



Certificate / Certificat

Zertifikat / 合格証

BUE 2006049 P0042 C007

exida hereby confirms that the:

Seated valves:

**Type 2000 / 2012 / AP2000 / AP2012,
Type 2100 / 2101 / AP07 / AP08**

**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:



ABD 1000490856 EN Version: C Status: RL (released / freigegeben) printed: 15.05.2024

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 2000 / 2012 / AP2000 / AP2012 Static application
- C2: Type 2100 / 2101 / AP07 / AP08 Static application
- C3: Type 2000 / 2012 / AP2000 / AP2012 Dynamic application
- C4: Type 2100 / 2101 / AP07 / AP08 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	64	0	484	64	0	1126	255	0	335
C1, Severe Service	64	0	484	64	0	1126	255	0	335
C2, Clean Service	69	0	310	69	0	958	227	0	163
C2, Severe Service	69	0	546	69	0	1800	360	0	266
C3, Clean Service	69	0	310	69	0	958	227	0	163
C3, Severe Service	69	0	546	69	0	1800	360	0	266
C4, Clean Service	71	0	300	71	0	947	239	0	172
C4, Severe Service	71	0	536	71	0	1789	372	0	274

* 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 -

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Type 2100 / 2101 / AP07 / AP08

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80 N Main St
Sellersville, PA 18960