

## Model P-950 Viscosity Index Analyzer



**On-line Dual-bath Viscosity Index Analyzer for continuous measurement of absolute or dynamic viscosity and viscosity index of Newtonian fluids**

- ▶ Customizable 2-4000 cP Sample Range (optional kinematic output in cSt)
- ▶ Continuous Sample Viscosity and Viscosity Index output
- ▶ Does not require atmospheric recovery system
- ▶ Superior repeatability exceeding ASTM D-445 and D-2270
- ▶ Remote diagnostics over IP



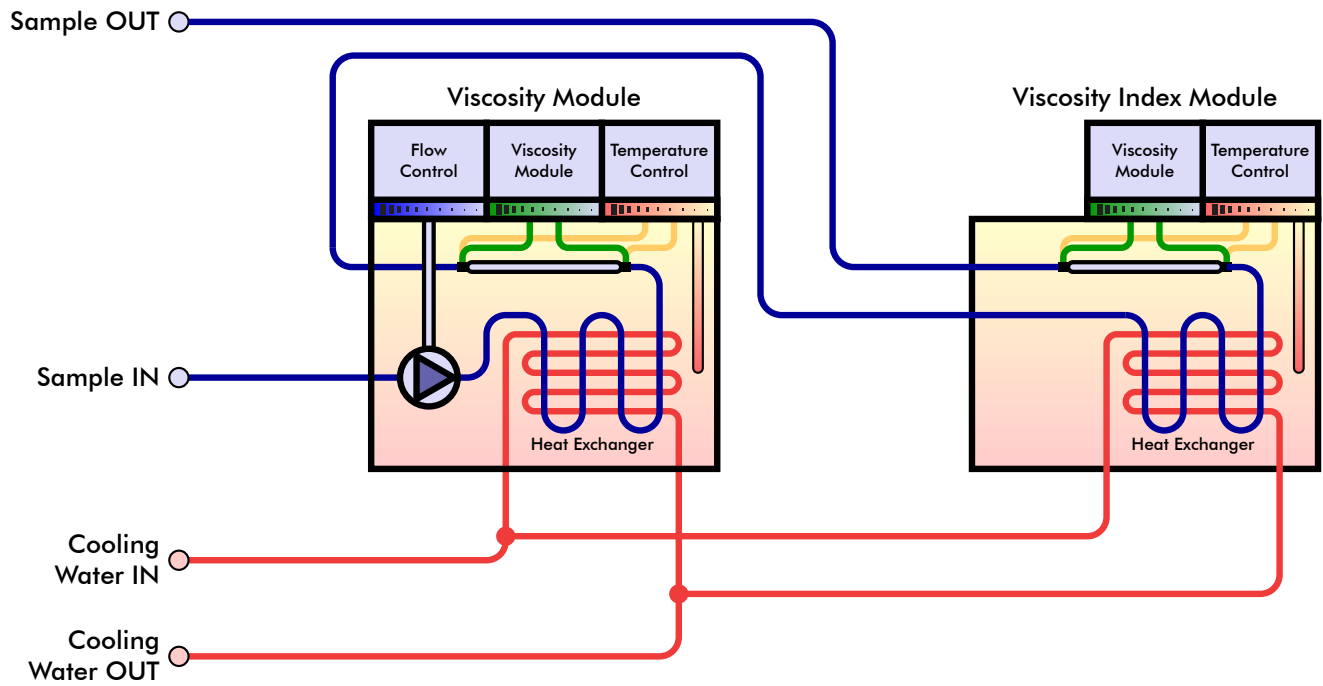
The Model P-950 Viscosity Index Analyzer is the result of combining the latest, state-of-the-art technology with over 45 years of industry experience. The result is an unsurpassed, high-quality viscosity measurement system that produces the process control signal required to perform today's optimized and cost-efficient petroleum refining operations.

This updated design combines traditional, reliable oil bath viscosity with key systems control upgrades. With the end user in mind, attention to design detail allows for ease of maintenance previously thought unattainable by conventional systems.

