

Certificate



SIL/PL
Capability

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ID 0600000000

No.: 968/V 1177.00/20

Product tested	Actuators of type Electrohydraulic (EH) in linear and rotary design	Certificate holder	Integracion de Sistemas de Actuacion S.A. de C.V. Intesista Blvd. Popocateptl 38 Hab los Pirules 54040 Tlalnepantla de Baz Mexico
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Type designation	Spring returned (SR) electrohydraulic (EH) linear actuator Spring returned (SR) electrohydraulic (EH) rotary actuator Double acting (DA) electrohydraulic (EH) linear actuator Double acting (DA) electrohydraulic (EH) rotary actuator
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Codes and standards	IEC 61508 Parts 1-2 and 4-7:2010
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Intended application	Safety Function: Spring returned actuator - The safety function is to take up the safe position by built-in spring. Double acting actuator - The safety function is to take up the safe position by external pressure supply.
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Specific requirements	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 according to IEC 61508 and IEC 61511-1:2016 + AMD1:2017.
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Summary of test results	see back side of this certificate.
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Valid until 2025-10-27

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 1177.00/20 dated 2020-10-27. This certificate is valid only for products, which are identical with the product tested.

TÜV Rheinland Industrie Service GmbH
Bereich Automation
Funktionale Sicherheit

Köln, 2020-10-27

Certification Body Safety & Security for Automation & Grid


Dipl.-Ing. (FH) Wolf Rückwart

Holder: Integracion de Sistemas de Actuacion S.A. de C.V.
 Intesista
 Blvd. Popocatéptl 38
 Hab los Pirules
 54040 Tlalnepantla de Baz
 Mexico

Product tested: Linear and Rotary Actuators of type
 Electrohydraulic (EH)

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 returned Linear-Actuator: Take up the safe position by built-in spring

Dangerous Failure Rate	λ_D	1.31 E-07 / h	131 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	5.83 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	5.87 E-05	

Spring returned Rotary-Actuator: Take up the safe position by built-in spring

Dangerous Failure Rate	λ_D	3.04 E-07 / h	304 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.35 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.37 E-04	

Double acting Linear-Actuator: Take up the safe position by external pressure supply

Dangerous Failure Rate	λ_D	1.64 E-07 / h	164 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	7.30 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	7.36 E-05	

Double acting Rotary-Actuator: Take up the safe position by external pressure supply

Dangerous Failure Rate	λ_D	2.72 E-07 / h	272 FIT
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.21 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.23 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.

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.