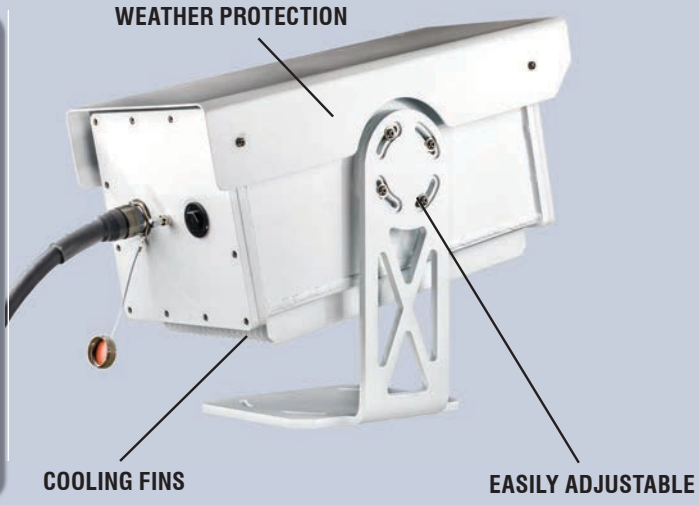
FLAREGUARDIAN™

Flare Monitoring & Control System

BURNERS | FLARES | INCINERATORS | PARTS & SERVICE

FlareGuardian can automatically control assist media based on real-time feedback to improve performance and reduce costs.



FLAREGUARDIAN™

The Zeeco Difference.

Our only business is the combustion business. By concentrating on what we do best, Zeeco has grown into a worldwide leader in combustion solutions. We are a privately held company whose ownership stays highly involved in daily operations, with upper management comprised of the world's leading combustion experts.

When you call Zeeco, we answer. When you make a request, you get a quick, efficient response. We are lean and efficient, able to make decisions quickly, without bureaucracy and red tape. Our sales, engineering, and purchasing groups work hand-in-hand to deliver highly competitive quotes and heroic turnaround times. We stand ready and willing to travel anywhere in the world to discuss upcoming projects firsthand, and to ensure that every existing project runs seamlessly.

Choose Zeeco.

Choose to work with our dedicated, flexible, and innovative team, and you won't be disappointed. Call or email us today to request a quote or to learn more about our proprietary combustion systems.

ZEECO facility on 250 acres (1 km²)

FLAREGUARDIAN™
Flare Monitoring & Control System

Direct Flare Monitoring That Meets EPA 40 CFR.

Day and night, the ZEECO® FlareGuardian™ Flare Monitor is an innovative and revolutionary instrument utilizing patented Video Imaging Spectro-Radiometry (VISR) technology. FlareGuardian provides flare system users and operators with accurate, reliable real-time reporting and feedback to determine important performance metrics, simplify compliance, and optimize flare performance.

The known shortcomings of current indirect monitoring methods combined with the new EPA standards and deadlines drove the development of a new flare combustion efficiency (CE) measurement and monitoring method – a technology that can be used to directly, autonomously, and continuously measure CE and smoke levels in real time.

FlareGuardian allows operators to eliminate tedious aiming, data reduction, and ongoing operation and maintenance costs associated with other flare monitoring methods while staying in compliance with the Refinery RTR rule under 40 CFR 63.670. Previously, flare operators have been limited to indirect flare monitoring options including Gas Chromatograph (GC), calorimeters, flare gas flow meters and monitoring, and steam / air controls. Now, the maintenance and calibration-free ZEECO FlareGuardian offers an alternative direct monitoring system that eliminates ongoing maintenance and operational costs.

The EPA is requiring compliance with 40 CFR Parts 60 and 63 by January 31, 2019. Be ready with FlareGuardian.

Real Time. Reliable. Customizable.

The FlareGuardian system provides real-time, easy-to-read feedback on flare system performance. Based on VISR's unique multi-spectral Infrared (IR) imager, FlareGuardian uses a high frame rate, high spectral selectivity, and high spatial resolution over a fast data acquisition cycle of 91–33ms.

