

Draeger Flame Detector

FD 10 Range

Instructions For Use

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 **WARNING**

You must read, understand, and follow these instructions for use before you use the flame detector in order to ensure the proper operation and function of the flame detector.



Safety Symbols used in this Manual

While reading this Manual, you will come across a number of warnings concerning some of the risks and dangers you may face while using the device. These warnings contain "signal" words that will alert you to the degree of hazard you may encounter. These words, and the hazard they describe, are as follows:

 DANGER
Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION
Indicates a potentially hazardous situation which, if not avoided, could result in physical injury.
 NOTICE
Indicates a potentially hazardous situation which, if not avoided, could result in damage to the product.

For Your Safety

Strictly follow these Instructions for Use

Any use of the flame detector requires full understanding and strict observation of these instructions. This flame detector is only to be used for the purposes specified herein.

Maintenance

The device must be inspected and serviced by experts at regular intervals and a record kept. Repair and general overhaul of the device may only be carried out by appropriately trained service personnel. We strongly recommend that a service contract be signed with Draeger Safety for repairs and maintenance. Only authentic Draeger spare parts may be used for maintenance. Be sure to read the information contained in the chapter "Maintenance".

Accessories

Only use accessories listed in the order list on page 7.

Safe Connection of Electrical Devices

Do not connect electrical devices not mentioned in these "Instructions for Use" before contacting the manufacturer or an expert.

Use in areas subject to explosion hazards

Equipment or components which are used in potentially explosive-hazard areas and have been tested and approved according to National, European or International regulations may only be used under the specified conditions under which they were approved. The equipment or components may not be modified in any manner.

Intended Use

The Draeger Flame Detector FD10 range is intended to monitor and trigger the necessary control actions upon the detection of fire or flame in a given environment and is intended to be used in areas which may contain potential explosive atmospheres.

Explosion protection approvals

The explosion-protection approvals are valid for use of the device in gas/vapour-air mixture of combustible gases and vapours under atmospheric conditions. The explosion-protection approvals are not valid for use in oxygen enriched atmospheres. In case of unauthorised opening of the enclosure, the explosion-protection approval is voided.

NOTE: The Draeger Flame detectors 1300, 1700, and 2300 are certified under the designation FD10. All certificates will refer to the FD10.

Installing

Only trained service personnel (e.g. Draeger Safety service personnel) may install the flame detector under observation of the regulations applicable at the respective location.

Selecting the Detector Position & Mechanical Installation

To ensure optimum performance and to minimise down time and false alarms, consideration to the location and position of the flame detector must be observed.

The following points should be considered in the completion of this task:

- A clear view of the area to be protected
- Mounting of detectors on vibration free structures to provide best performance.
- Adequate number of detectors to cover the area to be protected.
- Detectors to be positioned so that they operate within their recommended operating distance.
- Type of fire hazard presented.
- Further influences which that could absorb wavelengths i.e. certain gases,

heavy rain and dense fog.

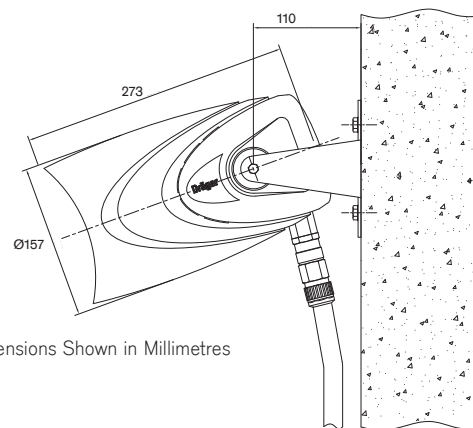
- The angle at which the sensor is positioned, this should always be downward and at a minimum of 10° - 20°.

The device does not contain any parts that can be serviced by the user.

Mounting the unit

When mounting the bracket, it should be secured to a structure which is free from vibration, and capable of holding the detector and bracket. In addition it is essential that all of the factors above are considered.

Figure 1: Mounting FD10 Range



All Dimensions Shown in Millimetres

Electrical Installation

When installing, the entire wiring must meet currently valid national regulations regarding the installation of electrical devices, and - if necessary - the national regulations regarding the installation in potentially explosive atmospheres. In case of doubt, the official responsible authorities are to be consulted prior to installation of the device.



CAUTION

Ensure that any power is switched off before connecting any cabling to the flame detector. The connections are made in the rear terminal compartment through suitable certified glands.

To access the terminal connections release the terminal cover locking screw using a 2 mm hexagon key and unscrew the terminal compartment cover.

The detector requires 24 Volts DC nominal supply voltage, also available are an isolated 4-20mA output and 3 relays.

