

Q46H 四通球阀

Q46H Four-way Ball Valve

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开 维 喜 阀 门 集 团 有 限 公 司
Kaiweixi Valve Group Co., Ltd.

Q46H 四通球阀

型号: Q46H-16/25/40/64
公称压力: PN16, PN25, PN40, PN64
适用温度: $\leq 500^{\circ}\text{C}$
连接方式: 法兰
其他参数: 制造标准按 GB/T 12237

规格: DN40-DN300
适用介质: 水、蒸汽、油品及腐蚀性介质
阀体材质: 碳钢、不锈钢
驱动方式: 手动、电动、气动

Q46H Four-way Ball Valve

Model: Q41Y-16/40/64/100 Specifications: DN40-DN300
Nominal Pressure: PN16, PN25, PN40, PN64
Applicable Media: Water, steam, oil and corrosive media
Applicable Temperature: $\leq 500^{\circ}\text{C}$ Body Material: Carbon steel, stainless steel
End Connection : Flange Operation: Manual, pneumatic, electric
Other Parameters: Manufacturing standard according to GB/T 12237.

Q46H 四通球阀概述

Q46H 四通球阀是一种可实现介质多向切换与流程转换的特殊结构阀门，其阀体设有四个通道，通过内部球体旋转实现多种流通过程的组合。该阀门通常采用法兰连接，阀体为铸钢或不锈钢材质，内部球体通道呈特殊设计，阀座密封采用金属硬密封或增强复合材料。它通过将手柄旋转 90 度或 180 度，即可在一次操作中同时改变多个端口的连通状态，广泛应用于石油化工、制药、电站、热交换及流程工业中，用于完成介质的交叉换向、流程切换或系统旁通等复杂控制任务。

Q46H Four-way Ball Valve Overview

Q46H four-way ball valve is a special structural valve that can achieve multi-directional switching of media and process conversion. Its valve body is equipped with four channels, and multiple flow paths are combined through the rotation of the internal sphere. This valve is usually connected by flanges, with a cast steel or stainless steel body and a specially designed internal spherical passage. The valve seat seal is made of metal hard seal or reinforced composite material. It can simultaneously change the connectivity status of multiple ports in one operation by rotating the handle 90 or 180 degrees. It is widely used in the petrochemical, pharmaceutical, power station, heat exchange, and process industries to complete complex control tasks such as medium crossover, process switching, or system bypass.



Q46H 四通球阀产品图
Q46H Four-way Ball Valve Product Image

Q46H 四通球阀特点

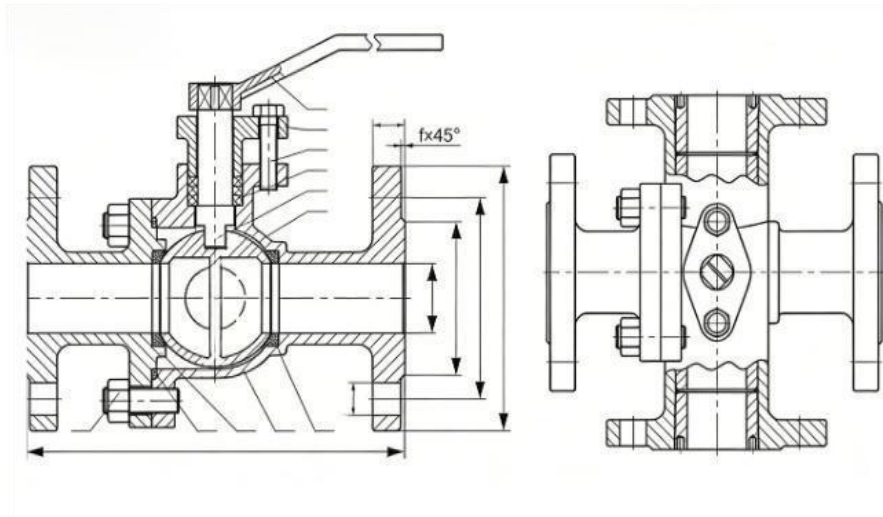
1. 独特的四通流向控制：单一阀门具备四个接口，通过球体一次旋转即可实现两种主流工艺介质的完全交叉换向或流程的切换与旁通，极大地简化了复杂管路系统的设计与设备配置。
2. 可靠的密封性能：采用金属硬密封或复合密封结构，耐温耐压性能好，适用于高温、高压及对密封要求严格的工况，确保在各流位下均能有效隔离介质，防止串流。
3. 紧凑一体化设计：用一个紧凑的阀门单元替代了原本需要多个阀门和管件才能实现的功能，节省安装空间，减少管道连接点，降低了泄漏风险与系统复杂度。
4. 操作便捷高效：仅需旋转手柄 90 度或 180 度即可完成流程的快速切换，操作直观、迅速，减少了转换步骤和时间，便于实现流程的自动化控制。
5. 多用途与高适应性：适用于水、蒸汽、油品、气体及多种化工介质，尤其适合需要定期切换流向、进行流程交替运行或设备一开一备的系统，功能集成度高，用途广泛。

