

Q21Y 气动高压球阀

Q21Y Pneumatic High-Pressure Ball Valve

使 用 说 明 书



开维喜阀门集团有限公司
Kaiweixi Valve Group Co., Ltd.

Q21Y 气动高压球阀

型号: Q21Y
公称压力: PN16, PN25, PN40, PN64
适用温度: ≤425℃
连接方式: 焊接
其他参数: 制造标准按 GB/T12237

规格: DN10-DN25
适用介质: 水、气、油
阀体材质: 碳钢、不锈钢、锻不锈钢
驱动方式: 气动

Q21Y Pneumatic High-Pressure Ball Valve

Model: Q21Y	Specifications: DN10-DN25
Nominal Pressure: PN16, PN25, PN40, PN64	Applicable Media: Water, gas, oil
Applicable Temperature: ≤425℃	Body Material: stainless steel, carbon steel, forged stainless steel
End Connection: welded	Operation: pneumatic
Other Parameters: Manufacturing standard according to GB/T12237.	

Q21Y 气动高压球阀概述

Q21Y 气动高压球阀是一种采用气动执行机构驱动的高压专用球阀，设计符合高压工况要求。阀体采用锻钢或不锈钢材质，内部采用金属硬密封或增强密封结构，通过气动执行器驱动阀杆带动球体实现 90 度快速启闭。该阀门专为高压气体、液体及腐蚀性介质设计，工作压力可达 **PN160** 或更高等级，适用于石油化工、天然气、高压加注及工业自动化系统，是高压管路中实现快速可靠截断与自动化控制的关键设备。

Q21Y Pneumatic High-Pressure Ball Valve Overview

The Q21Y Pneumatic High-Pressure Ball Valve is a high-pressure specialized ball valve driven by a pneumatic actuator, designed to meet the requirements of high-pressure working conditions. The valve body is made of forged steel or stainless steel, and features a metal hard-seal or reinforced sealing structure internally. The pneumatic actuator drives the stem to rotate the ball 90 degrees for rapid opening and closing. This valve is specifically designed for high-pressure gases, liquids, and corrosive media, with a working pressure of up to PN160 or higher. It is suitable for applications in petrochemicals, natural gas, high-pressure filling systems, and industrial automation, serving as key equipment for achieving rapid, reliable shut-off and automated control in high-pressure pipelines.



Q21Y 气动高压球阀产品图

Q21Y Pneumatic High-Pressure Ball Valve Product Image

Q21Y 气动高压球阀特点

1. 高压密封可靠：采用金属硬密封或增强复合密封结构，耐高压、耐磨损，确保在高压差工况下的可靠密封与长寿命。
2. 气动驱动快速响应：配备单作用或双作用气动执行器，启闭迅速（通常仅需数秒），响应灵敏，适合自动化控制与紧急切断。
3. 结构紧凑耐压强：阀体采用锻钢或高强度不锈钢，结构紧凑且承压能力高，适用于高压、高频次操作工况。
4. 安全防护设计完善：通常具备防火防静电结构，阀杆防吹出设计，部分型号支持气源故障时自动复位（单作用弹簧复位）。
5. 智能控制维护便捷：可配置电磁阀、限位开关等附件，实现远程控制与状态反馈。模块化设计便于维护和密封件更换。

Q21Y Pneumatic High-Pressure Ball Valve Features

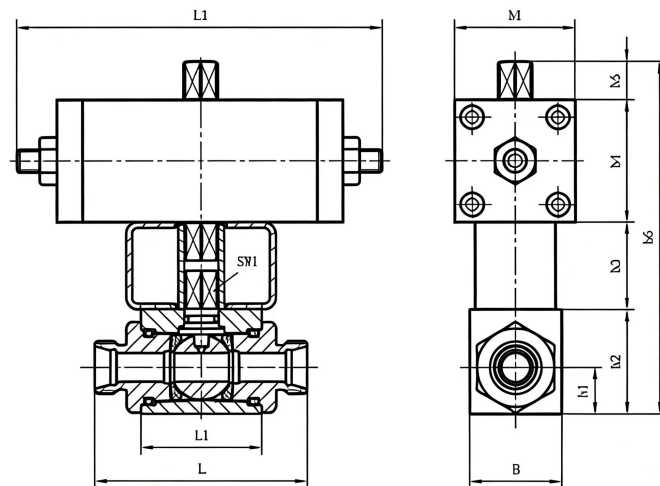
1. Reliable High-Pressure Sealing: Utilizes metal hard-seal or reinforced composite sealing structures, offering high-pressure resistance and wear resistance, ensuring reliable sealing and long service life under high-pressure differential conditions.
2. Rapid Response of Pneumatic Actuation: Equipped with single-acting or double-acting pneumatic actuators, enabling fast opening and closing (typically within seconds) with sensitive response, suitable

