开维喜阀门集团
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D941X 电动法兰蝶阀系列

D941X Electric Flange Butterfly Valve Series

使用说明书

Operating Instructions

开维喜阀门集团有限公司

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D941X 法兰电动蝶阀

D941X Flange Electric Butterfly Valve

型号：D941X
规格：DN50-DN2000
公称压力：PN10~PN16
适用介质：水、酸、碱及腐蚀性介质
适用温度：≤ 120 ℃
阀体材质：铸铁、铸钢、不锈钢+衬胶、衬氟
连接方式：法兰
驱动方式：电动

Model: D941X
Specifications: DN50－DN2000
Nominal Pressure: PN10－PN16
Applicable Media: Water, acids, alkalis, and corrosive media
Applicable Temperature: ≤ 120° C
Valve Body Materials: Cast iron, cast steel, stainless steel + rubber lining, fluorine lining
Connection Type: Flanged
Actuation Mode: Electric

概述

D941X 法兰电动蝶阀是一种以电动机为驱动源，通过电力控制蝶板作 90° 旋转运动来实现管道介质启闭或调节的阀门。该阀门采用法兰连接方式，通过螺栓与管道法兰紧密连接，安装稳固可靠。电动执行器接收控制信号后，通过内部齿轮传动或蜗轮蜗杆机构将电机旋转扭矩传递至阀杆，驱动与之固定的蝶板在阀体内精准转动。蝶板密封面通常包覆有橡胶等弹性材料，与阀体内壁的阀座形成过盈配合，实现双向软密封。D941X 电动蝶阀具有操作简便、自动化程度高、可实现远程及智能控制等特点，广泛应用于给排水、暖通空调、消防、电力及工业自动化等系统中。

Overview

The D941X Flange Electric Butterfly Valve is a type of valve that uses an electric motor as the driving source to control the 90-degree rotational movement of the disc for opening, closing, or regulating the medium in a pipeline. This valve adopts a flange connection method, securely fastened to the pipeline flanges via bolts, ensuring stable and reliable installation. Upon receiving control signals, the electric actuator transmits the motor's rotational torque to the valve stem through an internal gear drive or worm gear mechanism, thereby driving the attached disc to rotate precisely within the valve body. The disc sealing surface is typically overlaid with elastic materials such as rubber, forming an interference fit with the valve seat on the inner wall of the valve body to achieve bidirectional soft sealing. The D941X Electric Butterfly Valve features simple operation, a high degree of automation, and the capability for remote and intelligent control. It is widely used in water supply and drainage, HVAC, fire protection, power systems, and industrial automation applications.

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D941X 法兰电动蝶阀产品图

D941X Flange Electric Butterfly Valve Product Illustration

特点

1、电动智能控制：采用一体化或分体式电动执行机构，可接收 4-20mA 信号或开关量信号实现精确控制，支持远程操作、自动调节和集中控制，智能化程度高。

2、法兰连接稳固：阀体采用标准法兰端面设计，连接强度高、密封性好，安装稳固，适用于中高压管道系统。

3、高性能软密封：蝶板密封圈采用三元乙丙橡胶（EPDM）、丁腈橡胶（NBR）或氟橡胶（FKM）等弹性材料整体包覆，密封性能优良，可实现双向零泄漏（密封等级达 VI 级）。

4、低流阻节能设计：阀门全开时蝶板厚度为流道唯一障碍，流阻系数极低，能有效降低管道系统压力损失，节约运行能耗。

5、结构紧凑耐用：相比同口径闸阀，结构长度短、整体重量轻，占用空间小；关键部件采用不锈钢或铜合金材质，耐腐蚀性强，使用寿命长。

6、多种控制模式：具备开关型、调节型等多种控制方式，可配备限位开关、力矩保护、手自动切换等功能，适应不同工况需求。

7、维护简便经济：模块化设计，主要密封件更换方便；电动执行器防护等级高（通常 IP67），适应潮湿、粉尘等恶劣环境，维护成本低。

8、安全可靠运行：具备过载保护、断信号自锁等功能，确保阀门在异常情况下安全可靠，避免系统事故。

Features

1、Electric Intelligent Control: Equipped with an integrated or split-type electric actuator capable of receiving 4-20mA or on/off signals for precise control. Supports remote operation, automatic regulation, and centralized control, offering a high degree of intelligence.

