

# Certificate

## Certificate of Conformity for Actuator Functional Safety

**Certificate No.:** 01 202 CHN/K-2283330001-Z

**Certificate holder:** **Keypos Technology (Zhongshan) Co., Ltd.**  
No.1 of First Floor, No.11 Xiyi Street, Lefeng Zhong Road, Lianfeng,  
Xiaolan Town, Zhongshan City, Guangdong Province 528415, P.R. China

**Product tested** Linear Pneumatic Actuators

**Type designation** PA Series

**Codes and standards** IEC 61508 Parts 1-2 and 4-7:2010

**Intended application** Safety Function: Move a valve into its safe position by spring return 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 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 the Annex of this certificate.

Valid until 2029-07-14

The issue of this certificate is based upon an examination, whose results are documented in Report No. R\_CHN/K-2283330001-Z dated 2024-07-15.

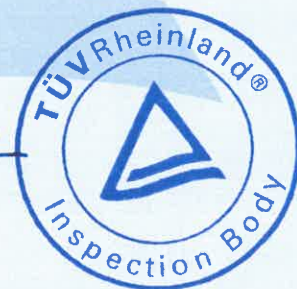
This certificate is valid only for products which are identical with the product tested.

Place: Beijing

Date: 15 July, 2024

*Ping Lu*  
Technical Certifier

TÜV Rheinland (China) Ltd.



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**Results of Assessment**

Route of Assessment		2H / 1s
Type of Sub-system		Type A
Mode of Operation		Low Demand Mode
Hardware Fault Tolerance	HFT	0
Systematic Capability		<b>SC 3</b>

**Move a valve into its safe position by spring return force****Linear Pneumatic Actuator**

Dangerous Failure Rate	$\lambda_D$	<b>495 FIT</b>
Average Probability of Failure on Demand 1001	$PFD_{avg}(T_1)$	2.20 E-03
Average Probability of Failure on Demand 1002	$PFD_{avg}(T_1)$	2.26 E-04

Assumptions for the calculations above: DC = 0 %, T1 = 1 year, MRT=72 h,  $\beta_{1002}$  = 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 of the last six years.

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.