

美标压力平衡式倒装油密封旋塞阀

American Standard Pressure-Balanced Inverted Oil-Sealed Plug Valve

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

美标压力平衡式倒装油密封旋塞阀

型号: ZDAX47	规格: DN15-DN350
公称压力: 150Lb~900Lb	适用介质: 水, 蒸汽, 油品等
适用温度: $\leq 180^{\circ}\text{C}$	阀体材质: ASTM A216-WCB、ASTM A351-CF8、CF8M、CF3、CF3M
连接方式: 法兰、焊接	驱动方式: 手动、电动

Model: ZDAX47

Specification: DN15-DN350

Nominal pressure: 150Lb ~ 900Lb

Applicable medium: Water, steam, oil, etc.

Applicable temperature: $\leq 180^{\circ}\text{C}$

Valve body material: ASTM A216 WCB, ASTM A351 CF8, CF8M, CF3, CF3M

Connection method: flange, welded

drive method: Manual, electric



美标压力平衡式倒装油密封旋塞阀产品图

American Standard Pressure-Balanced Inverted Oil-Sealed Plug Valve Product Diagram

概述

ZDAX47 美标压力平衡式倒装油密封旋塞阀是一种通过锥形或圆柱形旋塞（塞体）的旋转运动来实现流体通道的开启或关闭的阀门。该阀为直通式结构，旋塞上设有贯通的介质流道，通过旋转旋塞 90 度，使流道与阀体通道对齐或垂直，从而实现全开或全关。其阀杆与旋塞为一体式或固定连接设计，操作时阀杆与旋塞同步旋转，无升降动作，填料密封位于阀杆与阀体之间，确保外密封可靠。该阀采用倒装式安装结构，旋塞大端位于阀体底部，介质压力有助于增强密封性能。阀门设有压力平衡结构，通过旋塞上下端压力平衡通道，有效平衡介质压力对旋塞的轴向推力，大幅降低操作扭矩。阀门配备独特的油密封系统，通过向旋塞与阀体密封面之间注入密封脂，形成强制油膜密封，可有效补偿密封面的微量磨损，提高密封性能，同时降低操作扭矩。阀门符合美标设计规范，结构尺寸标准化，阀体两端采用法兰连接方式，通过螺栓与

管道法兰紧固，密封可靠，拆卸方便。该阀门依靠旋塞与阀体密封面之间的精密配合及油膜润滑实现密封，操作扭矩小，密封性能稳定，使用寿命长，广泛应用于石油、天然气、化工等行业的苛刻工况管路系统中，作为截断或接通介质之用。

Overview

The ZDAX47 American standard pressure-balanced inverted lubricated plug valve is a type of valve that opens or closes the fluid passage through the rotary motion of a tapered or cylindrical plug. The valve adopts a straight-through structure, with a through-type medium flow port provided on the plug. By rotating the plug 90 degrees, the flow port aligns with or becomes perpendicular to the valve body passage, thereby achieving fully open or fully closed positions. The valve stem is integrally or fixedly connected to the plug. During operation, the stem and plug rotate synchronously without any lifting motion. Packing sealing is provided between the stem and the valve body to ensure reliable external sealing. The valve adopts an inverted mounting design, with the large end of the plug located at the bottom of the valve body, where medium pressure helps to enhance sealing performance. The valve is equipped with a pressure-balanced structure, utilizing pressure balance passages at the upper and lower ends of the plug to effectively balance the axial thrust of the medium pressure on the plug, significantly reducing operating torque. The valve features a unique lubricated sealing system, which injects sealing grease between the plug and the valve body sealing surfaces to form a forced oil film seal, effectively compensating for minor wear on the sealing surfaces, improving sealing performance, and reducing operating torque. The valve is designed in compliance with American standards, with standardized structural dimensions. Both ends of the valve body adopt flanged connections, which are fastened to the pipeline flanges by bolts, providing reliable sealing and convenient disassembly. The valve relies on precise fit and oil film lubrication between the plug and the valve body sealing surfaces to achieve sealing, offering low operating torque, stable sealing performance, and long service life. It is widely used in demanding pipeline systems in petroleum, natural gas, chemical and other industries for shut-off or flow passage applications.

