



System Overview

F300K Compact Flame Scanner



Sensors and systems for combustion engineering

www.lamtec.de

Approvals.



CE 0085

Gas Appliances Directive 2009/142/EC, CE0085

CE 0036

Pressure Equipment Directive 2014/68/EU, CE0036

SIL-3

SIL 3 Confirmation, DIN EN 61508 Parts 1-7



Class I, Division 2, Group A, B, C, D,
Hazardous Locations



EAC

EAC Ex



EN 60079, Ex Device Group II Device Category 3,
IBExU12ATEX
Ex nA nC ic IIC T5 (T6) Gc X (Zone 2)

The new generation of flame monitoring.

An innovative and versatile flame scanner for a wide range of applications that can address virtually any control task. This is the next generation of flame monitoring.

The new F300K compact flame scanner from LAMTEC now offers operators of industrial furnaces and power stations a high-end product that meets the high demands of complex furnaces safely, reliably and effectively.



The LAMTEC F300K flame scanner in operation.

Advanced Flame Rating (EFA)

- 5 Flame intensities
- 3 RMS values of the sensor signal (sum/UV/IR)
- Output of all signals via gateway
- Detection of unstable conditions before loss of flame (e.g. high recirculation rate)



Advantages:

- Microprocessor flame monitoring in a compact design
- Integrated flame sensor, amplifier and flame relay
- Flame self-learning function ON/OFF
- Digital flame frequency evaluation in 14 selectable ranges (5 to 210 Hz)
- Three selectable operating modes
- Remote software with diagnostics function
- Standard version certified for Ex Zone II
- SIL 3
- -40 °C ... + 85 °C (higher temperatures possible, with the cooling air housing)
- IP67

Applications:

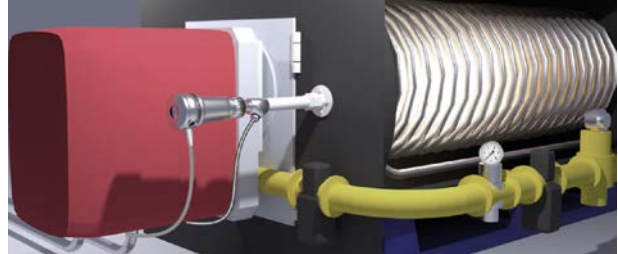
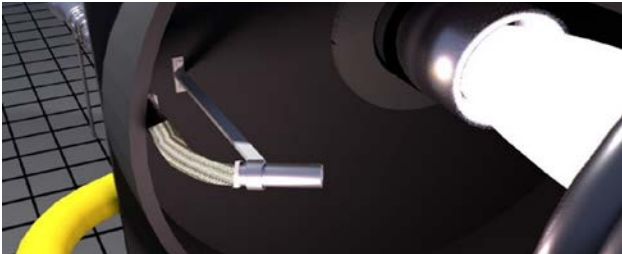
- Combustion systems with and without selection tasks
- Single and multi-fuel burners
- Combustion chamber monitoring
- Power plants, heating plants, process furnaces, waste combustion plants, etc.
- Combustion plants with restricted view of the flame

Fuel:

- Gas
- Oil
- Coal
- Biomass
- Process waste gases
- Dust of all kinds
- Special fuels
- Chemical residues

F300K-FO with Fibre Optic

- For use on boiler systems with limited view of the flame
- Use at high temperatures in the normal growing range of a flame monitor and up to 350°C



Summary:

- 3 Operating modes, can be externally preselected, switchable during operation
- 14 Graduated frequency ranges
- Available as single or double sensor (IR/UV)
- Can be operated via four buttons
- Flame ON/OFF LED, fault, flame intensity, operating modes
- Can be completely operated without opening the device, which means that the same degree of protection IP67 is retained, even during commissioning
- Menu-guided configuration and commissioning with Flame ON/OFF self-learning function
- Alignment assistance by means of a logical graphical display of flame data
- Switching threshold can be individually adjusted in the entire signal range, 13 pre-selectable amplification levels
- Easy operation via graphic user interface with status display (optional)
- Field bus interfaces:
 - MODBUS TCP (client/server)
 - MODBUS RTU (master/slave)
 - Ethernet (Frame)
 - PROFIBUS (Slave)
 - CANopen
- Indepth analysis via F300K remote software (optional)
 - Read, write and store parameter records from multiple F300K devices via CAN-Bus
 - Analysis via the simulation of different parameterisations
- Periodical signals, including the network frequency and their harmonic components are identified. No adjustment of country-specific network frequencies needed
- Analogue output 0/4 ... 20 mA, configurable for flame intensity or RMS value of the sensor signal
- Parameter setting capability of switching threshold, frequency range, etc. based on operating mode
- Download, back-up and upload of parameter records in the user interface
- Device selection via menu control
- Operation and commissioning
- 2 operating levels for the commissioning: Standard and expert, password-protected
- Simulation of switching behaviour, "What would happen if?", to assist in setting the Flame ON/OFF parameters with optional user interface or PC remote software
- Extended flame rating (optional)
Additional output of:
 - Up to 5 flame intensities
 - Up to 3 RMS values of the sensor signal

