

Soteria®

Multi-Sensor Detector (Dual Optical / Heat)



Product overview

Product	Soteria Multi-Sensor Detector (Dual Optical / Heat)
Part No.	SA5100-710APO
Digital Communication	Discovery and CoreProtocol® compatible

Product information

The Soteria Multi-Sensor Detector (Dual Optical / Heat) combines dual angle smoke and heat sensors into a single algorithm that achieves reduced susceptibility to false alarms. The detector can operate in 5 modes of sensitivity.

- Available with integrated switchable isolator
- Drift compensation
- Tricoloured LED status indicator
- FasTest® for quicker testing of detectors
- Locking mechanism (grub screw)
- DIL Switch Addressing

*Note: Not all features are available when Soteria devices are connected to a 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.

Digital communication	<i>Discovery and CoreProtocol compatible</i>	
Sensor configuration	Smoke	<i>Chamber with IR emitter receiver pair (LED and photodiode) and a second photodiode receiver to get multiple angle light scattering information.</i>
	Heat	<i>Single, centrally positioned, NTC thermistor.</i>
Sampling frequency	<i>Once per second</i>	
Terminal functions (note: L1 & L2 are polarity sensitive)	+L2	<i>Loop in and out positive</i>
	-L1 in	<i>Loop (isolated) negative</i>
	-L1 out	<i>Loop (isolated) negative</i>
	+R	<i>Remote indicator positive connection</i>
	-R	<i>Remote indicator negative connection (4.7 mA maximum)</i>
Supply voltage (Vmin-Vmax)	<i>17 V – 35 V dc</i>	
Modulation voltage	<i>5 V – 13 V peak to peak</i>	
Quiescent current	<i>600 µA</i>	
Power-up Surge Current	<i>2 mA</i>	
Alarm current, LED illuminated	<i>4 mA</i>	
Clean-air analogue value (excluding Mode 5)	<i>23 +2/-0</i>	
Alarm level analogue value	<i>85 - 97 (Specific values based on the cause of the alarm).</i>	
Operating Modes	1	<i>High Sensitivity - EN54-29, EN54-7 and EN54-5</i>
	2	<i>Clean Environments - EN54-7 (optical only)</i>
	3	<i>General Purpose - EN54-29, EN54-7, and EN54-5</i>
	4	<i>Harsh Environments - EN54-29, EN54-7, and EN54-5</i>
	5	<i>Low Sensitivity - EN54-5 (heat only)</i>
Status indicator	Alarm	<i>Red</i>
	Fault	<i>Flashing Yellow</i>
	Isolate	<i>Yellow</i>
	Poll	<i>Green</i>
Operating temperature	<i>-10°C to 55°C</i>	
Humidity	<i>0% to 90% RH (no condensation or icing)</i>	
IP Rating	<i>IP40</i>	
Dimensions	<i>103 mm diameter x 55 mm height</i>	
Weight	<i>100g</i>	
Materials	<i>All parts are made in >ABS< except the swirl/screen which is in >POM< and the light guides which are in >PC<.</i>	

Electrical description

The Soteria detector is designed to be connected to a two wire loop circuit carrying both data and power. A shortcircuit isolator is integrated into the detector.

Operation

The Soteria Multi-Sensor Detector (Dual Optical / Heat) mounts two LED indicators which illuminate red when in alarm, yellow to indicate a fault and green to indicate protocol activity.

The photo-electric smoke sensing channel works on a light scattering-Tyndall effect basis: an IR emitter-receiver pair (LED and photodiode) is placed in a smoke chamber, designed to have a high immunity to environment light and dust settling.

The optical detection also exploits a second photodiode receiver to take advantage of the dual angle scattering information to improve the capability to reject nuisance related signals.

Proper amplification and data processing is applied to the signals to discriminate transient signals, noises, etc from real fire and dangerous situations. The optical smoke sensing channels compensates for environment light and uses an enhanced dust compensation algorithm to sensibly reduce maintenance periods.

The heat sensing channel exploits a single, centrally positioned, NTC thermistor which supervises the environment temperature.

The mixed information of optical and thermal detection gives an high immunity to false alarms, increases sensitivity in case of temperature raising and allows the product to achieve multiple criteria photo-thermal detection. The dual optical/heat algorithm is based on 5 modes, and allows to adapt the detector performances to different application environments.

Communication

Soteria uses the new digital CoreProtocol to allow more advanced control and configuration, whilst maintaining backwards compatibility with the previous generation of Apollo products – 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.

Device Addressing

The addressing method will not be using the XPERT Address card, instead, it will be through soft addressing or a DIL switch on bottom of the detector.

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 Multi-Sensor Detector (Dual Optical / Heat) response modes

Mode	Mode Description	Optical Sensor		Heat Sensor
		Response Value		Response Type
		%/m	dB/m*	
1	High Sensitivity	2.7	0.12	A1R
2	Clean Enviroments	2.7	0.12	N/A
3	General Purpose	2.7	0.15	A1R
4	Harsh Enviroments	3.8	0.17	A1R
5	Low Sensitivity	-	-	A1R

* Tested in oil mist to EN54-7 standard

Backward Compatibility

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

It should be noted that not all features of Soteria will be available when used with Discovery fire control panels.

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.

FasTest can also be enabled using magnets. Using the line marker on the side of the detector, a magnet can activate FasTest. It is active when the LED's flash RED two times (smoke, heat). The LED flash pattern will change depending on which cell has been tested and passed, for example: GREEN, RED = smoke cell has been tested and passed. Using this feature provides a localised and panel indication that testing has been performed and is automatically logged.

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 Multi-Sensor Detector (Dual Optical / Heat) 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 Multi-Sensor Detector (Dual Optical / Heat) 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 Multi-Sensor Detector (Dual Optical / Heat) complies with the essential requirements of the Construction Products Regulation (EU) 305/2011 in respect of EN 54-5:2017 and EN 54-7:2018.

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

Figure 1 - Soteria Multi-Sensor (Dual Optical / Heat) dimensional drawing

