

D81X 手动沟槽软密封蝶阀系列

D81X Manual Grooved Soft-sealing Butterfly Valve Series

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书

Instruction Manual



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

D81X 手动沟槽软密封蝶阀

D81X Manual Grooved Soft-sealing Butterfly Valve

型号: D81X 规格: DN50 ~ DN300
公称压力: PN10-PN16 适用介质: 水、消防泡沫混合液
适用温度: $\leq 80^{\circ}\text{C}$ 阀体材质: 铸铁、球铁、不锈钢
连接方式: 卡箍 驱动方式: 手动
Model: D81X
Size: DN50 ~ DN300
Nominal Pressure: PN10-PN16
Applicable Media: Water, firefighting foam concentrate mixture
Applicable Temperature: $\leq 80^{\circ}\text{C}$
Body Material: Cast iron, ductile iron, stainless steel
Connection Type: Clamp
Drive Mode: Manual

概述

D81X 手动沟槽软密封蝶阀是一种通过圆盘形蝶板绕其固定轴（阀杆）旋转来开启、关闭和调节流体通道的阀门。其阀杆轴线位于蝶板密封面中心与管道通道中心线相交的“中线”位置，蝶板两侧对称。阀门采用沟槽连接方式，即阀体两端无法兰，而是在阀体外圆上车有标准沟槽，通过配套的卡箍（俗称“哈夫夹”）将阀门与沟槽式管道进行刚性锁紧连接，无需焊接或法兰螺栓，安装快捷且对中方便。蝶板密封圈通常采用 EPDM（三元乙丙橡胶）等弹性材料，直接硫化或镶嵌在蝶板或阀体上，启闭时依靠蝶板的旋转挤压变形实现零泄漏密封。该阀门通过手动蜗轮或手柄驱动阀杆旋转 90° 或更小角度，即可快速控制水、消防泡沫混合液等非腐蚀性流体的通断与流量，广泛应用于建筑消防、给排水、空调循环水及工业冷却水等管路系统。

Overview

The D81X manual grooved soft-sealing butterfly valve is a valve that opens, closes, and regulates fluid flow by rotating a disc-shaped butterfly plate around its fixed axis (valve stem). Its valve stem axis is located at the centerline position where the sealing surface center of the butterfly plate intersects with the centerline of the pipeline channel, with the butterfly plate being symmetrical on both sides. The valve adopts a grooved connection method, meaning there are no flanges at both ends of the valve body. Instead, standard grooves are machined on the outer circumference of the valve body. The valve is rigidly locked to the grooved pipeline using matching clamps, requiring no welding or flange bolts, offering fast installation and easy alignment. The butterfly plate sealing ring is typically made of elastic materials such as EPDM, which is directly vulcanized or embedded onto the butterfly plate or valve body. During opening and closing, the rotation of the butterfly plate compresses and deforms the sealing ring to achieve zero-leakage sealing. The valve is driven by a manual worm gear or handle to rotate the valve stem by 90° or less, allowing rapid control of the flow of non-corrosive fluids such as water and firefighting foam concentrate. It is widely used in pipeline systems such as building fire protection, water supply and drainage, air conditioning circulating water, and industrial cooling water.



