

API 美标固定球阀

API Standard Trunnion Mounted Ball Valve

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开维喜阀门集团有限公司
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API 美标固定球阀

型号: API	规格: DN15-DN500
公称压力: 1.6Mpa-4.0Mpa	适用介质: 水、气、油
适用温度: $\leq 550^{\circ}\text{C}$	阀体材质: 不锈钢、碳钢
连接方式: 法兰	驱动方式: 手动、气动、电动、涡轮
其他参数: 制造标准按 API608/API6D	

API Standard Trunnion Mounted Ball Valve

Model: API	Specifications: DN15-DN500
Nominal Pressure: 1.6Mpa-4.0Mpa	Applicable Media: water, gas, oil
Applicable Temperature: $\leq 550^{\circ}\text{C}$	Body Material: Stainless Steel, Carbon Steel.
End Connection : Flange	Operation: Manual, pneumatic, electric , gear
Other Parameters: Manufacturing standard according to API608/API6D.	

API 美标固定球阀概述

API 美标固定球阀是严格遵循美国石油学会（API）标准设计制造的高性能球阀，采用固定球结构。阀体通常采用铸钢、锻钢或不锈钢材质，球体由上下转轴固定支撑，在高压下不产生位移。阀门通过阀杆驱动球体作 90 度旋转实现启闭，密封副采用弹簧预紧的浮动阀座结构。该设计符合 API 6D、API 608 等标准，适用于高压、大口径及严苛工况，广泛应用于石油、天然气、化工及长输管线等关键管路系统，是实现可靠截断与调节的高端阀门设备。

API Standard Trunnion Mounted Ball Valve Overview

The API Standard Trunnion Mounted Ball Valve is a high-performance ball valve designed and manufactured in strict compliance with the American Petroleum Institute (API) standards, featuring a trunnion-mounted ball structure. The valve body is typically made of cast steel, forged steel, or stainless steel, with the ball fixed and supported by upper and lower trunnions, ensuring no displacement under high pressure. The valve is opened and closed by rotating the ball 90 degrees via the stem, and the sealing pair adopts a spring-preloaded floating seat structure. This design conforms to standards such as API 6D and API 608, making it suitable for high-pressure, large-diameter, and demanding operating conditions. It is widely used in critical pipeline systems, including petroleum, natural gas, chemical, and long-distance transmission pipelines, serving as a high-end valve device for reliable isolation and regulation.



API 美标固定球阀产品图

API Standard Trunnion Mounted Ball Valve Product Image

API 美标固定球阀特点

- 1.严格 API 标准符合性：全过程遵循 API 6D、API 608 等标准，在压力等级、结构设计、材料及测试方面满足美标体系要求。
- 2.固定球高压性能：球体由轴承固定，转动摩擦小，阀座采用弹簧加载设计，确保高压差工况下的可靠密封与低操作扭矩。
- 3.双向密封与防火安全：通常采用双活塞效应（DPE）或双堵泄放（DBB）阀座结构，实现双向密封。符合 API 607 防火标准。
- 4.低流阻长寿命设计：全通径结构流阻极小，适合输送管线。密封面磨损可自动补偿，维护周期长，使用寿命长。
- 5.智能控制维护便捷：可配置齿轮箱或执行机构，支持自动化控制。部分结构支持在线维护，阀座和密封件可快速更换。

API Standard Trunnion Mounted Ball Valve Features

1. Strict Compliance with API Standards:

The entire process adheres to standards such as API 6D and API 608, meeting the requirements of the American standard system in terms of pressure class, structural design, materials, and testing.

2. High-Pressure Performance of Trunnion-Mounted Ball:

The ball is fixed by bearings, reducing rotational friction. The seats are spring-loaded, ensuring reliable sealing and low operating torque under high-pressure differential conditions.

3. Bidirectional Sealing and Fire-Safe Design:

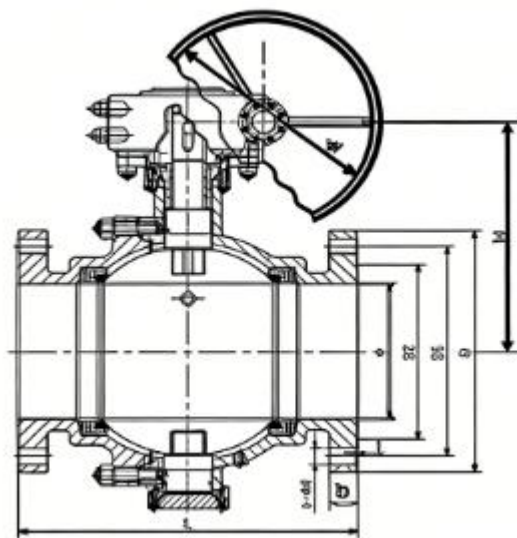
Typically equipped with a Double Piston Effect (DPE) or Double Block and Bleed (DBB) seat structure to achieve bidirectional sealing. Compliant with API 607 fire-safe standards.

