System overview

Flame Monitoring Device F152

Sensors and systems for combustion engineering

LAMTEC

Approvals.

CE 0085
Gas Appliances Directive 2009/142/EC, CE0085

CE 0036
Pressure Equipment Directive 2014/68/EU, CE0036

SIL3
■ DIN EN 61508 Part 2

MH48669
Controls, Primary Safety Certified for Canada –
Component
■ UL 372

Flame Monitoring Device F152.

Flame monitoring solution for the cost-concious customer.

The F152 from LAMTEC is a standard SIL 3 category flame monitoring device that can be used in a number of different applications and for a diverse range of monitoring requirements. The digital flame frequency evaluation covers a range from 10 to 200 Hz. The F152 flame monitoring device is approved for continuous operation.

Design
The F152 flame monitoring device consists of a case containing an integrated electronic control system. The case for the F152 flame monitoring device has been designed for top hat rail assembly. The F152 flame monitoring device can also be combined with an additional external flame sensor from the range FFS07 or FFS08, which monitor the flame in the IR range or UV range respectively.

Field of application
The F152 flame monitoring device from LAMTEC provides operators of industrial combustion systems and power plants with a safety solution for monitoring burner flames without demanding flame discrimination requirements.

Properties
The F152 flame monitoring device has been designed for use as a two-channel system with electronic self-monitoring. It also features an integrated digital flame frequency evaluation function. The relevant monitoring parameters are displayed via LEDs. One of the key practical benefits of the F152 flame monitoring device is its standard measurement output for intensity in the range 0 … 20 mA. No modifications needed for country-specific mains frequencies as cut-out occurs on a sliding scale. The F152 flame monitoring device is available with a 230 VAC power supply as standard or with an optional 115 VAC supply on request.
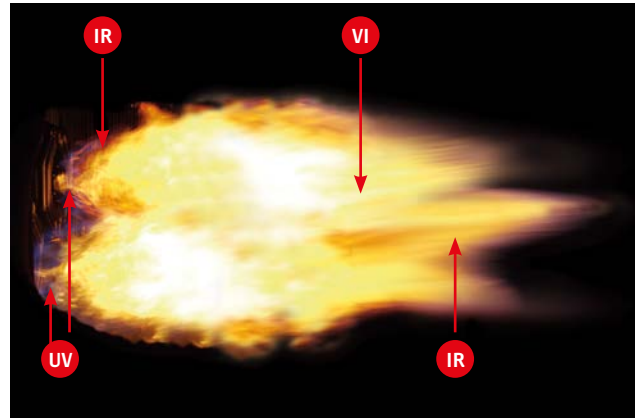
Spectrum of the flame.

IR Infra-red range   **UV** Ultra-violet range   **VI** Visual range

Specialities
The F152 flame monitoring device and the FFS07 and FFS08 sensors meet the requirements of IEC 61508-2 SIL 3. The devices correspond to DIN EN 298 for operation with gas and oil as well as DIN EN 746-2 for process burners. They also meet the requirements in the directives for pressure equipment (2014/68/EU) and gas appliances (2009/142/EC). An Ex Zone 1 certification for the FFS07 flame sensor will be available shortly.

Summary:

- Suited for single and multi-fuel burners in standard boiler applications, power plants and process furnaces

- Suitable for fuels such as oil, gas, biomass, dust and process gases

- Plug-in module for top hat rail assembly

- Two-channel system with electronic self-monitoring (no mechanical shutter needed)

- Digital flame frequency evaluation for 10 to 200 Hz

- LED based status display

- Measurement output for intensity 0 … 20 mA

- UV and IR flame sensor

- SIL 3 as per DIN EN 61508-2

- Meets DIN EN 298 for operation with gas and oil as well as DIN EN 746-2 for process burners

- Corresponds to 2014/68/EU (Pressure Equipment Directive) and 2009/142/EC (Gas Appliances Directive)

- No modifications needed for country-specific mains frequencies, cut-out occurs on a sliding scale

- Flame sensors FFS07 and FFS08 are available for several different IR & UV spectral ranges

- With power connection ex factory 230 VAC or 115 VAC available

Basic system.

F152.

