

Certificate



SIL/PL
Capability

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ID 060000000

No.: 968/V 1068.01/23

Product tested	Floating Ball Valve	Certificate holder	Cameron Valves & Measurement 845 S.E. 29th Street Oklahoma City, OK 73129 USA
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Type designation	WKM 320F
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Codes and standards	IEC 61508 Parts 1-2 and 4-7:2010
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Intended application	Operated by an actuator the safety function can be: - Close on demand and external tightness - Open on demand and external tightness
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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 side of this certificate.

The issue of this certificate is based upon an evaluation in accordance with the Certification Program CERT FSP1 V3.0:2020 in its actual version, whose results are documented in Report No. 968/V 1068.01/23 dated 2023-07-21. 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
Am Grauen Stein, 51105 Köln

Köln, 2023-08-11

Certification Body Safety & Security for Automation & Grid


Dipl.-Ing. (FH) Wolf Rückwart

Holder: Cameron Valves & Measurement
 845 SE 29th St
 Oklahoma City, OK 73129
 United States of America

**Product tested: Floating Ball Valve of type
 WKM 320F**

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

Close on demand and external tightness

Dangerous Failure Rate	λ_D	2.61 E-07 / h	261 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.16 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.18 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	2.03 E-07 / h	203 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	9.04 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	9.13 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 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.