



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 Systems

The **CelerosFlow CV700 & 100-320 (Reverse Acting) Actuator models** have been assessed and are considered suitable for use as part of the final element in a low demand Safety Function **up to and including SIL 2**, with respect to random failure rates and architectural constraints, however the complete safety function loop will need to be analysed to confirm its suitability to meet the required integrity

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

- **ESC Ltd Report: J222_FM001 rev. 1.**

The product was assessed against the following failure mode:

- Ability to generate the minimum specified torque to move drive shaft to the predefined safe position when connected to valve.

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

- Random Hardware Failures;
- Architectural Constraints.

Device	λ_{DU} (/hr)	λ_{DD} (/hr)	λ_S (/hr)	Device Type	SFF	Predicted PFD (refer to Note 1 & Note 2)
CV700 (Reverse Acting)	2.58E-07	0.00E-00	1.39E-06	A	84.4%	1.13E-03
1000-320 (Reverse Acting)	3.11E-07	0.0E-00	9.73E-07	A	75.8%	1.36E-03

Note 1: The analysis was based on the assumption that repairs would be carried out with a Mean Down Time (MDT) of 168hours, a Proof Test Interval (PTI) of one year (8760 hours)

Note 2: The remaining sensing, logic solver and additional final element sub-systems were excluded from the assessment, in order to allow for their PFD contributions, the devices were assessed against 20% of the SIL band.

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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