FFS07/FFS08.
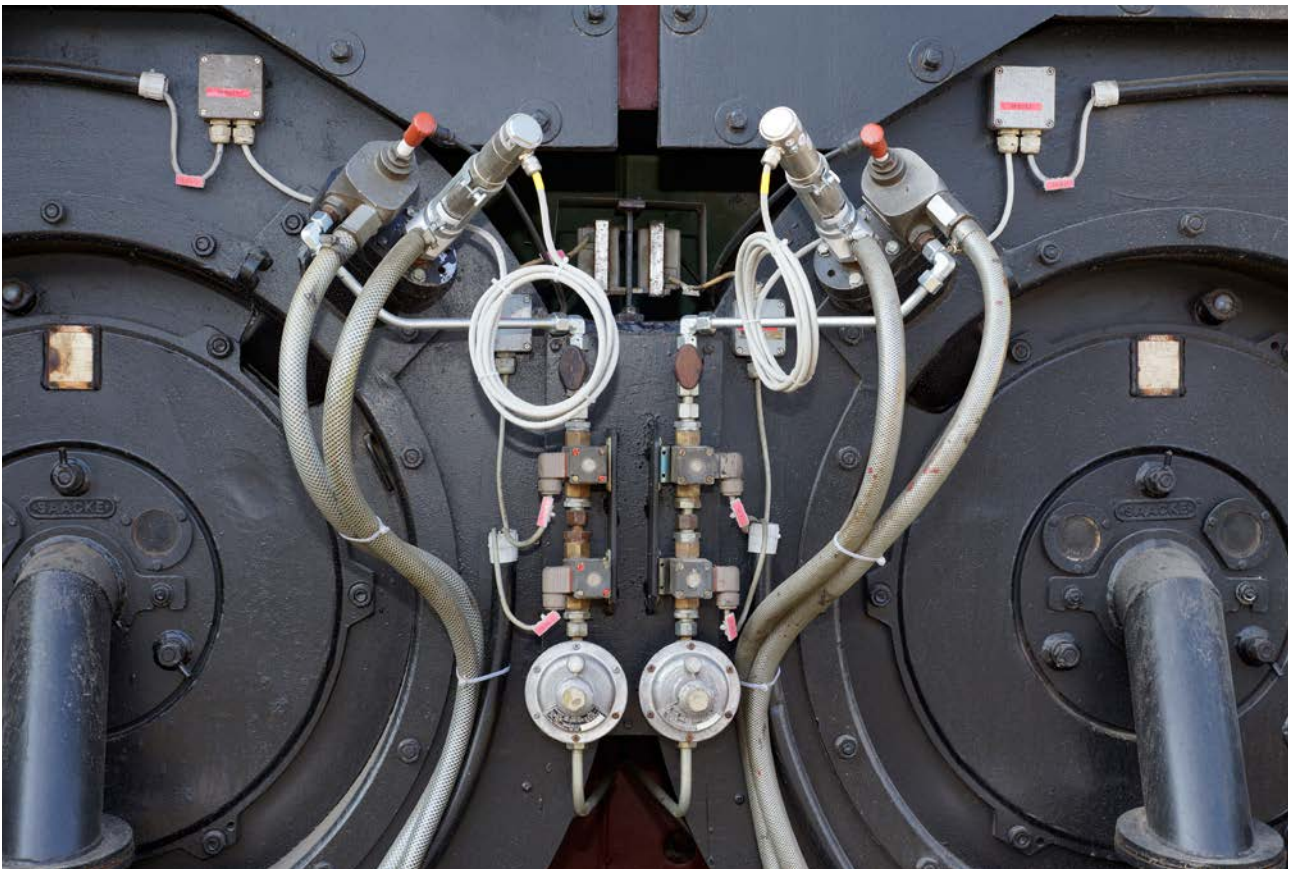
Set-up and function
When combined with the FFS07 or FFS08 flame sensors, the F152 flame monitoring device provides users with a safety solution for monitoring burner flames without demanding flame discrimination requirements. The housing for the F152 flame monitoring device has been designed for top hat rail assembly.

Applications:
- Single and multi-fuel burners in heating stations
- Process furnaces

Fuels:
- Oil, gas, biomass, dust, process gases

Standards and directives:
- DIN EN 298 for gas and oil operation
- DIN EN 746-2 for process furnaces
- Category SIL 3 as per IEC 61508 Part 2
- 2014/68/EU (Pressure Equipment Directive)
- 2009/142/EC (Gas Appliances Directive)

Properties:
- Two-channel design with dynamic electronic self-monitoring.
- No modifications needed for country-specific mains frequencies, cut-out occurs on a sliding scale
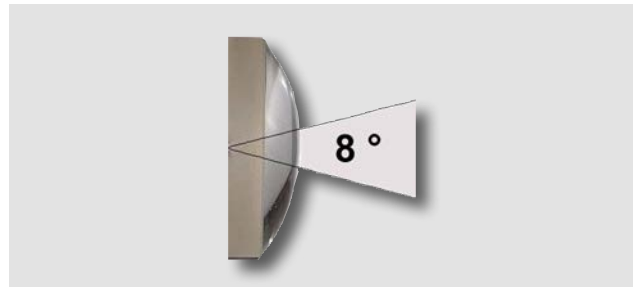
Flame sensor
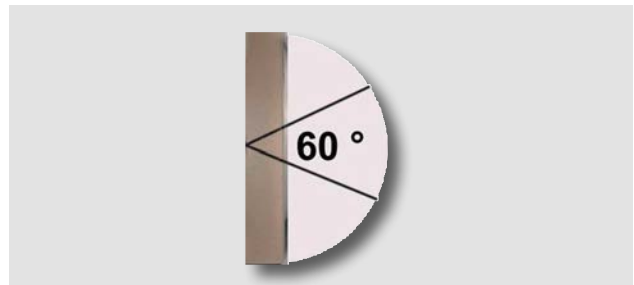- The flame sensor is available for monitoring flames in the IR range or UV range (FFS07, FFS08).

