

DFS-Fiber Flame Scanner

Advanced Technology For Safety & Efficiency

The ABB Inc. DFS-Fiber Flame Scanner is a rugged, high temperature flame scanner designed for use on tilting tangential or wall mounted firing systems. This multi-fuel scanner reliably monitors burner flame and detects unstable operation and flame-out conditions.

This reliable instrument is available in visible light or infrared (IR) versions. All use solid state silicon photodiodes, and contain no shutters or moving parts. Several configurations are available to accommodate the firing of pulverized coal, natural gas, and/or oil on tangential fired units or coal and/or oil on wall fired boilers.

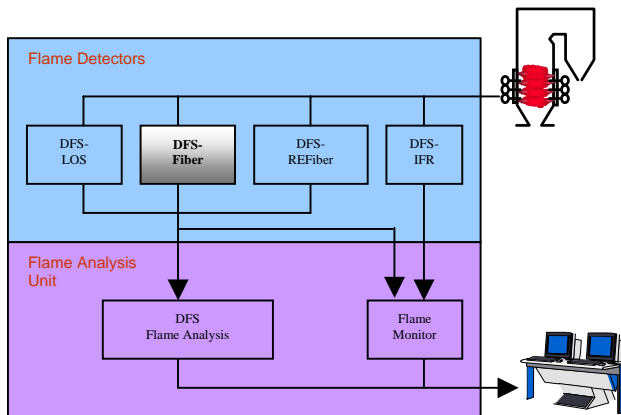
As with all DFS scanners the DFS-Fiber Flame Scanner has been ruggedly designed for years of reliable service in the power plant environment.



Optical Head and Available Lenses

The scanner stainless steel optical head houses a lens that couples the light energy from the burner flame into a high temperature fiber optic cable. On tilting tangential boilers the fiber cable allows the scanner's lens to tilt with the corner so the scanner always has a clear view of the fireball or oil gun. On wall fired units the fiber cable allows the scanner lens to have an unobstructed view of the flame allowing for unsurpassed flame discrimination under all operating conditions.

The fiber optic cable consists of a fiber bundle encapsulated in a stainless steel overbraided flex cable. The cable is installed in a 1/2 inch outer stainless steel flex hose



and a 1/2 inch schedule 40 pipe connected to a rugged cast aluminum housing.

The cable is terminated at a photodiode electronics card mounted in the housing. The scanner optical head assembly is rated for 900° F operation.

All scanners are supplied with a standard length fiber optic cable. Simply changing the length of the flex hose and the rigid pipe sets the overall length of the scanner assembly. No special length cable is required. Excess cable is simply coiled inside the aluminum housing.

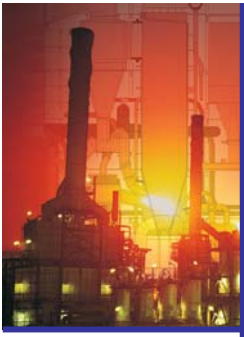
The fiber optic cable transmits the light from the optical head to a photodiode electronics card. This converts the collected light energy into an electrical flame current signal.



Scanner Assembly

The photodiode circuit has a wide dynamic light range making the scanner extremely sensitive to combustion flame over the entire operating range of the boiler.





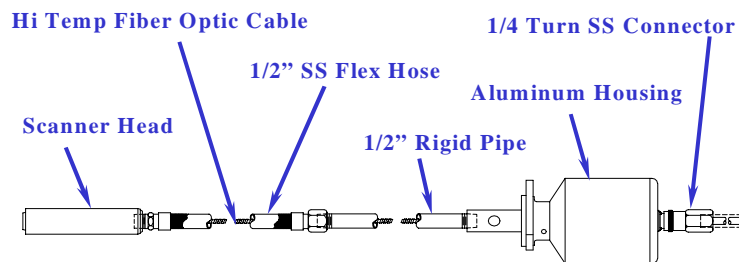
The flame current signal from the electronics card is input to a remotely mounted DFS Flame Analysis Unit.

The DFS Flame Analysis Unit determines whether the scanner is observing a flame that is unstable, on, or off. The intensity and flicker frequency of the flame signal is measured using an ABB Inc. proprietary algorithm. If the intensity and frequency both exceed their programmed trip points, flame is proven.

The Flame Analysis Unit also calculates a flame quality value, which can be used by plant operators as an early indication of flame degradation.

Installation of the DFS-Fiber Flame Scanner is accomplished by inserting the scanner down a guidepipe installed through the windbox. On wall fired burners a rigid guide pipe is used where as on tilting tangential boilers a flexible guide pipe is used to support the corner tilts. Once installed in the guidepipe, the scanner head has excellent visual access to the combustion flame.

The DFS-Fiber Flame Scanner fits in 2" guide pipes designed by Combustion Engineering, Inc. This minimizes scanner installation requirements on many boilers of CE design as existing guidepipes can be reused with the new DFS-Fiber scanners.



Details of the Scanner

ABB DFS-Fiber Flame Scanner Specifications:

Application Type	Wall Fired, Fixed Tangential, Tilting Tangential Fired Boilers
Burner Type	Main Flame or Ignitor/Lighter Flame
Fuel Type	Tangential Fired - Natural Gas, Oil, Coal or any Wall Fired – Coal, oil, coal and oil
Detector	Visible Light (VL) or Infrared (IR) photodiode

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