



Certificate / Certificat Zertifikat / 合格証

VAL 2103067 C002

exida hereby confirms that the:

**V Series and ERV
Floating Ball Valves**

**ValvTechnologies
Houston, TX - USA**

The manufacturer
may use the mark:



Have 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**

Revision 1.0 February 17, 2022

Surveillance Audit Due
March 1, 2025

Safety Function:

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

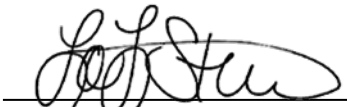
The safety function of the ERV is for the Valve to open upon a trip of the safety system.

Application Restrictions:

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




Evaluating Assessor


Certifying Assessor

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 :

These products have 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.

Versions:

Valve Series	Sizes	Pressure Class
V Series - V1-1 Floating Ball Valve	¼" – 4"	900 – 4500
V Series - V1-2 Floating Ball Valve	½" – 36"	150 – 600
V Series - V1-3 Floating Ball Valve	½" – 2"	150 – 600
V Series - V1-4 Floating Ball Valve	4" – 8"	900 - 4500
	4" – 20"	900 - 2500
	4" – 24"	900 - 1500
	4" – 34"	900
ERV Electronic Relief Valves	5/8" – 8"	300 – 4500
	5/8" – 10 1/16"	300 – 2500

IEC 61508 Failure Rates in FIT¹, Static Applications

Device	λ _{SD}	λ _{SU}	λ _{DD}	λ _{DU}
Full Stroke, Clean Service	0	0	0	466
Tight Shut-Off, Clean Service	0	0	0	1611
Open on Trip, Clean Service	0	168	0	298
Full Stroke, Severe Service	0	0	0	833
Tight Shut-Off, Severe Service	0	0	0	3097
Open on Trip, Severe Service	0	334	0	500

¹ FIT = 1 failure / 10⁹ hours

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: VAL 21-03-067 R001 V1R1 (or later)

Safety Manual: VALV01-ENG-SIL-001 R1 (or later)

V Series & ERV Floating Ball Valves



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