

# COMPACT FLAME CONTROLLER

## CFC 100

### TECHNICAL DESCRIPTION

EDITION: TB CFC100 EN REV. 1 2012-03-07

**IMPORTANT:** Please note, that all mounting and wiring as well as all changing or adjustment at the flame monitoring and evaluation equipment should only be carried out by fully trained and authorized personnel.  
BFI Automation is pleased to support you if you do not have any experience with the equipment. Our service personnel are carrying out world wide installations, supervision and commissioning and is available upon request.  
For the stage of planning you can ask our sales and project engineers for any support you may need.  
BFI Automation is providing any kind of training for your engineers.

PLEASE READ THIS LEAFLET CREFULLY AS IT CONTAINS NECESSARY INFORMATION FOR THE USE OF THIS EQUIPMENT. FOR MORE DETAILED INFORMATION PLEASE REFER TO THE OPERATING AND MAINTENANCE MANUAL.

# Compact Flame Controller CFC 100 UV

- Flame scanner with integrated flame controller
- tested by German TÜV
- For intermittent, continuous and 72hours operation
- Recommended for gas and oil flames, also in combination
- Recommended for Duct burners and heat recovery boilers
- Dual channel design
- Adjustable sensitivity settings via hand terminal HT100
- Analog Output 4 – 20 mA for flame intensity
- Flame analysis via hand terminal HT100
- Optical status indication
- No special cables required
- Type of protection IP 65



**WARNING**

**WARNING: IMPROPER INSTALLATION OF THESE PRODUCTS  
MAY BE HAZARDOUS TO LIFE AND PROPERTY**

## Function

The Compact Flame Controller CFC100 is equipped with a high temperature resistant UV-tube. The preamplifier generates an impulse signal which is proportional to the detected UV radiation. The subsequently thresholds adjustment is used for the discrimination and adaptation to the respective burner condition.

The further functional groups integrate the signal processing for the dynamic monitoring channel, which, by means of a dark-phase monitoring, continuously checks the failure-safety of the unit.

A component defect leads to an immediate switch-off of the flame-relay, which is available as a potential-free changeover contact.

The switching state „flame on“ is displayed by a yellow LED on the rear side of the unit, just as the intensity of flame, which is displayed by a flashing green LED. A flame intensity output 4 to 20 mA can be used for external displays.

The safety switch-off time is fixed to 1 second.

## Adjustment of Analog output 4 to 20mA

Adjustments like current start value and signal window can be done with the hand terminal HT100.

## Mounting

The correct positioning of the sight tube to the flame with less vibration is an important requirement for an optimised flame control. The assembly must ensure the primary combustion zone is inside the visible angle of the flame monitoring device for all loads.

Length and diameter of the sight tube are directly related to the available flame radiation, because the visibility angle of the device is defined. The maximum length 'L' of a sight tube is related to the tube's diameter 'd'.

d	1"	1,5"	2"
L	0,5m	0,8m	1,1m

The tube should be as short as possible. A diameter of 2 inch is recommended.

The right adjustment is shown in the following drawing. The optical adjustment device BFI 235 is available ex stock (part-no.: P 106)

The compact flame controller is delivered with a flange for quick assembly. The device is equipped with a supply for purge air which prevents the lens of contamination with dust and a subsequent damage.