Q46H Four-way Ball Valve Features

1. Unique four-way flow control: A single valve has four interfaces, which can achieve complete cross directional or process switching and bypass of two mainstream process media through one rotation of the sphere, greatly simplifying the design and equipment configuration of complex pipeline systems.
2. Reliable sealing performance: Adopting metal hard sealing or composite sealing structure, it has good temperature and pressure resistance, suitable for high temperature, high pressure and working conditions with strict sealing requirements, ensuring effective isolation of the medium at all flow positions and preventing flow.
3. Compact integrated design: Replacing functions that originally required multiple valves and fittings with a compact valve unit, saving installation space, reducing pipeline connection points, and lowering leakage risks and system complexity.

4. Convenient and efficient operation: Simply rotate the handle 90 or 180 degrees to quickly switch the process. The operation is intuitive and fast, reducing the number of conversion steps and time, making it easy to achieve automated control of the process.

5. Multi purpose and high adaptability: Suitable for water, steam, oil products, gases, and various chemical media, especially suitable for systems that require regular flow direction switching, process alternating operation, or equipment on and off, with high functional integration and wide applications.



Q46H 四通球阀结构图
Q46H Four-way 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 Carbon steel, stainless steel
2	球体 Ball	碳钢、不锈钢 Carbon steel, stainless steel
3	密封圈 sealing ring	司太立、本体 Sitaili, ontology
4	填料 packing	柔性石墨 Flexible graphite
5	阀杆 Stem	2Cr13、不锈钢 stainless steel

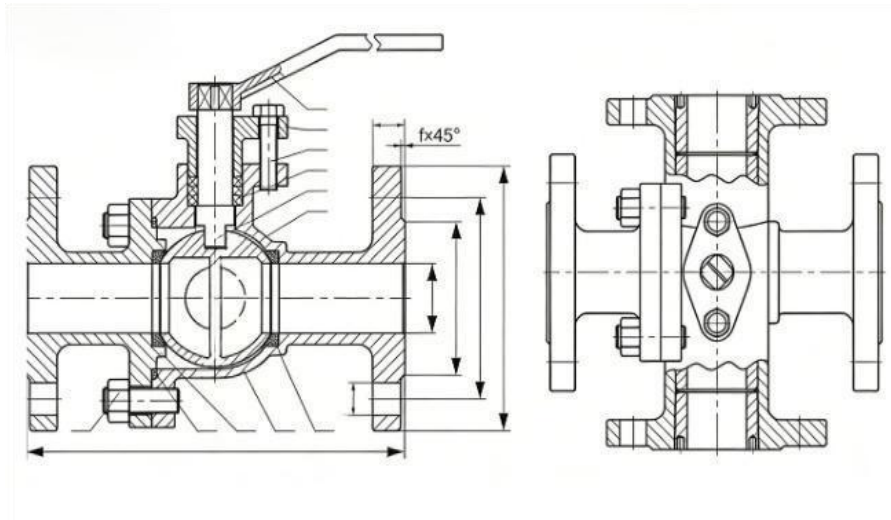
性能规范表 Performance Specification		
公称压力 Nominal Pressure	1.6/2.5/4/6.4	Mpa
强度试验压力 Shell Test	2.4/3.75/6/9.6	
密封试验压力 Seal Test	1.76/2.75/4.4/7.04	
适用温度 Suitable Temp.	≤500	℃

