Certificate / Certificat
Zertifikat / 合格証

ROS 2009098 C001

exida hereby confirms that the:

2120 Vibrating Fork Liquid Level Switch
Rosemount Tank Radar
(an Emerson company)
Sweden

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 B Element

2120 H, K, G – DRY: SIL 2 @ HFT=0; SIL 3 @ HFT = 1; Route 2_H

2120 V – DRY: SIL 1 @ HFT=0; SIL 2 @ HFT = 1; Route 1_H

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

Safety Function:
The 2120 Vibrating Fork Liquid Level Switch measures point level and subsequently communicates this level to a logic solver via a range of interfaces, specified by the model code.

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 3.1 January 6, 2021
Surveillance Audit Due January 1, 2024

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

exida Certification

John C Gozallinas
Evaluating Assessor

Certifying Assessor

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Systematic Capability: SC 3 (SIL 3 Capable)
Random Capability: Type B Element

2120 H, K, G – DRY: SIL 2 @ HFT=0; SIL 3 @ HFT = 1; Route 2_H

2120 V – DRY: SIL 1 @ HFT=0; SIL 2 @ HFT = 1; Route 1_H

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

2120 Vibrating Fork Liquid Level 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 must be met for each element. This device meets exida criteria for Route 2_H for models H, K, and G, and meets criteria for Route 1_H for model V.

IEC 61508 Failure Rates in FIT*

2120 Level Switch	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}	SFF
NAMUR (K) - DRY = On	0	118	131	24	n/a
8/16mA (H) - DRY=On	0	136	152	29	n/a
PNP/PLC (G) - DRY=On	0	241	130	41	n/a
Relay (V) - DRY=On	0	131	130	102	72.0%

* FIT = 1 failure / 10^9 hours

Note that this certificate is limited to only those variations of the product listed above, configured for Dry application.

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: ROS 20-09-098 R006 V3R2 or later

Safety Manual: 00809-0500-4030 Rev AH or later

80 N Main St
Sellersville, PA 18960