特点

1. 压力平衡结构，操作轻便：阀门设有压力平衡通道，有效平衡介质压力对旋塞的轴向推力，大幅降低操作扭矩，适用于高压大口径工况。
2. 倒装结构，密封增强：阀门采用倒装式安装结构，旋塞大端位于阀体底部，介质压力有助于增强密封性能，密封可靠。
3. 油密封系统，强制润滑：阀门设有独特的油密封系统，通过向旋塞与阀体密封面之间注入密封脂，形成强制油膜密封，可有效补偿密封面磨损，降低操作扭矩，延长使用寿命。
4. 美标设计，规范统一：阀门符合美标设计规范，结构尺寸标准化，便于与美标管道及仪表配套使用，适用于出口项目及外资项目。
5. 耐腐蚀与耐磨：阀体及旋塞可根据介质选用碳钢、不锈钢、合金钢等材质，密封面可进行硬化处理（如堆焊硬质合金、渗氮等），耐磨损、抗冲刷，使用寿命长。
6. 双向密封无流向限制：阀门设计为双向密封，无严格介质流向要求，安装适应性更强。
7. 法兰连接，可靠便捷：阀体两端采用法兰连接方式，通过螺栓与管道法兰紧固，密封可靠，拆卸方便，适用于中大口径及较高压力的管道系统。

Feature

1. Pressure-Balanced Structure for Light Operation: The valve is equipped with pressure balance passages that effectively balance the axial thrust of the medium pressure on the plug,

significantly reducing operating torque, suitable for high-pressure and large-diameter applications.

2 . Inverted Structure for Enhanced Sealing: The valve adopts an inverted mounting design, with the large end of the plug located at the bottom of the valve body, where medium pressure helps to enhance sealing performance, ensuring reliable sealing.

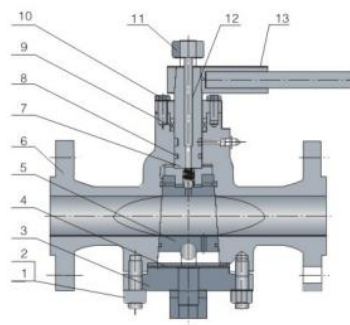
3 . Lubricated Sealing System with Forced Lubrication: The valve is equipped with a unique lubricated sealing system, which injects sealing grease between the plug and the valve body sealing surfaces to form a forced oil film seal, effectively compensating for sealing surface wear, reducing operating torque, and extending service life.

4 . American Standard Design with Unified Specifications: The valve is designed in compliance with American standards with standardized structural dimensions, facilitating matching with American standard pipelines and instruments, and suitable for export projects and foreign-funded projects.

5 . Corrosion and Wear Resistance: The valve body and plug can be made of carbon steel, stainless steel, alloy steel, or other materials depending on the medium. Sealing surfaces can be hardened (e.g., hardfacing with cemented carbide, nitriding, etc.), providing wear resistance, erosion resistance, and long service life.

6 . Bidirectional Sealing with No Flow Direction Restriction: The valve is designed for bidirectional sealing with no strict requirement on flow direction, offering greater installation flexibility.

7 . Flanged Connection, Reliable and Convenient: Both ends of the valve body adopt flanged connections, which are fastened to the pipeline flanges by bolts, providing reliable sealing and convenient disassembly, suitable for medium and large-diameter pipeline systems under higher pressure.



