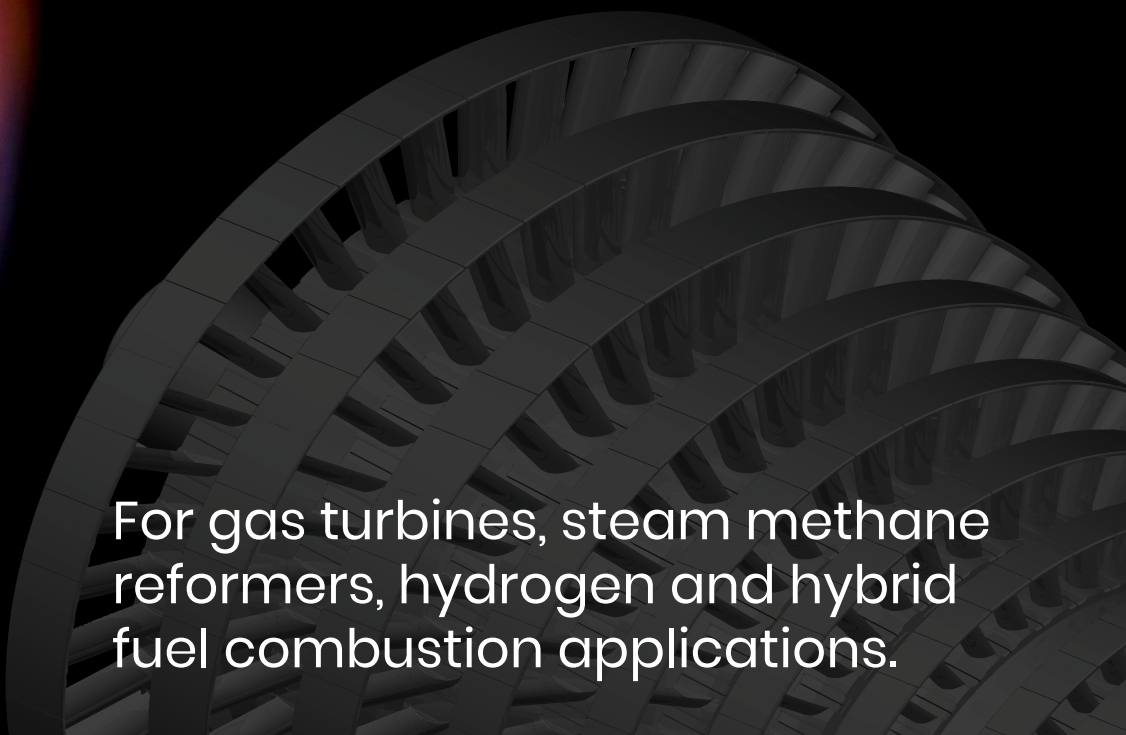
Reuter-Stokes

Flame Sensing Solutions



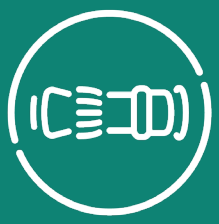
For gas turbines, steam methane reformers, hydrogen and hybrid fuel combustion applications.

One of the most important functions of a control system is the ability to quickly stop the fuel supply if flameout is detected.

Flame sensors ensure a known flame condition and must have fast response times to avert unplanned downtime or even catastrophic events, such as explosions.

Rugged construction, rigorous validation

Reuter-Stokes flame sensors are hazardous location certified, including North America, ATEX, and IECEx.



Reliable flame detection in the harshest environments

Designed for use with multiple fuel types (including hydrogen and hybrid fuel blends), low NOx combustors and steam injection.

