



SF810-LOS

Uvisor SF810 Line-of-Sight Flame Scanner

Product scope

- Line-of-sight member of the ABB Uvisor SF810 flame-scanner family.
- Solid-state sensing options cover UV, IR and combined spectra.
- Supports continuous self-check and associated FAU810 analysis.
- Requires optical alignment and complete suffix verification.

Manufacturer source

ABB Uvisor SF810 Series Datasheet 9AKK108472A1757

Selected ABB pages cover the SF810 portfolio, LOS arrangement, technical data, dimensions and ordering structure.

Request a fast quote	Product reference	
Email: info@apterpower.com Phone: +86 18106909650 apter.com/inquiry.php	SF810-LOS	

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DATA SHEET

ABB Ability™ Symphony® Plus

Multi Fuel Safe Flame Scanner Uvisor™ SF810 Series



Figure 1. SF810.



Figure 2. SF810-PYRO.

The SF810 product portfolio includes a set of advanced multi-fuel flame scanners designed to provide accurate, reliable information regarding the presence or absence of a burner flame (the primary purpose of a flame scanner), and at the same time continuously monitors the burner flame quality to provide additional operating information to plant personnel (Figure 1).

The SF810-PYRO flame scanner builds on the SF810 basic design by adding a sensing element for the FAU810 analysis unit to compute the Flame Temperature measurement in real time. It delivers an innovative approach to meet the stringent requirement of safety and the challenging demand of qualitative information for a combustion monitoring system.

The SF810-PYRO flame scanner bases on the proven rock-solid technology of the standard SF810 flame scanner series and it features the

ABB has combined the two highly successful flame scanner product lines, Uvisor™ and Safe Flame DFS, into a new advanced Flame Scanner, the Uvisor SF810 Series.

sensing element for the FAU810 analysis unit to compute the Flame Temperature measurement in real time (Figure 2). Specifically, the “Flame Temperature” reading offers a valuable input to improve burner combustion efficiency and support tighter control of combustion process dynamics such as fuel-air ratio and NOx emissions.

In rugged housing, the SF810 embeds solid-state sensor modules that cover the complete flame radiant spectrum (UV-to-IR including a dual sensor UVIR). Terminations are available as screw type removable connectors; including quick release connector for IP66/67 or as quick release connector for II 2GD Ex d IIC T 6 hazardous areas.

The SF810 flame scanner is available with accessories for the following installations:

- Line of sight (LOS) for wall fired burners' boilers
- Fiber optic cable (FOC) with outer guide pipe, for corner fired tilting burners' boilers

Multi Fuel Safe Flame Scanner Uvisor SF810 Series

Application:

Utility and industrial boilers

- Wall fired, corner fired, WHRB, down-shot and cyclone burner types

Multifuel:

- Natural gas, coke oven gas
- Light and heavy fuel oil, orimulsion
- Pulverized coal
- Sulphur gas

Features:

Operation

- UV, IR solid state sensors
- Dual sensor UVIR and dual sensor IRIR (SF810-PYRO only)
- Continuous self-check
- F-FFRT Fast Flame Failure Response Time

- Line of sight with accessories to give precise alignment with the flame

- Rigid fiber optic cable to improve discrimination performance for deep wind boxes

- Flexible fiber optic cable to maintain flame alignment for tilting burner

Environment

- ATEX
 - II 2 G Ex db op pr IIC T6 Gb
 - II 2 D Ex tb IIIC T85°C Db
 - IP66/67
- IECEx
 - Ex db op pr IIC T6 Gb
 - Ex tb IIIC T85°C Db
 - IP66/67

Table 1. Features and details.