D81X 手动沟槽软密封蝶阀产品图

D81X Manual Grooved Soft-sealing Butterfly Valve Product Image

特点

1. D81X 手动沟槽软密封蝶阀安装维护便捷 D81X 手动沟槽软密封蝶阀：采用沟槽卡箍连接方式，无需焊接或法兰螺栓，仅需机械组装即可完成管路连接，安装速度比传统法兰连接提高数倍。卡箍连接所占空间约为法兰的 70%，螺栓数量少，特别适用于空间狭窄或禁火工况的安装现场。整体结构简单，零部件少，拆卸与更换容易，维护成本经济。
2. D81X 手动沟槽软密封蝶阀结构紧凑轻巧 D81X 手动沟槽软密封蝶阀：阀体采用球墨铸铁（QT450-10）制造，具有强度高、重量轻的特点。对夹式沟槽结构设计使得阀门体积小、结构长度短，相比同口径法兰蝶阀重量大幅减轻，适合做成大口径阀门，便于运输和安装。
3. D81X 手动沟槽软密封蝶阀启闭迅速轻便 D81X 手动沟槽软密封蝶阀：蝶板旋转 90° 即可完成全开或全关，操作简单快捷。采用中线密封结构设计，操作扭矩小，启闭轻巧省力，手柄带有开关定位自锁功能，可实现全开-半开-关闭等状态的锁定，避免误操作。
4. D81X 手动沟槽软密封蝶阀密封性能可靠 D81X 手动沟槽软密封蝶阀：采用高弹性 EPDM 橡胶阀座，含胶率高达 50%，拉伸强度 16.1MPa。独特的 C 型橡胶密封圈设计实现三重密封效果，经仿真启闭实验 1 万次以上仍保持无泄漏。阀门采用双向密封设计，安装时无需考虑介质流动方向，使用灵活。
5. D81X 手动沟槽软密封蝶阀流体阻力小 D81X 手动沟槽软密封蝶阀：启闭件蝶板设计成直线型，全开时蝶板与流体方向一致，介质流道近似直通管。阀体通径与管道内径基本等径，蝶板对流体的阻挡很小，流量大而压力损失小。
6. D81X 手动沟槽软密封蝶阀防腐耐用性好 D81X 手动沟槽软密封蝶阀：阀体内腔及外表面采用无毒环氧树脂涂装，有效防止各种腐蚀性介质的腐蚀与冲蚀，经久耐用。阀轴采用防吹出设计，上端设有卡簧槽，防止阀轴使用过程中吹出，提高安全性。阀轴密封采用无油轴承与填料结合结构，实现自密封功能。
7. D81X 手动沟槽软密封蝶阀应用范围广泛 D81X 手动沟槽软密封蝶阀：阀体可采用球墨铸铁、不锈钢等多种材质，密封圈可选 EPDM、NBR、硅橡胶等不同材质。公称压力涵盖 PN10、PN16 等级别，适用介质包括水、消防泡沫混合液、油品、空气等，广泛应用于给排水、消防、空调、燃气、石油、化工、水处理、市政、造船等管道工程领域。

Features

1. D81X Manual Grooved Soft-Sealing Butterfly Valve Convenient Installation and Maintenance
The D81X manual grooved soft-sealing butterfly valve adopts grooved clamp connection, requiring no welding or flange bolts. Pipeline connection can be completed by mechanical assembly only, with installation speed several times higher than traditional flange connection. The clamp

connection occupies about 70% of the space required by flanges and uses fewer bolts, making it especially suitable for installation sites with limited space or where open flames are prohibited. The overall structure is simple with few components, making disassembly and replacement easy, and maintenance cost economical.

2. D81X Manual Grooved Soft-Sealing Butterfly Valve Compact and Lightweight Structure

The D81X manual grooved soft-sealing butterfly valve body is made of ductile iron (QT450-10), featuring high strength and light weight. The wafer-type grooved structure design gives the valve small volume and short structural length. Compared with flange butterfly valves of the same diameter, the weight is significantly reduced, making it suitable for large-diameter valves and convenient for transportation and installation.

3. D81X Manual Grooved Soft-Sealing Butterfly Valve Quick and Light Operation

The D81X manual grooved soft-sealing butterfly valve completes full opening or full closing by rotating the butterfly plate 90 degrees, with simple and fast operation. The centerline sealing structure design provides low operating torque, making opening and closing light and effortless. The handle has a switch positioning self-locking function, enabling locking at full open, partial open, and closed positions to prevent misoperation.

4. D81X Manual Grooved Soft-Sealing Butterfly Valve Reliable Sealing Performance

The D81X manual grooved soft-sealing butterfly valve adopts a high elasticity EPDM rubber valve seat with a rubber content as high as 50% and tensile strength of 16.1MPa. The unique C-shaped rubber sealing ring design achieves triple sealing effect, maintaining zero leakage after more than 10,000 simulated opening and closing cycle tests. The valve adopts a bidirectional sealing design, eliminating the need to consider medium flow direction during installation and offering flexible use.