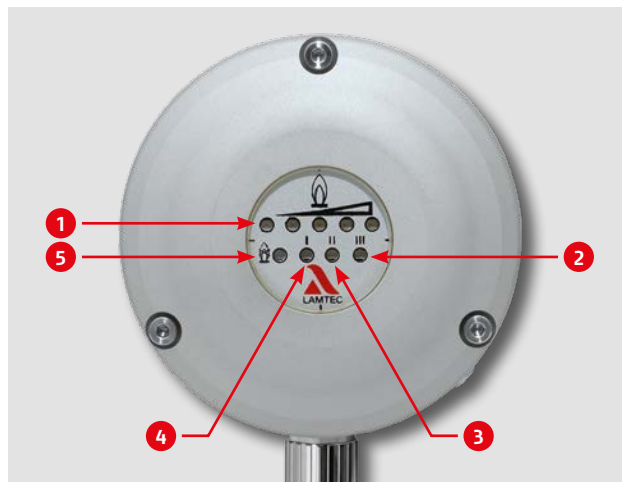
Product description.

The F300K is available in two versions.

F300K with LED display.



F300K with LED display.



F300K display unit with LED display.

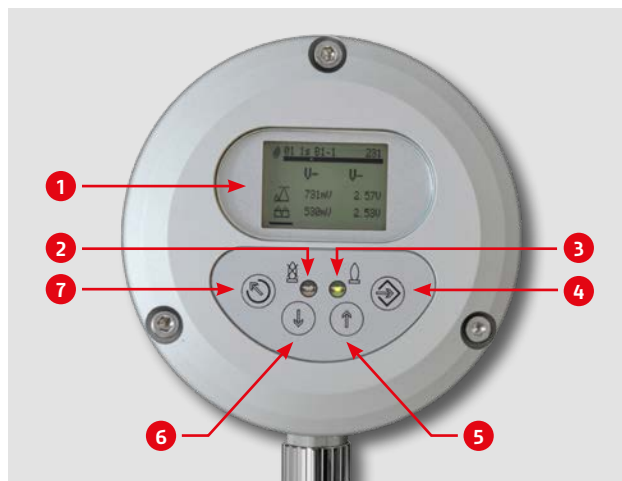
There are two versions of the F300K; LED display and control unit display. The LED display version offers basic operational visualisation including flame status, operating mode and intensity. The control unit display allows full configuration and parameter setting. The functionality of both units is identical.

1 LED in the display bar indicates the intensity of the flame as a dotted display: chain of 2 x yellow and 3 x green; middle LED flashing = warning. 2 LED green = operating mode 3. 3 LED green = operating mode 2. 4 LED green = operating mode 1. 5 LED red = flame OFF/ready for operation - flashes in the event of a fault.

F300K with user interface (UI).



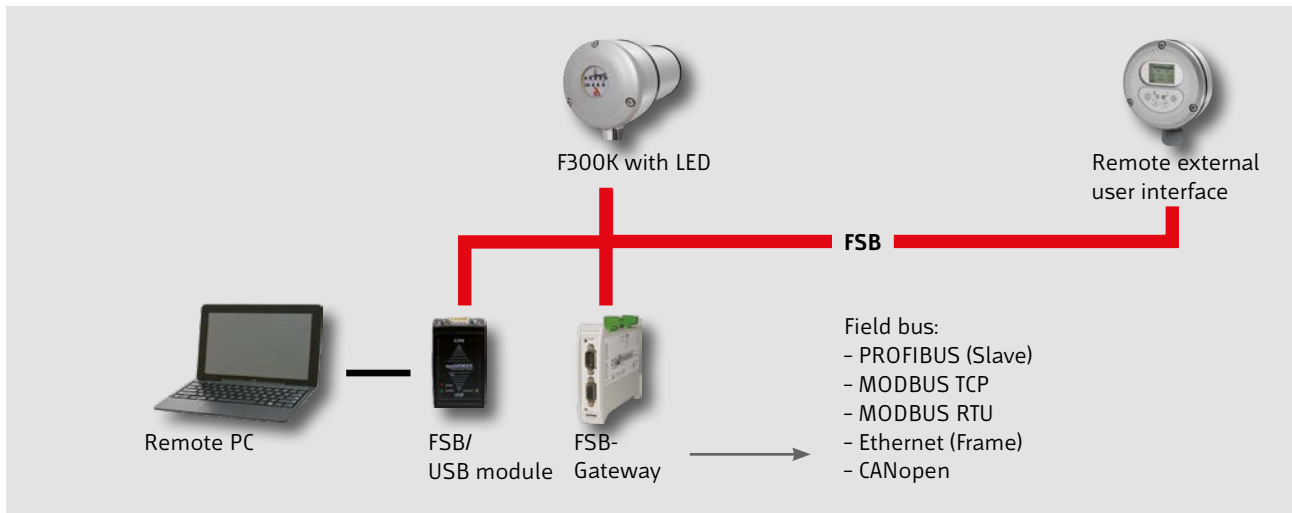
F300K with UI.