# Model P-950 Viscosity Index Analyzer

## APPLICATION

Given today's highly competitive environment, oil refiners are demanding instrumentation that aids in the optimization of the refining process. Therefore, refineries require a reliable and accurate viscosity analysis system to meet the required specifications. This analysis will allow the operators to optimize the refining process and therefore lower production costs while improving product quality.



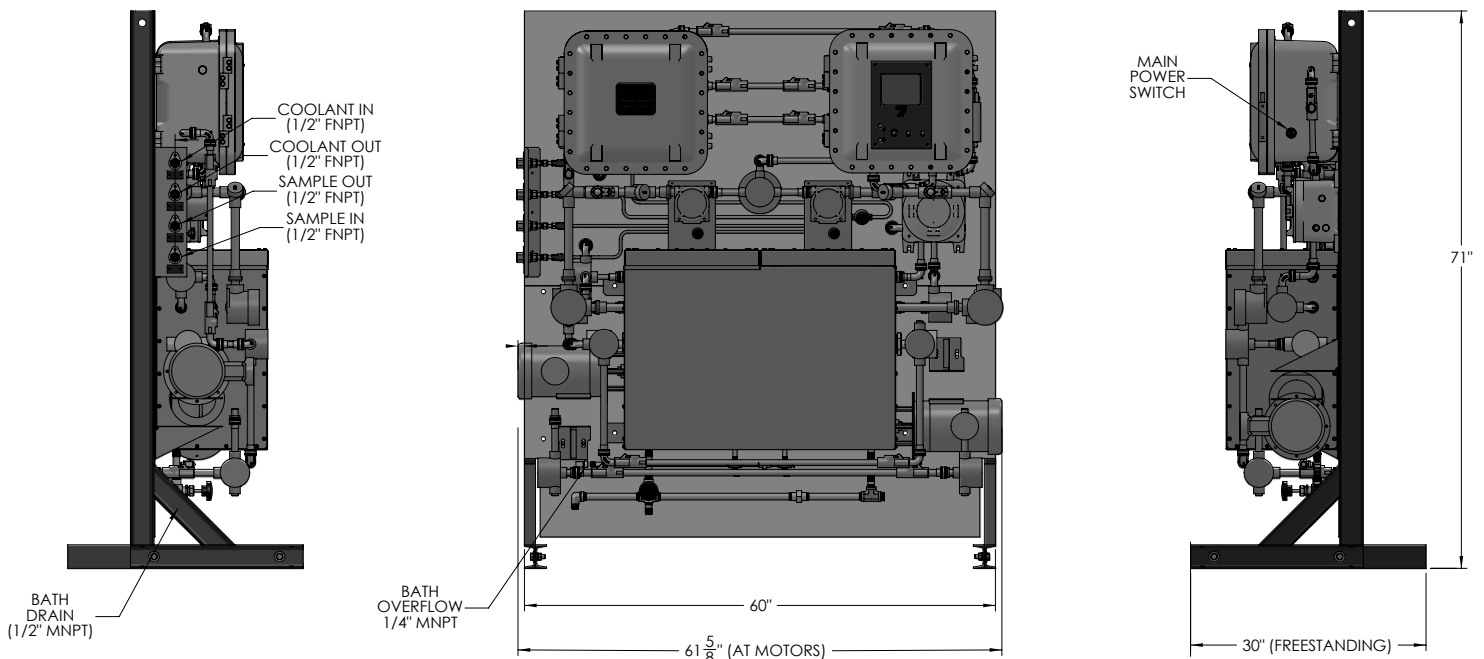
## OPERATING PRINCIPLE

The P-950 measurement cycle is designed to correlate to the ASTM Method D-445. The measurement itself is based on the Hagan-Poiseuille principle, which states that a fluid's pressure differential across a capillary will vary proportionally to the fluid's absolute viscosity.

Sample is continuously refreshed via a bypass line on the instrument. A filtered sample slipstream is pulled from this line into the microprocessor controlled heat exchanger oil bath which brings the sample temperature to the specified measuring temperature. An AC synchronous motor and dual precision pumping system simultaneously raises the sample pressure to a preset limit and pushes a small portion of this sample through a capillary restriction where the pressure is measured at both ends. This pressure differential is recorded by the instrument and a corresponding absolute viscosity is output. . An optional kinematic viscosity output package allows the end user to program fixed or enter assigned sample densities for an output of kinematic viscosity.

