ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

# ISO 15848-1 QUALIFICATION CERTIFICATE

**Certificate No.: 317689**

**Ref. Test report No.: 317690**

We hereby certify that the valve below has passed the fugitive emission test successfully according to Class BH of ISO15848-1:2015+Amd.1:2017 for a total of **1500** cycles.

| | |
|---|---|
| **Name of manufactuer** | Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd. |
| **Postal Address of manufactuer** | No.988, Yuexiu Road, Fenhu Economic Development Zone, PC: 215200, Suzhou City, Jiangsu Province, P. R. China |
| **Item** | 1" CL600 Ball Valve |
| **Valve size(NPS)** | 1" |
| **Pressure rating(Class)** | Class600 |
| **Stem size** | Φ16mm |
| **Body/bonnet material** | ASTM A182 F304 |
| **Stem seal material** | Flexible Graphite Packing |
| **Valve assembly drawing no.** | MSBBJ-1C6RJ-X6-D-GW Rev.A1 |

The tested valve covers performance class (para.6.6):

**ISO FE BH – CO2 – SSA0 – tRT – CL600 – ISO 15848-1**

**Extension of qualification (in particular) to untested valves in accordance with paragraph 8 of ISO15848-1.**

Other stem sizes qualified: 8 mm up to 32 mm

Other pressure ranges qualified: Class 600 and lower

This certificate must be read in conjunction with test report No.: 317690

Shanghai, January 22, 2025
*(Place, date)*

Guilin Chen
**TÜV SÜD Certification and Testing (China) Co., Ltd.**
Floor 3-13, No.151, Heng Tong Road,
Shanghai, 200070, P. R. China

TÜV SÜD Certification and Testing (China) Co., Ltd.
Shanghai Branch
Floor 3-13, No.151, Heng Tong Road,
Shanghai, 200070, P. R. China

Tel.: +86(0) 21 6141 0123
Fax: +86(0) 21 6140 8600
Internet: www.tuvsud.cn

**TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch**
Floor 3-13, No.151, Heng Tong Road, Shanghai, P. R. China
Tel.: +86(0) 21 6141 0123
Fax: +86(0) 21 6140 8600
Internet: www.tuvsud.cn

# Test Report

## (Valve fugitive emission test according to ISO15848-1: 2015+Amd.1:2017)

**Certificate No. : 317689**
**Test Report No.: 317690**

Applicant / Manufacturer: Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd.
No.988, Yuexiu Road, Fenhu Economic Development Zone,
PC: 215200, Suzhou City, Jiangsu Province, P. R. China

Inspection body: TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch
Floor 3-13, No.151, Heng Tong Road, Shanghai, P. R. China

Lab of test: Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd

Test Date: January 17-20, 2025

Description of valves: 1" CL600 Ball Valve
Size:1"
Pressure Rating: Class600
Drawing No. MSBBJ-1C6RJ-X6-D-GW Rev.A1

Test Witnessed By: CHEN Guilin/ TÜV SÜD Inspector

**TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch**
Floor 3-13, No.151, Heng Tong Road, Shanghai, P. R. China
Tel.: +86(0) 21 6141 0123
Fax: +86(0) 21 6140 8600
Internet: www.tuvsud.cn

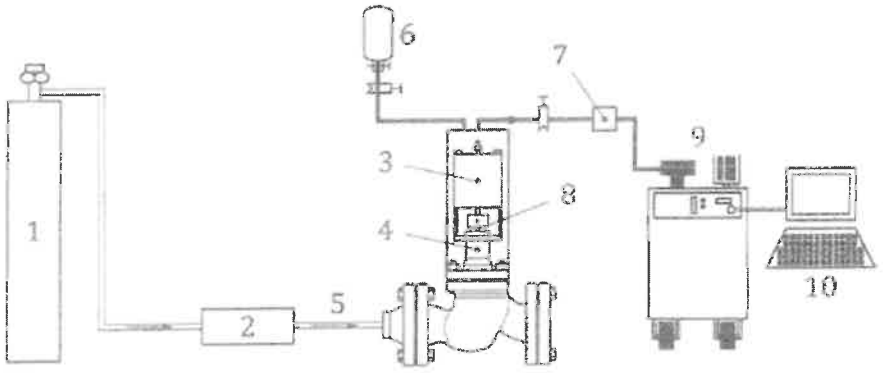


## Inspection and Tests

1. Conformity of Equipment

The test equipment was verified by TÜV SÜD inspector according to requirements of ISO15848-1:2015+Amd.1:2017 and found satisfactory. The detailed arrangement of the fugitive emission test equipment is shown below:

