



Flamonitec[®]

BFI AUTOMATION

Technical Information

Flame Detector KLC 2002

for all kind of flames with intermittent
burner operations



1 | Short Description

The flame detector KLC 2002 is a compact flame detector, which is special designed for blue burning combustion systems. The patented evaluation of the flame signal is based on the flicker frequencies of the flame. A microprocessor enables the evaluation and conversion of the flame signal into digital information to provide an output signal for burner control boxes. All flames will be detected by an automatic sensitivity control. Adjustments during commissioning and maintenance are not necessary!

Due to international standards the flame detector KLC 2002 will only detect signals caused by the flicker of the flame and no signal from continuous radiation and all kinds of constant frequency. These are signals caused by disturbing light sources, e.g. fluorescent tubes or background radiation from hot refractories will be cut off, so that unwanted influences are not possible.

The flame detector is equipped with an optical interface to get online information about monitoring of flame signal and serial number.

This technical information provides an overview of the technical data of the KLC 2002 and its application as well as ordering data and accessories. Only the original operating instructions for the KLC 2002 in the currently valid version are binding.

2 | Safety Instruction

The KLC 2002 is a safety component, so it is absolutely forbidden to open, to manipulate or to misuse this flame detector! Replace the flame detector in case of any damage, fall, shock, moisture, wetness or influences, which can destroy the flame detector, even though it is not recognizable! Repair works are strictly prohibited!

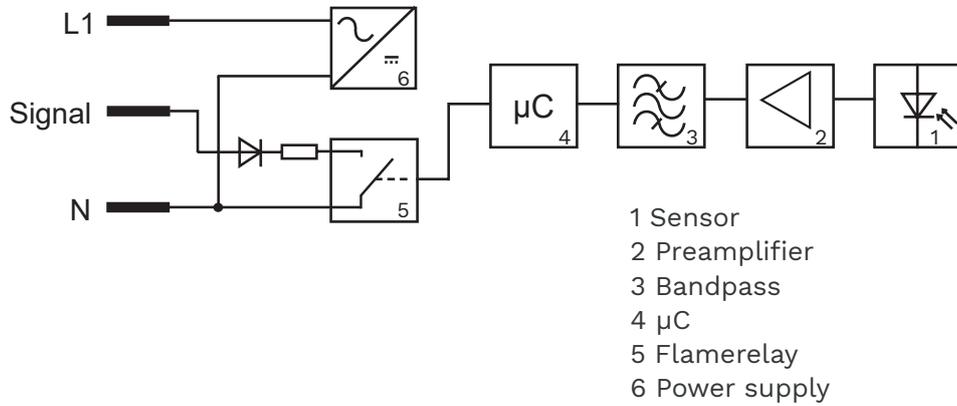
Before working at the flame detector switch off the power supply. Before first commissioning or replacement of the device check the wiring!

3 | Technical Data

Input	230/240 V AC (-15/+10 %) 115 V AC (optional) Frequency 50 – 60 Hz 24 V AC/DC (optional)
Consumption	max. 6 mA
Output	Switch-On Delay after energizing from safety relevant self check to final operating condition typical 2 s Switch-On delay after Flame On typical 0.5 s Switch-Off time after Flame Off < 0.6 s max. switching current 15 mA max. switching power 0.3 W max. switching voltage 280 V AC / 400 V DC
Optical Features	Spectral range 380 – 1150 nm Peak wavelength 920 nm Flicker frequencies 15 – 400 Hz
Switch on frequency	52 Hz for oil applications or 25 Hz for gas applications dominant flicker frequency
Switch off frequency	15 Hz dominant flicker frequency Acceptable loss of flame signal ca. 280 ms Disturbing frequency cut off > 35 Hz (optionally)
Operating Temperature	- 20 °C to + 60 °C
Humidity	max. 95 %, no condensation permitted Optional for higher temperatures
Operating position	any position
Kind of protection	IP 21
Protection Class	II
Weight	0.029 kg
Max. length of connection cable	The size of the cable is determined by the cable / conduit length while also considering the bias-reducing potential allowable which is normally indicated in the data sheet of the burner control or system. The signal strength has to be maintained at the correct level.
Applied standards	EN298: 2012-11 EU / 2016 / 426
Certification	CE0085BP0001*

