

# Certificate



SIL/PL  
Capability

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**No.: 968/V 1022.00/17**

<b>Product tested</b>	Spring Return Fail-safe Electric Valve Actuator	<b>Certificate holder</b>	Sun Yeh Electrical Ind. Co., Ltd. No. 68, Lane 854, Sec. 1, Shatian Rd. Dadu Dist. Taichung City 43244 Taiwan, R.O.C.
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<b>Type designation</b>	S500, S1300, S2000, S2600, SE500, SE1300, SE2000, SE2600
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<b>Codes and standards</b>	IEC 61508 Parts 1-2 and 4-7:2010
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<b>Intended application</b>	Safety Function: When de-energized, the actuator moves valves or dampers into its fail-safe position. Depending on which configuration is selected Fail-Closed or Fail-Open, the actuator rotates the valve plug to close-off the flow path through the valve body or open the flow path through the valve body.
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The valves are suitable for use in a safety instrumented system up to SIL 2 (low demand mode) acc. IEC 61511-1. Under consideration of the minimum required hardware fault tolerance HFT = 1 the valves may be used in a redundant architecture up to SIL 3.

<b>Specific requirements</b>	The instructions of the associated Installation, Operating and Safety Manual shall be considered.
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Summary of test results see back side of this certificate.

Valid until 2022-09-15

The issue of this certificate is based upon an examination, whose results are documented in Report No. 968/V 1022.00/17 dated 2017-09-15.

This certificate is valid only for products which are identical with the product tested. It becomes invalid at any change of the codes and standards forming the basis of testing for the intended application.

**TÜV Rheinland Industrie Service GmbH**  
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Köln, 2017-09-15

Certification Body Safety & Security for Automation & Grid



Dipl.-Ing. Stephan Hüb

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Precisely Right.

**Holder:** Sun Yeh Electrical Ind. Co., Ltd.  
 No. 68, Lane 854, Sec. 1, Shatian Rd.,  
 Dadu Dist., Taichung City 43244, Taiwan.

**Product tested:** Spring Return Fail-safe Electric Valve Actuator  
 S500 / S1300 / S2000 / S2600  
 SE500 / SE1300 / SE2000 / SE2600

### Results of Assessment

Route of Assessment		2 <sub>H</sub> / 1 <sub>S</sub>	
Type of Sub-system		Type A	
Mode of Operation		Low Demand Mode	
Hardware Fault Tolerance	HFT	0	
Lambda Dangerous confidence level of calculation 1- $\alpha$ = 95 %	$\lambda_D$	1.79 E-07 / h	179 FIT
Lambda Dangerous Undetected assumed Diagnostic Coverage DC = 0 %	$\lambda_{DU}$	1.79 E-07 / h	179 FIT
Mean Time To Dangerous Failure	MTTF <sub>D</sub>	5.59 E+06 h	639 a
<b>Average Probability of Failure on Demand 1oo1</b> assumed Proof Test Interval T <sub>1</sub> = 1 year	<b>PFD<sub>avg</sub>(T<sub>1</sub>)</b>	<b>7.83 E-04</b>	
<b>Average Probability of Failure on Demand 1oo2</b> assumed Proof Test Interval T <sub>1</sub> = 1 year assumed $\beta_{1oo2}$ = 10 %	<b>PFD<sub>avg</sub>(T<sub>1</sub>)</b>	<b>7.90 E-05</b>	

### Origin of values

The stated values are the results of extensive qualification tests on the reliability of the safety function under critical conditions. Random and systematic failures which are the responsibility of the manufacturer were examined.

### Systematic Capability

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

### 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.