



Certificate / Certificat Zertifikat / 合格証

ROS 1306005 C001

exida hereby confirms that the:

Rosemount 5300 Series 4-20mA HART Guide Wave Radar and Interface Transmitter

Device Label SW 2.A1 – 2.J0

Rosemount Tank Radar

(an Emerson Process Management company)

Gothenburg, 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

SIL 2@HFT=0 SIL 3@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 5300 Series Transmitter will measure Level within the stated safety accuracy.

Application Restrictions:

The unit must be properly designed into a Safety Instrumented Function per the Safety Manual requirements.

The manufacturer
may use the mark:



Valid until Nov 1, 2016.

Revision 1.1 Mar 31, 2014



ANSI Accredited Program
PRODUCT CERTIFICATION
#1004



Evaluating Assessor

Certifying Assessor

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Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type B Element

SIL 2@HFT=0 SIL 3@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

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 must be checked for each element.

IEC 61508 Failure Rates in FIT ¹

Route 1_H Table

Device	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}	SFF
Rosemount 5300 Series 4-20mA HART Guide Wave Radar Level and Interface Transmitter	0	60	965	96	91%

Route 2_H Table²

Device	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Rosemount 5300 Series 4-20mA HART Guide Wave Radar Level and Interface Transmitter	0	60	965	96

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. Worst case fault detection time must be obtained from the manufacturer.

The following documents are a mandatory part of certification:

Assessment Report: **ROS 13-06-005 R002 V1 R2**

Safety Manual: **00809-1400-4530**

¹ FIT = 1 failure / 10⁹ hours

² SFF not required for devices certified using Route 2_H data. For information detailing the Route 2_H approach as defined by IEC 61508-2, see Technical Document entitled "Route 2_H SIL Verification for Rosemount Type B Transmitters with Type A Components".

5300 Series Level Transmitter



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T-002, V3R1-3