



The manufacturer
may use the mark:



Revision 6.0 October 31, 2022
Surveillance Audit Due
October 1, 2025



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**

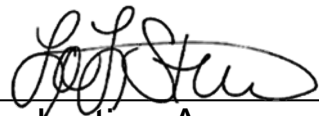
Safety Function:

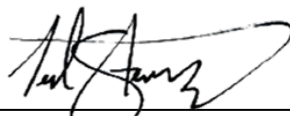
The Butterfly Valve will move to the designed safe position per the actuator design within the specified safety time.

Application Restrictions:

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




Evaluating Assessor


Certifying Assessor

BRA 071219 C005

Systematic Capability: SC 3 (SIL 3 Capable)**Random Capability: Type A Element**

**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 for each element.

**IEC 61508 Failure Rates, Clean Service, Static
Applications, Good Site Maintenance Practices in FIT¹**

Device	λ_{SD}	λ_{SU}	λ_{DO}	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 / 10⁹ 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



80 N Main St
Sellersville, PA 18960