美标压力平衡式倒装油密封旋塞阀结构图

American Standard Pressure-Balanced Inverted Oil-Sealed Plug Valve Structural diagram

零部件名称材料表 List of Component Names and Materials

序号/No.	名称/name	材料/material
1	双头螺栓/Stud bolt	ASTM A193-B7, A193-B8. A193-B8M
2	六角螺母/Hexagon nut	ASTM A194-2H, A194-8, A194-8M
3	阀盖/Bonnet	ASTM A216-WCB,ASTM A351-CF8,CF8M. CF3. CF3M
4	垫片/Gasket	柔性石墨+不锈钢,PTFE/Flexible graphite+Stainless steel,PTFE

5	塞子/Plug	ASTM A182-Gr.F6a ASTM A182-F22,ASTM A351-CF8 CR5M CF3CF3M
6	阀体/Valve body	ASTM A216-WCB,ASTM A351-CF8,CF8M,CF3,CF3M
7	阀杆/Valve stem	ASTM A182-Gr.F6a ASTM A182-F22 ASTM A182-F304,F316,F321,F304L,F316L
8	O 型圈/O-ring	丁晴橡胶/Nitrile rubber
9	填料/Packing	柔性石墨+不锈钢,PTFE/Flexible graphite+Stainless steel,PTFE
10	填料压盖/Packing gland	ASTM A216-WCB ASTM A351-CF8,CF8M,CF3,CF3M
11	加油嘴/Grease fitting	
12	止回阀/Check valve	
13	手柄/Handle	ASTM A47-32510,A216 WCB

性能规范表 Performance Specification Sheet

性能规范表 Performance Specification Sheet		
公称压力 Nominal Pressure	1.0	MPa
强度试验压力 Strength test pressure	1.5	
密封试验压力 Sealing test pressure	1.1	
适用温度 Applicable Temperature	≤180	℃

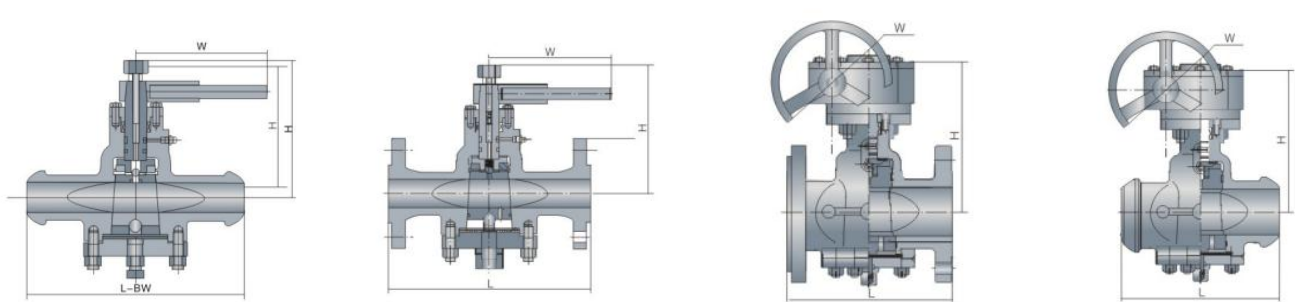
外形尺寸标准要求

- 1、阀门的结构长度按 ASME B16.10 的标准
- 2、连接法兰按 ASME B16.5 的标准

Standard requirements for external dimensions

1. The structural length of the valve shall comply with the standard of ASME B16.10
2. Connecting flanges according to ASME B16.5 standard

外形尺寸表 Outline dimension table



型号/Model: ZDAX47-150LB 压力等级/Pressure rating: 150LB																
口径 /Size	mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350
	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14

L-RF		108	117	127	140	165	178	190	203	229	254	267	292	330	356	381
L-BW		152	178	203	216	229	267	305	330	356	381	394	457	533	610	686
H		180	180	185	200	210	215	250	270	300	340	365	400	450	510	590
W		400	400	500	500	600	600	820	820	300	300	320	320	350	380	380
重量 /Weight (kg)		10	12	14	17	19	21	29	33	48	75	98	125	171	230	370

型号/Model: ZDAX47-600LB 压力等级/Pressure rating: 600LB																
口径 /Size	mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350
	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14
L-RF-BW		165	190	216	229	241	292	330	356	432	508	559	660	787	838	889
H		180	180	185	200	210	215	250	270	300	340	365	400	450	510	590
W		400	400	500	500	600	820	1000	1000	300	300	320	320	350	380	380
重量 /Weight (kg)		14	16	18	20	24	29	35	47	91	129	210	320	660	920	1250

