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Q47H 锻钢固定球阀

Q47H Forged Steel Fixed Ball Valve

使用说明书

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Q47H 锻钢固定球阀

型号：Q47H
规格： DN50-DN500
公称压力：1.6-6.4Mpa
适用介质：水、气、油
适用温度：≤350℃
阀体材质：锻钢、锻不锈钢
连接方式：法兰
驱动方式：气动、电动、手动、涡轮
其他参数：制造标准按 GB/T12237

Q47H Forged Steel Fixed Ball Valve

Model:Q47H
Specifications: DN50-DN500
Nominal Pressure:1.6-6.4Mpa
Applicable Media: water, gas, oil
Applicable Temperature: ≤350℃
Body Material: Forged steel steel, Forged stainless steel
End Connection :flange
Operation:Manual, pneumatic, electric,gear
Other Parameters: Manufacturing standard according to GB/T12237.

Q47H 锻钢固定球阀概述

Q47H 锻钢固定球阀是一种采用整体锻钢阀体与固定球结构的高性能工业球阀。阀体由 A105 等锻钢材料锻造而成，球体通过上下精密轴承固定支撑，内部采用金属硬密封或高性能软密封设计。阀门通过旋转阀杆带动球体实现 90 度可靠启闭，专为高压、高温及严苛工况设计，符合 API 6D 等相关标准。适用于石油、天然气、化工、电站及长输管线等关键系统，是实现高压截断与可靠控制的核心设备。

Q47H Forged Steel Fixed Ball Valve Overview

The Q47H Forged Steel Fixed Ball Valve is a high-performance industrial ball valve featuring an integral forged steel body and a fixed ball design. The valve body is forged from materials such as A105, while the ball is rigidly supported by precision upper and lower bearings. Internally, it incorporates either a metal hard seal or a high-performance soft seal configuration. The valve operates via a 90-degree rotation of the stem to reliably open or close the ball. It is specifically engineered for high-pressure, high-temperature, and demanding service conditions, complying with standards such as API 6D. This valve is suitable for critical applications in oil, natural gas, chemical, power generation, and long-distance pipeline systems, serving as essential equipment for high-pressure isolation and reliable flow control.

Q47H 锻钢固定球阀产品图
Q47H Forged Steel Fixed Ball Valve Product Image

Q47H 锻钢固定球阀特点

1.锻钢阀体高压耐受：采用整体锻钢锻造，材质均匀致密，机械强度高，可承受高压、高温及频繁压力冲击。

2.固定球结构稳定可靠：球体由轴承精密固定，操作扭矩低且稳定，适用于高压差工况，阀座采用弹簧预紧设计确保密封。

3.硬质密封耐磨损：密封副可选金属硬质合金或增强复合材料，耐冲刷、耐高温、耐磨损，使用寿命长。

4.防火安全设计：符合 API 607 防火标准，软密封失效后仍可通过金属密封副保持应急密封，阀杆防吹出结构安全可靠。

5.维护便捷长寿命：部分结构支持在线维护，密封件可更换。锻钢材质耐腐蚀性强，设计寿命长，综合使用成本低。

Q47H Forged Steel Fixed Ball Valve Features

1. High-Pressure Resistance of Forged Steel Body:

The valve body is made of integral forged steel with uniform and dense material, offering high mechanical strength and reliable performance under high pressure, high temperature, and frequent pressure surges.

2. Stable and Reliable Fixed Ball Structure:

The ball is precisely fixed by bearings, providing low and stable operating torque. This design is suitable for high-pressure differential conditions, and the spring-loaded seat ensures reliable sealing.

3. Hard Seal for Wear Resistance:

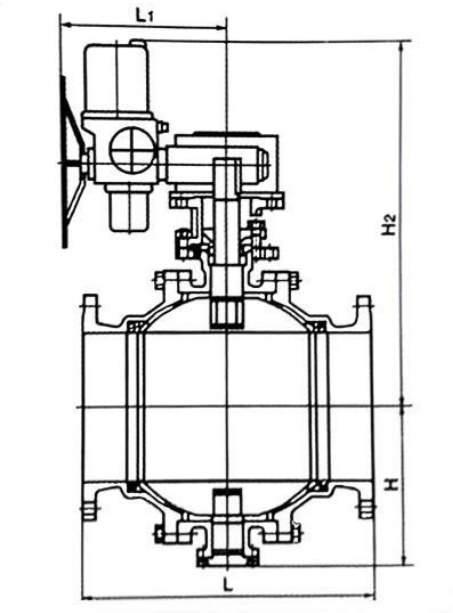
The sealing pair can be configured with either metal hard alloy or reinforced composite materials, offering excellent resistance to erosion, high temperatures, and abrasion for extended service life.

4. Fire-Safe Design:

Compliant with fire safety standards such as API 607. In the event of soft seal failure, the metal-to-metal sealing pair maintains emergency sealing integrity. The stem is designed with an anti-blowout feature for enhanced safety.