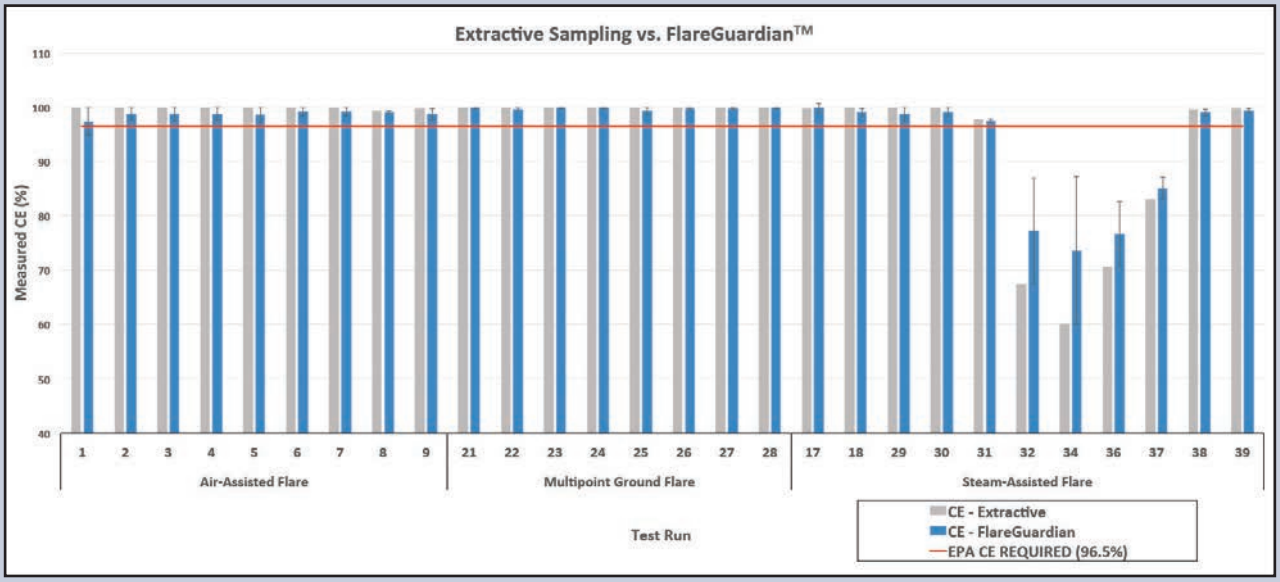
Eliminate the inaccuracies and delayed results inherent to indirect flare monitoring. Rather than determining compliance and combustion efficiency through a time-consuming, repetitive process of measuring inputs, assuming reactions and velocities, and arriving at an assumed operating status, FlareGuardian directly monitors flare performance in real-time.

When required, the FlareGuardian system automatically adjusts supplemental fuel additions, as well as any assist source (gas, steam, or air) via a closed-loop control system – lowering costs for supplemental fuel and maintaining more accurate destruction efficiency.

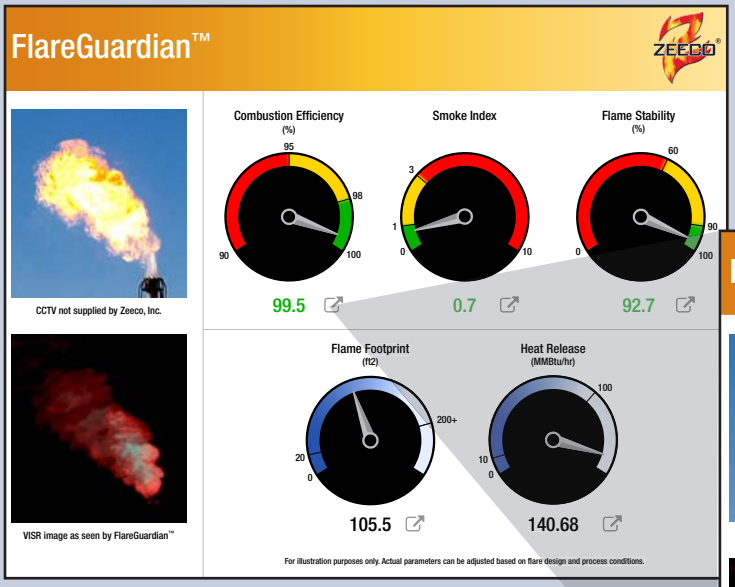
FlareGuardian is remotely-mounted at grade for non-contact monitoring that eliminates maintenance costs versus indirect monitoring methods that require sensors to be in contact with harsh, often corrosive flare vent gases.

EPA Rule 40 CFR Part 63	Purpose of Rule	FlareGuardian™ compliant?
§63.670 (b)	Presence of pilot flame	**Yes**
§63.670 (c)	No visible emissions	**Yes**
§63.670 (d) §63.670 (e) §63.670 (f)	Together, these three requirements are designed to ensure sufficient CE through surrogate parameters	**Yes**

FlareGuardian effectively monitors various types of visible-flame flares, including air-assisted, steam-assisted, and multi-point ground flares.

