SIL

Functional Safety Certificate

No. 1N190624.ZTTU94

Technical Construction File no. SIL-WSKTHNB893

Certificate's Zuercher Technik AG

Holder: Neumattstrasse 6, CH-4450, Sissach, Switzerland

Product: Ball Valve

Model(s): AF90D, AF94D, AF95D, AF96D, A/AF20, A/AF20D,

A/AF20DA

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 ball valve is a form of quarter-turn valve which uses a floating ball with athrough hole to open and close, the valve can be driven by manual (lever orgear box) or by actuators(pneumatic or electric) for either on/off or controlapplications.

* 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 24 June 2019

Chief Manager
Março Moring

Expiry date 23 June 2024

Deputy Manager Amanda Payne



Annex I



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- 1. The use of the product must obey the required rules to conservation of SIL3 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:

Component	Model
Ball Valve	AF90D, AF94D, AF95D, AF96D, A/AF20, A/AF20D, A/AF20DA

- 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. The SIL 3 capable certified Safety Instrumented Function of product is the following:
 - 1. SF1: To Close on demand.
 - 2. SF2: To Open on demand.
- 5. 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		
1001 configuration	SIL2	Low	9.16E-04		
1002 configuration	SIL3	Low	2.12E-04		

Safety function	Failure rate	Undetected dangerous failure rate	Tests intervals	MTTR
SF1	4.19E-05	4.28E-07	12months	48h
SF2	4.09E-05	4.31E-07	12months	48h

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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