

## Description

The FDRK90 is a reflection Beam Smoke Detector. Its operation is based on the relation between the smoke present in an environment, generated by the starting of a fire, and the infrared beam emitted by the device and reflected by a special optical reflector. It is also able to detect the presence of vapour and fog.

A fundamental feature of this detector is the ability to detect the presence of both white smoke and black smoke even if they are little dense. This detector has been designed for applications where the aesthetics, the small dimensions, the possibility of remote visualization of the signal and the simplicity of use have primary importance. So FDRK90 is particularly suitable to be installed in artistic environments like museums, churches, art galleries and in offices, hotels etc.



## Technical Features

- > a single detector can cover an area up to 750 mq.
- > installation is easy and quick
- > the internal electronics are controlled by a microprocessor a special function automatically compensates the signal drift caused by the opacity on the optical parts, generated by dust and dirt, minimizing the maintenance needs
- > the detector FDRK90 has 2 separated circuits for smoke detection: Oscuration and Turbulence
- > the detector FDRK90S has only the circuits for smoke detection: Oscuration
- > FDRK90 - 3 relay outputs: Alarm, Turbulence, Fault
- > FDRK90S - 2 relay outputs: Alarm, Fault
- > analog output that allows to remotely visualize the detector's signal level using an optional led bar module
- > maintenance is easy and not frequent
- > very low operational costs - cost effective
- > simplified alignment with signal level led indication
- > EN54-12 CPD and VDS certified

## Applications

- > industrial buildings
- > storehouses
- > supermarkets
- > shops
- > libraries
- > theaters
- > cinemas
- > conference halls
- > control rooms
- > hotels

### Operation

The FDRK90 it's an Optical Beam Smoke Detector suited with 2 separated detection circuits based on the principles of Obscuration and Turbulence (FDRK90)

#### Obscuration

The device has to be installed at one end of the area to be protected just under the level of the ceiling and the special reflector (FX) must be installed at the other end. When a fire begins, it produces smoke that rises up and intercepts the infrared beam of the detector. This causes an attenuation of the received signal that, if the threshold level is reached, will activate its alarm relay that can drive suitable alarm signalling devices.

#### Turbulence

Normally, during the starting phase of a fire, smoke clouds are generated and the thermal energy of the fire (heat) produces bubbles of hot air that rise up. When these clouds and bubbles intercept the beam emitted by the detector, they cause a perturbation in it because they modify the optical-physical characteristics of the transmission medium of the beam. These variations are obviously time related. A suitable circuit has been designed to detect these variations and when they reach the preset amplitude and time duration levels, an alarm signal is generated. The advantage of using the turbulence detection circuit it's a quicker detection of the fire, because it is revealed in it's beginning. So FDRK90, with this circuit, reveals dynamically both the smoke clouds by the starting of the fire and, in case the fire generates flames and so thermal energy, the perturbation phenomena produced by the combustion process.

#### Optical Reflectors

4 types of optical reflectors can be used with FDRK90: FX01 - FX02 - FX03 - FX07. The reflectors choice has to be done according to the optical path length (distance between detector and reflector) and to aesthetic needs of the environment. The FX07 it's particularly suitable to be installed in artistic places (museums, art galleries, etc).

#### Optional

ZC-01 - It is a optional base that facilitates the installation in the case in which the cable within pipe guide is outside of the wall. The ZC-01 is equipped of breakable holes on the sides.

**SUP90** - It is a adjustable support that allows the orientation of the optical beam in various directions. It is useful in the case of installation of the detector of the detector in an angle of the room.

**BLP-90** - Laser Pointer - eliminates the need to use a lamp for optical alignment detectorreflector - the pointer is installed and collimated in the laboratory - the time of installation of the detector is drastically reduced - just point the laser beam on the reflector to have optics aligned.



### Technical Data

- > Models: FDRK90 FDRK90S (without Turbulence)
- > Type: Reflection Optical Beam Smoke Detector
- > Power Supply: 12/24 Vdc
- > Power Supply Range: 11- 30 Vdc
- > Optical Path Length: 3 - 12 m with FX-07 reflector, 10 - 25 m with FX-01 reflector, 20 - 40 m with FX-02 reflector, 25 - 50 m with FX-03 reflector
- > Max covered area: 750 mq
- > Protection against the inversion of polarity
- > Digitally codified infrared beam
- > Power Consumption: 18,6 mA in normal operation, 34 mA with the alarm relay activated, 34 mA with the turbulence relay activated, 50 mA with both alarm and fault relay activated
- > Maximum angular missalignment of the detector: +/- 0,2°
- > Maximum angular missalignment of the reflector: +/- 0,2°  
Selection of the obscuration alarm threshold level with a 4 positions switch: position 1 - 70%, position 2 - 60%, position 3 - 50%, position 4 - 40%
- > Selection of the turbulence alarm threshold level with a 4 positions switch
- > Alarm Relay activation delay: 10 s
- > Fault Relay activation delay: 5 s
- > Detector's recovery time with alarm memory deactivated: about 5 s
- > Detector's recovery time with alarm memory activated: about 5 s (power supply off)
- > Working temperature: -10 + 55°C
- > Red LED indication: alarm status
- > Blue LED indication: compensation limit, interrupted beam, fault
- > Alarm Relay: 1A/24 V dc
- > Turbulence Relay: 1A/24 V dc - (FDRK90)
- > Fault/Maintenance Relay: 1A/24 V dc
- > 0-5 V Analog Output for signal level measuring/visualization
- > Dimensions: 162 x 62 x 62 mm.
- > Housing: autoextinguishing polycarbonate box
- > Relevant Standard: EN 54-12
- > Certifications: EN54-12/CPD (0786-CPD-20803), VDS2504-VDS2344 (G209131)
- > Protection Index: IP 50 (IEC 529-144)
- > Weight: 200 gr.