开维喜阀门集团
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Q41F 美标球阀

Q41F API Ball Valve

使用说明书

开维喜阀门集团有限公司

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Q41F 美标球阀

型 号 ： Q41F-C1150P/Q41F-C1300P/Q41F-C1300P/Q41-C1400P/Q41F-C1150C/Q41F-C1300C　　规 格 ：1/2”-8”

公称压力：PN16,PN25,PN40,PN64　　适用介质：水、油、液体

适用温度：-196～350℃　　阀体材质：铸钢、不锈钢、铝镍青铜

连接方式：法兰　　驱动方式：手动、气动、电动

其他参数：制造标准按 API6D

Q41F API Ball Valve

Model:Q41F-Cl150P/Q41F-Cl300P/Q41F-Cl300P/Q41-Cl400P/Q41F-Cl150C/Q41F-Cl300C

Specifications:DN15-DN200

Nominal Pressure: PN16,PN25,PN40,PN64

Applicable Media: Water, oil, liquid

Applicable Temperature: -196～350℃　　Body Material: carbon Steel、stainless steel,Aluminum-nickel bronze

End Connection : Flange　　Operation:Manual, pneumatic, electric Other Parameters: Manufacturing standard according to API6D.

Q41F 美标球阀概述

Q41F 美标球阀是按照 ASME B16.34 等美国标准设计和制造的法兰连接球阀，采用浮动球或固定球结构，通过球体 90 度旋转实现快速启闭。阀体通常采用 ASTM 标准材料如 A216 WCB 铸钢、CF8 不锈钢等，承压等级涵盖 Class 150 至 Class 600。阀门采用 PTFE 增强密封或金属硬密封，确保在石油、天然气、化工、电力等行业的中高压管路系统中实现对水、蒸汽、油品及腐蚀性介质的可靠截断与连通控制。

Q41F API Ball Valve Overview

Q41F API Ball Valve is a flange connected ball valve designed and manufactured in accordance with American standards such as ASME B16.34. It adopts a floating ball or fixed ball structure and can be quickly opened and closed by rotating the ball 90 degrees. Valve bodies are typically made of ASTM standard materials such as A216 WCB cast steel, CF8 stainless steel, etc., with pressure ratings ranging from Class 150 to Class 600. The valve adopts PTFE reinforced sealing or metal hard sealing to ensure reliable cut-off and connection control of water, steam, oil and corrosive media in medium and high pressure pipeline systems in industries such as petroleum, natural gas, chemical, and power.

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Q41F 美标球阀产品图
Q41F API Ball Valve Product Image

