

IR6003/7 IR Oil Mist/Smoke Detector



The Tyco IR6003/7 Oil Mist/Smoke Detector has been specially designed to be highly sensitive to the presence of oil & kerosene mists or smoke particles in the path of the detector beam.

The detector has been developed for use in enclosed oil rig well head areas, generator rooms and turbine enclosures. The detector automatically compensates for contamination of the detector lenses and signals when a point is reached where further deterioration cannot be tolerated and the lense requires cleaning.

Two levels of alarm status are provided. A low level alarm and a high level alarm. There is also a beam blocked status provided in the event that the beam is interrupted. The detector is intended to be used together with our P-UIM 6005/2 which will provide the detector as volt-free contacts.

Features

- // Automatic Self Calibration
- // Range = 2-50 metres
- // Weatherproof to IP65
- // Certified Intrinsically Safe EEx ib IIB T5
- // Robust Design
- // Heavy Duty Mounting Bracket available
- // Independent beam blocked output
- // Cleaning status output
- // Dual automatic compensation



Functional Description

Initialisation:

When the detector is switched on, its LED indicator blips on to signify power up. During the first 10 seconds the detector performs auto calibration to establish the quiescent obscuration level.

Please note: It is important that the beam path is cleared to a healthy state (no obscuration) prior to resetting the detector. If the beam path is not healthy, the detector will recalibrate to the current level of obscuration in turn reporting false alarm/fault conditions as the path clears. If obscuration is high (dirty lenses or oil/smoke is present) then the detector will not be able to establish operational state and will report a clean fault (LED pulses on for 4 sec) or a life fault (LED is illuminated continuously). The P-UIM will latch the fault condition and the detector/P-UIM will require resetting .

Alarm Level Detection:

The detector monitors the obscuration level within the beam path and when it detects a loss of 0.5 dB it latches a low level alarm condition. If the loss is maintained within the 0.5 to <1.5 dB band during the subsequent 15 second alarm monitoring period, a low level alarm will then be reported (LED will pulse On/Off for 30 seconds). If the loss exceeds 1.5 dB then a high level alarm is latched and this status will be reported (LED pulses On/Off for 2 minutes) at the earliest 8 seconds from the beginning of the alarm monitoring period. If the high level occurs subsequent to the initial 8 second of the alarm monitoring period and before a total of 15 seconds has elapsed, the high level alarm will be latched and reported immediately. Please Note: If the level of loss during the alarm condition monitoring period falls below 0.5 dB, the latched alarm level will reset and the detector will continue to monitor.

Beam Block:

If the level of obscuration increases suddenly to a high level of loss a beam blocked status will be latched and if the level is maintained for 60 seconds, Beam Blocked will be reported (LED flashes ON for 2 seconds). If the beam blocked level of obscuration clears for more than a few seconds during the 60 second period monitoring period, the detector will return to its normal operating state.

Dual Automatic Compensation:

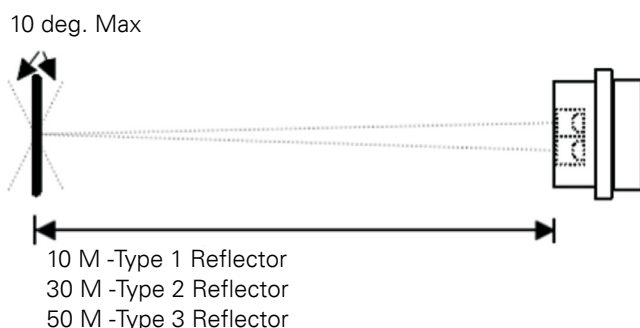
The detector automatically compensates for gradual detector lens contamination and also compensates for the more rapid environmental changes (eg. Temperature Change). The detector will report a clean fault (LED Flashes on for 4 seconds) once. If the detector is not cleaned it will continue to operate until a life fault is detected (LED on steady) at which point the detector latched to an off condition. The detector must be cleaned and reset once the life fault has been detected.

Installation Procedure

To install the detector, find an unobstructed path, ideally above head height that covers the area to be monitored. When choosing the beam path the direction of any prevailing air currents should be noted to assess the direction that any oil mist would be conveyed.

