

## Model P-840LT Pour Point Analyzer, Low Temp (No Flow)



### On-line Pour Point Analyzer (No Flow) for continuous measurement of pour point temperatures in hydrocarbons

- ▶ Operating range -150F to 77°F (-100°C to 25°C)
- ▶ Analysis cycles of 10 to 45 minutes
- ▶ Superior repeatability of less than 0.5°F (0.25°C)
- ▶ Increased reliability with operating uptime better than 99%
- ▶ P-840LT has an internal Cryo chiller cools to -125°C without external cooling system
- ▶ No Sample Recovery System needed, can return directly to process
- ▶ Stream switching and validation
- ▶ Remote diagnostics over IP
- ▶ ASTM D-97



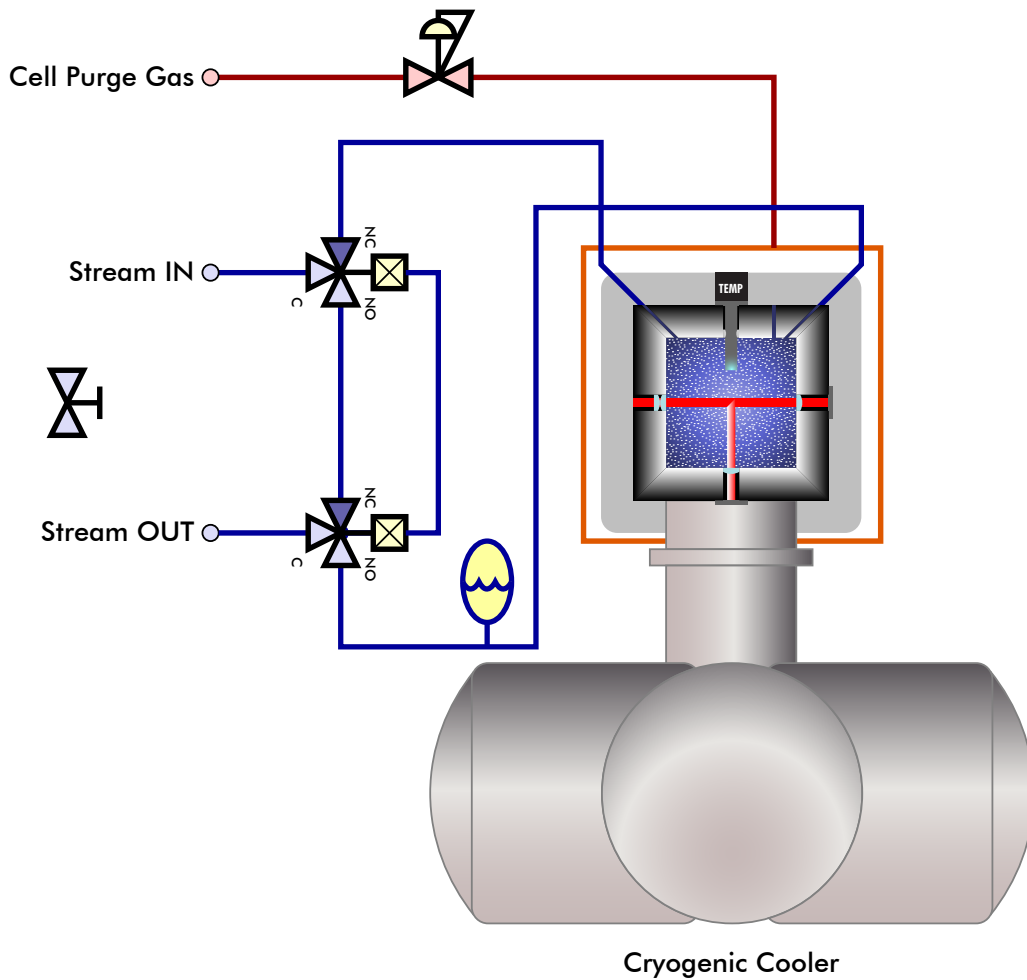
The Model P-840LT Pour Point Analyzer is the result of combining the latest, state-of-the-art technology with over 45 years of industry experience. The result is an unsurpassed, high-quality Pour Point measurement system that produces the process control signal required to perform today's optimized and cost-efficient petroleum refining operations.

