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D343H 三偏心硬密封蝶阀系列

D343H Triple Eccentric Hard Seal Butterfly Valve Series

使用说明书

Instruction Manual

开维喜阀门集团有限公司

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D343H 三偏心硬密封蝶阀

D343H Triple Eccentric Hard Seal Butterfly Valve

型号：D343H　　规格：DN50-DN2000
公称压力：PN10~PN25　　适用介质：水、油品及类似液体、气体。
适用温度：-29℃～600℃/-40℃～600℃　　阀体材质：铸钢、不锈钢、双相不锈钢
连接方式：法兰　　驱动方式：手动、蜗轮蜗杆、气动、电动

Model: D343H
Size Range: DN50 - DN2000
Nominal Pressure: PN10 - PN25
Applicable Media: Water, oil and similar liquids, gases
Applicable Temperature: -29° C to 600° C / -40° C to 600° C
Body Material: Cast steel, stainless steel, duplex stainless steel
Connection Type: Flanged
Actuation: Manual, worm gear, pneumatic, electric

概述

D343H 硬密封蝶阀是一种采用多层次金属硬密封结构、通过三维偏心原理实现严密关闭的法兰连接蝶阀。该阀门采用轴向偏心、径向偏置和锥形角偏心的三重偏心几何结构，使蝶板在启闭过程中与金属密封圈实现完全脱离，仅在关闭最终位置产生楔形压紧密封。阀杆传动采用蜗轮蜗杆机构，操作轻便且具备自锁功能。密封副采用不锈钢片与柔性石墨复合层叠结构，或蝶板密封面堆焊硬质合金，与阀体金属阀座形成高硬度、耐磨损的硬密封系统，适用于高温、高压及含有固体颗粒的严苛工况。

Overview

The D343H hard seal butterfly valve is a flanged connection butterfly valve that utilizes a multi-layer metal hard sealing structure and achieves tight shut-off through the triple eccentric principle. This valve features a triple eccentric geometry comprising axial eccentricity, radial offset, and conical angle eccentricity. This design ensures that the disc completely disengages from the metal seal ring during the opening and closing cycles, creating a wedge-type compressive seal only at the final closed position. The valve stem is operated via a worm gear mechanism, offering easy operation and self-locking functionality. The sealing pair consists of a laminated structure of stainless steel sheets and flexible graphite, or a hardfaced alloy on the disc sealing surface. This forms a high-hardness, wear-resistant hard sealing system against the metal seat, making the valve suitable for demanding conditions involving high temperatures, high pressures, and media containing solid particles.

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D343H 三偏心硬密封蝶阀产品图

D343H Triple Eccentric Hard Seal Butterfly Valve Product Image

特点

1、多层次金属硬密封：密封副采用不锈钢片与柔性石墨交替叠压的弹性密封环，或蝶板表面堆焊硬质合金，形成多道密封防线，耐磨损、耐高温，使用寿命长。

2、三维偏心结构：通过精密计算的三维偏心设计，实现蝶板在开启瞬间即与密封圈完全脱离，旋转过程零摩擦，关闭时依靠偏心距实现渐进式楔紧，密封可靠且操作扭矩小。

3、耐高温高压性能：金属密封结构允许阀门在≤425℃的高温环境下长期工作，压力等级可达 PN16～PN40，适用于蒸汽、热媒油、高温烟气等工业介质。

4、抗冲刷耐腐蚀：硬质密封面能有效抵抗介质中固体颗粒、结晶物或弱腐蚀性成分的冲刷与侵蚀，阀体内腔可采用喷涂防腐涂层，延长整体使用寿命。

5、双向零泄漏密封：借助偏心结构的自紧效应，阀门在正向与反向压力下均可实现金属硬密封，达到双向零泄漏等级，安装不受介质流向限制。

6、长寿命低维护设计：蜗轮传动机构运行平稳可靠，硬密封副耐磨损性强，在正常工况下可实现长期免维护运行，特别适用于电力、冶金、化工等对可靠性要求高的关键流程。

Features

1、Multi-layer Metal Hard Seal: The sealing pair consists of an elastic sealing ring made of laminated stainless steel sheets and flexible graphite, or features a hardfaced alloy on the disc surface. This creates a multi-layer seal that is wear-resistant, high-temperature resistant, and offers a long service life.

