Certificate / Certificat
Zertifikat / 合格証

ASC 1501030 C001

exida hereby confirms that the:

Series 364 Solenoid Valves

ASCO, L.P.
Florham Park, NJ - USA

Have been assessed per the relevant requirements of:

IEC 61508 : 2010 Parts 1-7

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 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.

The manufacturer may use the mark:

Revision 2.1 July 25, 2018
Surveillance Audit Due
May 1, 2019

Evaluating Assessor

Certifying Assessor

ANSI Accredited Program
ISO/IEC 17065
PRODUCT CERTIFICATION BODY
#1004

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ASC 1501030 C001

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

Series 364 Solenoid Valves

Systematic Capability :

These products have 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 these products 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[1]

Type	Function and Safe Mode Considered	Configuration		No Diagnostics		Automated PVST[2] Diagnostics			
		NC	NO	λ_{SU}	λ_{DU}	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
SOV	Single Solenoid Valve, DTT	✓	✓	568	354	552	16	313	41
	Single Solenoid Valve, ETT	✓	✓	32	555	21	11	512	43
	Double Solenoid Valve, ETT	User Config.		37	816	26	11	745	71
	Latching Palm Button, Single Solenoid Valve, DTT	✓	N/A	644	380	637	7	340	40
	Adder for >16 Watt Coils - DTT	✓	✓	405	0	401	4	0	0
	Adder for >16 Watt Coils - ETT[3]	✓	✓	0	85	0	0	84	1
Non-SOV	Pilot Operated / Spring Return, DTT	✓	✓	143	237	130	13	210	27
	Pilot Operated / Spring Return, ETT	✓	✓	27	356	16	11	326	30
	Double Pilot, Air Operated (with Detent), ETT	User Config.		27	521	16	11	474	47
	Palm Operated / Air Return, ETT	✓	N/A	18	442				
	Palm Operated / Air Return, Manual Trip (MT)	✓	N/A	18	360				
	Pilot Operated / Spring Return, Latching, DTT	✓	N/A	200	283	195	5	255	28
	Pilot Operated / Spring Return, Latching, ETT	✓	N/A	30	466	19	11	430	36
	Remote Pilot, Latching Non Indicating, DTT	✓	N/A	226	342	221	5	308	34
	Remote Pilot, Latching Non Indicating, Remote Pilot Trip	✓	N/A	20	559	18	2	494	65
	Specialized Application: NON Latching Indicating, DTT	✓	N/A	235	251				
	Button Operated / Spring Return, Manual Trip (MT)	✓	✓	28	206				

[1] FIT = 1 failure / 10^9 hours

[2] PVST = Partial Valve Stroke Test of a final element Device

[3] Only one adder is used for ETT Double Solenoid Valves

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: ASC 15/01-030 R001 V1 R2 (or later)

Safety Manual: V9629R8 (or later)

80 N Main St
Sellersville, PA 18960