2、Sturdy Flange Connection: The valve body features a standard flange end face design, ensuring high connection strength and excellent sealing performance. Installation is stable and secure, making it suitable for medium- and high-pressure pipeline systems.

3、High-Performance Soft Seal: The disc sealing ring is integrally overlaid with elastic materials such as EPDM, NBR, or FKM, providing superior sealing performance. Capable of achieving bidirectional zero leakage (sealing class up to Class VI).

4、Low Flow Resistance & Energy-Saving Design: When fully open, the disc thickness is the only obstruction in the flow path, resulting in an extremely low flow resistance coefficient. This effectively reduces pressure loss in the pipeline system and saves operational energy consumption.

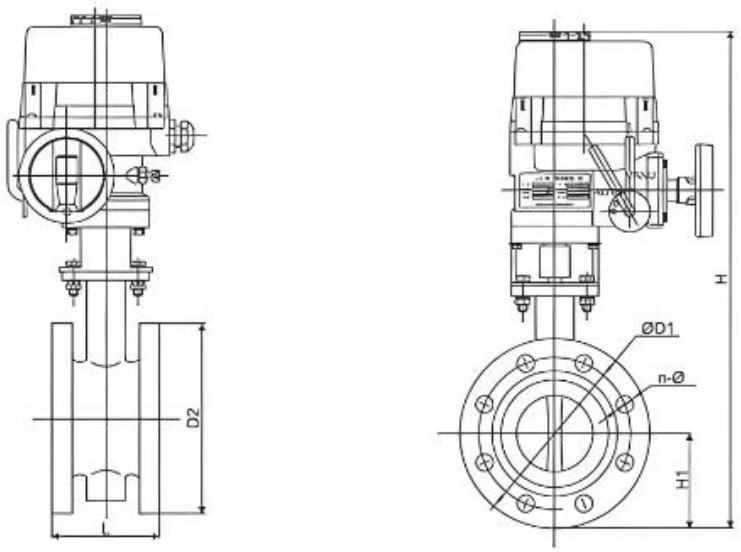
5、Compact and Durable Structure: Compared to gate valves of the same diameter, it features a

shorter face-to-face length and lighter overall weight, occupying minimal space. Key components are made of stainless steel or copper alloy, offering strong corrosion resistance and a long service life.

6、Versatile Control Modes: Offers multiple control modes including on/off and regulating types. Can be equipped with features such as limit switches, torque protection, and manual/automatic switching to adapt to various operational requirements.

7、Easy and Economical Maintenance: Modular design allows for convenient replacement of main sealing components. The electric actuator boasts a high protection rating (typically IP67), suitable for harsh environments like humidity and dust, resulting in low maintenance costs.

8、Safe and Reliable Operation: Includes functions such as overload protection and signal loss self-locking, ensuring safe and reliable valve performance under abnormal conditions and preventing system failures.



D941X 电动法兰蝶阀结构图

D941X Electric Flange Butterfly Valve Structural Diagram

主要零件材料 List of Component Names and Materials

名称 Name	材料 Material
阀体 Valve Body	铸铁、铸钢、不锈钢+衬胶、衬氟 Cast iron, cast steel, stainless steel + rubber lining, fluorine lining
蝶板 Disc	碳钢包覆橡胶、 碳钢包覆氟塑料、不锈钢 双相不锈钢板 1.4529、C276 Carbon Steel with Rubber Lining, Carbon Steel with Fluoroplastic Lining, Stainless Steel, Duplex Stainless Steel Plate 1.4529, C276
阀座 Valve Seat	天然橡胶、三元乙丙胶 Natural Rubber, EPDM
阀杆 Valve Stem	不锈钢、 2Cr13、304Stainless Steel, 2Cr13, 304

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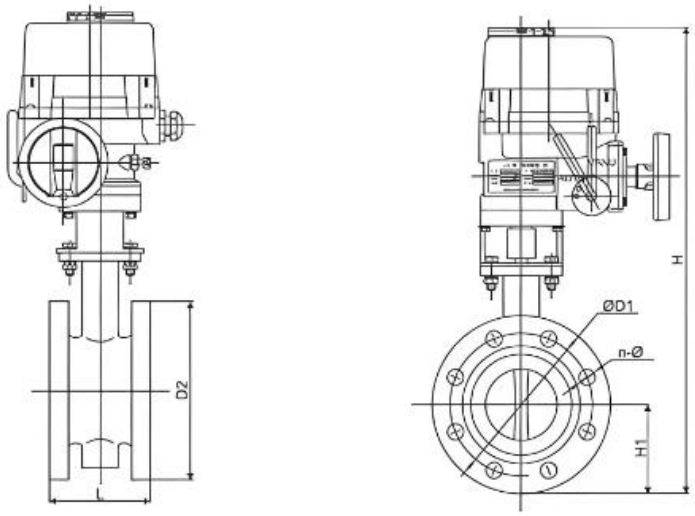
性能规范表 Performance Specification Table

