Certificate

No.: 968/V 1339.00/25

Product tested	Pneumatic Actuator	**Certificate holder**	Rotork Flow Technology (Suzhou) Co., Ltd. Building A, No 88, Yinhe Road, Southeast Street Changshu, Jiangsu, 215558 P.R. China
Type designation	GTE Series Rack and Pinion Actuator		
Codes and standards	IEC 61508 parts 1-2:2010		
Intended application	Safety Functions: Spring Return type: Move to fail-safe position by internal spring force Double Acting type: Move to fail-safe position by external pneumatic energy The actuators 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 actuators 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.

Valid until 2030-01-24

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 1339.00/25 dated 2025-01-16. 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-11052-02-00.

TÜV Rheinland Industrie Service GmbH
Bereich Automation
Funktionale Sicherheit
Am Grauen Stein, 51105 Köln

Köln, 2025-01-24

Certification Body Safety & Security for Automation & Grid

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Holder: Rotork Flow Technology (Suzhou) Co., Ltd.
Building A, No. 88, Yinhe Road
Southeast Street, Changshu,
Jiangsu, 215558
P.R. China

Product tested: Pneumatic Actuators
Type: GTE Series Rack and Pinion Actuators

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**

Spring Return type: Move to fail-safe position by internal spring force

Dangerous Failure Rate	λ_D	1.94 E-07 / h	**194 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	8.64 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	8.72 E-05	

Double Acting type DN 300: Move to fail-safe position by external pneumatic energy

Dangerous Failure Rate	λ_D	3.74 E-07 / h	**374 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.67 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.70 E-04	

Double Acting type DN 50 to DN 270: Move to fail-safe position by external pneumatic energy

Dangerous Failure Rate	λ_D	4.90 E-07 / h	**490 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	2.18 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	2.23 E-04	

Assumptions for the calculations above: DC = 0 %, T_1 = 1 year, MRT = 72 h, β_{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 qualification tests and 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.