Certificate / Certificat

Zertifikat / 合格証

ELL 1610010 C001

exida hereby confirms that the:

Pneumatic Trip System

Elliott Company
Jeannette, PA - 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

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

Safety Function:

The Pneumatic Trip System will reduce turbine speed to less than 500 RPM in 15 minutes on an overspeed 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 2.0 April 1, 2021
Surveillance Audit Due
September 1, 2023

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

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Pneumatic Trip System

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 device meets *exida* criteria for Route 2_H.

IEC 61508 Failure Rates in FIT*

Application/Device/Configuration	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}	MTTFS
Full Stroke, Clean Service, 1oo2 Solenoid Architecture	1182	0	0	799	97
Full Stroke with PVST, Clean Service, 1oo2 Solenoid Architecture	1099	83	200	599	104
Full Stroke, Clean Service, 2oo2 Solenoid Architecture	202	0	0	1156	566
Full Stroke with PVST, Clean Service, 2oo2 Solenoid Architecture	119	83	200	956	963

* FIT = 1 failure / 10^9 hours

See the assessment report for the applicable models.

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: ELL 16/10-010 R002 V2 R1 (or later)

Safety Manual: 5046521

80 N Main St
Sellersville, PA 18960