ON-LINE CLOUD POINT MONITOR

PROCESS/ON-LINE

42701D NEC Purge • **42701E** CENELEC Purge
42701DX NEC Ex-Proof • **42701H** CENELEC/ATEX Ex-Proof

Measure cloud point of hydrocarbon products quickly, accurately, completely on-line!

The PSPI Cloud Point Monitor determines cloud point in correlation with ASTM and IP testing procedures even at ultra-low temperatures! Utilizing on-stream process technology, the 42701 arrives pre-programmed with three different operational modes, each with cycle times of less than 10 minutes. And because the spent sample is returned directly to process, no sample collection system is needed. The Cloud Point Monitor is completely microprocessor-controlled with self-test and diagnostic capabilities, making it simple to operate and maintain.

- Measures Cloud Point from -62° to 25°C (-80° to 77°F) with repeatability of ±0.5°C
- Measurement correlates to ASTM D 2500 and IP 219
- No sample recovery system required for return pressure up to 1.4 kg/cm^2 (20 psi) below inlet pressure
- Programmable operation and display in Celsius or Fahrenheit scales
- Typical applications are locations where automatic, on-line composition analysis of aviation fuel, diesel fuel, cycle oil or gas oil Streams is required:
  - *quality monitoring*
  - *blending optimization*
  - *closed loop process control*
  - *quality assurance*

THEORY OF OPERATION

Cloud Point measurements are performed by passing a single beam of monochromatic light from a fiber optic light source through the sample, measuring the amount of light reaching the detector module and calculating the delta change from a baseline measurement as the sample is cooled. To minimize the effect of material buildups on the sample cell windows, a new baseline is established on every cycle.

The formation of wax crystals results in a sudden drop in the amount of light reaching the detector. The sample temperature when these crystals form is the cloud point. Cloud point temperature is displayed in either degrees °C or °F on the monitor's local readout and output as an analog signal. Once the cloud point is determined, the sample cell is flushed and a new measurement cycle initiated.

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SPECIFICATIONS

Performance

– **Response Time**: Typical cycle time is 2 to 10 minutes (user-programmable); sample dependent
– **Operation Modes**: High Speed Trending Monitoring, Laboratory Test Simulation, Combination Trend & Laboratory Simulation
– **Ambient Temperature Limits**: 4° to 38ºC (41° to 100ºF); weather protection required; no direct sunlight

Sample Requirements

– **Flow Rate**: 0.8 to 1.6 liters/minute (0.2 to 0.4 gallons/minute)
– **Inlet Pressure**: 10.5 kg/cm^2 (150 psig) maximum
– **Return Pressure**: Minimum differential pressure inlet to outlet 1.4 kg/cm^2 (20 psig)
– **Temperature**: 10° to 37°C (50° to 100°F), but at least 10°C (20°F) above expected cloud point temperature
– **Color Influence**: Nil below ASTM 8 color
– **Water Influence**: Nil below 5000 ppm

Utility Requirements

– **Electrical**: 115 or 230 VAC (±10%), 50/60 Hz, single phase, 300 watts
– **Purge Gas** *(DX/H models optional)*: Clean, dry Nitrogen (98% pure) or other inert gas at 2.0 to 4.2 kg/cm^2 (30 to 60 psig) input pressure; 42 liters/minute (1.5 SCFM) initial purge rate at 2.8 kg/cm^2 (40 psig) input
– **Coolant**: 50/50 water/glycol mixture at 10.5 kg/cm^2 (150 psig) maximum pressure; minimum pressure differential of 2.8 kg/cm^2 (40 psig)

Signal Outputs

– **Analog Outputs**: One isolated 4–20 mAdc Cloud Point Value (standard)
– **Alarm Relays**: 3 SPST fail-safe alarm relays (standard): Level 1 Alarm, Level 2 Alarm, Purge Alarm
– **Serial Output**: RS-232C serial output available (optional)
– **"Come Read" Contact**: Dry relay contact for end of measurement cycle notification (optional)

Signal Inputs

– **Remote Program Selection**: Terminals available for four 24 VDC dry contact relays (optional)
– **Remote Standby**: Terminals available for customer-supplied dry contact control of instrument; allows control room to take monitor "off-line" (optional)
– **Automatic Validation Check**: Terminals available for dry contact or user-selectable intervals (optional)
– **Stream Switching** *(42701D only)*: Terminals available for customer-supplied dry contact switching between two process streams (optional)

Area Classification

Explosion-Proof Enclosures:
– **42701DX**: NEC Class 1, Div 1, Groups C & D
– **42701H**: CENELEC EExd IIC T4; KEMA 03 ATEX 2033 (pending); CE
Purged Enclosures:
– **42701D**: NEC Class 1, Div 1, Group D
– **42701J**: JIS Purged (Japan)

Dimensions & Weight

Uncrated:	H	W	D	units
• **Analyzer** (42701D)	889	788	305	mm
99 kg (217 lbs)	35	31	12	inches
• **Analyzer** (42701DX/H)	1804	724	762	mm
272 kg (600 lbs)	71	29	30	inches
Crated:	**H**	**W**	**D**	**units**
• **Analyzer** (42701D)	1041	889	407	mm
159 kg (350 lbs)	41	35	16	inches
• **Analyzer** (42701DX/H)	1956	838	864	mm
340 kg (750 lbs)	77	33	34	inches

Optional Accessories

– **Filter Coalescer** separates water from petroleum liquids and acts as high-efficiency filter
– **Sample Conditioning System** prepares and presents representative sample to analyzer with minimum lag time

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

42701D

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