

Original Operating Instructions

UV Compact Flame Detector IFC 10

Type: IFC 10
Document: TB IFC 10 EN Rev.0



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1	General aspects	1
1.1	Preamble	1
2	Safety	2
2.1	Intended use	2
2.1.1	Safety test	2
3	Technical data	3
3.1	General characteristic features	3
3.2	Electrical system, optical system, mechanical system	3
3.3	Weight	4
3.4	Dimensions	4
3.5	Block diagram IFC 10	4
4	Transport, installation and connection	5
4.1	Scope of delivery	5
4.2	Dimensions IFC 10	6
4.3	Installation	6
4.3.1	Alignment of IFC 10	7
4.3.2	Usage of glasses and lenses	7
4.3.3	Purge air connection	7
4.4	Connection	8
4.4.1	Electrical connection	8
4.4.2	Connection diagram IFC 10	8
4.4.3	Connection to BMS	9
4.5	Storage	9
5	Description	9
5.1	Functional description IFC 10	9
5.2	Optionally function blocks for IFC 10	10
5.2.1	Relay module 1 for flame detectors RMF 1	10
6	Operation of the flame detector	11
6.1	Test of the flame detector	11
6.2	Operating indicator LED	11
7	Maintenance and servicing	12
7.1	Cleaning	12
7.2	Maintenance interval	12
7.3	Safety check	12
7.4	Behavior in case of malfunction	12
8	Troubleshooting	13



9	Order data	14
10	Accessories	15

1 General aspects

1.1 Preamble

This Quick Guide provides an overview of the technical data of the IFC 10, its application, installation and handling, as well as ordering data and accessories.
Binding is solely the original operating instructions of the IFC 10 in its currently valid version.
To reflect the original operating instructions of the IFC10:

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2 Safety

2.1 Intended use

The IFC 10 is a compact UV flame detector, which is specially designed for severe conditions often experienced in industrial applications for single flame combustion. The IFC 10 can be connected directly to the ionisation or LDR input of the control box. The UV sensor ensures that the flame detector does not react to background radiation from hot refractory or from any other infrared light source.

The flame detector IFC 10 has been developed to meet the requirements of European Standards EN298:2012-11 for burner management control units which make a 'no-flame' check after normal burner shut down when the flame amplifier is permanently energised.

With the Dioptic holder, which serves also as a connection interface of the flame detector to the combustion chamber, the IFC 10 can be fitted with different glasses and lenses to special requirements. The flame detector is equipped with an optical interface which visibly indicates the flame signal intensity. A simple diagnosis of the flame intensity is directly on the furnace or boiler possible.

▲WARNING

Danger when improperly used !

The device may cause hazards if it is not used as intended and/or for any other purposes.

The device has to be used only for the purposes for which it is intended.

The procedures described in the operating instructions have to be observed.

The manufacturer/supplier shall not be liable for damage resulting from use for non-intended purposes. The user/operating company alone shall bear the risk.

2.1.1 Safety test

▲WARNING

In order to ensure correct operation, the compact flame detector IFC 10 as well as flame amplifiers of all applications have to be tested several times by starting and stopping the burner several times. In all cases the flame relay has to be switched off reliably in case of an absent flame. Carry out this test whilst several neighbouring burners are started and stopped and different boiler outputs are used. This is an indispensable pre-requisite for a safe and correct operation of the device !

3 Technical data

3.1 General characteristic features

- UV-Tube
- Fully electronic construction
- Spectral analyzing process
- CE 085CN0133

3.2 Electrical system, optical system, mechanical system

Optical features	185 to 265 nm, tolerated flame signal fades approx. 200 ms
Orientation	axial
Lifetime of the tube	approx. 10000 h
Distance to flame	< 2 m
Input	230 V AC 120 V AC (optional) Nominal frequency 50-60 Hz
Prefuse	max. 1 A , slow
consumption	max. 5,5 mA
Operating temperature	-20 to +60°C (temperatures higher than 50°C reduces life of the UV tube)
Operating position	any position
Kind of protection	IP 65
Protection class	I
Humidity	max. 95% r.H., non-condensing
Cable length IFC 10 C	length on request
Electrical connenction IFC 10	Amphenol eco mate plug C016

Restart time	>5s between controlled shut-down and renewed heat request
Output data	Flame on reaction time typically 0.5s Log off time <0.5s
Switching output	Floating, galvanically isolated max. switching current 15 mA max. switching power 0.3 W max. switching voltage 280 V AC / 400 V DC

