



Certificate / Certificat Zertifikat / 合格証

Armaturen 1101068 C001

exida hereby confirms that the :

Ball Valves

Series

NFA16-NFB16

The manufacturer
may use the mark:



Revision 4.0 March 04, 2025
Surveillance Audit Due
April 1, 2028

Has 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, Route 2_H Device

**PFD_{AVG} and Architecture Constraints
must be verified for each application**

Safety Function:

The Ball Valve will move to the designed safe position per the actuator design within the specified safety time.

Application Restrictions:

The unit must be properly designed into a Safety Instrumented Function per the requirements in the Installation, Operations and Maintenance and Safety Manuals for the respective valve type.



Evaluating Assessor

Certifying Assessor



Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A, Route 2_H Device

PFD_{AVG} and Architecture Constraints must be verified for each application

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*

- V1 Floating Ball valves KHF 51*, soft or metal seated
- V2 Floating Ball valves KHL 51*, soft seated
- V3 Floating Ball valves KHF 71*, soft or metal seated
- V4 Trunnion Ball valves KHF 71*, soft seated
- V5 Trunnion Ball valves KHF 71*, metal seated

Valve and application	Fully closed			Tight shut off			Fully Open		
	λ_{safe}	λ_{DD}	λ_{DU}	λ_{safe}	λ_{DD}	λ_{DU}	λ_{safe}	λ_{DD}	λ_{DU}
V1 Clean service	0	0	485	0	0	1331	145	0	320
V1 Clean service with PVST	0	214	251	0	214	1117	145	214	108
V2 Clean service	0	0	473	0	0	1339	145	0	328
V2 Clean service with PVST	0	219	254	0	219	1120	145	219	109
V3 Clean service	0	0	492	0	0	1383	172	0	320
V3 Clean service with PVST	0	214	278	0	214	1169	172	214	108
V4 Clean service	0	0	683	0	0	1637	204	0	479
V4 Clean service with PVST	0	314	389	0	314	1323	204	314	165
V5 Clean service	0	0	662	0	0	1616	204	0	458
V5 Clean service with PVST	0	302	360	0	302	1314	204	302	156

* FIT = 1 failure / 10⁹ hours

† PVST = Partial Valve Stroke Test of a final element Device

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:

1101-068-C R004 V4R0 Assessment report.
Safety Manual 1.1-08/2024

