



# Certificate / Certificat Zertifikat / 合格証

DC 1302072 C001

*exida* hereby confirms that the:

**DM-700 Toxic Gas Sensor**

**Detcon**

**The Woodlands, TX- USA**

The manufacturer  
may use the mark:



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 2 (SIL 2 Capable)**

**Random Capability: Type B Element**

**SIL 2 @ HFT=0; Route 1<sub>H</sub>**

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

Revision 1.1 September 30, 2016  
Surveillance Audit Due  
January 1, 2020

### Safety Function:

The DM-700 is a smart device to detect toxic gas hazards. It contains self-diagnostics and is programmed to send its output to a specified failure state upon internal detection of a failure.

### Application Restrictions:

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



ANSI Accredited Program  
PRODUCT CERTIFICATION  
#1004



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Evaluating Assessor

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Certifying Assessor

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**Systematic Capability: SC 2 (SIL 2 Capable)****Random Capability: Type B Element****SIL 2 @ HFT=0; Route 1<sub>H</sub>****PFD<sub>AVG</sub> and Architecture Constraints  
must be verified for each application**DM-700 Toxic Gas  
Sensor**Systematic Capability:**

The Product has met manufacturer design process requirements of Safety Integrity Level (SIL) 2. 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\***

Device	$\lambda_{SD}$	$\lambda_{SU}$	$\lambda_{DD}$	$\lambda_{DU}$	SFF
DM-700 Toxic (with application restrictions*)	0	217	3034	316	91.1%

\*For toxic gas sensors, combustible or toxic gas is not constantly present (e.g. for long periods of more than 24 hours).

\* 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:** DC 13-02-072 R002 V1 R2

**Safety Manual:** DM-700 Safety Manual V3



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