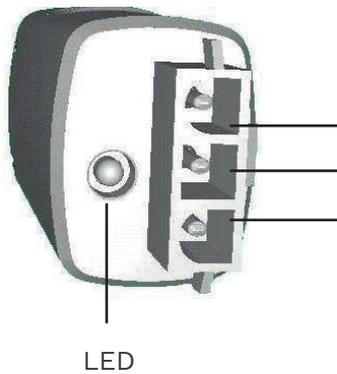
*only versions with the function „Disturbing frequency cut-off,, (DFC)

4 | Block diagram



5 | Connector Diagram KLC 2002

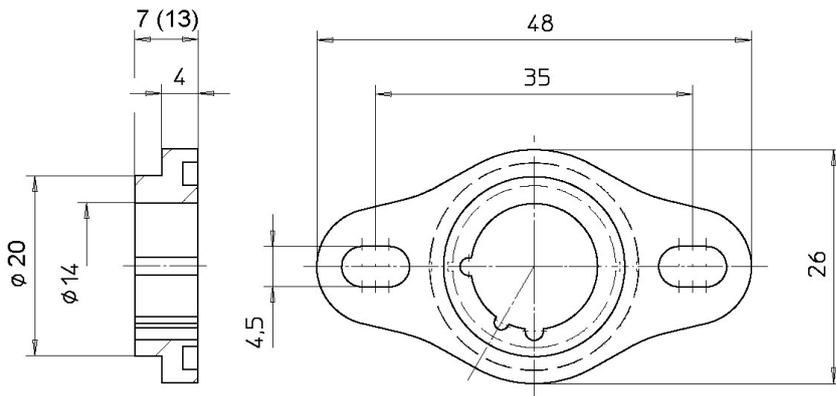
Control boxes Dungs / Lamtec



Wirecolour	Control boxes			
	MPA 22	BT300	DKO 9.. DKW 9.. DMO 9..	TMO 720-4
	Terminal	Terminal	Terminal	Terminal
Blue	12 – 5 N	LDR+	2	2
Black	12 – 3 Ion	LDR-	1	1
Brown	6 – 17 L1	L	9	9

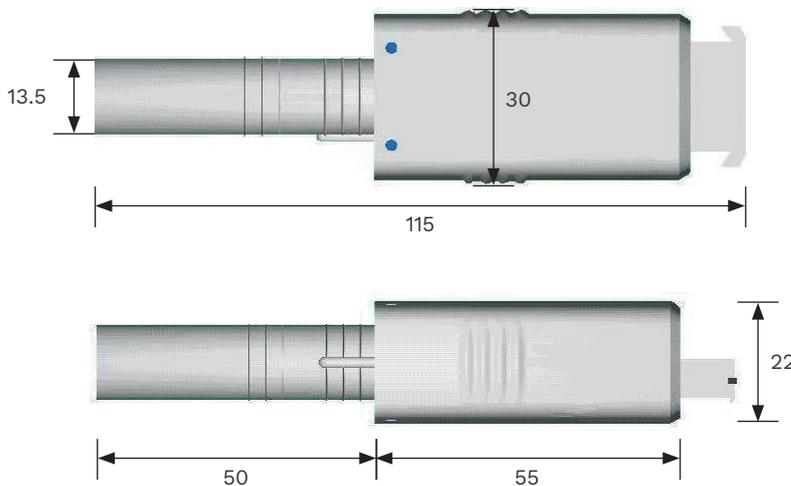
6 | Mounting flange KLC

The mounting flange KLC serves for to the admission, attachment and adjustment of the flame detector. Two overall heights with 7 mm and 13 mm are available. By means of an O-ring, the mounting flange KLC can be simply sealed to the burner housing.



