



Certificate / Certificat

Zertifikat / 合格証

BUE 2006049 P0042 C008

exida hereby confirms that the:

Diaphragm valves:

**Type 2030 / 2031 / 2032 / 2033 / AP2030,
Type 2103 / 2104 / 2105 / AP09**

**Bürkert Werke GmbH & Co. KG
Ingelfingen, Germany**

Have been assessed per the relevant requirements of:

IEC 61508 : 2010 Parts 1-2

and meets requirements providing a level of integrity to:

Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A Element

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 Valve will move to the designed safe position within the specified safety time.

Application Restrictions:

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



C. Krupke

Evaluating Assessor

J. Hochhaus

Certifying Assessor

The manufacturer may use the mark:



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Revision 2.0 April 19, 2024
Surveillance Audit Due
April 30, 2027



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Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A Element

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 products have 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 element meets *exida* criteria for Route 2_H.

IEC 61508 Failure Rates in FIT*

- C1: Type 2030 / 2031 / 2032 / 2033 / AP2030 Static application
- C2: Type 2103 / 2104 / 2105 / AP09 Static application
- C3: Type 2030 / 2031 / 2032 / 2033 / AP2030 Dynamic application
- C4: Type 2103 / 2104 / 2105 / AP09 Dynamic application

Device, Application	Full Stroke			Tight shut off			Open on Trip		
	λ_{Safe}	λ_{DD}	λ_{DU}	λ_{Safe}	λ_{DD}	λ_{DU}	λ_{Safe}	λ_{DD}	λ_{DU}
C1, Clean Service	85	0	148	85	0	433	145	0	152
C1, Severe Service	85	0	216	85	0	784	205	0	219
C2, Clean Service	92	0	153	92	0	438	162	0	183
C2, Severe Service	92	0	220	92	0	789	222	0	251
C3, Clean Service	91	0	117	91	0	424	149	0	63
C3, Severe Service	91	0	179	91	0	791	209	0	75
C4, Clean Service	99	0	109	99	0	416	166	0	90
C4, Severe Service	99	0	171	99	0	783	226	0	103

* FIT = 1 failure / 10⁹ hours

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: BUE 20-06-049 R008 V2R0 Assessment Report Valves

Safety Manual: Safety Manual_00_00815378, Rev -

Diaphragm valves:

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Type 2103 / 2104 / 2105 / AP09

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