



The manufacturer may use the mark:



Revision 3.0 September 27, 2023
Surveillance Audit Due
October 1, 2026



Certificate / Certificat Zertifikat / 合格証

DIE 1510104 C001

exida hereby confirms that the:

2 & 3-Way Trunnion Ball Valves
DIE ERSTE INDUSTRY CO., LTD.
Taichung, Taiwan - R.O.C.

Has been assessed per the relevant requirements of:

IEC 61508 : 2010 Parts 1-3

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

**PFH/PFD_{avg} and Architecture Constraints
must be verified for each application**

Safety Function:

The 2 & 3-Way Trunnion Ball Valves will close, close with tight shut-off or open to trip depending on the Safety Instrumented Function design.

Application Restrictions:

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



Jack Gao

Evaluating Assessor

Diamond Lee

Certifying Assessor

DIE 1510104 C001

Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A Element

SIL 2 @ HFT=0; SIL 3 @ HFT = 1; Route 2_H

PFH/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 element meets *exida* criteria for Route 2_H.

IEC 61508 Failure Rates in FIT*

Application	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Full Stroke, Clean Service	0	0	0	578
Tight Shut-Off, Clean Service	0	0	0	1195
Open on Trip, Clean Service	0	117	0	461
Full Stroke, Severe Service	0	0	0	1081
Tight Shut-Off, Severe Service	0	0	0	2304
Open on Trip, Severe Service	0	234	0	847

* 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 PFH/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: DIE 15/10-104 R005 V3R1 (or later)

Safety Manual: DIE ERSTE 2 & 3-Way Ball Valves Safety Manual_v1.5 (or later)

2 & 3-Way Trunnion Ball Valves



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