

Q41F 一体式低温球阀

Q41F Integral Cryogenic Ball Valve

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

Q41F 一体式低温球阀

型号: Q41F	规格: DN15-DN200
公称压力: PN16, PN25, PN40	适用介质: 液态氮、液化天然气
适用温度: -196℃ ~ -29℃	阀体材质: 低温钢、不锈钢
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 BS 6364/ JB/T 7749	

Q41F Integral Cryogenic Ball Valve

Model: Q41F	Specifications: DN15-DN200
Nominal Pressure: PN16, PN25, PN40	Applicable Media: Liquid helium、LNG
Applicable Temperature: -196℃ ~ -29℃	Body Material: Low-temperature steel, stainless steel
End Connection : flange	Operation: Manual, pneumatic, electric, gear
Other Parameters: Manufacturing standard according to BS 6364/ JB/T 7749.	

Q41F 一体式低温球阀概述

Q41F 一体式低温球阀专用于-46℃及以下的低温介质工况，如液化天然气(LNG)、液氧、液氮等。采用整体式阀体结构与加长阀盖设计，确保密封可靠性并防止结霜。阀座选用增强聚四氟乙烯(PTPL)或金属材料，配合精密研磨球体，实现双向密封与低泄漏率。适用于石油化工、空分及冷冻储运等领域，在深冷环境中保持稳定操作与长久使用寿命。

the Q41F Integral Cryogenic Ball Valve Overview

The Q41F integral Cryogenic ball valve is specifically designed for Cryogenic media conditions at -46°C and below, such as liquefied natural gas (LNG), liquid oxygen, and liquid nitrogen. It features an integral valve body structure and an extended valve cover design to ensure sealing reliability and prevent frosting. The valve seat is made of reinforced polytetrafluoroethylene (PTFE) or metal materials, combined with a precision-ground ball, to achieve bidirectional sealing and low leakage rates. Suitable for applications in petrochemical, air separation, and cryogenic storage and transportation fields, it maintains stable operation and a long service life in deep cold environments.



Q41F 一体式低温球阀产品图
Q41F Integral Cryogenic Ball Valve Product Image

Q41F 一体式低温球阀特点

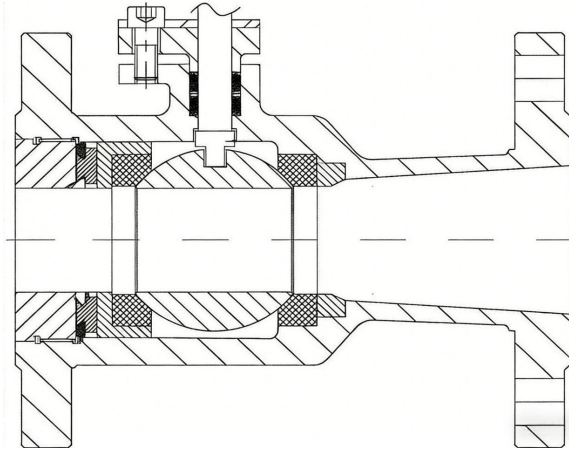
1. 一体式阀体结构 - 整体锻造成型，杜绝外漏隐患，提高承压强度与结构完整性。
2. 深冷处理工艺 - 关键零件经超低温深冷处理，避免材料冷脆，保证低温下的尺寸稳定与性能。
3. 防结霜长颈阀盖 - 加长阀颈有效隔离低温介质，防止填料结冰，确保阀杆操作灵活。
4. 双向密封设计 - 弹簧加载阀座与高精度球体配合，实现介质双向切断，适应压力波动工况。
5. 防火与防静电结构 - 符合防火安全标准，内置防静电装置，避免火花风险。
6. 轻便低扭矩操作 - 流道优化与低摩擦设计，启闭轻便，可配手动、气动或电动执行机构。

Q41F Integral Cryogenic Ball Valve Features

1. Integral Valve Body Structure – Forged as a single piece, eliminating external leakage risks and enhancing pressure resistance and structural integrity.
2. Cryogenic Treatment Process – Key components undergo ultra-Cryogenic deep cryogenic treatment to prevent material cold brittleness, ensuring dimensional stability and performance in Cryogenic conditions.
3. Anti-Frosting Extended Neck Design – The extended valve neck effectively isolates Cryogenic media, prevents packing from freezing, and ensures smooth stem operation.
4. Bidirectional Sealing Design – A spring-loaded valve seat paired with a high-precision ball achieves bidirectional media shutoff and adapts to pressure fluctuation conditions.
5. Fire-Safe and Anti-Static Structure – Complies with fire safety standards and features a built-in

anti-static device to prevent sparking risks.

