Viking VSF Intelligent Visual Flame Detectors

Detectors for hazardous applications where fast optical flame detection is critical

Intelligent Flame Detection

Is there an alternative technology better equipped than UV or IR to reliably detect a flame?*

What is a flame? Remarkably, this is not so commonly asked question when looking for a fire. The fundamental interpretation of a flame is that the carbon particles, most frequently referred to as soot, when heated by the exothermic energy created during oxidation of the fuel; incandesce or in simpler terms, glow white.

As they cool the color of these particles turn to orange then red and then finally to black as smoke. This is how humans interpret a flame visually and hence recognize it as fire.

Image capture from a CCD pixel array is possible via the photoelectric effect, where light energy is produced by the flame's incandescence. Photons are emitted from the flame then received by the pixels of the array, creating a picture of the flame. The photoelectric effect transforms the energy intensity from the photons into a proportional electrical charge.

Viking VSF300 and VSF301 flame detectors can analyze the array output and similarly as the human brain would. The equipment interprets images visually and confirms whether or not a fire is present. The VSF300 and VSF301 can make this decision and output the appropriate alarm condition.

The video is constantly monitored at 25 frames per second (this speed causes persistence of vision which is faster than the human eye) seeking out flame characteristics.

Video flame detection was developed out of a necessity to detect fires on-board offshore oil and gas installations yet did not react to sources of spurious alarms that are responsible for expensive production losses. Since then, video flame detection has become commonplace in environments and facilities that cannot afford these false alarm situations.

The motive for advancement toward video flame technology was because previous flame detection was achieved largely by measuring radiation of specific UV and IR wavelengths that are emitted from fires. False alarms from blackbody radiation, process relief flare reflections, hot CO_2 emissions, as well as desensitization from all number of sources, can be laid to rest with the realization of video flame detection. Having a reliable flame detector that is immune to these nuisance alarms is crucial to protect lives and assets and keep productivity up and running costs down.

Multi-Frequency Infrared Flame Detection

The Viking VSF303 multi-spectrum infrared (IR) flame detector quickly detects all hydrocarbon fires over a long range, including those not detectable in the visible spectrum.

The VSFS303 compliments the VSF300 and VSF301 Video Flame Detectors by delivering superior performance in the detection of hydrocarbon fires. The VSF303 utilizes the latest IR flame detection algorithms to ensure maximum false alarm immunity.

Video or Multi-Spectrum Flame Detection?

Fire Type	Video Flame Detection	Multi-Spectrum IR
Gasoline / n-Heptane	✔	✔
Diesel Fuel	✔	✔
JP4 / Kerosene	✔	✔
Ethanol	✔	✔
Methanol	🟥	✔
Methane	🟩	✔
Hydrogen	🟥	🟥
Wood stack	✔	✔
Silane	✔	🟥
Inhibitor	**Immunity to False Alarm**	
Sunlight	✔	✔
Dust/Sand/Oil/Grease	✔	✔
Water	✔	🟧
Arc Welding	✔	🟧

Notes: Checkmark = **Recommended**
Green = **Detects / Immune**; Red = Does Not Detect; Orange = May False Alarm

VSF300 Video Flame Detector

VSF300 is an explosion-proof intelligent **video flame detector** capable of detecting an n-Heptane (gasoline) fire at 200 feet and JP4 (kerosene-gasoline blend jet fuel) at 300 feet. The detector processes live video images using onboard digital signal processing and advanced software.

- Massive 120° horizontal and 80° vertical field(s) of view (FoV)
- Maximum false alarm immunity & eliminates sensitivity loss from sunlight & black body heat
- Continuous optical test, without a reflector
- International hazardous area approvals: FM/ATEX/IEC Ex
- Certified performance testing to multiple fuels: FM 3260
- Spatially aware — single sensitivity detection
- Easy integration using industry-standard outputs: alarm & fault relays (0-20mA)
- Worldwide marine approvals

VSF301 Video Flame Detector

The VSF301 is an explosion-proof **video flame detector** like the VSF300, that adds a live video feed and on-board recording capabilities.