5. D81X Manual Grooved Soft-Sealing Butterfly Valve Low Fluid Resistance

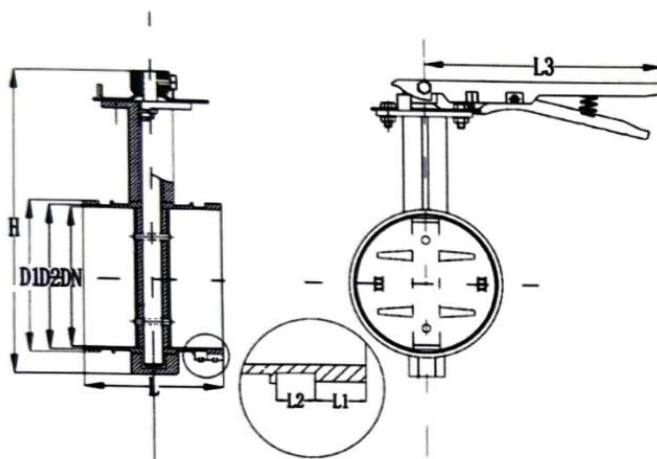
For the D81X manual grooved soft-sealing butterfly valve, the opening and closing butterfly plate is designed in a streamlined shape. When fully open, the butterfly plate aligns with the fluid direction, and the medium flow path is approximately a straight pipe. The valve bore is essentially the same diameter as the pipeline inner diameter, and the butterfly plate creates minimal obstruction to fluid flow, resulting in large flow capacity and low pressure loss.

6. D81X Manual Grooved Soft-Sealing Butterfly Valve Excellent Corrosion Resistance and Durability

The inner cavity and outer surface of the D81X manual grooved soft-sealing butterfly valve body are coated with non-toxic epoxy coating, effectively preventing corrosion and erosion from various corrosive media, ensuring long service life. The valve shaft adopts a blow-out proof design with a snap ring groove at the upper end, preventing the valve shaft from blowing out during use and improving safety. The valve shaft seal adopts a combined structure of an oil-free bearing and packing, achieving a self-sealing function.

7. D81X Manual Grooved Soft-Sealing Butterfly Valve Wide Application Range

The D81X manual grooved soft-sealing butterfly valve body can be made of various materials such as ductile iron and stainless steel, and the sealing ring can be made of different materials including EPDM, NBR, and silicone rubber. Nominal pressure covers PN10, PN16 and other grades. Applicable media include water, firefighting foam concentrate, oil products, air, etc. It is widely used in pipeline engineering fields such as water supply and drainage, fire protection, air conditioning, gas, petroleum, chemical industry, water treatment, municipal engineering, and shipbuilding.



D81X 手动沟槽软密封蝶阀结构图

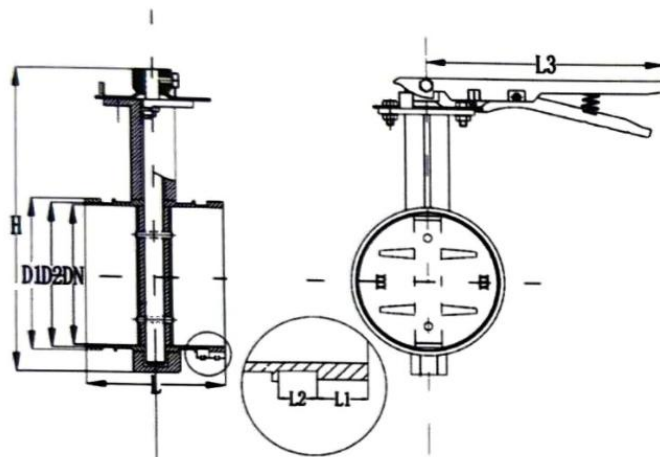
D81X Manual Grooved Soft-sealing Butterfly Valve Structure Drawing

零部件名称材料表 Parts Name and Materials Table

名称 Name	材质 Materials
阀体 Body	铸铁、球铁、不锈钢 Cast iron, ductile iron, stainless steel
蝶板 Disc	QT450+EPDM
阀轴 Valve stem	2Cr13

性能规范表 Performance Specification Table

性能规范表 Performance Specification Table		
公称压力 Nominal Pressure (PN)	1.0/1.6	MPa
强度试验压力 Strength Test Pressure	1.5/2.4	
密封试验压力 Seal Test Pressure	1.1/1.76	
适用温度 Suitable Temperature Range	≤80	℃



