Ampac

Fire detection and evacuation solutions that save lives.

Soteria Dimension Optical Detector

Features

- Flush Mounted

- Utilises digital CoreProtocol communications

- Compatible with Discovery and XP95 systems*

- Integrated switchable isolator as standard

- 8-way DIL switch addressing

- Drift compensation

- FasTest® for quicker testing

- Tricoloured LED status indicator

- Polycarbonate moulding for colour stability and strength

- Comprehensively tested to exceed EN 54-7 and EN 54-17 standards

- Approved to AS7240-7 and FPANZ4512 listed

- Locking mechanism (grub screw)

*Note: Not all features may be available when Soteria devices are connected to an XP95 or Discovery fire control panel.

Description

The innovative design of the Soteria Dimension Optical Detector differs from standard fire detectors, having no   chamber and being flush mounted. A new optical sensing   technology is used to detect smoke particles outside the   detector housing. A combination of Infra-Red (IR) LEDs and photo-diodes identify smoke particles, detected just below the detector housing and initiates an alarm.

Item Numbers

Description	Item No (AS/NZ)	Part No (EN)
White Detector	4106-2107	FL5100-600AMP
Black Detector	4106-2111	FL5100-660AMP
Mounting Box	4106-2108	FL5000-200AMP
Digital Communication	XP95®, Discovery® and CoreProtocol® compatible	

Electrical Considerations

The Soteria Dimension Optical Detector is designed to be connected to a two-wire loop circuit carrying both data and a 17 V - 35 V dc supply. A short-circuit isolator is also integrated into the detector head.

Technical Data

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

Specifications

Dimensions

Detector	140mm diameter x 38.2mm depth
With backbox	140 mm diameter x 71mm depth

Weight

Detector	148g
With backbox	273g

Materials

Housing	White flame-retardant polycarbonate
Terminals	Nickel plated stainless steel

Soteria Dimension Optical Detector

Specifications

Detection Principle	Photo-electric light scattering
Sensor configuration	Chamberless detector with two-photodiodes. Micro-controller provides sensor timings, digital signal processing
Sample frequency	Once per second
Terminal Functions (Note: L1 and L2 are polarity sensitive)	-L1 in — Loop in Negative
	-L1 out — Loop out negative
	+L2 — Loop in and out positive
	+R — Remote indicator positive connection (internal connection
	-R — Remote indicator negative connection (4.7 mA maximum)
Supply voltage (Vmin–Vmax)	17 - 35 V dc
Digital Communication	XP95, Discovery Protocol and CoreProtocol compatible
Modulation voltage	5 - 13 V peak to peak
Quiescent Current	1 mA
Power-up surge current	1mA
Maximum power-up time	15 s
Alarm current, LED illuminated	4.5 mA
Maximum loop current	2A
Clean-air analogue value	23 +4/-0
Alarm level analogue value	55
Status Indicator	Alarm — Continuous Red
	Fault — Flashing Yellow
	Isolated — Continuous Yellow
	Poll — Flashing Green
Operating temperature	- 20 °C to + 55 °C
Humidity	0% to 95% RH (no condensation or icing)
Effect of atmospheric pressure	None
Effect of wind speed	None
IP rating	IP55 - rating not EN 54 approved
Standards & Approvals	EN 54-7, EN 54-17, CPR, LPCB, VdS, BOSEC, FG, SBSC , AS7240-7 and FPANZ

Operation

The Soteria Dimension Optical Detector contains two daylight filtered photo-diodes and three IR emitters in different positions and angles. Different combinations of these are used to act as smoke sensors and proximity sensors to measure the smoke level at the detector and to detect any physical obstruction or interference of the detector.

As this detector is chamberless, an IR LED emits light outside the detector. The light is scattered by smoke back towards the detector and registered by a photo-diode.

A pair of microprocessors control these sensors, setting the sensor timings and using a digital phase-sensitive detection algorithm to reduce noise and the effect of background light. They then provide digital filtering for transient rejection, compensation for drift and temperature and ultimately make an alarm decision.

The mode of operation may be selected at the fire control panel (see Table 1).

Table 1: Soteria Dimension Optical Detector Operating modes

Mode	Response Value		Minimum Time to Alarm Fault	Minimum Time to Proximity Fault
	%/m*	dB/m**	Seconds	Seconds
1	4.8	0.27	15	5
2	4.8	0.27	30	5
3	4.8	0.27	15	10
4	4.8	0.27	30	10
5	4.8	0.27	30	15

* Tested in grey smoke

** Tested in oil mist to EN 54-7 standard

With the detection region external to the detector case, the Soteria Dimension Optical Detector is designed to be flush mounted, with a very low profile.

The device has a polycarbonate front plate, which can be locked into place with a grub screw locking mechanism. Three LEDs provide status indication as detailed in the Technical Data table (see page 1).

