



# Certificate / Certificat Zertifikat / 合格証

BETA B.V. 080432 P0007 C01.2

*exida* hereby confirms that the:

## **BETA Pressure, Temperature and Vacuum Switches**

**BETA B.V.**

**Rijswijk - Netherlands**

Has been assessed per the relevant requirements of:

**IEC 61508 : 2000 Parts 1-7**

and meets requirements providing a level of integrity to:

**Systematic Capability: SC 2 (SIL 2 Capable)**

**Random Capability: Type A Element**

**SIL 2 @ HFT = 0**

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

Safety Function:

The air-relay / micro switch will de-energize when the input pressure or temperature rises above or falls below the set-point within the stated safety accuracy.

Application Restrictions:

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



Evaluating Assessor

Certifying Assessor

The manufacturer  
may use the mark:



Revision 3.0 February 25, 2015



ANSI Accredited Program  
PRODUCT CERTIFICATION  
#1004

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**Random Capability: Type A Element**

**SIL 2 @ HFT = 0**

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must be verified for each application**

**BETA Pressure,  
Temperature and  
Vacuum Switches**

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.

Switch	$\lambda_{safe}$	$\lambda_{dang.}$	$\lambda_{total}$
Pressure switches C.-P.....-series, air-relay	431	212	643
Pressure switches W.-P.....- or C.-P.....- or Z.-P.....- or B.-P.....- series, micro-switch	276	124	400
Temperature switches C.-T.....- series, air-relay	394	233	627
Temperature switches W.-T.....- or C.-T.....- or Z.-T.....- or B.-T.....- series, micro-switch	248	134	382
Vacuum switches W.-V.....- or C.-V.....- or Z.-V.....- or B.-V.....- series	171	80	251
Differential pressure switches W.-D.....- or C.-D.....- or G.-D.....- or Z.-D.....- series	813	255	1068

All failure rates are given in FIT (failures / 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: BETA 0804-32-C R004 V1R2

Safety Manual: BETA B.V. Safety Manual Rev A



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