Soteria®

Optical/Heat Multisensor Detector



Product overview

Product	**Optical/Heat Multisensor Detector**
Part No.	**SA5100-700 (isolated)**
	SA5100-760 (isolated black)
Native Protocol	**XP95, Discovery and CoreProtocol®**

Product information

The Soteria Optical/Heat Multisensor Detector uses new optical sensing technology, PureLight®, to detect smoke particles entering the chamber and is fitted with two thermistors for detecting heat. It can be switched to detect smoke, heat or a combination of both offering greater flexibility.

- Dual heat sensors
- PureLight optical technology reduces false alarms and enhances smoke recognition
- Available with integrated switchable isolator
- Drift compensation
- Tricoloured LED status indicator
- FasTest® for quicker testing of detectors
- Universal XPERT card addressing
- Locking mechanism (grub screw)

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	*Smoke*	*Photo-electric light scattering*
	Heat	*Thermistor*
Sensor configuration	*Smoke*	*Chamber with surface-mount infrared emitter and prism. Solid state integrated photo-diode and amplifier.*
	Heat	*Dual exposed heat sensing elements*
Sampling frequency	*Once per second*	
Terminal functions (note: L1 & L2 are polarity sensitive)	*+L2*	*Loop in and out positive*
	–L1 in	*Loop (isolated) negative*
	–L1 out	*Loop (isolated) negative*
	+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	*XP95, Discovery and CoreProtocol compatible*	
Modulation voltage	*5 V – 13 V peak to peak*	
Quiescent current	*Isolated detector: 350 µA*	
Power-up surge current	*560 µA*	
Maximum power-up time	*10 seconds*	
Alarm current, LED illuminated	*3.5 mA*	
Clean-air analogue value (excluding Mode 5)	*23 +4/–0*	
Alarm level analogue value	*55*	
Status indicator	*Alarm*	*Red*
	Fault	*Flashing Yellow*
	Isolate	*Yellow*
	Poll	*Green*
Operating temperature	*–40°C to 70°C*	
Humidity	*0% to 95% RH (no condensation or icing)*	
Effect of atmospheric pressure	*None*	
Effect of wind speed	*None, tested up to 10 m/s*	
IP Rating	*IP44*	
Dimensions	*100 mm diameter x 38.5 mm height*	
Weight	*96 g*	

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Manufacturer's Specification (cont'd)

Materials	*Housing: White flame-retardant polycarbonate* *Terminals: Nickel plated stainless steel*

For specifications associated with isolator performance, please refer to PP2090.

Electrical description

The Soteria detector is designed to be connected to a two-wire loop circuit carrying both data and power. All Soteria Detectors feature a short-circuit isolator integrated into the head.

Operation

The low profile design of the Soteria Optical/Heat Multisensor Detector is sleek and evolutionary, with a 360° LED indicator which illuminates red when in alarm, yellow to indicate a fault and green to indicate protocol activity.

At the heart of the Soteria detector is PureLight Sensing Technology which incorporates:

- Cone technology combined with a high-intensity infra-red LED to provide stability and accurate sensitivity to smoke
- A photo-diode and an amplifier integrated into an Application-Specific Integrated Circuit (ASIC)
- 'Serpentine' pathway designed to provide a barrier against dust and insect ingress
- A sophisticated dynamic algorithm, providing transient rejection and compensation for drift whilst maintaining accurate sensitivity

In addition to the optical smoke sensor, the Soteria Optical/Heat Multisensor Detector uses dual temperature sensors for improved reliability and is responsive in all detector orientations.

The independent signals from the optical smoke and heat sensors are combined in the detector microprocessor to produce an alarm decision according to the response mode chosen. With reference to Table 1, the five modes provide response behaviour which incorporates pure smoke detection, pure heat detection or a combination of both. The mode of operation of this processing is selected at the fire control panel.

Device Addressing

A universal XPERT 8 card is supplied with all XPERT 8 Intelligent Mounting Bases. Using a coding guide, pips on the card are removed to set the address of the detector. This simplifies and speeds up installation, commissioning and maintenance. The address location remains the same no matter how often detectors are replaced.

When Soteria devices are used with CoreProtocol, device auto-addressing can be enabled by fire control panels that have been designed to incorporate this feature.

Table 1: Soteria Optical/Heat Multisensor Detector response modes

Mode	Optical Sensor	Heat Sensor	Minimum Time to Alarm
	Response Value	Response type	
	dB/m**		Seconds
1	0.10	>15°C rise	20
2	0.15	–	30
3	0.18	>21°C rise	20
4	0.25	>15°C rise	20
5	–	A1R	20

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

When the Soteria detector is operating as a multisensor (i.e. Modes 1, 3 and 4) the temperature signal processing extracts only rate-of-rise information combined with the optical signal (see Table 1). In these modes the detector will not respond to a slow temperature increase, even if the temperature reaches a high level. A large sudden change in temperature can, however, cause an alarm without the presence of smoke.

Mode 5 has no smoke sensitivity at all, but gives a pure heat detector response meeting the response time requirements for a Category A1R detector in the European standard EN 54-5. In this mode the detector has a "fixed temperature" alarm threshold at 57°C, in addition to rate-of-rise characteristics.

Communication

Soteria uses the new digital CoreProtocol to allow more advanced control and configuration, whilst maintaining backwards compatibility with previous generations of Apollo products – XP95 and Discovery. Discovery and CoreProtocol make use of the Normal, Read and Write modes with additional non-volatile data fields made available to the fire control panel.

Backward Compatibility

Soteria detectors have been designed to operate on XP95 and Discovery loops. This allows for Soteria detectors and bases to operate on existing systems and for Soteria detectors to operate on XP95 and Discovery bases (XPERT 7 Intelligent Mounting Base).

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

Maintenance and Service

Soteria detectors have been designed with a comprehensive set of features to support maintenance and service, from self test capabilities to drift compensation warnings on dirty detectors.

The new FasTest® mode facility on Soteria can be enabled within a fire control panel that incorporates this feature. This facilitates quicker testing of detectors with appropriate test equipment. FasTest disables the transient rejection algorithms to allow a faster detector response, whilst ensuring the detectors absolute sensitivity remains identical to Mode 3. A visual pass/fail indication is provided by the detector and overall, FasTest reduces commissioning and maintenance time.

Maintenance has to be performed in accordance with all applicable standards. Clean the detector externally using a soft damp cloth. For full cleaning and recalibration detectors should be returned to Apollo Fire Detectors.

EMC Directive 2014/30/EU

The Soteria Optical/Heat Multisensor Detector complies with the essential requirements of the EMC Directive 2014/30/EU, provided that it is used as described in this datasheet.

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

Conformity of the Soteria Optical/Heat Multisensor 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 Optical/Heat Multisensor 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.

Figure 1 - Soteria Optical/Heat Multisensor Detector with XPERT 8 Intelligent Mounting Base dimensional drawing

