XP95 I.S.

Optical Smoke Detector

Product overview

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

Approvals

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, 23°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: 2001*
Supply Wiring	*Two wire supply, polarity insensitive*
Terminal functions	*L1 Positive supply* *L2 Negative supply and remote LED negative* *+R Remote LED positive* *Notes:* *1. I.S. detectors are polarity sensitive* *2. There is no requirement for series resistance on remote LED lines.* *3. The remote LED characteristic differs from XP95.*
Supply voltage	*14 - 22 V*
Quiescent current	*340 µA*
Power-up surge current	*1 mA*
Alarm indicator	*Clear light emitting diode (LED) emitting red light*
Alarm LED current	*4 mA*
Remote LED current	*1 mA (internally limited)*
Storage temperature	*-30°C to +80°C*
Operating temperature	*-20°C to +40°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)*
Effect of atmospheric pressure	*Unaffected*
Effect of wind speed	*Unaffected by wind*
Vibration, impact & shock	*To EN 54-7*
IP Rating	*designed to IP23D*
Standards & approvals	*EN 54, MED, LR, BV, ABS, CCS, KRS, CCCf, BOSEC, VNIIPO, IECEx, SBSC, NANIO, PESO and ATEX*
BASEEFA Certificate No.	*BAS02ATEX1289*
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 (50 mm height with mounting base)*
Weight	*105 g* *157 g with base*
Materials	*Housing: White flame-retardant polycarbonate* *Terminals: Nickel plated stainless steel*

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Assessed to ISO 9001:2008 Cert/LPCB ref. 010
Assessed to ISO 14001:2004 Cert/LPCB ref. 010 EMS
Cert/LPCB ref. 010

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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°C.

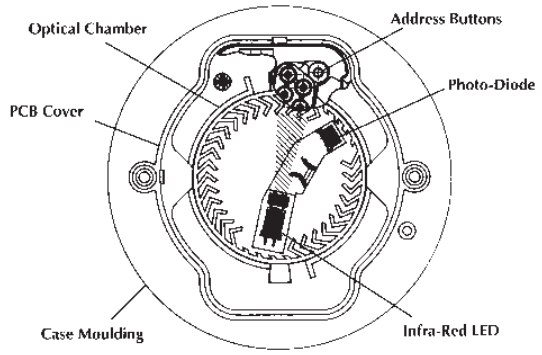
Remote LED connection

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 dœs 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 dœs not increase the current drawn from the loop.

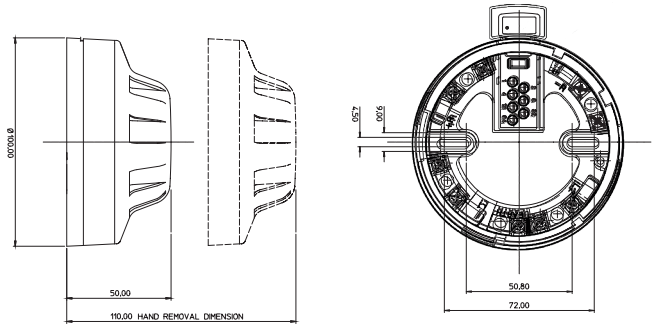
System certification allows for the use of any LED indicator having a suitable surface area between 20 mm² and 10 cm² which covers all commonly used case styles from T1 (3 mm) upwards but would exclude some miniature and surface mounted types. Additional requirements of the certification are that the 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



XP95 I.S. Optical Smoke Detector dimensions



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 305/2011/EU

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

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

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.