



Certificate of Conformity to IEC 61508
Safety Integrity Level (SIL) 3 (at HFT = 1) in Terms
of Random Hardware Performance Requirements
and Systematic Capability

Functional Safety of Safety-Related Programmable Electronic Systems

The Pneumatrol 3/2 Direct Acting Poppet Valve with Actuator BV5009 (Note 1) Assembly – De-Energise to Trip Function has been assessed and is considered capable for use in a Low Demand Safety Function up to SIL 3 (with a Hardware Fault Tolerance (HFT) = 1) with regards to random failure rates and systematic capability. The assessment was based on the assumptions, data provided and recommendations given in:

- ESC Ltd report: E058_SV001 rev. 3.
Letter from Stephen Lord of Pneumatrol to Paulo Oliveira of ESC; SIL Statement Direct Acting Poppet; Received 20/12/2018

The system was assessed against the following failure mode:

- De-energised to close within 500ms – minimal or no leakage to output (port 2) or exhaust chamber (port 3) required to achieve the response time.

The assessment was carried out to determine compliance with IEC 61508 with regards to:

- Random Hardware Failures (Predicted Probability of Failure on Demand (PFD)) was based on a 1 year proof test;
Architectural Constraints;
Systematic capability.

Table with 7 columns: Type, Configuration, Achieved PFD, Achieved SIL (PFD) (Note 2), Achieved SIL (Architecture), Systematic Capability, Overall Achieved SIL. It contains two rows of data for different configurations of the 3/2 Direct Acting Poppet Valve.

Note 1: The SIL Capability assessment is only valid when the valve is used with an Exd coil similar to the BV5009 actuator.

Note 2: The sensing, logic solver and reaming final element sub-system have been excluded for the analysis and subsequently 80% of the SIL band has been allocated for their inclusion (e.g. SIL 2 band is modified to ≥ 0.2E-03 to < 0.2E-04).

Handwritten signature of Kenneth G L Simpson

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