Certificate – Сертификат – 證明書 – Certificat – 증명서 – شهادة

SIL

Functional Safety Certificate

No. 4I250818.CCAQS80

Test Report / Technical Construction File no. SIL-CQCYYB(25)-50

Certificate's Holder: Chongqing Chuanyi Automation Co., Ltd.
Measurement & Control Technology Branch
No. 61, Middle Section of Huangshan Avenue, Dazhulin Sub-district,
Liangjiang New Area, Chongqing, China

Product: Rotary Paddle Level Switch

Model(s): RS, RS10 Series

Standard: Has been assessed per the relevant requirements of:
IEC 61508 Parts 1-7:2010

And meets requirements providing a level of integrity to:
Systematic Capability: SC 3 (SIL 3 Capable)
Random Capability: Type B Element
SIL 2 @ HFT= 0; SIL 3@ HFT=1; Route 2_H
PFD_{AVG} and Architecture Constraints must be verified each application

* Safety Function:
The RS, RS10 series rotary paddle level switch utilizes a synchronous motor to drive the rotating shaft and blades through reduction gears. When the measured solid materials come into contact with or cover the blades, the rotation of the blades is hindered. This resistance is transmitted to the detection device inside the instrument through the rotating shaft. The detection device then outputs a switch signal and cuts off the motor power supply to stop the blades from rotating.

*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

Date of issue 18 August 2025

Expiry date 17 August 2030

For online check:

Approver
Ente Certificazione Macchine
Legal Representative
Luca Bedonni

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Annex I

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1. The use of the product must obey the required rules to conservation of SIL 3 properties, these rules are recalled in the §6 of the Assessment Report reference: [SIL Capability assessment report]

2. The product version of hardware components used for validation and type tests are the following:

Product:	Model(s):
Rotary Paddle Level Switch	RS, RS10 Series

3. Acceptable environmental constraints for the system are recalled in the safety Manual. These elements must be checked for each integration operation of the product.

4. Hypothesis used for calculations are presented here under:
   - The mode of operation is Low demand, which means less than 1 trip demand each year;

Component architecture	SIL Capability	Demand frequency	PFD
1oo1 configuration	SIL2	Low	3.0E-04
1oo2 configuration	SIL3	Low	8.7E-04

5. IEC 61508 Failure Rates in FIT*

Device	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}	SFF
RS, RS10 Series	0	170	329	36	93.2%

**FIT=1 failure/10⁹ hours*

Safety function	Failure rate	Undetected dangerous failure rate	Tests intervals	MTTR
SF1	3.65E-07	3.6E-08	12months	24h
SF2	3.65E-07	3.6E-08	12months	24h

6. The Safety Integrated Level of the safety function using the product shall be calculated taking into account the characteristics of the whole system.

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