



Certificate / Certificat Zertifikat / 合格証

FLO 091050 C001

exida hereby confirms that the:

**G4, G4Z, G4B, G4XZ, TSG4
Durco Two-way Plug Valves**

**Flowserve Corporation
Cookeville, TN - USA**

Have been assessed per the relevant requirements of:

IEC 61508 : 2010 Parts 1-2

and meets requirements providing a level of integrity to:

Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A, Route 2_H Device

**PFH/PFD_{avg} and Architecture Constraints
must be verified for each application**

Safety Function:

The Two-way Plug Valve will move to the designed safe position per the actuator design within the specified safety time.

Application Restrictions:

The unit must be properly designed into a Safety Instrumented Function per the Safety Manual requirements.



Evaluating Assessor

Certifying Assessor

The manufacturer may use the mark:



Revision 4.1 June 26, 2023
Surveillance Audit Due
July 1, 2026



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Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A, Route 2_H Device

**PFH/PFD_{avg} and Architecture Constraints
must be verified for each application**

Systematic Capability :

The product has met manufacturer design process requirements of Safety Integrity Level (SIL) 3. These are intended to achieve sufficient integrity against systematic errors of design by the manufacturer.

A Safety Instrumented Function (SIF) designed with this product must not be used at a SIL level higher than stated.

Random Capability:

The SIL limit imposed by the Architectural Constraints must be met for each element. This device meets *exida* criteria for Route 2_H.

IEC 61508 Failure Rates in FIT*

Application	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Full Stroke	0	0	0	468
Tight Shut-Off	0	0	0	892
Open on Trip	0	142	0	326
Full Stroke with PVST	0	0	183	285
Tight Shut-Off with PVST	0	0	183	709
Open on Trip with PVST	142	0	183	143

* FIT = 1 failure / 10⁹ hours

SIL Verification:

The Safety Integrity Level (SIL) of an entire Safety Instrumented Function (SIF) must be verified via a calculation of PFH/PFD_{avg} considering redundant architectures, proof test interval, proof test effectiveness, any automatic diagnostics, average repair time and the specific failure rates of all products included in the SIF. Each element must be checked to assure compliance with minimum hardware fault tolerance (HFT) requirements.

The following documents are a mandatory part of certification:

Assessment Report: FLO 09-10-50 R015 V5R1 Assessment Cookeville Rotary Valves (or later)

Safety Manual: SIL Safety Guide Durco Plug Valves, Rev 3



G4 SleeveLine, G4Z Fire Sealed, G4B Marathon, G4XZ Firesafe, and TSG4 Severe Service Two-way Plug Valves