Certificate

No.: 968/V 1193.01/26

Product tested	Ball Valves (details see page 2 - 11)	**Certificate holder**	Chongqing ChuanYi Control Valve Co., Ltd. No.879 Caihe road, Caijiagang town, Beibei district Chongqing P.R. China
Type designation	Group I: O-type cut-off ball valve Group II: V-ball valve Group III: Eccentric rotary valve Group IV: Plastic-lined ball valve Group V: Cryogenic ball valve Group VI: Ceramic ball valve Group VII: Multi-way ball valve Group VIII: Lined plug valve Group IX: Disc valve Group X: Orbit ball 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 11 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 1193.01/26 dated 2026-06-02. 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

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

Product tested: O-type cut-off ball valves; Group I:
ZJHR, ZJHR-1000, ZJHR-1001, ZJHR-1010, ZJHR-1011, ZJHR-1100, ZJHR-1101, ZJHR-1110, ZJHR-1111, ZJHR-1003, ZJHR-1013, ZJHR-1103, ZJHR-1113, ZJHR-2010, ZJHR-2110, ZJHR-2000, ZJHR-2100,ZJHR-4000, ZJHR-4010, ZJHR-4100, ZJHR-4110, ZJHRB, ZJHRD, R200, R300, R400, R500, R700, R200-100, R200-103, R200-110, R200-113, R700-000, R700-004, R700-014, R700-010, R700-100, R700-104, R700-110, R700-114, ZJHR, ZJHR-5100, ZJHR-5110, ZJHR-5000, ZJHR-5010, ZJHR-7000, ZJHR-7004, ZJHR-7010, ZJHR-7014, ZJHR-7100, ZJHR-7104, ZJHR-7110, ZJHR-7114, ZJHR-8100, ZJHR-8103, ZJHR-8110, ZJHR-8113, ZJHR-9110

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	3.09 E-07 / h	**309 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.38 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.40 E-04	

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

Dangerous Failure Rate	λ_D	6.98 E-07 / h	**698 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.11 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.21 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	1.97 E-07 / h	**197 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	8.77 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	8.85 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: V-ball valves; Group II:
ZJHV, ZJHVB, ZJHV-010, ZJHV-110, ZJHV-011,
ZJHV-111, ZJHR-3110, ZJHV-040, ZJHV-140

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	6.65 E-07 / h	**665 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	2.96 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.06 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	1.90 E-07 / h	**190 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	8.46 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	8.54 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: Eccentric rotary valve; Group III:
VFR, VFRB, VFR-010, VFR-110, VFR-011,
VFR-111, FERV

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	2.66 E-07 / h	**266 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.18 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.20 E-04	

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

Dangerous Failure Rate	λ_D	6.31 E-07 / h	**631 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	2.81 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	2.90 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	1.61 E-07 / h	**161 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	7.17 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	7.22 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: Plastic-lined ball valves; Group IV:
ZJHRF, ZJHRFB, ZJHVF, ZJHRF-1,
ZJHRF-2, ZJHVF-1, ZJHVF-2

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	3.92 E-07 / h	**392 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.75 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.78 E-04	

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

Dangerous Failure Rate	λ_D	7.58 E-07 / h	**758 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.37 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.50 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.

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

Product tested: Cryogenic ball valve; class V:
R100, R100-200, R100-201, R100-210, R100-211,
R100-300, R100-301, R100-310, R100-311

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	2.94 E-07 / h	**294 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.31 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.33 E-04	

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

Dangerous Failure Rate	λ_D	6.79 E-07 / h	**679 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.02 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.12 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	1.86 E-07 / h	**186 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	8.28 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	8.36 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.

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

Product tested: Ceramic ball valve; class VI:
ZJTV-1, ZJTV, ZJTR, ZJTR-1, ZJTR-2

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	3.10 E-07 / h	**310 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.38 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.40 E-04	

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

Dangerous Failure Rate	λ_D	6.97 E-07 / h	**697 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.10 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	3.21 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	1.92 E-07 / h	**192 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	8.55 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	8.63 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: Multi-way ball valve; class VII:
T20-T30, T20-T31, T20-L30, T20-L31, T20-L40, T20-L41, T20-T300, T20-T301, T20-T302, T20-T305, T20-T310, T20-T311, T20-T312, T20-L300, T20-L301, T20-L302, T20-L305, T20-L310, T20-L311, T20-L312, T20-L400, T20-L410, T20-Y310, T20-T30F, T20-L30F

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	3.39 E-07 / h	**339 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.51 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.53 E-04	

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

Dangerous Failure Rate	λ_D	8.87 E-07 / h	**887 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.95 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	4.12 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	1.81 E-07 / h	**181 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	8.06 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	8.13 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: Lined plug valve; class VIII:
ZJXS, ZJXS-Y, KEA

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	3.26 E-07 / h	**326 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.45 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.47 E-04	

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

Dangerous Failure Rate	λ_D	8.76 E-07 / h	**876 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.90 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	4.07 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	1.68 E-07 / h	**168 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	7.48 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	7.54 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: Disc valve; class IX:
R800-110, R800-120, R800-130,
R800-140, R800-200

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	5.05 E-07 / h	**505 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	2.25 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	2.30 E-04	

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

Dangerous Failure Rate	λ_D	8.89 E-07 / h	**889 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.96 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	4.13 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	3.98 E-07 / h	**398 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.77 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.81 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: Orbit ball valve; class X:
ZJHR-6010, ZJHR-6110

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	3.26 E-07 / h	**326 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	1.45 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	1.47 E-04	

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

Dangerous Failure Rate	λ_D	8.75 E-07 / h	**875 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	3.90 E-03	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	4.06 E-04	

Open on demand and external tightness

Dangerous Failure Rate	λ_D	1.68 E-07 / h	**168 FIT**
Average Probability of Failure on Demand 1oo1	$PFD_{avg}(T_1)$	7.48 E-04	
Average Probability of Failure on Demand 1oo2	$PFD_{avg}(T_1)$	7.54 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.