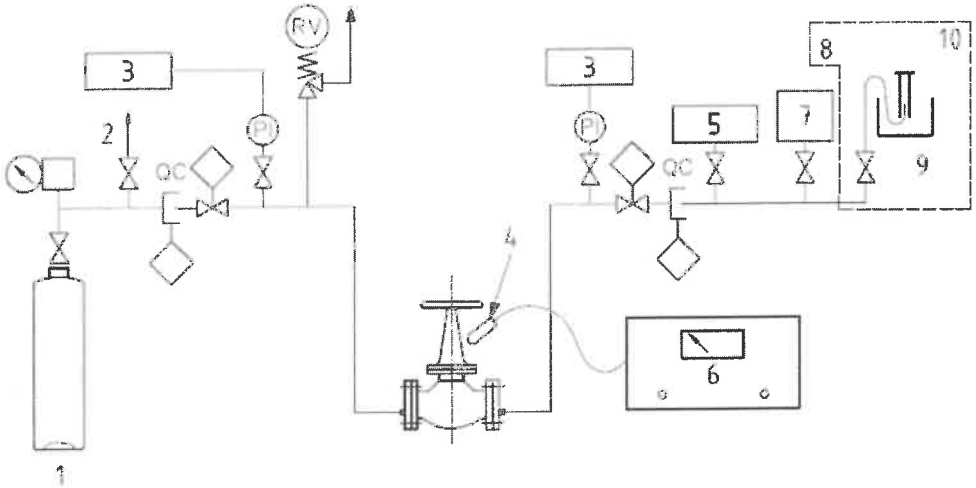
**Figure 1** Typical stem seal leakage measurement system with Vacuum Method




Key

| | | | |
|---|---|---|---|
| 1 | helium at 97 % purity | 6 | standard calibrated leak |
| 2 | pressure control | 7 | vacuum breaker (optional) |
| 3 | actuator | 8 | tested stem sealing |
| 4 | vacuum | 9 | helium mass spectrometer |
| 5 | helium | 10 | data acquisition |

**Figure 2** Typical body seal leakage measurement system with Sniffing Method




Key

| | | | |
|---|---|---|---|
| QC | quick coupling | | |
| 1 | helium gas supply | 6 | mass spectrometer |
| 2 | vent | 7 | flow rotameter |
| 3 | pressure recorder | 8 | hose |
| 4 | probe | 9 | measuring cylinder |
| 5 | gas flow meter | 10 | safe location (outside) |

**TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch**
Floor 3-13, No.151, Heng Tong Road, Shanghai, P. R. China
Tel.: +86(0) 21 6141 0123
Fax: +86(0) 21 6140 8600
Internet: www.tuvsud.cn



2. Document review

The specific product data file provided by the valve manufacturer includes:

a) cross sectional valve assembly drawing;
b) bill of valve material
c) stem or shaft seal description, dimension and specifications;
d) body seal description, dimension and specifications;
e) material specifications of stem or shaft seal components;
f) hydrostatic test certificate.

The above documents are reviewed with no objection.

3.Technical Data of Test Valve:

General description of test valve

| | |
|---|---|
| **Name of manufactuer** | Antiwear (Suzhou) Industrial Intelligent Technology Co., Ltd. |
| **Postal Address of manufactuer** | No.988, Yuexiu Road, Fenhu Economic Development Zone, PC: 215200, Suzhou City, Jiangsu Province, P. R. China |
| **Item** | 1" CL600 Ball Valve |
| **Valve size(NPS)** | 1" |
| **Pressure rating(Class)** | Class600 |
| **Stem size** | Φ16mm |
| **Body/bonnet material** | ASTM A182 F304 |
| **Stem seal material** | Flexible Graphite Packing |
| **Valve assembly drawing no.** | MSBBJ-1C6RJ-X6-D-GW Rev.A1 |

4.Visual and dimensional check of the test valve:

The test valve was chosen at random by the manufacturer in its workshop and submitted to the laboratory. The visual and dimensional check was performed according to drawing No.: MSBBJ-1C6RJ-X6-D-GW Rev.A1 and results found satisfactory. The mark was verified on valve as following:

| -- | 1" | 600 | F304 |
|---|---|---|---|
| Manufacturer` Brand | Size | Class | Material |

The stem size was measured as Ø16mm.

