

# Certificate



SIL/PL  
Capability

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**No.: 968/V 1029.00/20**

**Product tested** Pneumatic Scotch Yoke Actuators      **Certificate holder** Actreg, S.A.U.  
C/ De la Ciència 45 - 47  
08840 Viladecans,  
Barcelona  
Spain

**Type designation** S&YK 10-12-15  
Spring Return (SR) and Double Acting (DA)

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

**Intended application** Safety Functions:  
Spring Return variant:  
- To move in direction of spring force  
- To move in reverse direction of spring force  
  
Double Acting variant:  
- Acting (to move) on demand

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 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 2025-01-09

The issue of this certificate is based upon an examination, whose results are documented in Report No. 968/V 1029.00/20 dated 2020-01-09.

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

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

Köln, 2020-01-15

Certification Body Safety & Security for Automation & Grid

*Dr. R. G. A.*  
Dr.-Ing. Thorsten Gantevoort

**Holder: ACTREG S.A.U**  
**C/ De la Ciència 45-47**  
**08840 Viladecans-Barcelona, Spain**

**Product tested: Valve Actuator Scotch & Yoke Compact S&YK (SR & DA)**  
**• Spring Return: SY01K10-12-15 (SR)**  
**• Double Acting SY01K10-12-15 (DA)**

### 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		<b>SC 3</b>

### Spring Return

#### To move on direction of force Spring

Dangerous Failure Rate	$\lambda_D$	5.68 E-07 / h	<b>568 FIT</b>
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	2.49 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	2.56 E-04	

#### To move on reverse direction of force Spring

Dangerous Failure Rate	$\lambda_D$	9.65 E-07 / h	<b>965 FIT</b>
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	4.23 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	4.44 E-04	

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

### Double Acting

#### Acting (to move) on demand

Dangerous Failure Rate	$\lambda_D$	6.42 E-07 / h	<b>642 FIT</b>
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	2.81 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	2.91 E-04	

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

### Origin of values

The stated values are the results of a FMEDA for the design and manufacturing process.  
 Random and systematic failures which are in the responsibility of the manufacturer were examined.

### 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.