Certificate / Certificat

Zertifikat / 合格証

ROS 1204020 C001

exida hereby confirms that the:

Rosemount 644 4-20mA HART Temperature Transmitter

with Option Code QT
Device Label SW 1.1.1 and 1.1.2

Rosemount Inc.

(an Emerson Process Management company)

Shakopee, MN - USA

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

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:
Emerson's Rosemount 644 Temperature Transmitter will measure temperature within stated performance specifications when operated within the environmental limits found in the product manual. Extended ambient operating temperature range options[1] (down to -60C) must be specified in the model code along with option code QT for this certificate to remain valid across the extended ambient temperature limits.

The manufacturer may use the mark:

Revision 4.1 May 15, 2025
Surveillance Audit Due
December 1, 2026

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

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

Rudolf P. Chalupa
Evaluating Assessor

Molly Lyon O'Brien
Certifying Assessor

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Rosemount 644 4-20mA HART Temperature Transmitter

with Option Code QT

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[2,3]

Application/Device/Configuration	λ_{SD}	λ_{SU}[4]	λ_{DD}	λ_{DU}	#	SFF
644 Single T/C mode	0	0	362	39	136	90.3%
644 Dual T/C mode	0	0	371	39	140	90.5%
644 Single RTD mode	0	0	317	30	131	91.4%
644 Dual RTD mode	0	0	330	31	135	91.4%

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 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 12/04-020 R002 V4 R2 (or later)

Safety Manual: 00809-0200-4728 Section 7

1. BR6 must be ordered with option code QT for this certificate to be valid below -40C.

2. FIT = 1 failure / 10^9 hours

3. 644 can be configured with single or dual RTD or Thermocouple sensors. The failure rates of the device vary with sensor configuration as well as other device configuration paramenters. See FMEDA for details on how to calculate the failure rates based on the configuration.

4. It is important to realize that the No Effect failures are no longer included in the Safe Undetected failure category according to IEC 61508, ed2, 2010.

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