

SIL



Functional Safety Certificate

No. 3J190514.RVDD11

Technical Construction File no. ZREC1905021-SIL

Certificate's Holder: Remington Valve, LLC
8226 Kerr Street, Houston, TX 77029, USA

Product: Severe Service Ball Valve

Models: R series, J series, S series, E series, I series, C series, M series, T series, P series, K 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 A Element
SIL 2 @ HFT= 0; SIL 3@ HFT=1; Route 2H
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:



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 14 May 2019

Expiry date 13 May 2024

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Annex I



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- The use of the product [Series Butterfly valves] 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]
- The product version of hardware components used for validation and type tests are the following:

Component	Model
Severe Service Ball Valve	R series, J series, S series, E series, I series, C series, M series, T series, P series, K series

- Acceptable environmental constraints for the system are recalled in the safety Manual (Ref: [SIL-SM-02]). These elements must be checked for each integration operation of the product.
- The SIL 3 capable certified Safety Instrumented Function of product [Series Butterfly valves] is the following:
 - SF1: To Close on demand.
 - SF2: To Open on demand.
- 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	6.94E-03
1oo2 configuration	SIL3	Low	1.83E-04

Safety function	Failure rate	Undetected dangerous failure rate	Tests intervals	MTR
SF1	8.75E-07	3.61E-07	12months	24h
SF2	4.77E-07	1.21E-08	12months	24h

- The Safety Integrated Level of the safety function using the product [Series Butterfly valves] shall be calculated taking into account the characteristics of the whole system.