Certificate / Certificat
Zertifikat / 合格証

ASH 1207077 C001

exida hereby confirms that the:

A-Series Pressure Switch

Ashcroft Inc.
Stratford, CT - 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 Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A Element

SIL 1 @ HFT=0; SIL 2 @ HFT = 1; Route 1_H

SIL 2 @ HFT=0; SIL 3 @ HFT = 1; Route 2_H

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

Safety Function:
The A-Series Switch will de-energize the associated circuit when the trip pressure is reached. The de-energized switch position is with the NC switch contact open on a high pressure trip, or the NO switch contact open on a low pressure trip.

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

_____
Evaluating Assessor

_____
Certifying Assessor

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A-Series Pressure Switch

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 for each element. This element meets *exida* criteria for Route 2_H.

IEC 61508 Failure Rates in FIT*

Single Switch		λ_{SD}	λsu	λ_{DD}	λ_{DU}	#
S-1	High Trip	0	26	0	89	67
	Low Trip	0	88	0	51	50
S-2	High Trip	0	24	0	68	65
	Low Trip	0	70	0	48	48
BV-1	High Trip	0	24	0	128	290
	Low Trip	0	100	0	78	273
BV-2	High Trip	0	24	0	139	309
	Low Trip	0	100	0	88	292
BV-3	High Trip	0	24	0	173	279
	Low Trip	0	130	0	92	262

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.

The following documents are a mandatory part of certification:

Assessment Report: ASH 16/02-007 R002 V2,R1 (or later)

Safety Manual: I&M009-10210

* FIT = 1 failure / 10^9 hours

exida®

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T-002, V5R3