5.Preparation of the test valve:

Before the fugitive emission test, the test valve was hydrostatic tested under 165bar, the test showed no visible leakage or deformation. Then the valve was cleaned and dried.

6.Calibration of test instrument

**TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch**
Floor 3-13, No.151, Heng Tong Road, Shanghai, P. R. China
Tel.: +86(0) 21 6141 0123
Fax: +86(0) 21 6140 8600
Internet: www.tuvsud.cn



The test instrument was turned on, warmed up at the minimum time according to the requirements of the equipment manufacturer and calibrated with the standard calibrated leak 100% helium according to the procedure specified in Annex A, Para.A.1.4.2 of ISO15848-1:2015+Amd.1:2017.

7.Fugitive emission test and measurement

The test valve was mounted on a test rig with the stem positioned vertical. And the fugitive emission test is carried out as per requirement of ISO15848-1:2015+Amd.1:2017 Para.5.

7.1 Preliminary tests at room temperature (test 1)

The valve was pressurized with test fluid Helium to 100.0bar according to manufacturer's requirements in the partly opened position, the temperature at locations "X"/"Y"/"Z" are measure and recorded as room temperature

The stem seal leakage measurement was performed by the Vacuum method as described in ISO15848-1 Annex A.

The body seal leakage measurement was performed by the sniffing method as described in ISO15848-1 Annex B.

The test results are as follows:

Test results of preliminary tests

| Item | ISO15848-1 Required Value | Actual Value |
|---|---|---|
| Stem leakage (mbar.l/s) | $\leq 2.84\times10^{-5}$ | $1.1 \times 10^{-8}$ |
| Body seal leakage(ppmv) | ≤50 | 10 |
| The test results meet the requirements of ISO15848-1:2015+Amd.1:2017. | | |

7.2 Mechanical cycle test at the room temperature (test 2/3/4/5/6)

A total of 1500 mechanical cycles was performed on the test valve while it was kept pressurized under a differential pressure of 100.0bar according to the manufacturer's requirements at room temperature. The pressure should be improved and kept at 100.0bar to measure the leakage, and then the leakage from the stem seal and from the valve body seal were both measured with following results:

Test results of final tests

| Item | ISO15848-1 Required Value | Actual Value |
|---|---|---|
| Stem leakage (mbar.l/s)after 50 cycles | $\leq 2.84\times10^{-5}$ | $4.7 \times 10^{-7}$ |
| Stem leakage (mbar.l/s)after 100 cycles | $\leq 2.84\times10^{-5}$ | $3.8 \times 10^{-7}$ |
| Stem leakage (mbar.l/s)after 150 cycles | $\leq 2.84\times10^{-5}$ | $1.3 \times 10^{-6}$ |
| Stem leakage (mbar.l/s)after 200 cycles | $\leq 2.84\times10^{-5}$ | $2.3 \times 10^{-6}$ |
| Stem leakage (mbar.l/s)after 205 cycles | $\leq 2.84\times10^{-5}$ | $8.2 \times 10^{-7}$ |
| Body seal leakage(ppmv) after 205 cycles | ≤50 | 18 |
| Stem leakage (mbar.l/s)after 1000 cycles | $\leq 2.84\times10^{-5}$ | $2.7 \times 10^{-7}$ |
| Stem leakage (mbar.l/s)after 1500 cycles | $\leq 2.84\times10^{-5}$ | $1.3 \times 10^{-6}$ |
| Body seal leakage(ppmv) after 1500 cycles | ≤50 | 12 |
| The test results meet the requirements of ISO15848-1:2015+Amd.1:2017 | | |

8. Post test examination

After all the above tests completed, the test valve was disassembled and all sealing components visually examined. It is found that no notable wear and any other significant observations.

**TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch**
Floor 3-13, No.151, Heng Tong Road, Shanghai, P. R. China
Tel.: +86(0) 21 6141 0123
Fax: +86(0) 21 6140 8600
Internet: www.tuvsud.cn



9.Performance classes

As a result of the above tests, the test valve covered performance classes as follows:

**ISO FE BH – CO2 – SSA0 – tRT – CL600 – ISO 15848-1**

10. Extension of qualification to untested valves shall be according to ISO15848-1:2015+Amd.1:2017 paragraph 8.

We, hereby declare that I have checked test valve and witnessed the fugitive emission test on the tested valve according to ISO15848-1:2015+Amd.1:2017. The test results are as mentioned in this report.

TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch

RONG Zhibin

Prepared by: Rong Zhibin

Date: January 22, 2025

Chen Guilin

Reviewed by: Chen Guilin

Date: January 22, 2025

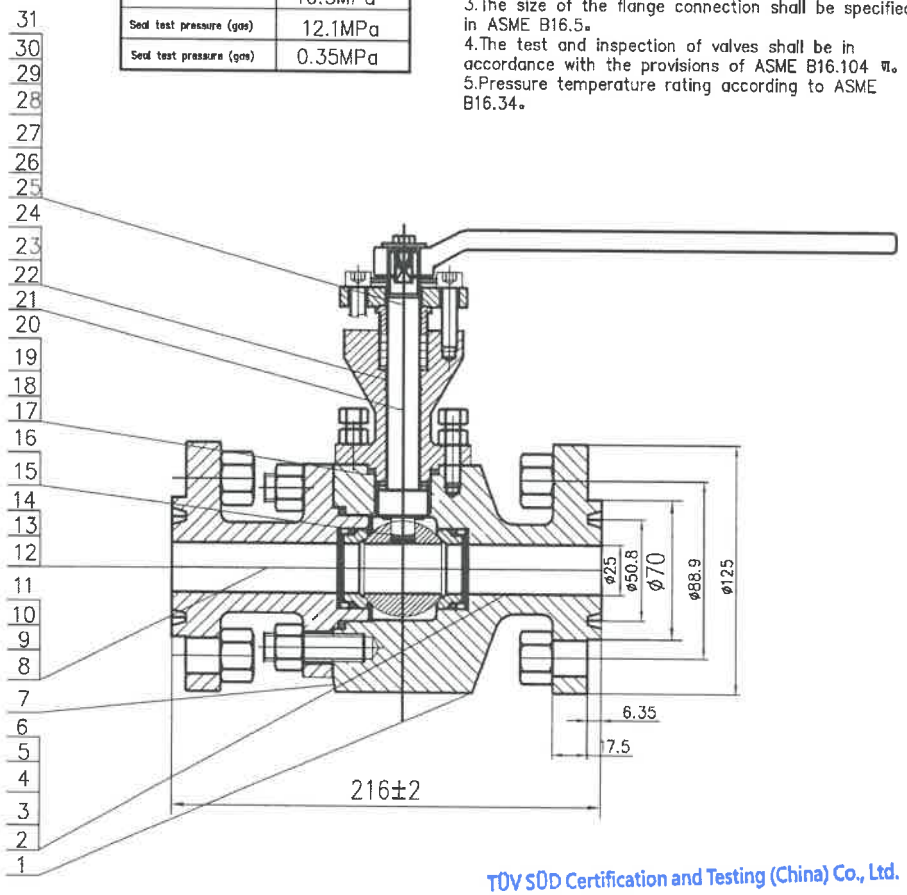
**Annexes:**

1) Copy of Drawing No.: MSBBJ-1C6RJ-X6-D-GW Rev.A1.
2) Test Report of Fugitive Emission Test No. ATW20250101.

| performance specification | |
|---|---|
| Nominal pressure or pressure level | CLASS 600 |
| Nominal diameter or caliber | NPS 1 |
| Shell test pressure (liquid) | 16.5MPa |
| Seal test pressure (gas) | 12.1MPa |
| Seal test pressure (gas) | 0.35MPa |