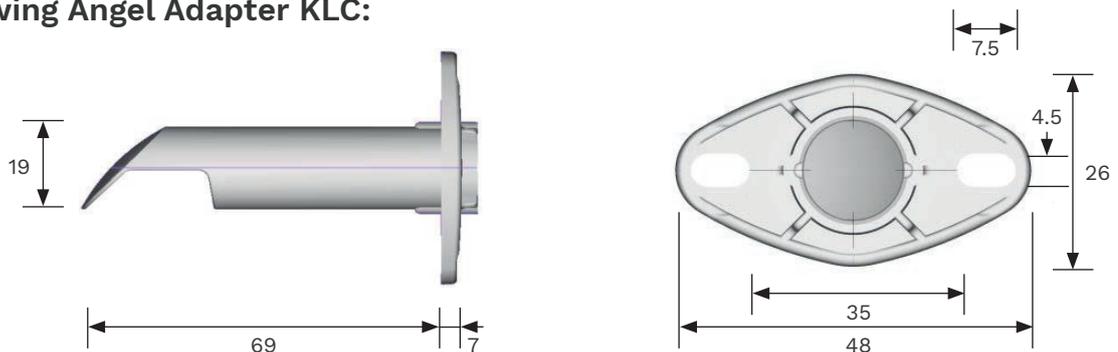
All dimensions in mm

7 | Dimensions



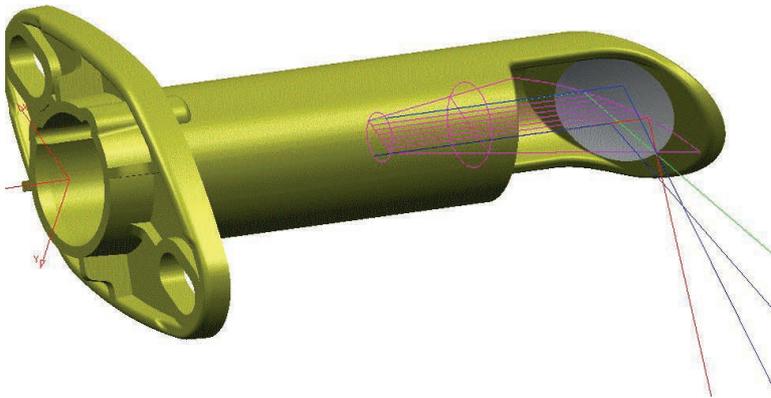
All dimensions in mm

Viewing Angel Adapter KLC:



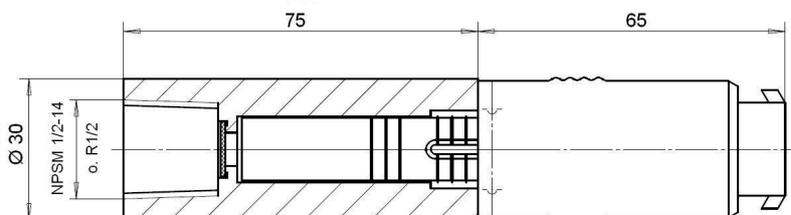
8 | Viewing Angel Adapter KLC for radial adjustment

With the optionally available viewing angle adapter by means of an optimally formed out reflector surface the radial adjustment of the KLC 2002 is accomplished to the flame axle. The angle adapter replaces the mounting flange KLC. Separate type of flame detector is not necessary therefore. With maintenance work the reflector surface is to be controlled on possible contamination and if necessary it is to clean with a clean, soft and lint free cloth. The angel adapter is offered in two different styles. The standard mirror is prone to scratches and the stainless steel mirror which is much more robust.



9 | Adapter ADP

The adapter ADP makes it possible to mount the flame detector series KLC with axial adjustment directly to the combustion chamber. The integrated quartz glass prevents the withdraw of heat gases from the burner. In case of higher temperature at the surface the ADP is heat insulated up 180 °C.