The Soteria Dimension Optical Detector has been designed and manufactured in the UK to exacting standards using advanced simulation and development processes.

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Soteria Dimension Optical Detector

Application

Fire detectors should always be installed in accordance with all local and national laws and codes of practice. Optical smoke detectors are recommended for general use, particularly where there is a risk of slow burning fires.

Communication

The Soteria Dimension Optical Detector uses the digital CoreProtocol to allow more advanced control and configuration, whilst maintaining backwards compatibility with previous generations of products – Discovery and XP95. For future feature availability, please check with your panel partner.

It should be noted that not all features of the Soteria Dimension Optical Detector will be available when used with Discovery or XP95 fire control panels. If the Soteria Dimension Optical Detectors are used with XP95 fire control panels incorporating drift compensation algorithms, these must be disabled when communicating with the Soteria Dimension Optical Detectors.

Device Addressing

The device address may be set using an 8-bit DIL switch on the detector head.

Note: On mixed systems addresses 127 and 128 are reserved. Refer to system's panel manufacturer for further information.

Backward Compatibility

The Soteria Dimension Optical Detectors have been designed to operate on XP95 and Discovery loops.

EMC Directive 2014/30/EU

The Soteria Dimension Optical 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 on request.

Conformity of the Soteria Dimension Optical Detector with the EMC Directive, does not confer compliance with the directive on any apparatus or systems connected to it.

Construction Products Regulations 305/2011/EU

The Soteria Dimension Optical Detector complies with the essential requirements of the Construction Products Regulation 305/2011/EU.

A copy of the Declaration of Performance is available on request

Detector Location

Correct alignment of the detector can be done by positioning the arrow marked on the backbox with the longest clear line of sight which is free from any ceiling mounted obstructions. The commissioning label present on the faceplate of the detector should line up with the backbox arrow when fitted.

Refer to Figure 1 & 2 for best practice.

Necessary Requirements:

- Always maintain the minimum clearance of 500 mm in all directions (Figure 1)
- Position backbox arrow towards the longest clear line of sight which is free from any ceiling obstructions (Figure 2)
- Only remove commissioning label, on commissioning the system
- For internal use only

The commissioning label is used to aid installation, to shield from dust and to protect the lenses from fingerprints. It must only be removed upon commisioning of the system, as leaving the label on will report a fault to the panel.

Commissioning

The installation must conform to BS5839–1 (or applicable local codes). Because of the way Soteria Dimension works, it is imperative that the windows are kept free from damage, scratches, dirt and fingerprints. The commissioning label present on the faceplate of the detector must not be removed before any installation work is carried out. Before commissioning please remove the label and ensure the windows are free from fingerprints, residue and dirt.

Maintenance & Cleaning

Maintenance should be performed in accordance with applicable local codes. Clean the detector with a dry, lint free cloth. Ensure the fire system is suitably isolated before cleaning detectors.

Troubleshooting

Before investigating individual units for faults, it is important to check that the system wiring is fault free. Earth faults on data loops may cause communication errors. Many fault conditions are the result of simple wiring errors. Check all connections to the unit.

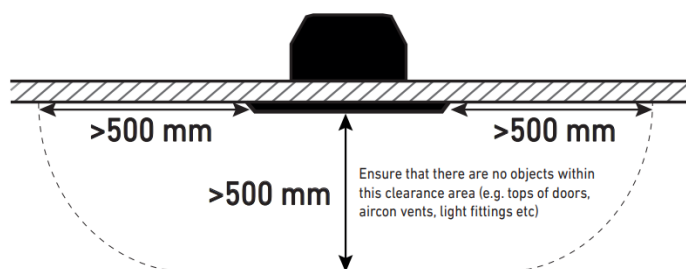**Fire detection and evacuation solutions that save lives.**

Soteria Dimension Optical Detector

Testing

The preferred method of testing the detector is with a Solo 365 using a special Solo 367 adapter, the process is described in the test equipment's installation guide. We recommend cleaning detectors after testing using a dry lint-free cloth.

The new FasTest® mode (**CoreProtocol® only**) facility on Soteria Dimension Optical Detector, which can be enabled on a compatible fire control panel, facilitates quicker testing of detectors with appropriate test equipment. The FasTest disables both a portion of the signal processing algorithm and proximity sensing to allow for a faster detector response, whilst ensuring that the detectors absolute sensitivity remains identical to that of mode 3 (refer to Operating Modes Table). This helps to reduce commissioning time.

Figure 1: Soteria Dimension Optical Detector Siting Requirements (Minimum Clearance)

>500 mm   >500 mm

>500 mm

Ensure that there are no objects within this clearance area (e.g. tops of doors, aircon vents, light fittings etc)

Figure 2: Soteria Dimension Optical Detector Siting Requirements (Correct Alignment)

>500 mm

>500 mm