Certificate

SIL/PL Capability

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ID 0600000000

No.: 968/V 1072.01/20

Product tested	Automated solenoid valves with emergency tripping function by spring force 3/2-way or 5/2-way	**Certificate holder**	ASCO SAS 53 rue de Beauce 28110 Lucé France
Type designation	551 and 553 ARCTIC series		
Codes and standards	IEC 61508 Parts 1-2 and 4-7:2010		

Intended application

Safety function: Move to fail-safe position by spring force, if auxiliary power is cut off or fails. Depending on the piping of installation, the valve will supply the fluid media or vent the fluid media.

The assessment of the Certification Body comes to the result that the valves meet the requirements of IEC 61508 and are therefore 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 acc. IEC 61508 and IEC 61511.

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.

Valid until 2025-08-17

The issue of this certificate is based upon an examination, whose results are documented in Report No. 968/V 1072.01/20 dated 2020-07-24.
This certificate is valid only for products which are identical with the product tested.

Köln, 2020-08-17

TÜV Rheinland Industrie Service GmbH
Bereich Automation
Funktionale Sicherheit
Am Grauen Stein, 51105 Köln
Certification Body Safety & Security for Automation & Grid

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TÜVRheinland®
Precisely Right.

Holder: ASCO S.A.S
Emerson Automation Solutions
53 rue de la Beauce
BP 30017 Lucé 28111
France

Product tested: Automatic solenoid valve with emergency tripping function by spring force
551 - 553 ARCTIC 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	1.44 E-07 / h	**144 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	6.31 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.20 E-05	

Open on Demand

Dangerous Failure Rate	λ_D	1.32 E-07 / h	**132 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	5.78 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	2.93 E-05	

Assumptions for the calculations above: DC = 0 %, T_1 = 1 year, β_{1oo2} = 5 %

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.
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.