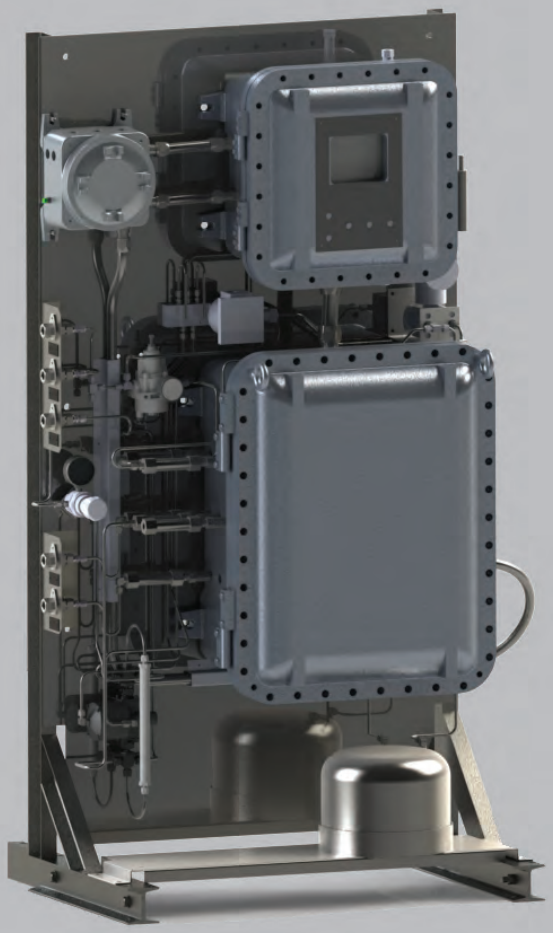
ORB instruments, inc.

Model P-870LT CFPP Analyzer



On-line CFPP Analyzer for the continuous measurement of the cold filter plug point in petroleum products

- Measurement range -50°C to 25°C
- Analysis cycles of 30 to 90 minutes
- Repeatability meets IP309
- Increased reliability with operating uptime better than 99%
- P-870LT has an internal Cryo chiller that can cool to -125°C without external cooling system
- Stream switching and validation options
- Modbus via TCP/IP

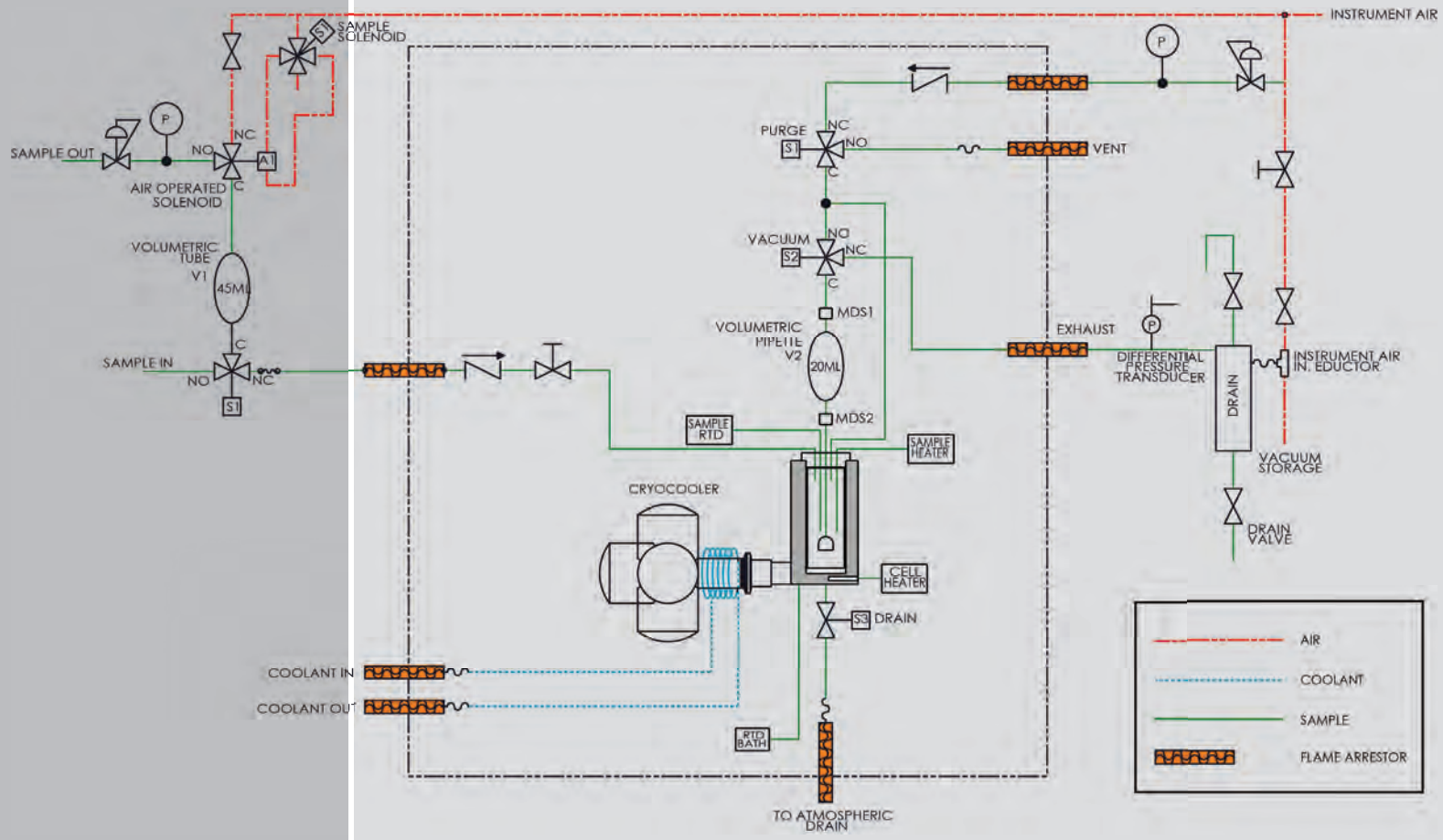
The Model P-870LT CFPP Analyzer is the result of combining the latest, state-of-the-art technology with over 20 years of industry experience. The result is an unsurpassed, high-quality CFPP measurement system that produces the process control signal required to perform today's optimized and cost-efficient petroleum refining operations.