Technical specifications			
Property	Value		
Optical sensor technology	IR versions: UV versions: UVIR version: PYRO (IRIR version:	Si photodiode SiC photodiode Si + SiC photodiode ¹ Si-Si dual IR color photodiode ²	Spectral response peak @ 920nm Spectral response peak @ 280nm Spectral response peak @280nm and 920nm
	¹ Si and SiC photodiodes signals can be processed individually or both combined as per burner operation ² Only SF810-PYRO contains dual IR sensor		
Measured temperature range	800°C to 1800°C (1472° F to 3272°F) @ +/-1% absolute accuracy ¹ ¹ SF810-PYRO only		
Power supply voltage	Flame Analysis Unit FAU810 Powered		
Power consumption	Max 300 mW/600 mW (Dual Sensor)		
Local configuration	No		
Air source for lens cleaning	From clean ambient air		
Air flow for lens cleaning	LOS (Line Of Sight) versions: 115 l/min (4 SCFM) Excessive contaminants might require a flow up to 400 l/min (14 SCFM) FOC (Fiber Optic Cable) versions: 400 l/min (14 SCFM)		
Minimum cleaning air pressure	LOS (Line Of Sight) versions: 20mm H ₂ O (1" W.C.) above the max wind box pressure measured at the "Y" connection inlet. FOC (Fiber Optic Cable) versions: 300mm H ₂ O (12" W.C.) above the max wind box pressure measured		
Maximum fiber optic continuous operating temperature	482° C (900° F) for VL and IR fiber optic cables 350° C (662° F) for UV and dual sensor UVIR fiber optic cable		
Housing mounting thread	1" NPT male		
Cable entry thread	– 3/4 "NPT female tread (Scanner models "T" and "TL") – 16 contacts quick release connector type CVB-EX. Protection mode: Ex d IIC T6 tD A21 IP66/IP67 T85°C (Scanner models "QC") – 16 contacts quick release connector. Protection mode: IP66/IP67 (Scanner models "Q")		
Electrical connections (terminal versions)	Removable terminals with screws Allowable cable section: AWG 28-AWG16, 0.08-1.5mm ² Recommended ABB standard cable: – Single Sensor scanner drawing no. EC-DWG-G041ELE803 – Dual Sensor scanner drawing no. EC-DWG-GO41ELE802		
Compatible Control Unit	The SF810-PYRO flame scanner is compatible only with the Flame Analysis Unit FAU810 (FW Vers. ≥/ > 3.13) Refer to the table below for the compatibility of the SF810 flame scanner with the associated Analysis Unit		

Multi Fuel Safe Flame Scanner Uvisor SF810 Series

Table 1. Features and details (continued).

Scanner models	Analysis Units		
	DFS	FAU800	FAU810
SF810-IR Series (≠/ > Rev.E)	X	X	X
SF810-IR Series (< Rev.E)	X	X	X
SF810-UV Series (≠/ > Rev.E)			X
SF810-UV Series (< Rev.E)	X	X	X
SF810-UVIR Series (≠/ > Rev.E)			X
SF810-UVIR Series (< Rev.E)		X	X
SF810-PYRO Series (> Rev.G)			X ¹
Safe FlameIR assembly round board (C10-24113)	X	X	X
Safe Flame Full Spectrum assembly round board (c10-24114)	X	X	X
1.5 Deg. PC board (C87-97308)	X	X	X
4 Deg. PC board (C87-97342)	X	X	X
IFM (Ionization Flame Rod)		X	X

¹ FAU810 FW ≥ C3.16.

Environmental specification	
Property	Value
Safety specifications	EN 61010-1 (IEC 61010-1)
Class of installation	I
Over voltage category	I
Pollution degree	2
Protection (EN 60529)	IP66 - IP67
Ambient operating temperature (EN/IEC 60068-2-1/2/14)	- 40° to 70°C (-40° to 158 °F) in ATEX T6 classified zones - 60° to 80°C (-40° to 176 °F) NO Ex zones - 60° to 105°C (-76° to 221 °F) w/air cooler
Ambient storage and transportation temperature (EN/IEC 60068-2-1/2/14)	-40°C to 85°C (-40°F to 185°F)
Relative humidity (EN/IEC 60068-2-78)	40°C, RH 95%
Vibration sinusoidal operating (IEC 654-3 Severity Class VH4) (IEC 60068-2-6)	Frequency range: 5 to 200 Hz, Acceleration: 20m/s ² peak (2 G) Displacement: 0.15 mm peak
Shock operating (IEC 60068-2-27)	Acceleration: 15G – Duration of pulses: 11 ms duration (half sine wave) – Three shocks in each direction (6 pulses in each axis)

Mechanical specification	
	Value
Dimensions	Diameter 95 mm max (3,7") Overall length: 180mm approx. (7")
Weight	1 kg approx. (2.2 lb)
Degree of protection	IP66 – IP67 (CEI EN 60529) Equivalent NEMA 4x

Line of Sight (LOS)

Standard assembly



Figure 3. SF810 standard assembly.

