SIL
Functional Safety Certificate

ECM
Ente Certificazione Macchine
let's be your partner

No. 3Q181114.SMCQT32

In Partnership with:

POCE
POCE Technology

Certificate's Holder:
SHENZHEN MORC CONTROLS CO., LTD.
Morc Building, No.8, Dabao Rd, Bao'an District, Shenzhen City, Guangdong Province, China.

Product:
Solenoid Valve

Model(s):
MC50 Series

Standard:
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 A 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 Valve will move to the designed safe position when de-energized / energized 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:

SIL VERIFIED
let's be your partner
Compliance Approved

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

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Annex I

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1. **SC 3 (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.

2. A Safety instrumented Function (SIF) designed with this product must not be used at a SIL level higher than stated.

3. **Random Capability:**
   The SIL limit imposed by the Architectural Constraints for each element.

4. IEC 61508 Failure Rates:

Failure Rate Data	Per 10^9 Hours					
Clean Service	Close On Trip				Open On Trip	
	Full Stroke		Tight Shutoff			
	Normal	Pvst	Normal	Pvst	Normal	Pvst
Fail Dangerous Detected		265		265		265
Fail Dangerous Undetected	626	343	1480	1226	436	171

PVST: Partial Valve Stroke Test

5. 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.