



# 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<sub>H</sub> Device**

**PFH/PFD<sub>AVG</sub> and Architecture Constraints  
must be verified for each application**

Revision 5.1 August 17, 2021

Surveillance Audit Due  
November 1, 2021

### 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  
ISO/IEC 17065  
PRODUCT CERTIFICATION BODY  
#1004



Evaluating Assessor

Certifying Assessor

**Systematic Capability: SC 3 (SIL 3 Capable)**

**Random Capability: Type A, Route 2<sub>H</sub> Device**

**PFH/PFD<sub>AVG</sub> 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<sub>H</sub>.

**IEC 61508 Failure Rates in FIT\***

Static Application – Clean Service	$\lambda_{SD}$	$\lambda_{SU}$	$\lambda_{DD}$	$\lambda_{DU}$
Full Stroke	0	0	0	629
Tight Shut-Off	0	0	0	1501
Open on Trip	0	177	0	453
Full Stroke with PVST†	0	0	188	441
Tight Shut-Off with PVST	0	0	188	1313
Open on Trip with PVST	175	2	188	265
Static Application – Severe Service	$\lambda_{SD}$	$\lambda_{SU}$	$\lambda_{DD}$	$\lambda_{DU}$
Full Stroke	0	0	0	1051
Tight Shut-Off	0	0	0	2737
Open on Trip	0	348	0	702
Full Stroke with PVST	0	0	280	771
Tight Shut-Off with PVST	0	0	280	2457
Open on Trip with PVST	345	3	280	422

\* FIT = 1 failure / 10<sup>9</sup> 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 PFH/PFD<sub>avg</sub> 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:

**ReportAssessment :** L&T Q10/04-017 R004

**Safety Manual:** FSM-002 R2 Butterfly Valves

Butterfly Valves



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Sellersville, PA 18960