Envent Model TFS2

Hydrocarbon Composition Analyzer

The TFS2 is an all optical analytical platform using a Precisive TFS (tunable filter spectroscopy) infrared sensor from MKS Instruments. The TFS2 offers a multi-component gas analysis at unparalleled speed. The standard Envent TFS2 measures methane, ethane, propane, iso-butane, iso-pentane and a combined measurement for (n-butane, n-pentane and n-hexane), as well as % level CO_2 and H_2S.

The spectrometer utilizes a tunable Fabry-Perot assembly that provides wavelength scanning along with advanced spectral processing that can produce response times as fast as 1 to 10 seconds. Additional measurement options are available depending on the application. This includes component analysis for the HPI market such as ethylene, propylenes, and butenes (Canada, Mexico and Middle East). Sampling is with a flow-through cell, suitable for continuous, online, unattended operation. The analyzer does not require carrier gas, fuel gas or on-site calibration gas. The standard Envent system configuration provides measurements of up to 100% methane, 25% ethane, 25% propane, 10% butanes and 5% pentanes, 100% H_2S and 100% CO_2. Diatomic compounds such as nitrogen, oxygen and hydrogen are not measured directly and are combined and reported as one group of unmeasured inert gases.

Features

- Response times as fast as 1 to 10 seconds typical depending on application and accuracy desired.
- No carrier gas or instrument air required.
- First principle measurement.
- BTU, Wobbe Index and density outputs.
- Linear response throughout the measurement ranges.
- Sample cell pressure and temperature compensated.
- Remote & completely unattended operation.
- Additional measurement recipes available.
- Data logging.
- Stream Switching.

Applications

- Natural Gas measurements including processing, transmission, storage and distribution.
- BTU & Wobbe Index analysis.
- Power Generation (turbine, internal combustion engine, fuel cell).
- LNG/LPG/BOG.
- Acid Gas.
- Gas Plant Inlet.
- Truck/Ship/Railcar Unloading Terminals.
- Portable/Temporary analysis.
- Fuel Gas Monitoring.
- Pipeline Blending.
- Flare Gas Monitoring.

Additional Package Options

TFSYP	Class1, Division 1 Y purged Nema 4x enclosure
TFS-1	Class1, Division 1 in an explosion proof enclosure
TFS-P-SS	General Purpose Portable in Nema 4x enclosure
TFS-P-TC	General Purpose Portable in Transport case

- **Fast response times from 1 to 10 seconds.**
- **No carrier gas or instrument air required.**
- Multi-component hydrocarbon gas analysis plus percent level H_2S and CO_2.
- Wide range of additional components/ recipes to choose from.
- BTU and Wobbe Index.
- Limited maintenance required.
- Low total cost of ownership.
- Advanced software provides full configurability.

Powered by Precisive® mks

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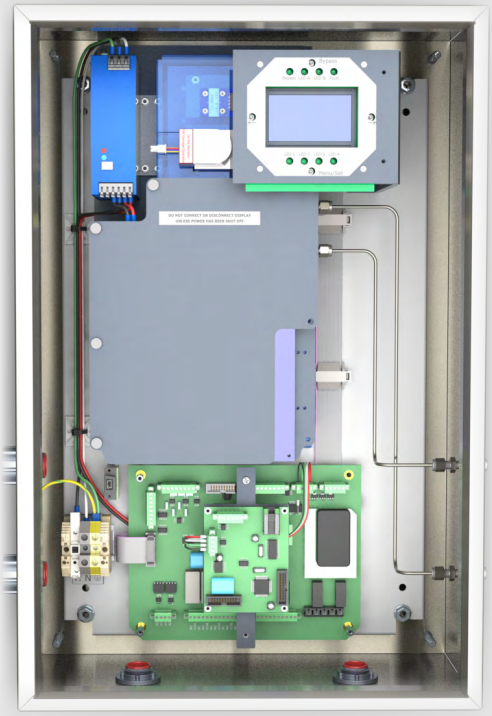
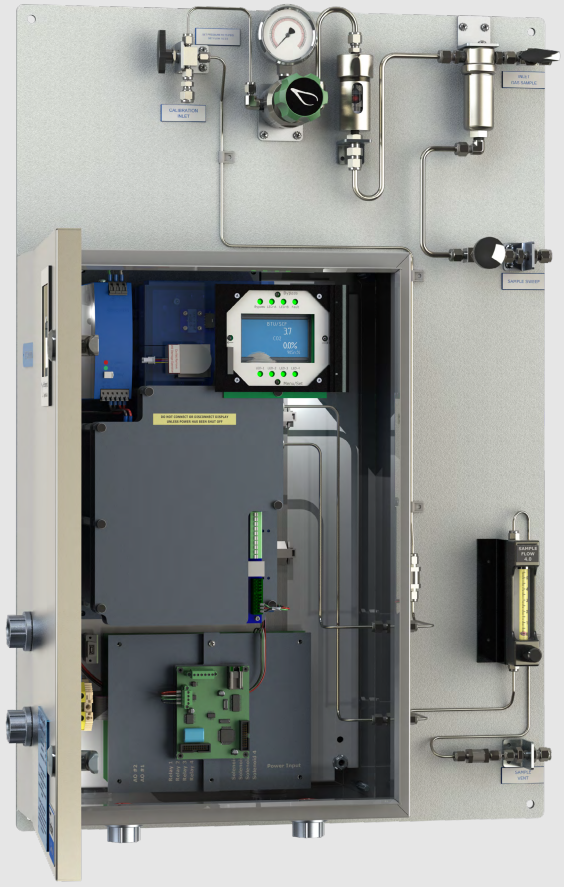
Envent
Engineering Ltd.



