Monitoring and Control for Single-line Process Environments

VISCOpro 2000

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Cambridge Viscosity®
by PAC

The ideal solution for single-line monitoring and control applications:

- Complements and controls CVI's high-quality sensors for increased reliability
- Automated cleaning and viscosity control minimizes user interaction and maximizes accuracy
- Straightforward operations increases viscosity controls efficiency and profitability
- Correlates with ASTM D7483 and ASTM D445

VISCOpro 2000

FAST AND RELIABLE PROCESS VISCOSITY MEASUREMENT

When you have a process line or simulation system of components that are critical to your operations, you need to know that the viscosity parameters are correct or controlled at all times. You want automated monitoring for continuous, reliable, and accurate measurements, but you also want hands-on control – the ability to change settings, measure different attributes, and capture and analyze real-time data.

APPLICATION RANGE

- In-line or In-tank Viscosity Measurement from 0.2 To 20,000 centipoise

STANDARD METHODS

Correlation to:
- ASTM D7483
- ASTM D445

The VISCOpro 2000 viscometer offers menu-driven electronics to complement and control Cambridge Viscosity's high-quality in-line and in-tank sensors. Powerful yet easy to use, the VISCOpro 2000 provides viscosity, temperature, temperature-compensated viscosity, and optional density readings on an enhanced visual display panel. Thirteen factory-set standard measurement ranges from 0.2-20,000 cP are available for greater accuracy.

Selecting operating characteristics, control set points, and alarms (six different settings) are easy using a menu-driven interface with RS232 (standard) and RS485 (optional) communications ports. A built-in 1,000-point data logger captures key data in real time that can be easily exported to common graphing programs for analysis. The VISCOpro 2000 can be easily programmed for up to 40 different fluid settings, enabling rapid changeovers in production processes with consistent results.

VISCOPRO MONITOR AND CONTROL MENUS

SELF-CLEANING OPERATION

Our proprietary software cleans the sensor at regular intervals by forcing the piston to the bottom of the chamber with increased force. This action does not affect measurement levels or data capture, yet effectively eliminates particle build up that can interfere with the system's reliability. The VISCOpro 2000 will also switch to cleanout mode whenever necessary.

AUTOMATIC VISCOSITY CONTROL (PROPORTIONAL-INTEGRAL)

The system is factory-set yet configurable. Its microprocessor "learns" how much control is needed for each fluid setting, and automatically adjusts to the ideal level, maximizing accuracy and allowing for minimal operator intervention.

MULTIPLE OUTPUT SIGNALS

The VISCOpro 2000 does more than measure viscosity; it transmits analog signals for temperature and temperature-compensated viscosity (TCV); optional density measurement is available. TCV is a particularly important attribute as fluctuations in temperature wastes money and materials while harming quality control efforts. VISCOpro 2000 eliminates the effects of variations in process temperature and increases viscosity-control efficiency.

AUTOMATIC DATE AND TIME-STAMPED DATA LOGGING

With automatic date and time-stamped data logging, you have an audit trail to identify errors and changes to the process, as well as performance and quality trends. The data can easily be exported to spreadsheet programs for further analysis and customized reports.

SECURITY AND ALERTS

The VISCOpro 2000 features a supervisory lock-out function to prohibit unauthorized viewing of line status or changing of settings. When levels reach user-configured thresholds, alarms are triggered to alert operators so they can quickly take appropriate action.

QUICK CHANGE MEMORY SETTINGS

If your process line runs more than one fluid, very often each fluid requires its own viscosity control setting. When you change the fluid, you have to be sure to consistently and accurately change the settings. The VISCOpro 2000 allows you to name each fluid and select its setting.

COMPATIBLE IN-LINE SENSORS

301
Ideal where threaded connections are desired, the 301 sensor mates directly to a tee or pipe with standard 1.25" NPT ends. Recommended for line sizes < 2".

311
Appropriate for most applications, the 311 sensor has a quick-disconnect flange for fast, tool-less removal. Recommended for line sizes < 2".

372
The 372 sensor installs directly into small-diameter process lines using 1/4" NPT fittings. Available with removable jacket.

374
The 374 sensor incorporates an integral heater and ½" sanitary process connections making it the ideal choice for a wide range of biopharmaceutical and R&D applications.

392
Designed with a rugged, four-bolt stainless steel flange, the 392 sensor fits easily to any pipe line size over 1.5".

501
The 501 sensor is used extensively in compressor, on-engine & hydraulic applications. Sensor connects via ½" NPT threads and 90° push-pull connector allows for low clearance installations.