All dimensions in mm

10 | Function Disturbing frequency cut off

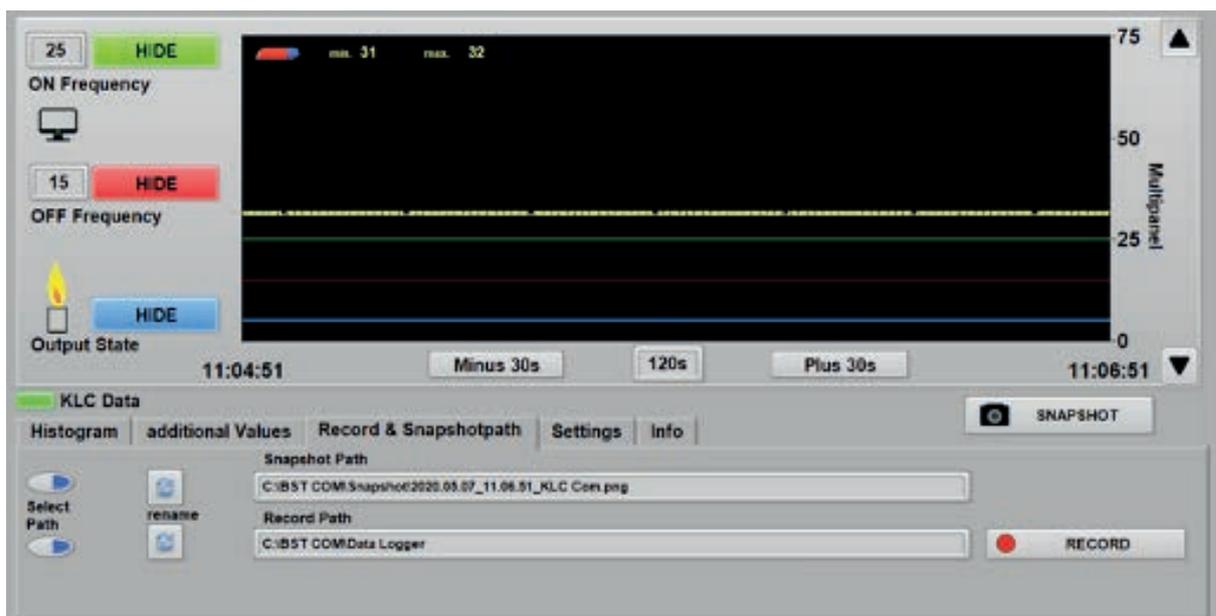
The KLC 2002 is optionally available with the function disturbing frequency cut off. With this option the KLC 2002 detects only real flames, which are characterized by unsteady changing flicker frequencies. Constant light and every constant frequency e.g. from fluorescent tube or other electrical lamp, are cut off and won't lead to a permanent flame detection. In this case the KLC 2002 will switch the output a first but after a period of about 5 s the KLC 2002 will switch the output off again. During revision it has to be kept in mind that this property is intended and no malfunction.

11 | Diagnostic with BST-com

With the read out unit KLC-com, consisting of optical adapter with cable, interface (USB) and software, the following information can be read from the KLC 2002:

- Impulses
- Serial Number
- Version / Edition
- present flicker frequency

For connection, place the optical adapter to the opening at the LED. Via the connection cable and the interface the a.m. information will be transferred to a Laptop or PC by using the special software. Further information is available in the manual KLC com.



12 | Overview of articles

Article	Version	Part-No.
Flame detector KLC 2002/ 230 V AC, 25/15Hz, DFC	Axial, with disturbing frequency cut off, for gas applications	6011-1233-01
Flame detector KLC 2002/ 230 V AC, 52/15Hz, DFC	Axial, with disturbing frequency cut off, for oil applications	6011-1236-12
Flame detector KLC 2002/ 24 V DC, 25/15Hz, DFC	Axial, with disturbing frequency cut off, for gas applications	6011-1213-07
Flame detector KLC 2002/ 24 V DC, 52/15Hz, DFC	Axial, with disturbing frequency cut off, for oil applications	6011-1216-00
Mounting flange KLC	overall height 7 mm	1550-4220-07
Mounting flange KLC	overall height 13 mm	1550-4220-13
Angle adapter KLC, standard mirror	Accessories for radial mounting applications	1550-4225-10
Angle adapter KLC, stainless steel mirror	Accessories for radial mounting applications	1550-4225-20
ADP 10 – UV, heat insulated, R ½"	Adapter for direct mounting ap- plications, heat insulating	6580-2030-00
Connecting cable KLC, 600 mm	length 600 mm	6060-2220-00
Connecting cable KLC, 1000 mm	length 1000 mm	6060-2220-10
Connecting cable KLC, 2000 mm	length 2000 mm	6060-2220-20
Connecting cable KLC	Length on request	-
Read out unit KLC-Com	optical adapter, USB-interface, BST-Com Software via download	6040-4830-00
Flame simulation device TG 10	optical adapter, USB-interface, Software	6030-0020-01
RMF 1 / 230	Relay modul for 230 V AC	6040-0001-00
RMF 1 / 24	Relay modul for 24 V DC	6040-0001-20



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Disposal information

The flame detector is equipped with electrical and electronic components and must be disposed separate from household waste. Follow the local and actual regulations for waste disposal.



All data are without guarantee and refer to the product group. Product specific information is contained in the operating instructions. We reserve the right to make technical changes. | © BFI Automation Mindermann GmbH 2023/34

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