for automated control and emergency shut-off.

3. Compact Structure and High Pressure Resistance: The valve body is made of forged steel or high-strength stainless steel, featuring a compact design and high-pressure-bearing capacity, ideal for high-pressure and high-frequency operation conditions.

4. Comprehensive Safety Protection Design: Typically includes fireproof and anti-static structures, with a stem anti-blowout design. Some models support automatic reset in case of air source failure (single-acting spring return).

5. Intelligent Control and Easy Maintenance: Can be configured with accessories such as solenoid valves and limit switches to achieve remote control and status feedback. The modular design facilitates maintenance and seal replacement.



Q21Y 气动高压球阀结构图

Q21Y Pneumatic High-Pressure 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
5	阀杆 Stem	不锈钢 stainless steel

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	1.8-7.04	

型号 Model	DN	PN (bar)	L1	L2	B	b1	h1	h2	h4	h5	h6	SW1
Q21Y	32	316	84	290	75	108	37.5	84	60	108	282	14
Q21Y	40	315	91	290	85	108	42.5	95	60	108	293	14
Q21Y	50	315	100	290	104	108	52	112.5	60	108	310.5	14

Q21Y 气动高压球阀安装、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、连接方式（螺纹或焊接）及气动执行器规格是否符合高压系统设计的要求。清洁阀门内腔及管道端口，确保无杂质。
2. 管道连接：若为螺纹连接，应在管道螺纹上缠绕密封带并均匀紧固；若为焊接连接，需由合格焊工按高压管道焊接规范施焊，焊接时阀门需处于全开位置并采取冷却措施。
3. 气路连接：连接洁净、稳定的气源管路至执行器进气口，建议在气路中安装三联件（过滤器、减压阀、油雾器）。确保气路密封可靠，无泄漏。
4. 电气附件安装：根据需要安装电磁阀、限位开关等附件，并按接线图正确接线。高压环境需确保电气接口满足防爆防护要求。
5. 系统测试：安装后先进行管道压力试验，试验压力需符合设计要求。再通气测试气动执行器动作，验证阀门启闭是否顺畅、限位是否准确。

使用操作

1. 气动操作：通过电磁阀控制气路实现阀门自动启闭。操作前需检查气源压力是否稳定，确保在执行器工作压力范围内。
2. 手动应急操作：若气源故障，可切换至执行器上的手动操作模式（通常通过操作手轮或拨动离合器），操作后需恢复自动状态。
3. 状态监控：通过限位开关信号或位置指示器实时确认阀门开关状态。高压运行时需注意阀门有无异常振动或泄漏。
4. 注意事项：本阀门适用于高压截断，不建议用于节流调节。带压操作时如感觉动作异常，应立即切换至手动模式并排查气路或阀门内部问题。

维护保养

1. 定期检查：定期检查管道连接处有无泄漏，阀体表面有无腐蚀或损伤。检查气路三联件工作状态，及时排水、补油。
2. 气动系统维护：定期清洁或更换空气过滤器滤芯，检查减压阀设定压力，确保油雾器油量充足。检查电磁阀及气管接头密封性。