A self contained cryogenic cooling compressor out performs traditional Peltier modules reaching colder temperatures and eliminating the need for an expensive external cooling system. This small cooling system allows captured samples to be cooled to -125°C. The high pressure sample cell optics allow sample extraction and return to process and pressure conditions, thereby eliminating the need for atmospheric recovery.

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### 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 analysis system of the Pour Point temperature 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-840LT measurement cycle is designed to correlate to ASTM Method D-97 and IP-15. A precision differential pressure sensing system has been employed to monitor the loss of flow due to the formation of wax crystals during the measuring cycle cool down. The P-840LT pressure sensor monitors the state of the flow conditions through high-pressure detection cell that allows measurement cycles to occur at process pressures, eliminating the need for expensive sample recovery. A state of the art, Stirling Thermoacoustic (Pulse Tube) Cryocooler has been incorporated in the P-840LT. This cooler is a helium-based device that can cool at a capacity of 8 Watts at 77 °K. The cryocooler hot surface is cooled by either plant cooling water or by instrument air. The use of the cryocooler eliminates the requirement of an external explosion proof re-circulating chiller system. It also allows cooling to  $-125^{\circ}\text{C}$ , significantly colder than the  $-85^{\circ}\text{C}$  conventional Peltier cooled systems reach.

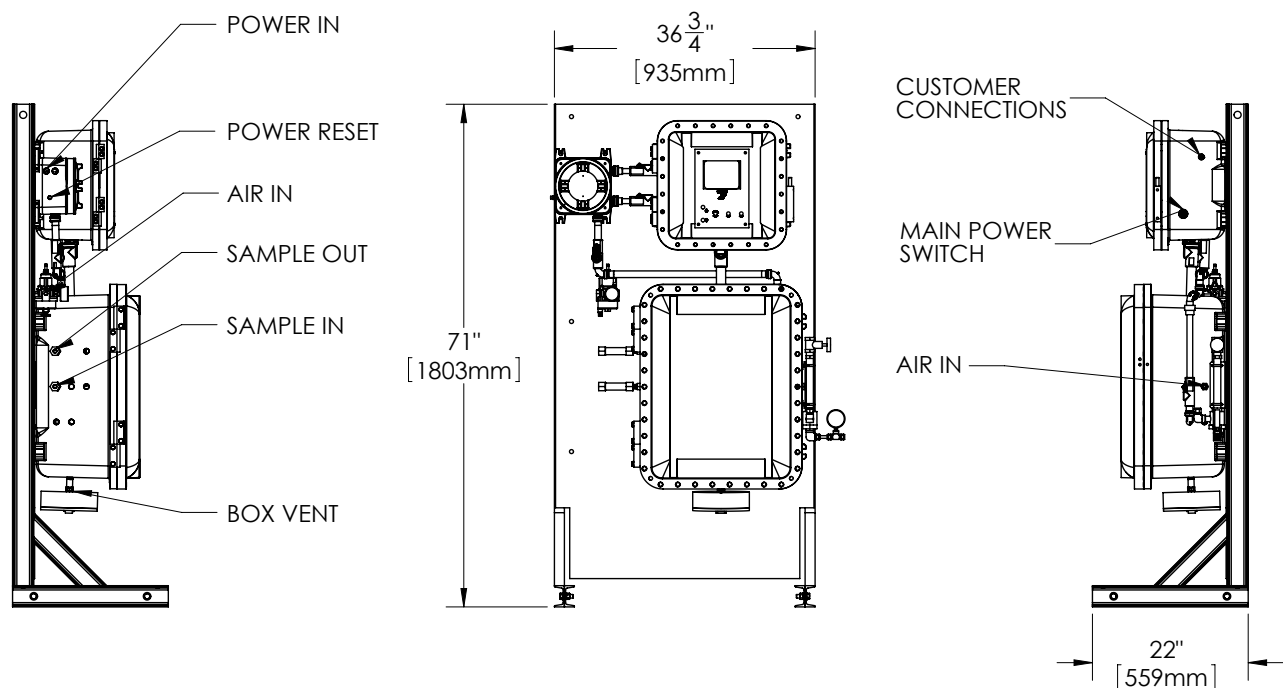
First, the P-840LT measurement cycle is initiated by a sample flush through the sample detection cell. This flush time is programmable and allows fresh sample to be placed in the detection cell for the next cycle. This flush also helps to warm and dislodge any remaining wax crystals that have adhered to the detection cell walls.

