



# ENGINEERING SAFETY CONSULTANTS

*The Global Provider of Functional Safety Expertise and Technical Consultancy*

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## IEC 61508 Random Hardware Reliability Certificate

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### ***Functional Safety of Safety-Related Programmable Electronic Systems***

The **Metrohm Ltd, NDIR XDS Process Analyser ATEX Variant (Ref: A629280213C)** has been assessed and is considered capable for use in a low demand Safety Function up to (and including) SIL 1, with respect to random hardware failures and architectural constraints.

The assessment was based on the assumptions, data provided, and recommendations given in:

- **Engineering Safety Consultants Ltd Report: L074\_FM001 rev. 2;**
- **Renewal letter from Metrohm Ltd, signed by Alexandre Olive, Product Manager Spectroscopy, dated February 2023.**

The product was assessed against the following failure mode:

- **Failure to detect presence of chemical substance within the configured concentration limits.**

The assessment was carried out to determine compliance with IEC 61508 (2010 Edition) with regards to:

- SIL 1 with a HFT = 0 via Route 1H;
- Architectural Constraint (Type B SFF 60% - 90%).

Device	$\lambda_{DU}$ (/hr)	$\lambda_{DD}$ (/hr)	$\lambda_S$ (/hr)	SFF (%)	Device Type	Estimated SIL Capability
NDIR XDS Process Analyser ATEX Variant (Ref: A629280213C)	6.5E-06	4.1E-05	1.2E-05	88	B	SIL 1

Note 1: The SIL of a complete SIF (sensor, logic solver and final element subsystems) must be verified to calculate the required PFD / PFH, considering any redundancy, Proof Test Interval (PTI), Proof Test Coverage (PTC), Mission Time and Mean Time To Restoration (MTTR) for all elements included in the SIF. Each subsystem should be verified to ensure compliance with the minimum HFT requirements.

Note 2: This study did not consider Systematic Capability.

**IMPORTANT:** It should be noted that this assessment does not include confirmation of the response time of the device. For response times (along with any relevant assumptions) reference should be made to the Safety Manual of each device and the total SIF response time **MUST** be compared against the process safety time for the specific application.

Managing Director: Simon Burwood

Assessment Date: May 2021

Renewal Date: February 2023, valid to February 2025

Certificate: L074\_CT001 rev. 2

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