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.

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FLAREGUARDIAN™
Flare Monitoring & Control System
ZEECO facility on 250 acres (1 km²)

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

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

### EPA Rule 40 CFR Part 63

<table>
<thead>
<tr>
<th>Rule Reference</th>
<th>Purpose of Rule</th>
<th>FlareGuardian™ compliant?</th>
</tr>
</thead>
<tbody>
<tr>
<td>§63.670 (b)</td>
<td>Presence of pilot flame</td>
<td>Yes</td>
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<tr>
<td>§63.670 (c)</td>
<td>No visible emissions</td>
<td>Yes</td>
</tr>
<tr>
<td>§63.670 (d)</td>
<td>Together, these three requirements are designed to ensure sufficient CE through surrogate parameters</td>
<td>Yes</td>
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</tbody>
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### 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 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 with harsh, often corrosive flare vent gases.
The EPA is requiring compliance with 40 CFR Parts 63. 

FlareGuardian allows operators to eliminate tedious time-consuming, repetitive process of measuring inputs, assuming reactions and velocities, and arriving at an agreement with the extractive results. Thirty-nine test runs were performed covering a CE range of approximately 60-100%.

FlareGuardian effectively monitors indirect methods. For illustration purposes only. Actual parameters can be adjusted based on flare design and process conditions.

Flame Footprint (FF) 105 to 10,480 ft² (9.8 to 974 m²) 

Smoke Index (SI) 0 to 10 

Combustion Efficiency (CE) 0-100% 

Power Input 110/220 VAC, 50/60 Hz, 15A, Single Phase 

User Interface Windows OS (optional) 

Industrial Interface MODBUS / TCP

Mounting Hardware Adjustable in two axes

Environment IP67, NEMA 4X, up to 122ºF (50ºC)

Dimensions (L X W X H) 24" x 20" x 10" (61cm x 51cm x 25.4cm)

HFOV/VFOV 11.75 degrees / 9.4 degrees

Image Resolution 320 X 240 Pixels

Thermal Sensitivity <15mK at 86°F (30°C)

Imager Detector Type Focal Plane Array, Cooled InSb

FlareGuardian effectively monitors indirect methods. For illustration purposes only. Actual parameters can be adjusted based on flare design and process conditions.
The EPA is requiring compliance with 40 CFR Parts and operational costs. Direct Flare Monitoring That Meets EPA

FlareGuardian™ offers an alternative to indirect steam / air controls. Now, the maintenance and calibration of calorimeters, flare gas flow meters and monitoring, and operators have been limited to indirect flare monitoring. FlareGuardian allows operators to eliminate tedious smoke levels in real time.

Eliminate the inaccuracies and delayed results inherent to indirect flare monitoring. Rather than determining CE and combustion efficiency through a time-consuming, repetitive process of measuring inputs, FlareGuardian provides flare system users and technology. FlareGuardian provides flare system users and patented Video Imaging Spectro-Radiometry (VISR) technology. Day and night, the ZEECO® FlareGuardian™ Flare Monitor monitors flare performance in real-time.

FlareGuardian results showed a strong agreement with the extractive results. The known shortcomings of current indirect monitoring method – a technology that can be used to simplify compliance, and optimize flare performance.

FlareGuardian is remotely-mounted at grade for non-construction and construction free ZEECO FlareGuardian offers an alternative and operational costs.

FlareGuardian™ compliant?

- §63.670 (d)
- §63.670 (e)

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