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IEC 61508 Functional Safety Capability Statement

Michell Instruments UK Ltd, XTP601 Process Oxygen Analyser, XTC601 Binary Gas Analyser & XPM601 Paramagnetic Gas Analyser

Manufacturer:	Michell Instruments UK Ltd 48 Lancaster Way Business Park, Ely, Cambridgeshire, CB6 3NW, UK
Product:	Process Oxygen Analyser, Binary Gas Analyser & Paramagnetic Gas Analyser
Model:	XTP601, XTC601 & XPM601

Application:	Low Demand Mode Safety Instrumented Function
Safety Function:	XTP601: Upon detection of oxygen presence within another gas stream, 4-20mA output is generated (Additional Sensing, logic and final element subsystems not part of this analysis) XTC601/XPM601: Upon detection of target gas within another gas stream, 4-20mA output is generated (Additional Sensing, logic and final element subsystems not part of this analysis)
Applied standard:	IEC 61508 Ed2 2010 Parts 1-3 & IEC 61511 Ed1
Systematic Capability:	Suitable up to SIL 2
Applicable report:	ERM Report: H215_FM001 rev. 6

Assessment Route:	1_H
Hardware Fault Tolerance:	0
Type:	B
Application restrictions:	None

Model No.	λDU (/hr)	λDD (/hr)	λS (/hr)	SFF	SIL AC (HFT = 0)	SIL SC
XTP601	5.4E-08	7.4E-07	1.6E-07	94%	SIL 2	SC 2
XTC601	3.9E-08	7.0E-07	1.6E-07	96%	SIL 2	SC 2
XPM601	3.9E-08	6.8E-07	1.6E-07	96%	SIL 2	SC 2

SIL AC (Architectural Constraints): Represents the maximum allowable SIL of each hardware element, assuming Hardware Fault Tolerance (HFT) = 0.

SIL SC (Systematic Capability): A measure of confidence (expressed on a scale of SC 1 to SC 4) of the confidence that the systematic safety integrity of a device meets the requirements of the specified SIL.

It should be noted that for a device to meet a required SIL that the SIL AC and SIL SC of the device needs to both be met. In addition to this, the required Probability of Failure on Demand

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(PFD) value for the complete Safety Instrumented Function (SIF) needs to adhere to the SIL PFD ranges.

IMPORTANT: It should be noted that this assessment considers only the Michell Instruments UK Ltd, XTP601 Process Oxygen Analyser, XTC601 Binary Gas Analyser & XPM601 Paramagnetic Gas Analyser, and does not include confirmation of the response time of the device(s).

The Michell Instruments UK Ltd, XTP601 Process Oxygen Analyser, XTC601 Binary Gas Analyser & XPM601 Paramagnetic Gas Analyser have been assessed and are considered capable for use in a low demand mode safety function up to (and including) SIL 2 with regards to random hardware failures, architectural constraints and Systematic Capability.

Note 1: The SIL of a complete SIF (sensor, logic solver and final element subsystems) must be verified to calculate the required PFD / Probability of Failure per Hour (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.

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