



VSD 301

### Technical data

The detector has an alarm relay with potential free normally open contacts which will make contact when smoke is detected.

An analogue output is provided which may be connected to a building management system where the signal level may be used to indicate the presence of smoke and the current service state of the optics.

VSD 302 and VSD 602 (only) incorporate a moving dot LED display to indicate the current state of the optical devices, a fault relay is also provided to signal unit failure and or the need for cleaning.

<b>Sensitivity</b>	Adjustable from: 3% to 25% obscuration ( 0.1 to 0.9 db/m )
<b>Power supply</b>	24 Vac at 50-60Hz, 24 Vdc, (-10..+15%)
<b>Consumption</b>	62 mA
<b>Relay output</b>	Volt free normally open contact
<b>Contact rating</b>	1A at 120 Vac, 24 V dc.
<b>Analogue output</b>	2-10 Vdc (3V = normal)
<b>Operation</b>	+10 to +40°C 0 to 95% r.H. non condensing
<b>Storage</b>	-10 to +50°C 0 to 95% r.H. non condensing
<b>Protection</b>	IP65 Head only with suitable cable gland
<b>Weight</b>	<300 g

### Features

- **IR-detection (obscuration)**
- **Outputs**

<b>Analogue</b>	<b>2-10 Vdc</b>
<b>Relay</b>	<b>SPDT 1A@24 Vdc, 120 Vac</b>
- **Analogue output status levels**

<2 Vdc	<b>Sensor fault</b>
3-7 Vdc	<b>Normal operation</b>
7-9 Vdc	<b>Optics require cleaning</b>
>9,5 Vdc	<b>Smoke alarm</b>
- **LED bargraph display for indication of dirt level and service level (only VSD 302 and VSD 602)**
- **Standard probe lengths 300 mm and 600 mm**

### Description

The VSD series duct smoke detector has been developed from a proven design using modern devices to provide effective and reliable detection of smoke in ventilation systems.

Detection of smoke is achieved by monitoring a carefully controlled infra red beam within a perforated tube which is inserted into the ductwork. This method senses smoke directly within the duct, eliminating the problems associated with conventional detectors mounted in sampling boxes.

Circuitry incorporated in the design of the detector controls the infra red beam continuously. This ensures that the detectors response will remain constant throughout operation of the system. External influences including background pollution, airborne dust and low level electrical interference frequently found in commercial and industrial applications, a common source of problems with some other types of detector, are selectively filtered by the electronics thereby providing the highest sensitivity to smoke combined with effective rejection of short term disturbances that would otherwise give a false alarm.

The detector features variable sensitivity and an advanced signal damping circuit which can be bypassed for testing purposes. An LED bargraph visually indicates the smoke density and service state of the optical devices (VSD 302 and 602 only) and this signal is available as an analogue output to communicate with a building automation system.

### Ordering codes

Type no.	Description
<b>VSD 301</b>	Duct smoke detector, 300 mm probe length
<b>VSD 601</b>	Duct smoke detector, 600 mm probe length
<b>VSD 302</b>	Duct smoke detector, 300 mm probe length, with LED bargraph display
<b>VSD 602</b>	Duct smoke detector, 600 mm probe length, with LED bargraph display

### Application

The VSD should be installed in ventilation or airconditioning systems to prevent the smoke generated by a fire circulating within the building and spreading through areas which are not immediately affected. In particular these detectors should be fitted wherever the ventilation ductwork passes through fire barriers and where smoke control dampers are fitted. This allows the dampers to be closed immediately, thereby limiting the spread of smoke which would otherwise occur if heat activated systems alone were used.

These detectors should also be fitted in the return air ducts of single zone or package air handling units in order that the supply fans may be automatically shut down thus limiting the provision of oxygen to the fire. The exhaust fans and air control dampers, where fitted, may also be moved to the full exhaust condition to expel any smoke during evacuation of the building.

The number and correct positioning of the detectors will of course depend on the design of the building and the ventilation system serving it. These detectors are primarily designed for building return air monitoring and suitability for other applications should be confirmed prior to purchase. For further information please contact our technical department.

