



ENGINEERING SAFETY CONSULTANTS

The Global Provider of Functional Safety Expertise and Technical Consultancy

IEC 61508 Safety Integrity Level Capability Certificate

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 P detectors** have been assessed and are considered capable for use in a low demand Safety Function up to (and including) 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 P Review Report Iss3, by TFSG dated 02/07/2012;**
- **Generation 6 P FMEDA Iss2, by TFSG dated 06/06/2012;**
- **Renewal Letter from Tyco Fire & Security GmbH, signed by Deepika Sahni, Principal Regulatory Engineer, Dated 23rd April 2023;**
- **Addition of 835P / 855P products to B118_CT002 Certificate Letter from Tyco Fire & Security GmbH, signed Deepika Sahni, Principal Regulatory Engineer, Dated 2nd February 2022.**

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 850P;**
- **Generation 6 856P;**
- **Generation 6 840P;**
- **Generation 6 830P;**
- **Generation 6 835P;**
- **Generation 6 855P;**
- **Generation 6 FC460P;**
- **Generation 6 4098-6252 Optical;**
- **Generation 6 4098-6232 Optical.**

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

- SIL 2 with a HFT = 0 via Route 1H;
- 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 devices. 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
850P / 855P	Optical Smoke Detector with s/c Isolator	2.6E-07 /hr	3.2E-06 /hr	4.5E-07 /hr	92%
856P	Optical Smoke Detector with s/c Isolator	2.6E-07 /hr	3.2E-06 /hr	4.5E-07 /hr	92%
840P	Optical Smoke Detector	2.6E-07 /hr	3.2E-06 /hr	4.5E-07 /hr	92%
830P / 835P	Optical Smoke Detector	2.6E-07 /hr	3.2E-06 /hr	4.5E-07 /hr	92%
FC460P	Optical Smoke Detector	2.5E-07 /hr	3.0E-06 /hr	4.5E-07 /hr	92%
4098-6252 Optical	Optical Smoke Detector with s/c Isolator	2.6E-07 /hr	3.2E-06 /hr	4.5E-07 /hr	93%
4098-6232 Optical	Optical Smoke Detector	2.6E-07 /hr	3.2E-06 /hr	4.5E-07 /hr	92%

It should be noted that all variant models stated above are functionally equivalent to the 850P / 855P, 830P / 835P or FC460P detectors.

Note 1: The SIL of a complete SIF (sensor, logic solver and final element subsystems) must be verified to calculate the required PFD / PFH, considering any redundancy, Proof Test Interval (PTI), Proof Test Coverage (PTC), Mission Time and Mean Time To Restoration (MTTR) for all elements included in the SIF. Each subsystem should be verified to ensure compliance with the minimum HFT requirements.

Managing Director: Simon Burwood
 Assessment Date: February 2012
 Renewal Date: April 2023, valid to April 2025
 Certificate: B118_CT002 rev. 8

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