Each detector has a built in terminal block of 37 terminals providing for a number of output connections:

- 4 terminals for 24v DC power
- 2 terminals for 4 – 20mA output
- 6 terminals for alarm relay
- 6 terminals for fault relay
- 6 terminals for spare relay
- 2 terminals for manual test activation
- 2 terminals for internal linking of cable screens (shields)
- 2 terminals for passive components
- 1 terminal for connection to the enclosure (housing)

A 0-20mA current loop is provided along with an alarm relay and fault relay. A 2 input manual test inputs are provided which take a 24V input (referenced to an external 0V, hence two inputs). This input allows the user to manually activate an optical test. There is also a pair of terminals (35 & 37) into which is connected a user defined passive component to allow for interfacing to a number of vendors fire panels.



NOTICE

Where terminals 35 & 37 are not interfaced with vendor panels but the alarm relay is required it is necessary to place a hard wired link between terminals 35 & 37.

Each terminal is capable of accepting a suitably crimped/ferruled 2.5mm² core wires. The detector also has an external earth (ground) connection capable of accepting 4mm² wires.



NOTICE

Wiring must be in accordance with local regulations. No more than one conductor should be used in each terminal. Duplicate terminals are supplied to allow 'daisy chaining' of connections if required.

Duplicate terminals are not supplied for 4-20mA connections, which cannot be 'daisy-chained'.

Figure 2: Wiring for operation with isolated 4-20mA output

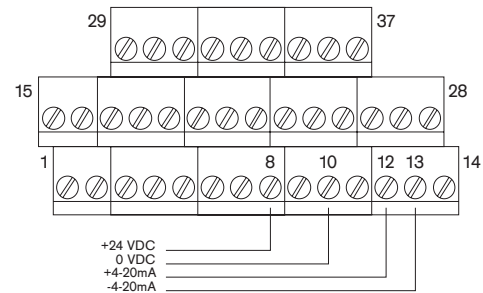


Figure 3: Wiring operation as 3-wire device with 4-20mA output

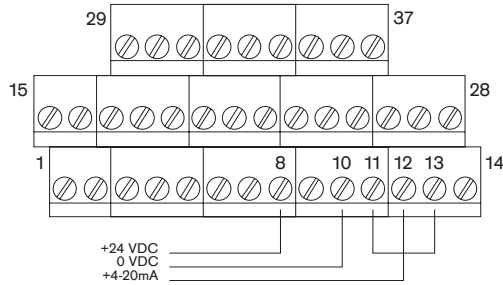
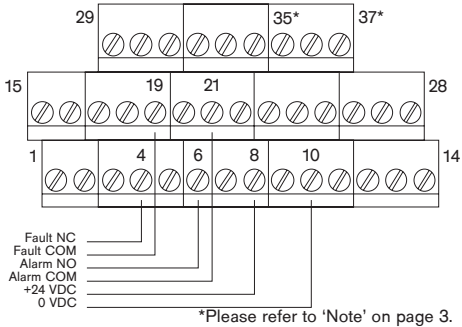


Figure 4: Wiring with relay output



Note:

When this equipment is installed within either:

NEC 500 Class 1 Div 1

NEC 505 Class 1 Zone 1

Certified areas then it must be installed using type MC-HL cable (Metal Clad for Hazardous Locations)

Mechanical Installation



CAUTION

Before replacing the terminal compartment cover ensure the threads are lightly lubricated using suitable non-setting silicone grease. Hand-tighten the terminal cover then tighten the locking screw with a 2mm hexagon key (see Technical Specification' section).

Finally the protective cover is fitted over the housing, to do this:

- Briefly remove the detector from its mounting bracket by slackening the two M8 fixing screws.
- Fit the two sides of the cover around the detector itself before aligning together and tightening with the 4 securing screws.
- Return the detector to its mounting bracket and secure into position by tightening the two M8 screws to the specified torque (see section Technical Data). ENSURE THAT THE DEVICE IS COVERING THE CORRECT AREA

Unused cable entries must be fitted with appropriate certified stopping plugs before commissioning the detector.

The detector is now ready for power on and set-up.

Operation




When the power is initially turned on there is a delay of approximately thirty seconds where the system performs an internal test and system initialisation.

An optical and hardware check is performed within the testing. If the device has correct functionality and displays a green LED, it is now ready for fire detection.

However, if there is a hardware or optical failure within the device the yellow LED will illuminate to indicate a problem. This will stay illuminated until the problem has been addressed and remedied by the operator.

The flame detector generates a 0-20mA signal to indicate its status (see Maintenance section); this should be checked during the installation of the detector.


Alternatively the status and operation of the device can be monitored by the colour of the LED illuminated.

System Status	LED Status	Visual Indicator
Power On / Running	Green LED indicates successfully running	
System Fault / Failed Optical Check	Yellow LED indicates a system hardware fault or optical failure	
Fire Detected	Red LED indicates a hazard has been detected	

Maintenance

Observe respective national regulations. (e.g. in Europe 60079-17 applies.)

The Draeger Flame Detector FD10 Range performs an automatic optics test every 30 minutes; this normally takes approximately 10 seconds.

