hmi

high-accuracy measurement instruments

FICHA TÉCNICA DE PRODUTO

PRODUCT DATASHEET

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Uvisor™ SF810 Multi Fuel Safe Flame Scanner
800 Series Combustion Instruments

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.

The Uvisor™ SF810 is a multi-fuel flame scanner designed to provide stable and reliable information of both the flame consistency and the flame quality on utility and industrial boiler burners.

In a single harsh proven housing, the Uvisor™ SF810 embeds the Solid State Sensor module, covering the whole flame radiant spectrum (UV-Vis-IR and dual sensor UVIR).

Terminations are available on screw type removable connectors or on quick release connector for IP66-IP67 or ATEX II 2GD Ex d IIC T6 for hazardous areas.

The Uvisor™ 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, cooling hose and fitting flanges for corner fired tilting burners' boilers

Application:

Utility and Industrial boilers

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

Multi fuel

- Natural Gas, Coke Oven Gas
- Light & heavy fuel oil, Orimulsion
- Pulverized coal
- Sulphur gas

Features:

Operation

- UV, VL, IR solid state sensors
- Dual sensor UVIR
- Continuous self-check
- F-FFRT Fast Flame Failure Response Time

Environment

- ATEX II 2GD Ex d IIC T6 tD A21 IP66 T80°C
- Certificate number: ICEPI 06 ATEX 03C024

Installation

- Line of sight with aiming accessories
- Fibre optic cable through the windbox

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Technical specifications

Property	Value
Optical sensor Technology	IR versions: Si photodiode pectral response peak @ 920nm
	VL versions: Si photodiode Spectral response peak @ 560nm
	UV versions: SiC photodiode Spectral response peak @ 280nm
	UVIR version: Si + SiC photodiode1 Spectral response peak @ 280nm and 920nm
	1 Si and SiC photodiodes signals can be processed individually or both combined as per burner operation
Power supply voltage	FAU810 Powered. Compatible with FAU800 and DSF Safe Flame Sensor Module (SF810 Single Sensor only)
Power consumption	Max .300 mW / 600 mW (Dual Sensor)
Local configuration	None
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 (Fibre Optic Cable) versions: 400 l/min (14 SCFM)
Minimum cleaning air pressure	LOS (Line Of Sight) versions: 20mm H_2O (1" W.C.) above the max wind box pressure measured at the "Y" connection inlet. FOC (Fiber Optic Cable) versions: 400mm H_2O (12" W.C.) above the max wind box pressure measured at the "Y" connection inlet.
Maximum fibre 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	¾ " NPT female (N/A for connectorized versions)
Electrical connections (terminal versions)	Removable terminals with screws Allowable cable section: AWG 28-AWG16, 0,08-1.5mm²

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Environmental specifications	
Property	**Value**
Safety Specifications	EN 61010-1 (IEC 61010-1)
Class of installation Over voltage category Pollution degree Protection (EN 60529)	I II 2 IP66 – IP67

Environmental	
Ambient Operating temperature (EN/IEC 60068-2-1/2/14)	-40° to 80°C (-40° to 176 °F) in ATEX classified zones -40° to 85°C (-40° to 185 °F) No ATEX classified zones
Ambient Storage and transportation temperature (EN/IEC 60068-2-1/2/14)	-40°C / 85°C (-40 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 ÷ 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 specifications	
Property	**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)