5. Easy Maintenance and Long Service Life:

Certain structural designs support in-line maintenance, allowing for replaceable sealing components. The forged steel material provides strong corrosion resistance, contributing to a long design life and low total cost of ownership.



Q47H 锻钢固定球阀结构图

Q47H Forged Steel Fixed 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	碳钢、不锈钢 cast steel, stainless steel
2	球体 ball	不锈钢 stainless steel
3	密封垫 seal gasket	PTFE
4	填料 packing	柔性石墨+不锈钢 Flexible Graphite+stainless steel
5	阀杆 Stem	1CR13

性能规范表 Performance Specification		
公称压力 Nominal Pressure	1.6-6.4	Mpa
强度试验压力 Shell Test	2.4-9.6	

密封试验压力 Seal Test	1.76-7.04	
适用温度 Suitable Temp.	350	℃

外形尺寸标准要求

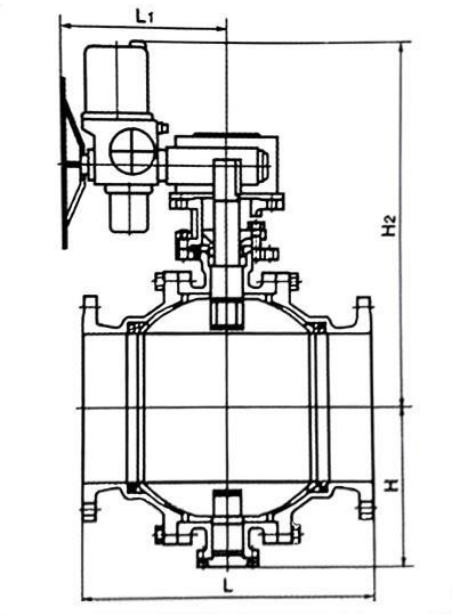
1、阀门的结构长度按 GB/T12221 的标准

2、连接法兰按 GB9113 的标准

Dimensions Standard Requirements

1. The structural length of the valve shall conform to the standard GB/T12221.

2. The connecting flange shall conform to the standard GB9113.



Q47H 锻钢固定球阀外形图

Q47H Forged Steel Fixed Ball Valve View Drawing

Q47H 锻钢固定球阀外形尺寸表

Q47H Forged Steel Fixed Ball Valve Dimensions Table

PN1.6MPa 下的电动固定球阀外形尺寸：

Overall Dimensions of Electric Fixed Ball Valve under PN1.6MPa

DN		25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700
d_1		25	32	40	50	65	80	100	125	150	200	250	300	337	387	438	498	591	686
L		165	180	190	216	241	283	305	356	394	457	533	610	686	762	864	914	1067	1245
H		50	55	80	102	114	127	152	184	219	273	360	395	430	470	550	580	700	800
电动	H_2	–	–	–	–	–	–	–	–	554	600	652	760	770	830	–	940	940	1150
	L_1	–	–	–	–	–	–	–	–	235	235	235	259	400	400	–	410	410	410

PN2.5MPa 下的电动固定球阀外形尺寸：

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Overall Dimensions of Electric Fixed Ball Valve under PN2.5MPa

DN		25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700
d_1		25	32	40	50	65	80	100	125	150	200	250	300	337	387	438	498	591	686
L		165	180	190	216	241	283	305	381	403	502	648	648	762	838	914	991	1143	1346
H		50	55	80	102	114	127	152	184	219	273	395	395	430	470	550	580	700	800
电动	H_2	–	–	–	–	–	–	–	–	235	235	400	400	410	410	–	420	690	690
	L_1	–	–	–	–	–	–	–	–	74	350	420	420	420	400	–	400	410	650

Q47H 锻钢固定球阀安装、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）、连接标准及锻钢材质是否符合高压管道设计要求。清洁阀门内腔及管道连接面，确保无杂质。检查固定球机构及阀座预紧状态。

2. 法兰或焊接连接：根据阀门接口形式（法兰 RF/RTJ 或对焊）进行连接。法兰连接需使用高强度垫片及螺栓，按十字对称顺序均匀拧紧至规定扭矩。对焊连接需由合格焊工按工艺规程施焊，焊接时阀门应处于全开位置并采取阀体冷却措施。

3. 安装方向确认：阀门可水平或垂直安装，但需确保阀杆执行机构（如手轮、齿轮箱）有足够的操作空间，并能清晰观察开关指示。流向应与阀体箭头一致。

4. 执行机构安装：若配备齿轮箱或执行器，需确保驱动轴与阀杆精确对中，并按要求调整行程和扭矩限制。安装后验证开关位置准确性。

5. 系统压力测试：阀门安装后参与管道系统压力试验。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，并验证启闭功能。

