

XP95 I.S. Optical Smoke Detector



Product overview

Product	I.S. Optical Smoke Detector
Part No.	55000-640

Compliance



Product information

The XP95 Intrinsically Safe (I.S.) Optical Smoke Detector works on the light scatter principle and is ideal for applications where slow burning or smouldering fires are likely.

- Responds well to slow burning, smouldering fires
- Well suited to escape routes
- Unaffected by wind or atmospheric pressure

Technical data

All data is supplied subject to change without notice. Specifications are typical at 24 V, 25°C and 50% RH unless otherwise stated.

Detection principle	Photo-electric detection of light scattered in a forward direction by smoke particles						
Chamber configuration	Horizontal optical bench housing an infrared emitter and sensor arranged radially to detect scattered light						
Sensor	Silicon PIN photo-diode						
Emitter	GaAs infra-red light emitting diode						
Sampling frequency	Once per second						
Sensitivity	Nominal response threshold value of 0.12 dB/m when measured in accordance with EN 54-7						
Supply Wiring	Two wire supply, polarity insensitive						
Terminal functions	<table border="0"> <tr> <td>L1</td> <td>Positive supply</td> </tr> <tr> <td>L2</td> <td>Negative supply and remote LED negative</td> </tr> <tr> <td>+R</td> <td>Remote LED positive</td> </tr> </table>	L1	Positive supply	L2	Negative supply and remote LED negative	+R	Remote LED positive
L1	Positive supply						
L2	Negative supply and remote LED negative						
+R	Remote LED positive						
	Notes:						
	1. I.S. detectors are polarity sensitive						
	2. Do not fit a series resistance on remote LED lines.						
	3. The remote LED characteristic differs from XP95.						
Supply voltage	14 - 22 V						
Modulation voltage	5 - 6 V						
Quiescent current	340 µA						
Power-up surge current	1 mA						
Alarm indicator	Clear light emitting diode (LED) emitting red light						
Alarm LED current	1 mA						
Remote LED current	1 mA (internally limited)						
Storage temperature	-30°C to +80°C						
Operating temperature	-20°C to +45°C (T5) -20°C to +60°C (T4)						
Guaranteed temperature range	-20°C to +60°C						
Humidity	0% to 95% RH (no condensation or icing)						
Vibration, impact & shock	To EN 54-7						
IP Rating	IP 44						
Standards and approvals	EN 54, MED, LR, BV, ABS, CCS, KR, CCCF, LPCB, CPR, EAC, BOSEC, ATEX, IECEX, SBSC, DNV-GL, SIL, PESO, RINA						
BASEEFA Certificate No.	BAS02ATEX1289X						
IECEX Certificate No.	IECEX BAS 12.0091X						
Classification (max ambient)	Ex ia IIC T4 GA (≤ +60°C) Ex ia IIC T5 GA (≤ +45°C)						
Dimensions	100 mm diameter x 42 mm height						
Weight	105 g						
Materials	Housing: White flame-retardant polycarbonate Terminals: Nickel plated stainless steel						

Operation

The I.S. Optical Smoke Detector uses the same outer case as the ionization smoke detector and is distinguished by the indicator LED which is clear in standby and red in alarm. Within the case is a printed circuit board which on one side has the light proof labyrinth chamber with integral gauze surrounding the optical measuring system and on the other the address capture, signal processing and communications electronics.

An infrared light emitting diode within its collimator is arranged at an obtuse angle to the photo-diode. The photo-diode has an integral daylight blocking filter.

The infrared LED emits a burst of collimated light every second. In clear air the photo-diode receives no light directly from the infrared LED because of the angular arrangement and the dual mask. When smoke enters the chamber it scatters photons from the emitter infrared LED onto the photo-diode in an amount related to the smoke characteristics and density. The photo-diode signal is processed by the optical ASIC and passed to the A/D converter on the communications ASIC ready for transmission when the device is interrogated.

Electrical description

The I.S. Optical Smoke Detector is designed to be connected to a two wire loop circuit carrying both data and a 14 V to 22 V dc supply. The detector is connected to the incoming and outgoing supply via terminals L1 and L2 in the mounting base. A remote LED indicator requiring not more than 1 mA may be connected between the +R and L2 terminals. An earth connection terminal is also provided. The detector is calibrated to give an analogue value of 25 ± 7 counts in clean air. This value increases with smoke density. A count of 55 corresponds to the EN 54 alarm sensitivity level.

Environmental characteristics

The I.S. Optical Smoke Detector is unaffected by wind or atmospheric pressure and operates over the temperature range -20°C to $+60^{\circ}\text{C}$.

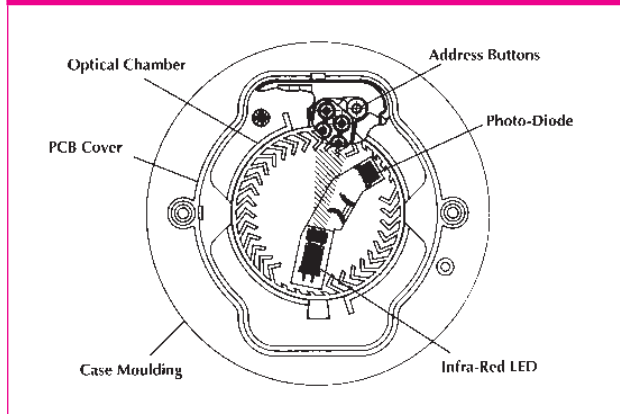
Remote LED connection

A drive point is provided on the XP95 I.S. Optical Smoke Detector for a remote LED indicator. The indicator must be a standard high-efficiency RED LED and does not require a series limiting resistor since current is limited within the detector to approximately 1 mA. Unlike the standard XP95 range, the remote LED cannot be controlled independently from the integral LED since it is effectively connected in series with the integral LED. The benefit of this configuration is that the illumination of the LED does not increase the current drawn from the loop.

System certification allows for the use of any LED indicator having a suitable surface area between 20 mm^2 and 10 cm^2 which covers all commonly used case styles from T1 (3 mm) upwards but would exclude some miniature and surface mounted types. Additional requirements of the certification are that the LED and its terminations must be afforded a degree of protection of at least IP20 and must be segregated from other circuits and conductors as defined in BS EN 60079-14.

The Apollo MiniDisc Remote Indicator, Part No. 53832-070, is suitable.

XP95 I.S. Optical Smoke Detector sectional view



EMC Directive 2014/30/EU

The XP95 I.S. Optical Smoke Detector complies with the essential requirements of the EMC Directive 2014/30/EU, provided that it is used as described in this data sheet.

A copy of the Declaration of Conformity is available from Apollo upon request.

Construction Products Regulation (EU) 305/2011

The XP95 I.S. Optical Smoke Detector complies with the essential requirements of the Construction Products Regulation (EU) 305/2011.

A copy of the Declaration of Performance is available from Apollo upon request.

Conformity of the XP95 I.S. Optical Smoke Detector with the EMC Directive, does not confer compliance with the directive on any apparatus or systems connected to them.

Marine Equipment Directive 2014/90/EU

The XP95 I.S. Optical Smoke Detector complies with the essential requirements of the Marine Equipment Directive 2014/90/EU.

ATEX Directive 2014/34/EU

The XP95 I.S. Optical Smoke Detector complies with the essential requirements of the ATEX Directive 2014/34/EU.