性能规范表 Performance Specification Table		
公称压力 Nominal Pressure	1.0/1.6	MPa
强度试验压力 Strength Test Pressure	1.5/2.4	
密封试验压力 Sealing Test Pressure	1.1/1.76	
适用温度 Applicable Temperature	≤120	℃



D941X 电动法兰蝶阀外形尺寸图

D941X Flange Electric Butterfly Valve Overall Dimension Drawing

D941X 电动法兰蝶阀外形尺寸表

D941X Flange Electric Butterfly Valve overall dimension table

公称通径 DN		结构长度 Face-to-face dimension	外形尺寸(参考值) Overall dimensions (reference values)				连接尺寸(标准值) Connection dimensions (standard values) 0.6MPa				参考重量 weight
mm	inch	L	H	H0	A	B	D	D1	D2	n-d	
50	2	108	63	306	180	200	140	110	88	4-14	13
65	21/2	112	70	321	180	200	160	130	108	4-14	14
80	3	114	83	346	180	200	190	150	124	4-18	15.5
100	4	127	105	387	180	200	210	170	144	4-18	19.5
125	5	140	115	411	180	200	240	200	174	8-18	25.5
150	6	140	137	447	270	280	265	225	199	8-18	28.5
200	8	152	164	572	270	280	320	280	254	8-18	48
250	10	250	206	646	270	280	375	335	309	12-18	69
300	12	270	230	738	380	420	440	395	363	12-22	91
350	14	290	248	761	380	420	490	445	413	12-22	110
400	16	310	289	877	450	470	540	495	463	16-22	140

450	18	330	320	938	480	490	595	550	518	16-22	180
500	20	350	343	993	480	490	645	600	568	20-22	215
600	24	390	413	1131	480	490	755	705	667	20-26	290
700	28	430	478	1476	640	660	860	810	772	24-26	560
800	32	470	525	1533	640	660	975	920	878	24-30	910
900	36	510	585	1655	750	860	1075	1020	978	24-30	1500
1000	40	550	640	1765	850	900	1175	1120	1078	28-30	1750
1200	48	630	755	1995	850	900	1405	1340	1292	32-33	2180
1400	56	710	910	2310	1000	925	1630	1560	1510	36-36	2400
1600	64	790	1030	2595	1000	925	1830	1760	1710	40-36	2870
1800	72	870	1140	2810	1100	980	2045	1970	1918	44-39	3380
2000	80	950	1250	3100	1100	980	2265	2180	2180	48-42	4010

安装与维护须知

一、安装说明

1. 安装前检查：

核对验证： 仔细核对阀门铭牌上的型号（D941X）、公称通径（DN）、压力等级（PN）、阀体材质及电动执行器型号，确保其与管道设计要求一致。核验阀体上的流向箭头与介质流向匹配。
外观与内部检查： 检查阀门及电动执行器外观，确认无运输损伤。清除阀腔内及软密封面（通常为橡胶或氟塑料）上的所有防护物、油脂和杂物，防止损伤密封。
手动功能测试： 将电动执行器切换至 “手动”模式（通常有手轮或手动手柄），手动操作阀门，确认蝶板启闭灵活、无卡阻。测试后，将蝶板置于 微开状态（约 10%开度），以便安装对准。操作完毕切换回“自动”模式。

2. 安装位置与方向：

阀门可安装于水平或垂直管道上。安装位置应充分考虑空间，便于电气接线、操作、维护及观察。
流向确认： 必须确保阀体上标示的箭头方向与管道中介质的预定流向一致。本阀门通常为单向密封设计。

