Model P-500 Flash Point Analyzer

Orb Instruments on-line Flash Point Analyzer for the continuous measurement of flash point in petroleum products

- Correlates to ASTM D56 (TAG) and D93 (Pensky Martens Closed Cup)
- Operating range 25°C to 125°C
- Rapid analysis cycle of 5 minutes
- Repeatability less than 2°F (1.0°C)
- Micro-processor controlled
- External programming
- Color graphics screen
- Independent sample and flash chamber temperature control
- Remote diagnostics over IP

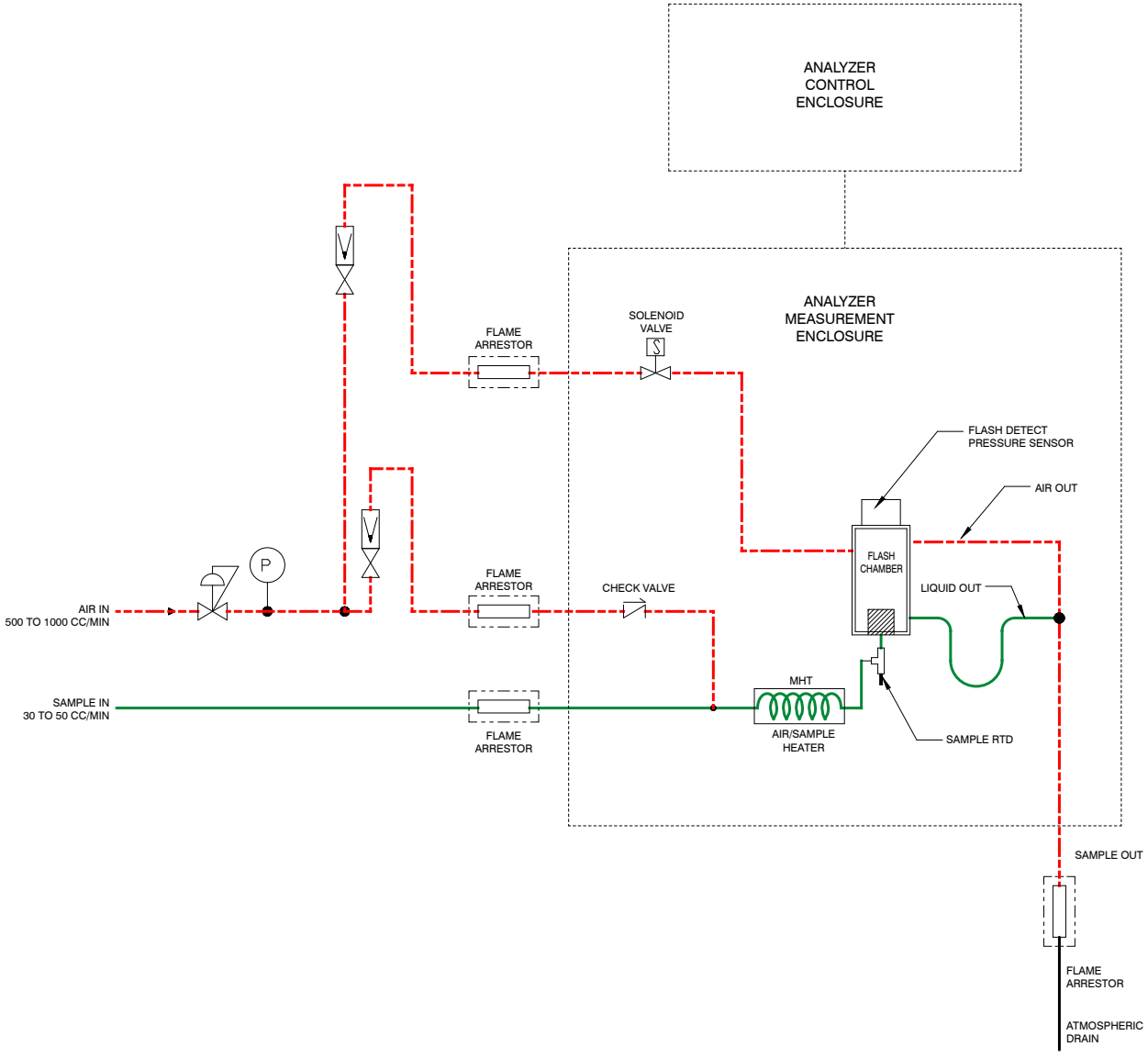
The Model P-500 Flash Point Analyzer is the result of combining the latest, state-of-the-art technology with over 45 years of industry experience. The result is an unsurpassed, high-quality Flash Point measurement system that produces the process control signals required to perform today's optimized and cost-efficient petroleum production operations.

