

Temco, Inc.

Design Excellence in Core Analysis Instrumentation

Liquid & Gas Permeameters LPS-630 & GPS-620

Features

- User Friendly Instrumentation
- Digital Electronics for manual or optional computer control
- Steady State Measurement
- Pulse Decay Measurement
- Easy Access Core Holders

Temco offers a series of permeameters for the routine and special core analysis measurement of gas permeability using the steady state and pulse decay permeability measurements as approved by API RP-40. The measurement of the gas permeability of a reservoir core sample is essential for the estimation of the rate of oil recovery. These routine permeameters are designed for easy operation, accurate measurement, and are ideal for most University laboratories.

Gas Permeameters

The permeameters are designed for user friendly operation. The core sample is loaded into a Hassler type core holder. Once the sample is loaded and connected to the instrument, the desired confining pressure can be applied. The confining pressure desired can be specified by the customer from 2,500, 5,000 or 10,000 psi. The gas permeability is then measured using a steady state measurement as recommended by the API. A metering valve is located at the inlet to the core to adjust the inlet gas flow rate. The differential pressure across the core is measured by one of two differential pressure transducers. Two differential pressure transducers are provided so that more accurate measurements can be made over a wider range of permeabilities. Spare, interchangeable differential pressure plates are also provided for a wider, more accurate measurement. When the gas exits the core holder, it then passes through three mass flow transducers to measure the flow rates. Three flow meters are used for accuracy over a wider range. For higher flowing pressures, an optional back pressure regulator can be provided with the instrument. The steady state measurement is recommended for gas permeabilities from 1 md to 10 Darcies.

For gas permeabilities below 1 md, the instrument can be provided with a pulse decay permeameter module. The pulse decay module can measure ultra low gas permeabilities in minutes, rather than a steady state method, which could take hours. For the pulse decay measurement, the pore pressure is limited to 1,000 psi, but the confining pressure can be 2,500, 5,000, or 10,000 psi. The pulse decay module is made utilizing a separate module in the instrument.

Liquid Permeameter

For liquid permeability measurements the measurement is again made using a steady state measurement. The injection of the liquid can be made using a liquid metering pump or an optional accumulator and gas pressure source. The liquid permeameters have the same features as the gas permeameters, but are not provided with a pulse decay module. For liquids, the flow rate is normally measured at the metering pump. If a constant pressure is used for injection, then the outlet fluid is collected in a beaker. The beaker is placed on an analytical balance and the flowrate is determined over time. The software will calculate the flowrate, measure the differential pressure, and calculate the permeability.

Specifications

Steady State Measurement Range	1 md to 10 Darcies
Gas Permeability Pulse Decay Measurement range	0.0001 to 10 md.
Wetted Material	316 Stainless Steel standard
Core Holder	RCHR Series Hassler
Core Diameter(s)	1", 1½", & 2" standard
Core Length	0-3" standard
Confining Pressure	2,500, 5,000, or 10,000 psi
Confining Pressure Hand Pump	Yes
Differential Pressure Transducers, 2 each	Ranges- 0-12.5 psid, 0-125 psid standard
Spare Differential Pressure Plates, 4 each	Ranges- 12.5, 125, 500, 1,250 psid
Gas Mass Flow Transducers, 3 each	Ranges- 50, 500, 2000 sccm
Liquid Mass Flow Transducers, 3 each	Ranges- 0.5 to 50 cc/min
BP Series Back Pressure Regulator	Optional
Electrical	110 VAC 60 Hz or 220-240 VAC 50 Hz 1 Phase

Automation Software

The permeameters can be provided with user friendly automation and data acquisition SmartPerm™ software. The software features are described in detail in the Smart Series software literature.

Computer

Processor	1.8 Gigahertz minimum
Ram	128 megabyte minimum
Hard drive	20 gigabyte minimum
CD ROM	Read & write
Floppy	3½"
Monitor	17" SVGA
Printer	Color Inkjet
Software	Windows, Excel
Electrical	220 VAC, 50 Hz, 1 Phase