外形尺寸标准要求

- 1、阀门的结构长度按 GB/T 12221 的标准
- 2、连接法兰按 GB/T 9113 的标准

Dimensions Standard Requirements

1. The structural length of the valve shall conform to the standard GB/T 12221.
2. The connecting flange shall conform to the standard GB/T 9113.



Q46H 四通球阀外形图
Q46H Four-way Ball Valve View Drawing

Q46H 四通球阀外形尺寸表

Q46H Four-way Ball Valve Dimensions Table

DN	D1	d	K	D	f	C	N-Z	L
40	34	85	110	145	3	16	4-18	200
50	46	100	125	160	3	16	4-18	220
65	60	120	145	180	3	18	4-18	260
80	70	135	160	195	3	20	8-18	280
100	95	155	180	215	3	20	8-18	320
125	119	185	210	245	3	22	8-18	380
150	145	210	240	280	3	24	8-23	440
200	190	265	295	335	3	26	12-23	550
250	240	320	355	405	3	30	12-25	670
300	290	375	410	460	3	30	12-25	720

Q46H 四通球阀安装、使用与维护说明书

安装指南

1. 安装前准备：核对阀门型号、压力等级及法兰标准，确认其通道功能符合工艺流程设计要求。彻底清洁阀门内腔及各管道接口，确保无异物。
2. 流向确认与管道连接：仔细对照阀门铭牌或阀体上的永久性流向示意图，准确识别四个端口的对应功能（如进口 A/B、出口 A/B）。将管道与对应端口牢固连接，确保介质流向与设计要求一致。
3. 法兰紧固：使用合适垫片，按对角线顺序分步均匀拧紧所有连接螺栓，确保各法兰面平行密封，防止阀

体因受力不均而变形或内漏。

4. 操作空间预留：阀门必须安装在手柄或执行机构有完全无障碍旋转空间的位置，并能清晰观察到流向指示牌，以确保操作准确无误。

5. 系统测试：在系统压力试验前，建议将阀门切换至一个确定的流路位置。缓慢升压，检查各连接处及阀体是否有泄漏。

使用操作

1. 切换操作：通过手柄或执行器进行 90 度或 180 度旋转，以实现预定的流向切换（如交叉换向）。操作应平稳、到位，感受到明确的机械限位感，严禁在未到位时强行操作。

2. 状态确认：操作前后必须确认手柄位置与流程所需的流向模式完全匹配。强烈建议在阀门附近设置永久性的流向指示牌，防止误操作导致流程混乱或事故。

3. 专用功能应用：本阀门专为多路介质切换设计，严禁用作节流调节。每次切换完成后，应观察系统参数（压力、流量）是否正常，以验证切换正确性。

4. 带压切换注意事项：在系统带压状态下切换时，动作应缓慢、谨慎，注意系统可能出现的压力波动，并确保切换动作符合安全操作规程。

维护保养

1. 定期检查：定期检查各法兰连接处有无外漏，阀杆填料处密封情况，以及紧固件是否松动。保持阀门外部及指示标志清洁、清晰。

2. 内漏与串流处理：若发现阀门内部泄漏或介质串流，首先可在系统允许的条件下，进行数次完整的流程切换操作，利用介质冲刷可能存在的杂质。若问题持续，则需隔离系统进行拆检。

3. 拆卸维修（适用于可分体结构）：维修前必须确保系统完全隔离、泄压、排空。拆卸时标记阀体各部件相对位置。重点检查球体密封面、各阀座密封圈是否磨损或损伤，并根据损坏情况研磨修复或更换部件。重新组装时必须确保各零件对位准确，并均匀上紧螺栓。