型号/Model: ZDAX47-300LB 压力等级/Pressure rating: 300LB																
口径 /Size	mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350
	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14
L-RF		140	152	165	178	190	216	241	283	305	381	403	419	457	502	762
L-BW		152	178	203	216	229	267	305	330	356	381	457	521	559	635	762
H		180	180	185	200	210	215	250	270	300	340	365	400	450	510	590
W		400	400	500	600	600	820	1000	1000	300	300	320	320	350	380	380
重量 /Weight (kg)		12	14	16	19	21	24	31	36	61	86	130	190	255	380	560

型号/Model: ZDAX47-900LB 压力等级/Pressure rating: 900LB																
口径 /Size	mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350
	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14
L-RF-BW		229	229	254	279	305	368	419	381	457	559	610	737	838	965	1029
H		180	180	185	200	210	215	250	270	300	340	365	400	450	510	590
W		400	400	500	600	600	820	1000	1000	300	300	320	320	350	380	380
重量 /Weight (kg)		17	29	21	24	30	37	44	65	110	160	255	380	810	1050	1460

美标压力平衡式倒装油密封旋塞阀安装与维护须知

第一部分：安装须知

一、 安装前准备

核对阀门：核对设备铭牌，确认公称压力、口径及壳体材质（通常为铸钢、不锈钢或合金钢）符合设计要求，确认阀门符合美标设计规范。检查旋塞与阀体密封面有无划伤或锈蚀，并检查压力平衡通道是否畅通。检查注脂阀是否完好，油密封系统各部件齐全。清点法兰密封垫片及法兰连接件。

管道准备：安装前必须对管道系统进行彻底吹扫或冲洗，清除管道内残留的焊渣、铁锈、油污及杂物，防止杂质进入阀腔损伤密封面或堵塞压力平衡通道。

方向与姿势：阀门为双向密封阀门，无严格介质流向限制。由于采用倒装式结构，安装时应注意旋塞大端位于阀体底部。为便于操作和维护，推荐水平安装并使阀杆处于垂直向上位置，手轮或执行机构应朝向便于操作的方向，注脂阀应朝向便于注脂操作的位置。法兰连接时应确保两法兰面平行对中。

Part 1: Installation Instructions

1、 Preparation before installation

Verification: Check the valve nameplate to confirm that the nominal pressure, nominal diameter, and body material (typically cast steel, stainless steel, or alloy steel) meet the design requirements, and confirm that the valve complies with American standards. Inspect the sealing surfaces of the plug and valve body for scratches or corrosion. Check that the pressure balance passages are unobstructed. Check that the lubricating fitting is intact and all oil sealing system components are complete. Count the flange gaskets and flange fasteners.

Pipeline Preparation: Before installation, the pipeline system must be thoroughly purged or flushed to remove weld slag, rust, oil, and other debris, preventing foreign matter from entering the valve cavity and damaging the sealing surfaces or blocking the pressure balance passages.

Orientation and Position: The valve is a bidirectional sealing valve with no strict flow direction restriction. Due to the inverted design, note that the large end of the plug is located at the bottom of the valve body. For ease of operation and maintenance, horizontal installation is recommended with the valve stem in a vertical upward position. The handwheel or actuator should face a direction convenient for operation, and the lubricating fitting should face a direction convenient for lubrication operations. During flange connection, ensure that the two flange faces are parallel and aligned.

