Certificate / Certificat
Zertifikat / 合格証

UEC 2006041 C001

exida hereby confirms that the:

12 Series Switch and Options

United Electric Controls
Watertown, MA - USA

Has been assessed per the relevant requirements of:

IEC 61508 : 2010 Parts 1-2

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

PFH/PFD_{avg} and Architecture Constraints must be verified for each application

Safety Function:

The 12 Series switch contacts with change state when the setpoint Pressure or Temperature is reached within the stated safety accuracy.

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 1.4 February 29, 2024
Surveillance Audit Due
March 1, 2027

ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17065
PRODUCT CERTIFICATION BODY
#1004

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Random Capability: Type A Element

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

PFH/PFD_{avg} and Architecture Constraints must be verified for each application

12 Series Switch and Options

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 must be met for each element. This element meets *exida* criteria for Route 2H.

Model – Switch Type	Trip	λ_{SD}	λ_{SU}[1]	λ_{DD}	λ_{DU}	#
Pressure -Single Switch	High	0	45	0	141	193
	Low	0	67	0	119	194
Pressure - Dual Switch, Series	High	0	29	0	199	197
	Low	0	53	0	175	197
Pressure - Dual Switch, Parallel	High	0	64	0	88	197
	Low	0	83	0	69	197
Differential Pressure – Single Switch	High	0	169	0	300	427
	Low	0	227	0	245	427
Differential Pressure – Dual Switch, Series	High	0	152	0	359	430
	Low	0	212	0	302	430
Differential Pressure – Dual Switch, Parallel	High	0	187	0	248	430
	Low	0	243	0	195	430
Temp, Local Access – Single Switch	High	0	34	0	270	42
	Low	0	79	0	215	42
Temp, Local Access– Dual Switch, Series	High	0	17	0	329	45
	Low	0	64	0	272	45
Temp, Local Access – Dual Switch, Parallel	High	0	52	0	218	45
	Low	0	95	0	165	45
Temp, Remote Access– Single Switch	High	0	21	0	178	62
	Low	0	99	0	99	58
Temp, Remote Access– Dual Switch, Series	High	0	4	0	236	65
	Low	0	84	0	155	61
Temp, Remote Access– Dual Switch, Parallel	High	0	39	0	125	65
	Low	0	115	0	49	61

* FIT = 1 failure / 10^9 hours

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: UEC 20/06-041 R002 V3 R1 (or later)
Safety Manual: Safety Manual 12_100_120 Series Rev 1

80 N Main St
Sellersville, PA 18960