



Certificate / Certificat Zertifikat / 合格証

L&T 1004017 C002

exida hereby confirms that the:

Butterfly Valves

L&T VALVES LIMITED

Tamil Nadu- India

The manufacturer
may use the mark:



Has been assessed per the relevant requirements of:

IEC 61508 : 2010 Parts 1-7

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**

Valid until August 3, 2018
Revision 4.0 August 2, 2015

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.



ANSI Accredited Program
PRODUCT CERTIFICATION
#1004



Evaluating Assessor

Certifying Assessor

L&T 1004017 C002

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*

Application	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Clean Service				
Full Stroke	0	0	0	698
Tight Shut-Off	0	0	0	1722
Open on Trip	0	252	0	447
Full Stroke with PVST [†]	0	0	211	487
Tight Shut-Off with PVST	0	0	211	1511
Open on Trip with PVST	249	3	211	236
Severe Service				
Full Stroke	0	0	0	1185
Tight Shut-Off	0	0	0	3152
Open on Trip	0	500	0	684
Full Stroke with PVST	0	0	317	867
Tight Shut-Off with PVST	0	0	317	2835
Open on Trip with PVST	495	5	317	367

* 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:

Assessment Report: L&T Q10/04-017 R004

Safety Manual: FSM-002 R2 Butterfly Valves

Butterfly Valves



64 N Main St
Sellersville, PA 18960