

# Certificate



SIL/PL  
Capability

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**No.: 968/V 1035.00/18**

|                       |   |                           |   |
|-----------------------|---|---------------------------|---|
| <b>Product tested</b> | Linear pneumatic spring return gate valve actuators | <b>Certificate holder</b> | Cameron, A<br>Schlumberger Company<br>3505 W Sam Houston<br>Parkway N<br>Houston, TX 77043<br>USA |
|-----------------------|---|---------------------------|---|

**Type designation** MP 14 and MP 18

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

**Intended application** Safety Function: On demand of safety function or loss of pneumatic pressure, the actuator will position the gate of the valve in the required position.

The actuators are suitable for use in a Safety Instrumented System in low demand mode up to SIL 2. 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 2023-02-13

The issue of this certificate is based upon an examination, whose results are documented in Report No. 968/V 1035.00/18 dated 2018-02-13.

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, 2018-02-13

Certification Body Safety & Security for Automation & Grid

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

**Holder: Cameron, A Schlumberger Company**  
**3505 W Sam Houston Parkway N**  
**Houston, TX 77043**  
**USA**

**Product tested: Linear pneumatic spring return gate valve actuators type MP 14 and MP 18**

### 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<br>confidence level of calculation $1-\alpha = 95\%$   | $\lambda_D$                             | 2.66 E-07 / h    | 266 FIT |
| Lambda Dangerous Undetected<br>assumed Diagnostic Coverage DC = 0 %   | $\lambda_{DU}$                          | 2.66 E-07 / h    | 266 FIT |
| Mean Time To Dangerous Failure  | MTTF <sub>D</sub>                       | 3.77 E+06 h      | 430 a   |
| <b>Average Probability of Failure on Demand 1oo1</b><br>assumed Proof Test Interval $T_1 = 1$ year                                  | <b>PFD<sub>avg</sub>(T<sub>1</sub>)</b> | <b>1.16 E-03</b> |         |
| <b>Average Probability of Failure on Demand 1oo2</b><br>assumed Proof Test Interval $T_1 = 1$ year<br>assumed $\beta_{1oo2} = 10\%$ | <b>PFD<sub>avg</sub>(T<sub>1</sub>)</b> | <b>1.18 E-04</b> |         |

### Origin of values

The stated values are the results of field feedback of the last 19 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.