 **WARNING**

The Draeger Flame Detector FD 10 Range contains no user serviceable parts. In the event of suspected failure, the suspect unit should be returned to Draeger Safety UK Ltd

NO ATTEMPT SHOULD BE MADE TO DIS-ASSEMBLE THE UNITS IN HAZARDOUS AREAS!

When replacing the detector front cover assembly it is essential for the function of the detector that the calibration bar in front of the lens is horizontal when the cover is in place. To do this hand-tighten the front cover and then back it off a maximum of half a turn until the two locking screws align with the detector housing. Tighten both locking screws to the specific torque (see Technical Data) using a 2mm hexagon key.

The only servicing requirement to ensure that the detector is fully functional is to measure the output between 0-20mA as per the table 'Detector Outputs' and collaborate these readings to the expected LED colour to be illuminated. In addition, ensure that the lenses are clean.

1300 IR Flame Detector	1700 UV Flame Detector	2300 UVIR Flame Detector
0mA = Fault	0mA = Fault	0mA = Fault
1.9mA ± 0.15mA = Optical Fault	1.9mA ± 0.15mA = Optical Fault	1.9mA ± 0.15mA = Optical Fault
3.8mA ± 0.23mA = Normal	3.8mA ± 0.23mA = Normal	3.8mA ± 0.23mA = Normal
15.6mA ± 0.40mA = Warning	15.6mA ± 0.40mA = Warning	8mA = IR Presence
20mA = Fire	20mA = Fire	12mA = UV Presence
		15.6mA ± 0.40mA = Warning
		20mA = Fire

A function test of the detectors using a suitable test torch should be carried out regularly. (See Accessories).

Furthermore a manual optics check of the detector may be carried out at anytime by connecting 24 Volts to pin 15 (manual test input) of the terminal block. The terminal compartment cover and front cover threads must be lightly lubricated with non-setting grease prior to re-assembly.

The detector outer cover (weather shield) is moulded ABS/polycarbonate and is not antistatic. Therefore, CLEAN ONLY WITH A DAMP CLOTH.

Accessories

The following accessories and spare parts are offered for the Draeger Flame FD10 Range

Part Description	Part Number
Dräger Flame Simulator	2307023
Dräger Flame Plastic Cover	2350448
Dräger Flame Mounting Bracket	2350447

How to Dispose of the Device



From August 2005, regulations apply to the whole of the EU for the disposal of electrical and electronic devices; these regulations are set in the EU Directive 2002/96/EG and in national laws relating to this device.

Special collection and recycling possibilities have been established for private households. However, since the device has not been registered for use in private households, it cannot be disposed of as special household waste. For disposal, it can be sent back to your national Draeger Safety Sales organisation; if you have any questions requiring disposal, then please contact this location.

Technical Data

Ambient conditions		-40° to +60°C (-40 to +140°F), 91.5 to 105.5kPA, 0-99% rel.hum
IP Rating		IP 67, NEMA 4X (with O-rings fitted)
Supply voltage	Flame 1300 Flame 1700 Flame 2300	18 to 32VDC, current consumption 160mA quiescent state at 24 VDC (maximum 230mA) 18 to 32VDC, current consumption 160mA quiescent state at 24 VDC (maximum 180mA) 18 to 32VDC, current consumption 175mA quiescent state at 24 VDC (maximum 240mA)
CE Marking		Devices and protective systems for the use for the intended purpose in explosion-hazard area (Directive 94/9/EC), CENELEC only
Dimensions		Approx: 275 x 155mm
Weight	Aluminium Housing	Less than 3.5kg (7.7lbs)
	Stainless Steel Housing	Less than 5kg (11lbs)
Regulatory Approvals	ATEX	Certificate Number: ITS 04 ATEX 11807 ATEX: II 2 G EEx d IIC EEx d [ia] IIC T6 (T _{amb} -50°C to +60°C) EEx d [ia] IIC T5 (T _{amb} -50°C to +70°C)
	IECEX	Certificate Number: ITS 04.0003 IEC Ex d: II 2 G EEx d IIC EEx d [ia] IIC T6 (T _{amb} -50°C to +60°C) EEx d [ia] IIC T5 (T _{amb} -50°C to +70°C)
	FM/CSA	Class I, Groups A, B, C, D Class I, Zone 1, Groups IIA, IIB, & IIC Ex d II C; T6/T5; -40°C ≤ T _{amb} ≤ +60°C / +70°C
	Operating Distance	0.1m ² (1 sq. foot) N-heptane fire or Propane flame fire at 18m and respond within 30 seconds. 5 inch (800W) propane flame at 1.44m (4 feet 9 inches) and respond within 30 seconds.
Measuring Technique Characteristics		
Torque Settings	Housing Screws Back Cover Locking screw Front Cover Locking screw	15 Nm 0.8 Nm 0.8 Nm
Reliability - Mean time Between Failure (MTBF)		≥ 100,000 Hours
Response time to Fire	Flame 1300 Flame 1700 Flame 2300	3.5 seconds 1 second 3.3 seconds

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