Soteria Dimension

Optical Detector



Product overview

Product	**Soteria Dimension Optical Detector**
Part No.	**FL5100-600APO** **FL5100-660APO (Black Variant)**
Native Protocol	**XP95®, Discovery® and CoreProtocol®**

Product information

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.

- 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
- Locking mechanism (grub screw)

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

Manufacturer's Specification

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

Detection principle	*Photo-electric light scattering*	
Sensor configuration	*Chamberless detector with two photo-diodes. Micro-controller provides sensor timings, digital signal processing and alarm decision.*	
Sampling 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 to positive)*
	–R	*Remote indicator negative connection (4.7 mA maximum)*
Supply voltage (Vmin–Vmax)	*17 V - 35 V dc*	
Digital communication protocol	*XP95, Discovery Protocol and CoreProtocol compatible*	
Modulation voltage	*5 V - 13 V peak to peak*	
Quiescent current	*1 mA*	
Power-up surge current	*1 mA*	
Maximum power-up time	*15 s*	
Alarm current, LED illuminated	*4.5 mA*	
Maximum loop current through isolator	*2 A*	
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*	
Vibration, impact and shock	*EN 54-7:2018*	
IP Rating	*IP55 - rating not EN 54 approved*	
Standards	*EN 54-7:2018, EN 54-17:2005*	
Dimensions:		
Detector	*140 mm diameter x 38.2 mm depth*	
with backbox	*140 mm diameter x 71 mm depth*	
Weight:		
Detector	*146 g*	
with backbox	*273 g*	
Materials: Housing	*Flame-retardant polycarbonate*	
Terminals	*Nickel plated stainless steel*	

All information in this document is given in good faith but Apollo Fire Detectors Ltd cannot be held responsible for any omissions

Electrical description

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.

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 in the event of a fire and to detect any physical obstructions.

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	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.

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 Apollo digital CoreProtocol to allow more advanced control and configuration, whilst maintaining backwards compatibility with previous generations of Apollo 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 from Apollo 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 Regulation (EU) 305/2011

The Soteria Dimension Optical 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 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.

For wiring best practices please reference our *Screened Cable Wiring in Fire Systems* document (Ref.No. TSD 162),

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

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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)

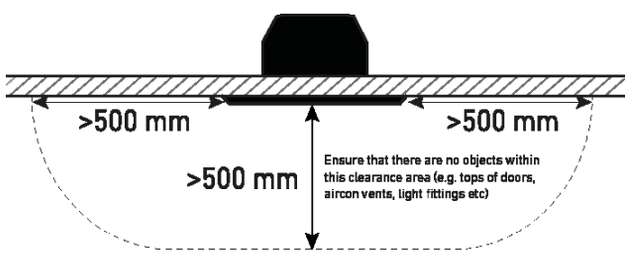


Figure 2: Soteria Dimension Optical Detector Siting Requirements (Correct Alignment)

