

CERTIFICATE

E+H 1009074 P0012 C02



exida Certification S.A. hereby confirms that the

Soliphant M Level Switch

Endress+Hauser GmbH + Co KG

Maulburg, Germany

Has been assessed according to the relevant requirements of

IEC 61508:2000

Parts 1 - 3, and meets requirements providing a level of integrity to

Systematic Integrity : SIL 2 Capable

Random Integrity : SIL 2 @ HFT=0

Safety Function

The Soliphant M will measure high level within the stated safety accuracy and indicate an output.

Application Restrictions

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



Assessor



Certifying Assessor

Date: 12 November 2010

exida Certification SA, Nyon, Switzerland



Systematic Integrity: SIL 2 Capable

SIL 2 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 the statement without "prior use" justification by end user or diverse technology redundancy in the design.

For a Soliphant M used in final element assembly, SIL must also be verified for the specific application using the following failure data:

Random Integrity: SIL 2 @ HFT=0

Summary for the Soliphant M

Type B device

IEC61508 failure rates

Model	Safety Manual	Fail-Safe State	SU	Det.	H	L	DU	AU	NE
FEM51	SD203FEN_0106	Out De-Energized	500				63	3	188
FEM52	SD204FEN_0106	Out De-Energized	455				58	12	117
FEM54	SD205FEN_0106	Out De-Energized	494				54	3	172
FEM55	SD208FEN_0106	Out to 8 mA	280	46	47	91	31	3	247
FEM57 / FTL325 P	SD207FEN_0106	Out De-Energized	404	99			33	10	360
FEM58	SD206FEN_0106	Out < 0.5 mA	297	90	18	2	48	12	110

All failure rates are given in FIT=10⁻⁹/h

DD – Output does not indicate level within safety accuracy but failure detected by automatic diagnostics.

Det. – Internal fault detected by automatic diagnostics, output goes to state defined by jumper setting

H – Output goes to high saturation current level

L – Output goes to low saturation current level

DU – Output does not indicate level within safety accuracy and undetected by internal automatic diagnostics

AU – Internal failure of diagnostics

NE – No effect of safety function or automatic diagnostics

SIL Verification:

The Safety Integrity Level (SIL) of an entire Safety Instrumented Function (SIF) must be verified via a calculation of PFD_{AVG} 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:

E+H 03-03-22 R036 V1R1.3 Assessment report.

Safety manuals - see table above.

The holder of this certificate may use this mark.

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