



pressure varies during the test. In addition, the VPA measures the volume of pore fluid produced by the test sample to the nearest 0.01 cc and reports the value to the automated DAQ system. A high pressure insulating coupling (HPIC) provides electrical insulation between upstream and downstream portions of the pore pressure system.

Test Sample Assembly

The test sample assembly includes a sample end cap at each end of the core sample. One end cap includes a porous plate that is permeable to brine but not to gas (or oil) at typical test differential pressures. The end caps and core sample are enclosed in a rubber jacket which isolates the assembly from the confining fluid in the test cell. Two potential electrode wires are embedded in the rubber jacket, along the length of the core sample.

Electrical Resistivity Measurement Electronics

A common electrical resistivity measurement electronics system measures the electrical resistivity of the core sample in each test cell in the system at an operator-specified test interval. An ER-8 switch box switches the connections from the measurement system to each of up to eight test cells in the system. For systems with more than eight test cells, additional ER-8 switch boxes can be added.

Electrical resistivity measurements require that an alternating current be applied to the sample, that the current through the sample be measured, and that the voltage and phase be measured relative to ground (one sample end cap), at the other sample end cap and at the two potential electrodes along the length of the sample. These measurements allow a "2-pole" measurement from end cap to end cap, and a "4-pole" measurement between the two potential electrodes.

Automated DAQ and Test Control System

The PC-based DAQ and test control system allows the operator to define a unique test for each test cell in the system. At operator-specified intervals, the system automatically measures the electrical resistivity of the sample in the specified test cell, and records that measurement along with other test conditions (confining pressure, temperature, pore pressure, etc.). For systems where pore fluid produced is measured manually, the operator can enter volumes associated with specific electrical measurements. For systems using VPA's for measurement of pore fluid volume production, these values are read and recorded automatically. Current test status and data, as well as data history can be viewed by the operator. Data can be exported to a spreadsheet template where much of the data reduction and display is done automatically.