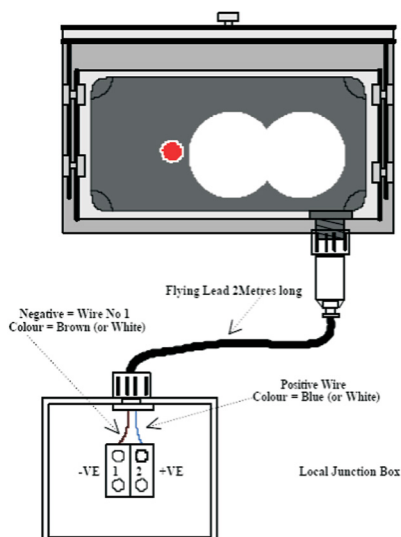
It should be noted that the beam must not be within 500 mm of any wall or partition. The operating range is 2-50 metres.

The reflector sheet must be mounted on a flat surface (self adhesive backing) such that the detector and reflector are aligned horizontally and vertically. To assist in this procedure a tool is available (01-33-21) to ensure the detector beam is focused centrally on the reflector. The alignment tool intensifies the IR beam & converts its image to visible light. Due to the nature of operation of the alignment tool, it is recommended that it should be used in subdued light conditions. The physics of the reflector construction, enable the reflector to be up to 10 degrees out of alignment in any one plane as detailed in the following diagram:



Distance	Reflector Size	Type
2 to 10 M	0.6 x 0.6 M (1 x 6 M x 0.6 M)	1
10 to 30 M	1.2 x 1.2 M (2 x 1.2 M x 0.6 M)	2
30 to 50 M	1.8 x 1.8 M (3 x 1.8 M x 0.6 M)	3

This diagram shows the detector connected to a local junction box via the flying lead (01-33-14). The local junction box will require connecting to our P-UIM via a suitable safety barrier which provided the necessary detector to user equipment interface. (For details see Power UIM 6005/2 Datasheet 01-33-22)



For details on how to mount the detector refer to heavy duty mounting bracket Datasheet (01-33-24)

Commissioning

Once the detector has been installed correctly by connecting it to the hazard monitoring system via the P-UIM, the user should power up the detector loop and perform the following confidence checks:

1. The detector LED blips On briefly as it receives power from the P-UIM. The P-UIM Life indicator is flashing.
2. Also Output On indicator should be On steady, all other indicators are extinguished.
3. Wait 20 seconds and check that the status detailed in step 1 above remains unchanged.
4. Block the beam path of the detector for 1 minute and check that the detector signals a beam blocked state (LED flashes On for 2 seconds). The P-UIM Beam Blocked indicator is lit steady. Now remove the obstruction from the detectors path.

5. Initiate a short reset and check that the P-UIM returns to the status detailed in step 1.
6. Initiate a long reset with the beam path blocked and check that the detector indicates a Life Fault (LED is lit steady). The P-UIM Life indicator is lit steady. Now remove the obstruction for the detectors path.
7. Initiate a long reset and check that the P-UIM returns to the status detailed in step 1.

Operational Parameters

The detector receives its DC supply from the P-UIM and provides status reports to the P-UIM as follows:

- // A **normal/healthy** detector input condition is indicated when the current is >20 mA and <32 mA (normally 25mA). The LED on the front of the detector will be extinguished.
- // A **low alarm** condition is indicated when the current pulses from normal to 42 mA with a 1 second equal mark space ratio for a period of 30 seconds.

- // A **high alarm** is indicated when the when the current pulses from normal to 42 mA with a 0.5 second equal mark space ratio for a period of 2 minutes.
- // A **beam blocked** condition is indicated when the current switches from normal to 17 mA for a period of 2 seconds
- // A **cleaning fault** condition is indicated when the current switches from normal to 17 mA for a period of 4 seconds
- // A **life fault** condition is indicated when the current falls to 17 mA for >5 seconds.

