



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 PC 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 PC Review Report Iss3, by TFSG dated 02/07/2012;**
- **Generation 6 PC 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;**
- **Addition of 835PC / 855PC products to B118_CT003 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 850PC;**
- **Generation 6 851PCN;**
- **Generation 6 840PC;**
- **Generation 6 830PC;**
- **Generation 6 835PC;**
- **Generation 6 855PC;**
- **Generation 6 FC460PC;**
- **Generation 6 4098-6254 3oTec Triple Sensor;**
- **Generation 6 4098-6234 3oTec Triple Sensor.**

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

- Random Hardware Failures (Predicted PFD <3.0E-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 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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ENGINEERING SAFETY CONSULTANTS LTD
2nd Floor, Exchequer Court, 33 St. Mary Axe,
London, EC3A 8AA UK
Telephone/Fax: +44 (0)20 8542 2807
E-Mail: info@esc.uk.net Web: www.esc.uk.net
Registered in England and Wales: 7006868
Registered Office: 33 St. Mary Axe, London, EC3A 8AA



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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}
850PC / 855PC	Multi Sensor Detector with s/c Isolator	6.0E-07 /hr	5.7E-06 /hr	1.2E-06 /hr	91%	2.9E-03
851PCN	Multi Sensor Detector with s/c Isolator	6.0E-07 /hr	5.7E-06 /hr	1.2E-06 /hr	91%	2.9E-03
840PC	Multi Sensor Detector	6.0E-07 /hr	5.7E-06 /hr	1.2E-06 /hr	91%	2.9E-03
830PC / 835PC	Multi Sensor Detector	6.0E-07 /hr	5.7E-06 /hr	1.2E-06 /hr	91%	2.9E-03
FC460PC	Multi Sensor Detector	5.9E-07 /hr	5.5E-06 /hr	1.2E-06 /hr	92%	2.8E-03
4098-6254 3oTec Triple Sensor	Multi Sensor Detector with s/c Isolator	6.0E-07 /hr	5.7E-06 /hr	1.2E-06 /hr	91%	2.9E-03
4098-6234 3oTec Triple Sensor	Multi Sensor Detector	6.0E-07 /hr	5.7E-06 /hr	1.2E-06 /hr	91%	2.9E-03

It should be noted that all variant models stated above are functionally equivalent to the 850PC / 855PC, 830PC / 835PC or FC460PC 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_CT003 rev. 7

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London, EC3A 8AA UK

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