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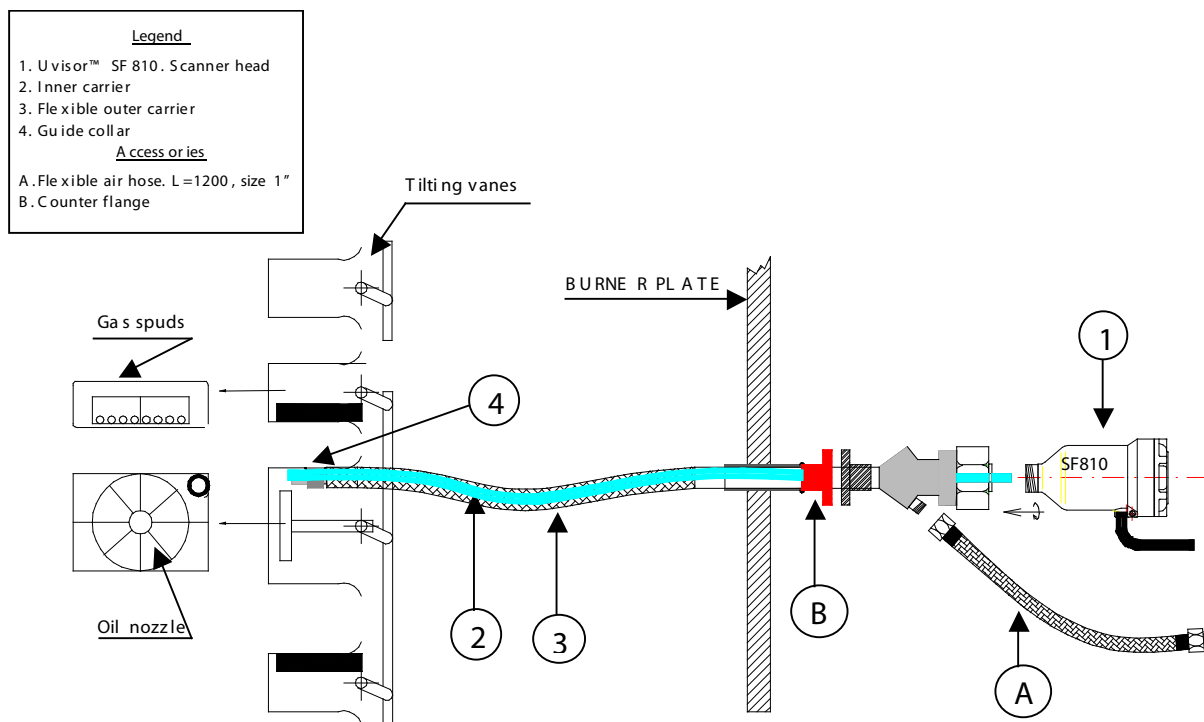| **Uvisor™ SF810. LOS (Line of Sight) installation**	
SF810 – SCANNER HEAD	
	Flame Scanner Swivel Flange Wall fired burner
SF810 – with provision for purging air and swivel flange	Purge air supply
SF810 – with provision for purging air, swivel flange and isolation valve	Purge air supply
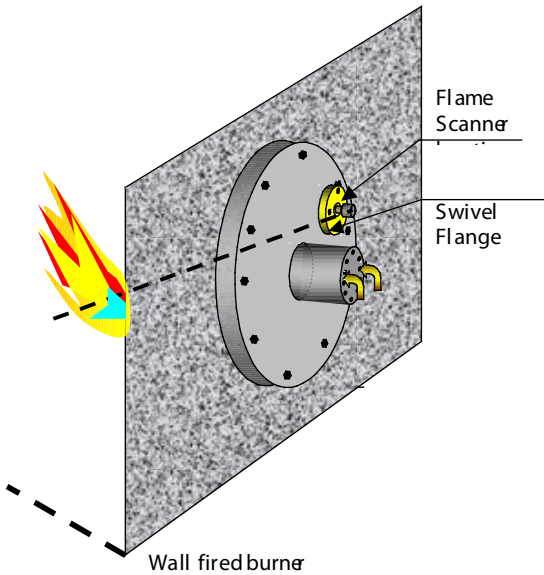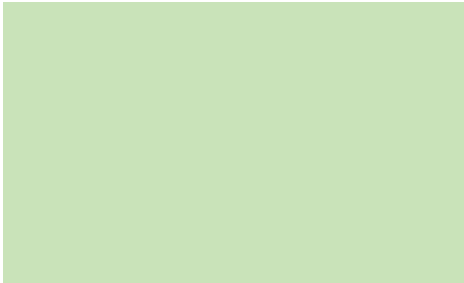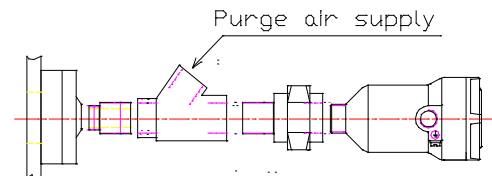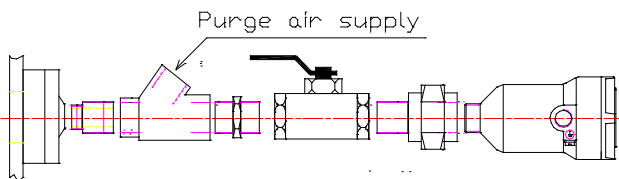
Uvisor™ SF810 Multi Fuel Safe Flame Scanner

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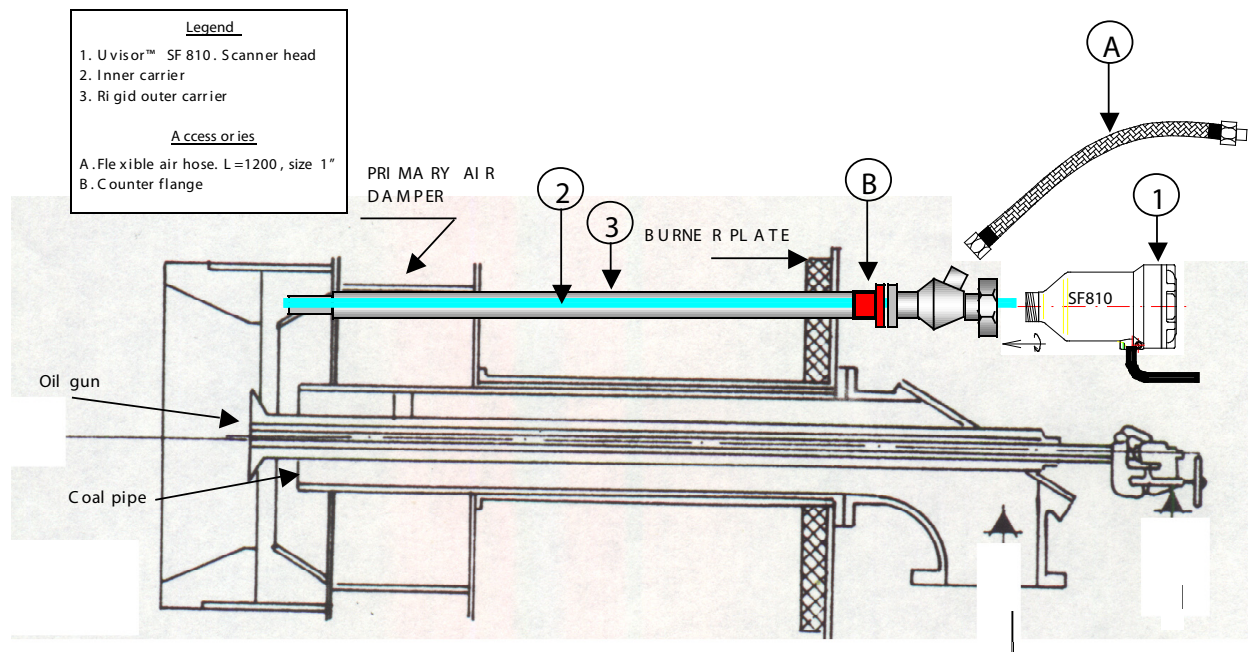**Uvisor™ SF810 FOC (Fiber Optic Cable) installation**