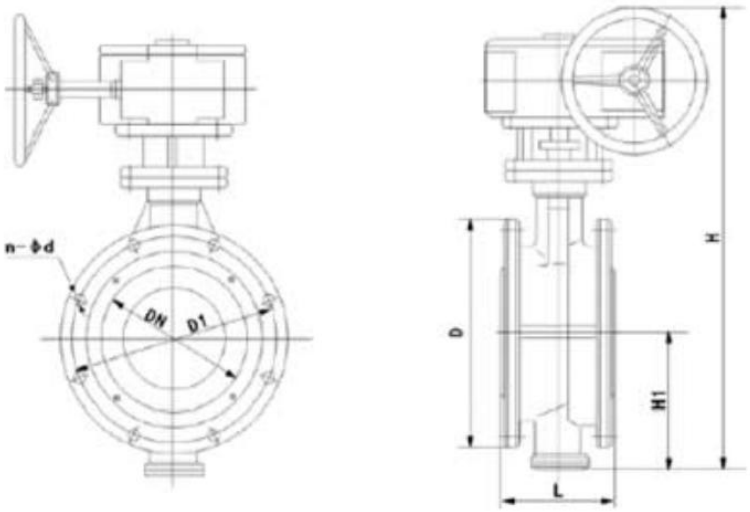
2、Triple Eccentric Structure: Through precisely calculated triple eccentric design, the disc completely disengages from the seal ring at the moment of opening, achieving zero friction during rotation. Upon closing, it utilizes the eccentricity to create a progressive wedging action, ensuring reliable sealing with low operating torque.

3、High Temperature and Pressure Resistance: The metal sealing structure allows the valve to operate long-term under high temperatures up to 425° C, with pressure ratings up to PN16~PN40. It is suitable for industrial media such as steam, heat transfer oil, and high-temperature flue gas.

4、Erosion and Corrosion Resistance: The hard sealing surface effectively resists erosion and corrosion from solid particles, crystals, or mildly corrosive components in the medium. The valve body cavity can be coated with anti-corrosion coatings to extend the overall service life.

5、Bidirectional Zero Leakage Seal: Leveraging the self-energizing effect of the eccentric structure, the valve achieves a metal-to-metal seal under both forward and reverse pressure, resulting in bidirectional zero-leakage performance. Installation is not restricted by media flow direction.

6、Long Life, Low Maintenance Design: The worm gear drive operates smoothly and reliably. The highly wear-resistant hard sealing pair enables long-term maintenance-free operation under normal conditions. This makes it particularly suitable for critical processes in industries such as power generation, metallurgy, and chemical engineering where high reliability is required.



D343H 三偏心硬密封蝶阀结构图

D343H Triple Eccentric Hard Seal Butterfly Valve Structure Diagram

零部件名称材料表 Parts and Materials List

名称	材料
阀体 Valve Body	铸钢、不锈钢、双相不锈钢 Cast steel, stainless steel, duplex stainless steel
蝶板 Disc	WCB 碳钢密封面堆焊钴基硬质合金 WCB Carbon Steel with Cobalt-Based Hard Alloy Hardfaced on Sealing Surface
阀座 Seat	金属与蝶板硬密封面适配 Metal Matched with Hard Sealing Surface of Disc
阀杆 Stem	2Cr13/304 不锈钢 2Cr13/304 Stainless Steel
传动机构 Transmission Mechanism	球墨铸铁 QT450 Ductile Iron QT450
螺栓 / 螺母 Bolt/Nut	碳钢或不锈钢匹配阀体材质 Carbon Steel or Stainless Steel Matched with Valve Body Material

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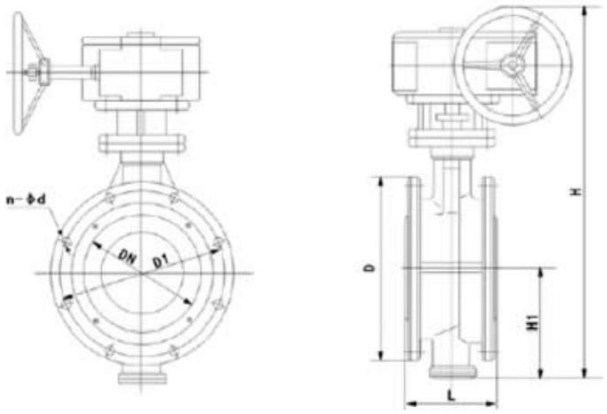
性能规范表 Performance Specification Table

