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

CERTIFICATE

(Certificate of conformity with technical requirements in:)

API STANDARD 607 Eighth Edition, October 2022

Certificate No.:314447

Ref. Test report No.: 314446

Name and postal address of manufacturer: **FX FLOW CONTROL BV.**
Upscale Digital Pump and Valve Industrial Park, Qiaoxia Town, Yongjia County,Wenzhou City, Zhejiang Province

We hereby certify that the fire test on below valves have been conducted at the laboratory designated by manufacturer and witnessed by TÜV SÜD inspector according to requirements of API STD 607 Eighth Edition, October 2022. The testing results of valves meet the requirements of API STD 607 Eighth Edition, October 2022.

1. Description of Test Valve :

Type of Test Valve	NPS 4 Class150 Trunnion Ball Valve
Description of Test Valve	NPS 4 Class150 Trunnion Ball Valve
Valve Size (NPS)	4"
Pressure Rating (Class)	150
Valve Body Material	ASTM A105N

2. Qualified Range of Valves :

Type	Trunnion Ball Valve
Description of Valves	Trunnion Ball Valves
Qualified Sizes (NPS) *(according to API 607 Table 3)*	4"; 5";6";8"
Qualified Pressure Ratings (Class) *(according to API 607 Table 4)*	Class 150; Class 300;
Qualified Valve Material	Ferritic, ASME B16.34 material groups 1.1 through 1.18
Remark: the technical data of tested valves see back of this certificate appendix 1.	

This certificate is issued according to API STD 607 Eighth Edition, October 2022, based upon the result of testing report on above mentioned test valve. The additional valve qualification shall be limited on similar valves of same basic design and construction as the test valves and of the same nonmetallic materials as the test valve in the seat-to-closure member seal, seat-to-body seal, stem seal, and body joint and seal according to API STD 607 Eighth Edition, October 2022 Paragraph 7.

Shanghai, Nov. 5, 2024
(Place. date)

Zhenrong Xie
TÜV SÜD Certification and Testing (China) Co., Ltd
No.151, Hengtong Road
200070 Shanghai P.R.China

Appendix 1:

Certificate No.: 314447

Ref. Test report No.: 314446

Name and postal address of manufacturer: **FX FLOW CONTROL BV.**
Upscale Digital Pump and Valve Industrial Park, Qiaoxia Town, Yongjia County,Wenzhou City, Zhejiang Province

Technical Data of Valve

1. Type of Test Valve: NPS 4 Class150 Trunnion Ball Valve

2. Description of Test Valve: NPS 4 Class150 Trunnion Ball Valve

3. Details of Valve:

Valves Size (NPS) / Material / Part Name	4"
Body	ASTM A105N
Gasket	SS316+Graphite
Trunnion	ASTM A105N
O-Ring	VITON
Bonnet	ASTM A105N
Bolt	ASTM A193 B7
Nut	ASTM A194 2H
Drain	AISI 1025
Bearing	SS316+PTFE
Ball	ASTM A182 F316
Seat Insert	RPTFE
Seat Ring	ASTM A182 F316
Stem Bushing	SS316+PTFE
Stem	ASTM A182 F316
Packing	Graphite
Gland Flange	ASTM A105N
Lever	C.S.+Zn
Design Drawing No.:	Q47-4-150LB-1

Shanghai, Nov. 5, 2024
(Place, date)

Zhenrong Xie
TÜV SÜD Certification and Testing (China) Co., Ltd

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

Tel.: +86 21 6141-0123
Fax: + 86 21 6140-8600

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

Test Report

(Valve Fire Test According to API STANDARD 607 Eighth Edition, October 2022.)

Certificate No. : 314447
Test Report No.: 314446

Applicant / Manufacturer: **FX FLOW CONTROL BV**
Upscale Digital Pump and Valve Industrial Park, Qiaoxia Town, Yongjia County,Wenzhou City, Zhejiang Province

Inspection body: TÜV SÜD Certification and Testing (China) Co., Ltd

Floor 3-13, No.151, Hengtong Road, Shanghai, P. R. China

Lab of Test: Lishui Valve Lab Technical Co., Ltd.