This small, compact and robust cryo-cooled system allows captured samples to be cooled to IP309 bath temperatures.

APPLICATION

Typically produced through the refining and distillation of crude oil, diesel fuel is on the heavy end of the various crude oil distillates. As such, it has a high BTU content and power, making it an attractive fuel alternative for trucks, locomotives, and heavy equipment. However, its high wax content causes problems with diesel vehicle operation in cold weather due to crystallization that can block engine fuel filters. Ultra low sulfur diesel fuel presents even greater cold flow challenges.

The Model 870LT Cold Filter Plug Point Analyzer is designed for the quick and continuous online determination of the CFPP of base and blended diesel fuels. As a result, it enables refinery operators to fine-tune the use of additives and wax modifiers in winter fuel mixes, optimizing blending efficiency while ensuring product quality.



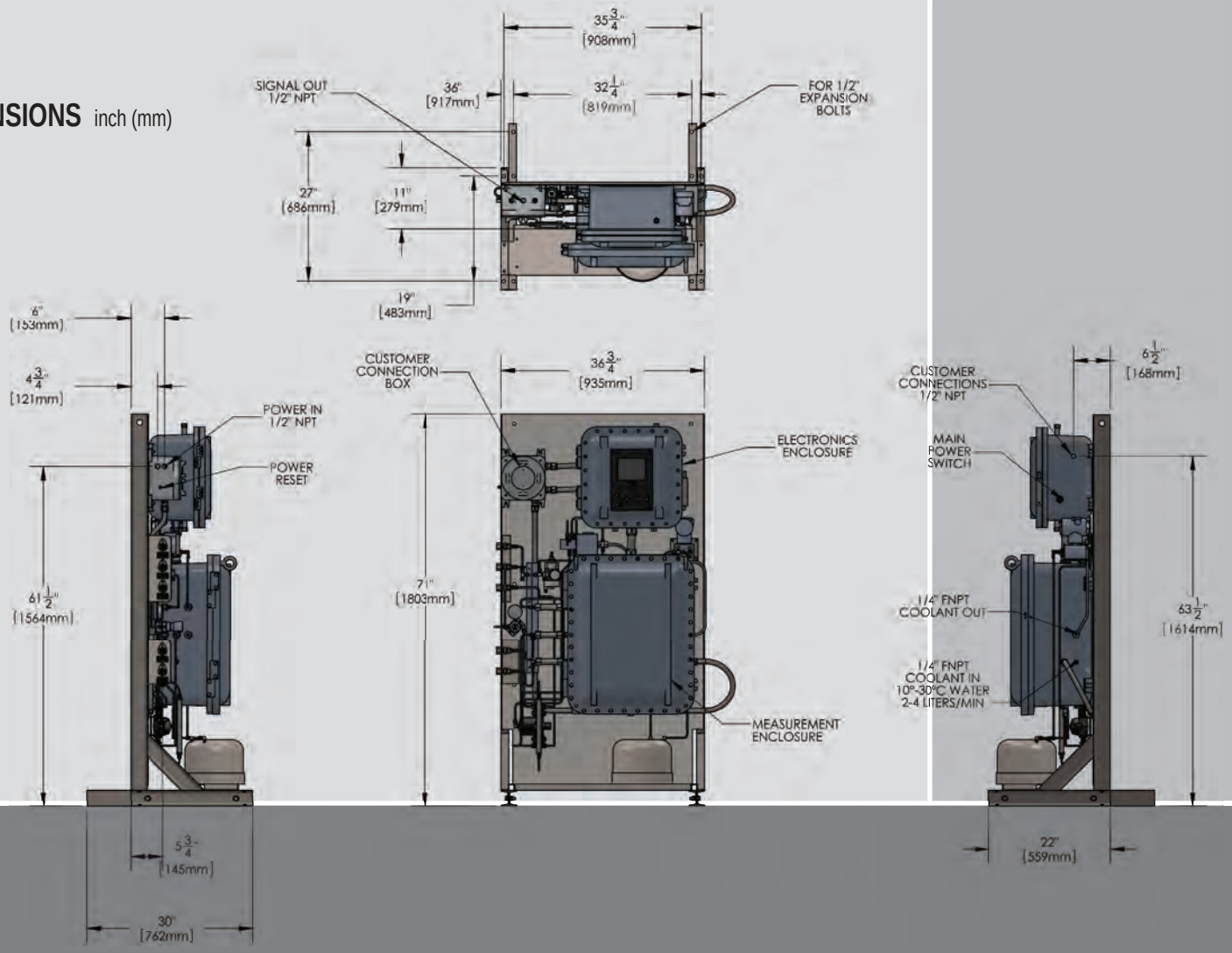
OPERATING PRINCIPLE

The P-870 Cold Filter Plug Point Analyzer is an online instrument that measures CFPP in correlation with IP-309 (DIN 51428). To ensure that a representative sample is always available for analysis, the sampling system is designed to permit the continuous flow of sample through the sampling path.

During a typical measurement cycle, a 45 mL petroleum sample is loaded into the test vessel and cooled in a -34°C bath to a test temperature generally 10°C above the expected CFPP temperature. When the sample reaches the test temperature, vacuum is applied to pull the sample through a 45 micron mesh screen into a 20 mL pipette. The sample is then allowed to drain back into the test vessel.

The sample is then cooled an additional 1°C and the process repeated until the sample can no longer be pulled through the mesh screen in 60 seconds (CFPP detection) or the sample temperature reaches -20°C. Should the sample temperature reach -20°C without CFPP detection, the cooling bath temperature drops to -51°C and testing continues until CFPP is detected.

DIMENSIONS inch (mm)



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PRODUCT GUIDE

Petroleum Analyzers
- **Cloud Point**
- **Cold Filter Plug Point**
- **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-Ups**
- **Training**
- **Technical Support**

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ANALYSIS PERFORMANCE	