FLEXIBLE FIBER OPTIC ASSEMBLY

Legend

1. Uvisor™ SF 810. Scanner head
2. Inner carrier
3. Flexible outer carrier
4. Guide collar

Accessories

A. Flexible air hose. L=1200, size 1"
B. Counter flange

Tilting vanes

Gas spuds

BURNER PLATE

Oil nozzle

SF810

1

4

2

3

B

A

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Uvisor™ SF810 FOC (Fiber Optic Cable) installation

FIXED FIBER OPTIC ASSEMBLY

Legend

1. Uvisor™ SF 810. Scanner head
2. Inner carrier
3. Rigid outer carrier

Accessories

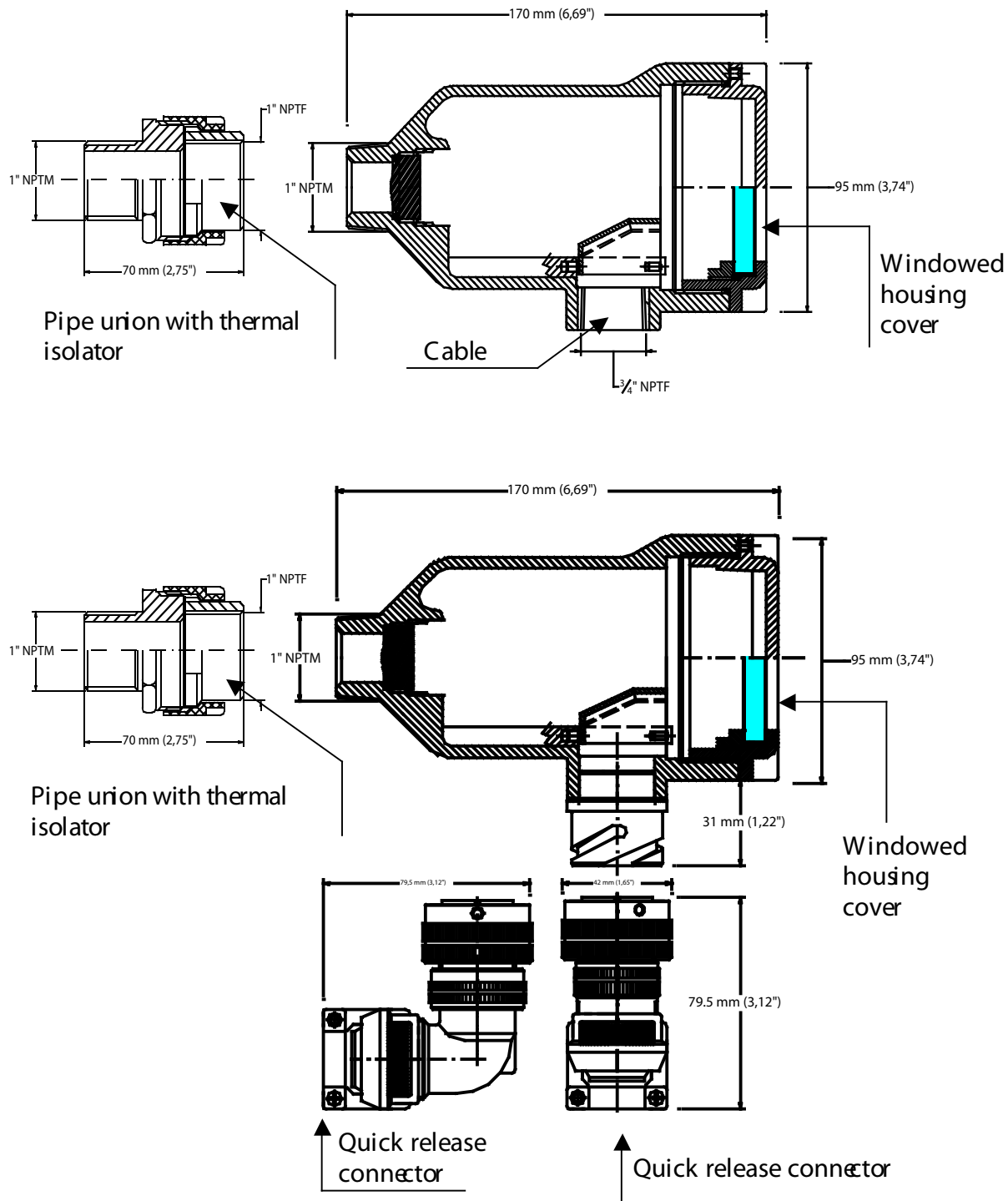A. Flexible air hose. L=1200, size 1″
B. Counter flange

