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

SIL

Functional Safety Certificate

No. 2X210115.HCS0D12
Technical Construction File no. SIL-HZKCS-2021-A1

Certificate's Holder: Hanzhongkun (Shanghai) Control System Co., Ltd.
Zone C, Floor No. 1, Building No. 5, No. 98 Songhai Road, Qingpu District, Shanghai, China

Product: Electric Actuator
Model(s): HKM.2 Series; HKP.2 Series; HKL.2 Series

Standard: Has been assessed per the relevant requirements of:
IEC 61508:2010 Parts 1-7
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 device
PFD_{avg} and Architecture Constraints must be verified each application

* Safety Function:
The electrical actuators will move to the designed safe position within the specified safety time.
* Application Restrictions:
The unit must be properly designed into a safety instrumented function per the safety manual requirements.
* 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 15 January 2021

Service Manager
Luca Bedonni

Expiry date 14 January 2026

Deputy Manager
Amanda Payne

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Annex I

No. 2X210115.HCS0D12

Technical Construction File no. SIL-HZKCS-2021-A1

1. The use of the product [Actuator] must obey the required rules to maintain the SIL 3 Capable properties. These rules are stated in the Assessment Report, reference No.: [SIL Capability assessment report].

2. The product version of hardware components used for assessment are the following:

Product Type	Model
Electric Actuator	HKM.2 Series; HKP.2 Series; HKL.2 Series

3. Assessed documents for the present certification are defined in the Assessment Report [SIL Capability assessment report].

4. Acceptable environmental constraints for the system are stated in the safety manual (Ref: [SIL-HZKCS-03]). These elements must be checked for each integration of the product.

5. The SIL capable certified of the product is the following:
   - Safety function: move to the designed safe position within the specified safety time.

6. The fail rates in FIT (FIT=1 failure/10^9 hours) is the following:

Safety Function	Fail safe detected λ_{SD}	Fail safe undetected λ_{SU}	Fail dangerous detected λ_{DD}	Fail dangerous undetected λ_{DU}
Stay put	0	125	83	15
ESD open	156	124	75	26
ESD close	206	113	95	37

7. The safety integrity level (SIL) of the entire Safety Instrument 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 element must be checked to assure compliance with minimum hardware fault tolerance (HFT) requirements.

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