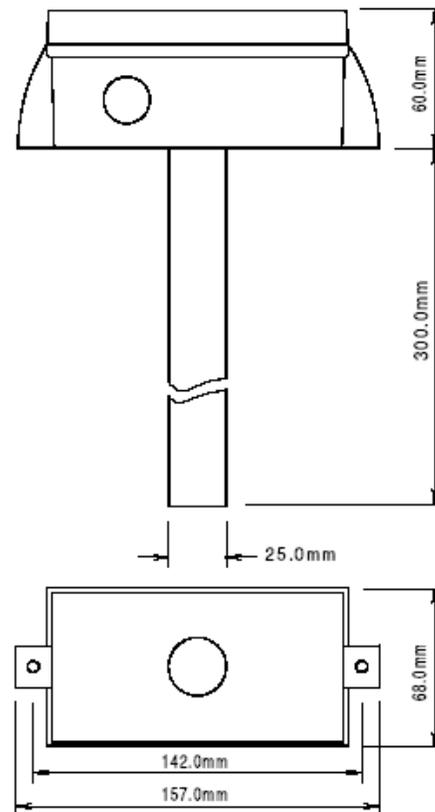
### Location

The VSD is an optical beam detector and therefore, air velocity has little effect on performance, however, careful positioning of the detector is required if optimum detection is to be achieved. The detector should always be fitted with the holes in the sensing tube parallel to the airflow.

Where air changes direction its density will vary, therefore, bends and changes in section should be avoided wherever possible when positioning the detector. The chosen location should also allow access for routine cleaning, however, where site conditions restrict the choice consideration should be given to the air flow pattern to ensure that the detector is in the main airstream.

In order to provide the earliest possible detection of smoke the chosen location should limit the number of grilles or branch ducts entering the system prior to the detector position to the minimum possible. This will reduce the possibility of small quantities of smoke in the duct from the early stages of a fire being diluted by air from unaffected areas prior to passing over the detector. For this reason each room should, ideally, be protected individually and large open plan areas should be zoned. The detector should always be fitted as far downstream from the last grille or branch as possible to ensure that the air is well mixed.

### Dimensions (mm)



### Installation Notes

Removable links are provided for signal damping and internal latching of the output relay.

It is recommended that the damping be used LK1 (link in place ) for normal use as this will give the best false alarm rejection. The link should be removed for testing purposes.

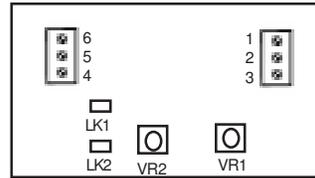
The internal latching circuit is enabled with the link LK2 in place, in this condition any alarm will result in the detector signal remaining on until locally reset. Power failure will also result in an alarm output on restoration of power and the detector will need to be reset locally.

If the latching link is removed the detector will auto reset after the obscuration is removed and conditions return to normal for this reason the electrical circuit to which the detector is connected should self latch with reset facilities.

Due to the self recalibrating design of the detector as dust builds up on the optics the internal signal is increased to compensate, this results in the detector maintaining sensitivity during operation. For this reason routine cleaning should take place either when the internal service relay operates (VSD 302 and VSD 602 only) or on a planned basis. Failure to clean the detector will ultimately result in an alarm signal occurring before the detector attempts to reset. Following this alarm the detector will not be able to recalibrate and will not function.

As with all detectors it is not recommended to switch fan or damper loads directly as any fire in the vicinity may damage the detector or the wiring resulting in loss of control.

### Electrical connections



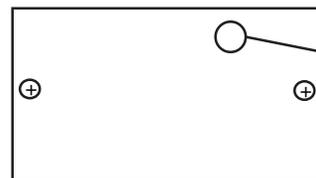
#### LINK POSITION

- LK1 ON = DAMPED
- LK1 OFF = UNDAMPED
- LK2 ON = ALARM RELAY LATCHED
- LK2 OFF = ALARM RELAY AUTO RESET

#### TERMINAL CONFIGURATION

- 0 VOLT SUPPLY ----- 1
  - 24 VOLT SUPPLY ----- 2
  - 0 -10V ANALOGUE OUT ----- 3
- 
- 6 ----- ALARM CONTACT
  - 5 ----- \* FAULT CONTACT
  - 4 ----- RELAY COMMON

\* Only VSD 302 and VSD 602



Reset button in the front cover

We reserve the right to make changes in our products without any notice which may effect the accuracy of the information contained in this leaflet.