Test Date: Oct.30~Nov.01.2024

Description of valves: Trunnion Ball Valve

Size:NPS 4

Pressure Rating:Class150

Drawing No.:Q47-4-150LB-1

Test Witnessed By: Wang Zhongxiang / TÜV SÜD Inspector

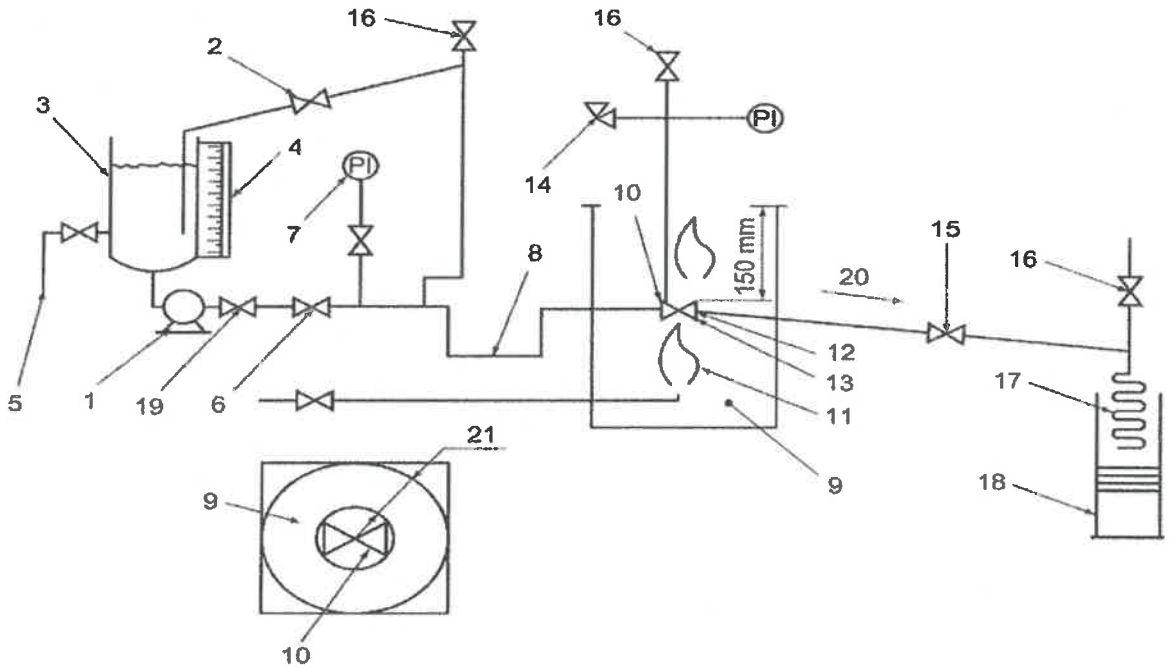
TÜV SÜD Certification and Testing (China) Co.. Ltd
Shanghai Office
Floor 3-13, No.151, Heng Tong Road.
Shanghai 200070 P.R.China

Inspection and Tests

1. Conformity of Equipment

The test equipment was verified by TÜV SÜD inspector according to requirements of API STANDARD607 Eighth Edition, October 2022. Para.5.3 and found satisfactory. The detail arrangement of the fire-test equipment is shown below:

Figure 1. Typical Fire-Test System Using a Pump as the Pressure Source



Key

1. Pressure source
2. Pressure regulatorand relief
3. Vessel for water
4. Calibrated sight gauge
5. Water supply
6. Shutoff valve
7. Pressure gauge
8. Piping arranged to provide vapor trap
9. Enclosure for test
10. Test valve mounted horizontally with stem in horizontal position
11. Fuel gas supply and burner
12. Calorimeter cubes
13. Flame environment and body thermocouples
14. Pressure gauge and relief valve
15. Shut-off valve
16. Vent valve
17. Condenser
18. Container
19. Check valve
20. Slope
21. Clearance: 150mm

2. Calibration of measurement and test instrument

   The measurement and test instrument have been properly calibrated such as pressure gauges, therm-couples, etc.

3. Technical Data of Test Valve:

   a) Description of test valve

Type of Test Valves	NPS 4 Class150 Trunnion Ball Valve
Description of Valves	NPS 4 Class150 Trunnion Ball Valve
Pressure Rating, Class/PN	Class150
Valve Size, NPS/DN	NPS 4
Face to face dimension	ASME 16.10
End Flange Connection	ASME B16.5
Pressure Test	API 598
Designed Standard	API 6D

   b) Details of technical data on test valve

Part Name	Materials
Body	ASTM A105N
Gasket	SS316+Graphite
Trunnion	ASTM A105N
O-Ring	VITON
Bonnet	ASTM A105N
Bolt	ASTM A193 B7
Nut	ASTM A194 2H
Drain	AISI 1025
Bearing	SS316+PTFE
Ball	ASTM A182 F316
Seat Insert	RPTFE
Seat Ring	ASTM A182 F316
Stem Bushing	SS316+PTFE
Stem	ASTM A182 F316
Packing	Graphite
Gland Flange	ASTM A105N
Lever	C.S.+Zn
Design Drawing No.:	Q47-4-150LB-1

4. Visual and dimensional Check on Valve Specimen:

The specimen 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. Q47-4-150LB-1and results found satisfactory. The mark was verified on valve as following:

--	Trunnion Ball Valve	NPS4	CL150	A105	FX FLOW CONTROL BV
Manufacturer`s Brand	TYPE NAME	Size	Class	Material	Company

5. Document Review:

The chemical and mechanical test report of forging was reviewed and found satisfactory. Also the inspection report of shell test, seat test and pneumatic test was reviewed and found.