Technical requirements

1.Valves are designed and manufactured in accordance with ASME B16.34。
2.The structural length of the valve is specified in ASME B16.10。
3.The size of the flange connection shall be specified in ASME B16.5。
4.The test and inspection of valves shall be in accordance with the provisions of ASME B16.104 Ⅵ。
5.Pressure temperature rating according to ASME B16.34。




TÜV SÜD Certification and Testing (China) Co., Ltd.
Industry Service

☒ reviewed

☐ witnessed

by

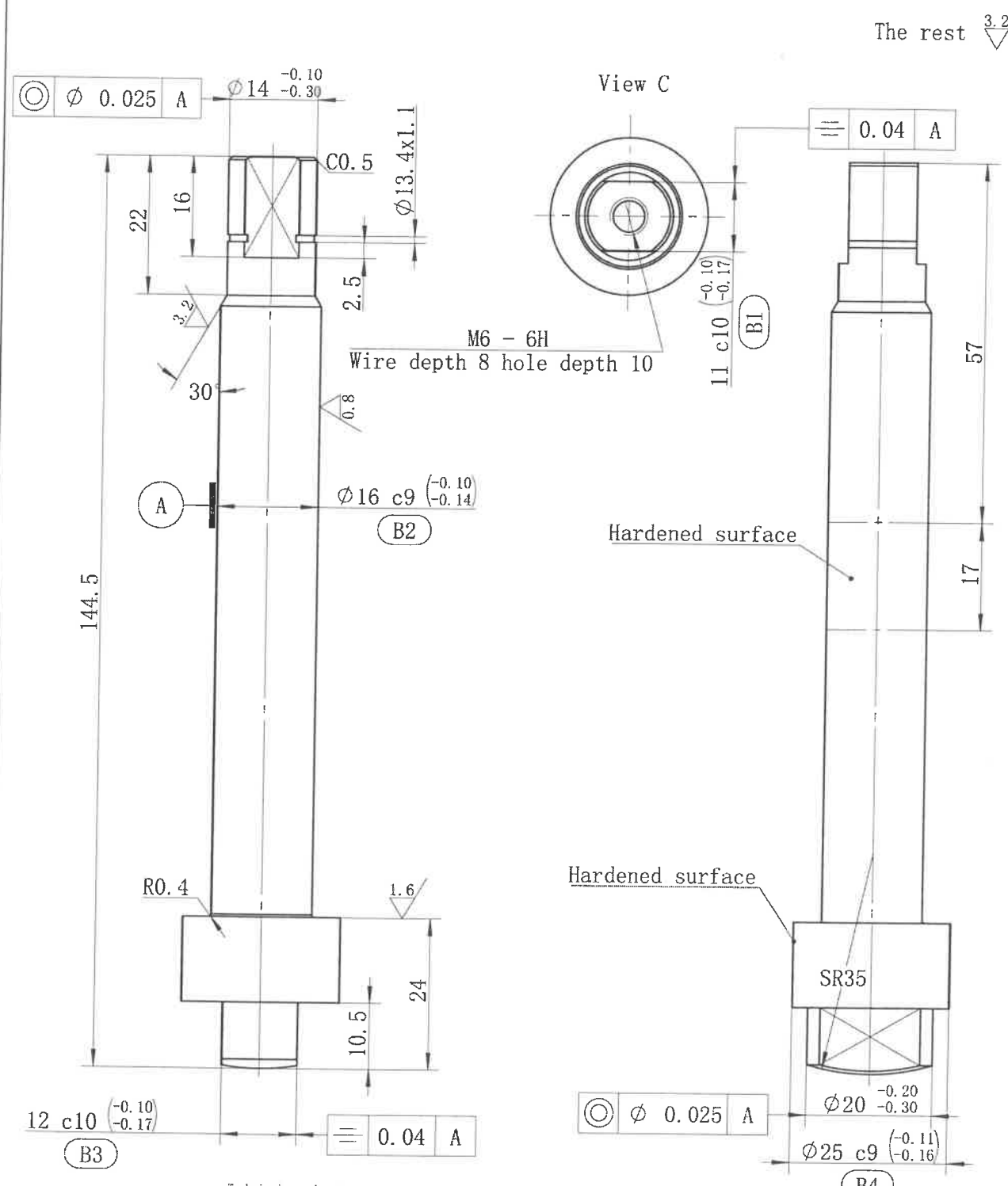
dated 2025-1-17

| NO | Specification | Number | Version | Remark |
|---|---|---|---|---|
| 31 | Bolt-GB/T5783-M6x10-8.8+Zn | 1 | A1 | |
| 30 | Washer-GB/T5287-6-A2 | 1 | A1 | |
| 29 | Locating plate-14x11x2x25-304 | 1 | A1 | |
| 28 | Check ring-GB/T894.1-14-A2 | 1 | A1 | |
| 27 | Wrench-11x250-CF8 | 1 | A1 | |
| 26 | Standard disc spring-GB/T1972-A16-631 | 2 | A1 | |
| 25 | Screw-GB/T70.1-M6x30-B8-2 | 2 | A1 | |
| 24 | Packing bushing-16.5x28x15-X6-304 | 1 | A1 | |
| 23 | Hold-down grid-18x46x10-X6-CF8 | 1 | A1 | |
| 22 | Packing seat-16x24x2-316 | 1 | A1 | |
| 21 | Packing-16x24x4-Flexible graphite | 2 | A1 | |
| 20 | Graphite annulus-16x24x4-Flexible graphite | 2 | A1 | |
| 19 | Nut-GB/T6175-M8-A194-8 | 4 | A1 | |
| 18 | Fully threaded stud-GB/T901-M8x30-B8-2 | 4 | A1 | |
| 17 | Sell-GB/T119.1-8x20-A2 | 2 | A1 | |
| 16 | Gland box-1C6Y-C-T76-X6-F316L | 1 | A1 | |
| 15 | Graphite annulus-28x36x4-Flexible graphite | 1 | A1 | |
| 14 | Coil bearing-16x18x10-SD-X6-316L+QPQ | 1 | A1 | |
| 13 | Coil bearing-25x28x15-SD-X6-316L+QPQ | 1 | A1 | |
| 12 | Thrust bearing-17x24.5x2-SD-X6-316+QPQ | 2 | A1 | |
| 11 | Valve stem-B11x16xB12x145-0.8-PT-X6-FXM-19+G14 | 1 | A1 | |
