Certificate

No.: 968/V 1194.01/26

Product tested	Butterfly Valves (details see page 2 - 5)	**Certificate holder**	Chongqing ChuanYi Control Valve Co., Ltd. No.879 Caihe road, Caijiagang town, Beibei district Chongqing P.R. China
Type designation	Group I: Triple eccentric and quadruple eccentric butterfly valve Group II: Face sealing and double eccentric butterfly valve Group III: Rubber-coated and fluorine-coated butterfly valve Group IV: Ultra-low temperature butterfly valve		
Codes and standards	IEC 61508 parts 1-2:2010		
Intended application	Safety functions: - Close on demand and external tightness - Close on demand with leakage rate as per GB/T 4213 and external tightness - Open on demand and external tightness 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.		
Specific requirements	The instructions of the associated Installation, Operating and Safety Manual shall be considered.		

Summary of test results see page 2 to 5 of this certificate.

Valid until 2031-06-03

The issue of this certificate is based upon an evaluation in accordance with the Certification Program CERT FSP1 V3.0:2020 in its actual version, whose results are documented in Report No. 968/V 1194.01/26 dated 2026-06-03. This certificate is valid only for products, which are identical with the product tested. Issued by the certification body accredited by DAkkS according to DIN EN ISO/IEC 17065. The accreditation is only valid for the scope listed in the annex to the accreditation certificate D-ZE-11052-02-00.

TÜV Rheinland Industrie Service GmbH
Bereich Automation
Funktionale Sicherheit
Am Grauen Stein, 51105 Köln

Köln, 2026-06-03

Certification Body Safety & Security for Automation & Grid

Dipl.-Ing. Thomas Steffens

www.fs-products.com
www.tuv.com

TÜVRheinland®
Precisely Right.

10/222 12. 12 E A4 ® TÜV, TUEV and TUV are registered trademarks. Utilisation and application requires prior approval.

TÜV Rheinland Industrie Service GmbH, Am Grauen Stein, 51105 Köln / Germany
Tel.: +49 221 806-1790, Fax: +49 221 806-1539, E-Mail: industrie-service@de.tuv.com

Holder: Chongqing ChuanYi Control Valve Co., Ltd.
No.879 Caihe road, Caijiagang town,
Beibei district, Chongqing,
P.R. China

Product tested: Triple eccentric and quadruple eccentric butterfly valve; Group I:
VBJG, VBJG-300002, VBJG-300012, VBJG-300022, VBJG-300000, VBJG-300001, VBJG-300010, VBJG-300011, VBJG-300021, VBJG-300031, VB200, VB500, VB400, VBJG-400, VBJG-400002, VBJG-400012, VBJG-400001, VBJG-400011, VBJG-400022, VBJGB, VBJG-300102, VBJG-300101, VBJG-310, VBJG-310002, VBJG-310021, VBJG-310022, VBJG-310001, VBJG-400102, VBJG-400101, VBJG-400021, VBJG-400000, VBJG-400010, VBJG-400032, VBJG-400031, VBJG-320012, VBJG-320011, VBJG-320002, VBJG-320001, VBJG-320000, VBJG-320010, VBJG-320030, VBJG-320031, VBJG-320032

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
Systematic Capability		**SC 3**

Close on demand and external tightness

Dangerous Failure Rate	λ_D	3.55 E-07 / h	**355 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.58 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.61 E-04	

Close on demand with leakage rate as per GB/T 4213 and external tightness

Dangerous Failure Rate	λ_D	7.56 E-07 / h	**756 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.37 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.49 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	3.16 E-07 / h	**316 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.41 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.43 E-04	

Assumptions for the calculations above: DC = 0 %, T_1 = 1 year, MRT = 72 h, β_{1oo2} = 10 %

Origin of failure rates

The stated failure rates for low demand are the result of an FMEDA with tailored failure rates for the design and manufacturing process.
Furthermore the results have been verified by field-feedback data.
Failure rates include failures that occur at a random point in time and are due to degradation mechanisms such as ageing.
The stated failure rates do not release the end-user from collecting and evaluating application-specific reliability data.

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.