D81X 手动沟槽软密封蝶阀外形尺寸图

D81X Manual Grooved Soft-sealing Butterfly Valve Overall Dimension Drawing

D81X 手动沟槽软密封蝶阀外形尺寸表

D81X Manual Grooved Soft-sealing Butterfly Valve Overall Dimension Table

管道 公称 直径 DN	管道外径 Pipe outer diameter			管端至沟 槽边尺寸 Dimension from pipe end to groove edge	沟槽宽度 Groove width	沟径直径 C Groove diameter C		沟槽深 度 D Groove depth D	管壁最小 壁厚 T Minimum pipe wall thickness T
	实际尺 寸 Actual size	公差 Tolerance		A $\pm$ 0.76	B $\pm$ 0.76	实际尺 寸 Actual size	公差 Tolerance		
50	60.3	+0.61	-0.61	15.88	7.93	57.15	-0.38	1.58	3.6
65	73.0	+0.74	-0.74	15.88	7.93	69.09	-0.46	1.98	4.0
65	76.1	+0.76	-0.76	15.88	7.93	72.26	-0.46	1.98	4.0
80	88.9	+0.89	-0.79	15.88	7.93	84.94	-0.46	1.98	4.5
90	101.6	+1.02	-0.79	15.88	7.93	97.38	-0.51	2.11	5.0
100	108.0	+1.07	-0.79	15.88	9.53	103.73	-0.51	2.11	5.0
100	114.3	+1.14	-0.79	15.88	9.53	110.08	-0.51	2.11	5.0
125	133.0	+1.32	-0.79	15.88	9.53	129.13	-0.51	2.11	5.0
125	139.7	+1.40	-0.79	15.88	9.53	135.48	-0.51	2.11	5.0
125	141.3	+1.42	-0.79	15.88	9.53	137.03	-0.56	2.13	5.0
150	159.0	+1.60	-0.79	15.88	9.53	153.21	-0.56	2.16	5.4
150	165.1	+1.60	-0.79	15.88	9.53	160.90	-0.56	2.16	5.4
150	168.3	+1.60	-0.79	15.8B	9.53	163.96	-0.56	2.16	5.4
200	219.1	+1.60	-0.79	19.05	11.10	214.40	-0.64	2.34	5.4

D81X 手动沟槽蝶阀 安全、安装与维护须知

一、安全总则

- 使用范围：本产品适用于非腐蚀性的清水、污水、消防水及一般弱腐蚀性流体（具体以阀体衬胶材质为准）。严禁用于与橡胶密封圈及阀体材质发生剧烈化学反应的强酸、强碱或有机溶剂。
- 压力限制：使用时严禁超过阀门铭牌标注的公称压力（PN10/16/25）。水压试验时，阀门必须处于全开状态，切勿利用阀门作为管道盲板进行单侧打压，以免损坏密封副。
- 安全操作：手动操作时严禁使用加长杠杆或大号扳手强行开关，以防扭断阀杆或压坏密封面。带传动装置（电动/气动）的阀门，在调试或维修时必须切断电源并释放气源。
- 介质防护：若介质中含有硬质颗粒或长纤维杂物，建议在阀门上游安装过滤器，防止杂质卡阻蝶板导致关闭不严或划伤密封面。

二、安装说明

- 安装前检查：核对阀门型号、口径、压力等级是否与设计一致。检查阀体及橡胶密封面有无划伤，清除管道内的焊渣、铁屑及油污。安装前必须手动将蝶板转动 2 至 3 次，确认无卡滞。安装就位时，建议将蝶板开启 4 度至 5 度（微开状态），以便于衬胶密封圈与管道法兰的吻合。
- 安装方向：常规工况下，D81X 蝶阀具备双向密封功能，安装时可不考虑介质流动方向。若阀门配套了偏心设计或单向伸缩器，则必须按照阀体箭头方向安装（通常箭头指向为关闭时的压力方向）。
- 管道对接（关键）：D81X 采用沟槽式（卡箍）连接，无需法兰焊接。安装时需使用专用的沟槽卡箍，确保管道端面与阀体沟槽定位线对齐。严禁通过强行拧紧卡箍螺栓来校正管道的直线度偏差。应先将卡箍套在阀体沟槽两端，确认橡胶密封垫位于沟槽中心后，再均匀对角拧紧螺栓。
- 驱动装置安装：若安装蜗轮箱或电动头，应确保阀杆与执行机构输出轴同心。手动操作阀门至全关位后，再安装执行机构并调整限位开关，防止过扭矩损坏阀体。

