



The manufacturer may use the mark:



Valid until April 1, 2018
Revision 2.4 May 27, 2015



ANSI Accredited Program
PRODUCT CERTIFICATION
#1004

Certificate / Certificat

Zertifikat / 合格証

ROS 1107062 C002

exida hereby confirms that the:

**Emerson's Rosemount® 2051
Pressure Transmitter with 4-20mA HART**
Device Label SW 1.0.0-1.4.x

**Rosemount Inc.
Shakopee, MN - 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 B Element

SIL 2@HFT=0 SIL 3@HFT=1, Route 1_H
For models where SFF ≥ 90%

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 Emerson's Rosemount® 2051 Pressure Transmitter with 4-20mA HART will measure Pressure/Level/Flow 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

Certificate / Certificat / Zertifikat / 合格証

ROS 1107062 C002

Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type B Element
SIL 2@HFT=0 SIL 3@HFT=1, Route 1_H
For models where SFF ≥ 90%

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.

IEC 61508 Failure Rates in FIT¹

Device	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}	SFF
Rosemount® 2051 Coplanar Differential & Coplanar Gage	0	84	258	32	91%
Rosemount® 2051 Coplanar Absolute, In-line Gage & Absolute	0	94	279	41	90%

Route 2_H Table²

Device	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Rosemount® 2051 Coplanar Differential & Coplanar Gage	0	84	258	32
Rosemount® 2051 Coplanar Absolute, In-line Gage & Absolute	0	94	279	41
Rosemount® 2051 Flowmeter Series based on 1195, 405, or 485 Primaries				
Flowmeter Series ³	0	92	258	41
Rosemount® 2051 Level Transmitter: (w/o additional Seal)				
Coplanar Differential & Coplanar Gage	0	84	258	67
Coplanar Absolute, In-line Gage & Absolute	0	94	279	75
Rosemount® 2051 with Remote Seals ⁴				

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.

The following documents are a mandatory part of this certification:

Assessment Report: ROS 11/07-062 R005 V3 R2

Safety Manual: 00809-0100-4107

¹FIT = 1 failure / 10⁹ hours

²SFF 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".

³Refer to ROS 13/04-008 R001 V1R0 for the Flowmeter FMEDA report for models that are excluded.

⁴Refer to the Remote Seal (ROS 1105075 R001 V1R3) FMEDA report for the additional failure rates to use when using with attached Remote Seals, or use exSILentia.



64 N Main St
 Sellersville, PA 18960

Emerson's
 Rosemount® 2051
 Pressure Transmitter
 with 4-20mA HART