性能规范表 Performance Specification Table		
公称压力 Nominal Pressure	1.6	MPa
强度试验压力 Strength Test Pressure	2.4	
密封试验压力 Seal Test Pressure	1.76	
适用温度 Applicable Temperature	≤425	℃



D343H 三偏心硬密封蝶阀外形尺寸图

D343H Triple Eccentric Hard Seal Butterfly Valve Overall Dimension Drawing

D343H 三偏心硬密封蝶阀外形尺寸表

D343H Triple Eccentric Hard Seal Butterfly Valve overall dimension table

公称通径（DN）	主 要 尺 寸 Size			法兰 尺寸 和 螺栓 尺寸 Flange Dimensions and Bolt Sizes								
				1.0MPa			1.6MPa			2.5MPa		
	L	H1	H	D	D1	n-Φd	D	D1	n-Φd	D	D1	n-Φd
50	108	350	112	165	125	4–18	165	125	4–18	165	125	4–18
65	112	370	115	185	145	4–18	185	145	4–18	185	145	8–18
80	114	380	120	200	160	4–18	200	160	8–18	200	160	8–18
100	127	420	138	220	1801	8–18	220	180	8–18	235	190	8–22
125	140	460	164	250	210	8–18	250	210	8–18	270	220	8–26
150	140	555	175	285	240	8–22	285	240	8–22	300	250	8–26
200	152	760	200	340	295	8–22	340	295	12–22	360	310	12–26
250	165	830	243	395	350	12–22	405	355	12–26	425	370	12–30
300	178	895	250	445	400	12–22	460	410	12–26	485	430	16–30
350	190	950	280	505	460	16–22	520	470	16–26	555	490	16–33
400	216	1190	305	565	515	16–26	580	525	16–30	620	550	16–36
450	222	1255	350	615	565	20–26	640	585	20–30	670	600	20–36
500	229	1305	380	670	620	20–26	715	650	20–33	730	660	20–36
600	267	1340	445	780	725	20–30	840	770	20–36	845	770	20–39

700	292	1520	480	895	840	24–30	910	840	24–36	960	875	24–42
800	318	1710	530	1015	950	24–33	1025	950	24–39	1085	990	24–48
900	330	1810	580	1115	1050	28–33	1125	1050	28–39	1185	1090	28–48
1000	410	1960	650	1230	1160	28–36	1255	1170	28–42	1320	1210	28–56
1200	470	2250	760	1455	1380	32–39	1485	1390	32–48	1530	1420	32–56
1400	530	2435	850	1675	1590	36–42	1685	1590	36–48	1755	1640	36–62
1600	600	2780	1030	1915	1820	40–48	1930	1820	40–56	1975	1860	40–62
1800	670	3020	1230	2115	2020	44–48	2130	2020	44–56	2195	2070	44–70
2000	760	3270	1350	2325	2230	48–48	2345	2230	48–62	2425	2300	48–70