3. 密封系统维护: 若阀门出现内漏, 可能为高压下密封面磨损。需在系统泄压后拆卸检查, 更换受损的阀座或球体密封件。
4. 阀杆密封维护: 若阀杆处出现外漏, 可尝试均匀适度拧紧填料压盖。高压工况下若泄漏持续, 需更换高压专用填料。
5. 长期停用: 停用前应排空管道内高压介质, 关闭气源并排空气路。对阀杆及外露金属表面做防锈处理。重新启用前需全面测试气动功能与密封性能。

Installation, Operation, and Maintenance Instructions for Q21Y Pneumatic High-Pressure Ball Valve Installation Guide:

1. Pre-Installation Preparation: Verify that the valve model, pressure rating, connection method (threaded or welded), and pneumatic actuator specifications meet the design requirements of the high-pressure system. Clean the internal cavity of the valve and the pipeline ends to ensure no impurities are present.
2. Pipeline Connection: For threaded connections, wrap sealing tape on the pipeline threads and tighten evenly. For welded connections, qualified welders must perform the welding in accordance with high-pressure pipeline welding standards. During welding, the valve must be fully open, and cooling measures must be implemented.
3. Air Circuit Connection: Connect a clean and stable air supply line to the actuator's air inlet. It is recommended to install an air preparation unit (filter, regulator, lubricator) in the air circuit. Ensure the air circuit is sealed reliably and leak-free.
4. Electrical Accessory Installation: Install accessories such as solenoid valves and limit switches as needed, and connect the wiring correctly according to the wiring diagram. In high-pressure environments, ensure electrical interfaces meet explosion-proof and protection requirements.
5. System Testing: After installation, conduct a pipeline pressure test first, ensuring the test pressure meets design specifications. Then, perform an air supply test to verify the actuator's operation, ensuring smooth valve opening/closing and accurate limit switch positioning.

Operation Instructions:

1. Pneumatic Operation: Use solenoid valves to control the air circuit for automatic valve opening and closing. Before operation, check that the air supply pressure is stable and within the actuator's working pressure range.
2. Manual Emergency Operation: In case of air supply failure, switch to the manual operation mode on the actuator (typically via a handwheel or clutch mechanism). After manual operation, restore the valve to automatic mode.
3. Status Monitoring: Confirm the valve's open/close status in real-time using limit switch signals or position indicators. During high-pressure operation, monitor for abnormal vibrations or leaks.
4. Precautions: This valve is suitable for high-pressure shut-off and is not recommended for throttling. If abnormal operation is detected during pressurized use, immediately switch to manual mode and troubleshoot the air circuit or internal valve issues.

Maintenance Instructions:

1. Regular Inspections: Periodically check pipeline connections for leaks and inspect the valve body surface for corrosion or damage. Monitor the condition of the air preparation unit and promptly drain water or replenish oil as needed.
2. Pneumatic System Maintenance: Regularly clean or replace the air filter element, check the pressure setting of the regulator, and ensure the lubricator has sufficient oil. Inspect the sealing of solenoid valves

and air tube connections.

3. Sealing System Maintenance: If internal leakage occurs, it may be due to wear on the sealing surfaces under high pressure. After system depressurization, disassemble the valve for inspection and replace damaged seats or ball seals.

4. Stem Seal Maintenance: If external leakage occurs at the stem, try evenly and moderately tightening the gland. If leakage persists under high-pressure conditions, replace with high-pressure-specific packing.

5. Long-Term Storage: Before decommissioning, drain high-pressure media from the pipeline, shut off the air supply, and purge the air circuit. Apply anti-rust treatment to the stem and exposed metal surfaces. Before recommissioning, thoroughly test the pneumatic functionality and sealing performance.

非常感谢您的阅读！

Thank you very much for reading!

开维喜阀门集团有限公司

地址：浙江省温州市永嘉县瓯北街道三桥工业区林下路 1 号

电话：+86 18967796135

网址： <https://www.kaiweixi.com>

E-mail: yannie@kaiweixi.com

Kaiweixi Valve Group Co., Ltd

Address: No.1 Linxia Road, Sanqiao Industrial Zone, Oubei Street, Yongjia County, Wenzhou City, Zhejiang Province

Phone: +86 18967796135

URL: <https://www.kaiweixi.com>

E-mail: yannie@kaiweixi.com