- Operates with or without color video output
- On-board recording of pre-
- and post-fire alarms
- Continuous optical test, without a reflector
- Microprocessor controlled heated-optics
- International hazardous area approvals: FM/ATEX/IEC Ex
- Certified performance testing to multiple fuels: FM 3260/EN 54-10
- Spatially aware — single sensitivity detection
- Easy integration using industry-
- standard outputs: alarm & fault relays (0-20mA)
- Certified SIL 2 capable
- Worldwide marine approvals

VSF303 Multi-Spectrum IR Flame Detector

The Viking VSF303 is an explosion-proof **multi-spectrum IR** flame detector. The device delivers superior performance, responding to hydrocarbon liquid fuel and gas fires at long distances. The VSF303 has been tested by Factory Mutual (FM) to detect a hydrocarbon fuel pan fire at ~200 feet within 5 seconds.

- Long detection distances and enhanced false alarm immunity
- Continuous optical test, without a reflector
- Microprocessor controlled heated-optics
- International hazardous area approvals: FM/ATEX/IEC Ex
- Certified performance testing to multiple fuels to FM 3260 and EN 54-10 standards
- Adjustable sensitivity to ensure detectors do not cross vote
- Certified SIL 2 capable

VSF3008 Flame Simulator

VSF3008 is used to test the complete range of VSF flame detectors without the need for scaffolding. The simulator produces a unique flame pattern recognized by the VSF30X product line causing the detectors to initiate a full alarm function.

VSF Flame Detector Accessories

- VTP4 Twisted Pair to Coaxial Converter
- BNC Converter
- RS232—485 Converter
- VIM4 Quad Channel Video Isolator
- Flame Simulator Charger (Spare)
- VSF Series Sunshield
- Detector Sealing Kit — Metric
- Standard Bracket 316 Stainless Steel (spare only)
- Vertical to Horizontal Mounting Adapter
- Marine Bracket 316 Stainless Steel

Part Numbers, Support, & Contact Information

Viking Part	Viking Model	Suffix	Housing	Cable Entry	Weight (lbs.)
24372	VSF300 IVFD	-NPT	Aluminum	¾" NPT	5.5
24373	VSF300 IVFD	-M25	Aluminum	M25	5.5
24374	VSF300 IVFD	-NPT-SST	Stainless Steel	¾" NPT	13.2
24375	VSF300 IVFD	-M25-SST	Stainless Steel	M25	13.2
24368	VSF301 IVFD-V	-NPT	Aluminum	¾" NPT	5.5
24369	VSF301 IVFD-V	-M25	Aluminum	M25	5.5
24370	VSF301 IVFD-V	-NPT-SST	Stainless Steel	¾" NPT	13.2
24371	VSF301 IVFD-V	-M25-SST	Stainless Steel	M25	13.2
24598	VSF303 MSIR	-NPT	Aluminum	¾" NPT	5.5
24365	VSF303 MSIR	-M25	Aluminum	M25	5.5
24595	VSF303 MSIR	-NPT-SST	Stainless Steel	¾" NPT	13.2
24367	VSF303 MSIR	-M25-SST	Stainless Steel	M25	13.2
24382	VSF3008 ITEST	N/A	Aluminum	N/A	5.5

Design Support & Consulting

VIS provides expert design, engineering, and consulting services at to ensure your fire protection needs are met quickly & efficiently. Each solution can be custom-tailored for your installation, from design to commissioning to deployment and maintenance.

Contact us at **DesignCenter@SupplyNet.com**

Buying VIS Solutions

All VIS solutions are sold through Viking SupplyNet. Established in 1988, SupplyNet distributes the largest selection of integrated detection, alarm, and suppression systems to customers in over 70 countries. SupplyNet's state-of-the-art inventory system links all locations worldwide to ensure that every solution is available for timely delivery – to any job site, anywhere in the world.

SupplyNet Locations:
www.VikingGroupInc.com/locations

Contact Us

Viking Integrated Safety
Viking Group, Inc.
5150 Beltway Dr. SE
Caledonia, Michigan 49316

- Toll Free Phone: (800) 968-9501
- Local Phone: (269) 945-9501
- Local Fax: (269) 945-9599 (General Inquiries)
- Customer Service Fax: (269) 945-5090
- Web: **Safety.SupplyNet.com**
- E-mail: **VIS@VikingCorp.com**

*Author Credit

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