

PPMS

PHYSICAL PROPERTY MEASUREMENT SYSTEM

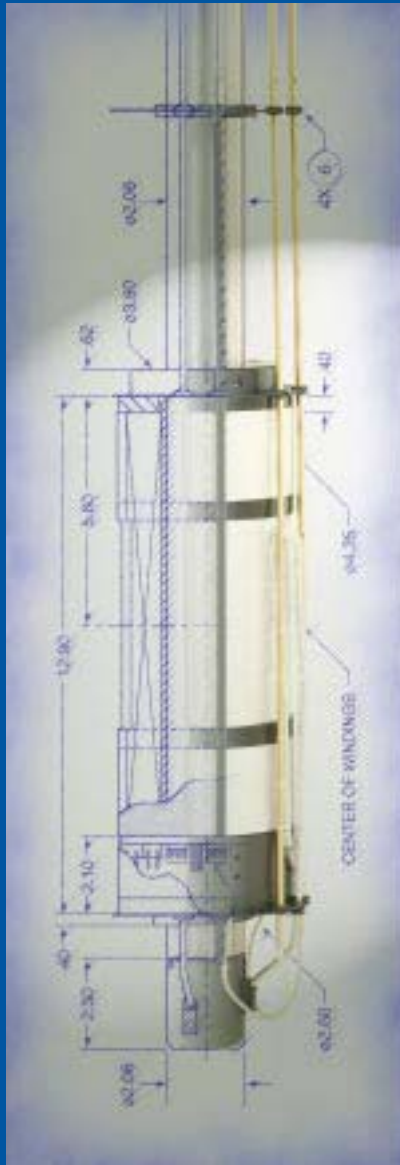


physical
property
measurement
PPMS system

Quantum Design



SYSTEM FEATURES



Much of the versatility of the PPMS is based on the design of the PPMS probe. The probe incorporates the magnet, the temperature control, and the sample puck connector.

THE QUANTUM DESIGN PHYSICAL PROPERTY MEASUREMENT SYSTEM (PPMS) REPRESENTS A UNIQUE CONCEPT IN LABORATORY EQUIPMENT. IT IS AN OPEN ARCHITECTURE, VARIABLE TEMPERATURE-FIELD SYSTEM THAT IS OPTIMIZED TO PERFORM A VARIETY OF AUTOMATED MEASUREMENTS. AT QUANTUM DESIGN WE KNOW YOUR TIME IS VALUABLE, SO WE BROUGHT LABORATORY AUTOMATION TO A NEW LEVEL. WHILE THE PPMS AUTOMATICALLY RUNS YOUR MEASUREMENTS, YOU CAN BE ANALYZING DATA FROM PREVIOUS MEASUREMENTS, PLANNING YOUR NEXT EXPERIMENT, AND CREATING NEW MATERIALS.

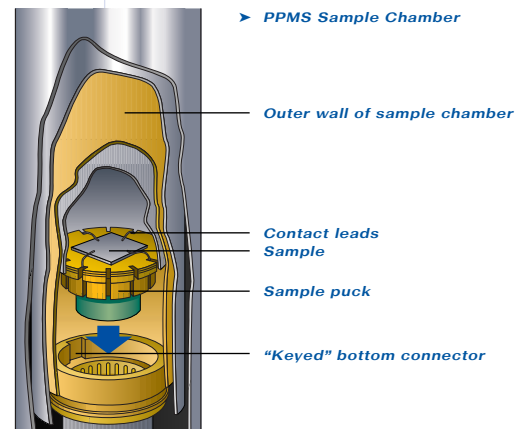
THE PPMS WORKS LIKE A DEDICATED SYSTEM, BUT ITS TREMENDOUS FLEXIBILITY LETS YOU PERFORM DIFFERENT TYPES OF MEASUREMENTS. PLUS, YOU CAN EASILY INTEGRATE YOUR OWN UNIQUE EXPERIMENT WITH THE PPMS. THE FOLLOWING PAGES LIST SPECIALLY CONFIGURED PPMS INSTRUMENTS FOR HEAT CAPACITY, MAGNETOMETRY, AND ELECTRO-TRANSPORT APPLICATIONS. HOWEVER, ANY OF THE CAPABILITIES CAN BE COMBINED TO CONFIGURE A SYSTEM SUITABLE FOR YOUR PARTICULAR RESEARCH NEEDS.

