

The manufacturer
may use the mark:



Reports:

GE 08-01-54 R002 V1R1
IEC 61508 Assessment
3500_63, 350800, 3500_33
GE 08-01-54 R003 V1R1
SafetyCase Review
3500_63, 350800, 3500_33
GE 08-01-54r2 R001 V1 R3
3500-63

Validity:

This assessment is valid for
the 3500/63 Hazardous Gas
Monitor, 350800 Sensor, and
3500/33 Relay Card

This assessment is valid until
January 01, 2012.

Revision 1.0 December 19, 2008


exida
Certification S.A.

Certificate / Certificat Zertifikat / 合格証

GE 080154 C001

exida hereby confirms that the:

**3500/63 Hazardous Gas Monitor
350800 Sensor
3500/33 Relay Card**

**GE Optimization & Control / Bently Nevada
Minden, NV
USA**

Has been assessed per the relevant requirements of:

IEC 61508 Parts 1, 2, 3

and meets requirements providing a level of integrity to:

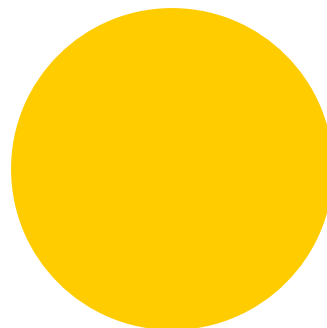
**Systematic Integrity: SIL 2 Capable
Random Integrity: SIL 2 @ HFT=0**

Safety Function:

The 350800 Sensor and 3500/63 Hazardous Gas Monitor
measure hazardous gas concentrations and subsequently
communicate this level to a logic solver via an analog 4-20mA
signal or when used in combination with the 3500/33 Relay Card
via a digital on/off signal.

Application Restrictions:

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





Product Assessor



Auditor

Certificate / Certificat / Zertifikat / 合格証

GE 080154 C001

Systematic Integrity: SIL 2 Capable

Random Integrity: SIL 2 @HFT=0

3500/63 Hazardous Gas Monitor
 350800 Sensor
 3500/33 Relay Card
 GE Optimization & Control / Bently Nevada
 Minden, NV
 USA

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

IEC 61508 Failure Rates

Device	λ_{sd}	λ_{su}	λ_{dd}	λ_{du}	SFF
350800 - gas sensor	0 FIT	38 FIT	2778 FIT	188 FIT	-
3500/63 - per gas sensor input	0 FIT	52 FIT	190 FIT	25 FIT	-
3500/63 - common to all gas sensor inputs	0 FIT	128 FIT	732 FIT	50 FIT	-
3500/63 - per mA output	0 FIT	3 FIT	104 FIT	10 FIT	-
3500/63 - common to all mA outputs	0 FIT	2 FIT	45 FIT	0 FIT	-
3500/33 - per relay output	0 FIT	90 FIT	0 FIT	26 FIT	-
3500/33 - common to all relay outputs	0 FIT	225 FIT	788 FIT	105 FIT	-

Hazardous Gas Monitor, Sensor, and Relay Card Configuration	λ_{sd}	λ_{su}	λ_{dd}	λ_{du}	SFF
Single gas sensor input, mA output	0 FIT	223 FIT	3849 FIT	273 FIT	93.7%
Single gas sensor input, relay output	0 FIT	533 FIT	4488 FIT	394 FIT	92.7%

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.

* FIT = 1 failure / 10^9 hours



Form	Version	Date
C61508	2.01	July 2008