D343H 三偏心硬密封蝶阀 安装与维护须知

一、安装说明

安装前检查：

核对阀门型号、通径、压力等级及阀体、密封件材质是否与管路设计要求一致。

检查阀门外观，确保运输过程中阀体、法兰、蜗轮箱等部件无损伤。清除阀腔内及密封面上的防锈物和杂物，注意避免损坏密封面。

手动旋转蜗轮箱手轮，确认蝶板启闭灵活、无卡阻，安装前应将蝶板置于微开状态（约 10° 开度），避免强制关闭损伤密封副。

安装位置与方向：

阀门可安装于水平或垂直管道上，安装位置应确保蜗轮操作箱可自由转动并有足够操作空间。

请注意阀体上的流向箭头指示，确保其与介质流向一致。对于 D343H 三偏心蝶阀，虽然设计上可能允许双向密封，但按照箭头指示安装能获得最佳密封效果和使用寿命。

管道对接要求：

使用标准法兰与阀门法兰配对连接，确保法兰密封面清洁、垫片（推荐使用金属缠绕垫片或相应等级垫片）完好且对中良好。

严禁通过强行拧紧螺栓来校正管道法兰与阀门法兰间的错位或间隙。管道应同轴对中，法兰间应基本平行。

安装时先穿入所有螺栓，采用对角、交替、分步的方式均匀拧紧，确保法兰受力均匀，防止因局部受力过大导致阀体变形或密封泄漏。

对于 DN300 及以上的大口径阀门，安装时应考虑在阀门两侧设置独立的管道支撑，避免管道重量和振动使

阀门承受过大应力，影响密封性能。

驱动装置安装：

阀门标配蜗轮蜗杆传动机构，如需加装电动/气动执行机构，应在阀门管道安装就位、管道系统完成试压吹扫后进行。

安装前，手动将阀门操作至全关位置，确保执行机构输出轴与阀杆轴心精确对中，同轴度偏差应在允许范围内。

按照执行机构说明书进行连接安装、行程限位（主要依靠蜗轮箱自身限位）和扭矩设定（执行器扭矩应大于阀门最大操作扭矩）。

安装完成后进行数次全程开关测试，确认动作平稳、开关到位、无卡滞，并与中控室信号反馈一致。

二、使用与操作说明

开启与关闭：

首次安装或维修后使用时，建议在低压或无介质状态下缓慢进行数次全开全关操作，使密封副（金属对金属）充分磨合，检查有无异常声音。

正常操作时应匀速、平稳地旋转手轮，避免冲击力。到达全开或全关位置（有明显阻力感或限位）后，严禁强行再旋转手轮。

蜗轮机构具有可靠的自锁功能，可保持蝶板在任意开度位置，无需额外锁定装置。

开度调节：

D343H 蝶板与阀座为三偏心结构，启闭扭矩小，适用于调节工况。通过蜗轮箱上的开度指示器可精确控制蝶板角度，实现流量调节。

若阀门长期处于部分开启的调节状态，建议定期（如每月）进行 1-2 次全行程操作，清除密封面上可能存在的沉积物，防止卡涩。

注意事项：

虽然可用于调节，但应避免阀门长期处于微小开度（如<15° ）状态，以免高速介质流长时间冲刷密封面，导致过早损坏。

高温工况（如＞200℃）使用时，冷态安装并首次通入热介质后，待阀门及管道温度稳定后，需对法兰连接螺栓进行热态再紧固，防止因热膨胀差异导致泄漏。

介质中含有固体颗粒时，严禁在微小开度下长期运行，以免颗粒物冲刷或卡入密封面，造成密封损坏。

操作过程中如遇异常阻力或卡阻，应立即停止操作，查明原因（如异物卡堵、阀杆弯曲、轴承损坏等）并排除故障，切勿强行操作。

三、维护与保养说明

日常维护：

定期检查阀门外部和法兰连接处有无介质泄漏迹象。

保持蜗轮箱、阀杆等外露部件的清洁，定期清除灰尘和油污。通过蜗轮箱上的注油嘴，定期加注专用润滑脂（如二硫化钼锂基脂）。

检查蜗轮箱操作手轮是否灵活，开度指示器指针与阀板实际位置是否一致，如有偏差及时调整。

定期检查：

根据使用工况，建议每 6-12 个月进行一次全面检查。对于高温、高频操作或含杂质的恶劣工况，应缩短检查周期至 3-6 个月。

检查内容包括：

密封面磨损情况：　通过全关位置检查泄漏量，判断密封面磨损程度。

阀杆转动灵活度：　手动操作全程，检查有无卡滞或扭矩异常增大。

连接螺栓紧固状态：　检查阀体与蜗轮箱、法兰与管道连接螺栓是否松动。

蜗轮箱齿轮磨损状况：　检查齿轮啮合情况，有无异常磨损、点蚀或断齿。

阀杆密封：　检查阀杆填料函处有无渗漏，必要时可微调填料压盖螺栓，若填料已硬化或磨损严重，需及时更换。

存放要求：

长期存放时，阀门应处于微开状态（约 10°-20°），使密封面脱离接触，防止长期受压变形。安装好法兰保护盖，防止异物进入。

存放于干燥、通风的室内环境，避免露天日晒雨淋，避免与酸碱等腐蚀性物质接触。

蜗轮传动部件及外露加工面应涂抹防锈油脂，并定期（如每半年）进行检查和保养。

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故障与处理：

泄漏： 检查蝶板是否关到位；检查密封面是否损坏或有杂质嵌入；检查法兰螺栓是否均匀紧固；检查管道应力是否过大导致阀体变形。

操作扭矩过大： 检查阀座或蝶板密封面是否有异物卡阻；检查阀杆轴承和蜗轮箱润滑是否充分；检查管道安装是否偏心导致阀杆受额外应力。

蜗轮箱空转或卡死： 检查蜗轮与阀杆连接键是否滚键或损坏；检查传动齿轮是否磨损、断齿或内部有异物。

开度指示不准： 松开指针固定螺钉，将阀门操作至全关或全开位置，重新调整指针指向对应刻度后紧固。

重要提示： 对于涉及密封副研磨、关键部件（如阀座、蝶板、阀杆）的更换等高难度维修操作，建议联系专业技术人员或返回生产厂家处理，以确保维修质量。

四、重要提示：

本说明为 D343H 三偏心硬密封蝶阀的通用性技术指导。对于高温高压、强腐蚀、颗粒冲刷严重、高频操作或用于关键安全联锁系统等特殊工况时，必须严格遵守相关行业规范、设计标准及制造商提供的专项技术要求进行操作与维护。

D343H Triple Eccentric Hard Seal Butterfly Valve Installation and Maintenance Instructions

I. Installation Instructions

Pre-Installation Inspection:

Verify that the valve model, diameter, pressure rating, and materials of the body and sealing components conform to the pipeline design requirements.

Inspect the valve appearance to ensure no damage to the body, flanges, worm gear box, and other components during transportation. Remove preservatives and debris from the valve cavity and sealing surfaces, taking care to avoid damaging the sealing surfaces.

Manually rotate the handwheel of the worm gear box to confirm that the disc opens and closes flexibly without jamming. Before installation, the disc should be placed in a slightly open position (approx. 10° opening) to avoid forced closure damaging the sealing pair.