Uvisor™ SF810 Multi Fuel Safe Flame Scanner

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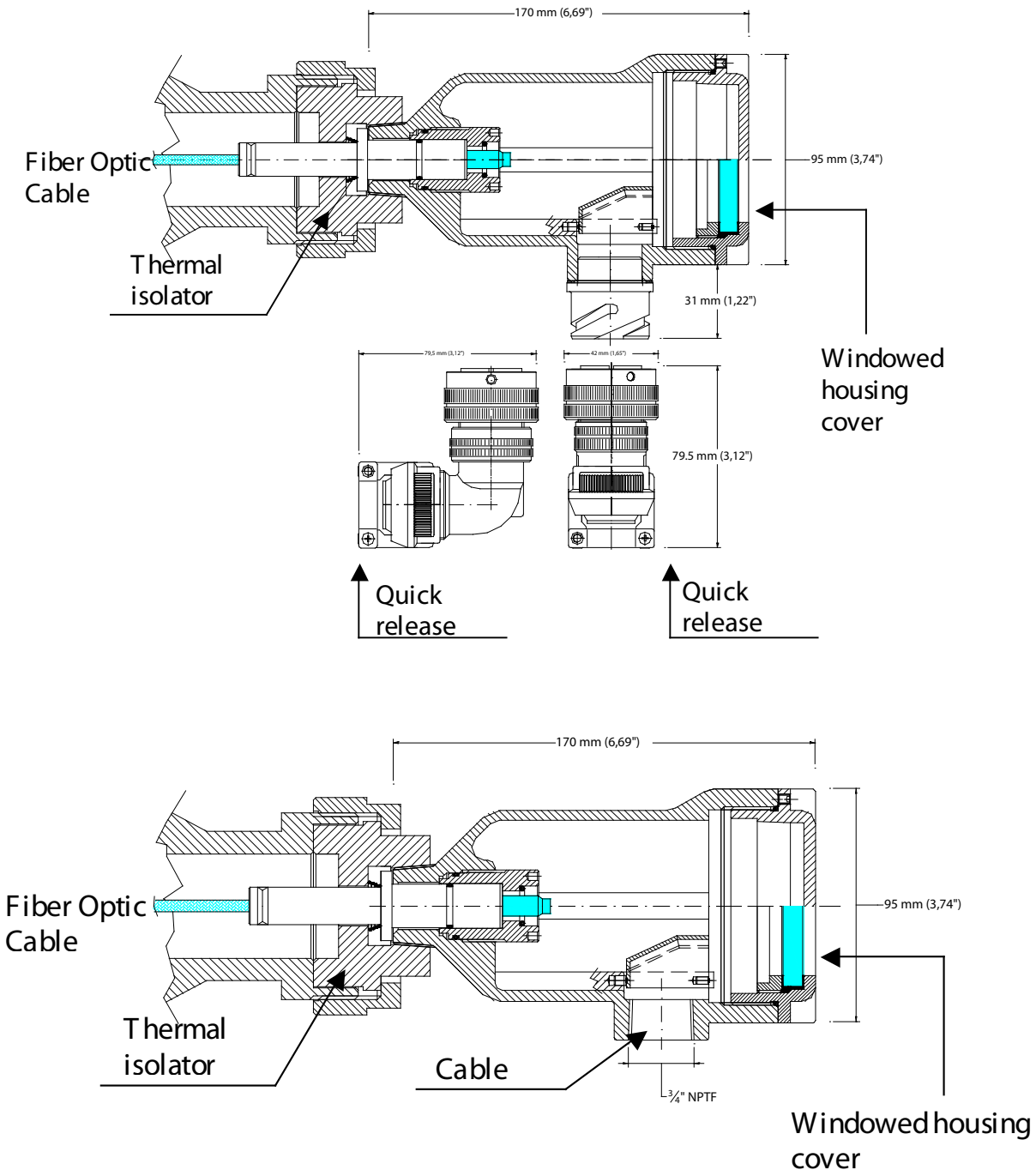**Uvisor™ SF810 Line of Sight (LOS). Measurements**

SF810. Mechanical dimension

170 mm (6,69")

1" NPTF

1" NPTM

1" NPTM

95 mm (3,74")

70 mm (2,75")

Pipe union with thermal isolator

Cable

¾" NPTF

Windowed housing cover

170 mm (6,69")

1" NPTF

1" NPTM

1" NPTM

95 mm (3,74")

70 mm (2,75")

Pipe union with thermal isolator

31 mm (1,22")

Windowed housing cover

79,5 mm (3,12")

42 mm (1,65")

79.5 mm (3,12")

Quick release connector

Quick release connector

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Uvisor™ SF810 Multi Fuel Safe Flame Scanner

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Uvisor™ SF810 FOC (Fiber Optic Cable). Measurements

Fiber Optic Cable

Thermal isolator

170 mm (6,69")

95 mm (3,74")

31 mm (1,22")

79,5 mm (3,12")

42 mm (1,65")

79.5 mm (3,12")

Quick release

Quick release

Windowed housing cover

Fiber Optic Cable

Thermal isolator

Cable

¾" NPTF

170 mm (6,69")

95 mm (3,74")

