

# SIL



## Functional Safety Certificate

**No. 0P231228.RPWU85**

Test Report / Technical Construction File no. TSHN23121453464

**Certificate's Holder:** Respo products  
D-595, Kamla Nagar, Agra, 282005, India

**Product:** Fixed Gas Detector  
**Model(s):** BS03

**Rating:** Supply voltage DC24V±6V, 4~20mA or bus output

**Standard:** Has been assessed per the relevant requirements of:  
IEC 61508:2010 Parts 1-3

And meets requirements providing a level of integrity to:  
Systematic Capability: SC 2 (SIL 2 Capable)  
Random Capability: Type B Element  
SIL 2 Capable@ HFT= 0; Route 1<sub>H</sub>  
PFD<sub>AVG</sub> and Architecture Constraints must be verified each application

\* Safety function:  
BS03 Gas Detectors measure hazardous gas concentrations/ and subsequently communicate this level to a logic solver via an analog 4-20mA signal.

\* Is suitable to be safety function according to the description and the configuration defined in Annex I.

**Verification Mark:**



The Verification Mark can be affixed on the product. It is NOT permitted to alter the Verification Mark in any way

**Remark:** This SIL Verification of Compliance has been issued on a voluntary basis. ECM confirms that a Test Report is existent for the above listed product(s) and found to meet the requirements of above standards for application in safety related system up to Safety Level of **SIL 2**. The unit must be properly designed into a Safety Instrument Function as per the requirements in the Safety Manual. The Verification Mark shown above can be affixed on the product. It is NOT permitted to alter the Verification Mark in any way. In addition the Verification's Holder is NOT allowed to transfer the Verification to third parties. This certificate can be checked for validity at [www.entecerma.it](http://www.entecerma.it)

**Date of issue 28 December 2023**

**Expiry date 27 December 2028**

**For online check:**



**Approver**  
**Ente Certificazione Macchine**  
**Legal Representative**  
**Luca Bedonni**



**Ente Certificazione Macchine**

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# Annex I

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1. Application Restrictions:  
The unit must be properly designed into a Safety Instrumented Function per the Safety Manual requirements.
2. 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.

3. IEC 61508 Failure Rates:

Device	$\lambda_{sd}$	$\lambda_{su}$	$\lambda_{dd}$	$\lambda_{du}$	SFF
BS03	0 FIT	281.55 FIT	182.55 FIT	49.46 FIT	90.37%

4. 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.