



ENGINEERING SAFETY CONSULTANTS

The Global Provider of Functional Safety Expertise and Technical Consultancy

Certificate of Conformity to IEC 61508 Safety Integrity Level (SIL) 2

Functional Safety of Safety-Related Programmable Electronic Systems

Manufacturer: Tyco Fire & Security GmbH (TFSG)
Victor Von Bruns-Strasse 21
8212 Neuhausen am Rheinfall
Schaffhausen
Switzerland

The **TFSG, Generation 6 PH detectors** have been assessed and are considered capable for use in a low demand Safety Function up to SIL 2, with regards to random hardware failures and architectural constraints.

It should be noted that Systematic Capability (SC) has not been addressed as part of this certificate.

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

- **Generation 6 PH Review Report Iss3, by TFSG dated 02/07/2012;**
- **Generation 6 PH FMEDA Iss2, by TFSG dated 06/06/2012;**
- **Renewal Letter from Tyco Fire & Security GmbH, signed by P.W. Cottrell, R&D Engineer – Sensor Team, Dated 8th April 2021.**

The assessment was carried out against failure modes where the detectors were unable to detect and process alarms over the addressable system. The following models were assessed:

- **Generation 6 850PH;**
- **Generation 6 851PH;**
- **Generation 6 851PHN;**
- **Generation 6 856PH;**
- **Generation 6 840PH;**
- **Generation 6 830PH;**
- **Generation 6 FC460PH;**
- **Generation 6 4098-6251 Optical Heat;**
- **Generation 6 4098-6231 Optical Heat.**

The assessment was carried out to determine compliance with IEC 61508 (2010 Edition) with regards to:

- Random Hardware Failures (Predicted PFD <2.0E-03), based on a one year proof test interval;
- Architectural Constraint (Type B, SFF >90%, <99%).

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.

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The following models are covered by this certificate:

Model Name	Product Description	λ DU Dangerous Undetected Failures	λ DD Dangerous Detected Failures	λ S Safe Failures	Safe Failure Fraction	PFD _{avg}
850PH	Multi-sensor Detector with s/c Isolator	3.2E-07 /hr	4.3E-06 /hr	4.5E-07 /hr	93%	1.6E-03
851PH	Multi-sensor Detector with s/c Isolator	3.2E-07 /hr	4.3E-06 /hr	4.5E-07 /hr	93%	1.6E-03
851PHN	Multi-sensor Detector with s/c Isolator	3.2E-07 /hr	4.3E-06 /hr	4.5E-07 /hr	93%	1.6E-03
856PH	Multi-sensor Detector with s/c Isolator	3.2E-07 /hr	4.3E-06 /hr	4.5E-07 /hr	93%	1.6E-03
840PH	Multi-sensor Detector	3.2E-07 /hr	4.3E-06 /hr	4.5E-07 /hr	93%	1.6E-03
830PH	Multi-sensor Detector	3.2E-07 /hr	4.3E-06 /hr	4.5E-07 /hr	93%	1.6E-03
FC460PH	Multi-sensor Detector	3.0E-07 /hr	4.1E-06 /hr	4.5E-07 /hr	93%	1.5E-03
4098-6251 Optical Heat	Multi-sensor Detector with s/c Isolator	3.2E-07 /hr	4.3E-06 /hr	4.5E-07 /hr	93%	1.6E-03
4098-6231 Optical Heat	Multi-sensor Detector	3.2E-07 /hr	4.3E-06 /hr	4.5E-07 /hr	93%	1.6E-03

It should be noted that all variant models stated above are functionally equivalent to the 850PH, 830PH or FC460PH detectors.

Managing Director: Simon Burwood

Member of IEC 61508 (MT61808-1-2) & IEC 61511 (MT61511) Maintenance Committees

Assessment Date: February 2012

Renewal Date: April 2021, valid to April 2023

Certificate: B118_CT004 rev. 6

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