



The manufacturer
may use the mark:



Valid until January 1, 2019
Revision 2.0 December 9, 2015



ANSI Accredited Program
PRODUCT CERTIFICATION
#1004

Certificate / Certificat Zertifikat / 合格証

VIR 080153 C001

exida hereby confirms that the:

Ball Valve Series Emerson Process Management Virgo Valves SRL Milan, Italy

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**

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

VIR 080153 C001

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*

Device	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Full Stroke	0	0	0	691
Tight-Shutoff	0	0	0	1272
Open to Trip	0	189	0	502
Full Stroke w/PVST	0	0	283	408
Tight-Shutoff w/PVST	0	0	283	989
Open to Trip w/PVST	187	2	283	219
Underground, Full Stroke	0	0	0	763
Underground, Tight-Shutoff	0	0	0	1344
Underground, Open to Trip	0	189	0	574
Underground, Full Stroke w/PVST	0	0	304	459
Underground, Tight-Shutoff w/PVST	0	0	305	1039
Underground, Open to Trip w/PVST	0	189	304	270
Cryogenic, Full Stroke	0	0	0	707
Cryogenic , Tight-Shutoff	0	0	0	1288
Cryogenic , Open to Trip	0	171	0	536
Cryogenic , Full Stroke w/PVST	0	0	265	442
Cryogenic , Tight-Shutoff w/PVST	0	0	267	1021
Cryogenic , Open to Trip w/PVST	0	171	265	271

* 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: VIR 08-01-53 R003 V2R2

Safety Manual: VEU SM 001 Revision 2

Ball Valve Series



64 N Main St
Sellersville, PA 18960