6. Lightweight Low-Torque Operation – Optimized flow path and low-friction design enable effortless opening and closing, compatible with manual, pneumatic, or electric actuators.



Q41F 一体式低温球阀结构图

Q41F Integral Cryogenic 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	不锈钢 stainless steel
2	球体 ball	不锈钢 stainless steel
3	密封垫 seal gasket	PTFE
4	填料 packing	PTFE+O 型圈 PTFE + O ring
5	阀杆 Stem	不锈钢 stainless steel

性能规范表 Performance Specification

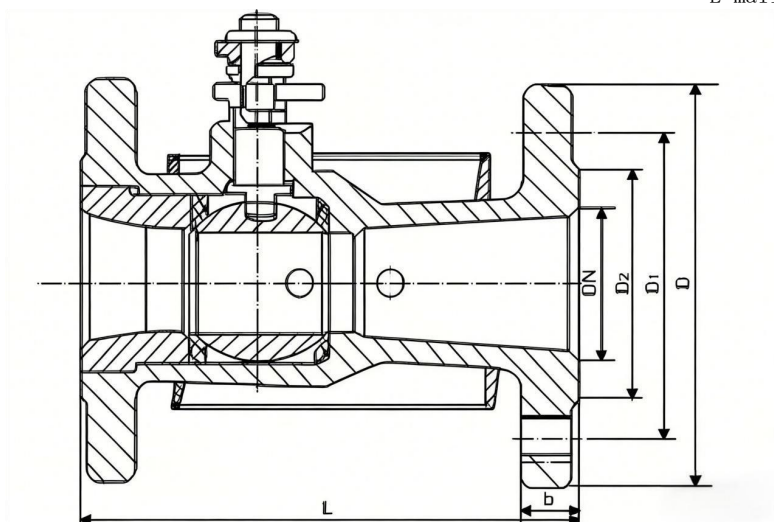
公称压力 Nominal Pressure	1.6/2.5/4	Mpa
强度试验压力 Shell Test	2.4/3.75/6	
密封试验压力 Seal Test	1.76/2.75/4.4	
适用温度 Suitable Temp.	-196~-29	℃

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 一体式低温球阀外形图

Q41F Integral Cryogenic Ball Valve View Drawing

Q41F 一体式低温球阀外形尺寸表

Q41F Integral Cryogenic Ball Valve Dimensions Table

型号	公称通径 DN(mm)	尺寸(mm)							
		L	D	D1	D2	b-f	z-Φd	H	D
Q41-16	15	130	95	65	45	14-2	4-14	105	150
	20	150	105	75	55	16-2	4-14	110	150
	25	160	115	85	65	16-2	4-14	120	160
	32	180	135	100	78	18-2	4-18	140	180
	40	200	145	110	85	18-3	4-18	155	250
	50	230	160	125	100	20-3	4-18	175	300
	65	290	180	145	120	20-3	4-18	195	300
	80	310	195	160	135	22-3	8-18	225	320
	100	350	215	180	155	24-3	8-18	250	320
	125	400	245	210	185	26-3	8-18	270	360
	150	480	280	240	210	28-3	8-23	290	360
	200	600	335	295	265	30-3	12-23	350	450
	250	730	405	355	320	30-3	12-25	405	450
Q41-25C	15	130	95	65	45	16-2	4-14	105	150
	20	150	105	75	55	16-2	4-14	110	150
	25	160	115	85	65	16-2	4-14	120	160
	32	180	135	100	78	18-2	4-18	140	180
	40	200	145	110	85	18-3	4-18	155	250
	50	230	160	125	100	20-3	4-18	175	300
	65	290	180	145	125	22-3	8-18	195	300
	80	310	195	160	135	22-3	8-18	225	320
	100	350	230	190	160	24-3	8-23	250	320
	125	400	270	220	188	28-3	8-25	270	360

	150	480	300	250	218	30-3	8-25	290	360
	200	600	360	310	278	34-3	12-25	350	450

型号	公称通径	尺寸(mm)							
		L	D	D1	D2	D6	b-f	z-φd	H
Q41-40C	15	130	95	65	45	40	16-2	4-14	105
	20	150	105	75	55	51	16-2	4-14	110
	25	160	115	85	65	58	16-2	4-14	120
	32	180	135	100	78	66	18-2	4-18	140
	40	200	145	110	85	76	20-3	4-18	155
	50	230	160	125	100	88	20-3	4-18	175
	65	290	180	145	120	110	22-3	8-18	195
	80	310	195	160	135	121	22-3	8-18	225
	100	350	230	190	160	150	24-3	8-23	250
	125	400	270	220	188	176	28-3	8-25	270
	150	480	300	250	218	204	30-3	8-25	290
	200	600	375	320	282	260	38-3	12-30	350

