



System overview

Flame Monitoring Device F130I

Flame Monitoring Device F130I.

Ionisation-based flame monitoring.

The F130I is LAMTEC's new safety flame monitoring device designed specifically for pilot and main flames. The F130I supports flame rod for ionisation detection, UV tubes, and optical flame sensors.

The F130I flame monitoring device by LAMTEC provides operators of industrial combustion systems and power plants with a reliable high-tech device for flame monitoring. The F130I flame monitoring device is especially impressive when used for more demanding monitoring requirements, such as monitoring in combustion systems with single burner flames. The F130I flame monitoring device is particularly suited for use in single burner systems.

Set-up and function

The F130I is a DIN rail mounted device and has been designed for installation within a control panel. The unit houses an integrated electronic control system designed specifically for use with ionisation flame rods, UV tubes and optical flame sensors.

Flame sensor

The F130I includes three flame sensor inputs that are either used individually or in combination with one another. The three inputs are the ionisation input (ION), the UV input, and the LDR input. Depending on the flame sensor, different properties of the flame are used to determine the status of the flame and its intensity and to convert it into an electrical signal which can then be evaluated.

Field of application

The F130I flame monitoring device by LAMTEC provides operators of industrial combustion systems and power plants with a reliable high-tech device for flame monitoring. The F130I flame sensor is especially impressive

Approvals

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

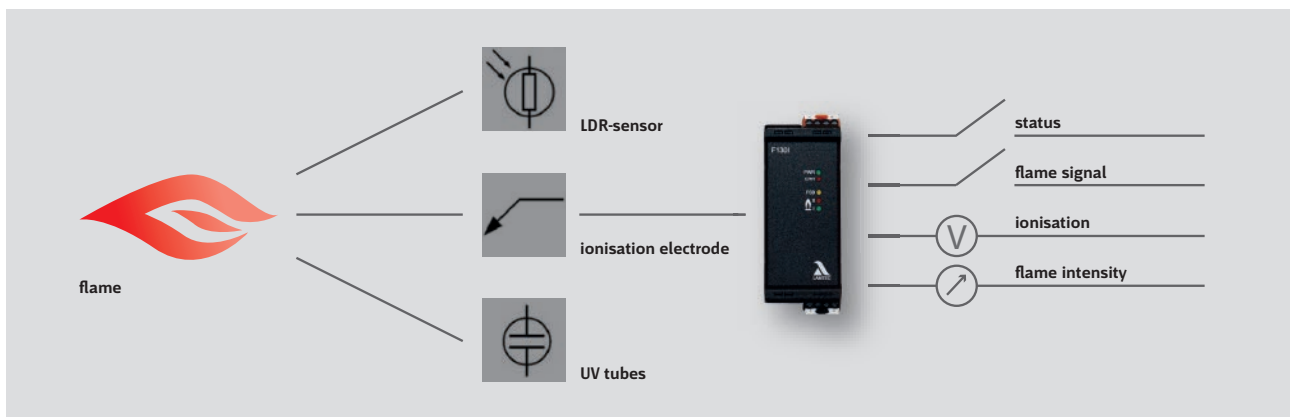
TUV
SUD
CE 0036
Pressure Equipment Directive 2014/68/EU, CE0036

TUV
SUD
SIL 3
SIL 3 Confirmation, DIN EN 61508 Parts 1-7

when used for more demanding monitoring requirements, such as monitoring in combustion systems with single burner flames. The ionisation-based F130I flame monitoring device has been approved for permanent operation.

Specialities

The evaluation device may only be operated with the approved flame sensors. The F130I is not designed for the direct switch-off of fuel valves. The subsequent signal processing must be carried out in the control system, which is adapted to suit the combustion system in question.



Overview of functions.

Flame sensor

The F130I includes three sensor inputs:

- Ionisation input (ION)
- UV input
- LDR input

The sensor inputs can be used individually or in combination. If one of the flame sensors detects a flame, the flame relay output is switched on and flame signalled. The spectral sensitivity of the flame sensors determines their suitability for specific fuels. The following table lists all approved flame sensors for the device and their application areas.