3.3 Weight

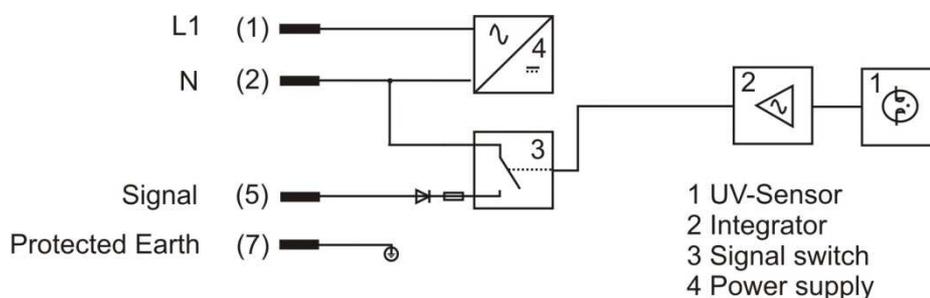
Weight approx. 0.520 kg

3.4 Dimensions

Length (without plug or gland) 101.1 mm
Width 66 mm
Height 92 mm

Dimensions see under item 4.4

3.5 Block diagram IFC 10



4 Transport, installation and connection

NOTICE

All installation and connection work may be carried out by qualified and approved specialist staff only !

Observe the legal stipulations and adjustment instructions of the plant operator !

4.1 Scope of delivery

- Compact flame detektor IFC 10
- Operating instructions (optional, customer dependend)
- Connection cable in other length (optional)

Refer to the order papers for the exact scope of delivery and compare with the delivery note.

Checking for completeness

Check the entire delivery for completeness against the accompanying delivery note. Please refer to our terms of sale and delivery otherwise.

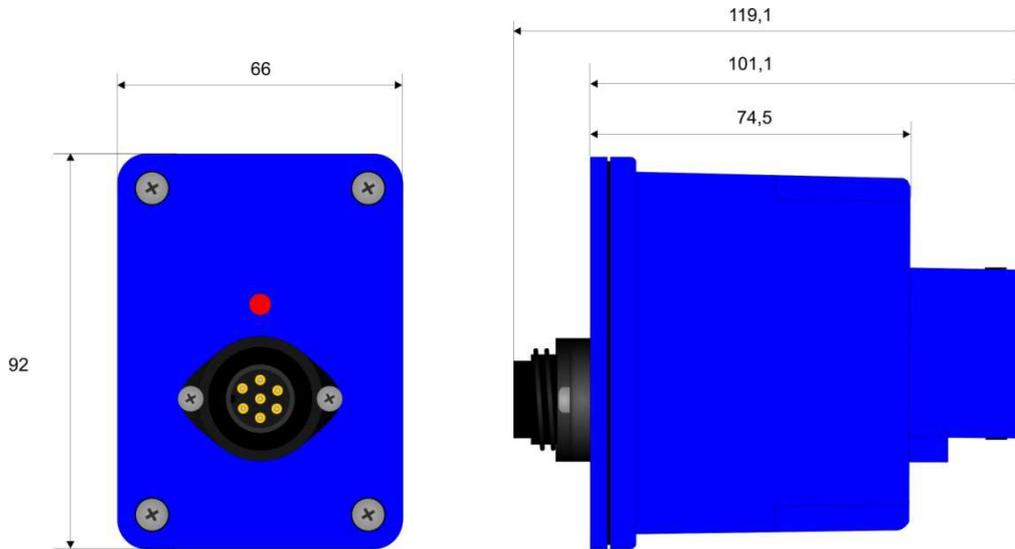
Report any damage

After arrival of the device and accessories, notify the shipping agent, the insurance company and BST Solutions immediately in case of any damage caused by transport or inadequate packaging.

Take steps to minimise and prevent further damage.

Report the insurance case to the insurance company without delay and transmit the full claim documents at once in order to expedite the claims settlement (at the latest in sufficient time before the expiry of any periods of preclusion and/or limitation relating to the compensation claims against third parties).

4.2 Dimensions IFC 10



4.3 Installation

NOTICE

All installation and connection work may be carried out by qualified and approved specialist staff only ! The legal regulations as well as adjustment instructions of the plant operator have to be observed !

The IFC 10 should be mounted close to the flame with straight alignment. The compact flame detector should be mounted with the diopter. The diopter guaranties a quick mounting and demounting of the compact flame controller. A diameter of 1" is recommended for viewing tube that is cut down on the port side of the rear sight to ½". The sight pipe must be adequately dimensioned.

