

BUREAU VERITAS
Certification



Type certificate by assessment of the product design

Given to

Zhejiang Sanfang Control Valve Co., Ltd.
No.41 Jinqiu Avenue, Fuyang District
Hangzhou
China

Bureau Veritas Certification certifies that the design of the product mentioned below has been assessed and fulfils the relevant requirements of the following standard:

IEC 61508 Ed2 – Parts 1, 2, 4

Description of the product

ZSHO/ ZSHV Ball Valve
*(Type A Element/
SIL 2 Capable in 1oo1 configuration
SIL 3 Capable in 1oo2 configuration)*

Is suitable to be used in safety function according to the description and the configuration defined in appendix 1

This certificate only applies to the design of the product (as referred above) and to the corresponding technical file.

Assessment report reference:
INS-E-ZJ-14-0064_007_SIL Capability assessment report_R1

The appendix 1 is an integral part of this certificate.

Certificate N°: C140003-1
Emission date: October 14th 2016
End of validity: October 13th 2019

Jacques MATILLON
General Manager
p/p Eric Rouaix
Functional Safety Certification Manager

cofrac

**CERTIFICATION
DE PRODUITS
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The use of the product Ball Valve must obey the required rules to maintain the SIL 3 Capable properties. These rules are stated in the section 6 of the Assessment Report reference: INS-E-ZJ-14-0064_007_SIL Capability assessment report_R1.

The product versions of hardware components used for the assessment are the following:

Component	Model
Ball Valve	ZSHO/ ZSHV Ball Valve

Assessed documents for the present certification are defined in the Appendix 1 and 2 of the Assessment Report reference : INS-E-ZJ-14-0064_007_SIL Capability assessment report_R1.

Acceptable environmental constraints and design lifetime for the product are stated in the safety Manual (Ref.: SIL2015-008 Safety Manual for Ball Valve). These elements must be checked for each integration of the product.

The certified Safety Function(s) of Ball Valve is/are the following:

- SF1: Open or Close on demand.

Hypothesis used for mode of operation is the following:

- The mode of operation is "Low demand", which means less than 1 trip demand each year;

			Calculation hypothesis		Intermediate results		Final results	
Type	Component architecture	Safety function	Tests intervals	MTTR	Failure Rate	Undetected dangerous failure rate	SIL Capability	Probability of Failure on Demand
ZSHO Ball Valve	Ioo1 configuration	SF1	18 months	24 h	3.95E-07	3.95E-07	SIL 2	2.61E-03
	Ioo2 configuration	SF1	18 months	24 h	N/A	N/A	SIL 3	2.69E-04
ZSHV Ball Valve	Ioo1 configuration	SF1	18 months	24 h	6.16E-07	6.16E-07	SIL 2	4.07E-03
	Ioo2 configuration	SF1	18 months	24 h	N/A	N/A	SIL 3	4.25E-04

The Safety Integrity Level of the safety function using the Ball Valve shall be calculated taking into account the characteristics of the complete system supporting the safety function.

This certificate does not imply the conformity of this product to any European Directive and does not allow CE marking.



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the assessment report are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with BUREAU VERITAS CERTIFICATION. This certificate is issued within the scope of the General conditions of Service of BUREAU VERITAS CERTIFICATION available. Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against BUREAU VERITAS CERTIFICATION for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the BUREAU VERITAS CERTIFICATION or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.