使用操作

1. 启闭操作：通过执行器、齿轮箱或手动装置进行平稳的 90 度旋转操作。固定球结构操作扭矩通常较低且稳定，达到全开或全关机械限位时应停止操作。

2. 状态确认：通过执行器反馈信号、阀杆位置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：本阀门适用于高压、高温工况的全开或全关闭断。不应用于流量调节。长期全开运行时，建议定期进行全行程开关操作以保持阀座灵活性。

4. 注意事项：带压操作时若感觉扭矩异常持续增大，应立即停止操作。检查系统压力是否超标、阀门内部是否卡滞或是否有杂质影响。

维护保养

1. 定期检查：定期检查连接处有无泄漏，阀体表面有无异常腐蚀或损伤。检查外部紧固件及执行机构连接状态是否正常。

2. 密封系统维护：阀门通常配备阀座注脂系统。应根据运行工况定期通过注脂阀注入专用高温高压密封脂，以润滑和保养硬密封面，并可在发生轻微内漏时进行临时性密封补偿。

3. 阀杆密封维护：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适用于高温高压工况的专用填料。

4. 内部检修：如需内部检修，必须先确认系统已完全泄压、隔离并冷却至常温。重点检查固定球体与阀座的硬质合金密封面的磨损、冲蚀情况。轻微损伤可由专业人员研磨修复，严重损坏需更换密封组件。

5. 长期停用：阀门长期存放应处于全开或全关位置。通过注脂系统向密封面注入足量保养脂进行保护。对阀杆等外露金属表面采取防锈措施。重新启用前需彻底清洁注脂通道，并进行全面的压力测试和功能检查。

Installation, Operation, and Maintenance Instructions for Q47H Forged Steel Fixed Ball Valve

Installation Guide

1. Pre-Installation Preparation: Verify that the valve model, pressure class (Class), connection standard, and forged steel material comply with the high-pressure pipeline design requirements. Clean the valve inner cavity and pipeline connection surfaces to ensure they are free of contaminants. Inspect the fixed ball mechanism and the pre-tightened condition of the seat.

2. Flange or Welded Connection: Connect the valve according to its end type (flange RF/RTJ or buttweld). For flange connections, use high-strength gaskets and bolts, and tighten them evenly in a crisscross sequence to the specified torque. For buttweld connections, welding must be performed by qualified welders following approved procedures. The valve should be fully open during welding, and cooling measures should be applied to the valve body.

3. Installation Orientation: The valve can be installed horizontally or vertically, but ensure sufficient operating space for the stem actuator (e.g., handwheel, gearbox) and clear visibility of the position indicator. The flow direction must align with the arrow on the valve body.

4. Actuator Installation: If equipped with a gearbox or actuator, ensure precise alignment between the drive shaft and the valve stem, and adjust travel and torque limits as required. Verify the accuracy of the open/close positions after installation.

5. System Pressure Testing: The installed 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 and verify the valve’s open/close functionality.

Operation

1. Opening/Closing Operation: Perform smooth 90-degree rotation via the actuator, gearbox, or manual device. The fixed ball structure typically provides low and stable operating torque. Stop operation once the full open or full closed mechanical stop is reached.

2. Position Indication: Clearly determine the valve’s open/closed position via actuator feedback, stem position indicator, or mechanical stop marks. For critical pipelines, installing permanent status tags is recommended.

3. Normal Service: This valve is designed for on/off isolation in high-pressure and high-temperature applications and should not be used for flow throttling. If the valve remains fully open for extended periods, periodic full-stroke operation is recommended to maintain seat flexibility.

4. Precautions: If an abnormal and persistent increase in operating torque is felt during pressurized operation, stop immediately. Investigate whether system pressure exceeds limits, internal jamming has occurred, or contaminants are affecting the valve.

Maintenance

1. Regular Inspection: Periodically inspect connections for leaks and the valve exterior for abnormal corrosion or damage. Check the condition of external fasteners and actuator connections.
2. Sealing System Maintenance: The valve is typically equipped with a seat injection system. Based on operating conditions, periodically inject specialized high-temperature, high-pressure sealing grease through the injection fittings to lubricate and preserve the hard seal surfaces. This can also provide temporary sealing compensation in case of minor internal leakage.
3. Stem Seal Maintenance: If external leakage occurs at the stem, the gland follower nuts may be evenly and moderately tightened. If leakage persists or is severe, the system must be depressurized and the high-temperature/high-pressure specific packing replaced.
4. Internal Inspection: Before internal inspection, ensure the system is fully depressurized, isolated, and cooled to ambient temperature. Focus on inspecting the hard alloy sealing surfaces of the fixed ball and seats for wear and erosion. Minor damage can be repaired by qualified personnel through grinding; severely damaged components require replacement.
5. Long-Term Storage: Valves in long-term storage should be in the fully open or fully closed position. Protect the sealing surfaces by injecting a sufficient amount of preservation grease through the injection system. Apply anti-corrosion measures to exposed metal surfaces such as the stem. Before recommissioning, thoroughly clean the grease injection channels and conduct comprehensive pressure testing and functional checks.

非常感谢您的阅读！

Thank you very much for reading!

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