Oil & Gas > Detection & Control

Technical Specifications

Electrical:

Operating Voltage: 24 V (via P-UIM)
 Quiescent Current: 25 mA
 Alarm Current: 80 mA (max)
 Beam Length: 2 to 50 metres

Mechanical:

Dimensions: W165 x H125 x D165 mm
 Weight: 0.96 kg
 Material: Noryll GTX Grade 810

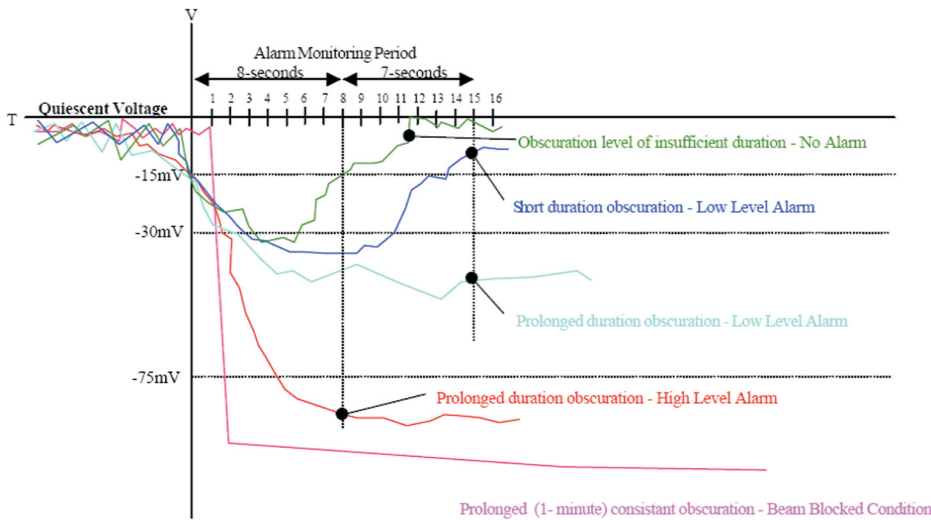
Environmental:

Operating Temperature: -10 to +55°C
 Housing Protection: IP65 LPC Tested
 BASEEFA 9 Cert: BAS 02 ATEX 2313X
 EEx ib IIB T5
 SIRA Cert: IECEX SIR 14.0009X
 I12 G Ex ib IIB T5 Gb

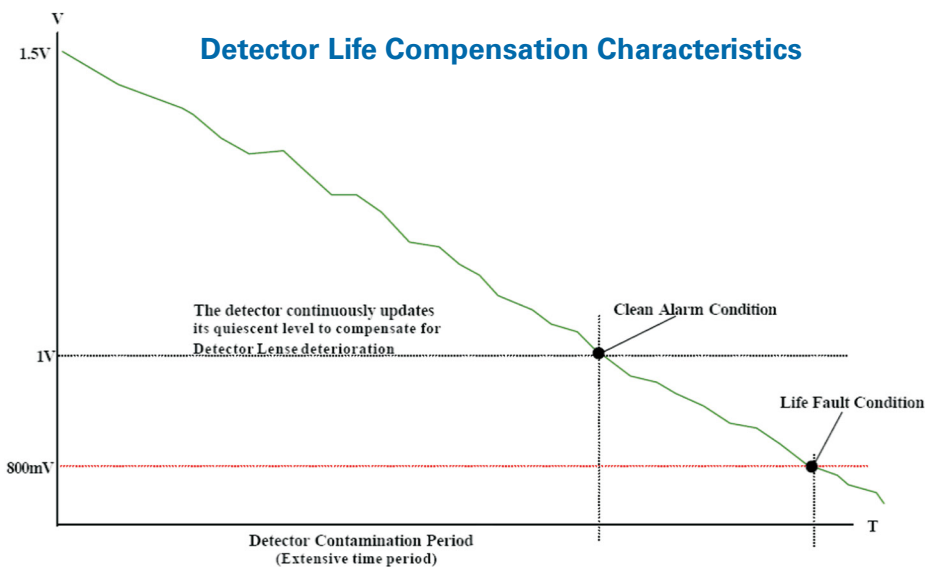
Accessories

Flying Lead: 01-33-14
 Reflector Type 1: 01-33-05
 Reflector Type 2: 01-33-10
 Reflector Type 3: 01-33-11
 P-UIM: 01-33-22
 0-20 mA Adapter: 01-33-22A
 Heavy Duty M/B: 01-33-24
 U-Bracket: 01-33-12
 IR Alignment Tool: 01-33-21
 IR Test Film: 01-33-26