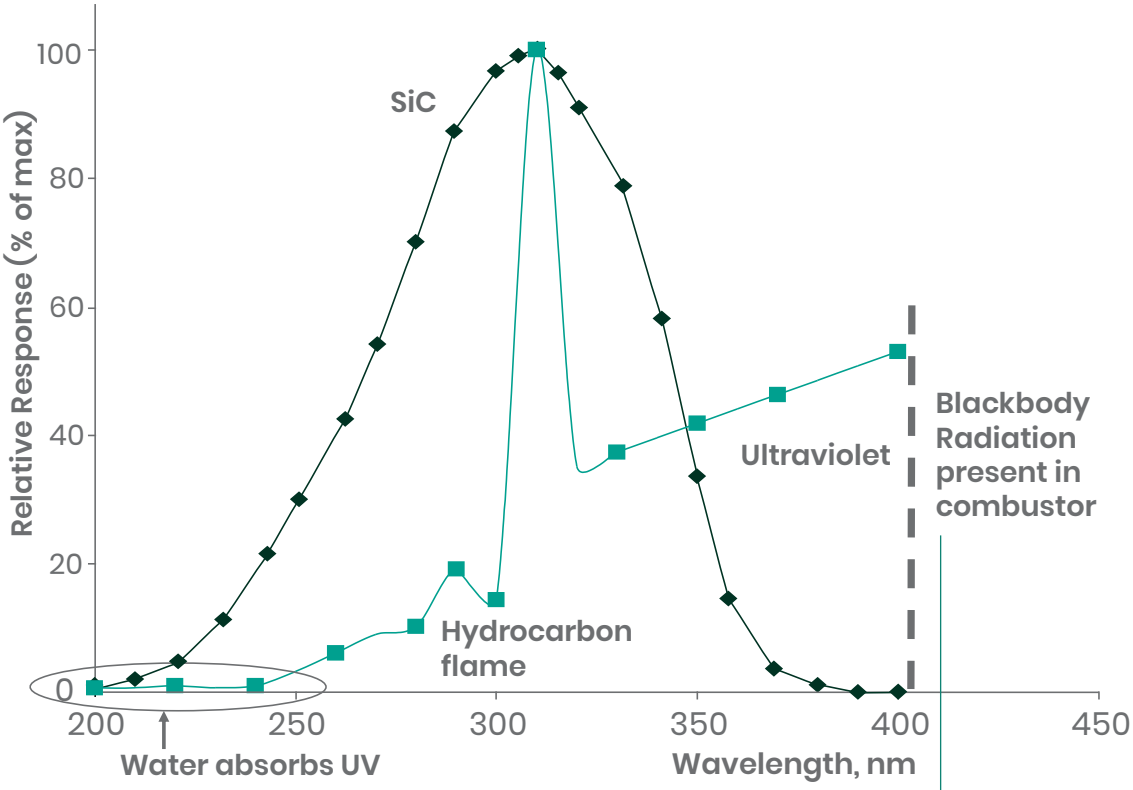
Low voltage operation

4-20 mA analog output with a very wide dynamic range eliminates the need for explosion-proof conduit. Module to convert output to other controller inputs is available.

Customized conversion

Customized flame sensor conversion kits simplify the process of upgrading older, maintenance-intensive systems. These enhancements are mechanically and electrically interchangeable with existing systems.

Spectral response



— **Flame emission**

— **SiC**

Peak sensitivity closely matches the key flame peak at 310 nm.

Specifications

Housing material	300 series stainless steel
Mechanical interface	3/4" NPT female
Sensor	Silicon Carbide (SiC) photodiode
Power requirements	24 VDC nominal, 12-30 VDC @ 100 mA
Process pressure	To 400 psig (2.8 MPa)

High sensitivity, fast response

Silicon Carbide (SiC) optical photodiode technology has higher sensitivity to longer UV wavelengths and is not susceptible to black body radiation.

Flame Tracker

500 million hours of fired operation

Part numbers	
RS-FS-9001	NA Class 1 Division 2, ATEX Zone 2
RS-FS-9004	NA Class 1 Division 1, ATEX Zone 1
RS-FS-9006	For aeroderivative gas turbines; NA Class 1 Division 2, ATEX Zone 2
RS-FS-9001-25X	NA Class 1 Division 2, ATEX Zone 2 (ILG)

Reuter-Stokes' original Flame Tracker monitors the presence of a flame using ultraviolet light in temperatures from -40°C (-40°F) up to 235°C (455°F) with water cooling, or 150°C (302°F) without.

The sensor signals the flame status to the control system in less than 0.025 seconds (25 ms). This means interruption-free service and improved availability.

Electrical connector

MIL-C-38999 series III size 15 (5pin)

What is ILG?

Now available for both the Flame Tracker and Flame Tracker Dry 325, Increased Low Gain (ILG) technology provides "flame on" signal at a lower flame light threshold.

This allows for increased sensitivity to low intensity flame light, enabling the detection of dim flames in both the primary and secondary combustion systems that can be caused by obstructions, condensation or deposits on the sensor window.

Increased sensitivity results in improved function in gas turbine primary and secondary systems, particularly in the presence of obscured sight tubes, fouled lenses, and other conditions that reduce the amount of light reaching the sensor for measuring flame on or flame off.

Standard Sensitivity:

5 mA @ $1x10^{10}$ photons/in^2/sec. @ 310 nm

Increased Low Gain (ILG) Sensitivity:

6.5 mA @ $1x10^{10}$ photons/in^2/sec. @ 310 nm

Flame Tracker Dry 325 (FTD 325)

How is FTD 325 different?

Built on the proven Silicon Carbide sensing element used in the water-cooled Flame Tracker, the FTD 325 system takes advantage of a remote electronics configuration that puts the sensing element in the hot end that can withstand 325°C, eliminating the need for cooling water and the risks that it brings.

The temperature-sensitive electronics are moved to a low spot in the turbine compartment where temperatures are below operational limits.

The electrical signal from the hot end is transmitted to the cool end via a 30-foot long mineral-insulated cable.

Eliminate the risk of water leaks

Reuter-Stokes' Flame Tracker Dry 325 eliminates the need for water cooling lines or electrical conduits on new turbines and upgrades. This streamlines operations, reduces maintenance requirements and simplifies outages, resulting in lower labor costs and shorter overall outage time.

Reliable and accurate detection

The FTD 325 boasts a rapid response time of less than 0.175 seconds. Similar products may take as long as 1.5 seconds to respond. Ready to install, no programming necessary.