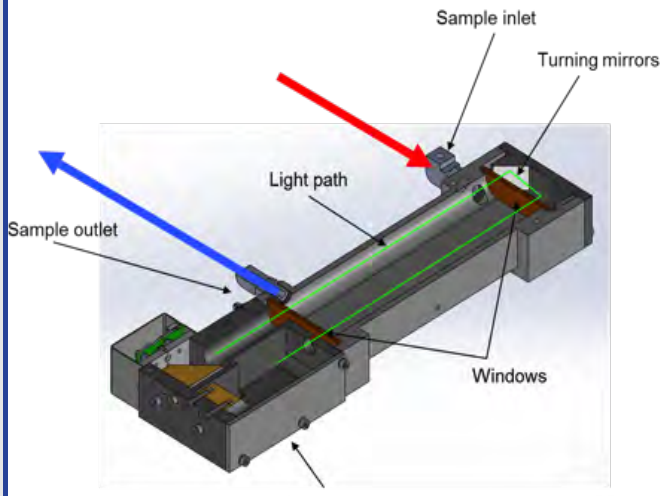
TFS2 Analyzer



TFS2 with Standard Sample Conditioning System Ethernet Card Option Added

Specifications

Measurement Ranges	Methane (CH_4):	2000ppm – 100%
	Ethane (C_2H_6):	2000ppm – 25%
	Propane (C_3H_8):	2000ppm – 25%
	i-Butane (C_4H_{10}):	1000ppm – 10%
	n-Butane (C_4H_{10}) + n-Pentane (C_5H_{12}):	1000ppm – 10%
	i-Pentane (C_5H_{12}):	1000ppm – 10%
	Carbon Dioxide (CO_2):	1% – 100%
	Hydrogen Sulfide (H_2S):	1% – 100%
Component Channels	8 components (consult factory for additional components)	
Accuracy	Methane (80-100%): ± 0.2%, Methane (0 – 80%): ±0.5% Other Hydrocarbons: ± 0.2%, H_2S ± 0.2% or 1% of reading, whichever is greater. CO_2: +/- 0.2%	
Repeatability	0.01% / 0.05% (repeatability based upon 5-second averaging)	
Zero Drift	Less than ±0.2% (absolute) per week (zero on air or N_2)	
Calibration	Permanent Factory Span Calibration (note: user component correction factors can be written to system) Zero gas recommended upon start-up and every 1-2 months.	
Update time	1 second – 10 seconds typical, software configurable (longer averaging time improves precision)	
Sampling	Technique: Flow through cell (100 ml internal volume) Flow Rate: 0.1 – 2 LPM (typical) Pressure: 0 – 2 psig (standard) consult factory for higher pressures. Sample Temp: 0 – 50ºC note cell is maintained at 60ºC. Connections: ¼" Swagelok	
Power	24 VDC (Optional 120/240 VAC, 75 peak 35 watts nominal)	
Display	128 x 64 Graphic Display; Menu is scrolled by internal button or external magnet.	
Outputs	128 x 64 Back-lit graphical display with scrolling menu Dual isolated 4-20 ma loop powered analog outputs 4 additional 5 amp SPDT alarm relays 4 solid state solenoid drivers for stream switching 4 dry contact inputs Internal archive storage via Envent HMI "ICE" Platform Modbus serial RS-232 and RS-485 Modbus TCP via ethernet	
Hazardous Area Certification	Certified for Class I Division 2, Groups B,C,D.	
Dimensions	61.0 x 40.6 x 15.2 cm - 27kg (approximately). 24" x 16" x 6" - 60lbs (approximately).	



Spectrometer assembly – light source, TFS and detector

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