Windowed housing cover

Uvisor™ SF810 Line of Sight (LOS). Measurements

Figure A: Uvisor™ SF810 with fiber optic assembly
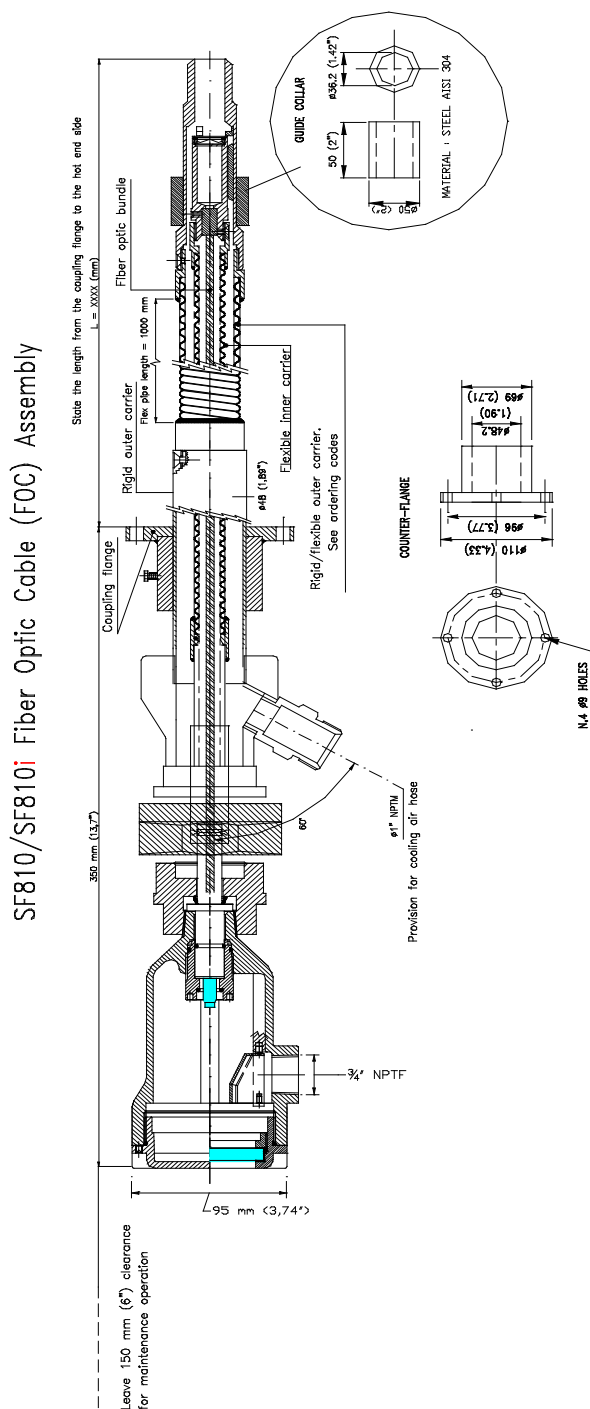
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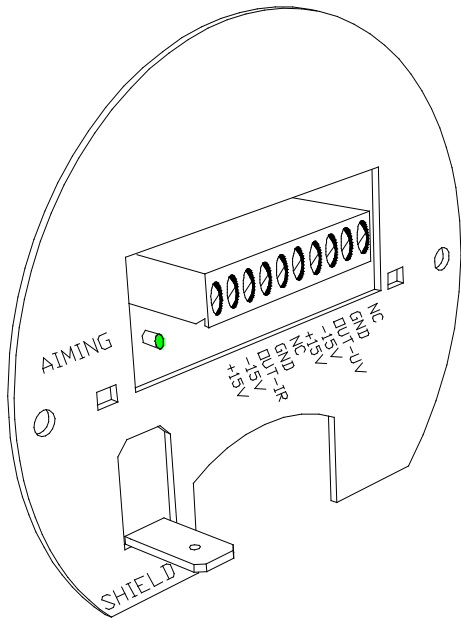# Uvisor™ SF810 Multi Fuel Safe Flame Scanner
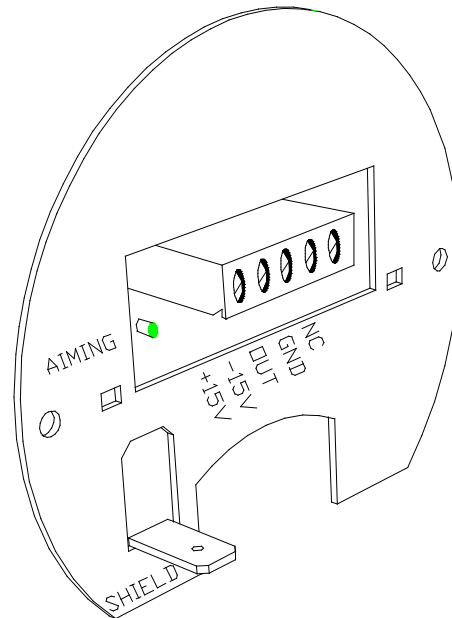
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Uvisor™ SF810. Electrical connection

Dual Sensor Faceplate	Single Sensor Faceplate

Connector / Terminal	Signal name	Description
+15 V	+15 V	Power supply positive input from FAU810/DFS.
		Sensor 1 / Sensor 2
-15 V	-15 V	Power supply negative input from FAU810/DFS
		Sensor 1 / Sensor 2
GND	GND	Return of power supply, ground ref. for all internal electronics.
		Sensor 1 / Sensor 2
OUT	Signal	Live flame signal. (Single Sensor)
OUT-IR	Signal	IR Live flame signal (Dual Sensor)
OUT-UV	Signal	UV Live flame signal (Dual Sensor)
NC	NC	(Not used)
SHIELD	Shield	Earth connection point for the shields of the cable(s)
	AIMING	Green light blinks faster when flame Intensity signal increases

