

Certificate



SIL/PL
Capability

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ID 060000000

No.: 968/V 1070.02/23

Product tested Ball and Plug Valves **Certificate holder** Energy Valves S.r.l.
Via Olgiate Molgora, 26
I - 23883 Beverate di Brivio (LC)
Italy

Type designation Floating Ball Valves, EF
NPS 1/2", 3/4", 1", 1 1/4" 1 1/2", 2", 2 1/2", 3", 4", 6", 8"
Trunnion Ball Valves, ET
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", 28", 30", 32", 36", 40", 42"
Standard Plug Valves, EP
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", 28", 30", 32", 36"
Expanding Plug Valves, EE
NPS 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 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.

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 1070.02/23 dated 2023-12-22. 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, 2024-01-16

Certification Body Safety & Security for Automation & Grid

Dipl.-Ing. (FH) Wolf Rückwart

Holder: Energy Valves S.r.l.
Via Olgiate Molgora, 26
I – 23883 – Beverate di Brivio (LC)
Italy

Product tested: Floating EF Ball Valves (NPS ½” ... 8”)
Trunnion ET Ball Valves (NPS ½” ... 42”)
Plug EP Valves (NPS ½” ... 36”)
Plug Trunnion EE Valves (NPS 3” ... 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
Systematic Capability	SC 3

Floating Ball Valves EF

		fail to close / fail to open		fail to close with tight shut off	
Dangerous Failure Rate	λ_D	3.18E-07	318 FIT	6.04E-07	604 FIT
Average Probability of Failure on Demand	$PFD_{avg}(T_1)$	1.39 E-03		2.65 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.42 E-04		2.73 E-04	

Trunnion Ball Valves ET

		fail to close / fail to open		fail to close with tight shut off	
Dangerous Failure Rate	λ_D	3.18E-07	318 FIT	6.45E-07	645 FIT
Average Probability of Failure on Demand	$PFD_{avg}(T_1)$	1.39 E-03		2.83 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.42 E-04		2.92 E-04	

Plug Valves EP and EE

		fail to close / fail to open		fail to close with tight shut off	
Dangerous Failure Rate	λ_D	3.30E-07	330 FIT	3.50E-07	350 FIT
Average Probability of Failure on Demand	$PFD_{avg}(T_1)$	1.45 E-03		1.53 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.47 E-04		1.56 E-04	

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

Origin of values

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.