Sensor type	F130I input	For fuel	Continuous operation	Wavelength range
UV tubes	UV	Gas / oil	No	190 ... 270 nm
LDR, visible	LDR	Oil	No	450 ... 800 nm
LDR, visible	LDR	Oil	No	400 ... 800 nm
Ionisation	ION	Gas	Yes	-

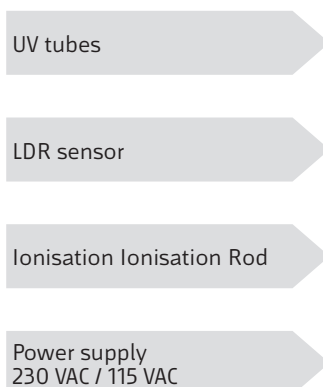
In certain special circumstances, the suitability of the device types may differ from that indicated in the table.

LAMTEC can only guarantee the correct operation and functionality of the F130I when it has been installed and commissioned in accordance with the relevant documented guidelines. Operators are advised to observe specific plant requirements when selecting the flame monitor. Please contact LAMTEC for application if necessary.

Summary:

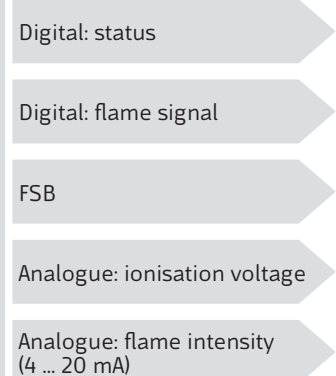
- Suitable for single and multi-burner systems in industrial, process and power generation application
- Approved for permanent operation with ionisation
- UV tubes and LDR sensors, approval for intermittent operation
- Suited for fuels such as oil, gas, bio-mass, dust and process gases
- Plug-in module for top hat rail assembly
- Two-channel system with electronic self-monitoring
- The F130I flame monitoring device is designed for installation in control panels
- LED based status display
- SIL 3 according to DIN EN 61508-1-7
- 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
- With power connection ex factory 230 VAC or 115 VAC available
- Separate models available for 115 VAC or 230 VAC power supplies

Inputs.



Flame Monitoring Device F130I

Outputs.



Order information.

F130I flame monitoring device options	
F130I flame monitor supply voltage 230 VAC	659G1001
F130I flame monitor supply voltage 115 VAC	659G1002



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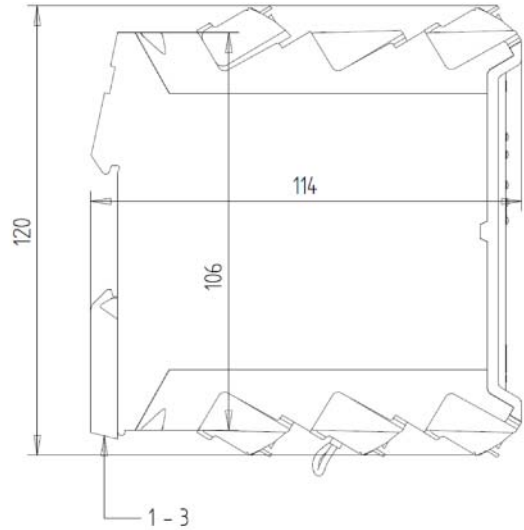
Technical Data: % \$=



Fig. 1-1 F130I



Fig. 1-2 dimensions F130I



Housing material: Plastic

The right to make technical changes is reserved.

Input parameters	
Auxiliary power/device supply	
Supply voltage ¹ :	Factory setting 230 VAC +10 % -15 % or 120 VAC +10 % -20 %
Mains frequency ¹ :	47 Hz ... 63 Hz
Power consumption:	≤ 10 VA
Internal device fusing:	50 mAT for 230 V device 100 mAT for 120 V device
External device fusing (mandatory):	min. 500 mAT max. 4 AT
Ionisation input	
Supply voltage ^{1, 2} : (Auxiliary power)	Device supply voltage
Ionisation current:	from 1 µADC Flame ON
Mode:	Continuous operation capable
¹ The product may not be transported, stored or operated outside the specified range. If it is, any guarantees with regard to safety-related functions lose their validity.	
² The attainable ionisation current at the plant is dependent on the supply voltage. The higher the supply voltage, the higher the sensitivity of the ionisation lance. The min. sensitivity of the device of 1 µA is independent on the supply voltage. See also Chapter F130I connection diagram 120 V device.	
Connection cable for ionisation electrode:	< 10 m
Connection cable for auxiliary power:	< 1 m
UV input	
Sensor voltage supply: (Auxiliary power)	> 200 VAC- lead mains potential
Permitted external input voltage to X16/1 for connection of a switch contact:	230 VAC 50/60 Hz
Input current in the ON state:	I _{min} = 100 µA