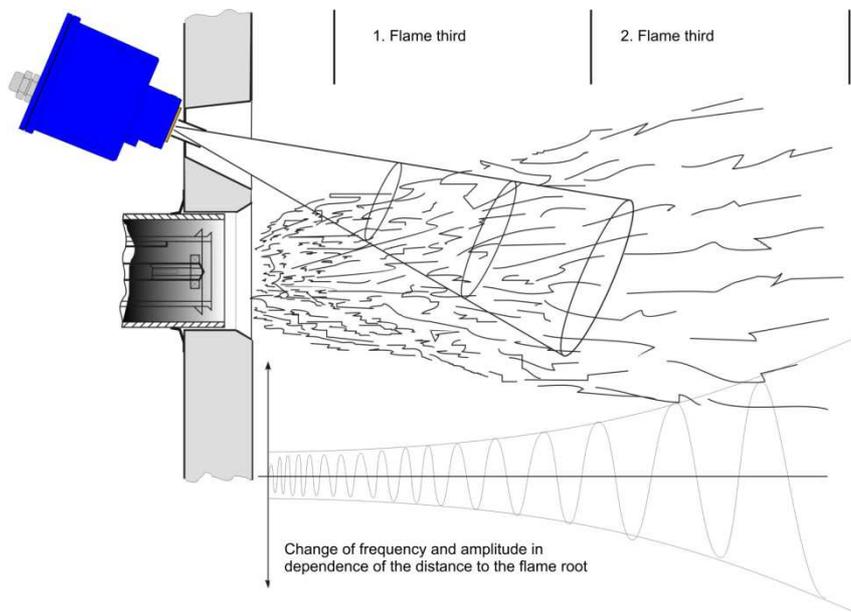
The alignment is to concentrate on the primary zone of the flame (flame root). The distance from the flame should be less than 2 m. Upon completion of the assembly work the screws of the rear sight to the flame menwächters are to be tightened down. At high temperature on the sight glass, which could heat the UV tube to about 60 ° C, an air connection is to be provided. To avoid interference, the direct view is to avoid a spark.

The maximum cable length of the cable is to be noted (see "Technical data). The connecting cable is to run separately from the high-energy ignition and power lines over long distances and not parallel to transfer it to.

⚠ DANGER

For safety reasons and technical regulations a controlled burner shut down of at least once per 24 hours must be guaranteed. Check according to EN 298:2012-11 need to check the UV tube to be used in the burner control to the controlled shutdown on the presence of a flame signal back.

4.3.1 Alignment of IFC 10



4.3.2 Usage of glasses and lenses

Depending on the distance and view angle to the flame, the diopter lens to be used when needed. If pressure prevailing in the combustion chamber, a diopter with quartz glass is recommended.

4.3.3 Purge air connection

If the sensor temperature may rise due to high combustion chamber temperatures above 60 ° C, a purge air connection in order to limit the temperature sensor to provide a maximum of 60 ° C is essential. The dimensioning of the scavenging air is dependent on the parameters of the furnace back pressure, and the pending purge air pressure and temperatures. Purge air connections are available as the diameters ¼" and ½" optionally. The air connection is combined with the diopter. Depending on the application again lenses and glasses are available. This eliminates the normal diopter.

4.4 Connection

4.4.1 Electrical connection

⚠ DANGER

Danger to life caused by electrical current !

The safety instructions and local safety regulations have to be observed during connection !

For connection data, please refer to the chapter titled "Technical data" as well as to the following terminal diagram.

Ensure that the available supply voltage complies with the voltage indicated on the type plate.

Prior to connection, check the device and the connecting cables for visible damage.

4.4.2 Connection diagram IFC 10

Occupancy male and female plug terminal	PIN	Internal connection AC/DC	Cable number	Connection for ionization output / LDR
	1	L	1	L
	2	N*	2	N
	3	NC	-	-
	4	NC	3	-
	5		4	ION/LDR
	6	NC	-	-
	PE	PE	Green / yellow	PE

4.4.3 Connection to BMS

		Control unit	
Cable color	general	Dungs MPA 22 - connection number	More BMS on demand
grey	neutral	12 – 5 N	
black	signal	12 – 3 Ion	
brown	phase	6 – 17 L1	
green-yellow	protected earth	protected earth	

4.5 Storage

Do not unpack any packed compact flame detector IFC 10 and accessories.

The following conditions apply to storage:

- Store in a dry place. Maximum relative humidity 95 %. Non condensing.
In addition, it has to be assured that the floor in the storage area will remain dry throughout the storage period.
- Protect from direct sunlight. Storage temperature:
-20 degrees to +50 degrees C (-4 degrees to 120 degrees F).
- Store in a dustfree location.
- Avoid mechanical vibrations and damage.

5 Description

5.1 Functional description IFC 10

The IFC 10 is a compact UV flame detector, which is specially designed for severe conditions often experienced in industrial applications for single flame combustion. The IFC 10 can be connected directly to the ionisation or LDR input of the control box. The UV sensor ensures that the flame detector does not react to background radiation from hot refractory or from any other infrared light source.

