

The manufacturer
may use the mark:



Reports:

FLO 10-01-53 R007 Mark
Series Assessment Report
V1 R1

FLO 10-01-53 R004 V1R1 -
Flowserve 3-Way FMEDA
Report

Validity:

This assessment is valid for
Mark One 3-Way valve

This assessment is valid until
July 1, 2013.

Revision 1.0 June 29, 2010



Certificate / Certificat Zertifikat / 合格証

FLO 10-01-53 C004

exida hereby confirms that the:

Mark One 3-Way valve

**Flowserve Corporation
Springville, UT - USA**

Has been assessed per the relevant requirements of:

IEC 61508 Parts 1, 2

and meets requirements providing a level of integrity to:

Systematic Integrity: SIL 3 Capable

Random Integrity:

**Type A; SIL must be verified for the entire
final element application**

Safety Function:

The valve will move to the designed safe position when de-energized / energized within the specified safety time.

Application Restrictions:

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



Product Assessor

Auditor

Certificate / Certificat / Zertifikat / 合格証

FLO 10-01-53 C004

Systematic Integrity: SIL 3 Capable

Random Integrity:

Type A, SIL must be verified for the entire final element application

Mark One 3-Way valve
Flowserve Corporation
Springville, UT - USA

SIL 3 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 without "prior use" justification by end user or diverse technology redundancy in the design.

Failure rates Mark One 3-Way valve (Clean Service)

	λ_{sd} (FIT)	λ_{su}^1 (FIT)	λ_{dd} (FIT)	λ_{du} (FIT)
Full Stroke	0	1731	0	623
Tight Shutoff	0	980	0	1374
Open to Trip	0	1765	0	589
Full Stroke with PVST	84	1647	236	387
Tight Shutoff with PVST	0	980	236	1138
Open to Trip with PVST	73	1692	236	353

¹ It is important to realize that the "no effect" failures are included in the "safe undetected" failure category according to IEC 61508. Note that these failures on their own will not affect system reliability or safety, and should not be included in spurious trip calculations

SIL Verification:

The Safety Integrity Level (SIL) of an entire Safety Instrumented Function (SIF) must be verified via a calculation of 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 subsystem must be checked to assure compliance with minimum hardware fault tolerance (HFT) requirements.

* FIT = 1 failure / 10⁹ hours



Form	Version	Date
C61508	2.3	May 2010