Using a simply constructed, yet rugged, measurement chamber and sample delivery method, operational cost savings have been realized without complicating the analytical system. The P-500 demonstrates the optimization of the measurement method by employing components and materials that allow for a rapid measurement cycle without limiting accuracy, repeatability or reliability.

Model P-500 Flash Point Analyzer

APPLICATION

To remain competitive, today's refiners must employ all optimization and product control techniques available. The Flash Point of mid-distillate products is one of the properties that must be maintained and controlled in order to produce and sell products to the market. The ORB P-500 is a state-of-the-art analyzer that implements the newest of electronics and detection principles for a low cost means of monitoring the Flash Point of a product during the refining process. By closely following the technique used in the lab, results can be counted on by the process operators.

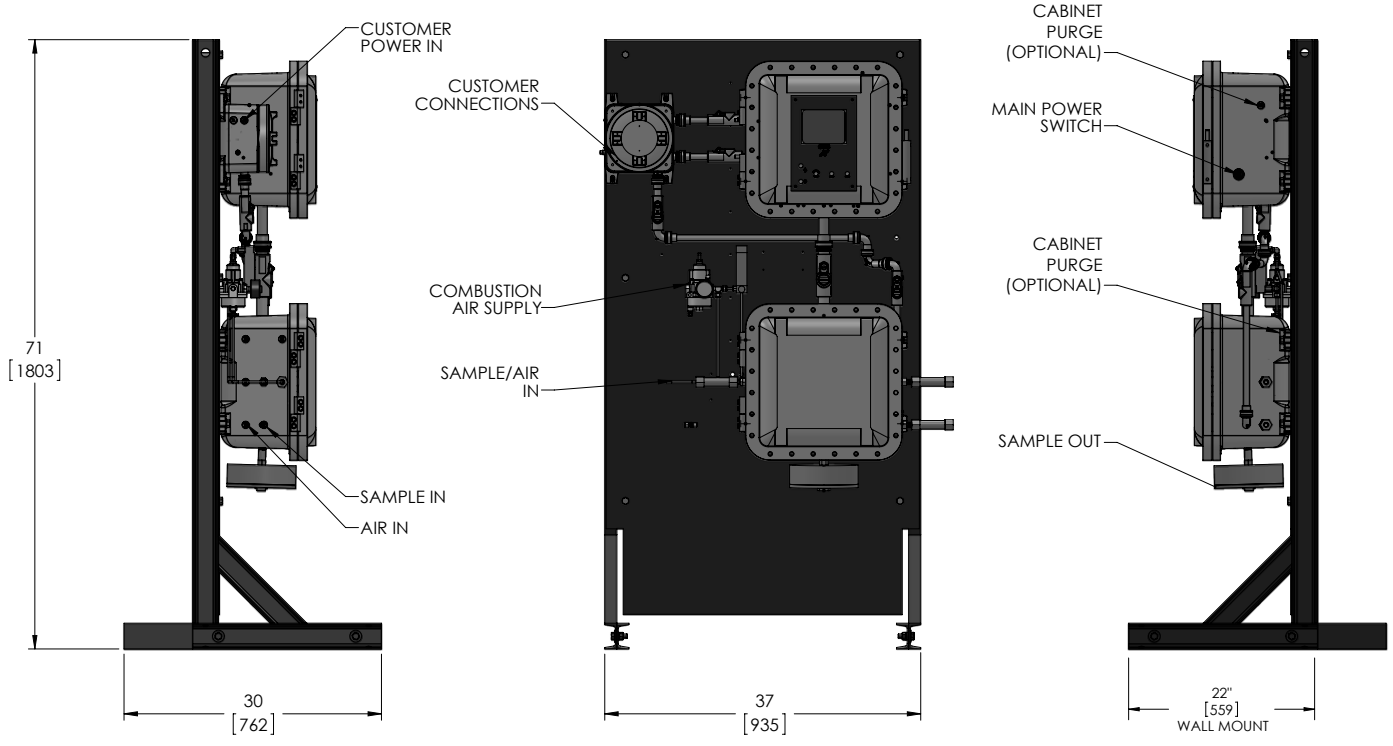


OPERATING PRINCIPLE

The P-500's Flash Point measurement cycle is based on the ASTM Methods D-56, D93 by using a small stainless steel flash chamber, sample heating tube, spark ignition circuitry and pressure detection system (used for flash detection).

