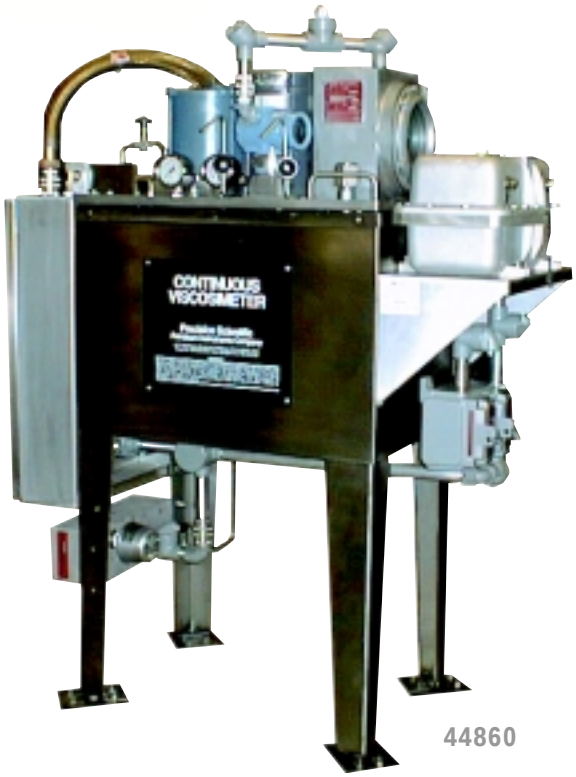
ON-LINE CONTINUOUS VISCOMETER

PROCESS/ON-LINE

44860 NEC Ex-Proof • **44865** CENELEC Ex-Proof

When you absolutely need to know the true viscosity...

The PSPI line of Continuous Viscometers offers continuous on-stream process measurement of fluid's absolute viscosity. The 44860 and 44865 models simulate ASTM D 445 testing procedures with an average response time of less than three minutes. An optional integral sample conditioning system prepares and presents sample to the analyzer with minimum lag time. And because the spent sample is returned directly to process, no atmospheric drain or sample recovery system is needed. 44860 and 44865 Continuous Viscometers are designed for easy maintenance, making them economical and simple to operate.



44860

- True viscosity measurements at user-specified temperatures
- Spans from 2 to 4000 Centipoise, selectable through the use of any of eleven standard capillary range tubes
- Bath temperature range of 38° to 135°C (100° to 275°F) with repeatability of ±0.5°F provides excellent temperature control
- Laboratory accuracy with on-line convenience which provides continuous absolute viscosity results comparable to ASTM D 445, IP 71 and DIN 51550
- No sample recovery system required for return pressures up to 26.4 kg/cm^2 (375 psig)
- Typical applications are locations where controlling the dilution of residual fuels and heavier fuel oil to constant viscosity specifications are required
- Highly stable capillary system includes booster pump and pressure regulator for extra precise measurements

THEORY OF OPERATION

The PSPI Continuous Viscometer is an on-stream, process monitor that measures the viscosity of Newtonian fluids in accordance with the Hagan-Poiseuille principle, which states that the pressure drop of a fluid, flowing through a capillary restriction under conditions of constant flow and constant temperature, will vary in proportion to changes in the absolute viscosity of that fluid.

The 44860 and 44865 are designed to provide the conditions—constant flow and constant temperature—required to determine the absolute viscosity of Newtonian fluids. These determinations are performed as follows: A representative product sample is taken from the process or slip-stream line and introduced to the monitor. The sample flows through an integral sample conditioning system and then enters the Monitor Bath, which is maintained at a preset temperature. A dual unit pumping system submerged in the bath raises the sample pressure to a preset pressure (booster pump) and also pumps a portion of the sample through a capillary assembly (metering pump). The pressure drop across the capillary assembly is measured and converted to an appropriate output signal.

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PRECISION
SCIENTIFIC PETROLEUM INSTRUMENTS

SPECIFICATIONS

Performance

- **Oil Bath Temperature**: Any two set point temperatures from approximately 5.5°C (10°F) above coolant temperature to 135°C (275°F) maximum
- **Accuracy**: Correlates to kinematic laboratory determinations (ASTM D 445, IP 71, DIN 51550) with respect to viscosities of Newtonian fluids; achievable accuracy of ±0.5%
- **Response Time**: Continuous Viscometer—2 to 3 minutes, dependent on fluid viscosity; Sample Conditioning System—45 second lag time is typical
- **Ambient Temperature Limits**: 5° to 40°C (41° to 104°F); weather protection required; no direct sunlight

Sample Requirements

- **Flow Rate**: 7.5 liter/hour minimum
- **Pressure**: 1.75 kg/cm^2 (25 psig) minimum, 10.55 kg/cm^2 (150 psig) maximum
- **Return Pressure**: 26.4 kg/cm^2 (375 psig) maximum
- **Temperature**: ±10°C (18°F) from bath temperature set point; ±55°C (100°F) with optional sample conditioning system

Utility Requirements

- **Electrical**: 115 or 230 VAC (±10%), 50/60 Hz, single phase, 1700 watts
- **Coolant**: 2 liters/minute (0.5 gallons/minute) maximum at 1.0 kg/cm^2 (15 psig) and 5.5°C below bath temperature set point
- **Steam**: Required only if incoming sample is below bath temperature set point; 1.75 kg/cm^2 (25 psig) saturated, maximum
- **Regulator Air**: Spent sample return plus 1.8 kg/cm^2 (25 psig); 28 kg/cm^2 (390 psig) max; Note: This is a monetary requirement as this pressure is locked into the pressure regulator.
- **Purge Air**: 2.8 cubic meters/hour at 1.0 kg/cm^2 (100 SCFH at 15 psig)

Signal Outputs

- **Analog Output**: 4-20 mAdc into 900 ohm load; loop powered; isolated (standard)

Area Classification

- **44860**: NEC Class 1, Div 1, Group D
- **44865**: CENELEC components rated for Zone 1, Group IIC; CE compliant

Dimensions & Weight

Uncrated:	H	W	D	units
• **44860**	1245	1004	419	mm
118 kg (260 lbs)	49	40	17	inches
• **44865**	1270	1086	705	mm
182 kg (400 lbs)	50	43	28	inches
Crated:	**H**	**W**	**D**	**units**
• **44860**	1397	1143	559	mm
170 kg (375 lbs)	55	45	22	inches
• **44865**	1423	1194	813	mm
227 kg (500 lbs)	56	47	32	inches

Optional Accessories

- **Sample Conditioning System** prepares and presents representative sample to analyzer with minimum lag time
- **Fast Loop Filter** continuously cleans filter, removing particulates down to 38 microns

Due to PSPI's commitment to continual product development, specifications are subject to change without notice.

44865

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