Line of Sight installation is recommended on those applications where the target burner flame is visible and unobstructed from the burner mounting front plate through the air vane.

Typical application:

- Front and opposite wall fired boiler
- Single and multiple burners

Wiring options

SF810 Line of Sight Flame Scanners are available with the following wiring options as described in Figure 4 and 5 below.

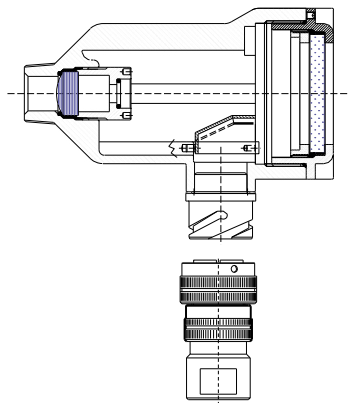


Figure 4. SF810 model LOS with "Quick Release" multi-pin connector.

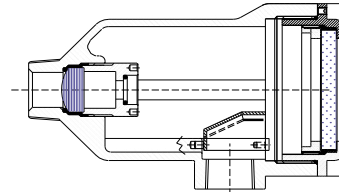


Figure 5. SF810 model LOS with 3/4" NPTF cable entry and terminal strip.

ABB ABILITY SYMPHONY PLUS MULTI FUEL SAFE FLAME SCANNER UVISOR SF810 SERIES

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Table 14. Flame scanners selection for corner fired (tangential fired) boilers.

Fuel	Gas (H ₂ , Propane, NG)*	Oil (Heavy oil)	Oil & Gas	Low NOx Pulverized Coal/ Oil & Coal	Legend
Sensor					
SF810 - LOS-IR	N/A	N/A	N/A	N/A	NG: Natural Gas
SF810 - FOC-IR	N/A		N/A		H ₂ : Hydrogen
SF810 - LOS-UV	N/A	N/A	N/A	N/A	Gas also includes blast furnace
SF810 - FOC-UV		N/A		N/A	Heavy Oil: With steam atomization
SF810 - LOS-UVIR	N/A	N/A	N/A	N/A	UV: Ultraviolet
SF810 - FOC-UVIR	N/A	N/A		N/A	IR: Infrared
SF810 - LOS-PYRO	N/A	N/A	N/A	N/A	LOS: Line of Sight (direct view)
SF810 - FOC-PYRO	N/A		N/A		FOC: Fiber Optic Cable (through the windbox)
					N/A: Not applicable or over requirements
					 Acceptable performance
					 Good performance
					 Excellent performance

* For off-shore installation, ABB recommends SF810 detector with standard SS316L casing.

Table 15. Flame scanners selection for wall (front or rear) fired boilers.

Fuel	Gas (H ₂ , Propane, NG)*	Oil (Heavy oil)	Oil & Gas	Low NOx Pulverized Coal/ Oil & Coal	Legend
Sensor					
SF810 - LOS-IR	N/A		N/A		NG: Natural Gas
SF810 - FOC-IR	N/A		N/A		H ₂ : Hydrogen
SF810 - LOS-UV		N/A	N/A	N/A	Gas also includes blast furnace
SF810 - FOC-UV		N/A	N/A	N/A	Heavy Oil: With steam atomization
SF810 - LOS-UVIR	N/A	N/A		N/A	UV: Ultraviolet
SF810 - FOC-UVIR	N/A	N/A		N/A	IR: Infrared
SF810 - LOS-PYRO	N/A		N/A		LOS: Line of Sight (direct view)
SF810 - FOC-PYRO	N/A		N/A		FOC: Fiber Optic Cable (through the windbox)
					N/A: Not applicable or over requirements
					 Acceptable performance
					 Good performance
					 Excellent performance

* For off-shore installation, ABB recommends SF810 detector with standard SS316L casing.

Table 16. Flame scanners selection for Down Shot boilers.

