

ADVANCED ROCK PROPERTIES

Core Flood System

Model ACFS50-180



...Quality is Everything...

RESERVOIR CONDITIONS COREFLOODING SYSTEM - is a automated, modular Core Flooding system that is configured for unsteady-state relative permeability tests. Core Flooding experiments in single and multi phase displacements are available in manual and automatic mode, addition of the gas delivery system allow performance of gas displacement experiments. In addition to relative permeability experiments the system is capable of performing a range of reservoir quality assessment experiments including: critical velocity, brine sensitivity, return permeability and acid sensitivity.

The core flooding system includes an automatic liquid sample collector. The automatic sampler for the effluent flowing from the core holder outlet. This device is connected to the core holder outlet via the main tube and operates through an automatic top drive. The valves switch positions according to the pre-set timing, allowing for the automatic collection of effluent samples.

This system is specifically configured to take advantage of Core Laboratories many years of performing waterflooding and simulation experiments.

The base system is configured for liquid/liquid displacements under unsteady state conditions or miscible flood, polymer and other enhanced oil recovery experiments to be performed. The system is rated to 10,000 psig confining pressure, 9,000 psig pore pressure at 360 °F (180 °C) temperature. The system features automated data acquisition, automated operation via an Inter Active Windows based graphical interface.

A test sequencer allows the user to predefine unique test sequences which can be saved and run at any time.

Hardware and software are fully customizable to meet the user's experimental requirements for pressure, temperature, phase, flow control and measurement, materials, sample dimensions and available with fully integrated accessories such as the acoustic separator, VC/VCL Series visual cells, FCH core holders for X-ray/CT/NMR and more. Automated data

acquisition and logging of pressures, temperature, flow rate and displaced fluid along with automated file back-up is controlled by the operating software.

FEATURES:

Automated state of the art system

Unsteady state relative permeability tests

Enhanced oil recovery tests

Formation damage and remediation tests

Forward and reverse flow capabilities

Two pressure taps are standard

Pulsation-free pumping system

Automatic confining pressure controller

Automated Digital Back Pressure Regulator

Precision Quartz pressure transducers with multiple pressure taps

Acoustically-monitored produced fluid separator

Highly corrosion-resistant construction throughout

Inert construction throughout

Unique split oven design for easy access to all components

Unique Test Sequencer software module allows the user to predefine test sequences that can be saved for future use

SPECIFICATIONS:

Maximum confining pressure: 10,000 psi (70MPa)- Higher pressures available

Maximum pore pressure: 6,000 psi (50MPa)- higher pressures available with different pumps

Maximum operating temperature: 360 °F (180 °C) - Higher temperatures available

Routine Core length: 25mm (1") to 150mm (6") standard (other lengths available upon request)

Pressure tap spacing: 50.4mm (2.0") unless otherwise specified

Routine Core diameter: 25mm (1.0)" and 38mm (1.5") (optionally 30 mm)