| 10 | Sphere-1C6Y-Q25-X6-B-F316L+G14 | 1 | A1 | |
| 9 | Junk ring-34x40x4.6-X6-316 | 2 | A1 | |
| 8 | Seal ring-34x40x5-J45-Flexible graphite | 2 | A1 | |
| 7 | Valve seat-1C6Y-PHB-YF-Q25-X6-D-F316L+G06 | 2 | A1 | |
| 6 | Disc spring-39.5x26.5x1.2x2.1-X6-Inconel750 | 2 | A1 | |
| 5 | Graphite annulus-53x61x4-Flexible graphite | 1 | A1 | |
| 4 | Nut-GB/T6175-M14-A194-8 | 4 | A1 | |
| 3 | Fully threaded stud-GB/T901-M14x50-B8-2 | 4 | A1 | |
| 2 | Bonnet-1C6RJ-Q25-X6-D-GW-F304 | 1 | A1 | |
| 1 | Valve body-1C6RJ-L-Q25-X6-D-GW-F304 | 1 | A1 | |

| Serial number | Change file number | Signature | Date |
|---|---|---|---|
| | | | |
| | | | |

Suzhou Industrial Intelligent Technology Co., Ltd.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Design | Yi Peng | Proof read | Thao Liangjun | Edition | A1 | Specification | MSBBJ-1C6RJ-X6-D-GW |
| Audit | Yang Shujun | | | | | | |
| Approval | LI Yufei | Date | 2021/2/18 | Proportion | 1:2.5 | | |




Technical requirements

1. The materials meet the requirements of Suzhou Industrial Intelligent Technology Co., Ltd. (Material Procurement Specification);
2. Spraying cemented carbide, coating hardness HRC≥60, coating surface shall not have cracks, scratches, falling off and other phenomena, the surface outside the spraying surface should be well protected during the spraying process, the effective thickness of the hard layer≥0.15mm. the picture shows the final molding size;
3. Class B size 4 pieces;
4. The processing surface is sharpened and blunt, and burrs are removed.;
5. The limit deviation of the processing size without tolerance is stipulated by GB/T1804-m;
6. The limit deviation of the processing size without tolerance is stipulated by GB/T1184-K.