6. Preparation before testing:

6.1 The thermocouples and calorimeters were installed properly according to Figure 1,2,3,4 in API 607. Two thermocouples (part 13) are installed to measure flame temperature, one is located under valve body, another is located under valve stem, both within 1". Two calorimeters (part 12) are positioned to the same place as the thermocouples do.

6.2 The test system including test valve (part 10) was cleaned through by water before testing. All air was purged from test valve and testing system by water.

6.3 The test system was pressurized to 1.5MPa after the test valve and system upstream of valve have been completely full of water and system downstream of the test valve have been completely empty of water. The system and test valve were carefully checked for leakage when the test pressure was held at 1.5MPa. No leakage was found on system and test valve.

7. Fire Test:

The fire test was conducted according to API STANDARD607 Eighth Edition, October 2022.Section 5. The pressure of the system upstream was increased to 0.20MPa, then the fire ignited. The flame temperature reached 750℃ within 2 minutes after ignition. The test pressure and temperature were maintained at 0.20MPa during the fire test. The temperature and pressure were recorded continuously by the operators. The system and test valve was cooled to below 100℃ within 10 mins of the extinguishing fire by shower nozzles after 30 mins' fire test and the cooling time was 7 Mins. The loss of water weight in vessel was measured by weighing scale and water in calibrated container (part 18) were read and recorded. The test result is shown as below:

Test result of fire test

Item	API 607 Required Value	Actual Value
Test Pressure (MPa)	0.20MPa	0.20 MPa
Test Temperature	750 ~ 1000℃	909- 942℃
Through-seat leakage according to API 607 table 1	≤400 ml/min	255 ml/min
Total time from fire test to cooling down	37 min	
External Leakage during burn & cool down	≤100 ml/min	35 ml/min
Conclusion: the test result is satisfactory according to API 607.		

8. Low pressure test:

Decrease & stabilize the pressure to the low test pressure at 0.20MPa, measured and recorded the through seat leakage over a 5mins period to API STANDARD607 Eighth Edition, October 2022.Para. 6.4 and 5.6.15. The test result was recorded as below:

Test result of low pressure test

Item	API 607 Required Value	Actual Value
Test Pressure (MPa)	0.20 MPa	0.20 MPa
Test Temperature	30℃	
Test Time	5 min	
Through Seat Leakage	≤160ml/min	40 ml/min
Conclusion: the test result is satisfactory according to API 607.		

The valves was operated against the low pressure at 0.20MPa to fully open position and then to the fully closed.

The pressure was stabilized to the low test pressure at 0.20MPa, measured and recorded the through seat leakage over a 5mins period to API STANDARD607 Eighth Edition, October 2022.Para. 6.4 and 5.6.16. The test result was recorded as below:

Test result of low pressure operation test

Item	API 607 Required Value	Actual Value
Test Pressure (MPa)	0.20 MPa	0.20 MPa
Test Temperature	30℃	
Test Time	5 min	
Through Seat Leakage	≤160ml/min	85 ml/min
Conclusion: the test result is satisfactory according to API 607.		

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9. Operational Test:

The operational test was conducted according to API STANDARD607 Eighth Edition, October 2022.Para. 6.6 and 5.6.18. The upstream pressure was increased to 1.50MPa then the test valve was fully opened against the high-test pressure differential to vent the piping and test valve body cavity to remove air or steam. The downstream shutoff valve was then closed and the system pressure was increased to and maintained at 1.50MPa. Then measured and recorded external leakage for a period of five minutes after valve was in the open position at high test pressure. The test result was recorded as below:

Test result of operational test

Item	API 607 Required Value	Actual Value
Test Pressure (MPa)	1.50 MPa	1.50 MPa
Test Temperature	30℃	
Test Time	5 min	
External Leakage	≤100 ml/min	56 ml/min
Conclusion: the test result is satisfactory according to API 607.		

The undersigned, hereby declare that I have checked test valve and witnessed the fire test on the test valve according to API STANDARD607 Eighth Edition, October 2022. The test result is satisfactory.

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

Wang Zhongxiang

Date: Nov. 5, 2024

Annexes:

1) Copy of Drawing No.:Q47-4-150LB-1
2) Copy of Test Record of Fire Test No.: LSV2024FB02418-2