EASE OF USE

The hallmarks of the PPMS are automation and ease of use. You can quickly and easily configure the PPMS to perform different types of measurements. In a matter of minutes you can install a measurement application, set up an automated sequence, and start collecting meaningful data. And, the PPMS is designed to run 24 hours a day, 7 days a week.

PPMS MULTIVU SOFTWARE

PPMS MultiVu is Windows™-based control software that contains all the functions essential for each measurement application. With it you can create measurement sequences that automate system operation, and you can control system parameters, such as magnetic field and temperature, manually. Plus, you can review saved data and monitor data as the PPMS collects it. All systems come complete with remote capability.



SAMPLE MOUNTING

The PPMS sample-mounting system is the most interesting and unique feature of this instrument. At the bottom of the sample chamber is a 12-pin connector pre-wired to the system electronics. This connector allows you to plug in a removable sample insert or sample “puck” and offers convenient access to electrical leads for application hardware and electronics. This connector provides the foundation for all of the PPMS measurement inserts.



► Specialized pucks, 2.4 cm in diameter, are used for different measurement applications.

environment. For example, the sealed sample chamber may hold a high vacuum without the need for additional inserts. This is significant for the design of the Heat Capacity and Helium-3 capabilities.

OPEN ARCHITECTURE

The tremendous flexibility of the PPMS lets you create your own experiments and easily interface your own third-party instruments to the PPMS hardware. The PPMS MultiVu software supports linking capabilities, so you can write your own programs in Delphi, C++, or Visual Basic to synchronize PPMS functions with the activity of other instruments to perform your custom experiment. The Model 6000 PPMS Controller houses and controls all the critical components of the instrument to provide direct communication with the application electronics for rapid data acquisition.

TEMPERATURE CONTROL OPERATION

To control the temperature, a vacuum pump draws helium into the annular region where heaters warm the gas to the correct temperature. This design reduces thermal gradients and increases system flexibility by making the sample chamber a controllable

The temperature control system offers the following features:

- Temperature sweep capability allows measurements to be taken while sweeping the temperature at a user-defined rate (0.01–6 K/min.).
- Continuous Low-Temperature Control (CLTC) ensures precise temperature control, uninterrupted operation below 4.2 K, and smooth transitions through the 4.2 K helium boiling point.

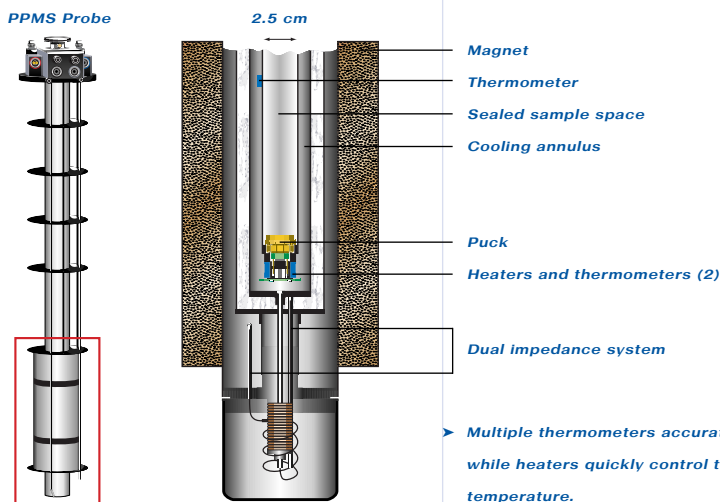
- Temperature range of 1.9–400 K accommodates many different types of measurements.

CONFIGURABLE THERMOMETRY

The UserTemp feature makes it extremely easy for you to incorporate your own calibrated thermometer into the hardware so that your thermometer can control the system temperature. UserTemp not only reads the thermometer but also controls the helium gas flow and heaters to minimize the time required to stabilize at each selected temperature. Many of the PPMS options utilize this feature to monitor the temperature close to the sample.

FIELD CONTROL

The PPMS can be configured with a 7 to 16 T longitudinal magnet or a 7 T transverse magnet. The low noise, bi-polar power supply allows continuous charging through zero field with current compensation and over-voltage protection.



► Multiple thermometers accurately monitor while heaters quickly control the system temperature.