

# ProGasMix FC

## Versatile gas mixer for wide range control of partial pressures

Optional: Probble - humidification and overpressure control

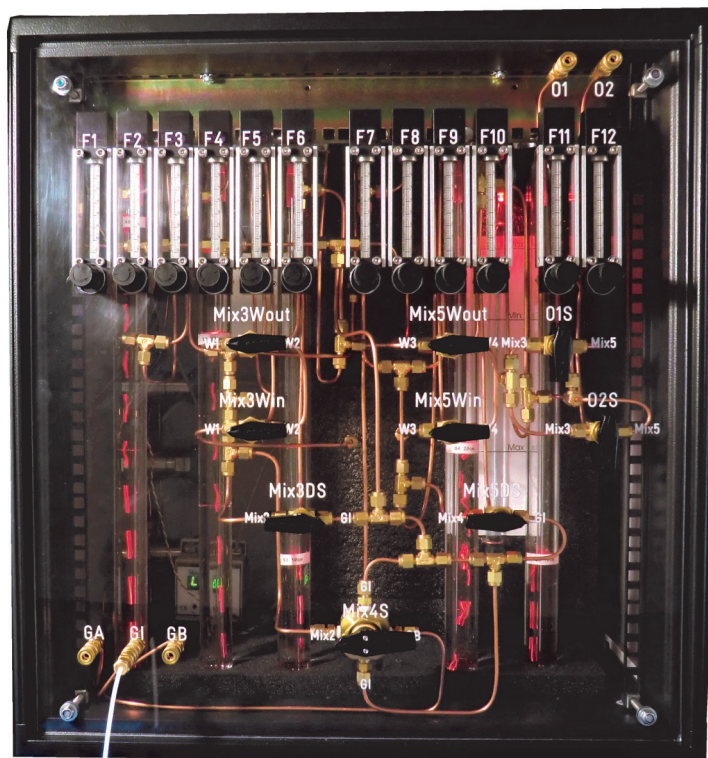
ProGasMix FC is a unique tool for students and researchers in materials science, suitable for use with the ProboStat or other systems using variable controlled atmospheres. It offers economy, simplicity, and insight to those who value versatility and wide ranges of mixing. Partial pressures and high temperature equilibria are calculated from flowmeter readings via accompanying software.

The ProGasMix FC is a rotameter-based manual gas mixer especially developed for laboratory investigations of the properties of oxides at high temperatures vs  $T$ ,  $pO_2$ ,  $pH_2O$  etc. or fuel cell tests with humidifi-

cation of fuel and/or oxidant. The mixer is especially known for its ability to deliver two mixtures suitable for concentration cell measurements of for instance transport numbers of oxide ions and protons independently.

Compared to mass-flow meter based system of equal features, the ProGasMix FC is order of magnitude less expensive and will last virtually forever. ProGasMix FC requires no frequent maintenance, repairs or calibration. The mixer is simple, serviceable, and "transparent" to the user, making it easy for users to understand what goes on inside the mixer.

- Fuel cell tests
- Conductivity measurements, impedance spectroscopy, etc. vs.  $pO_2$ ,  $pH_2O$ ,  $pH_2$
- Ionic transport number measurements by EMF of concentration cells
- Transport numbers of oxide ions and protons independently
- Gas permeation measurements
- Easy to inverse dual mixture outputs for transients or elimination of offsets
- Wide range mixing of three input gases into two output mixtures (down to ppm levels)
- Desktop size: 50 x 55 x 60 cm, 40 kg



For more information, visit our web page.

# 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, pO<sub>2</sub>, pH<sub>2</sub>O 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, BZCY72, etc.

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