Measurement Cycle Time	30 to 90 minutes
Measurement Range	-50°C to 25°C
Repeatability	± 1.0 C (2.0 F) Correlates to IP309
Reproducibility	± 1.0 C(2.0F) Correlates to IP309
Resolution (Temperature Sensor)	± 0.01 C (± 0.02 F)
Accuracy	IP309, DIN51428
Temperature Accuracy	± 0.1°C (± 0.2°F) of full scale
SAMPLE REQUIREMENTS	
Sample Flow Rate	Min. 50 cc/min – Max. 100 cc/min
Sample Pressure	Min. 20 psi (1.4 bar) – Max. 150 psi (10.0 bar)
Sample Temperature	At least 10°C (50°F) above CFPP
Sample Particulates	less than 10 µm - optional sample conditioning system available (P/N 700173)
Sample Conditions	homogenous, single-phase sample without water or water moisture
ENCLOSURE/INSTALLATION REQUIREMENTS	
Dimensions	Width 37.0 in (940mm) – Height 73.7 in (1874mm) – Depth 30.0 in (762mm)
Weight	approximately 500 lbs (228 kg)
Operating Temperature	Min. 40°F (5°C) – Max. 105°F (40°C)
Enclosure Material/Rating	Cast Aluminum Copper Free Alloy (Max Copper Content 0.3%)
Area Classification	See Catalog Numbers Below
Power	Jumper Selected 100 to 240 VAC (± 10%), 50/60 Hz, single phase, 2A
Instrument Air	Clean, dry Instrument air at Min. 40 psi (2.7 bar) – Max. 100 psi (6.8 bar)
Enclosure Cooling Purge Gas Supply	Clean, dry Instrument air at Min. 80 psi (5.5 bar) – Max. 120 psi (8.2 bar)
END USER CONNECTIONS	
Analog Output Signal	Single isolated self powered 4-20 mA analog output (optional second output available), selectable for sample CFPP
Relay Output Contact	Three SPDT Relays with contacts rated at 3A resistive load at 250VAC, selectable for CFPP alarm, analyzer maintenance warning or analyzer fault alarm
Serial Input/Output Signal	TCP/IP ModBus output available

HOW TO ORDER

ANALYZER SYSTEMS	
Catalog Number P-870LT-1400	ORB Model P-870LT CFPP Analyzer, CSA-CUS Ex d Class I Division 1 Groups B, C, D
Catalog Number P-870LT-1500	ORB Model P-870LT CFPP Analyzer, ATEX Ex d IIB + H2 T6 Gb
OPTIONS	
ACCESSORIES	
Catalog Number 700228	Sample Recovery System (low pressure and high pressure, contact ORB for further details)
Catalog Number 700538	Sample Conditioning Panel (for sample pressures greater than 35 psi and sample particulates greater than 10µm)
Catalog Number 702268	1-Year Spare Parts Kit
Catalog Number 702269	2-Year Spare Parts Kit

Lit. No. P-870LT-EN-US / FEB13

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

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