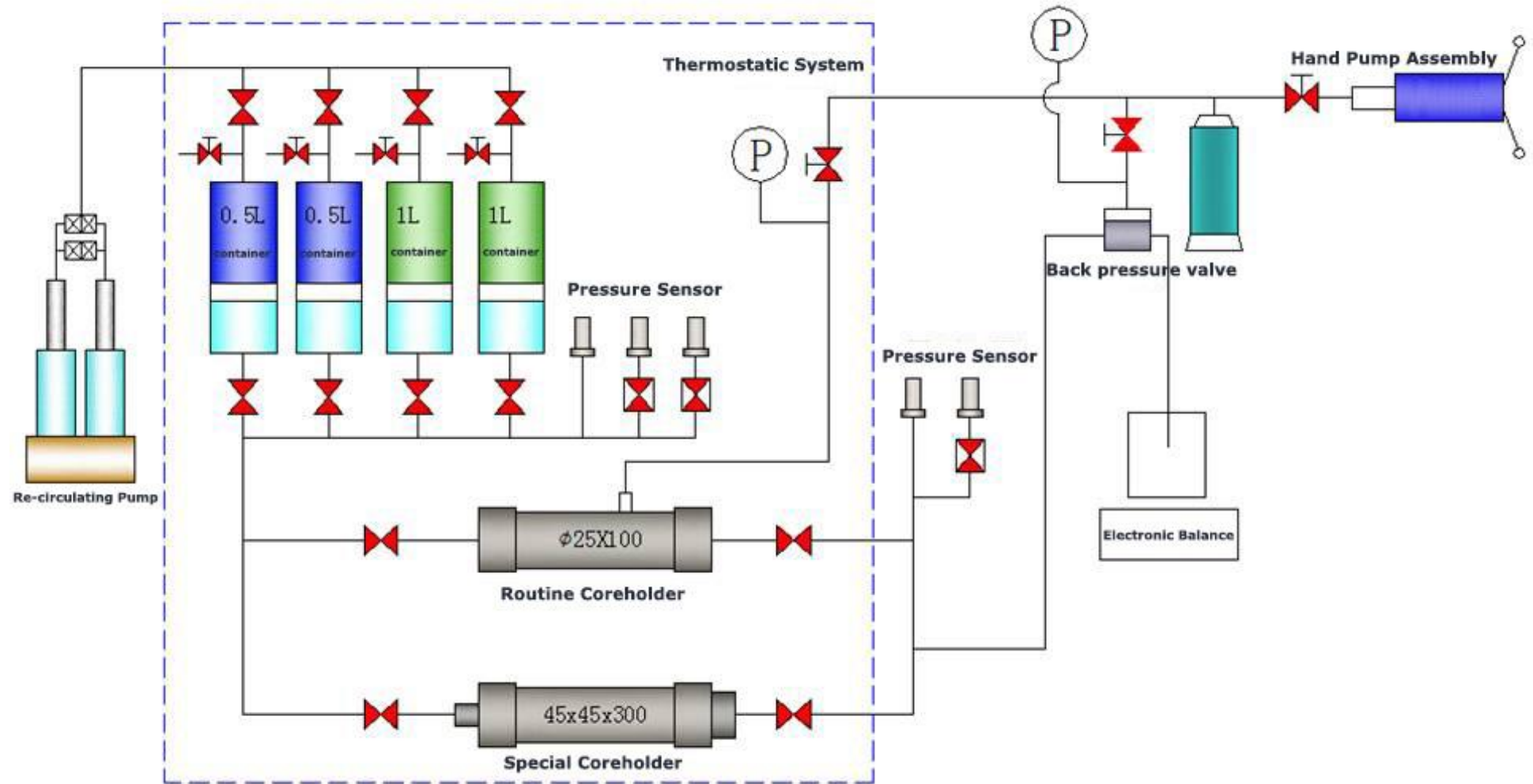
Special Core: 45 X 45 X 300 mm (Square)-- optionally

Flow rate range: 0.001 to 15 cc/min (other flow rates available)

