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Random Hardware Reliability 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, FV300 Flame Detector range** has been assessed and the variants listed below 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.

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

- **Failure Mode, Effects, and Diagnostics Analysis for the FV300 Family of Flame Detectors Report: FV300 Review Report – 1p3 – 28 Jun 18.pdf;**
- **Failure Mode, Effects, and Diagnostics Analysis for the FV300 Family of Flame Detectors Analysis Spreadsheet: ToSira FV300 FMEDA For Report 1p2 - 16Dec10 1945 25C.xlsm;**
- **Renewal letter from TFSG, signed by T.A. James, Special Hazards Team Leader, dated: 17/10/2022.**

The assessment was carried out against failure modes where the detector was unable to detect and signal alarms to the control function. The assessment applies to the following variants:

- FV311S – Non-camera, screw-terminal back box (516.300.006);
- FV311SC – With PAL camera, screw-terminal back box (516.300.008);
- FV311SC-N – With NTSC camera, screw-terminal back box (516.300.007);
- FV312S – Non-camera, remote cable back box (516.300.055);
- FV312SC – With PAL camera, remote cable back box (516.300.057);
- FV312SC-N – With NTSC camera, remote cable back box (516.300.056).

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

- SIL 2 with a HFT = 0 via Route 1_H;
- Architectural Constraints (Low demand, 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.

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

Managing Director: Simon Burwood
Assessment Date: November 2015
Renewal Date: October 2022, valid to October 2024
Certificate: D053_CT002 rev. 4

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