4. Low Flow Resistance and Long Service Life Design:

The full-bore structure minimizes flow resistance, making it suitable for transmission pipelines. Worn sealing surfaces are automatically compensated for, extending maintenance intervals and service life.

5. Smart Control and Easy Maintenance:

Can be configured with gearboxes or actuators to support automated control. Some designs allow for online maintenance, enabling quick replacement of seats and sealing components.



API 美标固定球阀结构图

API Standard Trunnion Mounted Ball Valve Structure Diagram

零部件名称材料表

Parts Name Material List

序号 NO.	名称 Name	材料 Material
1	阀体 body	ZG1Cr18Ni9Ti、CF8、CF3 、CF8M、 ZG1Cr18Ni12Mo2Ti
2	球体 ball	1Cr18Ni9Ti、1Cr18Ni12Mo2Ti、304、304L、316
3	密封垫 seal gasket	不锈钢/增强柔性石墨 Stainless Steel / Reinforced Flexible Graphite、PTFE
4	填料 packing	不锈钢/增强柔性石墨 Stainless Steel / Reinforced Flexible Graphite、PTFE
5	阀杆 stem	1Cr18Ni9Ti、1Cr18Ni12Mo2Ti、304、304L、316

性能规范表 Performance Specification

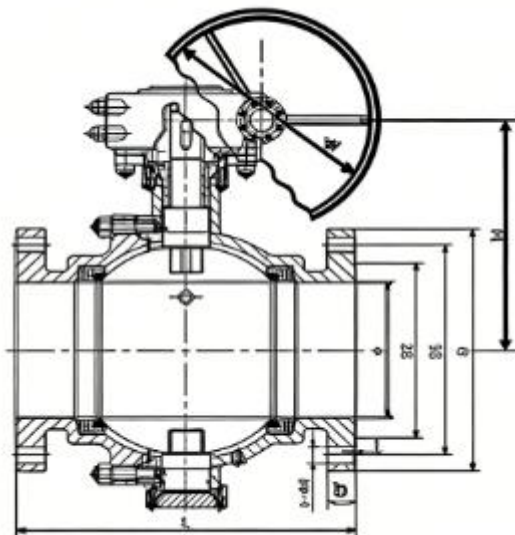
公称压力 Nominal Pressure	1.6-4.0	Mpa
强度试验压力 Shell Test	2.4-6.0	
密封试验压力 Seal Test	1.76-4.4	
适用温度 Suitable Temp.	550	℃

外形尺寸标准要求

- 1、阀门的结构长度按 ASME B16.10 的标准
- 2、连接法兰按 ASME B16.50 的标准

Dimensions Standard Requirements

1. The structural length of the valve shall conform to the standard ASME16.10.
2. The connecting flange shall conform to the standard ASME16.50.



API 美标固定球阀外形图

API Standard Trunnion Mounted Ball Valve View Drawing

API 美标固定球阀外形尺寸表

API Standard Trunnion Mounted Ball Valve Dimensions Table

in	DN	连接尺寸 Connection dimension (m)							
		L	D	D1	D2	f	b	Z-①d	H
		150Lb							
4	100	129	230	190.5	157.2	2	24.3	8-19	350
5	125	356	255	215.9	185.7	2	24.3	8-22	360
6	150	394	280	241.3	215.9	2	25.9	8-22	392
8	200	457	345	298.5	289.9	2	29	8-22	492
10	250	533	405	382	323.8	2	30.6	12-25	548
12	300	610	485	431.8	381	2	32.2	12-25	688

14	350	686	535	476.3	412.8	2	32.4	12-25	350
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API 美标固定球阀安装、使用与维护说明

安装指南

1. 安装前准备：核对阀门型号、压力等级（Class）、连接标准（法兰或对焊）及阀体材质是否符合 API 6D 和管道设计要求。清洁阀门内腔及管道密封面，确保无杂质。
2. 法兰连接与紧固：使用符合 ASME 标准的垫片及合金钢螺栓。将阀门置于管道法兰之间，确保阀体流向箭头与介质流向一致。按 API 规范采用十字对称顺序分步、均匀拧紧所有螺栓至规定扭矩。
3. 焊接端连接（如适用）：若为对焊端阀门，需由合格焊工按焊接工艺规程施焊。焊接时阀门应处于全开位置，并采取阀体冷却措施，防止内部密封件受热损坏。
4. 执行机构安装：若配备齿轮箱或执行器，需按制造厂要求安装并确保驱动轴与阀杆对中。安装后检查执行机构行程是否与阀门开关位置匹配。
5. 系统压力测试：阀门安装后参与管道系统的压力试验。试验压力需符合 ASME B16.34 等规范，试验后检查所有连接处有无泄漏。