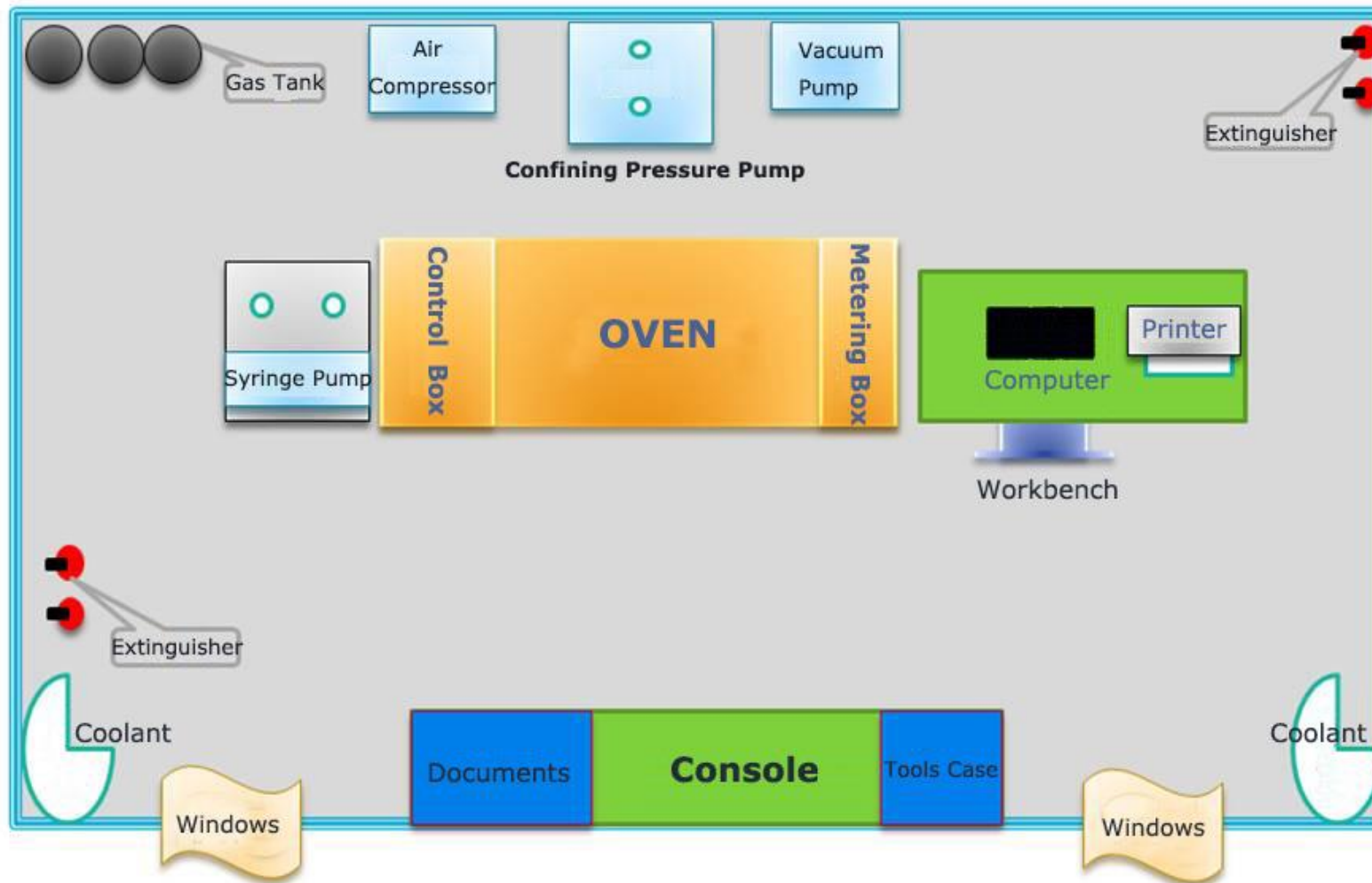
Pore fluid wetted parts: Hastelloy[®], titanium, Teflon[®], Viton[®] and PEEK