二、 安装过程

吊装与对中：平稳吊装阀门，确保阀体法兰与管道法兰自然对中，严禁强行撬动对孔。禁止以阀杆、手轮或注脂阀作为承力点。

位置选择：建议安装在需要可靠截断或接通介质的苛刻工况管段中，如高压管道、泵出口、反应器上下游或长输管道上。安装位置应留有足够的空间用于拆卸阀门、注脂操作及维护。

支撑与仪表：大口径或重型旋塞阀需有管道独立支撑，避免阀体承受额外弯矩。为监控运行状态，建议在阀门上下游安装压力表，用于判断阀门密封性能。法兰连接时应使用合适的密封垫片，按对角线顺序均匀紧固螺栓。

注脂系统准备：安装前应确认注脂阀处于关闭状态，注脂通道畅通。首次安装后可注入适量密封脂，建立初始油膜密封。

2、 Installation process

Lifting and Alignment: Lift the valve smoothly and ensure natural alignment between the valve body flange and the pipeline flange. Forced alignment by prying is prohibited. Do not use the valve stem, handwheel, or lubricating fitting as lifting or load-bearing points.

Location Selection: The valve should be installed in demanding pipeline sections where reliable shut-off or flow passage is required, such as high-pressure pipelines, pump outlets, upstream/downstream of reactors, or long-distance pipelines. Sufficient space shall be reserved for valve disassembly, lubrication operations, and maintenance.

Supports and Instruments: Large-diameter or heavy plug valves require independent pipeline supports to prevent additional bending moments on the valve body. To monitor operating status, it is recommended to install pressure gauges upstream and downstream of the valve to evaluate valve sealing performance.

For flange connections, use appropriate sealing gaskets and tighten bolts evenly in a diagonal sequence. **Lubrication System Preparation:** Before installation, confirm that the lubricating fitting is in the closed position and that the lubrication passage is unobstructed. After initial installation, an appropriate amount of sealing grease may be injected to establish an initial oil film seal.

第二部分：操作与使用须知

一、初始投运：

排气与充液：缓慢开启系统介质进口阀，打开阀门高点的排气阀（如有），待介质连续稳定流出后关闭，排尽阀腔内空气。

检漏与观察：升压至工作压力后，检查阀体与管道法兰连接处、阀杆填料处、注脂阀处有无渗漏。记录初始状态下的操作扭矩，作为运行基准值。观察并确认阀门在关闭状态下无内漏。

首次注脂：阀门安装后首次投运前，应通过注脂阀向密封面注入适量密封脂，建立初始油膜密封。注脂时应缓慢均匀注入，直至观察到操作扭矩明显下降或密封脂从密封面溢出为止。注脂后应关闭注脂阀。

二、运行监控与操作：

操作扭矩监测（科学维护依据）：定期记录阀门启闭时的操作扭矩。阀门采用压力平衡式结构，正常操作扭矩较小且稳定。当扭矩明显增大时，表明密封面密封脂不足或发生粘连、异物卡滞、压力平衡通道堵塞等，应及时补充密封脂或检查处理。严禁强行操作。

启闭操作：启闭阀门时应缓慢转动手轮或执行机构。旋塞阀为 90° 旋转启闭，全开或全关位置应有明显限位感。到位后勿过度施力。长期处于固定位置的阀门，建议每月进行一次全行程旋转，并定期补充密封脂，防止旋塞与阀体密封面粘连或结垢。

定期注脂维护：根据工况和使用频率，定期（如每 3-6 个月）通过注脂阀补充密封脂。注脂前应确认阀门处于关闭或半开状态（按制造商建议），缓慢注入密封脂直至操作扭矩恢复正常水平。注脂后应关闭注脂阀，擦除溢出的密封脂。

压力平衡系统检查：定期检查压力平衡通道是否畅通，确保压力平衡功能正常。如发现操作扭矩异常增大，应检查压力平衡通道是否堵塞。

密封脂选择：应根据介质特性、工作温度选择合适牌号的密封脂，确保与介质相容，不污染介质，且在工况温度下具有适当的粘度和密封性能。

Part 2: Instructions for Operation and Use

I. Initial Commissioning

Venting and Filling: Slowly open the system medium inlet valve. Open the vent valve at the high point of the valve (if available) and close it after a continuous and stable flow of medium emerges, ensuring that air in the valve cavity is completely expelled.

Leak Check and Observation: Raise the pressure to the working pressure and check for leakage at the valve-body flange connections, valve stem packing, and lubricating fitting. Record the initial operating torque as a baseline value. Observe and confirm that there is no internal leakage when the valve is closed.

