

# VISCOSITY SENSORS 440 & 443



## Viscosity Sensors 440 & 443

The Viscosity Sensors 440 and 443 installs into a high pressure pump through type system. Both ends mate to HiP HF4 fittings with a 9/16-28 thread. The Viscosity Sensor 440 is rated for continuous operation up to 20,000 psi while the 443 sensor is rated up to 30,000 psi.

Fluid flows through ¼ inch high pressure port for measurement. Fluid is typically measured under static

conditions. A continuous flow adapter is optionally available. System measures viscosity, temperature and temperature compensated viscosity. It provides data via RS-232.

The high-pressure viscosity sensors are used in various applications including PVT oil research, EOR, core analysis, and supercritical fluid research. Our industry leading viscosity technology

is based on a simple and reliable electromagnetic concept. Two coils move the piston back and forth magnetically at a constant force. Proprietary circuitry analyzes the piston's two-way travel time to measure absolute viscosity. A built-in temperature detector senses the temperature of the sampling chamber.

### KEY FEATURES

#### Proprietary and Proven Technology:

- Accurate and reliable requiring minimal sample size (less than 2 ml )
- Rugged stainless steel design that is highly durable
- Mercury free
- 440 sensor is pressure rated to 20,000 psi; the 443 sensor up to 30,000 psi
- Measures gas and gas condensates in addition to fluid sample

#### Easy to Use:

- Self-cleaning
- One moving part, the piston

### APPLICATION RANGE

Viscosity measurements from 0.2 To 20,000 centipoise and 0 To 20,000 psi; extended option available for up to 30,000 psi

### STANDARD METHODS

Correlates with ASTM D445  
Correlates with ASTM D7483

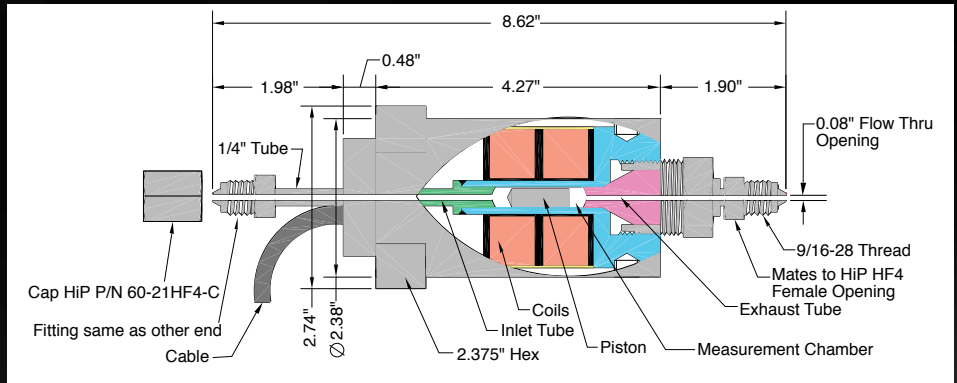


# solidpartners proven solutions

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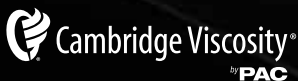
## SPECIFICATIONS

|                         |                                                                                                                                                      |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overall Viscosity       | 0.02 to 10,000 centipoise (cP)                                                                                                                       |
| Viscosity Ranges        | 0.02-.2cP, 0.2-2cP, 0.25-5cP,<br>.5-10cP, 1-20cP, 2.5-50cP,<br>5-100cP, 10-200cP, 25-500cP,<br>50-1,000cP, 100-2,000cP,<br>250-5,000cP, 500-10,000cP |
| Viscosity Accuracy*     | ±1.0% of full scale                                                                                                                                  |
| Repeatability           | ±0.8% of Reading                                                                                                                                     |
| Temperature Sensor      | PT100                                                                                                                                                |
| Wetted Materials        | Inconel 718 / 17-4 Stainless Steel                                                                                                                   |
| Maximum Particle Size   | 25-360 Microns                                                                                                                                       |
| Max Ambient Temperature | 375°F (190°C)                                                                                                                                        |
| Max Operating Pressure  | SPL440 - 20,000 psi (1,406 bar) / 19,000 psi (CRN)<br>SPL443 - High-pressure option - 30,000 psi                                                     |
| Power                   | Requires VISCOpro 2000 electronics                                                                                                                   |
| Certifications          | CE, Alberta Boilers Safety Association,<br>CRN #0F6429.2                                                                                             |

\* ± of 5% of full scale 500-10,000 and 1,000 to 20,000cP Ranges

## OPTIONS

|                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------|
| Extra High Pressure option- rated up to 43,000 PSI (3000bar)                                                          |
| Extra High Temperature - for high pressure viscosity analysis at temperatures up to 300° C                            |
| Multiple ranges, easy change over                                                                                     |
| Continuous flow adapter                                                                                               |
| Hastelloy or silicon coated pistons                                                                                   |
| Integrates directly into PumpWorks®, Labview®, and other laboratory software information management software products |



**Cambridge Viscosity**  
 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.



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