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| Quick conn. Pin	SF810 TB Pin	Signal Name	Conductor color	Pig tail fly end label	Description
A					(Not used)
B					(Not used)
C					(Not used)
D					(Not used)
E					(Not used)
F	1	+15V	Green / Cyan	F (+B)	Power supply positive input from FAU810/DFS.
G	2	-15V	Yellow / Red	G (-B)	Power supply negative input from FAU810/DFS.
H	3	Flame	Yellow / Blue	H (Sign)	Live flame signal.
J	4	GND	Yellow / Brown	J (Com)	Return of power supply, ground ref. for all internal electronics.
K					(Not used)
L					(Not used)
M					(Not used)
N	5	(reserved)	White / Black		(Not used)
P					(Not used)
R					(Not used)
S					(Not used)
T	(*)	SHIELD	Gray	T (Sh)	Earth connection point for the shields of the cable(s)

Single Sensor Connector pin assignment

Quick conn. Pin	SF810 TB Pin	Signal Name	Conductor color	Pig tail fly end label	Description
A	6	+15V_IR	Green / Orange	A (+B)	Power supply positive input from FAU810/DFS.
B	7	-15V_IR	Green / Magenta	B (-B)	Power supply negative input from FAU810/DFS.
C	8	Flame_IR	Green / Blue	C (Sign_IR)	Live flame signal IR
D	9	GND_IR	Green / Black	D (Com)	Return of power supply, ground ref. for all internal electronics
E					(Not used)
F	1	+15V_UV	Green / Cyan	F (+B)	Power supply positive input from FAU810/DFS.
G	2	-15V_UV	Yellow / Red	G (-B)	Power supply negative input from FAU810/DFS.
H	3	Flame_UV	Yellow / Blue	H (Sign_UV)	Live flame signal UV
J	4	GND_UV	Yellow / Brown	J (Com)	Return of power supply, ground ref. for all internal electronics
K					(Not used)
L					(Not used)
M	5	(reserved)	White / Red		(Not used)
N	10	(reserved)	White / Black		(Not used)
P					(Not used)
R					(Not used)
S					(Not used)
T	(*)	SHIELD	Gray	T (Sh)	Earth connection point for the shields of the cable(s)

Dual Sensor Connector pin assignment

* Internal wiring

ARRANGEMENT   20−29

NO. of CONTACTS   17

CONTACTS SIZE   16

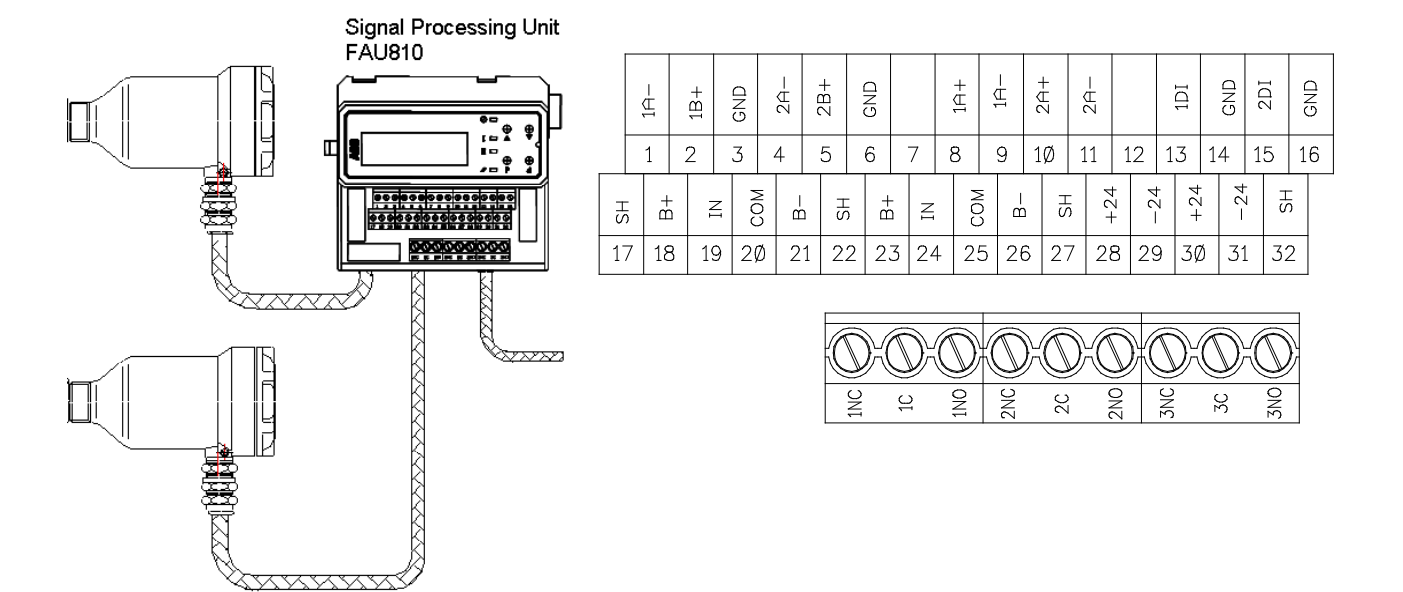SERVICE RATING   A
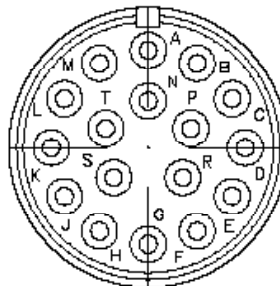
Front view male contacts Insert

