

Certificate



SIL/PL
Capability

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No.: 968/V 1232.00/21

Product tested	X-Series Neles Ball Valves	Certificate holder	Neles Finland Oy Vanha Porvoontie 229 FI-01380 Vantaa Finland
Type designation	XG, XM Full bore, trunnions XT, XA Full bore, seat supported XB, XC Reduced bore, seat supported M1, M2 Full bore, seat supported		
Codes and standards	IEC 61508 Parts 1-2 and 4-7:2010		
Intended application	Safety Functions: - Close on Demand - Open on Demand 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.		

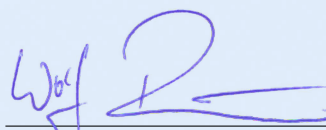
Summary of test results see back side of this certificate.

The issue of this certificate is based upon an evaluation in accordance with the Certification Program CERT FSP1 V1.0:2017 in its actual version, whose results are documented in Report No. 968/V 1232.00/21 dated 2021-04-30. This certificate is valid only for products, which are identical with the product tested.

TÜV Rheinland Industrie Service GmbH
Bereich Automation
Funktionale Sicherheit

Köln, 2021-05-06

Certification Body Safety & Security for Automation & Grid


Dipl.-Ing. (FH) Wolf Rückwart

Holder: Neles Finland Oy
 Vanha Porvoontie 229
 FI-01380, Vantaa
 Finland

Product tested: Ball Valves
 X-Series

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	2.31 E-07 / h	231 FIT
Average Probability of Failure on Demand 1001	$PFD_{avg}(T_1)$	1.03 E-03	
Average Probability of Failure on Demand 1002	$PFD_{avg}(T_1)$	1.04 E-04	

Open on Demand

Dangerous Failure Rate	λ_D	1.92 E-07 / h	192 FIT
Average Probability of Failure on Demand 1001	$PFD_{avg}(T_1)$	8.55 E-04	
Average Probability of Failure on Demand 1002	$PFD_{avg}(T_1)$	8.63 E-05	

Assumptions for the calculations above: DC = 0 %, $T_1 = 1$ year, MRT = 72 h, $\beta_{1002} = 10$ %

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.