Technical Data : % \$=

Input parameters	
Mode:	Intermittent operation Burner restart every ≤ 24 h necessary
Connection cable:	< 10 m
LDR input	
Sensor voltage supply: (Auxiliary power)	≤ 42 V - lead mains potential
Detectable sensor resistance range:	$220 \Omega \dots 220 \text{ K}\Omega$ Flame ON
Sensor current:	$\leq 100 \mu\text{A}$
Mode:	Intermittent operation Burner restart ≤ 24 h necessary
Short-circuit detection:	Yes
Connection cable:	< 10 m
Output parameters	
Output contact status signal	
Contact type:	Not safety-oriented, potential-free contact
Contact type:	NO, in the event of a malfunction, the contact is closed.
Protection class:	SKII, base isolation for the flame signal
Permissible switching voltage ¹ :	$230 \text{ VAC} \cos \varphi \geq 0.3$
Contact fusing (internal):	1 AT
Specified external contact fusing ¹ :	0.5 AT
Flame signal output contact	
Contact type:	Safety-oriented, potential-free contact
Contact type:	NO, for "flame on", the contact is closed
Protection class:	SKII, base isolation for the status signal
Permissible switching voltage ¹ :	$\leq 230 \text{ VAC} \leq 48 \text{ VDC}$
Permissible switching current ¹ :	Max. $0.5 \text{ A} \cos \varphi$ 0,4 Min. 10 mA provide external spark suppression for inductive loads, do not switch capacitive loads.
Contact fuse (soldered):	0.5 AT
Safety time (FFDT): Response time in the event of the flame going out	$t_{\text{Voff}} \leq 1 \text{ s}$
Switch-on time	$t_{\text{Von}} \leq 1 \text{ s}$
Analogue output (current loop)	
	- Leads mains potential not safety oriented
Current:	$0/4 \dots 20 \text{ mA}$
Load:	max. 240Ω
Intrinsic error:	$\pm 2 \%$ from $1/3$ of the value range
Connection cable:	Connection cable $\geq 10\text{m}$ must be shielded and applied one side to FPE.
Shunt measuring	
Transmission ratio ionisation current to voltage to be measured:	$10 \text{ mV (DC)} = 1 \mu\text{A (DC)}$
Intrinsic error:	$\leq 2 \%$
Electrical safety:	Contact protection by means of protective impedances

Technical Data: % \$=

Output parameters	
Min. impedance of the connected measuring device:	1 MΩ
Connection cable:	< 1 m
Technical capacity	
Connection cross section:	flexible 0.25 ... 2.5 mm ² rapid 0.20 ... 2.5 mm ²
Mode:	Continuous operation for: <ul style="list-style-type: none"> • Ionisation flame monitoring Intermittent operation for: <ul style="list-style-type: none"> • Ionisation flame monitoring • Optical monitoring
Safety integrity level:	DIN EN 61508 Part 2 - SIL 3
Overvoltage category:	DIN EN 60730-1, ÜK III
Susceptibility to interference:	DIN EN 298
Emitted interference:	DIN EN 55022, Class B
Environmental capacity	
Protection class:	DIN EN 60529, IP20
Ambient temperature ¹ :	- 20 ... + 60° C Environmental category D according to GL VI Part 7
Relative humidity:	3K5, 5 % ... 95 % as per DIN EN 60721-3-3
Vibration and oscillation	GL, VI Part 7, Para. 9, characteristic 1 (0.7g)
Storage/transport conditions	
Storage location:	Enclosed spaces
Air temperature ¹ :	- 20 ... + 80° C
Relative humidity:	According to DIN EN 60721-3-3: <ul style="list-style-type: none"> • Transport 2K3, up to 95 % • Storage 1K3, 5 % ... 95 %
Weight:	approx. 0.5 kg

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Order Information

Flame monitor F130I	Order number
Flame monitor F130I supply voltage 230 VAC	659G1001
Flame monitor F130I supply voltage 120 VAC	659G0502

Approvals



The information in this publication is subject to technical changes.

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