4. 流向标识维护：阀门上的流向示意图是安全操作的关键，维护时须加以保护。若标识模糊或损坏，必须立即修复或更换清晰的指示标牌。

5. 长期停用：若阀门长期停用，应将其置于一个不承受异常应力的流路位置，排空阀内积液，并对所有端口进行封堵。定期活动阀杆以防卡死。重新投用前需进行全面检查和功能测试。

Installation, Use, and Maintenance Manual for Q46H Four way Ball Valve

Installation Guide

1. Preparation before installation: Check the valve model, pressure rating, and flange standard to confirm that its channel function meets the requirements of the process design. Thoroughly clean the valve cavity and all pipeline interfaces to ensure that there are no foreign objects.

2. Flow confirmation and pipeline connection: Carefully refer to the permanent flow diagram on the valve nameplate or valve body to accurately identify the corresponding functions of the four ports (such as inlet A/B, outlet A/B). Connect the pipeline firmly to the corresponding port to ensure that the flow direction of the medium is consistent with the design requirements.

3. Flange tightening: Use appropriate gaskets and tighten all connecting bolts evenly in diagonal order, ensuring that each flange surface is parallel and sealed to prevent deformation or internal leakage of the valve body due to uneven stress.
4. Reserved operating space: The valve must be installed in a position where the handle or actuator has completely unobstructed rotation space, and the flow direction indicator can be clearly observed to ensure accurate operation.
5. System testing: Before the system pressure test, it is recommended to switch the valve to a determined flow path position. Slowly increase the pressure and check for leaks at all connections and valve bodies.

Usage and Operation

1. Switching operation: Rotate 90 degrees or 180 degrees through the handle or actuator to achieve the predetermined flow direction switching (such as cross direction switching). The operation should be smooth and precise, with a clear sense of mechanical limit, and it is strictly prohibited to forcefully operate before it is in place.
2. Status confirmation: Before and after operation, it is necessary to confirm that the position of the handle matches exactly with the flow pattern required by the process. It is strongly recommended to install permanent flow direction signs near the valve to prevent process confusion or accidents caused by misoperation.
3. Special function application: This valve is designed specifically for multi medium switching and is strictly prohibited from being used for throttling regulation. After each switch is completed, observe whether the system parameters (pressure, flow) are normal to verify the correctness of the switch.
4. Precautions for switching under pressure: When switching under pressure in the system, the action should be slow and cautious, paying attention to possible pressure fluctuations in the system, and ensuring that the switching action complies with safety operating procedures.

maintenance

1. Regular inspection: Regularly check whether there is any leakage at the flange connections, the sealing condition of the valve stem packing, and whether the fasteners are loose. Keep the exterior of the valve and indicator marks clean and clear.
2. Internal leakage and flow processing: If internal leakage or medium flow is found in the valve, multiple complete process switching operations can be carried out under the conditions allowed by the system, using the medium to flush out possible impurities. If the problem persists, the isolation system needs to be dismantled for inspection.
3. Disassembly and maintenance (applicable to separable structures): Before maintenance, it is necessary to ensure that the system is completely isolated, depressurized, and emptied. Mark the relative positions of each component of the valve body during disassembly. Focus on checking whether the sealing surface of the sphere and the sealing rings of each valve seat are worn or damaged, and grind, repair or replace the components according to the damage situation. When reassembling, it is necessary to ensure accurate alignment of each component and evenly tighten the bolts.
4. Flow direction identification maintenance: The flow direction diagram on the valve is crucial for safe operation and must be protected during maintenance. If the identification is blurry or damaged, clear indication signs must be repaired or replaced immediately.
5. Long term shutdown: If the valve is not in use for a long time, it should be placed in a flow path position that does not withstand abnormal stress, the accumulated fluid in the valve should be drained, and all ports should be sealed. Regularly move the valve stem to prevent it from getting stuck. Before being put back into use, a comprehensive inspection and functional testing are required.

非常感谢您的阅读！

Thank you very much for reading!

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