While continuously streaming viscosity data output, the P-950 also monitors several system parameters in order to assure a reliable measurement. Sample inlet temperature, bath temperature, and bath oil level are all continuously monitored to assure system reliability. An optional customizable sample conditioning system can be added to handle samples of extreme temperatures and/or heavy particulates.

## DIMENSIONS inch (mm)





## PRODUCT GUIDE

Petroleum Analyzers

- Cloud Point
- Cold Properties
- Flash Point
- Freeze Point
- Pour Point
- RVP
- RVP /VL20
- Salt-in-Crude
- Viscosity
- Viscosity Index

Other Products

- UV-Oil in Water
- Environmental Cabinets
- Sample Conditioning Systems
- Sample Recovery Systems
- Shelter Systems
- Spare Parts

Analyzer Services

- Field Service
- Start-Up & Commissioning
- Training
- Technical Support

## SPECIFICATIONS: MODEL P-950 VISCOSITY INDEX ANALYZER

ANALYSIS PERFORMANCE	
Measurement Cycle Time	Continuous
Measurement Range	2-4000 cP, Customizable Based on Capillary Specification
Repeatability	± 1% Full Scale
Reproducibility	Meets or exceeds ASTM Method D-445
Accuracy	Meets or exceeds ASTM Method D-445
Temperature Accuracy	± .2°F (0.1°C)
SAMPLE REQUIREMENTS	
Sample Flow Rate	Min. 2 gal/hr (125 mL/min)
Sample Return Pressure	Atmospheric – Max. 150 psi (10 bar)
Sample Pressure	Min. 20 psi (1.4 bar) – Max. 200 psi (14 bar)
Sample Temperature	± 100°F (38°C) of bath temperature set point
Sample Particulates	less than 10 µm - optional sample conditioning system available
Sample Conditions	homogenous, single-phase sample without free water
ENCLOSURE/INSTALLATION REQUIREMENTS	
Dimensions	62" (1575) Width – 71" (1803) Height – 30" (381) Depth
Weight	approximately 650lbs. (295kg)
Operating Temperature	Min. 40°F (5°C) – Max. 105°F (40°C)
Enclosure Material/Rating	stainless steel - NEMA 4X / IP65 / ATEX rated Ex-Proof Enclosures
Area Classification	NEC Class 1 Div 1 Group C & D or ATEX Zone 1 II B + H2 T4
Power	100 to 125VAC or 200 to 240 VAC, 50/60 Hz, single phase, 20A
Coolant/Steam Supply	0.5 gal/min (2 l/min) maximum at 10°F (6°C) below bath set point
END USER CONNECTIONS	
Analog Output Signal	4 isolated 4-20 mA output (optional second output available), selectable for sample Viscosity values, analyzer system/maintenance warning or analysis measurement indication
Relay Output Contact	three SPDT Relays with contacts rated at 3A resistive load at 250VAC, selectable for sample Viscosity value alarm, analyzer maintenance warning or analyzer fault alarm
Serial Input/Output Signal	TCP/IP or Serial/RTU ModBus output available

## HOW TO ORDER

ANALYZER SYSTEMS	
Catalog Number P-950-1400	ORB Model P-950 Viscosity Index Analyzer, NEC Explosion Proof
Catalog Number P-950-1500	ORB Model P-950 Viscosity Analyzer, ATEX Explosion Proof
OPTIONS	
Catalog Number 700538	Standard Panel Mount Sample Conditioning System
Catalog Number 700858	MODBUS TCP/IP Protocol
ACCESSORIES	
Catalog Number 702285	1-Year Spare Parts Kit
Catalog Number 702286	2-Year Spare Parts Kit

XPROOF ATEX/CE    PURGED ATEX/CE    PURGED ATEX/CE    PURGED ULCSA/CSA    GENERAL PURPOSE



ORB Instruments, Inc.  
4724 South Christiana  
Chicago, IL 60632 / USA

Phone: + (1) 773 927-8600  
Fax: + (1) 773 927-8620  
Email: sales@orbinstruments.com

www.orbinstruments.com