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5.2 Optionally function blocks for IFC 10

5.2.1 Relay module 1 for flame detectors RMF 1

The compact flame detector IFC 10 is a low power signal output equipped to simulate ionization or LDR signal. If a relay switch contact is required, the use of RMF 1 is recommended. The RMF 1 has an electrically isolated changeover contact with a maximum switching voltage of 250 V AC, a maximum switching current of 1 A and a maximum rating of 250 VA. More information can be found in BA RMF1 EN in its current version.

6 Operation of the flame detector

6.1 Test of the flame detector

To ensure the proper operation, the flame detector has to be tested several times by starting and stopping the burner. As long as there is no flame in all cases the flame relays has to be switched off solid. The test should be repeated for different operation situations (see also data-sheet). This is an essential condition for a safe and proper operation.

6.2 Operating indicator LED

Via the built-in LED the flame detector is indicating the following operating conditions:

LED	Meaning
off	IFC 10 is without connection or there is no detected flame
Blinking	Flame is detected The blinking of the LED represents the flame signal intensity Increasing blinking = higher intensity
on	The flame is detected with highest intensity

7 Maintenance and servicing

7.1 Cleaning

For cleaning, use a moist cloth to wipe the housing from the outside only. For maintenance of the sight glass, please use a clean and lint free cloth. Do not use any kind of cleaning sprays or liquids.

NOTICE

Do not scratch the glass !

7.2 Maintenance interval

There is a maintenance interval of less than 10000 hours of operation are observed. If the flame detector operated at temperatures $> 50^{\circ} \text{C}$, the maintenance interval is shortened considerably.

7.3 Safety check

A safety check of flame monitoring must be carried out during every commissioning and maintenance of the furnace because the UV tube subjects a natural aging and the end of its life causes problems. Here the following steps should be checked:

- The attempt to start the burner flame detector is darken -> after the end of the safety time into lock indicate a fault!
- The attempt to start the burner's flame detector with an external UV radiation, eg lighter or gas flame (ambient lighting is not sufficient) to illuminate - must go into lock during the pre-ventilation mode!
- The operation of the burner flame detector is darken -> depending on type of control boxrunng must either by executing a restart attempt at the end of the safety time or immediately after darkening the burner indicate a fault!

7.4 Behavior in case of malfunction

In case of malfunctioning of the flame sensor must be replaced, and send back to the manufacturer for check. Precaution after crossing the tube service life of 10,000 h should the UV tube be replaced by the manufacturer or by authorized personnel. IFC 10 is a safety component and may not be opened!

8 Troubleshooting

Error description	Cause	Remedy
No flame signal	I)connecting error or no active power	Please check the plugs an the conne- tions of the burner controller box
	II) Glass dirty	Power off the IFC and take it out of the flange. Now clean the glass carefully with a clean and fuzz-free cloth
	III) IFC 10 malfunction	Exchange IFC
	IV)Tube faulty	Exchange tube
Ambient light interference	I) Tube faulty	Exchange tube
	II) View to sparks	Change view

9 Order data

The compact flame detector IFC 10 is available from BST Solutions GmbH under the following order data:

Item	Version	Order No.:
Flame detector IFC 10 / 230 plug version	230 V AC	611181031000
Flame detector IFC 10 / 120 plug version	120 V AC	611281031000

10 Accessories

Following accessories are offered by BST Solutions :

Artikel	Ausführung	Artikelnummer
UV-tube kit for IFC		5010-0050-12
Diopeter ½" with nut and gasket		114030110000
Diopeter ½" with UV-quartz glass plate, nut and gasket		114030112000
Diopeter ½" with UV-quartz glass lense, nut and gasket		114030122000
Diopeter 1" with purge air connector ½", nut and gasket		46530100010
Diopeter 1" with purge air connector ½", UV-quartz glass plate, nut and gasket		46530112010
Diopeter 1" with purge air connector ½", UV-quartz glass lense, nut and gasket		46530122010
Diopeter 1" with purge air connector ¼", nut and gasket		46530100020
Diopeter 1" with purge air connector ¼", UV-quartz glass plate, nut and gasket		46530112020
Diopeter 1" with purge air connector ¼", UV-quartz glass lense, nut and gasket		46530122020
Relay module for flame detectors RMF 230V		640480002000
Relay module for flame detectors RMF-R 230V	with additional resistor output (20 kΩ)	640480002001

Relay module for flame detectors RMF 120V		640480002100
Relay module for flame detectors RMF-R 120V	with additional resistor output (20 kΩ)	640480002101
Connection cable with female right-angled plug, length 1.8 m		561313041800
Connection cable with female right-angled plug, length 3.0 m		561313043000
female right-angled plug		165303041000