PROCESS/ON-LINE

ON-LINE GENERAL FLASH POINT ANALYZER

45650 NEC Ex-Proof

Measure the flash point of high viscosity products quickly, conveniently and completely on-line!

The PSPI On-line General Flash Point Monitor is a continuous on-stream process monitor for measuring the flash point of high viscosity hydrocarbons. The 45650 simulates ASTM D 92 or ASTM D 93 testing procedures with an average cycle time of less than one minute. Spent sample is automatically returned directly to process stream. No catalyst is used, so sulfur sensitivity is completely eliminated. With the 45650 General On-Line Flash Point Monitor, analyzer software configuration and other functions can be modified without opening the explosion-proof enclosure, making it simple to operate and maintain.

- Accepts samples with viscosities as high as 200 cSt (9300 SSU) at 38°C (100°F) and flash point temperatures from 60° to 315°C (140° to 600°F) with repeatability of ±1.5°C (±3°F)
- Measurements correlate to ASTM D 93 Pensky Martens Closed Cup or ASTM D 92 Cleveland Open Cup
- Monitor returns sample directly to process stream 7.0 kg/cm^2 (100 psig) maximum
- No catalyst used, therefore monitor is insensitive to sulfur
- Typical applications include:
  - *monitoring heat exchangers in crude units to detect leakage and prevent crude contamination of bottoms*
  - *optimizing yield on gas oils and heavy fuels*
  - *optimizing yield on distillate side streams in vacuum distillation*
  - *fuel oil blending*
  - *solvent recovery*
  - *furfural extraction*

ON-LINE GENERAL FLASH POINT MONITOR

45650 NEC Ex-Proof

THEORY OF OPERATION

Product enters the Monitor's Pump Assembly, which can be steam heated when required to prevent sample freeze-up at ambient temperatures. Product then enters the instrument at a constant rate of flow, passes through a horizontal heater and is then mixed with a regulated flow of combustion air, which has been preheated in a coil of tubing wrapped around the Sample Heater.

The heated sample and air enter the Flash Cup, flooding the base of the cup and then passing over an annular orifice before overflowing to drain. The orifice provides for uniform distribution of hot vapors throughout the chamber. This vapor rises past an electrode, which is producing a high voltage spark at user-defined intervals during the heating cycle. The vapor then passes out the Flash Cup into a Liquid/Vapor Separator.

A microprocessor-based controller continuously monitors the temperature of the sample (within the sample heater) and the temperature of the sample/air mixture within the Flash Cup and regulates the voltage to the Sample Heater. During a measurement cycle, the sample temperature is continuously increased until the heated vapor is ignited by the high voltage spark. The force of this ignition is sensed by a Pressure Switch. The temperature of the sample/air mixture at the moment of ignition is reported as the flash point temperature and a cooling cycle is initiated. The flash point temperature is displayed on the monitor's digital readout and output as a 4-20 mAdc signal.

During the cooling cycle (less than 30 seconds), the high voltage spark circuits are de-energized and a solenoid valve in the Control Chassis diverts unheated air into the Flash Cup to retard carbon build-up and flush spent gasses from the Flash Cup. As this cooling cycle is quite brief, little change occurs in the liquid sample at the base of the Flash Cup. As a result, sample temperature is maintained at its approximate flash point value at all times.

SPECIFICATIONS

Performance

- **Response Time**: Detection cycle time typically less than 1 minute
- **Ambient Temperature Limits**: 5º to 40ºC (41° to 104ºF); weather protection required; no direct sunlight

Sample Requirements

- **Flow Rate**: Fast loop flow through; Monitor demands 0.6 to 1.5 meters/second (2 to 5 feet/second); 25 ml/minute filtered sample
- **Pressure**: 0.7 to 8.8 kg/cm^2 (10 to 125 psig)
- **Temperature**: At least 28°C (50°F) below lowest expected flash point temperature; 163°C (325°F) maximum at inlet to monitor
- **Viscosity**: No greater than 2000 cSt (9300 SSU) at 38°C (100°F)
- **Return Pressure**: 7.0 kg/cm^2 (100 psig) maximum

Utility Requirements

- **Electrical**: 115/230 (±10%), 50/60 Hz, single phase, 1400 watts
- **Instrument Air**: Clean, dry filtered and regulated at 2.1 kg/cm^2 (30 psig); Combustion air to 1000 cc/minute maximum; Purge air to 8000 cc/minute maximum
- **Steam**: 1.4 kg/cm^2 (20 psig) saturated, maximum

Signal Outputs

- **Analog Outputs**: Isolated 4–20 mAdc Flash Temperature (standard); Isolated 4–20 mAdc Sample Temperature (optional)
- **Alarm Relays**: SPST fail-safe alarm relay
- **Serial Output**: Optional RS-232C serial output available
- **"Come Read" Contact**: Dry relay contact (standard)

Signal Inputs

- **Customer Alarm**: Terminals available for customer-supplied dry contact alarm connection
- **Remote Standby**: Terminals available for customer-supplied dry contact control of instrument; Allows control room to take monitor "off-line"

Area Classification

- NEC Class 1, Div 1, Groups C & D

Dimensions & Weight

Uncrated:	H	W	D	units
• 136 kg (300 lbs)	1778	762	889	mm
	70	30	35	inches
Crated:	**H**	**W**	**D**	**units**
• 182 kg (400 lbs)	1905	864	991	mm
	75	34	39	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
- **Sample Recovery System** collects and periodically returns analyzed sample to process line
- **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.

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