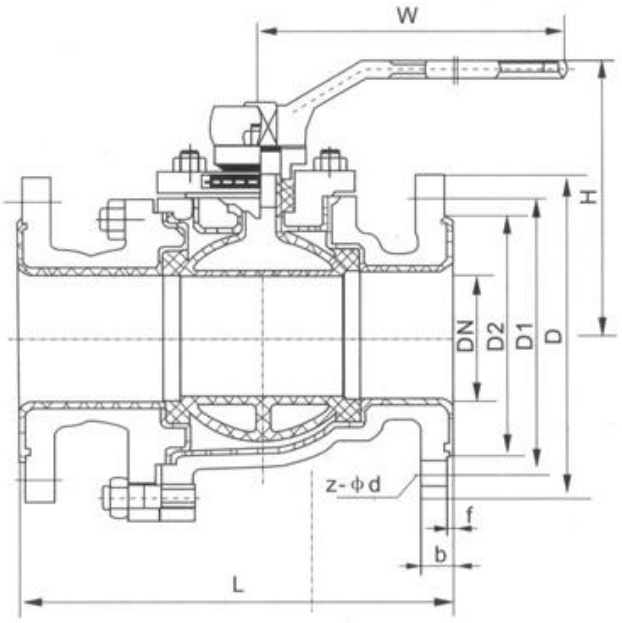
Q41F 美标球阀特点

1.标准合规设计：严格遵循 ASME、API 等美标规范，在压力等级、结构长度、法兰尺寸及材料要求上与国际通用标准兼容，确保互换性与全球项目适配性。
2.高性能密封：采用精密研磨球体与增强 PTFE 或耐高温 PPL 阀座组合，形成双向密封，适用于多种工况，部分型号支持防火防静电设计。
3.稳固连接与承压：采用 RF 或 RTJ 法兰面，配合高强度螺栓连接，结构稳固，能够承受系统压力波动与管道应力，安全性高。
4.低扭矩操作：流道顺畅、摩擦系数小，即使在高压力差下也能实现轻便的 90 度启闭操作，并可配置齿轮箱或气动、电动执行器。
5.维护简便可靠：多数设计为上装式或可分体连接，便于在线维护和更换阀座密封件，延长阀门使用寿命，降低运维成本。

Q41F API Ball Valve Features

1. Standard compliant design: Strictly follow American standards such as ASME and API, and be compatible with internationally recognized standards in terms of pressure rating, structural length, flange size, and material requirements, ensuring interchangeability and global project adaptability.
2. High performance sealing: The combination of precision ground spheres and reinforced PTFE or high-temperature resistant PPL valve seats forms a bi-directional seal, suitable for various working conditions, and some models support fire and anti-static design.
3. Stable connection and pressure bearing: RF or RTJ flange surface is used, combined with high-strength bolt connection, the structure is stable, able to withstand system pressure fluctuations and pipeline stress, and has high safety.
4. Low torque operation: Smooth flow channel, low friction coefficient, can achieve lightweight 90 degree opening and closing operation even under high pressure difference, and can be equipped with gearbox or pneumatic/electric actuators.

5. Easy and reliable maintenance: Most designs are top mounted or detachable connections, which facilitate online maintenance and replacement of valve seat seals, extend valve service life, and reduce operation and maintenance costs.



Q41F 美标球阀结构图
Q41F API Ball Valve Structure Diagram

零部件名称材料表
Parts Name Material List

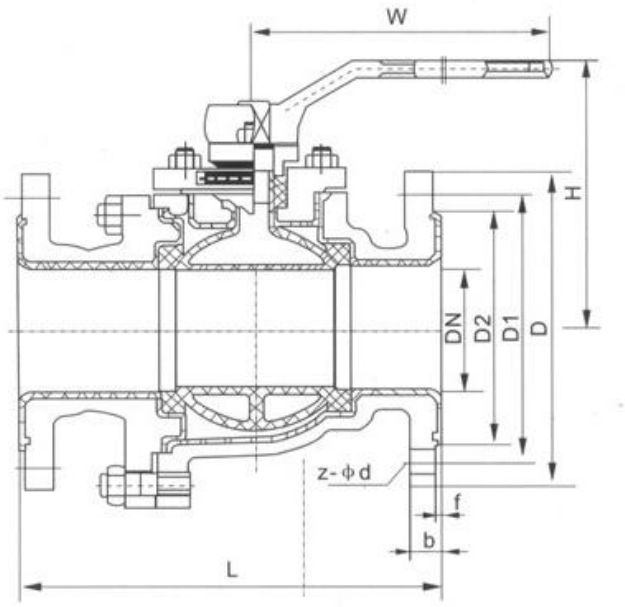
序号NO.	名称 Name	材料 Material
1	阀体 Body	碳钢、不锈钢 carbon Steel、stainless steel
2	球体 Ball	不锈钢 stainless steel
3	密封圈 sealing ring	PTFE、RPP
4	填料 packing	PTFE
5	阀杆 Stem	不锈钢 stainless steel

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.	≤350	℃

外形尺寸标准要求
1、阀门的结构长度按 ASME16.10 的标准
2、连接法兰按 ASME16.50 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.



