

Certificate



SIL/PL
Capability

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ID 0600000000

No.: 968/V 1032.00/17

Product tested	Interface valve (Hydraulic block and bleed controller)	Certificate holder	Ruelco, Inc. 1209 Distributors Row New Orleans, LA 70123 USA
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Type designation	8100, 8300
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Codes and standards	IEC 61508 Parts 1-2 and 4-7:2010
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Intended application	Safety Function: The Block and Bleed Controller changes states of the 3-way valve when pilot pressure drops. Changing states blocks the supply pressure and vents the output pressure through the outlet.
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The valves 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 valves 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. It has to be ensure that manual override is secured against manipulation if used in safety applications.
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Summary of test results see back side of this certificate.

Valid until 2022-12-07

The issue of this certificate is based upon an examination, whose results are documented in Report No. 968/V 1032.00/17 dated 2017-12-07.

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, 2017-12-07

Certification Body Safety & Security for Automation & Grid

Dipl.-Ing. Stephan Häb

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TÜVRheinland[®]
Precisely Right.

Holder: Ruelco, Inc.
1209 Distributors Row
NEW ORLEANS LA 70123
USA

Product tested: Interface Block and Bleed Controller
Type 8100 and 8300

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	
Lambda Dangerous confidence level of calculation $1-\alpha = 95\%$	λ_D	2.32 E-07 / h	232 FIT
Lambda Dangerous Undetected assumed Diagnostic Coverage DC = 0 %	λ_{DU}	2.32 E-07 / h	232 FIT
Mean Time To Dangerous Failure	MTTF _D	4.30 E+06 h	491 a
Average Probability of Failure on Demand 1oo1 assumed Proof Test Interval $T_1 = 0.083$ (once every month)	PFD_{avg}(T₁)	8.48 E-05	
Average Probability of Failure on Demand 1oo2 assumed Proof Test Interval $T_1 = 0.083$ (once every month) assumed $\beta_{1oo2} = 10\%$	PFD_{avg}(T₁)	8.49 E-06	

Origin of values

The stated values are the results of the analysis of field feedback of the last five years. 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.