

Certificate



No.: 968/V 1196.00/20


Product tested	Linear Pneumatic Diaphragm Actuators	Certificate holder	Chongqing ChuanYi Control Valve Co., Ltd. No.879 Caihe road, Caijiagang town, Beibei district Chongqing P.R. China
Type designation	HA1R, HA11R, HA1D, HA11D, HA2R, HA21R, HA2D, HA21D, HA3R, HA31R, HA3D, HA31D, HA4R, HA41R, HA4D, HA41D, HA5YR, HA51R, HA5YD, HA51D, HA4RX2, HA42R, HA4DX2, HA42D		
Codes and standards	IEC 61508 Parts 1-2 and 4-7:2010		
Intended application	Safety functions: - Turn a valve to its safe Position by spring force 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 the actuators may be used in a redundant architecture of the complete finla element assembly up to SIL 3.		
Specific requirements	The instructions of the associated Installation, Operating and Safety Manual shall be considered.		
Summary of test results see page 2 of this certificate.			
Valid until 2025-11-25			

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 1196.00/20 dated 2020-11-24. This certificate is valid only for products, which are identical with the product tested.

TÜV Rheinland Industrie Service GmbH
Bereich Automation
Funktionale Sicherheit

Köln, 2020-11-25

Certification Body Safety & Security for Automation & Grid


Dipl.-Ing. (FH) Wolf Rückwart

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No.879 Caihe road, Caijiagang town, Beibei district,
Chongqing,
P.R. China

Product tested: Linear Pneumatic Diaphragm Actuators
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HA4R, HA41R, HA5YR, HA51R, HA1D, HA11D,
HA2D, HA21D, HA3D, HA31D, HA4D, HA41D,
HA5YD, HA51D, HA4RX2, HA42R, HA4DX2, HA42D

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

Turn a valve into its safe position by spring force

Dangerous Failure Rate	λ_D	3.34 E-07 / h	334 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.49 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.51 E-04	

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

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 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.