Second, the sample solenoid is closed, locking in the sample. The cryocooler is then turned on to a programmed power level. This level is monitored during the cycle and changed to maintain a consistent cooling rate for Pour Point Detection. As the cooling cycle begins the temperature of the sample is monitored as well as the pressure signal. The cooling power is controlled until Pour Point is determined. The sample temperature at which this happens is recorded and sent to the control room. The cycle is then repeated.

By continuously tracking the pressure signal during the analysis cycle, the diagnostic function checks the fluidics system for leaks, drifts and other abnormal events. The VisioGraph advanced diagnostic routine not only provides end users with immediate knowledge of the condition of the analyzer, it also offers suggestions for troubleshooting.

To further enhance the precision and usefulness of the Model P-840LT Pour Point Analyzer, an optional validation/grab sample system can be added. This will allow the end user to either introduce a reference solution or an unknown sample for immediate analysis. This feature provides a simple system verification or a quick analysis of a non-automated sample stream. The optional dual-stream sampling system offers an economic way of automatically monitoring two sample streams with a minimal loss of measurement response time.

## 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**

ANALYSIS PERFORMANCE	
Measurement Cycle Time	10 to 45 minutes
Measurement Range	Min. -150°F (-100°C) Max. +77°F (+25°C)
Repeatability	± 0.5°C (1°F)
Reproducibility	Meets or exceeds ASTM Method D-97 or IP-15
Resolution	± 0.5 °F (0.25°C)
Accuracy	Meets or exceeds ASTM Method D-97 or IP-15
Temperature Accuracy	± 1°F (0.5°C)
SAMPLE REQUIREMENTS	
Sample Flow Rate	Min. 1 L/min – Max. 2 L/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	Min. 35°F (2°C) – Max. 150°F (65°C)
Sample Particulates	less than 10 µm - optional sample conditioning system available
Sample Conditions	homogenous, single-phase sample without free water
ENCLOSURE/INSTALLATION REQUIREMENTS	
Dimensions	Width 37.0 in (940mm) – Height 71 in (1803mm) – Depth 30.0 in (762mm)
Weight	500 lbs (228 kg)
Operating Temperature	Min. 40°F (5°C) – Max. 105°F (40°C)
Area Classification	CSA/CUS Class 1 Div 1 Group B, C + D or ATEX Zone1 II B + H2 T6
Power	self-selecting 100 to 125VAC & 200 to 240 VAC, 50/60 Hz, single phase, 5A
Cyro Cooling	Air cooled: 80-120psi 70 scfm / Water cooled: clean plant water 35°C or cooler
END USER CONNECTIONS	
Analog Output Signal	single isolated 4-20 mA output (optional second output available), selectable for sample Pour Point 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 Pour Point 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-840LT-1400	ORB Model P-840LT Pour Point Analyzer, CSA/CUS Class 1 Div 1 Group B,C,D
Catalog Number P-840LT-1500	ORB Model P-840LT Pour Point Analyzer, ATEX Zone1 II B + T6
OPTIONS	
Catalog Number 700538	Sample Conditioning System
Catalog Number 700858	MODBUS TCP/IP Protocol
ACCESSORIES	
Catalog Number 702232	1-Year Spare Parts Kit
Catalog Number 702233	2-Year Spare Parts Kit

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



Lit. No. P-840LT-EN-US / APR14



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