

Certificate



SIL/PL
Capability

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ID 0600000000

No.: 968/V 1014.01/22

Product tested	Ball Valves Floating & Trunnion Design	Certificate holder	JC Fábrica de Válvulas, S.A.U. Av. Segle XXI 75, Pol. Ind. Can Calderon 08830 Sant Boi de Llobregat, Barcelona Spain
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Type designation	Ball Valve Floating Figures: 300, 3300, 400/40000, UDV, 410, 500, 3500, 600, 3600, 700, 3700, 800/81500, 900, 3900 Ball Valve Trunnion Figures: 1900, 1500, 1600, 1700, 2500, 2600, 6000, 7000
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Codes and standards	IEC 61508 Parts 1-2 and 4-7:2010
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Intended application	Safety Function: Open or Close on Demand
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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 for the complete final element the valves may be used 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 sides of this certificate.

The issue of this certificate is based upon an evaluation in accordance with the Certification Program CERT FSP1 V1.0:2017 in its actual version, whose results are documented in Report No. 968/V 1014.01/22 dated 2022-11-10. This certificate is valid only for products, which are identical with the product tested. Issued by the certification body accredited by DAkkS according to DIN EN ISO/IEC 17065. The accreditation is only valid for the scope listed in the annex to the accreditation certificate D-ZE-11052-02-01.

TÜV Rheinland Industrie Service GmbH
Bereich Automation
Funktionale Sicherheit

Köln, 2022-12-08

Certification Body Safety & Security for Automation & Grid


Dipl.-Ing. (FH) Wolf Rückwart

Holder: JC Fábrica de Válvulas, S.A.U.
 Av. Segle XXI 75, Pol. Ind. Can Calderon
 08830 Sant Boi de Llobregat, Barcelona
 Spain

Product tested: Ball Valves
Floating Design Figures:
 300, 3300, 400/40000, UDV, 410, 500, 3500, 600,
 3600, 700, 3700, 800/81500, 900, 3900

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

Dangerous Failure Rate	λ_D	1.95 E-07 / h	195 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	8.68 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	8.76 E-05	

Open on Demand

Dangerous Failure Rate	λ_D	1.35 E-07 / h	135 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	6.01 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	6.05 E-05	

Assumptions for the calculations above: DC = 0 %, $T_1 = 1$ year, MRT = 72 h, $\beta_{1oo2} = 10$ %

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. 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.

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 (SC3).

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Product tested: Ball Valves
Trunnion Design Figures:
 1900, 1500, 1600, 1700, 2500, 2600, 6000, 7000

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

Dangerous Failure Rate	λ_D	2.53 E-07 / h	253 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.13 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.14 E-04	

Open on Demand

Dangerous Failure Rate	λ_D	2.49 E-07 / h	249 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.11 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.12 E-04	

Assumptions for the calculations above: DC = 0 %, $T_1 = 1$ year, MRT = 72 h, $\beta_{1oo2} = 10$ %

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