三、使用与操作说明

- 启闭操作：正常使用时，顺时针旋转手柄为关，逆时针为开。到达全开或全关位置后，需回转半圈，防止卡死并便于下次操作观察。首次使用时，建议在低压状态下缓慢启闭数次，以磨合橡胶密封面。
- 流量调节：蝶板在 0 度至 90 度内开启，流量特性近似线性，可用于调节流量。严禁长期处于 15 度以下的微小开度工作，否则高速介质流会严重冲蚀橡胶阀座，导致密封失效。
- 高温注意事项：若用于 80 摄氏度左右热水工况（需确认阀座耐温等级），在初次通入热介质后，需再次检查并拧紧卡箍螺栓，以补偿热膨胀差异。流体温度超过 120 摄氏度时，阀门本体需进行保温工程。

四、维护与保养

- 日常维护：建议每月进行 1 至 2 次全行程开关操作，防止因长期静止导致密封面粘连或因结垢卡死。保持阀杆清洁，定期清除阀体表面的油污和锈迹。若环境潮湿或腐蚀性较强，应在阀杆处涂抹防锈油脂或安装保护罩。
- 定期检修（每 6 至 12 个月）：检查阀体内壁衬胶有无气泡、磨损或脱落，检查蝶板有无腐蚀或缺损。关闭阀门观察下游是否有渗漏，若出现内漏，首先检查是否有异物卡在密封面；若为密封圈老化磨损，需更换密封圈。检查卡箍螺栓及阀杆压盖是否松动，如有松动需均匀拧紧。
- 长期存放：阀门应存放于干燥通风的室内，避免阳光直射和雨淋。存放时应保持微启状态（开启 4 度至 5

度或 10%至 15%开度），使橡胶密封面处于松弛状态，防止永久变形导致失效。两端必须使用保护盖封堵，以防灰尘进入。

五、 常见故障与排除

- 泄漏（外漏）：可能原因为阀杆 O 型圈磨损或压盖螺栓松动。排除方法为均匀拧紧填料压盖螺母；若仍泄漏，需更换阀杆密封圈。
- 泄漏（内漏）：可能原因为蝶板关闭不到位、橡胶阀座磨损刮伤或老化、蝶板与阀座间夹有杂物。排除方法为检查传动机构限位并重新调整至完全关闭位；清理杂物清洗阀门；必要时更换阀体衬胶或阀座。
- 启闭扭矩过大：可能原因为阀杆处缺润滑或锈蚀、内部结垢或异物卡阻、安装时卡箍压得过紧。排除方法为加注润滑油脂；拆解检查并清理内部水垢；松开卡箍螺栓重新对中安装。

六、 免责声明

本须知适用于常规 D81X 沟槽手柄蝶阀（铸铁或球铁阀体，橡胶密封，工作温度 0 摄氏度至 80 摄氏度）。对于特殊工况（如易燃易爆区、强腐蚀介质、高温蒸汽、氧气环境），必须严格遵循制造商的专项技术协议。若未按本须知操作导致阀门损坏或引发安全事故，制造商及经销商不承担相应责任。

D81X Manual Grooved Butterfly Valve Safety, Installation and Maintenance Instructions

I. General Safety Rules

- Scope of Use: This product is suitable for non-corrosive clean water, sewage, fire protection water and general weakly corrosive fluids (subject to the valve body lining material). It is strictly forbidden to use with strong acids, strong alkalis or organic solvents that may cause severe chemical reactions with the rubber sealing ring and valve body material.
- Pressure Limitation: Do not exceed the nominal pressure (PN10/16/25) marked on the valve nameplate during use. During hydrostatic testing, the valve must be in the fully open position. Do not use the valve as a pipeline blind flange for single-sided pressure testing, as this may damage the sealing pair.
- Safe Operation: Do not use extended levers or oversized wrenches to forcibly open or close the valve during manual operation, to avoid breaking the valve stem or crushing the sealing surface. For valves equipped with actuators (electric/pneumatic), the power supply must be disconnected and the air source released during commissioning or maintenance.
- Medium Protection: If the medium contains hard particles or long fibrous debris, it is recommended to install a strainer upstream of the valve to prevent impurities from jamming the butterfly plate, which could cause incomplete closure or scratch the sealing surface.

II. Installation Instructions

- Pre-installation Check: Verify that the valve model, bore diameter, and pressure rating are consistent with the design. Check the valve body and rubber sealing surface for scratches. Remove weld slag, iron filings and oil stains from the pipeline. Manually rotate the butterfly plate

2 to 3 times before installation to confirm there is no sticking. During positioning, it is recommended to open the butterfly plate 4 to 5 degrees (slightly open state) to facilitate the alignment of the lined sealing ring with the pipeline flange.