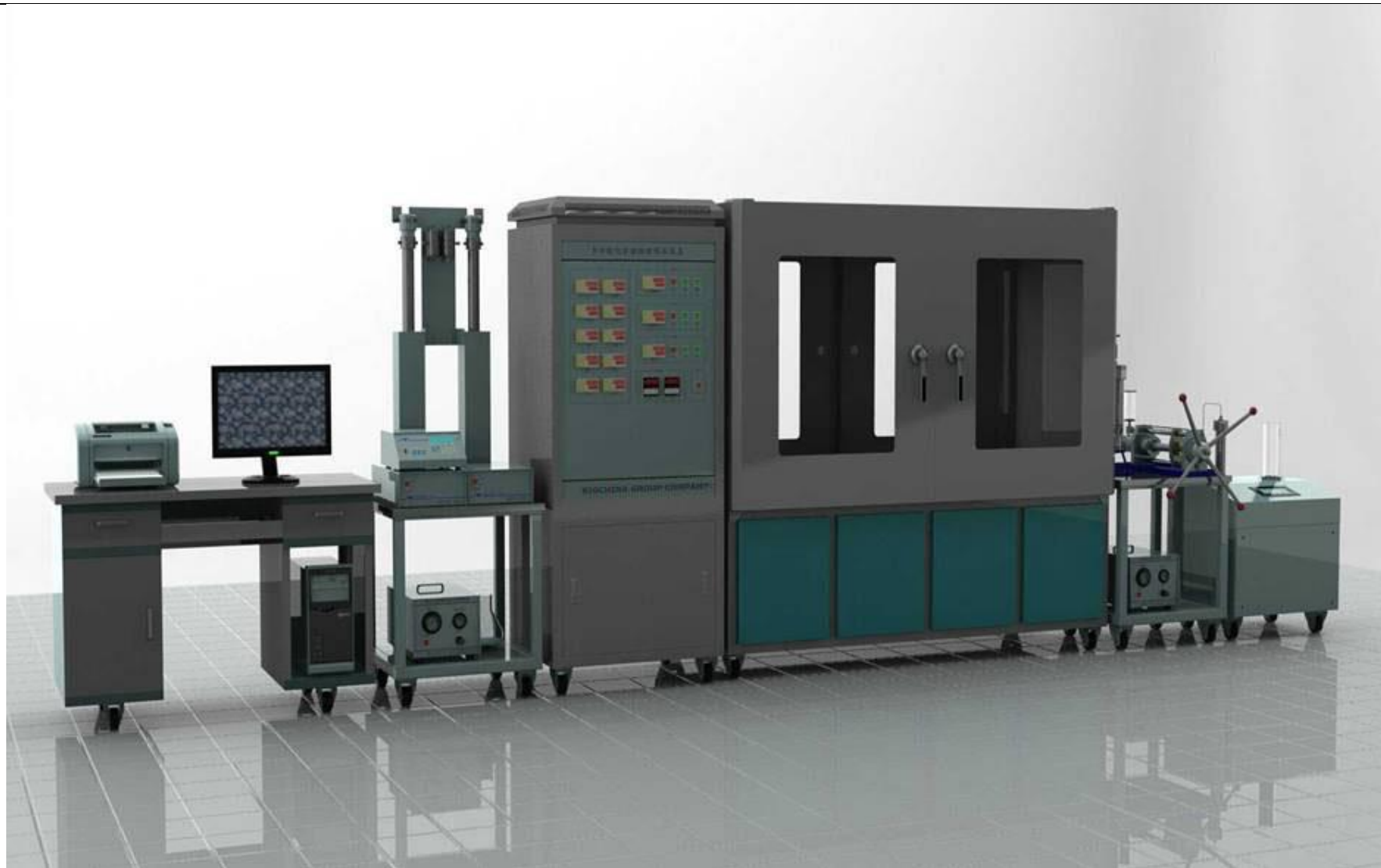
Hastelloy piston accumulators

Figure of Core Flood System Working Schematic:



Equipment Outward Appearance Chart







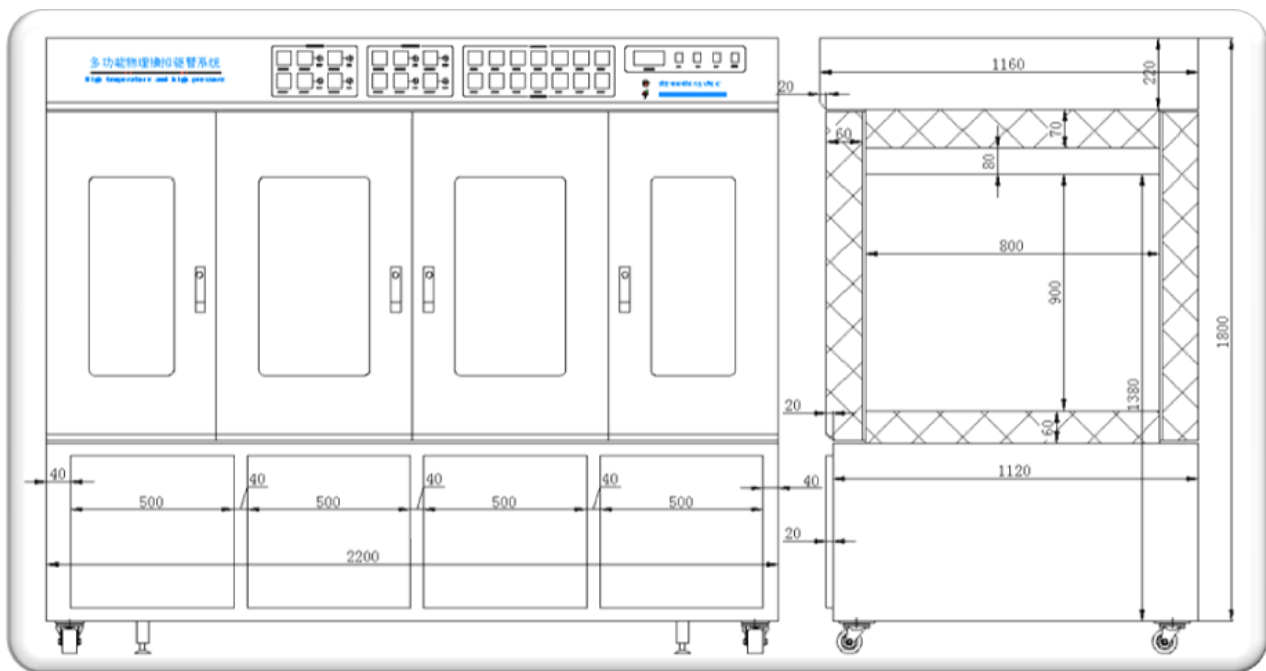


Scope Of Supply

Oven

Windowed Environmentally Safe Oven (Air Bath) rated to 450°F (±1 degree) minimum with automatic temperature control, lighted interior and emergency venting safety features. Allows pumps to be mounted inside the oven to eliminate thermal gradients in the re-circulating fluids.

