Soteria®
Optical Smoke Detector

Product overview

Product Type	Optical Smoke Detector
Part No.	SA5000-600 (non-isolated)
	SA5100-600 (isolated)
Digital Communication Protocol	XP95, Discovery & CoreProtocol® compatible

Product information

The Soteria Optical Smoke Detector uses new optical sensing technology, PureLight™, to detect smoke particles entering the chamber. PureLight marks a new stage in the development of Apollo optical technology and aims to reduce the possibility of false alarms whilst increasing the reliability of detection of a real fire.

- PureLight optical technology reduces false alarms and enhances smoke recognition
- Utilises digital CoreProtocol communications
- Compatible with XP95 and Discovery systems*
- Mechanically compatible with existing bases
- Available with or without integrated switchable isolator
- Drift compensation
- Tri-coloured LED status indicator
- Polycarbonate housing for colour stability and strength
- Comprehensively tested to exceed EN 54-7 standard
- FasTest® for quicker testing of detectors
- XPERT 8 card addressing
- Locking mechanism (grub screw)

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

Technical data

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	Chamber with surface-mount infrared emitter and prism. Solid state integrated photo-diode and amplifier.
Sampling frequency	Once per second

Terminal functions (note: L1 & L2 are polarity sensitive)	+L2	Loop in & 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 (4.7mA maximum)

Supply voltage (Vmin–Vmax)	17–35V DC
Digital communication protocol	CoreProtocol, Discovery & XP95 compatible 5–13V peak to peak
Quiescent current	Isolated detector: 350µA
	Non-Isolated detector: 300µA
Power-up surge current	560µA
Maximum power-up time	10s
Alarm current, LED illuminated	3.5mA

Isolated detector data only

Maximum loop current ($I_C$max; L1 in/out)	1A
Maximum series resistance ($Z_C$max; L1 in/out)	80mΩ
Maximum switch current ($I_S$max; L1 in/out)	3A
Maximum leakage current ($I_L$max; during isolation)	33mA (100ms pulse every 2s)
Isolation voltage (V_{SO}min–V_{SO}max)	12.5–15V DC
Reconnect voltage (V_{SC}min–V_{SC}max)	12.8–19.1V DC

A HALMA COMPANY
© Apollo Fire Detectors Limited 2015

INVESTORS IN PEOPLE

Technical data

Continued	
Clean-air analogue value	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 10m/s
Vibration, impact and shock	EN 54-7
IP Rating	IP44
Standards & approvals	SA5000-600 — EN 54-7, CPR & LPCB SA5100-600 — EN 54-7, EN 54-17, CPR & LPCB
Dimensions	100mm diameter x 36mm height (48mm height with XPERT 8 Intelligent Mounting Base)
Weight	83g
Materials	Housing: White polycarbonate UL94-V0
	Terminals: Tin plated stainless steel

Electrical Considerations

The Soteria detector is designed to be connected to a two-wire loop circuit carrying both data and power. A version with a short-circuit isolator integrated into the detector head is also available.

Operating Principles

The low profile design of the Soteria Optical Smoke 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

The sensitivity mode of operation of this processing is selected at the fire control panel (see Table 1).

Table 1 Soteria Optical Smoke Detector operating modes

Mode	Response Value		Minimum Time to Alarm
	%/m*	dB/m**	Seconds
1	1.4	0.10	5
2	1.4	0.10	30
3	2.1	0.14	5
4	2.1	0.14	30
5	2.4	0.16	5

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

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 or where the development of smoke could become the major hazard.

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.

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.

When Soteria detectors are used with an XPERT 7 Intelligent Mounting Base on a CoreProtocol system, Soteria devices will have a +128 address offset due to only 7 address pips being available on the XPERT 7 card.   For example, an XPERT 7 card set at 32 will address as 160 on CoreProtocol with Soteria detectors.

A HALMA COMPANY

INVESTORS IN PEOPLE

Maintenance & 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 2004/108/EC

The Soteria Optical Smoke Detector complies with the essential requirements of the EMC Directive 2004/108/EC, 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 Smoke Detector with the EMC Directive does not confer compliance with the directive on any apparatus or systems connected to it.

Construction Products Regulation 305/2011

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

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

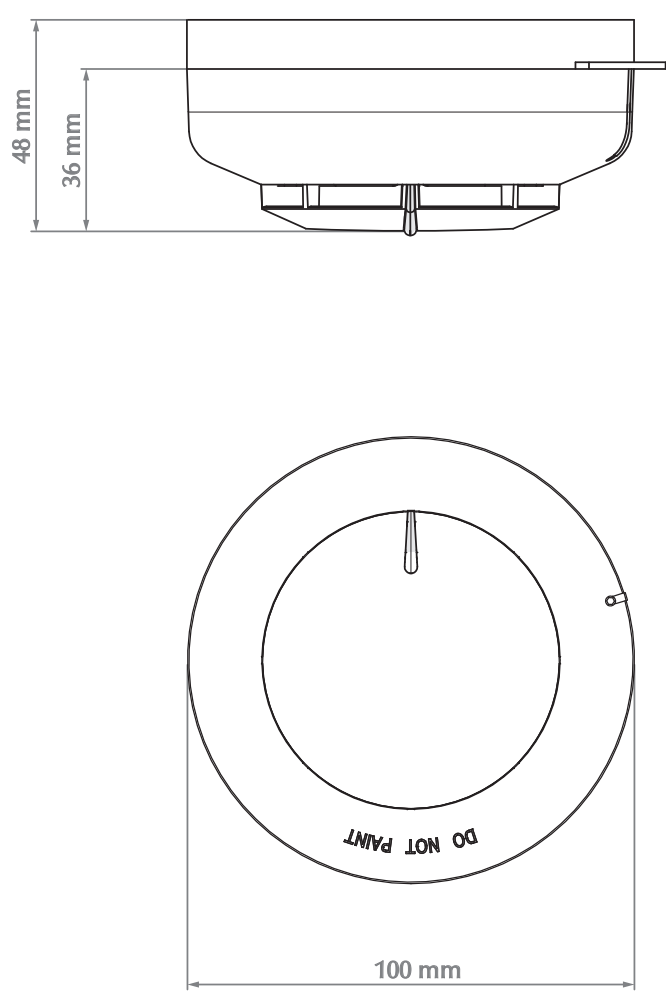**Figure 1 Soteria Optical Smoke Detector with XPERT 8 Intelligent Mounting Base dimensional drawing**

Figure 2 XPERT 8 Intelligent Mounting Base

apollo