使用操作

1. 启闭操作：通过手柄、齿轮箱或执行器进行 90 度旋转操作。固定球阀通常操作扭矩较低，操作应平稳，达到机械限位即停止。
2. 状态确认：通过执行器位置反馈、阀杆指示器或机械限位标志明确判断阀门开关状态。关键管线建议设置永久性状态标牌。
3. 常规运行：本阀门适用于全开或全关闭断工况，也可用于有限度的调节控制（需确认阀门设计允许）。长期全开运行时，建议定期进行全行程开关操作。
4. 注意事项：带压操作时若扭矩异常增大，应立即停止并检查是否因系统压力过高或阀门内部异常。

维护保养

1. 定期检查：定期检查法兰连接处有无泄漏，阀体表面有无异常腐蚀或损伤。检查所有外部紧固件及执行机构连接状态。
2. 阀座密封维护：固定球阀通常配备阀座注脂系统。可根据运行情况定期通过注脂阀注入专用密封脂，以维护密封性能或临时处理轻微内漏。
3. 阀杆填料维护：若阀杆处出现外漏，可均匀适度拧紧填料压盖螺母。若无效或泄漏严重，需在系统泄压后更换高温高压填料。
4. 内部检修（若设计允许）：部分固定球阀支持在线维护。需拆卸内部时，应先确认系统已完全泄压。检查球体与阀座密封面磨损情况，必要时更换密封组件。注意弹簧预紧阀座的复位调整。
5. 长期停用：阀门长期存放应处于全开或全关状态，对阀杆及外露金属表面采取防锈措施。若配备注脂系统，应注入适量保养脂保护密封面。重新启用前需进行压力测试和操作检查。

Installation, Operation, and Maintenance Instructions for API Standard Trunnion Mounted Ball Valve

Installation Guide

1. Pre-Installation Preparation

Verify that the valve model, pressure class (Class), connection standard (flanged or butt-weld), and body material comply with API 6D and pipeline design requirements. Clean the valve's internal cavity and pipeline sealing surfaces to ensure they are free of contaminants.

2. Flange Connection and Tightening

Use gaskets and alloy steel bolts that comply with ASME standards. Position the valve between the

pipeline flanges, ensuring the flow direction arrow on the valve body aligns with the medium flow direction. Tighten all bolts to the specified torque gradually and evenly in a crosswise symmetrical sequence, as per API standards.

3. Welded-End Connection (If Applicable)

For butt-weld end valves, welding must be performed by a qualified welder following approved welding procedures. The valve should be fully open during welding, and cooling measures must be applied to the valve body to prevent thermal damage to internal sealing components.

4. Actuator Installation

If equipped with a gearbox or actuator, install it according to the manufacturer's instructions and ensure proper alignment between the drive shaft and valve stem. After installation, verify that the actuator's travel matches the valve's fully open and fully closed positions.

5. System Pressure Testing

After installation, the valve must participate in the pipeline system's pressure test. The test pressure must comply with standards such as ASME B16.34. After testing, inspect all connections for leaks.

Operation Instructions

1. Opening and Closing Operations

Operate the valve by rotating it 90 degrees using a handle, gearbox, or actuator. Trunnion mounted ball valves typically require low operating torque. The operation should be smooth and should stop once the mechanical limit is reached.

2. Status Confirmation

Confirm the valve's open or closed status using the actuator position feedback, stem indicator, or mechanical limit markers. For critical pipelines, it is recommended to install permanent status placards.

3. Normal Operation

This valve is designed for isolation in fully open or fully closed positions and may also be used for limited flow regulation (if the valve design permits). If the valve remains fully open for extended periods, periodic full-stroke opening and closing operations are recommended.

4. Precautions

If abnormal torque increase is observed during pressurized operation, stop immediately and check whether it is due to excessive system pressure or internal valve issues.

Maintenance

1. Regular Inspections

Periodically inspect flange connections for leaks and check the valve body surface for abnormal

corrosion or damage. Verify that all external fasteners and actuator connections are secure.

2. Seat Seal Maintenance

Trunnion mounted ball valves are typically equipped with a seat injection system. Depending on operating conditions, periodically inject specialized sealant through the injection valve to maintain sealing performance or temporarily address minor internal leakage.

3. Stem Packing Maintenance

If external leakage occurs at the stem, evenly and moderately tighten the packing gland nut. If ineffective or if leakage is severe, replace the high-temperature, high-pressure packing after depressurizing the system.

4. Internal Maintenance (If Design Permits)

Some trunnion mounted ball valves support online maintenance. Before disassembling internal components, ensure the system is fully depressurized. Inspect the ball and seat sealing surfaces for wear and replace sealing components if necessary. Pay attention to the reset adjustment of spring-loaded seats.

5. Long-Term Storage

For long-term storage, the valve should be in the fully open or fully closed position. Apply anti-rust protection to the stem and exposed metal surfaces. If equipped with an injection system, inject an appropriate amount of preservative grease to protect the sealing surfaces. Perform pressure testing and operational checks before returning the valve to service.

非常感谢您的阅读！

Thank you very much for reading!

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