受控

| Serial number | Change file number | Signature | Date |
|---|---|---|---|
| | | | |
| | | | |

Suzhou Antway Industrial Intelligent Technology Co.,LTD

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Design | Wang Ruipeng | Proofread | Dong Wei | Edition | A3 | | |
| Audit | Yang Shujun | Substance | 0.25kg | | | Specification | Valve stem-B11x16xB12x145-0.8-PT-X6 |
| Approva | LI Yufei | Date | 2025/1/20 | Proportion | 1.1:1 | | |

# 苏州安特威工业智能科技股份有限公司

## ISO15848-1型式试验阀门低泄漏试压记录表

| 阀种 | | 球阀 | | 规格 | 1-600LB | 试验日期 | 2025.1.7-2025.1.20 | 报告编号 | ATW2025010 |
|---|---|---|---|---|---|---|---|---|---|
| 序号 | 项目 | 开关次数 | 试验温度 | 试验内容 | | 阀杆外漏要求值 | 阀杆填料检漏值 | 壳体外漏要求值 | 中道壳体检漏值 |
| 1 | 低泄漏测试 | 0 | 常温 | 从入口通入10MPa氦气，检测阀杆填料和壳体中道外漏，氦气漏率满足要求值 | | ≤2.84x10$^{-5}$mBar·l/s | 1.1X10$^{-8}$ mBar·l/s | 50ppm | 10 ppm |
| 2 | | 50 | 常温 | 从入口通入10MPa氦气，阀门动作开关 50 次后，检测阀杆填料外漏，氦气漏率满足要求值 | | ≤2.84x10$^{-5}$mBar·l/s | 4.7X10$^{-7}$ mBar·l/s | / | / |
| 3 | | 100 | 常温 | 从入口通入10MPa氦气，阀门动作开关 50 次后，检测阀杆填料外漏，氦气漏率满足要求值 | | ≤2.84x10$^{-5}$mBar·l/s | 3.8X10$^{-7}$ mBar·l/s | / | / |
| 4 | | 150 | 常温 | 从入口通入10MPa氦气，阀门动作开关 50 次后，检测阀杆填料外漏，氦气漏率满足要求值 | | ≤2.84x10$^{-5}$mBar·l/s | 1.3X10$^{-6}$ mBar·l/s | / | / |
| 5 | | 200 | 常温 | 从入口通入10MPa氦气，阀门动作开关 50 次后，检测阀杆填料外漏，氦气漏率满足要求值 | | ≤2.84x10$^{-5}$mBar·l/s | 2.3X10$^{-6}$ mBar·l/s | / | / |
| 6 | | 205 | 常温 | 从入口通入10MPa氦气，阀门动作开关 5 次后，检测阀杆填料和壳体中道外漏，氦气漏率满足要求值 | | ≤2.84x10$^{-5}$mBar·l/s | 8.2X10$^{-7}$ mBar·l/s | 50ppm | 18 ppm |
| 7 | | 1000 | 常温 | 从入口通入10MPa氦气，阀门动作开关 795 次后，检测阀杆填料外漏，氦气漏率满足要求值 | | ≤2.84x10$^{-5}$mBar·l/s | 2.7X10$^{-7}$ mBar·l/s | / | / |
| 8 | | 1500 | 常温 | 从入口通入10MPa氦气，阀门动作开关 500 次后，检测阀杆填料和壳体中道外漏，氦气漏率满足要求值 | | ≤2.84x10$^{-5}$mBar·l/s | 1.3X10$^{-6}$ mBar·l/s | 50ppm | 12 ppm |
| 执行标准 | | ISO 15848-1 | | | | | | | |
| 试压 | | 陈仕义 | | 日期 | 2025.1.20 | | | | |

TÜV SÜD Certification and Testing (China) Co., Ltd.
Industry Service
☐ reviewed
☒ witnessed
by Chen Gaili
dated 2025-1-20