Certificate / Certificat
Zertifikat / 合格証

BRA 071219 C005

exida hereby confirms that the:

Tri Lok Butterfly Valves

Bray International Inc.
Houston, Texas - USA

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

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

Safety Function:
The Butterfly 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 6.0 October 31, 2022
Surveillance Audit Due
October 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

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Systematic Capability: SC 3 (SIL 3 Capable)

Random Capability: Type A Element

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

Tri- Lok Butterfly Valves

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 for each element.

IEC 61508 Failure Rates, Clean Service, Static Applications, Good Site Maintenance Practices in FIT[1]

Device	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Full Stroke	0	0	0	505
Tight Shut-Off	0	0	0	1070
Open on Trip	0	103	0	402
Full Stroke with PVST[2]	0	0	179	326
Tight Shut-Off with PVST	0	0	179	891
Open on Trip with PVST	102	1	179	223

[1] FIT = 1 failure / 10^9 hours

[2] 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 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 subsystem must be checked to assure compliance with minimum hardware fault tolerance (HFT) requirements.

The following documents are a mandatory part of certification:

Assessment Report: BRA 19-05-130 R001, V3 R1 and later

Safety Manual: SM-1003, Tri Lok triple Offset Butterfly Valve Safety Manual

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Sellersville, PA 18960