Certificate / Certificat
Zertifikat / 合格証

LAD 2007099 C001

exida hereby confirms that the:

Floating Ball Valves

Ladish Valves
Houston, TX USA

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, Route 2_H Device

PFH/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 Safety Manual requirements.

The manufacturer may use the mark:

Revision 1.0 January 12, 2022
Surveillance Audit Due
February 1, 2025

ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17065
PRODUCT CERTIFICATION BODY
#1004

exida Certification

Evaluating Assessor

Certifying Assessor

Certificate / Certificat / Zertifikat / 合格証

LAD 2007099 C001

Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A, Route 2_H Device

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

Floating Ball Valves

Systematic Capability :

These 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 device meets *exida* criteria for Route 2_H.

Versions:

PF Floating Ball Valve Series: 401, 411, 421, 451

S Floating Ball Valve Series: S

IEC 61508 Failure Rates in FIT[1] Static Applications

Application/Device/Configuration	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Full Stroke, Clean Service	0	0	0	425
Tight Shut-Off, Clean Service	0	0	0	1176
Open on Trip, Clean Service	0	121	0	304
Full Stroke, Severe Service	0	0	0	750
Tight Shut-Off, Severe Service	0	0	0	2236
Open on Trip, Severe Service	0	242	0	508
Cryogenic Full Stroke, Clean Service	0	0	0	457
Cryogenic Tight Shut-Off, Clean Service	0	0	0	1193
Cryogenic Open on Trip, Clean Service	0	121	0	337
Cryogenic Full Stroke, Severe Service	0	0	0	780
Cryogenic Tight Shut-Off, Severe Service	0	0	0	2252
Cryogenic Open on Trip, Severe Service	0	242	0	538

[1]FIT – 1 failure/10^9 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: LAD 2007099 R002 V1R1 (or later)

Safety Manual: Ladish Ball Valve Safety Manual Rev A (or later)

80 N Main St
Sellersville, PA 18960