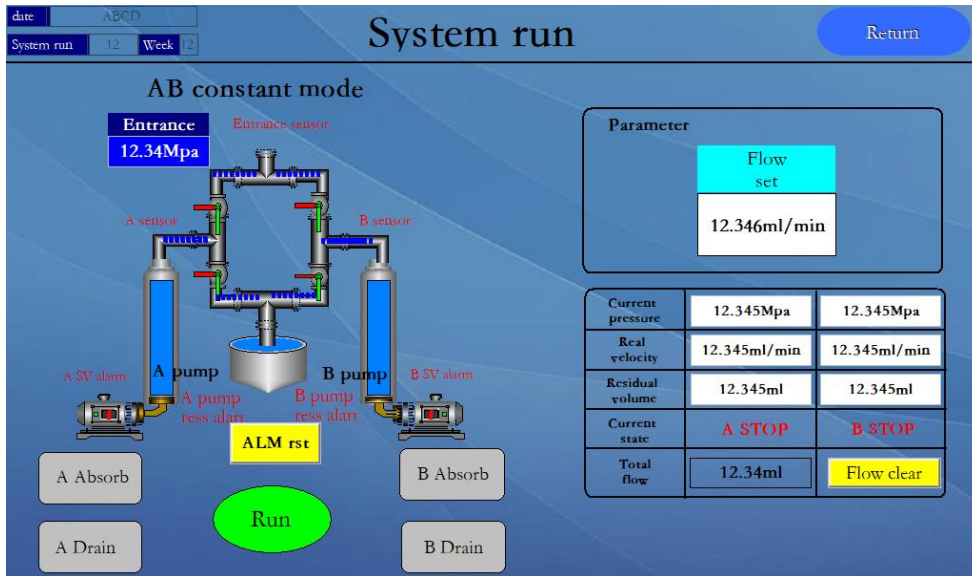
Figure of Oven



Piston Syringe Pump

Core Flood System

The dual piston syringe pump module includes controller and manifold. The pump features continuous pulse-free fluid delivery at either constant flow rate or constant pressure and at pressures up to 7,500 psi. Capacity 100 ml; minimum flow rate 0.01 milliliters per minute; maximum flow rate 25 milliliters per minute.





Accumulator

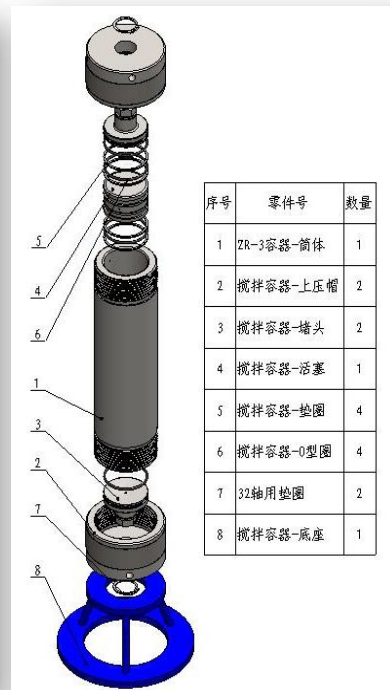
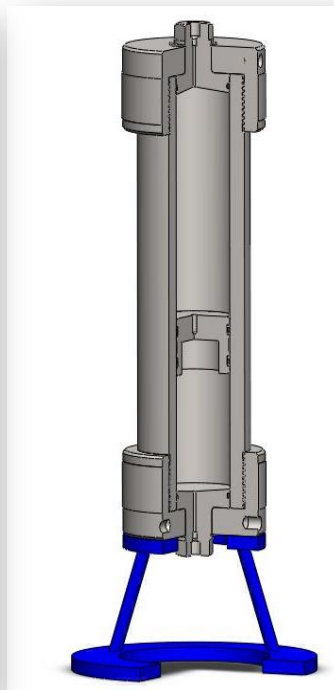
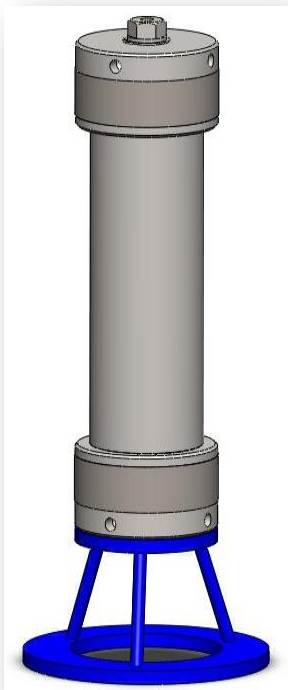
Stainless Steel construction floating piston design complete with valves, rack mounted.

Capacity: 1,000 cc.

Working Pressure: 10,000 psig,

Wetted material: 316 Stainless Steel

Temperature rating up to 350 deg F. (180 °C)