Q41F 美标球阀外形图

Q41F API Ball Valve View Drawing

Q41F 美标球阀外形尺寸表 PN1.6Mpa

Q41F API Ball Valve Dimensions Table PN1.6Mpa

DN	15	20	25	32	40	50	65	80	100	125	150	200
L	130	140	150	165	180	200	220	250	280	320	360	400
H	59	63	75	85	95	107	140	152	178	252	272	342
W	130	130	160	180	230	230	400	400	650	1050	1050	1410

Q41F 美标球阀外形尺寸表 PN2.5Mpa

Q41F API Ball Valve Dimensions Table PN2.5Mpa

DN	15	20	25	32	40	50	65	80	100	125	150	200
L	130	140	150	165	180	200	220	250	320	400	400	550
H	59	63	75	97	107	142	152	178	252	272	342	345
W	130	130	160	230	230	400	400	700	1100	1100	1500	1500

Q41F 美标球阀外形尺寸表 PN4.0Mpa

Q41F API Ball Valve Dimensions Table PN4.0Mpa

DN	15	20	25	32	40	50	65	80	100	125	150	200
L	130	140	150	180	200	220	250	280	320	400	400	550
H	59	63	75	97	107	142	152	178	252	272	342	345
W	130	130	160	230	230	400	400	700	1000	1100	1500	1800

Q41F 美标球阀外形尺寸表 PN6.4Mpa

Q41F API Ball Valve Dimensions Table PN6.4Mpa

DN	15	20	25	32	40	50	65	80	100	125	150	200
L	165	190	216	229	241	292	330	356	432	408	559	660
H	59	63	75	97	107	142	152	178	252	272	305	398
W	130	130	160	230	230	400	400	700	1000	1100	1500	1800

Q41F 美标球阀安装、使用与维护说明书

安装指南

1. 安装前准备：确认阀门铭牌参数（压力等级 Class、材质、标准）符合管路设计要求。清洁阀门内腔及管道法兰密封面，检查垫片材质（如缠绕垫、金属环垫）是否符合工况并完好无损。

2. 吊装与定位：使用阀体吊耳进行吊装，避免对阀杆或执行机构直接施力。将阀门置于管道法兰之间，确保介质流向与阀体所示箭头方向一致（双向密封阀门通常无流向限制）。

3. 法兰连接与紧固：使用符合 ASME 标准的螺栓、螺母。将垫片对中放置，按对角线顺序分步均匀拧紧螺栓，最终扭矩需符合相应标准规范，确保法兰面平行压紧，防止因应力不均导致泄漏或阀体变形。

4. 操作空间与支撑：安装时需为手轮、齿轮箱或执行器预留充足的操作与检修空间。对于大口径或重型阀门，应在管道下游侧提供适当的支撑，避免阀门承受过量管道应力。

5. 系统压力测试：系统试压前，建议将阀门处于半开位置。进行强度试验和密封试验时，压力与持续时间应符合 ASME B16.34 等相关标准要求。试压后检查所有连接部位。

使用操作

1. 启闭操作：通过手柄、齿轮装置或执行器进行 90 度旋转操作。操作应平稳，当达到全开或全关位置（通常有机械限位）时即停止，严禁使用加长杠杆强行超扭矩操作。

2. 状态确认：观察手柄位置（与管线平行时为开，垂直时为关）或执行器的开度指示器，清晰判断阀门开关状态。对于带锁定机构的阀门，操作后可按需锁定。

3. 常规运行：本阀门设计用于全开或全关的截断工况。不建议长期用于节流调节，以免介质高速冲刷损伤软密封阀座。

4. 带压操作注意事项：在系统带压状态下操作时，应缓慢进行并注意观察有无异常阻力或泄漏。若操作异常困难，应停止操作并排查原因。

维护保养

1. 定期检查：定期检查阀门外部状况，重点包括法兰连接处有无泄漏、阀杆填料处渗漏情况、紧固件是否松动以及阀门表面防腐层是否完好。

2. 阀杆密封调整：若阀杆填料处出现轻微渗漏，可在系统泄压后，使用扳手均匀、适度地拧紧填料压盖螺母。若调整无效，则应安排更换填料。

3. 内漏处理：若阀门出现关闭不严，首先可尝试将阀门在全开和全关位置间循环操作数次，利用介质冲刷可能卡在密封面上的杂质。若问题依旧，则需将阀门从管线拆卸，检查并清洗或更换阀座、球体密封面。对于上装式结构阀门，可能支持在线维护。

4. 长期停用保管：计划长期停用时，应将阀门置于全开或全关位置，排空阀内积液。对阀门通道进行密封保护，防止异物进入。存放于干燥室内。

5. 拆卸与大修：进行任何内部检修前，必须确保管路系统已完全隔离、泄压、排空并冷却至环境温度。拆卸时应标记零件相对位置，使用专用工具，避免损伤精密密封表面。重新组装时，建议更换所有垫片、填料及阀座等密封件，并确保螺栓紧固扭矩符合标准。检修后需重新进行压力测试。

