Certificate / Certificat

Zertifikat / 合格証

ASH 1602007 C001

exida hereby confirms that the:

B, D & T - Series Pressure Switches

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 B, D & T - Series Switches 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

The manufacturer may use the mark:

Revision 1.1 January 24, 2017
Surveillance Audit Due
December 1, 2019

ANSI Accredited Program
PRODUCT CERTIFICATION
#1004

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B, D & T - Series Pressure Switches

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.

IEC 61508 Failure Rates, Single Switch, in FIT*

Description	Trip	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Vacuum & Compound	High	0	45	0	152
	Low	0	50	0	150
Pressure, Metal Diaphragm	High	0	45	0	111
	Low	0	46	0	113
Pressure, Elastomeric Diaphragm	High	0	45	0	127
	Low	0	58	0	117
Pressure, Piston O-Ring	High	0	45	0	185
	Low	0	89	0	144
Differential Pressure	High	0	84	0	160
	Low	0	52	0	197
Temperature	High	0	45	0	136
	Low	0	68	0	116

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 V1 R1

Safety Manual: I&M900-10253

* FIT = 1 failure / 10^9 hours

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