Certificate

No.: 968/V 1195.01/26

Product tested	Control Valves (details see page 2 - 9)	**Certificate holder**	Chongqing ChuanYi Control Valve Co., Ltd. No.879 Caihe road, Caijiagang town, Beibei district Chongqing P.R. China

Type designation

Group I: Single-seat control valves
Group II: Bellows single-seat control valves
Group III: Single-seat sleeve control valves
Group IV: Bellows sleeve control valves
Group V: Twin-seat sleeve control valves
Group VI: Pilot sleeve control valves
Group VII: Plastic-coated single-seat control valves
Group VIII: Biting valves

Codes and standards

IEC 61508 parts 1-2:2010

Intended application

Safety functions:
- Close on demand and external tightness
- Close on demand with leakage class IV / V / VI according to GB/T 4213 or ANSI FCI 70-2-1 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 9 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 1195.01/26 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: Single-seat control valves; Group I
HTS, HLS, HTSJ(B), HLSJ(B), HAV, HAA, HLAS, HPS, HP4, HKA, HAS, HPAS, H100, H200, HTA, HAY, HTSKC, HLSKC, HAAKC, HLAKC, HPQ, HLC, HSC, HSN, HVH, HTS-10000, HTS-10010, HTS-10020, HTS-10100, HTS-30000, HTS-30100, HTS-50000, HTS-10110, HTS-10120, HTS-30010, HTS-30020, HTS-50020, HTS-50010, HTS-20100, HVHB, H100-000, H100-001, H100-002, H100-100, H100-101, H100-102, H200B, H400, H100A, H400A, HP4J, H200J

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	2.86 E-07 / h	**286 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.27 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.29 E-04	

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

Dangerous Failure Rate	λ_D	6.55 E-07 / h	**655 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	2.92 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.01 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	2.02 E-07 / h	**202 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	8.99 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	9.08 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.

TÜVRheinland®
Precisely Right.

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

Product tested: Bellows single-seat control valves; Group II
HLSW, HTSW, HTS-10001, HTS-10021, HTS-10011, HTS-10101, HTS-10111, HTS-10121, HTS-30001, HTS-30101, HTS-30111, HTS-30121, HTS-50001, HTS-50101, HTS-50111, HTS-50121, H110-00001, H110-11001, H110-10001, HMTW, HDTW

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	3.02 E-07 / h	**302 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.34 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.36 E-04	

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

Dangerous Failure Rate	λ_D	6.68 E-07 / h	**668 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	2.97 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.07 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	2.21 E-07 / h	**221 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	9.84 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	9.94 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: Single-seat sleeve control valves; Group III:
HCP, HAC, HCPB, HCPJ, HTB, HPC, HPAC, HCN, HKG, HKP, HKGA, HKPA, HKE, HKEA, HNQ, HKZ, HKD, HCP-10000, HTS-20000, HCP-10010, HCP-10020, HCP-10100, HKG-10000, HKG-10100, HKG-20000, HKG-20100, HKG-30000, HKG-30100, HTS-20100, HTS-20110, HTS-20120, HTS-20010, HTS-20020, HCP-10110, HCP-10120, HKG-10020, HKG-10010, HKG-10110, HKG-10120, HKG-20010, HKG-20020, HKG-20110, HKG-20120, HKG-30010, HKG-30020, HKG-30110, HKG-30120, H800, H100-010, H100-011, H100-012, H100-021, H100-022, H100-110, H100-111, H100-112, H100-121, H100-122

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	3.91 E-07 / h	**391 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.74 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.77 E-04	

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

Dangerous Failure Rate	λ_D	7.59 E-07 / h	**759 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.38 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.50 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	2.90 E-07 / h	**290 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.29 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.31 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: Bellows sleeve control valves; Group IV:
HCPW, HCP-10001, HCP-10101, HCP-10011, HCP-10021, HCP-10111, HCP-10121, HKG-10011, HKG-10101, HKG-10001, HKG-10111, HKG-10121, HKG-10011, HKG-10021

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	3.97 E-07 / h	**397 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.77 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.80 E-04	

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

Dangerous Failure Rate	λ_D	7.64 E-07 / h	**764 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.40 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.53 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	3.17 E-07 / h	**317 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: Twin-seat sleeve control valves; Group V:
HCB, HCBB, HCBJ, HCP-20000, HCP-20010, HCP-20020, HMT, HDT, HMH, HDH, HCP-20100, HCP-20110, HCP-20120, HMTJ, HDTJ, HMTB, HDTB

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	2.96 E-07 / h	**296 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.32 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.34 E-04	

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

Dangerous Failure Rate	λ_D	6.63 E-07 / h	**663 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	2.95 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.05 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	2.16 E-07 / h	**216 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	9.62 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	9.72 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.

TÜVRheinland®
Precisely Right.

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

Product tested: Pilot sleeve control valves; Group VI:
HCE, HCEN, HCP-50000, HKG-50000,
HCP-50100, HKG-50100

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	3.03 E-07 / h	**303 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.35 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.37 E-04	

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

Dangerous Failure Rate	λ_D	8.84 E-07 / h	**884 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.94 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	4.10 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	2.10 E-07 / h	**210 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	9.35 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	9.44 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.

TÜVRheinland®
Precisely Right.

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

Product tested: Plastic-coated single-seat control valves; Group VII: HPF, HPF-1, HPF-2, HPF-3, HPF-4, HPF-5, HPF-6, HPFJ, HPFA-2, HAT, HYAF, HYBF

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	3.11 E-07 / h	**311 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.38 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.41 E-04	

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

Dangerous Failure Rate	λ_D	6.75 E-07 / h	**675 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.01 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.10 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	2.32 E-07 / h	**232 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.03 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.04 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: Biting Valves; Group VIII:
HYA, HYB, HYAJ, HYAB, HYBJ, HYBB

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	3.48 E-07 / h	**348 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.55 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.58 E-04	

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

Dangerous Failure Rate	λ_D	7.14 E-07 / h	**714 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	2.45 E-07 / h	**245 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.09 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.10 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.