571
Small yet reliable, the 571 sensor is used for compressor, used oil analysis, on-engine, and hydraulic fluid applications. Designed to fit into 13/16 UNEF threaded ports.

COMPATIBLE IN-TANK SENSORS

321
The 321 sensor can be fitted to any pipe configuration without welding. The sensor's head is attached to its stem at a 90-degree angle.

322
Typically used in permanent in-tank mounted applications, the 322 sensor's head is attached to its stem at a 45-degree angle.

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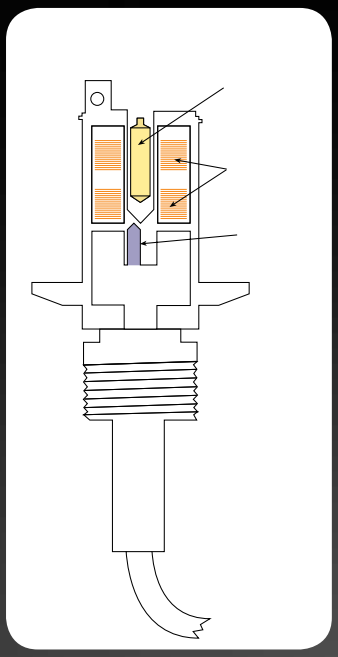
SPECIFICATIONS

Power input	100-240 VAC, 24 VDC, 12 W
Outputs	4-20mA; 1 RS232 (standard)/ RS485 (optional); 1 5V-TTL alarm; 1 on-off port for alarm or control
Accuracy	1.0% of full scale (correlates to ASTM D445) +/- 5% FS for 500-10,000 and 1,000-20,000 cP ranges
Repeatability	0.8% (ASTM D7483)
Ranges*	0.2-20,000cP (0.2-2cP, 0.25-5cP, 0.5-10cP, 1-20cP, 2.5-50cP, 5-100cP, 10-200cP, 25-500cP, 50-1,000cP, 100-2,000cP, 250-5,000cP, 500-10,000cP, 1,000-20,000cP)
Wetted Components	Standard 316L/430 Stainless Steel, Optional Hastelloy, Silicon Coating, and Sanitary Components
Maximum Temperature	190°C (sensor); 60°C (display electronics)
Maximum Pressure	1000 psi (70.3 bar), Optional: 2200psi (151 bar)
Temperature Sensor	PT100
Certifications	FM, CE, ATEX, NEMA4,IP-66



* ± of 5% of full scale 500-10,000 and 1.000 to 20,000cP Ranges

VISCOpro SYSTEM SPECIFICATION COMPARISON

	ViscoPro1600	ViscoPro2000	ViscoPro8000
Measurement Principle	Electromagnetic	Electromagnetic	Electromagnetic
Repeatability	± .8% Reading	± .8% Reading	± .8% Reading
Viscosity Range	0.2-20,000cP	0.2-20,000cP	0.2-20,000cP
Max Pressure Ratings	1,000 psi	1,000 psi	1,000 psi
Self Clean/Recovery	Automatic	Automatic	Automatic
Continuous Analysis	Yes	Yes w/logging	Yes w/graphing
Viscosity Units	cP; cSt; cup sec; SSU Factory Set	cP; cSt; cup sec; SSU User Selectable	User Selectable
Temp: °C or °F	°C or °F Factory Set	°C or °F Selectable	User Selectable
Sensor Temperature Range	-40°C to 190°C	-40°C to 190°C	-40°C to 190°C
Analog Outputs	4-20mA (2)	4-20mA (4)	4-20mA (1) User Selectable
Digital Communications	RS485	RS485/RS232	RS232, TCP/IP
Input power	12VDC	100-240 VAC/12-36 VDC	100-240 VAC
Temperature Compensated Viscosity (TCV)	No	Available	Available
Profibus, Modbus Compatible	No	Yes, Optional	Yes, Optional
Temp/Viscosity Control	No	PI	PI
Alarm Output	Yes, Factory Set	Yes	Yes
Screen	LCD Optional	Menu Driven LCD PC Optional	Touchscreen-Multichannel
FM, CE, ATEX	Standard	Optional	Optional

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With more than 10,000 installations worldwide, Cambridge Viscosity is the proven leader in viscosity management technology. With over 25 years of experience, Cambridge Viscosity understands and meets the needs of laboratory researchers and process engineers in a wide range of industries whose jobs depend on the quality, accuracy, and reliability of viscosity measurement equipment. With their patented sensor technology, Cambridge Viscosity has become the gold standard in small sample viscosity measurement.