



## Economical Temperature Control System for Materials Analysis

- Turn key temperature control system
- Extensible with Novocontrol Dielectric/ Impedance Analyzers
- Dedicated sample cell for dielectric and impedance spectroscopy included
- Designed for easy, safe and fully automatic operation
- wide temperature range: -100°C to +250°C
- 0.1°C stability
- Includes Novocool PID controller with non-linear extensions, stabilized power supplies, cryostat with gas-heating element, liquid nitrogen evaporator, 120 l Dewar vessel

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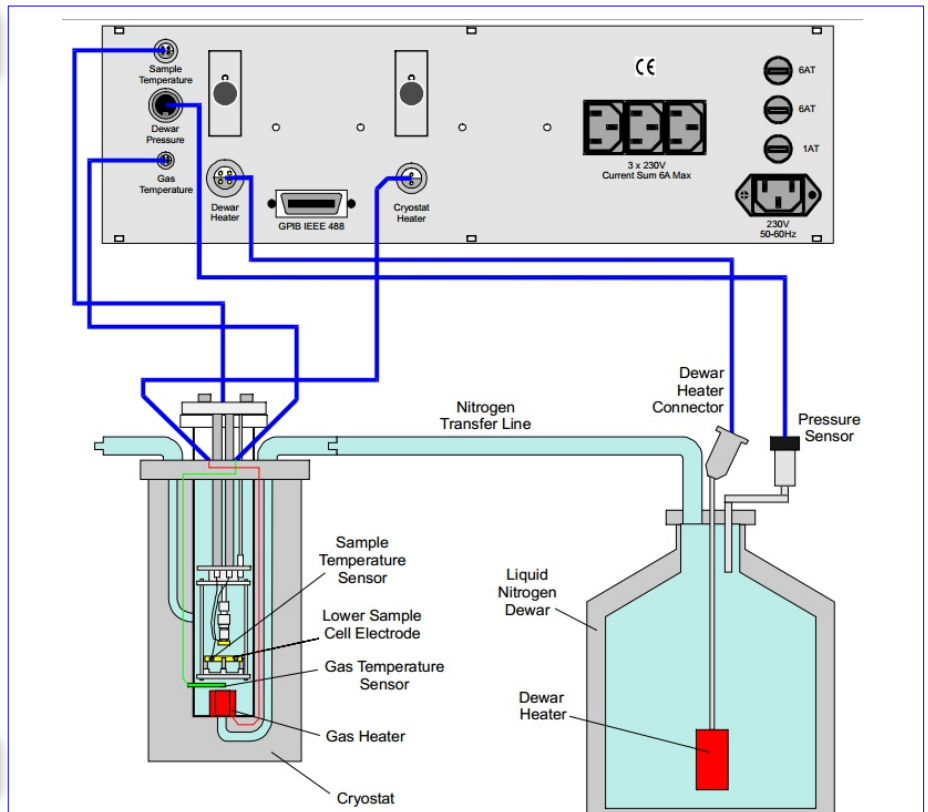
## Cryosystem

The Novocool Cryosystem is a high quality turn key temperature control system for applications in materials research. A sample cell particularly suited for dielectric and impedance spectroscopy is included. The system has been developed to set or change the temperature of the sample under test with high accuracy and reproducibility. The system is modular and may be combined with any Novocontrol dielectric or impedance analyzer.

The Novocool Cryosystem provides easy, safe and fully automatic operation, enabling computer-controlled long time experiments over several days without supervision.

## Applications

Various key materials properties, e.g., molecular relaxations, conductivity, phase separation, phase transitions, activation energy, glass temperature, rate of blending, purity, ageing, curing, either show marked temperature dependence or are only accessible through temperature-dependent measurements. A temperature control environment is, therefore, an essential part of any fully equipped system for the electrical characterisation of materials. Temperature control thus extends

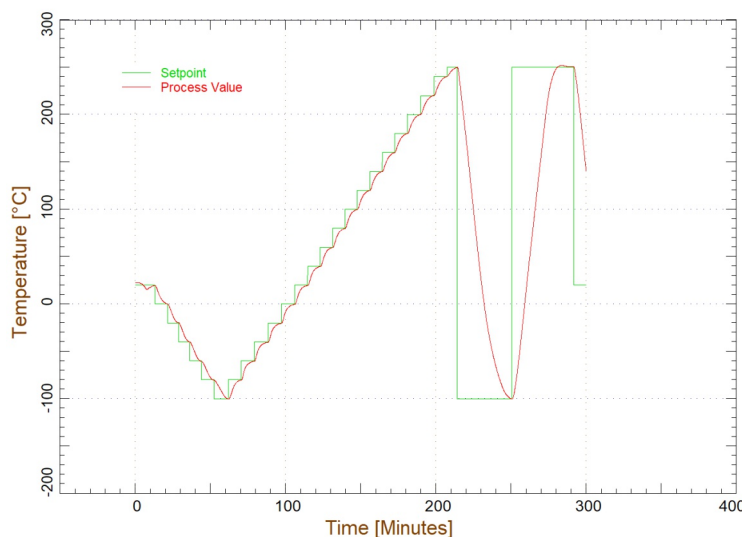


Principle of operation: A heating element builds up and controls a specified pressure in the liquid nitrogen Dewar vessel in order to create a constant nitrogen stream. The nitrogen stream, heated to a temperature appropriate for the desired sample temperature setting, flows directly through the sample cell inserted into the cryostat top flange. The sample temperature is measured at the lower sample cell electrode. The pressure inside the Dewar vessel as well as the gas and sample temperatures are constantly monitored by the Novocool controller. The multiple-channel design allows highly stable, fast and safe system operation. The Novocool cryostat thermal insulation supersedes a separate insulation vacuum. For optimized operation, the dewar pressure is dynamically adjusted by the Novocool microprocessor control unit.

the versatility of dielectric and impedance spectroscopy and increases the significance of the obtained results.

## Features

- Temperature range: -100 °C to 250 °C
- Temperature ramps from 0.1 °C/min to 20 °C/min
- 0.1 °C temperature stability
- Low temperature overshooting after set point step
- Rapid temperature stabilization
- Low nitrogen consumption due to automatic pressure - temperature adaptation
- Four-channel microprocessor controller with 24 bit ADC and IEC communication port
- Fully supported by Novocontrol DETACHEM control and evaluation software suite



Stabilization characteristics of the sample temperature (process value) compared to the temperature set point (step function). Set point step after sample temperature stabilization.