UV flame sensor
The UV flame sensor has a convex lens and detects the flame in a visual range of 8 °.

The IR flame sensor has a flat filter disc and detects the flame in a visual range of 60 °.

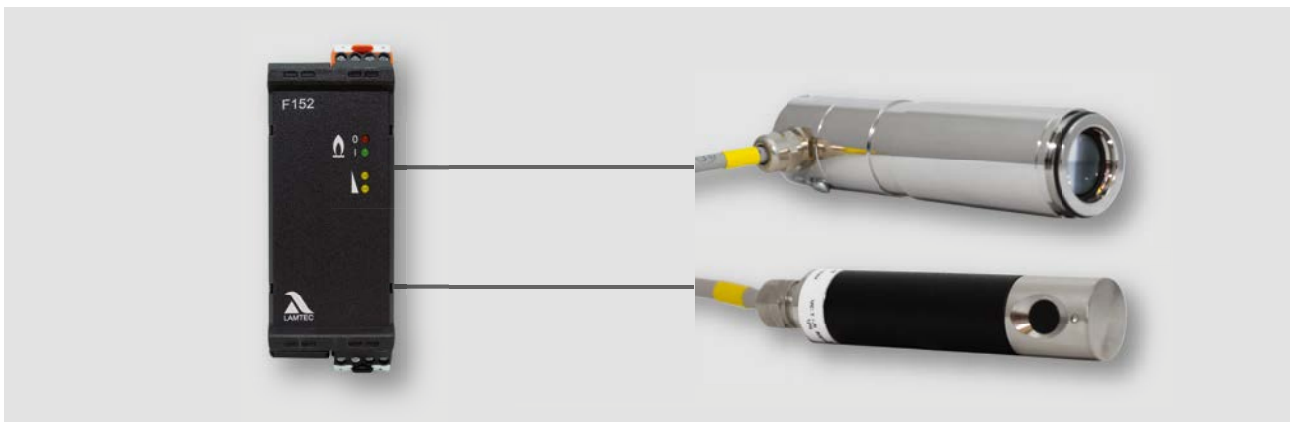## Selection criteria for spectrum and frequency
The spectral sensitivity of the flame sensors determines the flame monitoring device's suitability for specific fuels.
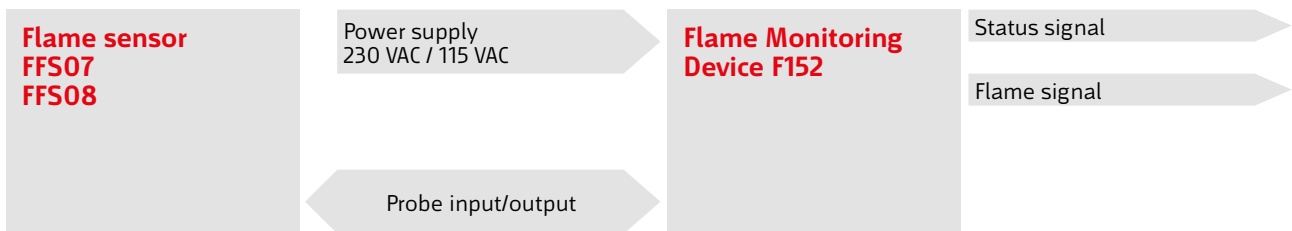
Selection criteria for fuels

The following table provides an overview:

Type	Spectrum/ nm	Viewing angle approx.	Preferred application/fuels
FFS07/08 UV-1	260 to 400	8°	Oil, gas
FFS07/08 UV-4	215 to 360	8°	Oil, gas, special gases like refinery gases and furnace gases
FFS07/08 IR-1	1000 to 2500	60°	Oil and gas combustion with strong flue-gas recirculation, waste gases with yellowish colour without UV radiation or with shielding of UV components using water vapour and dust

*In certain special circumstances, the suitability of the device types may differ from that indicated in the table.

Overview of functions.

Flame sensor FFS07 FFS08

Power supply 230 VAC / 115 VAC

Flame Monitoring Device F152

Status signal

Flame signal

Probe input/output

Only one sensor possible for each F152.

Notes.