



# Certificate / Certificat

# Zertifikat / 合格証

ROS 2009098 C002

exida hereby confirms that the:

## 2130 Vibrating Fork Liquid Level Switch

### Rosemount Tank Radar (an Emerson company)

### Sweden

The manufacturer may use the mark:



Revision 4.0 December 8, 2023  
Surveillance Audit Due  
January 1, 2027

Has been assessed per the relevant requirements of:

**IEC 61508 : 2010 Parts 1-3**

and meets requirements providing a level of integrity to:

**Systematic Capability: SC 3 (SIL 3 Capable)**

**Random Capability: Type B Element**

**2130 P, L, N, M, D; -DRY or -WET:**

**SIL 2 @ HFT=0, SIL 3 @ HFT=1; Route 2<sub>H</sub>**

**PFH/PFD<sub>avg</sub> and Architecture Constraints**

**must be verified for each application**

#### Safety Function:

The 2130 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.



*Valeria Motto*

Evaluating Assessor

*Molly Lynn O'Brien*

Certifying Assessor

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## ROS 2009098 C002

**Systematic Capability: SC 3 (SIL 3 Capable)**

**Random Capability: Type B Element**

**2130 P, L, N, M, D; -DRY or -WET:**

**SIL 2 @ HFT=0, SIL 3 @ HFT=1; Route 2H**

**PFH/PFD<sub>avg</sub> and Architecture Constraints  
must be verified for each application**

### 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<sub>H</sub> for all listed models.

### IEC 61508 Failure Rates in FIT\*

Device 2130 Level Switch	$\lambda_{SD}$	$\lambda_{SU}$	$\lambda_{DD}$	$\lambda_{DU}$
Model (N) - DRY = On	0	134	150	18
Model (N) - WET = On	0	16	257	29
Model (D) - DRY = On	0	146	148	94
Model (D) - WET = On	0	31	253	104
Model (D) - DRY = On, with Fault Relay	0	147	148	95
Model (D) - WET = On, with Fault Relay	0	32	253	105
Model (M) - Dry=On	0	155	171	25
Model (M) - Wet=On	0	41	276	35
Model (P) - DRY = On	0	162	165	42
Model (P) - WET = On	0	60	284	54
Model (L) - DRY = On	0	178	155	44
Model (L) - WET = On	0	76	278	55

\* FIT = 1 failure / 10<sup>9</sup> hours

### SIL Verification:

The Safety Integrity Level (SIL) of an entire Safety Instrumented Function (SIF) must be verified via a calculation of PFH/PFD<sub>avg</sub> 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 R005 V4R0 or later

**Safety Manual:** 00809-0500-4130 Rev AL or later

2130 Vibrating Fork  
Liquid Level Switch



80 N Main St  
Sellersville, PA 18960