

Certificate



SIL/PL
Capability

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No.: 968/V 1268.00/22

Product tested	Butterfly Valves	Certificate holder	Somas Instrument AB Box 107 66123 Säffle Sweden
Type designation	MTV, MTVF, MTVL, MTVG, MTV LN, MTVCL VSS, VSSF, VSSL, VSS LT, VSS LN FSVW, FSVF, FSVL, FSVG		
Codes and standards	IEC 61508 Parts 1-2 and 4-7:2010 ISO 13849-1:2015		
Intended application	Safety Functions: Open on Demand and Close 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 of the complete final element the valves may be used up to SIL 3. The valves can also be used in high demand applications up to 100 demands per year. The valves are suitable for operation in safety related systems with a Performance Level of up to PL c acc. ISO 13849-1. If redundant architecture (HFT ≥ 1), sufficient external diagnostics (DC low for PL d, resp. DC medium for PL e) and plausibility checks are realized, the valves may be used up to PL e. The demand rate is limited to 100 demands per year.		
Specific requirements	The instructions of the associated Installation, Operating and Safety Manual shall be considered.		

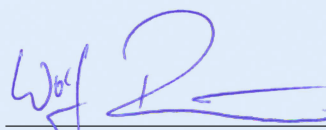
Summary of test results see back side of this certificate.

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 1268.00/22 dated 2022-03-16. This certificate is valid only for products, which are identical with the product tested.

TÜV Rheinland Industrie Service GmbH
Bereich Automation
Funktionale Sicherheit

Köln, 2022-04-05

Certification Body Safety & Security for Automation & Grid


Dipl.-Ing. (FH) Wolf Rückwart

Holder: SOMAS Instrument AB
Box 107
66123 Säffle
Sweden

Product tested: **Butterfly Valves**
MTV, MTVF, MTVL, MTVG, MTV LN
MTVC, MTVCL
VSS, VSSF, VSSL, VSS LT, VSS LN
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Results of Assessment

Route of Assessment		$2_H / 1_S$
Type of Sub-system		Type A
Mode of Operation		Low Demand Mode High Demand Mode up to 100 / year
Hardware Fault Tolerance	HFT	0
Systematic Capability		SC 3

Closing on Demand

Dangerous Failure Rate	λ_D	1.42 E-07 / h	142 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	6.32 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	6.37 E-05	

Open on Demand

Dangerous Failure Rate	λ_D	1.40 E-07 / h	140 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	6.23 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	6.28 E-05	

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

High demand Mode

Maximum Demands per Year	n_{op}	100 / a	1.14 E-02 / h
Mean Time to Dangerous Failure	MTTF _D	804 a	
Average Frequency of a dangerous Failure per Hour (Close on demand)	$\lambda_{DU} = PFH$	1.42 E-07	
Average Frequency of a dangerous Failure per Hour (Open on demand)	$\lambda_{DU} = PFH$	1.40 E-07	

Origin of failure rates

The stated failure rates 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.

Systematic Capability

The development and manufacturing process and the functional safety management applied by the manufacturer in the relevant lifecycle phases of the product has been audited and assessed as suitable for the use in applications with a maximum Safety Integrity Level of 3 (SC 3).