



Certificate / Certificat Zertifikat / 合格証

DEL 1804039 C001

exida hereby confirms that the:

Trunnion Mounted Ball Valve DeVal Flow Controls Private Ltd Pune - 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

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

Revision 1.1 Aug 09, 2019
Surveillance Audit Due
August 1, 2022

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.



Evaluating Assessor

Certifying Assessor

DEL 1804039 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

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*

Static Application – Clean Service	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Full Stroke	0	0	0	497
Tight Shut-Off	0	0	0	1030
Open on Trip	0	104	0	393
Full Stroke with PVST†	0	0	208	289
Tight Shut-Off with PVST	0	0	208	822
Open on Trip with PVST	103	1	208	185
Static Application – Severe Service	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Full Stroke	0	0	0	891
Tight Shut-Off	0	0	0	1926
Open on Trip	0	200	0	691
Full Stroke with PVST	0	0	361	530
Tight Shut-Off with PVST	0	0	361	1565
Open on Trip with PVST	198	2	361	330

* 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 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: DEL Q18/04-039 R008 V1R2 (or later)

Safety Manual: DEL-SM : 18/04-039 R001 (or later)

Series 7 & 8
Two Piece
/Three Piece
Trunnion
Mounted Ball
Valve (ASME
CLASS 150,
300, 600,
900, 1500)