Detector Monitoring Characteristics



Detector Life Compensation Characteristics

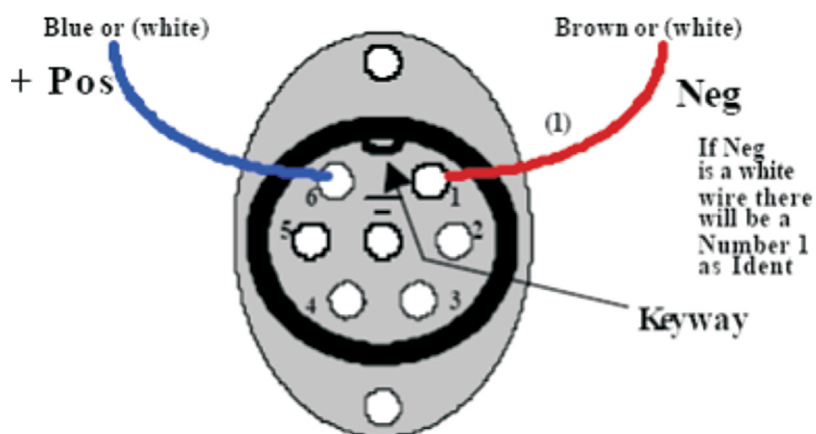


Ex Requirements

In order to maintain the EEx certified status of the equipment the following requirements must be met:

- // The apparatus cannot be repaired and must be replaced by an equivalent unit.
- // The apparatus is not intended to be exposed to dust conditions.
- // The equipment when installed in accordance with the instruction manual will not be subjected to mechanical stress.
- // The equipment should not be installed where it may be subjected to mechanical and thermal stress or where it may be attacked by existing or foreseeable aggressive substances.

Flying Lead Connections



Clients View of Connector

Datasheet cross references

Please find below a list of datasheets associated with these product range.

Datasheet PSF296UK	U Bracket	Issue 1. Aug 15
Datasheet PSF297UK	Flying Lead	Issue 1. Aug 15
Datasheet PSF298UK	Duct Reflector	Issue 1. Aug 15
Datasheet PSF299UK	Duct Mount Reflector	Issue 1. Aug 15
Datasheet PSF300UK	Infra Red Target Alignment Tool	Issue 1. Aug 15
Datasheet PSF301UK	P-UIM 6005/2	Issue 1. Aug 15
Datasheet PSF302UK	0.20 mA Adaptor	Issue 1. Aug 15
Datasheet PSF303UK	IR6003/7 Oil Mist/Smoke Detector	Issue 1. Aug 15
Datasheet PSF304UK	Reflector Type 1	Issue 1. Aug 15
Datasheet PSF305UK	Reflector Type 2	Issue 1. Aug 15
Datasheet PSF308UK	Test Film	Issue 1. Aug 15
Datasheet PSF309UK	Mounting Bracket Heavy Duty	Issue 1. Aug 15

Client List

Number	Name	General Count	Number	Name	General Count
1	Shell	150	19	Technip Mar.	5
2	BP	250	20	Det-tronics	30
3	How	50	21	HESS	4
4	Total	20	22	Debyl Ltd.	6
5	BNFL	8	23	North Sea	50
6	Micropack	10	24	STAT Oil	15
7	Maersk	10	25	Dutch Navy	16
8	Silvertch	30	26	Prudhoe Bay	10
9	ICS	60	27	FPSO	30
10	Reliance	3	28	HRL/Centrica	20
11	Paxman	16	29	Airbus	8
12	GEC	8	30	Kvaerner	4
13	EGT	20	31	Preussag	30
14	Pagannini	60	32	Zellweger	2
15	Thorn	8	33	Cooper Ene.	30
16	Olsen	2	34	Honeywell	10
17	Amec	4	35	Saipem SA	20
18	Thomassen	10	36	Autronica	15

There are many other companies who integrate our oil mist detection equipment into their safety systems, These can range from:

- Heavy Industrial Areas e.g. Engine Rooms
- Hazardous Areas
- Warehouses
- Marine Applications
- Oil Rigs
- FPSO's e.g. Shell BONGA
- Turbines
- Hydraulic Power Units
- Plus many more.....

Technical Product Sales / Oil & Gas - Detection & Control

Tyco Fire & Integrated Solutions (UK) Ltd

Tyco Park, Grimshaw Lane, Manchester, M40 2WL, UK

Tel: +44 (0)161 455 4243

Email: tfis.detectionspareres-repairs.uk@tycoint.com

Web: www.tycofis.co.uk/products/Fire-Detection-and-Alarm/oil-mist-detector

The right is reserved to modify or withdraw any product or service without notice. PSF303UK Issue – 1. Aug 2015 © 2015