

# Certificate



**No.: 968/V 1086.00/18**

<b>Product tested</b>	Pneumatic Actuators	<b>Certificate holder</b>	BERZICO INTERNATIONAL 3120 Germaine Guevremont Laval Quebec H7E 5L4 Canada
<b>Type designation</b>	BSY series pneumatic actuators BSYab-xxxxyy-cde / BSYab-xxxxyy-cdz BR series pneumatic actuators BRaxxxx / BRaxxxx-byy (For detailed information see test report)		
<b>Codes and standards</b>	IEC 61508 Parts 1-2 and 4-7:2010		
<b>Intended application</b>	Safety Function: On demand, the complete pneumatic actuator assembly actuate a valve into a safety position. The safety position of the actuator can correspond to either "closed" or "open".  The assessment based on the certification program of the Certification Body came to the result that 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.		
<b>Specific requirements</b>	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 2023-09-27

The issue of this certificate is based upon an examination, whose results are documented in Report No. 968/V 1086.00/18 dated 2018-11-22.

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

**TÜV Rheinland Industrie Service GmbH**  
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Am Grauen Stein, 51105 Köln

Köln, 2018-12-07

Certification Body Safety & Security for Automation & Grid

*Dr. R. G. A.*

Dr.-Ing. Thorsten Gantevoort

**Holder: BERZICO INTERNATIONAL**  
**3120 Germaine**  
**Guevremont Laval**  
**Quebec H7E 5L4**  
**Canada**

**Product tested: Pneumatic Actuators**  
 BSY series pneumatic actuators  
 BSYab-xxxxyy-cde/BSYab-xxxxyy-cdz  
 BR series pneumatic actuators  
 BRaxxxx/BRaxxxx-byy  
 (For detailed information see test report)

**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	
Type of Design		Single Acting	Double Acting
Lambda Dangerous confidence level of calculation 1-α = 95 %	λ <sub>D</sub>	249 FIT	498 FIT
Lambda Dangerous Undetected assumed Diagnostic Coverage DC = 0 %	λ <sub>DU</sub>	249 FIT	498 FIT
<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>1.09 E-03</b>	<b>2.18 E-03</b>
<b>Average Probability of Failure on Demand 1oo2</b> assumed Proof Test Interval T <sub>1</sub> = 1 year assumed β <sub>1oo2</sub> = 10 %	<b>PFD<sub>avg</sub>(T<sub>1</sub>)</b>	<b>1.10 E-04</b>	<b>2.20 E-04</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.