Fuel Sensor	Gas (H ₂ , Propane, NG)*	Oil (Heavy oil)	Oil & Gas	Low NOx Pulverized Coal/ Oil & Coal	Legend
SF810 - LOS-IR	N/A	N/A	N/A		NG: Natural Gas
SF810 - FOC-IR	N/A	N/A	N/A		H ₂ : Hydrogen Gas also includes blast furnace
SF810 - LOS-UV	N/A	N/A	N/A	N/A	Heavy Oil: With steam atomization
SF810 - FOC-UV	N/A	N/A	N/A	N/A	UV: Ultraviolet
SF810 - LOS-UVIR	N/A	N/A	N/A	N/A	IR: Infrared
SF810 - LOS-UVIR	N/A	N/A	N/A	N/A	LOS: Line of Sight (direct view)
SF810 - FOC-UVIR	N/A	N/A	N/A	N/A	FOC: Fiber Optic Cable (through the windbox)
SF810 - LOS-PYRO	N/A	N/A	N/A		N/A: Not applicable or over requirements
SF810 - FOC-PYRO	N/A	N/A	N/A		■ Acceptable performance ■ Good performance ■ Excellent performance

* For off-shore installation, ABB recommends SF810 detector with standard SS316L casing.

Table 17. Flame scanners selection for Gas Turbines.

Fuel Sensor	Gas Turbine	Legend
SF810 - LOS-IR	N/A	UV: Ultraviolet
SF810 - FOC-IR	N/A	IR: Infrared
SF810 - LOS-UV		LOS: Line of Sight (direct view)
SF810 - FOC-UV		FOC: Fiber Optic Cable (through the windbox)
SF810 - LOS-UVIR	N/A	N/A: Not applicable or over requirements
SF810 - FOC-UVIR	N/A	■ Acceptable performance ■ Good performance ■ Excellent performance
SF810 - LOS-PYRO	N/A	
SF810 - FOC-PYRO	N/A	

* For off-shore installation, ABB recommends SF810 detector with standard SS316L casing.

Versions and ordering codes

SF810 SafeFlame Scanners are offered with several mounting and wiring options to suite customer needs. The standard versions come with removable terminals. A quick release connector and preassembled connecting cable is also available.

Contact your local ABB organization for additional details.

Table 18. SF810 options and ordering codes.

Feature	Available models	Uvisor SF810 ordering codes							
Installation type	FOC (Scanner head for Fiber Optic Cable)	SF810	–	FOC	–	.....	–	...	
	LOS (Scanner head for Line of Sight)	SF810	–	LOS	–	.....	–	...	
Spectral range	IR	SF810	–	.....	–	IR	–	...	
	UV	SF810	–	.....	–	UV	–	...	
	UV + IR (dual sensor)	SF810	–	.....	–	UVIR	–	...	
	PYRO (dual IR sensor)	SF810	–	.....	–	PYRO	–	...	
Cabling method, protection index, hazardous areas	Screw terminals IP66/IP67 - Ex	SF810	–	.....	–	.....	–	T	
	Screw terminals IP66/IP67	SF810	–	.....	–	.....	–	TL	
	Quick-release connector IP66/IP67	SF810	–	.....	–	.....	–	Q	
	Quick-release connector IP66/IP67 - Ex	SF810	–	.....	–	.....	–	QC	
Housing	Stainless steel AISI316 case	SF810	–	.....	–	.....	–	TX	
Notes		IP66/IP67 and ATEX certificates on FOC assemblies are guaranteed only with ABB fiber optic cable P/N: • EC-DWG-G041MEC020 • EC-DWG-G041MEC021 • EC-DWG-G041MEC022							

Table 19. SF810 spare part options.

Assembly type	Article number	Description
SF810-FOC all models	Lens SF810-FOC	19mm Quartz Lens for SF810(i)
SF810-FOC all models	Lens holder SF810-FOC	SF810 FOC Lens Holder with Seeger ring and retainer
SF810-IR all models	SF810_IR Card	PCB IR Sensor for SF810-IR Flame Scanner
SF810-UV all models	SF810_UV Card	PCB UV Sensor for SF810-IR Flame Scanner
SF810-UVIR all models	SF810_UVIR Card	PCB UVIR Sensor for SF810-IR Flame Scanner



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