Q41F API Ball Valve Installation, Use, and Maintenance Manual

Installation Guide

1. Preparation before installation: Confirm that the valve nameplate parameters (pressure class, material, standard) meet the pipeline design requirements. Clean the valve cavity and pipeline flange sealing surface, check whether the gasket material (such as wrapped gasket, metal ring gasket) meets the working conditions and is intact.
2. Lifting and positioning: Use valve body lifting lugs for lifting to avoid direct force on the valve stem or actuator. Place the valve between the pipeline flanges to ensure that the flow direction of the medium is consistent with the arrow direction shown on the valve body (bidirectional sealed valves usually have no flow restriction).
3. Flange connection and fastening: Use bolts and nuts that comply with ASME standards. Place the gasket in the center and tighten the bolts evenly in diagonal order step by step. The final torque should comply with the corresponding standard specifications to ensure that the flange surface is parallel and compressed, preventing leakage or valve body deformation caused by uneven stress.
4. Operating space and support: Adequate operating and maintenance space should be reserved for handwheels, gearboxes, or actuators during installation. For large-diameter or heavy-duty valves, appropriate support should be provided on the downstream side of the pipeline to avoid excessive pipeline stress on the valve.
5. System pressure test: Before the system pressure test, it is recommended to place the valve in the half open position. When conducting strength and sealing tests, the pressure and duration should comply with relevant standards such as ASME B16.34. Check all connection parts after pressure testing.

Usage and Operation

1. Opening and closing operation: Rotate 90 degrees through a handle, gear device, or actuator. The operation should be smooth, and it should stop when it reaches the fully open or fully closed position (usually with mechanical limit). It is strictly prohibited to use an extended lever to forcefully exceed the torque operation.

2. Status confirmation: Observe the position of the handle (open when parallel to the pipeline, closed when perpendicular) or the opening indicator of the actuator to clearly determine the valve switch status. For valves with locking mechanisms, they can be locked as needed after operation.

3. Normal operation: This valve is designed for cutoff conditions of fully open or fully closed. It is not recommended to use it for long-term throttling regulation to avoid damage to the soft seal valve seat caused by high-speed flushing of the medium.

4. Precautions for pressurized operation: When operating the system under pressurized conditions, it should be done slowly and carefully observed for any abnormal resistance or leakage. If the operation is exceptionally difficult, stop the operation and investigate the cause.

maintenance

1. Regular inspection: Regularly inspect the external condition of the valve, focusing on whether there is leakage at the flange connection, leakage at the valve stem packing, whether the fasteners are loose, and whether the anti-corrosion coating on the valve surface is intact.

2. Valve stem sealing adjustment: If there is slight leakage at the valve stem packing, after the system is depressurized, use a wrench to evenly and moderately tighten the packing gland nut. If the adjustment is ineffective, replacement of the packing should be arranged.

3. Internal leakage treatment: If the valve is not tightly closed, first try cycling the valve between the fully open and fully closed positions several times, using the medium to flush out impurities that may be stuck on the sealing surface. If the problem persists, the valve needs to be disassembled from the pipeline, inspected and cleaned, or the valve seat and ball sealing surface replaced. For upper structure valves, online maintenance may be supported.

4. Long term shutdown storage: When planning to shut down for a long time, the valve should be placed in the fully open or fully closed position to drain the accumulated fluid in the valve. Seal and protect the valve channel to prevent foreign objects from entering. Store in a dry room.

5. Disassembly and overhaul: Before conducting any internal maintenance, it is necessary to ensure that the piping system has been completely isolated, depressurized, emptied, and cooled to ambient temperature. When disassembling, the relative position of the parts should be marked and special tools should be used to avoid damaging the precision sealing surface. When reassembling, it is recommended to replace all gaskets, packing, valve seats, and other sealing components, and ensure that the bolt tightening torque meets the standards. After maintenance, a pressure test needs to be conducted again.

非常感谢您的阅读！

Thank you very much for reading!

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