

Certificate



SIL/PL
Capability

www.tuv.com
ID 000069197

No.: 968/V 1070.00/18

Product tested Ball Valves **Certificate holder** Energy Valves Srl
Via Repubblica, 17
23841 Annone di Brianza
(LC)
Italy

Type designation Floating FB, FD, FT, FV, VB
NPS 1/2", 3/4", 1", 1 1/4" 1 1/2", 2", 2 1/2", 3", 4", 6", 8"

Trunnion TB, TD, TT, TB, TH
NPS 1/2", 3/4", 1", 1 1/4", 1 1/2", 2", 2 1/2", 3", 4", 6", 8", 10", 12", 14", 16", 18",
20", 22", 24"

Codes and standards IEC 61508 Parts 1-2 and 4-7:2010

Intended application Safety Function: Safe Closing (with or without Tight Shut Off), Safe Opening

The assessment based on the certification program of the Certification Body comes to the result that the valves meet the requirements of IEC 61508:2010 and are therefore suitable for use in a safety instrumented system up to SIL 2 (low demand mode).

Under consideration of the minimum required hardware fault tolerance HFT = 1 the valves may be used in a redundant architecture up to SIL 3 acc. IEC 61511.

Specific requirements The instructions of the associated Installation, Operating and Safety Manual shall be considered.

Summary of test results see back side of this certificate.

Valid until 2023-11-08

The issue of this certificate is based upon an examination, whose results are documented in Report No. 968/V 1070.00/18 dated 2018-10-30.

This certificate is valid only for products which are identical with the product tested.

TÜV Rheinland Industrie Service GmbH

Bereich Automation
Funktionale Sicherheit

Am Grauen Stein, 51105 Köln

Köln, 2018-11-08

Certification Body Safety & Security for Automation & Grid

Dr. R. G. A.

Dr.-Ing. Thorsten Gantevoort

Holder: Energy Valves Srl
Via Repubblica, 17,
I - 23841 - Annone di Brianza (LC)
Italy

Product tested: Floating Ball Valves (NPS ½" ... 8")
Trunnion Ball Valves (NPS ½" ... 24")

Results of Assessment

Route of Assessment		$2_H / 1_S$
Type of Sub-system		Type A
Mode of Operation		Low Demand Mode
Hardware Fault Tolerance	HFT	0

Floating Ball Valves

		fail to close / fail to open		fail to close with tight shut off	
Lambda Dangerous confidence level of calculation $1-\alpha = 95\%$	λ_D	3.18E-07	318 FIT	6.04E-07	604 FIT
Lambda Dangerous Undetected assumed Diagnostic Coverage DC = 0 %	λ_{DU}	3.18E-07	318 FIT	6.04E-07	604 FIT
Average Probability of Failure on Demand assumed Proof Test Interval $T_1 = 1$ year	$PFD_{avg}(T_1)$	1.39 E-03		2.65 E-03	
Average Probability of Failure on Demand 1oo2 assumed Proof Test Interval $T_1 = 1$ year assumed $\beta_{1oo2} = 10\%$	$PFD_{avg}(T_1)$	1.42 E-04		2.73 E-04	

Trunnion Ball Valves

		fail to close / fail to open		fail to close with tight shut off	
Lambda Dangerous confidence level of calculation $1-\alpha = 95\%$	λ_D	3.18E-07	318 FIT	6.45E-07	645 FIT
Lambda Dangerous Undetected assumed Diagnostic Coverage DC = 0 %	λ_{DU}	3.18E-07	318 FIT	6.45E-07	645 FIT
Average Probability of Failure on Demand assumed Proof Test Interval $T_1 = 1$ year	$PFD_{avg}(T_1)$	1.39 E-03		2.82 E-03	
Average Probability of Failure on Demand 1oo2 assumed Proof Test Interval $T_1 = 1$ year assumed $\beta_{1oo2} = 10\%$	$PFD_{avg}(T_1)$	1.42 E-04		2.92 E-04	

Origin of values

The stated values are the results of extensive FMEDA analysis on the reliability of the safety function under critical conditions. In addition, the failure rate was verified by the analysis of field feedback of the last seven years. Random and systematic failures which are the responsibility of the manufacturer were examined.

Systematic Capability

The development and manufacturing process and the functional safety management applied by the manufacturer in the relevant lifecycle phases of the product have been audited and assessed as suitable for the manufacturing of products for use in applications with a maximum Safety Integrity Level of 3 (SC 3).

Periodic Tests and Maintenance

The given values require periodic tests and maintenance as described in the Safety Manual. The operator is responsible for the consideration of specific external conditions (e.g. ensuring of required quality of media, max. temperature, time of impact), and adequate test cycles.