

The manufacturer
may use the mark:



Reports:

ASCO Q08/12-38 R003
FMEDA Report V3 R1
ASCO Q08/12-38 R005 IEC
61508 Assessment Report
V3 R3

Validity:

This assessment is valid for
the Series 8320 Solenoid
Valves

This assessment is valid until
Feb 28, 2013.

Revision 4 December 10, 2010



Certificate / Certificat Zertifikat / 合格証

ASCO 08/12-38 C003

exida hereby confirms that the:

Series 8320 Solenoid Valves

**ASCO Numatics
Florham Park, NJ - 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:

For a standalone Valve:

Type A Device: SIL 3 @ HFT=1 / SIL 2 @ HFT=0

For a Valve used in a final element assembly:

SIL must be verified for the specific 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. c



Product Assessor

Auditor

Certificate / Certificat / Zertifikat / 合格証

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Systematic Integrity: SIL 3 Capable

Random Integrity:

For a standalone Valve:

Type A Device: SIL 3 @ HFT=1 / SIL 2 @ HFT=0

For a Valve used in a final element assembly:

SIL must be verified for the specific application

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.

IEC 61508 Failure Rates

For valves used in a final element assembly, SIL must be verified for the specific application using the following failure rate data.

Failure rates according to IEC 61508, 1st edition, for the Series 8320 Solenoid Valves in FIT*

Device	λ_{sd}	λ_{su}	λ_{dd}	λ_{du}	SFF
8320, De-energize on trip	0 FIT	184 FIT	0 FIT	88 FIT	67.5%
8320, Energize on trip	0 FIT	86 FIT	0 FIT	136 FIT	38.8%
8320, De-energize with PVST	184 FIT	0 FIT	87 FIT	1 FIT	99.7%
8320, Energize with PVST	86 FIT	0 FIT	134 FIT	2 FIT	99.4%

Applications

8320, NC	8320, Normally Closed, De-energize on trip
8320, NC	8320, Normally Closed, Energize on trip

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

Series 8320 Solenoid Valves

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Form	Version	Date
C61508	2.3	May 2010