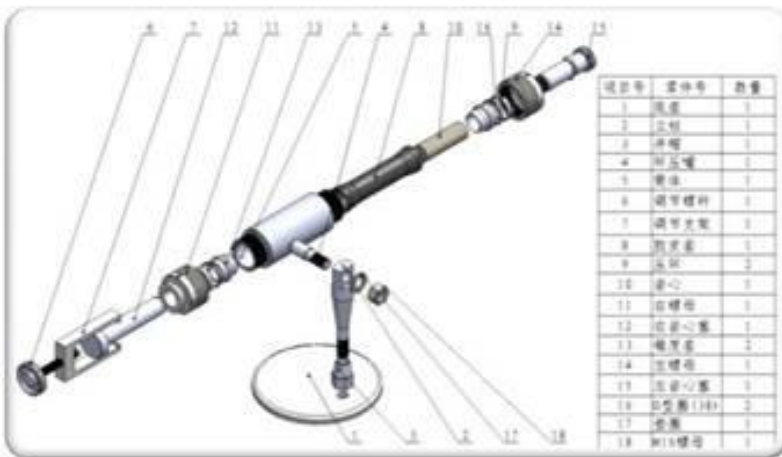


Tri Lock Core Holder

Hydrostatic (Biaxial) with 316 Stainless Steel wetted parts configured with static ports for accurate pressure differential measurements with 3 inlets and 2 outlet flow ports
Wetted material: 316 Stainless Steel, Seals/Sleeves: Viton.

Core Diameter: 25mm (1.0") and 38mm (1.5"); Core Length: 25mm (1") to 150mm (6") standard (other lengths available upon request)

Working Pressure: 10,000 psi; Working Temperature: 360 °F (180 °C)

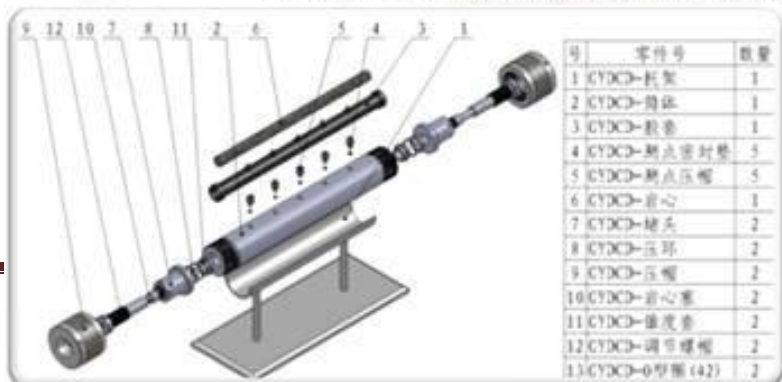


Outside Drawing

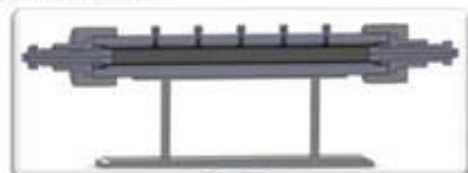


Cutaway Picture

Routine Coreholder Mold 25 X (25-120)



Routine Coreholder Mold (25 X 1000)



Section



Outside Drawing

Differential Pressure System

Differential Pressure System, consists of two high accuracy transducers accurate to 0.1% full scale and a separate array of four differential pressure transducers, accurate to 0.5% full scale, is provided to maintain accuracy at low differential pressures. 0 to 8, 0 to 80, 0 to 200 and 0 to 500 psid. All transducers are interfaced to host computer and data collected and stored by the operating program. Line pressure: 10,000 psi

Automated Overburden System

Automated Overburden System, controls the effective net overburden automatically by monitoring the differential pressure and pore pressure ensuring constant pore geometry. Utilizes one, single cylinder 10,000 psig.

The piston pump and associated plumbing controlled by Host computer allows control of effective net overburden pressure to within 0.2% Full Scale of pump transducer.

Visual Separator – consisting of a windowed cell with integrated travelling boroscope HD image system and associated image processing software to determine liquid level.

Wetted Material: 316 Stainless Steel

Working Pressure: 10,000 psi

Working Temperature: 150 Deg C

Volume: ~200 ml

Back Pressure Controller

Back Pressure Controller precise dome loaded back pressure regulator controls system back pressure, pressure set from a piston pump and associated plumbing controlled by the Host computer.

Dome-Loaded Back Pressure Regulator and Valve



Ambient Separator

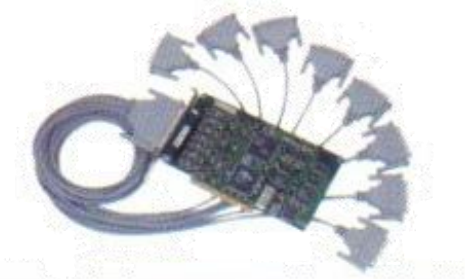
Core Flood System

Ambient Separator includes a Lucite ambient conditions separator mounted on a precision Sartorius electronic balance. The balances' interface allows direct computer access for data logging and graphical interface display of data.