- Installation Direction: Under normal conditions, the D81X butterfly valve has bidirectional sealing function, so the medium flow direction does not need to be considered during installation. If the valve is equipped with an eccentric design or a one-way expansion joint, it must be installed according to the arrow direction on the valve body (the arrow usually points to the pressure direction when closed).

- Pipeline Connection (Critical): The D81X adopts a grooved (clamp) connection and does not require flange welding. Use a dedicated grooved clamp during installation, ensuring the pipeline end face aligns with the valve body groove positioning line. Do not forcibly tighten the clamp bolts to correct pipeline straightness deviations. First, fit the clamp over both ends of the valve body groove, confirm the rubber gasket is centered in the groove, then tighten the bolts evenly in a diagonal pattern.

- Actuator Installation: If installing a worm gear box or electric actuator, ensure the valve stem is concentric with the actuator output shaft. Manually operate the valve to the fully closed position before installing the actuator and adjusting the limit switches to prevent damaging the valve body due to over-torque.

III. Operation Instructions

- Opening and Closing Operation: During normal use, turn the handle clockwise to close and counterclockwise to open. After reaching the fully open or fully closed position, turn back half a turn to prevent seizing and to facilitate the next operation and observation. For first use, it is recommended to slowly open and close the valve several times under low pressure to break in the rubber sealing surface.

- Flow Regulation: The butterfly plate opens from 0 to 90 degrees, with flow characteristics approximating linear, making it suitable for flow regulation. It is strictly forbidden to operate for long periods at a small opening of less than 15 degrees, as high-velocity medium flow will severely erode the rubber valve seat, leading to seal failure.

- High Temperature Precautions: If used in hot water conditions around 80 degrees Celsius (confirm the valve seat temperature rating), re-check and retighten the clamp bolts after initially introducing the hot medium to compensate for thermal expansion differences. When the fluid temperature exceeds 120 degrees Celsius, the valve body must be insulated.

IV. Maintenance and Care

- Routine Maintenance: It is recommended to perform a full-stroke opening and closing operation once or twice per month to prevent sealing surface adhesion due to prolonged inactivity or seizing due to scale buildup. Keep the valve stem clean and regularly remove oil stains and rust from the valve body surface. If the environment is humid or highly corrosive, apply anti-rust grease to the valve stem or install a protective cover.

- Periodic Inspection (Every 6 to 12 months): Inspect the valve body inner wall lining for bubbles, wear or detachment. Check the butterfly plate for corrosion or damage. Close the valve and observe

downstream for leakage. If internal leakage occurs, first check for foreign matter stuck on the sealing surface. If the sealing ring is aged or worn, replace it. Check that clamp bolts and the valve stem gland are not loose; if loose, tighten evenly.

- Long-term Storage: Store the valve indoors in a dry, ventilated area, protected from direct sunlight and rain. Store in a slightly open state (opened 4 to 5 degrees or 10% to 15% opening) to keep the rubber sealing surface relaxed and prevent permanent deformation leading to failure. Both ends must be sealed with protective covers to prevent dust ingress.

V. Common Faults and Troubleshooting

- Leakage (External): Possible causes are wear of the valve stem O-ring or loose gland bolts. The solution is to evenly tighten the packing gland nut. If leakage persists, replace the valve stem seal ring.

- Leakage (Internal): Possible causes are incomplete closure of the butterfly plate, wear, scratching or aging of the rubber valve seat, or debris trapped between the butterfly plate and the valve seat. Solutions include checking and readjusting the drive mechanism limit to the fully closed position, removing debris and cleaning the valve, and replacing the valve body lining or valve seat if necessary.

- Excessive Opening/Closing Torque: Possible causes are lack of lubrication or rust on the valve stem, internal scaling or foreign matter jamming, or the clamp being tightened too much during installation. Solutions include applying lubricating grease, disassembling and inspecting to clean internal scale, and loosening the clamp bolts to realign and reinstall.

VI. Disclaimer

These instructions apply to conventional D81X grooved handle butterfly valves (cast iron or ductile iron body, rubber seal, operating temperature 0 degrees Celsius to 80 degrees Celsius). For special operating conditions (such as flammable/explosive areas, highly corrosive media, high-temperature steam, oxygen environments), the manufacturer's special technical agreement must be strictly followed. The manufacturer and distributor assume no responsibility for valve damage or safety accidents caused by failure to follow these instructions.

非常感谢您的阅读！

Thank you very much for reading!

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