



The manufacturer may use the mark:



Valid until February 16, 2018  
Revision 1.0 February 16, 2015



ANSI Accredited Program  
PRODUCT CERTIFICATION  
#1004

# Certificate / Certificat Zertifikat / 合格証

MIL 1402039 C001

*exida* hereby confirms that the:

## Series H and Series MH Cylinders

### Milwaukee Cylinder, Cudahy, WI

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 Series H and Series MH Cylinder will move to the designed safe position within the specified safety time.

Application Restrictions:

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



Evaluating Assessor

Certifying Assessor

# Certificate / Certificat / Zertifikat / 合格証

MIL 1402039 C001

**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.

## IEC 61508 Failure Rates in FIT\*

| Failure Category      | $\lambda_{sd}$ | $\lambda_{su}$ | $\lambda_{dd}$ | $\lambda_{du}$ |
|-----------------------|----------------|----------------|----------------|----------------|
| Dual Acting           | 0              | 129            | 0              | 282            |
| Spring Return         | 0              | 129            | 0              | 230            |
| Dual Acting w/ PVST   | 129            | 0              | 170            | 112            |
| Spring Return w/ PVST | 129            | 0              | 130            | 101            |

|          |               |
|----------|---------------|
| Option 1 | Dual Acting   |
| Option 2 | Spring Return |

\* 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: MIL 14-02-039 R001 V1 R1

Safety Manual: Safety Manual for Series H & Series MH Hydraulic Cylinders

Series H and Series  
MH Cylinder



64 N Main St  
Sellersville, PA 18960

T-061, V1R7