ENGINEERING SAFETY CONSULTANTS
The Global Provider of Functional Safety Expertise and Technical Consultancy

Random Hardware Reliability and Systematic Assessment Certificate

Functional Safety of Safety-Related Programmable Electronic Systems

The OEM **'Shield' range of fire detectors** have been assessed and are considered capable for use in a low demand Safety Function up to (and including) SIL 2, with respect to random hardware failures, architectural constraints and systematic capability.

The assessment was based on the assumptions, data provided and recommendations given in:

- **Technis Report No. T663 Issue 1.1;**
- **Technis Report No. T595 Issue 2.0;**
- **Technis Report No. T617 Issue 2.0;**
- **Technis Report No. T618 Issue 3.0 – See Appendix 1 for results;**
- **Technis Report No. T594 Issue 3.0;**
- **Technis Report No. T662 Issue 1.2;**
- **Technis Report No. T616 Issue 2.0;**
- **Engineering Safety Consultants Ltd Prior Use Assessment Report G009_PU001 rev. 4;**
- **Renewal Letter from Apollo Fire Detection Ltd for products with no changes, signed by Billy Blakeman, Head of Conformance, Dated 23rd August 2022;**
- **Renewal Letter from Apollo Fire Detection Ltd for products with PCB / component changes with no impact to safety function, signed by Billy Blakeman, Head of Conformance, Dated 23rd August 2022.**

This certificate is applicable to the following devices:

- SIL-A7011;
- SIL-A8012 (see note 2) ;
- SIL-A8011 (see note 2);
- SIL-A9099;
- SIL-A6061 (see note 1);
- SIL-A8022;
- SIL-A8021;
- SIL-A8023;
- SIL-A7023;
- SIL-A7033.

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Products Assessed	PFD	SFF
SIL-A7011 SIL Indoor Manual Call Point with Isolator	5.0E-05	90% to < 99%
SIL-A7033 SIL I.S Manual Call Point	5.1E-05	90% to < 99%
SIL-A8022 SIL Heat Detector	3.2E-05	90% to < 99%
SIL-A8021 SIL Optical Detector	4.3E-05	90% to < 99%
SIL-A8023 SIL Multisensor Detector	4.5E-05	90% to < 99%
SIL-A8012 SIL I.S Heat Detector (see Note 2)	5.5E-06	90% to < 99%
SIL-A8011 SIL I.S Optical Detector (see Note 2)	1.4E-05	90% to < 99%
SIL-A9099 SIL Shield Protocol Translator (Single)	1.1E-05	90% to < 99%
SIL-A7023 SIL Waterproof Manual Call Point with Isolator	5.0E-05	90% to < 99%
SIL-A6061 SIL Input Output Unit with Isolator (See Note 1)	1.5E-04	60% to < 90%

The certified devices can only achieve SIL 2 if used in conjunction with a fire alarm control panel that supports all elements of the OEM protocol including full fault diagnostics.

The Safety Manual for each product covered by this certificate should provide a reference to the ESC assessment report: G009_PU001 rev. 4.

The assessment was carried out to determine compliance with regards to:

- Probability of Failure on Demand (PFD) with proof test interval of one year and a repair time of a detected failure of 24 hours against IEC 61508 (2010 Edition) and IEC 61511 (2016 Edition);
- Architectural Constraints (SFF) for Type B equipment against IEC 61508 (2010 Edition);
- Systematic Capability against IEC 61511 (2016 Edition), prior use, suitable up to SIL 2.

Note 1: The following devices can achieve only SIL 1 if used in a simplex configuration or SIL 2 if two are used in a duplex configuration, the two interfaces units are configured so that any output command is sent to both interface units and either working will operate the required output device.

Note 2: The listed devices are only to be used with the SIL-A8085 base to maintain the I.S. classification.

IMPORTANT: It should be noted that this assessment does not include confirmation of the response time of the device. For response times (along with any relevant assumptions) reference should be made to the Safety Manual of each device and the total SIF response time **MUST** be compared against the process safety time for the specific application.

Managing Director: Simon Burwood
Assessment Date: April 2017
Renewal Date: September 2022, valid to September 2024
Certificate: G009_CT001 rev. 8

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