3. 管道对接要求：

本阀门采用法兰连接。安装时，请使用与阀门法兰规格、密封面形式（如 RF）相匹配的标准管道法兰、垫片及连接螺栓。
严禁 通过强行拧紧螺栓来校正管道法兰与阀门法兰之间的错位、不平行或间隙过大。安装前应确保管道法兰对中、端面平行且清洁。
分步均匀拧紧：将阀门放入管道法兰之间，插入全部螺栓并用手初步拧紧。随后使用扭矩扳手，严格按照 对角、交叉的顺序，分 2-3 轮 逐步均匀拧紧所有法兰螺栓至规定扭矩值，确保阀门均匀受力，防止阀体变形导致密封失效。

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4. 电动执行机构安装与调试：

电动执行机构通常已在出厂前安装于阀门上。阀门在管道上安装紧固后，进行电气连接和调试。
电气连接： 由专业电工按照执行器接线图进行电源和控制信号线的连接。确保电源电压、频率与控制信号（如 4-20mA、开关量）与执行器铭牌及控制系统要求一致。接线必须牢固，做好防水防潮措施（防护等级 IP67 或以下时）。
手动操作： 在通电前，务必确认执行器处于 “手动”模式。转动手轮，感受操作是否顺畅。

行程与限位调试（关键步骤）：
a. 切换至“自动”或“远程”模式，通过控制信号或执行器面板按钮，使阀门 关闭。
b. 调节执行器内部的 关向限位开关（或通过设定关位行程），使蝶板准确到达全关位置，并确保密封。
c. 操作阀门 开启。
d. 调节执行器内部的 开向限位开关（或通过设定开位行程），使蝶板准确到达全开位置（通常为 90°）。
e. 反复进行数次完整的开关循环，观察动作是否平稳、启停位置是否精确且重复性好。

力矩保护设定： 确保执行器的过力矩保护功能已正确设定并启用，以防阀门卡死时损坏执行机构或阀门。
附件调试： 如配备阀位变送器、定位模块、加热器等附件，请按其说明书进行设置和测试。

二、使用与操作说明

1. 开启与关闭操作：

首次或长期停用后启用： 建议在系统压力较低或介质未完全充满管道时，通过“手动”模式或低速电动操作，缓慢进行数次全开全关操作，以磨合密封面。
正常自动操作： 通过控制系统（DCS/PLC）或现场控制箱发送指令进行操作。操作应平稳，避免频繁快速启闭。
手动操作（应急）： 在断电或维护时使用。操作前必须切换至“手动”模式。手动操作力应均匀，到达全开或全关位置有阻力感时即停止，切勿使用加力工具强行操作。

2. 开度调节：

当配置 调节型电动执行器（带定位功能）时，本阀门可用于流量或压力调节。通过输入连续的模拟信号（如 4-20mA），可精确控制蝶板在 0° 至 90° 间的任意角度。
避免长期小开度节流： 严禁 将本阀门长期用作节流阀并停留在极小开度（通常指<15°），以免高速流体对软密封面造成严重冲蚀和气蚀损坏。
定期全行程操作： 若长期处于部分开度的调节工况，应 每周或每月 定期进行一次全行程开关操作，以防止密封面局部沉积结垢或产生粘连。

3. 重要注意事项：

介质与温度： 确认阀门主体材质及软密封材料适用于工作介质及温度、压力范围。
高温工况： 用于高温介质时，冷态安装紧固后，系统首次升温至工作温度并稳定运行时，必须 在热态下对所有法兰连接螺栓进行 热态再紧固，以防泄漏。
电气安全： 确保执行器可靠接地，防止触电。在潮湿、易燃易爆环境，应选用相应防爆等级的产品并遵守

相关安全规程。
防水防潮： 虽然执行器具有一定防护等级，但仍应尽量避免被水长期浸泡或处于极端潮湿环境。

三、维护与保养说明

1. 日常维护：

定期巡检阀门外部、法兰连接处有无泄漏。
保持阀门及电动执行器外壳清洁，检查电缆接口密封是否完好。
监听阀门启闭过程中有无异常声响或振动。
检查执行器指示窗显示、状态指示灯是否正常。

2. 定期检查：

根据使用频率和工况条件，建议每 6 个月至 1 年 进行一次全面的预防性检查和维护。
阀门部分： 检查阀杆转动是否灵活、有无泄漏；检查法兰螺栓紧固状态；检查密封面磨损、老化情况（如有条件）。

执行机构部分：
检查执行器外部紧固件是否松动。
检查手动/自动切换机构是否灵活可靠。
对需要润滑的齿轮箱或传动部件，按照制造商的润滑周期和指定的润滑脂进行加注或更换。
检查电气接线端子是否紧固、有无氧化。
清洁执行器散热口（如有），确保通风良好。