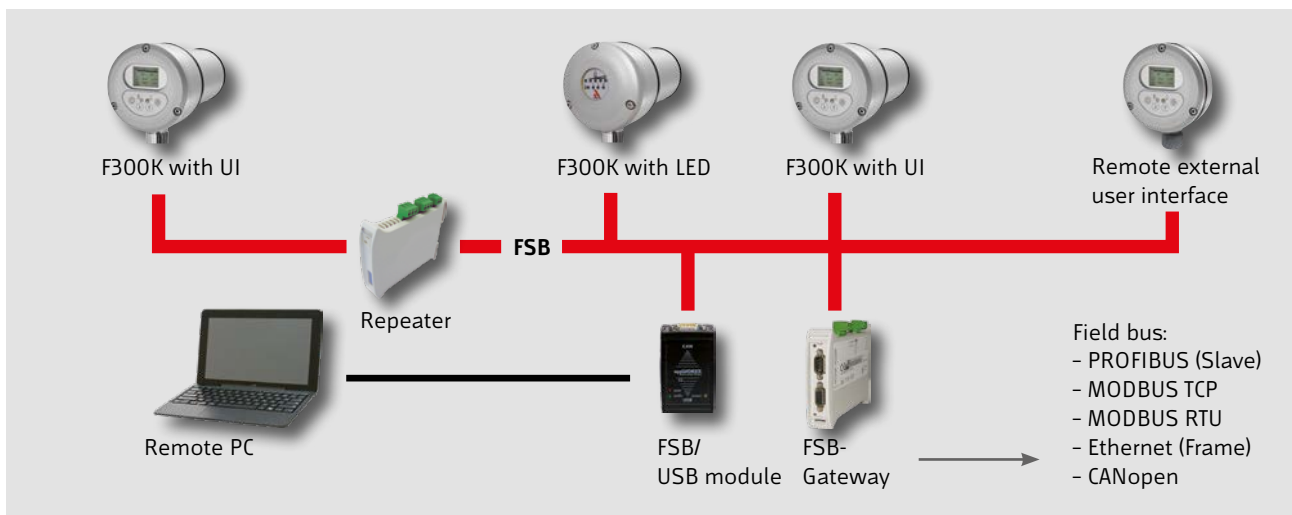
F300K operating and display unit with UI.

Integrated graphic user interface for menu-driven configuration, commissioning and operating simulation of the switch response with "What would happen if?". Data back-up/download and upload of the configuration and setting.

1 Display. 2 LED on and red = flame OFF/ready for operation - flashing red = fault. 3 LED on and green = flame ON, LED flashing green = fault. 4 ENTER key. 5 UP key. 6 DOWN key. 7 ESC/BACK key.



Example: Networking with an F300K.



Example: Networking of multiple F300Ks.

Selection criteria

The spectral sensitivity of the flame scanners determines their suitability for specific fuels.

Overview of suitable flame scanners:

The suitability of the device types may differ from that indicated in the table depending on particular circumstances.

