

# CERTIFICATE



Besta 1205006 P0027 C001.1

exida Certification S.A. hereby confirms that the

## Trimod Besta Level Switches

**Bachofen AG**

Uster, Switzerland

Has been assessed according to the relevant requirements of

**IEC 61508:2010**

Parts 1 - 2, and meets requirements providing a level of integrity to

**Systematic Integrity : SIL 3 Capable**

**Random Integrity :** Type A device,  $PFD_{AVG}$  and architecture constraints must be verified for each application

### **Safety Function**

The Trimod Besta level switch will actuate a switched signal for either a high or low limit fluid level.

### **Application Restrictions**

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



Assessor



Certifying Assessor

Assessment date: 21 January 2013

exida Certification SA, Nyon, Switzerland



# Systematic Integrity: SIL 3 Capable

## SIL 3 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. For a Trimod Besta level switch used in final element assembly, SIL must also be verified for the specific application using the following failure data:

### Summary for the Trimod Besta level switches :

Type A device, IEC 61508 failure rates

Switch type	$\lambda_{Safe}$	$\lambda_{DD}$	$\lambda_{DU}$	$\lambda_{AU}$
[V1]	81	0	139	0
[V2]	157	136	71	8
[V3]	20	0	97	0
[V4]	35	20	87	1
[V5]	81	0	161	0
[V6]	157	136	93	8
[V7]	76	0	128	0

Please refer to the assessment report for a detailed listing of the switch models included in each type listed above. All failure rates are given in FIT=10<sup>-9</sup>/h

### 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 subsystem must be checked to assure compliance with minimum hardware fault tolerance (HFT) requirements.

### The following documents are mandatory parts this certificate:

Besta 1205-006-C R003 V1R0 Assessment report.

Trimod Besta Safety manual V1.0