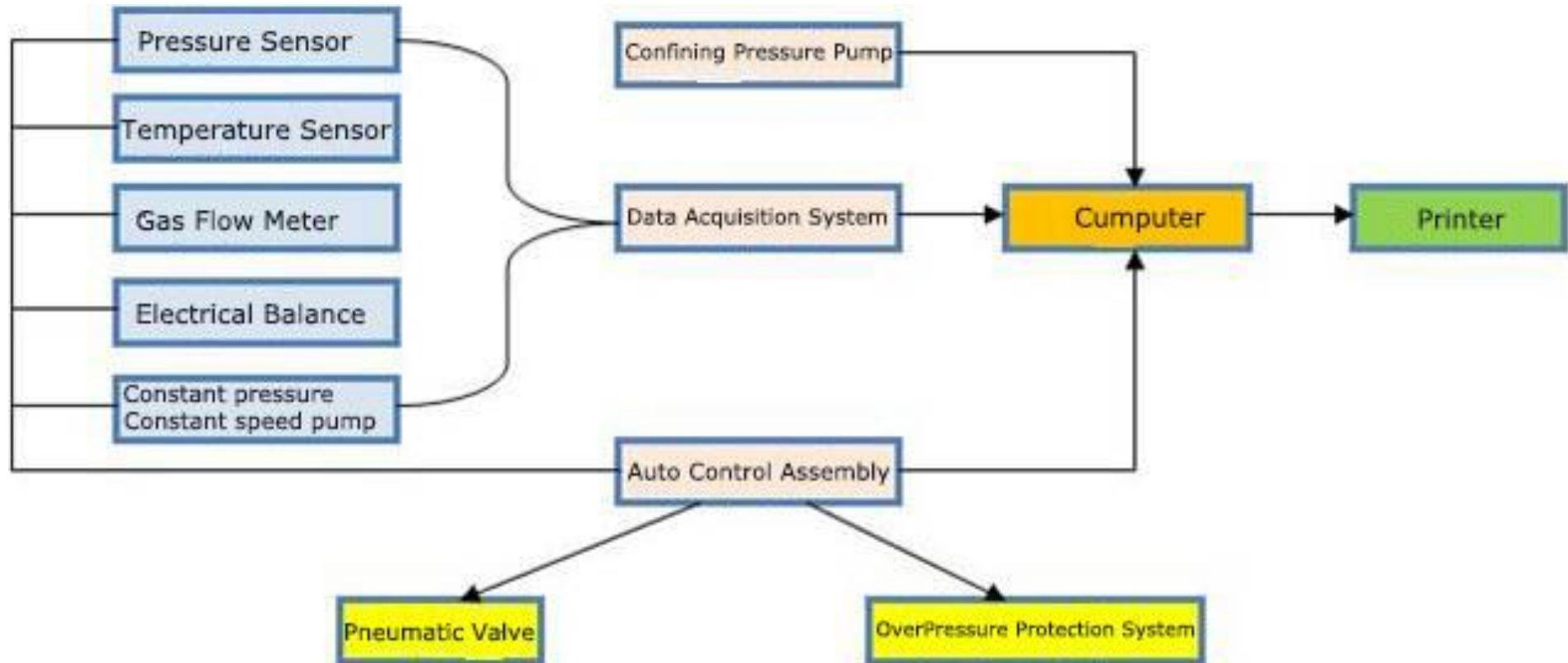
Scale Range 0 – 2,200 gm, scale accuracy +/- 0.01 gm

**Data Acquisition and Control**

Data Acquisition and Control: PC based control software that includes a PC system with a 19-inch LCD Screens, 1 TB minimum Hard Drive CD-DVD and high-speed USB interface for system operation. System software displays and logs all input/output data in real time, monitors all flow and pressure conditions and allows for both manual and automatic operation of system components normally operated in this type of equipment. Real time graphs and animation allow operator to easily visualize condition of the experiment. Includes Error Log, component configuration and calibration screens for ease of maintenance and repair along with alarm messages when system performs outside of set parameters.

Data Acquisition Card

Data Acquisition Process



All items including standard accessories

ITEM	SYSTEM CONSISTS		DESCRIPTION & SPECIFICATION	QTY
1	Inject System	Piston syringe pump	The pump features continuous pulse-free fluid delivery at either constant flow rate or constant pressure and at pressures up to 7,500 psi. Capacity 100 ml; minimum flow rate 0.01 milliliters per minute; maximum flow rate 25 milliliters per minute.	1
		Accumulator	Stainless Steel construction floating piston design complete with valves, rack mounted. Capacity 1000ml, Working pressure: 7500psi (50MPa) Wetted material: 316 Stainless Steel Temperature rating up to 350 deg F	2
			Stainless Steel construction floating piston design complete with valves, rack mounted. Capacity 500ml, Working pressure: 7500psi (50MPa) Wetted material: 316 Stainless Steel Temperature rating up to 350 deg F	2
		Valves, fittings and pipeline	Valve WFs-2 DW3 50MPa Valve WFz-2 DW3 50MPa connection valve M8×1, Three - way valve M8×1	1
		High Pressure pneumatic valve and solenoid valves assembly	The high pressure pneumatic valve and solenoid valve's life is very long over 10,000 times. DW3 50MPa	3
2	Simulation system	Core Holder	Hydrostatic with 316 Stainless Steel wetted parts configured with static ports for accurate pressure differential measurements Wetted material: 316 Stainless Steel, Seals/Sleeves: Viton. Core Diameter: 30 mm ,Core Length:50mm and 100 mm Working Pressure: 10,000 psi ,Working Temperature: 150 DegC	2