Typ	Spectrum/nm	Approx. view angle	Preferred applications/fuels
F300K UV-4	215 ... 360	8°	<ul style="list-style-type: none"> ■ Oil ■ Gas ■ Dust ■ Special applications in combination with fibre optics ■ Special gases such as refinery gases, blast furnace gases and hydrogen
F300K UV-4.6	215 ... 360	8°	<ul style="list-style-type: none"> ■ Special applications in combination with fibre optics
F300K IR-2	850 ... 1200	20°	<ul style="list-style-type: none"> ■ Combustion space monitoring
F300K IR-3	1000 ... 1700	60°	<ul style="list-style-type: none"> ■ Oil, gas, wood, coal and dust-fired furnaces with a high level of flue-gas recirculation ■ Yellowish waste gases without UV radiation or with shielding of the UV spectrum by water vapour and dust
F300K IR-4	1000 ... 2200	60°	
F300K UVIR-1	215 ... 360 850 ... 1700	8° 8°	<p>UV:</p> <ul style="list-style-type: none"> ■ Oil, gas, special gases like refinery gases and furnace gases <p>IR:</p> <ul style="list-style-type: none"> ■ Oil, gas, wood, coal, dust furnaces with strong FGR ■ Waste gases with yellowish colour without UV radiation or with shielding of UV components using water vapour and dust ■ Special applications in combination with fibre optics

Accessories.

Power supplies FN30-00, FN30-10, FN30-20, FN30-30

The FN30 power supply is available in four different versions. Versions FN30-20 and FN30-30 are equipped with output/coupling relay and fulfil the requirements of EN298 and conform to SIL 2 in accordance with EN61508.

Alternatively, a standard power supply with an output voltage of 24 V that meets the protective separation requirements can be used.

Power supply FN30 is designed for top rail mounting, but is also available in an integrated housing.



FN30-00 for top rail mounting.

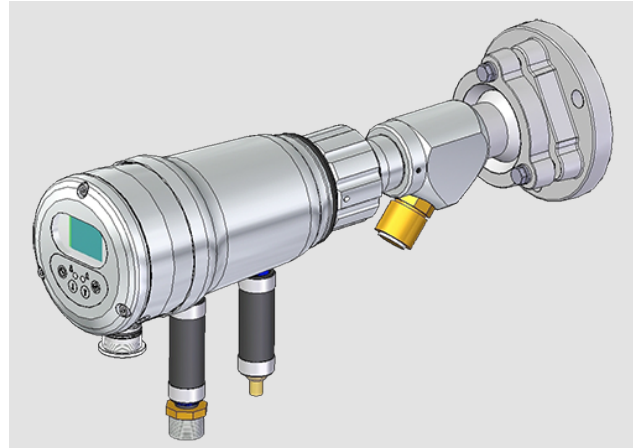
Connection cable

- Connecting cables are available in 3, 5 and 10 metre lengths.
- Standard LiYcY cable, temperature range of -40 ... +80 °C (inactive) silicone cable, temperature range -40 ... +150 °C
- For special ambient conditions, the silicone cable can also be supplied with a stainless steel metal protected tube
- IP67



Cooling air housing and adjustment bracket FK41

You will find a complete overview of the holders and cooling-air housings (also with extended air outlet) for LAMTEC flame scanners in the document „Flame Monitoring Systems and Accessories“ (DLT7660)“.



Cooling air housing and adjustment bracket

Flame-scanner testing device

You can use the FFP30 to test that your flame scanner is working properly. The testing device simulates a variable flame frequency. The testing device is screwed onto the flame scanner, and the IR or UV beam activated via a rocker switch. The F200K must be set to an adequate sensitivity to detect the flame simulation. It is designed to test all flame scanners from LAMTEC.

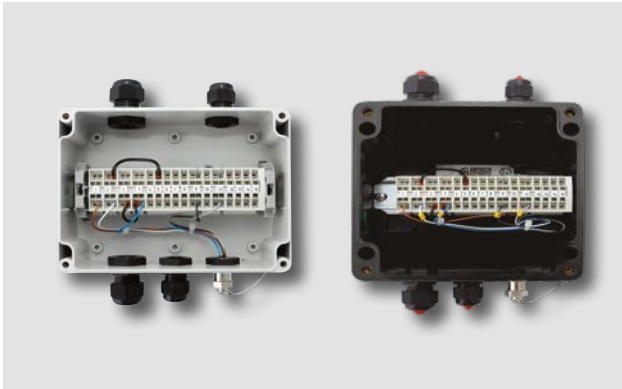


Flame-scanner testing device

FG30-00 and FG30-20 connection housings

LAMTEC offers two versions of the FG30 connection housing:

- FG30-00 with four cable glands and an M12 circular connector for FSB
- FG30-20 Ex II for use in explosion-hazard areas with four cable glands and an M12 circular connector for FSB Ex II 3G EX nA II T4 Gc X
- IP66