附件部分： 检查阀位反馈信号是否准确，限位开关、力矩开关动作是否可靠。

3. 存放要求：

阀门长期存放时，应 处于微开状态（蝶板开启约 5°-10°），避免密封面长期受压变形。

关闭阀门通道两端的法兰保护盖。
将电动执行器切换至“手动”模式。
断开主电源和控制电源。
存放于干燥、通风、无腐蚀性气体的室内环境。

4. 常见故障与处理：

阀门泄漏（关闭不严）：
检查并重新调整 关向限位。
检查密封面是否有异物或损伤。
检查法兰螺栓是否均匀紧固。

阀门不动作：

检查电源是否正常，控制信号是否送达。
检查执行器保险丝是否熔断。
检查是否触发过力矩保护而跳闸，若是，排查阀门是否卡阻。
切换至手动模式，检查是否可操作。

阀门动作中途停止或不到位：
检查限位开关设定是否准确或发生位移。
检查力矩保护值设定是否过小。
检查是否有异物卡阻阀门。

重要提示： 电动执行器内部结构复杂，涉及电气和精密机械。非专业人员 严禁 拆卸执行器外壳进行维修。软密封阀座等核心部件的更换也需专业知识。遇到无法解决的故障，应立即联系专业技术人员或阀门制造商进行处理。

Installation and Maintenance Guidelines

I. Installation Instructions

1. Pre-Installation Checks

Verification: Carefully verify that the model (D941X), nominal diameter (DN), pressure rating (PN), valve body material, and electric actuator model on the valve nameplate match the pipeline design specifications. Confirm the flow direction arrow on the valve body corresponds to the intended medium flow.
Visual & Internal Inspection: Inspect the exterior of the valve and electric actuator for any shipping damage. Remove all protective materials, grease, and debris from the valve cavity and the soft sealing surfaces (typically rubber or fluoroplastic) to prevent seal damage.
Manual Function Test: Switch the electric actuator to "Manual" mode (usually via handwheel or crank). Operate the valve manually to ensure the disc opens and closes smoothly without sticking. After testing, leave the disc in a slightly open position (approx. 10%) for alignment during installation. Switch back to "Automatic" mode upon completion.

2. Installation Position and Direction

The valve can be installed in horizontal or vertical pipelines. Choose a location with sufficient space for electrical wiring, operation, maintenance, and observation.
Flow Direction Confirmation: It is mandatory that the arrow marked on the valve body aligns with the intended medium flow direction in the pipeline. This valve is typically designed for unidirectional sealing.

3. Pipeline Connection Requirements

This valve utilizes a flanged connection. For installation, use standard pipeline flanges, gaskets, and bolts that match the valve's flange rating and face type (e.g., RF).
NEVER use bolt tightening to correct misalignment, non-parallelism, or excessive gaps between the pipeline flanges and the valve flanges. Ensure pipeline flanges are aligned, faces are

parallel and clean before installation.
Gradual and Uniform Tightening: Place the valve between the pipeline flanges, insert all bolts and hand-tighten initially. Then, using a torque wrench, tighten all flange bolts to the specified torque value in 2-3 stages, following a strict diagonal, crosswise pattern. This ensures even load distribution on the valve, preventing body distortion and seal failure.

4. Electric Actuator Installation and Commissioning

The electric actuator is typically pre-mounted at the factory. Finalize electrical connections and commissioning only after the valve is securely installed in the pipeline.
Electrical Connection: A qualified electrician must connect power and control signal wires according to the actuator wiring diagram. Ensure supply voltage, frequency, and control signals (e.g., 4-20mA, on/off) match the actuator nameplate and control system requirements. Connections must be secure and protected against moisture (especially for IP67 or lower ratings).
Manual Operation: Before powering on, ensure the actuator is in "Manual" mode. Turn the handwheel to check for smooth operation.

Stroke and Limit Adjustment (Critical Steps):
a. Switch to "Automatic" or "Remote" mode. Close the valve via control signal or actuator panel button.
b. Adjust the close-direction limit switch (or set the close position travel) so the disc accurately reaches the fully closed position with proper sealing.
c. Open the valve.
d. Adjust the open-direction limit switch (or set the open position travel) so the disc accurately reaches the fully open position (typically 90°).
e. Perform several complete open-close cycles. Observe if the action is smooth and the start/stop positions are precise and repeatable.