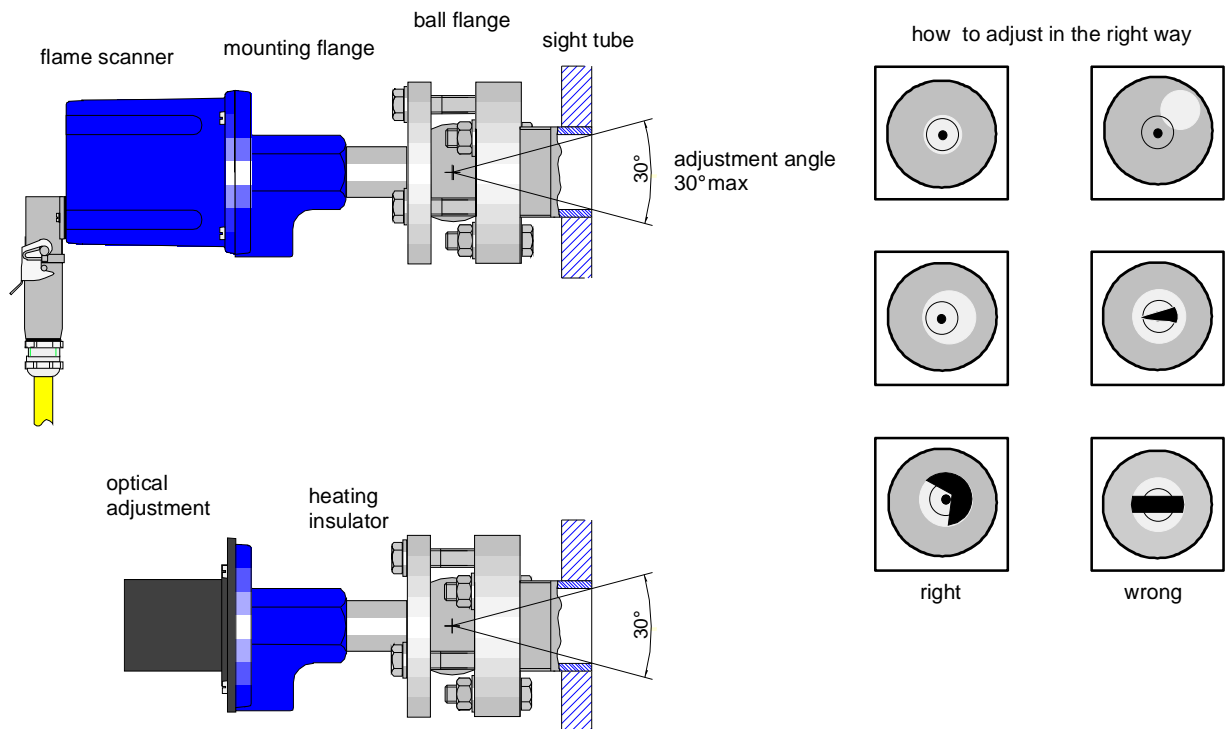
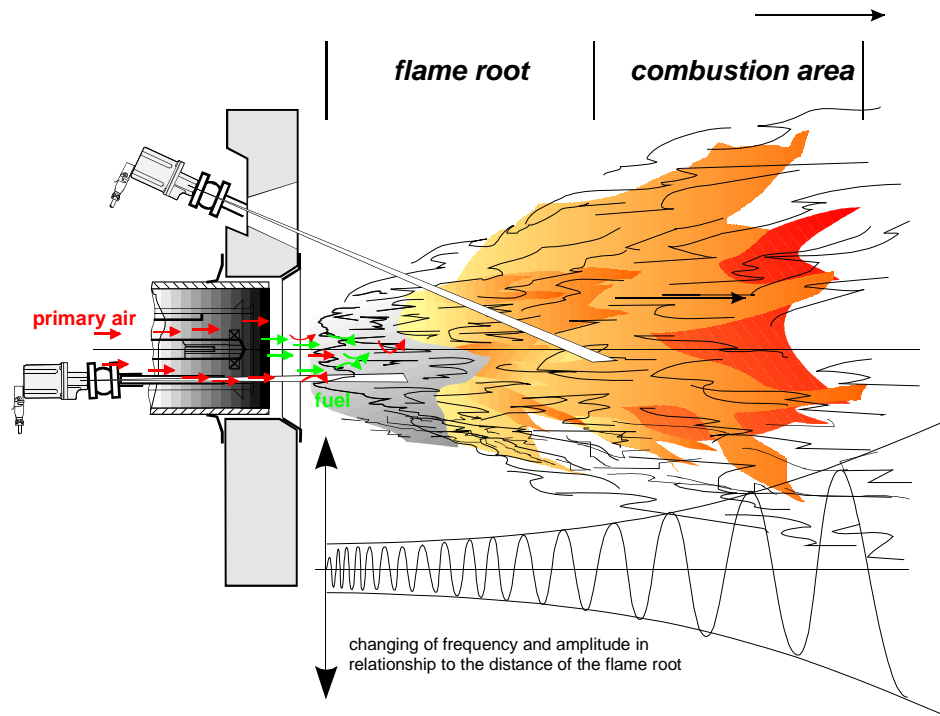
The optimised assembly kit consists of heating insulator, blocking valve and ball flange.

These mechanical devices are also available on demand.

## Maintenance

In case of a natural ageing depending UV tube degradation the UV tube unit can be replaced. This replacement must be done by following our "UV-Tube Replacement Instructions".

UV-Tube units and replacement instructions are available at BFI. Alternatively the replacement can be done at BFI factory in Germany.



  
**CAUTION**

**CAUTION:** All alignment and adjustment procedures should be used whenever parts are replaced, when the scanner has been moved, when the flame shape has altered (additional fuels, new burners, burner/register modifications), as well as on new installations.

## Installation

The pin configuration of the plug connector is shown in the terminal connection diagram.

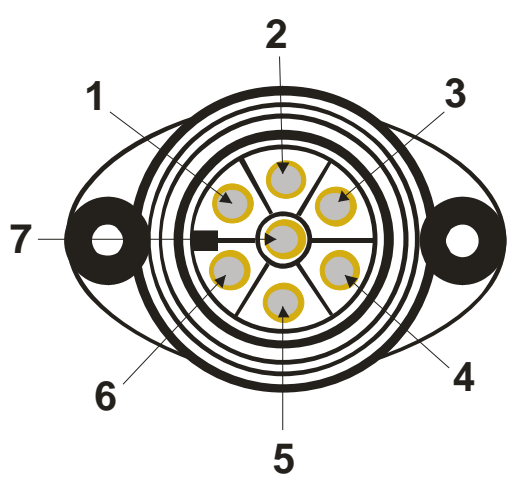

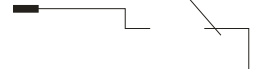
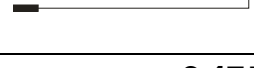
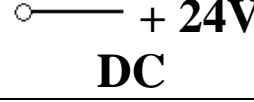
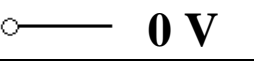
The flame intensity output has no potential separation from the power supply; it is related to the power supply ground. If there will be any problem in this case an isolation amplifier can be delivered on demand.