FG30-00 & FG30-20 Ex housing

Externes User Interface (UI) FB30

- Functions as for the integrated user interface
- A control unit can be coupled simultaneously with one or more F300K devices
- The control unit can be connected directly via the connection housing
- Power supply from the supply to the F300K (24 VDC)



UI FB30

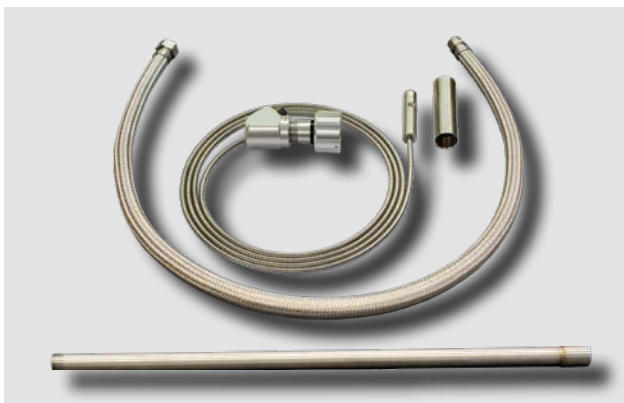
Fibre Optic

Available versions:

- Rigid Protective Housing - FOR
- Flexible Protective Housing - FOF

Available lengths:

- FOR 1.0 m to 10 m / 0.5 m graduation
- FOF 1.5 m to 10 m / 0.5 m graduation



Fiber Optik Systeme

FSB adapter

If there is no option for connecting the FSB, e.g. via a connection housing, the FSB adapter can be integrated between the F300K and connection cable.



FSB adapter

FSB gateway

- Via the FSB-Gateway an interface to the control technology can be implemented
- Data from one or from up to F300K devices can easily be sent via a control technology field bus



FSB gateway

FSB gateway is available for the following field buses:

- PROFIBUS (slave)
- MODBUS TCP (client/server)
- MODBUS RTU (master/slave)
- Ethernet (Frame)
- CANopen

Repeater

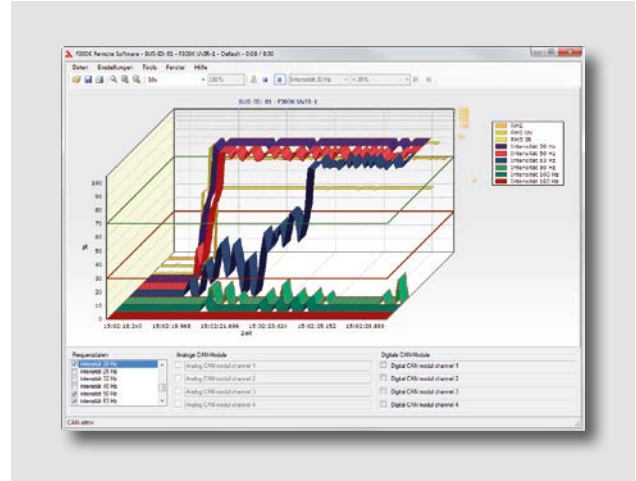
- One repeater is required for a total FSB line length of over 80 m
- By the use of multiple repeaters, up to 32 flame scanners with a line length of several 100 m can be coupled via a bus system.



Repeater

F300K Remote Software

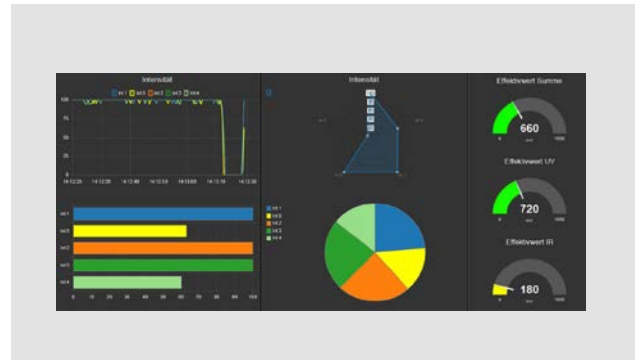
- Connection to the PC via FSB/USB module and adapter cables
- The F300K remote software permits the full parameter setting of an F300K. In addition, it also offers analysis, data backup and recording functions
- In addition to the F300K data, you can also connect up and record external, analogue and/or digital data by means of FSB modules. All of the data is synchronised



F300K Remote Software

Advanced Flame Rating Software + Module

- 5 Flame intensities
- 3 RMS values of the sensor signal (sum/UV/IR)
- Output of all signals via gateway
- Analog output of all signals
- RMS value output



Advanced Flame Rating Software and Module



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