SERVICE RATING	Min. distance air spacing guaranteed	Min. distance creepage guaranteed
A	1.6mm	3.2mm

SERVICE RATING	OPERATING VOLTAGE V D.C.	OPERATING VOLTAGE V A.C.	TEST VOLTAGE V A.C. RMS	MINIMUM FLASHOVER V A.C. RMS
A	700	500	2000	2800

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Uvisor™ SF810. Wiring Diagram

Signal Processing Unit FAU810

1A–	1B+	GND	2A–	2B+	GND		1A+	1A–	2A+	2A–		1DI	GND	2DI	GND
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

SH	B+	IN	COM	B–	SH	B+	IN	COM	B–	SH	+24	–24	+24	–24	SH
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

1NC	1C	1NO	2NC	2C	2NO	3NC	3C	3NO

SF810 #1 Terminal Board	FAU810 Terminal board	Signal
+15V	+B (18)	+15VDC
-15V	-B (21)	-15VDC
Out	IN (19)	Live flame signal
GND	COM (20)	GND
NC		NC (not used)
Shield	Ext. Ground Bar	Shield

SF810 #2 Terminal Board	FAU810 Terminal board	Signal
+15V	+B (23)	+15VDC
-15V	-B (26)	-15VDC
Out	IN (24)	Live flame signal
GND	COM (25)	GND
NC		NC (not used)
Shield	Ext. Ground Bar	Shield

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SF810 UVIR Terminal Board	FAU810 Terminal board	Signal
+15V	+B (18)	+15VDC
-15V	-B (21)	-15VDC
Out	IN (19)	Live flame signal IR
GND	COM (20)	GND
NC		NC (not used)
Shield	Ext. Ground Bar	Shield
+15V	+B (23)	+15VDC
-15V	-B (26)	-15VDC
Out	IN (24)	Live flame signal UV
GND	COM (25)	GND
NC		NC (not used)

Wiring Note:

Five-core shielded cable can be used to wire the FAU810 module with the scanner head SF810 dual sensor. Connection (*) to be wired.

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Uvisor™ SF810 Multi Fuel Safe Flame Scanner

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Flame scanners application table

Fuel / Scanner	Gas (Hydrogen, Propane,NG)		Oil (Heavy Oil - steam atom)		Oil & Gas		Low NOx Pulverized Coal /Oil & Coal			Gas/ Lfo Pilot	Gas Turbine	Notes
	W.F	T.F	W.F	T.F	W.F	T.F	W.F	T.F	D.S			
SF810 -LOS-IR			▮ Excellent				▮ Good		▮ Good	▮ Good	▮ Good	Stable signal and excellent target flame discrimination in wall and CF fired multi burner boiler. Side igniters and GT application can also be supported.
SF810 -FOC-IR				▮ Excellent				▮ Good				
SF810 -LOS-VL	▮ Good		▮ Good		▮ Good		▮ Good		▮ Good	▮ Good	▮ Good	Stable signal and excellent target flame discrimination in wall and CF fired multi burner boiler. Side igniters and GT application can also be supported.
SF810 -FOC-VL		▮ Good		▮ Good	▮ Good			▮ Good				
SF810 -LOS-UV	▮ Good		▮ Good		▮ Good					▮ Good	▮ Good	Stable signal and excellent target flame discrimination in wall and CF fired multi burner boiler. Side igniters and GT application can also be supported.
SF810 -FOC-UV		▮ Good		▮ Good	▮ Good							
SF810 -LOS-UVIR					▮ Good		▮ Good					Stable signal and excellent target flame discrimination in the whole operating range. Recommended in combined fuel operation.
SF810 -FOC-UVIR						▮ Good		▮ Good				

Abbreviation and symbols:

W.F	Wall fired boilers
D.S	Down Shot boilers
T.F	Tangential fired boilers
FOC	Fiber Optic Cable (Through the windbox)
LOS	Line of Sight (Direct view)
▮	Acceptable performance
▮▮	Good performance
▮▮▮	Excellent performance

Uvisor™ SF810 ORDERING CODES

Feature	Available models	Uvisor™ SF810 ORDERING CODES
Installation type	• FOC (Scanner head for Fiber Optic Cable) • LOS (Scanner head for Line Of Sight)	SF810 - FOC - ...... - ... - ... - ... SF810 - LOS - ...... - ... - ... - ...
Spectral range	• IR • UV • VL • IR+UV (dual sensor) • IR+VL (dual sensor)	SF810 - ...... - IR - ... - ... - ... SF810 - ...... - UV - ... - ... - ... SF810 - ...... - VL - ... - ... - ... SF810 - ...... - UVIR - ... - ... - ... SF810 - ...... - VLIR - ... - ... - ...
Cabling method, protection index, hazardous areas	• Removable screw terminals (IP66/IP67 and ATEX G/D) See note[2] • Removable screw terminals (IP66/IP67, no-ATEX) • Quick-release connector (IP66/IP67, no-ATEX) • Quick-release connector (IP66/IP67 and ATEX G/D) See note[2]	SF810 - ...... - ...... - T - ... - ... SF810 - ...... - ...... - TL - ... - ... SF810 - ...... - ...... - Q - ... - ... SF810 - ...... - ...... - QC - ... - ...
Housing	Conformal coating Aluminium case	SF810 - ...... - ...... - ... - C - W
Housing	Conformal coating Stainless steel AISI316 case	SF810 - ...... - ...... - ... - C - X
Notes		1) Greyed product codes are presently not available 2) IP66/IP67 and ATEX on FOC assemblies is guarantied only with ABB fibre optic cable P/N: SF810-FO-G-XXXX-mm, SF810-FO-Q-XXXX-mm or SF810-FO-GQ-XXXX-mm