Q41F 一体式低温球阀安装、使用与维护说明

安装说明:

1. 安装前需彻底清洁管道与阀门内腔，去除杂质并确保干燥，避免低温状态下水汽结冰。
2. 核对阀门流向标记与管道介质流向一致，建议采用立式或水平安装，阀杆朝上。
3. 阀门两端管道应对中无应力，法兰连接需均匀对称拧紧螺栓，防止因受力不均导致泄漏。
4. 焊接连接时，需对阀体采取保护措施，避免内部密封件受到焊接高温损伤。
5. 安装后应进行完整的泄漏测试与开关操作测试，确认无异常后方可投入系统使用。

使用说明:

1. 操作前需确认阀门及管道介质状态，在阀门全开或全关位置工作，严禁在调节流量工况下长期使用。
2. 手动操作时应平稳施力，如遇异常卡阻应立即停止，排查原因，不可强行开关。
3. 在低温系统首次通入介质时，应缓慢预冷阀门，避免温度骤降引起的热应力冲击。
4. 若配备执行机构，需定期检查执行器信号与阀门实际开度的一致性，确保联锁控制准确。
5. 阀门长期处于关闭状态时，建议定期进行启闭操作，以保持阀座与球体的活动性能。

维护说明:

1. 定期检查阀杆填料处有无泄漏，必要时可通过填料压盖进行微量调整，但不可过度压紧。

2. 在停机或检修期间，需对阀门进行全面检查，重点检查密封面磨损情况与阀座弹簧性能。
3. 拆卸维护时，需先使阀门恢复至常温，彻底泄压并排空内部介质后方可进行作业。
4. 更换的密封件、填料必须为原厂指定材质规格，装配前所有零件需清洁并干燥处理。
5. 维护完成后应重新进行压力试验与密封测试，合格后方可重新投入系统运行。

Installation, Operation, and Maintenance Instructions for Q41F Integral Cryogenic Ball Valve

Installation Instructions:

1. Before installation, thoroughly clean the pipeline and the internal cavity of the valve to remove impurities and ensure dryness, preventing moisture from freezing under Cryogenic conditions.
2. Verify that the flow direction marked on the valve aligns with the flow direction of the medium in the pipeline. Vertical or horizontal installation with the stem facing upward is recommended.
3. Ensure that the pipeline ends on both sides of the valve are aligned and stress-free. For flange connections, tighten the bolts evenly and symmetrically to prevent leaks due to uneven force distribution.
4. When welding connections are used, protective measures must be taken for the valve body to avoid damage to internal sealing components from welding heat.
5. After installation, perform a complete leak test and open/close operation test. Confirm that no abnormalities exist before putting the valve into system use.

Operation Instructions:

1. Before operation, confirm the status of the valve and the medium in the pipeline. Operate the valve only in fully open or fully closed positions. Long-term use under flow regulation conditions is strictly prohibited.
2. During manual operation, apply force smoothly. If abnormal jamming occurs, stop immediately, investigate the cause, and avoid forcing the valve open or closed.
3. When introducing medium into a Cryogenic system for the first time, pre-cool the valve slowly to avoid thermal stress shock caused by sudden temperature drops.
4. If the valve is equipped with an actuator, periodically check the consistency between the actuator signal and the actual valve opening to ensure accurate interlock control.
5. If the valve remains in a closed position for an extended period, regular opening and closing operations are recommended to maintain the functional performance of the seat and ball.

Maintenance Instructions:

1. Regularly inspect the stem packing for leaks. If necessary, make minor adjustments using the gland, but avoid over-tightening.
2. During shutdown or overhaul periods, conduct a comprehensive inspection of the valve, focusing on the wear of sealing surfaces and the performance of seat springs.
3. Before disassembling for maintenance, allow the valve to return to room temperature, fully depressurize it, and drain any internal medium before proceeding with work.
4. Replacement seals and packing must be of the material and specifications designated by the original manufacturer. All parts must be cleaned and dried before assembly.
5. After maintenance is completed, re-perform pressure testing and sealing tests. The valve may be returned to system operation only after passing these tests.

非常感谢您的阅读！

Thank you very much for reading!

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