Holder: Chongqing ChuanYi Control Valve Co., Ltd.
No.879 Caihe road, Caijiagang town,
Beibei district, Chongqing,
P.R. China

Product tested: Face sealing and double eccentric butterfly valve;
Group II:
VBB, VBD, VBJ, VBS, VBJG-600, VBJG-600001, VBJG-600011, VBJG-600003, VBJG-600013, VBJG-60200, VBJG-60201, VBJG-60302, VBJG-60410, VBJG-60411, VBJG-600021, VBJG-601013, VBJG-20000, VBJG-20001, VBJG-200000, VBJG-200010, VBJG-200001, VBJG-200011, VBJG-700000, VBJG-700001, VBJG-700100, VBJG-700101

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
Systematic Capability		**SC 3**

Close on demand and external tightness

Dangerous Failure Rate	λ_D	2.82 E-07 / h	**282 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.26 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.27 E-04	

Close on demand with leakage rate as per GB/T 4213 and external tightness

Dangerous Failure Rate	λ_D	6.82 E-07 / h	**682 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.04 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.14 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	2.03 E-07 / h	**203 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	9.04 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	9.13 E-05	

Assumptions for the calculations above: DC = 0 %, T_1 = 1 year, MRT = 72 h, β_{1oo2} = 10 %

Origin of failure rates

The stated failure rates for low demand are the result of an FMEDA with tailored failure rates for the design and manufacturing process.
Furthermore the results have been verified by field-feedback data.
Failure rates include failures that occur at a random point in time and are due to degradation mechanisms such as ageing.
The stated failure rates do not release the end-user from collecting and evaluating application-specific reliability data.

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.

Holder: Chongqing ChuanYi Control Valve Co., Ltd.
No.879 Caihe road, Caijiagang town,
Beibei district, Chongqing,
P.R. China

Product tested: Rubber-coated and fluorine-coated butterfly valve;
Group III:
VBSF, VBM, VBM-A, VBM-F, VBM-C, VBM-P;

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
Systematic Capability		**SC 3**

Close on demand and external tightness

Dangerous Failure Rate	λ_D	3.66 E-07 / h	**366 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.63 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.66 E-04	

Close on demand with leakage rate as per GB/T 4213 and external tightness

Dangerous Failure Rate	λ_D	7.66 E-07 / h	**766 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.41 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.54 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	2.87 E-07 / h	**287 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.28 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.30 E-04	

Assumptions for the calculations above: DC = 0 %, T_1 = 1 year, MRT = 72 h, β_{1oo2} = 10 %

Origin of failure rates

The stated failure rates for low demand are the result of an FMEDA with tailored failure rates for the design and manufacturing process.
Furthermore the results have been verified by field-feedback data.
Failure rates include failures that occur at a random point in time and are due to degradation mechanisms such as ageing.
The stated failure rates do not release the end-user from collecting and evaluating application-specific reliability data.

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.

TÜVRheinland®
Precisely Right.

Holder: Chongqing ChuanYi Control Valve Co., Ltd.
No.879 Caihe road, Caijiagang town,
Beibei district, Chongqing,
P.R. China

Product tested: Ultra-low temperature butterfly valve; Group IV:
VB100, VB100-412, VB100-422, VB100-210,
VB100-211, VB100-220, VB100-221, VB100-222,
VB100-212

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
Systematic Capability		**SC 3**

Close on demand and external tightness

Dangerous Failure Rate	λ_D	3.42 E-07 / h	**342 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.52 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.55 E-04	

Close on demand with leakage rate as per GB/T 4213 and external tightness

Dangerous Failure Rate	λ_D	7.15 E-07 / h	**715 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.18 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.29 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	2.63 E-07 / h	**263 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.17 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.19 E-04	

Assumptions for the calculations above: DC = 0 %, T_1 = 1 year, MRT = 72 h, β_{1oo2} = 10 %

Origin of failure rates

The stated failure rates for low demand are the result of an FMEDA with tailored failure rates for the design and manufacturing process.
Furthermore the results have been verified by field-feedback data.
Failure rates include failures that occur at a random point in time and are due to degradation mechanisms such as ageing.
The stated failure rates do not release the end-user from collecting and evaluating application-specific reliability data.

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.