Uvisor™ SF810 FOC Assembly ordering codes

Feature	Available choices	PART NUMBER assignment
Fiber optic extension type	Flexible extension	SF810 | - | FOC | - | ...... | - | ... | - | ... | - | ... | - | FE | - | xxxx
		For the assignment of the first 5 suffixes see previous tableXXXX = length (in mm) See Figure "A"
		FE assembly includes:
		• Scanner Head
		• Fiber optic cable
		• Inner fiber optic cable guide pipe with lens assembly
		• Flexible external guide pipe with coupling flange and guide ring
	Rigid extension	SF810 | - | FOC | - | ...... | - | ... | - | ... | - | ... | - | RE | - | xxxx
		For the assignment of the first 5 suffixes see previous tableXXXX = length (in mm) See Figure "A"
		REassembly includes:
		• Scanner Head
		• Fiber optic cable
		• Inner fiber optic cable guide pipe with lens assembly
		• Rigid external guide pipe with coupling flange and guide ring

Uvisor™ SF810 Parts Ordering Codes

Description	Ordering Code	Ordering information
Glass Fiber (for IR and VL FOC versions)	SF810-FO-G-XXXX-mm	State the length XXXX of the fiber optic cable
Quartz Fiber (for UV FOC version)	SF810-FO-Q-XXXX-mm	State the length XXXX of the fiber optic cable
Dual sensor Fiber (for UVIR FOC version)	SF810-FO-GQ-XXXX-mm	State the length XXXX of the fiber optic cable
Inner guide pipe - flexible	SF810-IGP-XXXX-mm	State the length XXXX of the guide pipe
Outer guide pipe - rigid	SF810-OGP-R-XXXX-mm	State the length XXXX of the extended pipe
Outer Guide pipe - flexible	SF810-OGP-F-XXXX-mm	State the length XXXX of the extended pipe
Flame Explorer SW	EC-PI-G018UTL220	Monitoring and configuration PC tool

Uvisor™ SF810 Multi-core cable codes

Cable	P/No	Ordering information
ABB cable for SF810 Single Sensor Cable only, no connectors, suitable for both ATEX and non-ATEX versions	C99-94510 (in use with Safe Flame Scanners) Or SF810-CBL-yyyy	SF810-XXX-IR/UV/VL-T-X-X SF810-XXX- IR/UV/VL -TL-X-X
ABB cable for SF810 Single or Dual Single Sensor Cable only, no connectors, suitable for both ATEX and non-ATEX versions	SF810-CBL-yyyy	SF810-XXX-IR/UV/VL-T-X-X SF810-XXX- IR/UV/VL -TL-X-X
ABB connectorized cable for SF810 Non-ATEX Cable with pre-assembled quick-release plug at one side only (non-ATEX version)	SF810-CBL-Q-yyyy	SF810-XXX-XX-Q-X-X
ABB connectorized cable for SF810 ATEX Cable with pre-assembled quick-release plug at one side only (ATEX version)	SF810-CBL-QC-yyyy	SF810-XXX-XX-QC-X-X

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Uvisor™ SF810 Multi Fuel Safe Flame Scanner

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Uvisor™ SF810 Fitting accessories

Description	P/No	Notes
1" NPTM / 1" NPTF Thermal isolation union	THU-1NPTMF	
Isolating Valve 1" NPTF / 1" NPTF	IV-1NPTF	
Purging air "Y" 1" NPTF / 1" NPTF Air inlet ¾" NPTF with Nipple 1" NPTM / 1" NPTM	PAY-1NPTFF	
Swivel flange assembly with 1" NPTM nipple and gasket $\emptyset_{EXT}$=85 mm (3.346")	SWF-1NPTM	
Purging air flexible house Armoured hose type 2TE DIN 2021 EN854 ND-19 Temperature –30 to 80°C (-22 to 176°F) L=1200 mm (47.2")	84410-S-0400000	
Purging air flexible house Armoured hose type 2TE DIN 2021 EN854 ND-25 Temperature –30 to 80°C (-22 to 176°F) L=1200 mm (47.2")	84410-S-0400001	
Armoured cable gland ATEX II 2GD T6 IP66 (gas & dusts)	CG3/4-EEx	
Counter flange for FOC external guide pipe	84410-S-0400002	

For more information please contact:

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Local ABB Unit Address

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Our offering:

	Actuators and Positioners		Analytical Instruments
	Device Management, Fieldbus and Wireless		Flow Measurement
	Force Measurement		Level Measurement
	Natural Gas Measurement		Pressure Measurement
	Recorders and Controllers		Temperature Measurement

HMI – Automação e Instrumentação, Lda.