

# SIL



## Functional Safety Certificate

**No. 3U241216.SNTWT98**

Test Report / Technical Construction File no. SIL-SNTCGD-(24)-12

**Certificate's Holder:** Shenzhen Nuoa Technology Co., Ltd.  
1301, 1401, 1501, 1601, Building C1, No.459, Qiaokai Road, Fenghuang Community, Fenghuang Street, Guangming District, Shenzhen, China

**Product:** Point-type combustible gas detectors for industrial and commercial use

**Model(s):** GTYQ-IR500/GTYQ-IR500L/GTYQ-IR500M/GTYQ-IR500S

**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 3 (SIL 3 Capable)  
Random Capability: Type B Element  
SIL 3 Capable@ HFT= 1, SIL 2 Capable@ HFT= 0, Route 1+  
PFDavg and Architecture Constraints must be verified each application

\* Safety function:  
The GTYQ-IR500L/GTYQ-IR500M/GTYQ-IR500S 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 3**. 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 16 December 2024**

**Expiry date 15 December 2029**

**For online check:**



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



**Ente Certificazione Macchine**

Via Cà Bella, 243 - 40053 Valsamoggia Loc. Castello di Serravalle (Bo) Italy  
☎ +39.0516705141 📠 +39.0516705156 ✉ [info@entecerma.it](mailto:info@entecerma.it) 🌐 [www.entecerma.it](http://www.entecerma.it)





# Annex I

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Application:

Restrictions:

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

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.

IEC61508

Failure Rates:

Device	$\lambda_{SD}$	$\lambda_{SU}$	$\lambda_{DD}$	$\lambda_{DU}$	SFF
GTYQ-IR500 4~20mA output	0 FIT	1214.11 FIT	484.79 FIT	185.65 FIT	90.15%
GTYQ-IR500L 4~20mA output	0 FIT	1246.65 FIT	459.28 FIT	175.65 FIT	90.66%
GTYQ-IR500M 4~20mA output	0 FIT	1206.23 FIT	409.55 FIT	175.65 FIT	90.19%
GTYQ-IR500S 4~20mA output	0 FIT	1196.12 FIT	387.12 FIT	175.65 FIT	90.01%

1 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.