Installation Position and Direction:

The valve can be installed on horizontal or vertical pipelines. The installation position must ensure the worm gear operating box can rotate freely and has sufficient operating space.

Pay attention to the flow direction arrow on the valve body to ensure it is consistent with the medium flow direction. Although the D343H triple eccentric butterfly valve may allow bidirectional sealing by design, installing according to the arrow direction ensures optimal sealing effect and service life.

Pipeline Connection Requirements:

Use standard flanges matching the valve flanges for connection. Ensure the flange sealing surfaces are clean, and the gaskets (spiral wound gaskets or equivalent grade gaskets are recommended) are in good condition and correctly aligned.

It is strictly forbidden to correct misalignment or gaps between pipeline flanges and valve flanges by forcibly tightening bolts. Pipelines should be coaxially aligned, and flanges should be essentially parallel.

During installation, insert all bolts first, then tighten them evenly in a diagonal, alternating, and step-by-step manner. This ensures uniform force on the flanges and prevents valve body deformation or sealing leakage caused by excessive local force.

For large-diameter valves DN300 and above, consider providing independent pipeline supports on both sides of the valve during installation. This prevents the valve from bearing excessive stress caused by pipeline weight and vibration, which could affect sealing performance.

Actuator Installation:

The valve is standardly equipped with a worm gear transmission mechanism. If an electric/pneumatic actuator needs to be added, it should be done after the valve has been installed in the pipeline and the pipeline system has undergone pressure testing and purging.

Before installation, manually operate the valve to the fully closed position. Ensure precise alignment between the actuator output shaft and the valve stem axis; the coaxiality deviation should be within the allowable range.

Perform the connection installation, stroke limit setting (mainly relying on the worm gear box's own limit stops), and torque setting (actuator torque should be greater than the valve's maximum operating torque) according to the actuator manual.

After installation, conduct several full-stroke opening and closing tests to confirm smooth operation, accurate open/close positioning, no jamming, and consistent signal feedback with the control room.

II. Operation Instructions

Opening and Closing:

For initial use after installation or maintenance, it is recommended to perform several slow full-open and full-close operations under low pressure or no medium conditions. This allows the metal sealing pair to fully run-in and checks for any abnormal sounds.

During normal operation, rotate the handwheel smoothly and steadily, avoiding impact forces. After reaching the fully open or fully closed position (indicated by significant resistance or limit stop), forcibly rotating the handwheel further is strictly prohibited.

The worm gear mechanism has a reliable self-locking function, capable of holding the disc at any opening position without the need for additional locking devices.