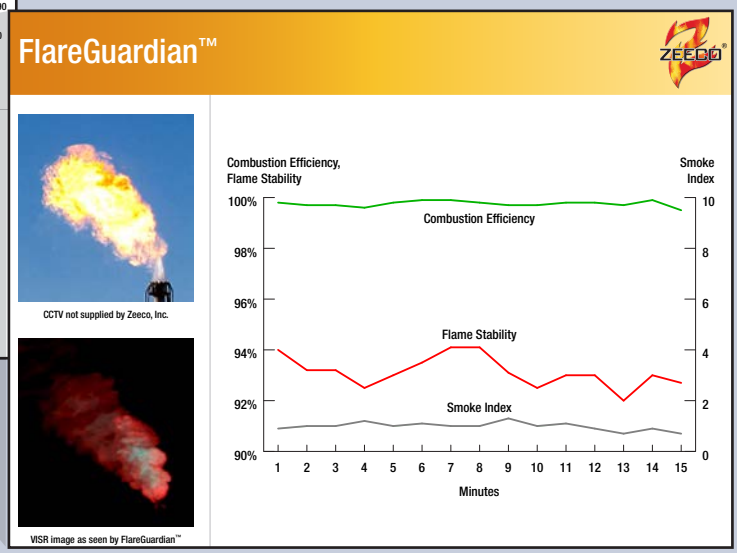


Above table and photos to the below right: *Extractive testing versus FlareGuardian results at a distance of 300 feet from the base of the flare stacks. An inductor with a sampling hood was suspended over each flare, and a portion of the gases captured by the inductor was extracted and transported via a heated sampling line to a contracted stack tester to continuously analyze samples for combustion products carbon dioxide (CO2) and carbon monoxide (CO), unburned hydrocarbon (HC), and oxygen (O2). The test methods and procedures used were consistent with standard EPA methods for stack testing. Thirty-nine test runs were performed covering a CE range of approximately 60-100%. The FlareGuardian results showed a strong agreement with the extractive results.*



FlareGuardian Dashboards provide a real-time image and a VISR image, plus real-time metrics and minute-by-minute performance history with a simple click.

The system's main dashboard screen shows five key metrics, customizable to reflect acceptable operating parameters for your facility. Clicking on the "Expanded View" icon launches a minute-by-minute history for key measurements.



Because FlareGuardian is mounted at grade, it can be installed without taking the flare offline.

FlareGuardian Imager	
Imager Detector Type	Focal Plane Array, Cooled InSb
Spectral Response	3.0 to 5.0 micron
Thermal Sensitivity	<15mK at 86°F (30°C)
Image Resolution	320 X 240 Pixels
HFOV/VFOV	11.75 degrees / 9.4 degrees
Focus/Exposure Control	Automatic

FlareGuardian System	
Total Weight (Without Stand)	82 lbs. (37 kg)
Dimensions (L X W X H)	24" x 20" x 10" (61cm x 51cm x 25.4cm)
Environment	IP67, NEMA 4X, up to 122ºF (50ºC)
Window	Optical grade silicon w/ AR coating
Operating Temperature	Up to 122ºF (50ºC)
Mounting Hardware	Adjustable in two axes
Industrial Interface	MODBUS / TCP
User Interface	Windows OS (optional)
Video Output	RTSP, 8-bit Color

FlareGuardian Power Supply	
Power Input	110/220 VAC, 50/60 Hz, 15A, Single Phase
Connectivity	Copper Ethernet RJ-45, Fiber Optic Transceiver (optional), 2/5 GHz wireless bridge

FlareGuardian Outputs	
Combustion Efficiency (CE)	0-100%
Smoke Index (SI)	0 to 10
Flame Stability (FS)	0 to 100 %
Flame Footprint (FF)	105 to 10,480 ft^2 (9.8 to 974 m^2)
Measurement Cycle	30 Hz, 1-sec AVG real-time output

Design Features and Benefits.

- Provides real-time combustion efficiency, smoke index, flame stability, flame footprint, heat release, and pilot status for a complete picture of flare performance
- Autonomous data collection (DCS or PLC) for optimized flare performance
- Simplify monitoring, reporting, and compliance activities
- Remote mounted, non-contact monitoring
- More accurate results versus indirect monitoring
- Eliminates need for monitoring surrogate parameters
- Short measurement cycle (milliseconds, averaged over seconds to 15 minutes, variable) enables quick response and minimizes cost for supplemental fuel, steam, or air
- Industrial closed loop interface allows for flare operation and control based on direct combustion efficiency and smoke index values in real-time
- Easy installation and maintenance, uninterrupted production processes, **no shutdown required**, and no calibrations

BURNERS

FLARES

THERMAL OXIDIZERS

PARTS & SERVICE

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ZEECO® combustion solutions are designed and manufactured to comply with applicable local and international standards as defined by our customers.

NSF
REGISTERED
ISO 9001: 2008

CERTIFICATIONS APPLY TO ZEECO HEADQUARTERS.

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