Torque Protection Setting: Ensure the actuator's over-torque protection is correctly set and enabled to prevent damage to the actuator or valve if jamming occurs.

Accessory Commissioning: For accessories like position transmitters, positioning modules, or heaters, follow their respective manuals for setup and testing.

II. Operation and Usage Instructions

1. Opening and Closing Operation

Initial or Post-Long-Term Startup: It is recommended to perform several slow, full open-close cycles in "Manual" mode or at low electric speed when system pressure is low or the pipeline is not fully filled, to gently seat the sealing surfaces.
Normal Automatic Operation: Operate via commands from the control system (DCS/PLC) or local control box. Operation should be steady; avoid frequent rapid cycling.
Manual Operation (Emergency): Used during power failure or maintenance. Always switch to

"Manual" mode first. Apply force evenly and stop when resistance is felt at the fully open/closed position. Never use tools to apply excessive force.

2. Throttling Operation

When equipped with a modulating electric actuator (with positioning capability), this valve can be used for flow or pressure regulation. A continuous analog signal input (e.g., 4-20mA) allows precise control of the disc at any angle between 0° and 90°.

Avoid Prolonged Low-Degree Throttling: The valve must NOT be used as a throttle valve and kept at a very small opening (typically <15°) for extended periods, as this causes severe erosion and cavitation damage to the soft seals.

Regular Full-Stroke Cycling: If used for prolonged modulation, perform a full open-close cycle weekly or monthly to prevent localized deposit buildup or adhesion on the sealing surfaces.

3. Important Precautions

Medium and Temperature: Ensure valve body and soft seal materials are suitable for the operating medium, temperature, and pressure range.

High-Temperature Service: For high-temperature media, hot re-tightening of all flange bolts is mandatory after the initial cold installation, once the system reaches and stabilizes at operating temperature, to prevent leaks.

Electrical Safety: Ensure the actuator is properly grounded to prevent electric shock. In damp or hazardous areas, use products with appropriate explosion-proof ratings and follow relevant safety codes.

Water & Moisture Protection: Although the actuator has an ingress protection rating, avoid prolonged immersion in water or exposure to extremely humid environments.

III. Maintenance and Servicing Instructions

1. Routine Maintenance

Periodically inspect the valve exterior and flange connections for leaks.

Keep the valve and actuator housing clean. Check cable gland seals for integrity.

Listen for unusual noises or vibrations during valve operation.

Check actuator display windows and status indicators for normal operation.

2. Periodic Inspection

Depending on usage frequency and conditions, a comprehensive preventive inspection every 6 to 12 months is recommended.

Valve Section: Check for smooth stem rotation and leaks; inspect flange bolt tightness; examine seal surfaces for wear/aging (if accessible).

Actuator Section:

Check external fasteners for tightness.
Verify manual/auto switching mechanism is flexible and reliable.
Lubricate gearboxes or drive components as per the manufacturer's schedule using specified grease.
Check electrical terminals for tightness and oxidation.
Clean actuator ventilation ports (if present) to ensure proper airflow.
Accessories: Verify valve position feedback signal accuracy. Check limit switches and torque switches for reliable operation.

3. Storage Requirements

For long-term storage, the valve should be in a slightly open position (disc ~5° -10° open) to prevent permanent seal deformation.
Install protective covers on both flange ends.
Switch the electric actuator to "Manual" mode.
Disconnect main and control power supplies.
Store indoors in a dry, ventilated area free of corrosive gases.

4. Common Troubleshooting

Leakage (Failure to Seal):

Check and readjust the close-direction limit.
Inspect sealing surfaces for debris or damage.
Check for uniform flange bolt tightness.

Valve Does Not Operate:

Check power supply and control signal availability.
Check actuator fuses.
Check if over-torque protection was triggered; if so, investigate valve binding.
Switch to manual mode to check operability.
Valve Stops Mid-Travel or Doesn't Reach Position:
Check limit switch settings for accuracy or displacement.
Check if torque protection setting is too low.
Check for foreign object jamming the valve.

Important Notice: The electric actuator contains complex electrical and precision mechanical components. Unauthorized personnel must NOT open the actuator housing for repair. Replacement of core components like the soft valve seat also requires expertise. For unresolved faults, contact qualified technical personnel or the valve manufacturer immediately.

非常感谢您的阅读！
Thank you very much for reading!

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