Opening Adjustment:

The D343H features a triple eccentric structure between the disc and seat, resulting in low operating torque and suitability for regulating conditions. The disc angle can be precisely controlled using the opening indicator on the worm gear box to achieve flow regulation.

If the valve remains in a partially open regulating state for a long time, it is recommended to perform 1-2 full-stroke operations periodically (e.g., monthly) to clear possible deposits on the sealing surfaces and prevent seizing.

Precautions:

Although suitable for regulation, avoid keeping the valve in a very small opening position (e.g., <15°) for extended periods. This prevents premature damage to the sealing surfaces caused by prolonged erosion from high-velocity medium flow.

For high-temperature applications (e.g., >200° C), after cold installation and initial introduction of hot medium, once the valve and pipeline temperatures stabilize, perform a hot re-torquing of the flange connection bolts. This prevents leakage caused by differential thermal expansion.

When the medium contains solid particles, strictly avoid long-term operation at very small openings. This prevents particles from eroding or getting embedded in the sealing surfaces, causing seal damage.

If abnormal resistance or jamming is encountered during operation, stop immediately, investigate the cause (e.g., foreign object blockage, bent stem, damaged bearing), and rectify the fault. Do not force the operation.

III. Maintenance Instructions

Routine Maintenance:

Regularly inspect the valve exterior and flange connections for any signs of medium leakage.

Keep exposed parts like the worm gear box and valve stem clean. Regularly remove dust and oil residue. Periodically inject specialized lubricating grease (e.g., molybdenum disulfide lithium grease) through the grease fittings on the worm gear box.

Check if the worm gear box handwheel operates flexibly and if the opening indicator pointer aligns with the actual disc position. Adjust promptly if there is any deviation.

Periodic Inspection:

Based on operating conditions, a comprehensive inspection is recommended every 6-12 months. For severe conditions involving high temperature, frequent operation, or containing impurities, shorten the inspection cycle to 3-6 months.

Inspection items include:

Sealing Surface Wear: Check the leakage rate at the fully closed position to assess the wear condition of the sealing surfaces.

Valve Stem Rotation Flexibility: Manually operate through the full stroke to check for jamming or abnormal increase in torque.

Bolt Tightness: Check for looseness in connecting bolts between the valve body and worm gear box, and between flanges and pipelines.

Worm Gear Box Gear Wear: Inspect gear meshing for abnormal wear, pitting, or broken teeth.

Valve Stem Seal: Check the stuffing box area for leakage. If necessary, slightly adjust the gland bolts. If the packing is hardened or severely worn, replace it promptly.

Storage Requirements:

For long-term storage, the valve should be kept in a slightly open position (approx. 10° -20°) to keep the sealing surfaces disengaged and prevent long-term pressure deformation. Install flange protectors to prevent foreign matter from entering.

Store in a dry, well-ventilated indoor environment. Avoid prolonged exposure to sunlight and rain, and prevent contact with acidic, alkaline, or other corrosive substances.

Apply anti-rust grease to the worm gear transmission parts and exposed machined surfaces. Inspect and maintain periodically (e.g., every six months).

Troubleshooting:

Leakage: Check if the disc is fully closed; check for damage or debris on sealing surfaces; check if flange bolts are evenly tightened; check for excessive pipeline stress causing valve body deformation.

High Operating Torque: Check for foreign objects jamming the seat or disc sealing surfaces; check if stem bearings and worm gear box are adequately lubricated; check for pipeline misalignment causing additional stress on the stem.

Worm Gear Box Idling or Jamming: Check if the key connecting the worm gear and stem is sheared or damaged; check for worn, broken gears, or foreign objects inside the transmission mechanism.

Inaccurate Opening Indicator: Loosen the pointer fixing screw, operate the valve to the fully closed or fully open position, and re-adjust the pointer to the corresponding scale before tightening.

Important Note: For high-difficulty repairs involving lapping of sealing pairs or replacement of critical components (such as seat, disc, stem), it is recommended to contact professional technicians or return to the manufacturer to ensure repair quality.

IV. Important Notice:

These instructions provide general technical guidance for the D343H Triple Eccentric Hard Seal Butterfly Valve. For special operating conditions involving high temperature, high pressure, strong corrosion, severe particle erosion, high-frequency operation, or use in critical safety interlock systems, relevant industry specifications, design standards, and the manufacturer's specific technical requirements must be strictly followed during operation and maintenance.

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

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