A maximum shunt resistance of 500  $\Omega$  should not be exceeded.

The device is immediately ready for operation after switching on the power supply.

**!!Do not disconnect the flame controller while energized!!**

## Connection Diagram

Plug configuration	PI N	Internal connection	Colours of BFI special cable KW6
	1		white
	2		brown
	3		pink
	4		green
	5		yellow
	6	Current output 4-20 mA	grey
	7	switching channel 2 with external 24 V DC	red

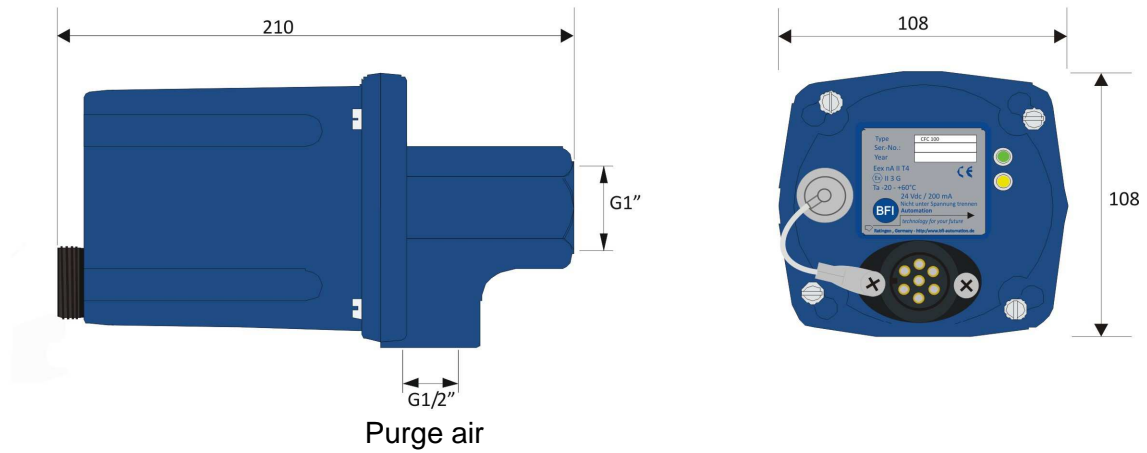
### Connection of compact flame controller

Internal			External		
contact	colour	function	Bruner control	mA-Anzeige	Power supply
1	white	Flame relay root	x		
2	brown	Flame relay „Flame ON“	x		
3	pink	Flame relay „Flame OFF“	x		
4	green	Power supply +24V DC			+24V DC/200mA
5	yellow	Power supply GND		-	GND
6	grey	Analog output + (4 bis 20mA)		+	
7	red	Switching channel 2 (+24V DC ext.)	(x)		



**CAUTION:** On all applications the compact flame controller must be tested by starting and stopping the burner several times to ensure proper operation. (e.g.: The flame relay must reliably drop out for all flame conditions.) The testing should be done with various adjacent burners ON and OFF and at various load levels. This is a requirement for proper operation.

## Standard Housing




Standard housing suitable for ATEX Zone II

## Accessories

- Hand Terminal HT100
- Power supply 230/115V AC
- Swivel mount 1 inch and 2 inch flange disk
- Heating insulator 1 inch
- 3-way ball cock 1inch
- Pressure screw joint 5bar size 1 inch
- Optical adjusting device

## Technical Data

Spectral sensitivity	185 to 260 nm
Angle of view	chooseable 2.7 or 30 degrees
Power Supply input	24 V DC
Current consumption	approx. 200 mA
Ambient temperature	-20...+60 degrees C
Current output	4-20 mA (Ra < 500 Ohm) Current window adjustable via hand terminal HT100
Channel switchover	remotely via 24 V DC
Flame relay	1 Switch-over-contact, potential free VDE 0110, Class A max. 60 V switching voltage max. 0.5 A switching current (fused 1A) max. 30 W switching power
Switch thresholds	adjustable via hand terminal HT100
Switch OFF times	fixed to 1 s
Sight tube connection	1" internal thread ISO 228
Purge air connection	1/2" internal thread ISO 228
Purge air quantity	10 Nm <sup>3</sup> /h
Electrical connection	Amphenol-Tuchel-Connector C16-1
Housing dimensions	
Standard incl. flange	210 x 108 mm (length x diameter)
Type of Protection	Standard Housing IP 65, similar to NEMA 4 ATEX Zone 2
	
Weight	
Standard	1.5 kg

Electronic self-monitoring for the fail-safe function control of the device according VDE 0116, EN 230, EN 298, and TRD 411 to 414. CE-conform

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