First, the sample and combustion air are externally mixed. This mixture then enters the lower analyzer enclosure. This mixture then enters the sample mixing and heating tube (MHT). The specially designed MHT allows for uniform mixing of combustion air and then the controlled heating of the continually flowing sample. Second, the air/sample mixture leaves the MHT and enters the stainless steel flash chamber. Here the spark ignition source is applied at a controlled rate and a detection circuit (based on pressure wave from actual flash) monitors for an actual flash. When the flash is detected, the incoming sample temperature in the cup is recorded as the flash point and reported via a remote 4-20 mA signal for the flash point. Third, the sample heater is turned off and the sample is allowed to cool to a programmed level below the detected flash point. The temperature setpoint of the Stainless Steel Flash Chamber is then set to a programmed offset from the last detected flash point temperature. This control of the flash chamber temperature minimizes the offset to the actual lab method. By continuously tracking the analyzer conditions during the Flash Point analysis cycle, the diagnostic function checks the system for 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-500 Flash Point Analyzer, an optional high pressure dual pump system can be added. This will allow the end user to eliminate the need for atmospheric drain.

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**

XPROOF ATEX/CE | PURGED ATEX/CE | PURGED ATEX/CE | PURGED UL | GENERAL CSA/CSA PURPOSE

SPECIFICATIONS: MODEL P-500 FLASH POINT ANALYZER

ANALYSIS PERFORMANCE	
Measurement Cycle Time	5 minutes
Measurement Range	25°C to 125°C (77°F to 257°F) (selectable)
Repeatability	± 1.0 C (2.0 F)
Reproducibility	± 1.0 C(2.0F)
Resolution (Temperature Sensor)	± 0.01 C (± 0.02 F)
Accuracy	Correlates to ASTM Methods D-56 (TAG), D-93 (Pensky Martens Closed Cup)
Temperature Accuracy	± 0.1°C (± 0.2°F) of full scale
SAMPLE REQUIREMENTS	
Sample Flow Rate	Min. 20 cc/min – Max. 80 cc/min
Sample Return Pressure	Atmospheric – optional high pressure sample recovery system available (P/N 700228)
Sample Pressure	Min. 20 psi (1.4 bar) – Max. 150 psi (10.0 bar) - optional sample conditioning system available (P/N 700538)
Sample Temperature	At least 10°C (15°F) below expected Flash Point
Sample Particulates	less than 10 µm - optional sample conditioning system available (P/N 700538)
Sample Conditions	homogenous, single-phase sample without water or water moisture
ENCLOSURE/INSTALLATION REQUIREMENTS	
Dimensions	Width 37.0 in (940mm) – Height 71 in (1803mm) – 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	x-proof (exxd)
Area Classification	CSA/CUS Class 1 Div 1 Group B, C + D or ATEX Zone 1 II B + H2 T6
Power	auto-selecting 100 to 240 VAC (± 10%), 50/60 Hz, single phase, 2A
Combustion Air	Clean, dry Instrument air at Min. 40 psi (2.7 bar) – Max. 100 psi (6.8 bar)
Cabinet 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 4-20 mA output (optional second output available), selectable for sample Flash 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 Flash Point 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-500-1400	Orb Model P-500 Flash Point Analyzer, CSA-CUS Class 1 Div 1 Group B,C + D
Catalog Number P-500-1500	Orb Model P-500 Flash Point Analyzer, ATEX Zone1 II B + H2 T6
OPTIONS	
Catalog Number 777777	High Viscosity Option (for viscosities above 220 CS at 38°C (100°F)
Catalog Number 700858	Modbus TCP/IP Protocol
ACCESSORIES	
Catalog Number 700228	Sample Recovery System (for pumping flash sample from atmospheric drain back to process pressures)
Catalog Number 700538	Sample Conditioning Panel (for sample pressures greater than 35 psi (2.4 bar) up to Max. 120 psi (8.3 bar) and sample particulates greater than 10µm)
Catalog Number 700613	1-Year Spare Parts Kit
Catalog Number 700614	2-Year Spare Parts Kit

Lit. No. Product Catalog-P500-EN-US /APR14

BARTEC ORB

ORB Instruments, Inc.
4724 South Christiana
Chicago, IL 60632 / USA

Phone: + (1) 773 927-8600
Fax: + (1) 773 927-8620
Email: sales@orbinstruments.com

www.orbinstruments.com