The manufacturer may use the mark:

Certificate / Certificat

Zertifikat / 合格証

ASC 10/11-039

exida hereby confirms that the:

EF8317A, EF8320A & EF8321A Harsh Environment Valves

ASCO Numatics Florham Park, NJ - USA

Has been assessed per the relevant requirements of:

IEC 61508 : 2010 Parts 1-7

and meets requirements providing a level of integrity to:

Systematic Integrity: SIL 3 Capable

Random Integrity: Type A Element

PFD_{AVG} and Architecture Constraints must be verified for each 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.

Reports:
ASC 10-11-039 R001 V1 R1 Assessment Report
ECR35958 FMEDA FOR HARSH VALVE (8320,8317,8321) SERIES Rev-A FMEDA Report

Validity:
This assessment is valid for the EF8317A, EF8320A & EF8321A Harsh Environment Valves

This assessment is valid until June 1, 2014.

Revision 1.0 May 17, 2011

Evaluating Assessor

Certifying Assessor

Certificate / Certificat / Zertifikat / 合格証

ASC 10/11-039

Systematic Integrity: SIL 3 Capable

Random Integrity: Type A Element

PFD_{AVG} and Architecture Constraints must be verified for each application

EF8317A, EF8320A & EF8321A Harsh Environment Valves

ASCO Numatics Florham Park, NJ - 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.

IEC 61508 Failure Rates in FIT*

Device - Application	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
EF8317A HE Valve, De-energize To Trip	0	103	0	80
EF8317A HE Valve, DTT with PVST†	100	3	74	6
EF8317A HE Valve, Energize To Trip	0	34	0	118
EF8317A HE Valve, ETT with PVST†	31	3	111	7
EF8320A HE Valve, De-energize To Trip	0	87	0	69
EF8320A HE Valve, DTT with PVST†	84	3	63	6
EF8320A HE Valve, Energize To Trip	0	34	0	92
EF8320A HE Valve, ETT with PVST†	31	3	85	7
EF8321A HE Valve, De-energize To Trip	0	143	0	211
EF8321A HE Valve, DTT with PVST†	140	3	200	11
EF8321A HE Valve, Energize To Trip	0	145	0	179
EF8321A HE Valve, ETT with PVST†	142	3	168	11

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 / 10^9 hours
† PVST = Automated Partial Valve Stroke Test (Full Cycle of Harsh Environment Valve

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Form	Version	Date
C61508	2.7-3	Mar 2011