OFS 2000R™ For Steam Line Applications

OFS-2000R™ Advantages

- Full path measurement = increased accuracy.
- Non-interfering - nothing in flow path.
- Easy installation and optical alignment.
- Reduced upstream/downstream diameters
- Ultra low maintenance design.
- Rugged; designed for harsh environments.
- Built in continuous self-test &diagnostics.
- Measurement unaffected by media pressure, moisture, temperature & opacity.
- No flow media high temperature limits.
- NIST - tested and unbeatable combination of advanced technology, high performance and proven reliability!

OFS 2000R for Steam-Assisted Flare Stacks

In December of 2015, EPA finalized the Petroleum Refinery Sector Risk and New Source Performance Standards. EPA MACT RSR 40 CFR 63.670 requiring 96.5% combustion efficiency or 98% destruction efficiency on all flares. It mandates that, if steam or air assist are used, the operator must account for the flows of these gases to measure and report the dilution in the combustion zone.

Precisely measuring the proper amount of steam to achieve maximum combustion efficiency has proven to be a difficult task and trying to calculate it is unreliable.

OFS 2000 sensors offer a pro-active, real-time-data approach to monitoring/controlling air and steam assisted flare lines to avoid over-steaming, excess aeration, and flame lift off - all of which cause compliance to go up in smoke.

The OFS-2000R can “see” through steam in the vapor phase, delivering accurate, quick-responding control signals which enable the operator to match the steam flow exactly to the flare output. OFS 2000R has a 5000:1 turndown ratio. It will not create a pressure drop, and is easily mounted on a steam line.

All OFS-2000 flow sensors are immune to the effects of temperature, pressure, humidity, density, path length, turbulent flow, or gas composition. OFS-2000R - series sensors are able to report velocities from 0.03 m/sec to 40 m/sec with +/- 2% accuracy. Response time of 0.3 seconds with 3 second updating, combined with full-path averaging make OFS 2000R the ideal sensor for steam line monitoring.

With added temperature and pressure inputs, OFS 2000R is capable of delivering moment-by-moment mass flow data, taking any guesswork out of tailoring fuel/air mix for optimum combustion.

In addition, the OFS 2000 scintillation measurement process is essentially drift-free. Calibration is not required. Continuous internal self-diagnostics assure the operator of accurate reporting day in, day out, 24/7/365.

All OFS 2000 models are equipped with

- Dual 4-20mA inputs and outputs
- MODBUS RTU over RS-232C serial
- Contact closures for alarms / warnings

Limited Distance Modems, ethernet adaptors and Fiber Optic connectivity assure easy interface with PC, PLC, DAS, CEM - almost any data collection device.

OFS systems are assembled per individual customer order. OSI offers an array of options to meet customer requests. Since the OFS 2000R is intended primarily for measuring steam flow lines we offer a variety of adapters and sight glasses to match ANSI 150 and 300 flanges (3” and 4”). Flange adapters and equipment enclosures are available in powder – coated aluminum or 316 Stainless Steel.

Optical Scientific Inc. ● 2 Metropolitan Court Suite 6 ● Gaithersburg, MD, 20878 ● USA
Ph. 301-963 3630 ● Fax 301-948-4674 ● email: sales@opticalscientific.com
www.opticalscientific.com

OFS2000R™ Specifications

Flow Performance			
Technique	Optical scintillation		
Velocity Range	0.03 to 40 m/s velocity		
Accuracy	2% of reading		
Resolution	0.1 m/s		
Response Time	User selectable: 3 sec to 600 sec		
Long Term Drift	<1% per year		
Steam Pipe Diameter	4 to 24 inches Consult factory for other diameters.		
Media Temperature	No upper limit		
Light Source	670 nm red LED		
Beam Divergence	5 degrees		
Maintenance			
Calibration check	Automatic 2- or 3-point calibration check once per day or as requested by External Calibration Check Request		
Diagnostics	Continuous monitoring of sensor status including power supply voltage check, performance check, optics contamination, etc.		
Indicators	TX Optical Unit - LEDs indicating power ON & correct operation		
	RX Optical Unit - LEDs indicating power ON & correct operation		
	Control Unit - LEDs indicating correct operation		
Operational Environment (Outdoor components: TX/RX Heads, NEMA 4/4X Control Unit)			
Ambient Temperature	-40 to 60 C		
Dust / Water Intrusion	NEMA4X / IP65		
Moisture	0-100% condensing		
Data Output			
Current Loop	Two 4-20 ma optically isolated outputs -- Loop 1: Velocity : (Scalable). Loop 2: Volumetric Flow		
Dry Contact Relay	Two relays: one for fault, one for calibration check indication		
Serial Data	RS-232 ASCII, fixed data string or MODBUS RTU format		
Command/Control Interface	User-Selectable with Integral Key Pad & Display including:		
	Sensor ID, Baud rate (9600 standard), Averaging Time, Units of Measure		
Connectivity	Direct wire / Limited Distance Modem / Fiber Optic Modem / Ethernet		
Power Requirements (Note all power connections fuse, surge, & EMI protected			
Transmitter Unit	Universal 100-240 VAC, 50/60 Hz, 12 VA		
Control Unit	Universal 100-240 VAC, 50/60 Hz, 40 VA		
Physical Characteristics			
Weight (Alum.)	TX & RX Optical Units	5 kg ea.	
	Control Unit (NEMA-4),	7 kg	
	Control Unit (rack mount),	6 kg	
	Flange Adapter (spool piece) (2)	3 kg ea.	
Dimensions	TX & RX Optical Units	15 x 15 x 14 cm ea	
	Control Unit (NEMA-4),	30 x 40 x 25 cm	
	Control Unit (rack mount),	13 x 43 x 51 cm	
Materials	TX & RX Optical Units	Powder-coated Aluminum or Stainless Steel	
	NEMA -4 Control Unit	Powder-coated Aluminum or Stainless Steel	
	Rack Mount Control Unit	Steel and Aluminum (rack mount)	
	Flange Adapter(s)	Powder-coated Aluminum or Stainless Steel	

Specifications are subject to change without notice.

OSi is ISO-9001 certified

Optical Scientific Inc.
2 Metropolitan Court Suite 6
Gaithersburg, MD 20878 USA
Ph. 301-963-3630 Fax 301-948-4674
website: www.opticalscientific.com
email: sales@opticalscientific.com

For the most reliable and best performing optical instruments, contact OSi today!