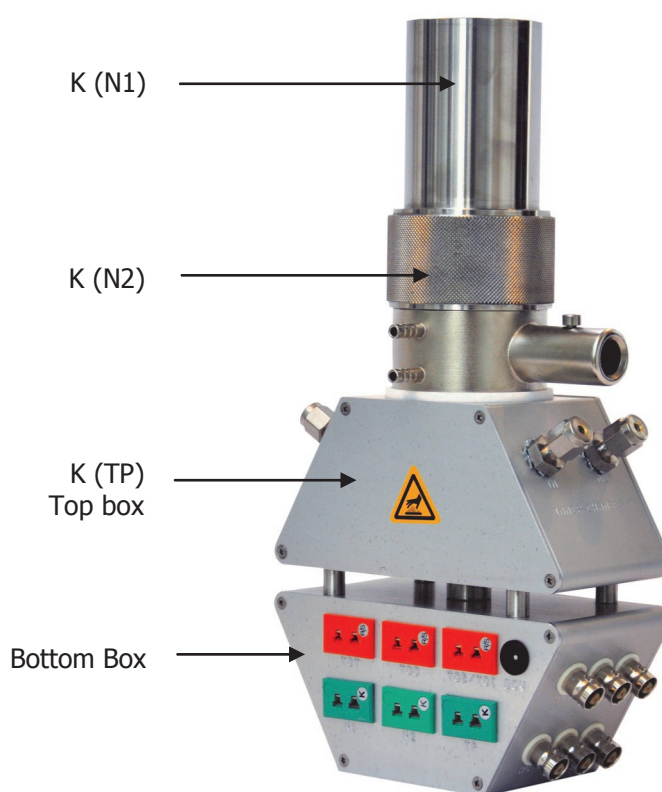
Three thermocouples control temperature in the base unit, and are located:

- N1: inside the neck, near the top level electrical pins.
- N2: inside the neck, halfway up, near the lower level electrical pins.
- TP: inside the top box, near the internal gas lines.

The thermocouples should be connected to a thermocouple reader or multimeter. NORECS Omega software with a multichannel multimeter is a suitable choice for reading large numbers of thermocouple voltages and converting them to temperatures.

A resistance heater heats the gas lines. The heater is supplied with direct current from the included power supply. An adjustable DC power source is provided with the cell allowing 1 volt steps. For safety reasons, the top box is equipped with automatic overheating protection that will disconnect the circuit if and when the temperature rises above 165°C.

Additional heating/insulation of the gas lines before the ProboStat™ base unit, and also the neck area, may be required. Contact us for more information.



NORECS products

Measurement Systems

ProboStat™ Versatile sample holder system for measurements of electrical properties, transport parameters, kinetics of materials, solid/gas interfaces and electrodes at high temperatures under controlled atmospheres.

SeebSys System for automated measurements of Seebeck coefficient and electrical resistance at high temperatures and under controlled atmospheres. Measurement software included.

CoulTCell Coulometric titration setup for measurements of oxygen nonstoichiometry of materials at high temperatures in different partial pressure of oxygen. Measurement software included.

Tubular membranes and electrolytes for ProboStat™ Use standard ProboStat™ for tubular gas separation membranes or electrolyte cells. Catalytic Membrane Reactor (CMR) for tubular membranes with CMR-modified ProboStat™.

Software

Omega Multipurpose measurement and data analysis software for electrochemical measurements. Omega is designed for maximum flexibility: it accepts data from many different sources such as instruments, furnaces and mass flow controllers. It can plot any measured or calculated data. With no time restrictions nor limit for simultaneous measurements. It was originally developed for ProboStat™ users.

Omega Temp Software to control and program furnace temperatures and profiles, with unlimited number of segments.

Atmosphere control

ProGasMix FC Versatile rotameter-based manual gas mixer especially developed for laboratory investigations of the properties of oxides at high temperatures vs T, pO₂, pH₂O etc., or fuel cell tests with humidification of fuel and/or oxidant. Partial pressures are calculated via accompany software. Allows measurements of proton and oxide ion transport numbers separately.

FCMix Simple and low-cost gas mixer that controls the flows of fuel, oxidant and one inert gas that can be routed to the fuel and oxidant for flushing, soft start, slow SOFC anode reduction, and safe operation, as well as tests of gas diffusion limitations.

Probble A combined humidification unit and over-pressure controller suitable for small gas flows to SOFC button cell testing (in for example ProboStat™), annealing furnaces, etc. Two units used with FCMix give combined humidification and overpressure control of each ProboStat™ cell chamber as well as fine pressure control in and between two cell chambers.

We supply

Furnaces Furnaces customized for ProboStat™

TempBox Simple thermocouple reader with USB port.

Samples and PLD targets 8YSZ, BZY-Ni, BZY, etc.

SOFC button cells Anode supported cells with 8YSZ electrolyte, porous nickel cermet anode and lanthanum cobaltite cathode.