		Oven	<p>Windowed Environmentally Safe Oven (Air Bath) rated to 360°F (±1 degree) minimum with automatic temperature control, lighted interior and emergency venting safety features. Allows the pumps to be mounted inside the oven to eliminate thermal gradients in the re-circulating fluids.</p> <p>Working Temperature: 180°C±1°C Working Chamber Size: 2000*800*850mm</p>	1
3	Automated Overburden System	Confining pressure Pump	<p>Automated Overburden System, controls the effective net overburden automatically by monitoring the differential pressure and pore pressure ensuring constant pore geometry. Utilizes one, single cylinder 7500 psig pump and associated plumbing controlled by Host computer allows control of effective net overburden pressure to within 0.2% Full Scale of pump transducer.</p> <p>Wetted Material: 316 Stainless Steel Working Pressure: 7500 psi (50Mpa) , Working Temperature: 180 Deg C Volume: ~100 ml</p>	1
		Back Pressure Controller	<p>Back Pressure Controller precise dome loaded back pressure regulator controls system back pressure, pressure set from a pump and associated plumbing controlled by the Host computer</p> <p>Working Pressure: 7500psi (50Mpa)</p>	1
4	Pressure and temperature measurement system	Pressure Sensor and Digital Pressure Gauge	<p>Pressure Range: 1MPa, 10MPa, 50MPa Accuracy: 0.25%</p>	5
		Temperature Sensor system	The temperature controlled by Host computer	1
5	Automatic weighing System	Precision electronic balance	<p>Ambient Separator includes a Lucite ambient conditions separator mounted on a precision electronic balance. The balances' interface allows direct computer access for data logging and graphical interface display of data.</p> <p>Scale Range 0 – 2,000 gm, scale accuracy +/- 0.01 gm</p>	1
6	Data	Data Acquisition	MOXA C168H/PCI、MOXA C104H/PCI, HY1232	1

	Acquisition and Control System	Card		
		Software	Data Acquisition and Control: System software displays and logs all input/output data in real time, monitors all flow and pressure conditions and allows for both manual and automatic operation of system components normally operated in this type of equipment. Real time graphs and animation allow operator to easily visualize condition of the experiment. Includes Error Log, component configuration and calibration screens for ease of maintenance and repair along with alarm messages when system performs outside of set parameters.	1
		Dell or Lenovo Computer and HP Printer	Processor Type: Intel Core 2 Duo Memory:4GB Hard Drive Capacity:1TB Monitor Screen Size: 19in. Operating System: Windows Keyboard, Mouse Printer HP1020	1
7	Auxiliary system	Vacuum pump and Control Case	Vacuum pump 2XZ-2/4 Power Supply:220V 50/60HZ Oil Capacity 600 ML 1/3hp Motor -0.1MPa	1
	Optional items		Special Core Holder for Special Core Analysis Wetted material: 316 Stainless Steel, Seals/Sleeves: Viton. Core size: 45(width)x45(height)x300 mm(Length) Working Pressure: 10,000 psi, Working Temperature: 180 DegC	1

2016 All instruments and instrumentation sub-systems were manufactured or assembled in the China (Rigchina Group) Specifications subject to change without notice

Warranty and Returns

1.Warranty

Rigchina Group Company warrants its products to be free from defects in material and workmanship for a period of 12 months from the time of shipment. If repair or adjustment is necessary, and has not been the result of abuse or misuse within the twelve-month period, please return, freight prepaid, and correction of the defect will be made without charge.

Out of warranty products will be repaired for a nominal charge. Please refer to the accompanying warranty statement enclosed with the product.

2>Returns

For your protection, items being returned must be carefully packed to prevent damage in shipment and insured against possible damage or loss. Rigchina will not be responsible for damage resulting from careless or insufficient packing.

Before returning items for any reason, authorization must be obtained from Rigchina Instrument Company. When applying for authorization, please include information regarding the reason the items are to be returned.

Our shipping address is:

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