

Mindex Limited

Unit 6, Gatwick Metro Centre
Balcombe Rd, Horley, Surrey
RH6 9GA, United Kingdom
Tel: 44 (0) 1293 408123
Fax: 44 (0) 1293 408 125
email: sales@mindex-ltd.co.uk
web: www.mindex-ltd.co.uk

FLUID

TECHNOLOGY - PHASE BEHAVIOR

Model 3000 Series Phase Behavior System

PVT is an acronym for **P**ressure, **V**olume, and **T**emperature, three physical properties that play a key role in the physical behavior of fluids. Chandler's Model 3000 PVT systems are designed for both quantitative and qualitative analysis of oil and gas condensates under various reservoir conditions.

Experimental PVT systems have been around for years. There are many variations, but the general principle is based on controlling the P, V, and T and measuring the resulting physical behavior of the test fluids.

In the past, reservoir fluid PVT labs relied on mercury to transport, pressurize, and agitate the test sample. The Chandler Fluid Technology product line, pioneered by Ruska, had been the world's leading supplier of mercury-based PVT equipment since 1945.

In 1987, Ruska undertook a development program to both eliminate mercury from the lab and automate the test process through computer control. The first system was installed in 1989 and since then, dozens of systems have been delivered around the world. The Chandler/Ruska PVT system is the most widely accepted analytical PVT system in both domestic and international scientific laboratories.



Positive Displacement Pump

Chandler/Ruska Positive Displacement Pumps are high pressure precision metering and volumetric pumps. These style pumps are required in the PVT lab to accurately deliver or transport fluids (often at elevated pressures) throughout the lab. Chandler/Ruska Positive Displacement Pumps basically consist of a piston and cylinder. The piston is injected into the cylinder thereby displacing an equivalent volume of pump fluid through one of the pump ports. This process can also be reversed to draw fluid into the pump.

The seal is made at the piston as it enters the cylinder so the volumetric accuracy of the pump is based on the dimensional control of the pump piston diameter and control of the linear positioning of the piston.

Specifications Model 3000 Series

Pressure

Range:	0-15,000 PSIA/ 103.4 Mpa
Resolution:	0.1PSIA (standard)
Non-Linearity & Hysteresis:	± 0.05% F.S.
Thermal Effects:	± 0.05% F.S.
Drift Error:	± 0.2% F.S.

Cell Volume

Pump Cell:	400 cc (nominal, Model 3000-0501)
Gas-Condensate Cell:	1,000 cc (nominal, Model 3000-1012)
Floating Piston Cell:	600 cc (nominal, Model 3000-2019)
Floating Piston Cell:	1600 cc (nominal, Model 3000-2081)

[Actual volumes will vary and must be determined by calibration]

Oven Temperature

Range:	Ambient to 204°C (400°F)
Resolution:	0.1°C
Accuracy:	± 0.5°C
Control:	± 0.2°C

Mechanical

Height:	75 inches (191 cm)
Width:	45 inches (114 cm)
Depth:	37 inches (94 cm) with doors
Depth:	31 inches (79 cm) doors removed
Weight:	960 lbs. (435 kg, 1350 lbs. crated)

[The front and back doors are easily removed by sliding them off the hinges]

Main Power

Power Supply:	230 VAC ± 10%, 50/60 Hz (single phase)
Max Power Consumption:	6000 Watts peak

Environment

Minimum Warm-Up Time:	30 minutes
Normal Ambient Operating Range:	15°C to 40°C (60°F to 104°F)
Normal Ambient Relative Humidity Range:	0% to 80%, non-condensing

Laboratory Analysis

Cylinders: Single or Dual

- ◆ Oil Analysis/Recombined Fluid
- ◆ Oil Analysis/Electromagnetic Viscosity
- ◆ Oil Analysis/ Capillary Viscosity/Density
- ◆ Oil Analysis/Solids Detection
- ◆ Oil Analysis/Gas-Condensate Analysis
- ◆ Gas Condensate/Low GOR
- ◆ Gas Condensate/High GOR
- ◆ Chemical and Solvent Evaluation



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