

# Certificate



**No.: 968/V 1091.00/19**

<b>Product tested</b>	Ball Valves	<b>Certificate holder</b>	Chongqing Hopeway Instrument Co.,Ltd. No. 66 Middle Section Huangshan Avenue North New Zone Chongqing P.R. China
<b>Type designation</b>	HB2510, HB2514, HB2516, HB2610, HS4510, HS4514, HS4516, HS4610, HB2810 and HS4810		
<b>Codes and standards</b>	IEC 61508 Parts 1-2 and 4-7:2010		
<b>Intended application</b>	Safety Function: Close or Open on Demand  The valves are suitable for use in a safety instrumented system up to SIL 2 (low demand mode). Under consideration of the minimum required hardware fault tolerance HFT = 1 the valves may be used in a redundant architecture up to SIL 3.		
<b>Specific requirements</b>	The instructions of the associated Installation, Operating and Safety Manual shall be considered.		
Summary of test results see back side of this certificate.			
Valid until 2024-01-15			

The issue of this certificate is based upon an examination, whose results are documented in Report No. 968/V 1091.00/19 dated 2019-01-15.  
This certificate is valid only for products which are identical with the product tested.

**TÜV Rheinland Industrie Service GmbH**  
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Funktionale Sicherheit  
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Köln, 2019-01-15

Certification Body Safety & Security for Automation & Grid

Dipl.-Ing. Thomas Steffens

**Holder:** Chongqing Hopeway Instrument Co., Ltd.  
No.66, Middle Section, Huangshan Avenue,  
North New Zone, Chongqing  
P.R. China

**Product tested:** Ball Valves  
HB2510, HB2514, HB2516, HB2610, HS4510,  
HS4514, HS4516, HS4610, HB2810 and HS4810

### Results of Assessment

Route of Assessment		$2_H / 1_S$	
Type of Sub-system		Type A	
Mode of Operation		Low Demand Mode	
Hardware Fault Tolerance	HFT	0	
Lambda Dangerous confidence level of calculation $1-\alpha = 95\%$	$\lambda_D$	3.50 E-07 / h	350 FIT
Lambda Dangerous Undetected assumed Diagnostic Coverage DC = 0 %	$\lambda_{DU}$	3.50 E-07 / h	350 FIT
<b>Average Probability of Failure on Demand 1oo1</b> assumed Proof Test Interval $T_1 = 1$ year	<b><math>PFD_{avg}(T_1)</math></b>	<b>1.53 E-03</b>	
<b>Average Probability of Failure on Demand 1oo2</b> assumed Proof Test Interval $T_1 = 1$ year assumed $\beta_{1oo2} = 10\%$	<b><math>PFD_{avg}(T_1)</math></b>	<b>1.56 E-04</b>	

### Origin of values

The stated values are the results of extensive qualification tests on the reliability of the safety function under critical conditions. In addition, the failure rate was verified by the analysis of field feedback of the last eight years. Random and systematic failures which are the responsibility of the manufacturer were examined.

### Systematic Capability

The development and manufacturing process and the functional safety management applied by the manufacturer in the relevant lifecycle phases of the product have been audited and assessed as suitable for the manufacturing of products for use in applications with a maximum Safety Integrity Level of 3 (SC 3).

### Periodic Tests and Maintenance

The given values require periodic tests and maintenance as described in the Safety Manual. The operator is responsible for the consideration of specific external conditions (e.g. ensuring of required quality of media, max. temperature, time of impact), and adequate test cycles.