



# Certificate / Certificat Zertifikat / 合格証

MP 1710058 C002

*exida* hereby confirms that the:

## **Pneumatic Rotary Actuator Micro Pneumatics Pvt. Ltd. Mumbai - India**

The manufacturer  
may use the mark:



Revision 1.0 March 29, 2018  
Surveillance Audit Due  
April 1, 2019

Has been assessed per the relevant requirements of:

**IEC 61508 : 2010 Parts 1-7**

and meets requirements providing a level of integrity to:

**Systematic Capability: SC 3 (SIL 3 Capable)**

**Random Capability: Type A, Route 2<sub>H</sub> Device**

**PFD<sub>avg</sub> and Architecture Constraints  
must be verified for each application**

### **Safety Function:**

The Pneumatic Rotary Actuator will move to the designed safe position when de-energized / energized within the specified safety time.

### **Application Restrictions:**

The unit must be properly designed into a Safety Instrumented Function per the Safety Manual requirements.



ANSI Accredited Program  
ISO/IEC 17065  
PRODUCT CERTIFICATION BODY  
#1004



Evaluating Assessor

Certifying Assessor

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**Systematic Capability: SC 3 (SIL 3 Capable)****Random Capability: Type A, Route 2<sub>H</sub> Device****PFD<sub>avg</sub> and Architecture Constraints  
must be verified for each application****Systematic Capability :**

The product has met manufacturer design process requirements of Safety Integrity Level (SIL) 3. These are intended to achieve sufficient integrity against systematic errors of design by the manufacturer.

A Safety Instrumented Function (SIF) designed with this product must not be used at a SIL level higher than stated.

**Random Capability:**

The SIL limit imposed by the Architectural Constraints must be met for each element. This device meets *exida* criteria for Route 2<sub>H</sub>.

**IEC 61508 Failure Rates in FIT\* for Pneumatic Rotary Actuator**

Application	$\lambda_{SD}$	$\lambda_{SU}$	$\lambda_{DD}$	$\lambda_{DU}$	#	E
Spring Return	0	173	0	292	428	260
Dual Acting	0	0	0	390	365	379
Spring Return with PVST	171	2	191	101	428	260
Dual Acting with PVST	0	0	299	91	365	379

\* FIT = 1 failure / 10<sup>9</sup> hours

**SIL Verification:**

The Safety Integrity Level (SIL) of an entire Safety Instrumented Function (SIF) must be verified via a calculation of PFD<sub>avg</sub> considering redundant architectures, proof test interval, proof test effectiveness, any automatic diagnostics, average repair time and the specific failure rates of all products included in the SIF. Each element must be checked to assure compliance with minimum hardware fault tolerance (HFT) requirements.

The following documents are a mandatory part of certification:

**Assessment Report:** MP 17-10-058 R003 V1R1 (or later)

**Safety Manual:** Rotary Actuator Safety Manual



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