Part numbers

RS-FS-9009-03	NA Class 1 Division 2, ATEX Zone 2
RS-FS-9010-03	NA Class 1 Division 1, ATEX Zone 1
RS-FS-9009-03-173	Shortened 4.4 meter MI cable for NovaLT gas turbines; NA Class 1 Division 2, ATEX Zone 2 (ILG)
RS-FS-9009-03-25X	30-foot cable (9.1 m), NA Class 1 Division 2, ATEX Zone 2 (ILG)
RS-FS-9010-03-25X	30-foot cable (9.1 m), NA Class 1 Division 1, ATEX Zone 1 (ILG)

While our catalog lists the standard Reuter-Stokes flame sensing product offerings, our team is ready to discuss the specialized needs for your operation.

General Kits

Model		
Flame Tracker Kit	RS-E2-0266G006	RS-FS-9001, RS-E2-0285P011 cable, cable grip kit, UV pen
Flame Tracker Kit	RS-E2-0266G016	RS-FS-9001, RS-E2-0285P011 cable, cable grip kit, E1-0062P005 primary sight tube
Flame Tracker Kit	RS-E2-0266G025	RS-FS-9001, RS-E2-0285P011 cable, cable grip kit, cooling coil, UV pen
FTD 325 Kit	RS-E2-0266G088	FTD 325, RS-E2-0285P011 cable, UV pen
FTD 325 Kit	RS-E2-0266G090	FTD 325, RS-E2-0285P011 cable, clamp, lock nut, bolt (x4 each)

Geiger Muller Upgrade Kits

Model		
FTD 325 Upgrade Kit	RS-E2-0266G097	Upgrade aeroderivative gas turbines from Geiger Muller sensors to FTD 325
FTD 325 Upgrade Kit	RS-E2-0266G098	Upgrade aeroderivative gas turbines from Geiger Muller sensors to FTD 325
FTD 325 Upgrade Kit	RS-E2-0266G092	Upgrade heavy duty gas turbines and DLN1 combustion systems from G/M to FTD 325
FTD 325 Upgrade Kit	RS-E2-0266G091	Upgrade heavy duty gas turbines & DLN1 combustion systems from G/M to FTD 325
FTD 325 Upgrade Kit	RS-E2-0266G099	Upgrade heavy duty gas turbines & DLN1 combustion systems from G/M to FTD 325
FTD 325 Upgrade Kit	RS-E2-0266G100	Upgrade heavy duty gas turbines & DLN1 combustion systems from G/M to FTD 325

Cables

Model		
Interconnect Cable	RS-E2-0285P001	Right angle connector, 60 feet (18.3 m), 36 inch (0.9 m) armor
Interconnect Cable	RS-E2-0285P003	Right angle connector, 60 feet (18.3 m), 75 inch (1.9 m) armor
Interconnect Cable	RS-E2-0285P004	Right angle connector, 120 feet (36.6 m), 36 inch (0.9 m) armor
Interconnect Cable	RS-E2-0285P010	Straight connector, 60 feet (18.3 m), 120 inch (3 m) armor
Interconnect Cable	RS-E2-0285P011	Straight connector, 60 feet (18.3 m), 36 inch (0.9 m) armor
Interconnect Cable	RS-E2-0285P012	Straight connector, 120 feet (36.6 m), 36 inch (0.9 m) armor
Interconnect Cable	RS-E2-0285P013	Straight connector, 60 feet (18.3 m), 96 inch (2.4 m) armor
Interconnect Cable	RS-E2-0285P021	Right angle connector, 15 feet (4.6 m), 36 inch (0.9 m) armor, burner applications

Accessories

Model		
Flame Sensor Module, Logic Output	RS-FSM-1002-001	Converts 4-20 mA to open collector logic output, four channels
Flame Sensor Module, Frequency Output	RS-FSM-1002-002	Converts 4-20 mA to frequency output, four channels
Relay Module	RS-FS-9100-RELAY	Converts 4-20 mA to relay output DIN rail mounted, single channel
Current to Frequency Module Kit, DLN1	RS-FS-9000-ITOF-8	Converts 4-20 mA to frequency output, DIN rail mounted, kit for eight channels
Current to Frequency Module Kit, non-DLN1	RS-FS-9000-ITOF-4	Converts 4-20 mA to frequency output, DIN rail mounted, kit for four channels
UV Pen Light	FS-9000-LP	UV pen light for sensor functional tests
Water Cooling Coil	SP-566	Water cooling coil for pressurized air on aeroderivative gas turbines
Air Cooling Can Assembly	RS-E2-0259	Air cooling can for use with pressurized air on aeroderivative gas turbines
Sight Tube	E1-0058P002	Sight tube, secondary position on DLN1 combustion system, 2.2 in. (5.6 cm) length
Cable Spool, 100 Foot	CB-37	18 gauge, shielded twisted pair. For connection of junction box to control system
High Temperature Cable Grip Kit	SP-653	Cable gland to seal the end of electrical conduit around the interconnect cables

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