

Certificate



No.: 968/V 1165.00/20

Product tested	Ball Valves	Certificate holder	Kunshan VIZA Valve Co., Ltd. NO. 18, Jinlu Road, Jinxi Town, Kunshan City Jiangsu Province, 215324 P.R. China
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Type designation	Two-piece Floating Ball Valve (types: FB, FD), Two-piece Trunnion Mounted Ball Valve (types: TCS, TPE), Three-piece Trunnion Mounted Ball Valve (types: TE, TM, TW)
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Codes and standards	IEC 61508 Parts 1-2 and 4-7:2010
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Intended application	Safety Functions: - Safe Closing - Closing with Leakage Rate A acc. ISO 5208 - Safe Opening
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The valves are 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.

Specific requirements	The instructions of the associated Installation, Operating and Safety Manual shall be considered.
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Summary of test results see back side of this certificate.

Valid until 2025-05-26

The issue of this certificate is based upon an examination, whose results are documented in Report No. 968/V 1165.00/20 dated 2020-05-08.
This certificate is valid only for products which are identical with the product tested.

TÜV Rheinland Industrie Service GmbH
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Köln, 2020-05-26

Certification Body Safety & Security for Automation & Grid

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Holder: Kunshan VIZA Valve Co., Ltd.
NO. 18, Jinlu Road, Jinxi Town, Kunshan City
Jiangsu Province, 215324,
P.R. China

Product tested: Ball Valves
Two-piece Floating (types: FB, FD),
Two-piece Trunnion (types: TCS, TPE),
Three-piece Trunnion (types: TE, TM, TW)

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
Systematic Capability		SC 3

Closing on Demand		FB	FD	TCS, TPE, TE, TM, TW
Dangerous Failure Rate	λ_D	304 FIT	307 FIT	369 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.33 E-03	1.34 E-03	1.62 E-03
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.35 E-04	1.37 E-04	1.65 E-04

Close on Demand with leakage rate A acc. ISO 5208		FB	FD	TCS, TPE, TE, TM, TW
Dangerous Failure Rate	λ_D	739 FIT	843 FIT	572 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.24 E-03	3.69 E-03	2.51 E-03
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.36 E-04	3.86 E-04	2.58 E-04

Open on Demand		FB	FD	TCS, TPE, TE, TM, TW
Dangerous Failure Rate	λ_D	209 FIT	212 FIT	211 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	9.15 E-04	9.29 E-04	9.24 E-04
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	9.25 E-05	9.39 E-05	9.34 E-05

Assumptions for the calculations above: DC = 0 %, $T_1 = 1$ year, $\beta_{1oo2} = 10$ %

Origin of failure rates

The stated failure rates for low demand are the result of an FMEDA with tailored failure rates for the design and manufacturing process. Furthermore the results have been verified by qualification tests and field-feedback data of the last seven years.

Failure rates include failures that occur at a random point in time and are due to degradation mechanisms such as ageing. The stated failure rates do not release the end-user from collecting and evaluating application-specific reliability data.

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.