Initial Lubrication: Before initial operation after valve installation, inject an appropriate amount of sealing grease through the lubricating fitting to establish an initial oil film seal. Inject slowly and evenly until the operating torque significantly decreases or grease begins to seep from the sealing surfaces. Close the lubricating fitting after injection.

II. Operation Monitoring and Handling

Torque Monitoring (Basis for Scientific Maintenance): Regularly record the operating torque when opening or closing the valve. The valve adopts a pressure-balanced structure, and the normal operating torque is low and stable. A significant increase in torque indicates insufficient sealing grease, sticking, foreign matter obstruction, or blockage of pressure balance passages on the sealing surfaces, requiring timely grease replenishment or inspection. Forced operation is prohibited.

Opening and Closing Operation: Rotate the handwheel or actuator slowly when opening or closing the valve. The plug valve opens and closes by a 90-degree rotation, and a distinct limit feel should be present at the fully open and fully closed positions. Do not over-torque when reaching the end position. For valves remaining in a fixed position for extended periods, a full-stroke rotation is recommended once per month with regular grease replenishment to prevent sticking or scaling between the plug and valve body sealing surfaces.

Regular Lubrication Maintenance: Depending on operating conditions and frequency, replenish sealing grease through the lubricating fitting regularly (e.g., every 3-6 months). Before lubrication, confirm that the valve is in the closed or partially open position (as recommended by the manufacturer). Inject sealing grease slowly until the operating torque returns to normal levels. Close the lubricating fitting after injection and wipe off any excess grease.

Pressure Balance System Check: Regularly check that the pressure balance passages are unobstructed to ensure proper pressure balance function. If operating torque increases abnormally, check whether the pressure balance passages are blocked.

Sealing Grease Selection: Select an appropriate grade of sealing grease based on the medium characteristics and operating temperature, ensuring compatibility with the medium, non-contamination, and proper viscosity and sealing performance at the operating temperature.

第三部分：维护与保养须知

一、日常维护

外观与泄漏检查：定期巡检，检查阀体、法兰连接处、阀杆填料压盖、注脂阀有无锈蚀、裂纹或泄漏。如有微量外漏可适当均匀拧紧填料螺栓。检查各法兰螺栓有无松动。

仪表维护：确保上下游压力表读数准确、灵敏。

操作灵活性检查: 定期（如每月）对阀门进行全行程启闭操作，确认转动灵活、无卡滞现象。

密封脂检查与补充: 定期检查密封脂状态，如发现操作扭矩增大或密封性能下降，应及时通过注脂阀补充密封脂。

压力平衡系统检查: 定期检查压力平衡通道是否畅通，确保压力平衡功能正常。

二、旋塞密封维护

安全隔离与泄压: 关闭阀门上下游的截止阀。缓慢打开下游泄放阀或系统放空口，确认阀腔压力降至零且无介质流出后，方可进行后续操作。对于高温介质，须待阀体温度降至常温后再作业。

拆卸填料压盖或阀盖: 使用合适工具，均匀对角松开并卸下填料压盖螺栓或阀盖螺栓。注意保护密封面，避免划伤。

取出与检查旋塞: 小心取出旋塞（如为可拆式结构）。检查旋塞与阀体密封面有无划伤、腐蚀坑点、剥落或异物粘连。检查密封脂储存槽和注脂通道是否畅通。检查压力平衡通道是否畅通。检查填料是否老化、变硬或失去弹性。

清洁密封面: 使用软布和清洁剂擦拭密封面，清除旧密封脂、结垢、锈蚀或粘连物。清洁注脂通道和压力平衡通道确保畅通。严禁用硬物刮擦密封面。对于轻微磨损，可使用专用研磨工具进行研磨修复。

检查与更换密封件: 必须更换所有旧填料和密封垫片。检查注脂阀是否完好，必要时更换。

回装与调试: 将旋塞准确复位，确保密封面清洁。通过注脂阀向密封面注入适量密封脂。均匀对称紧固填料压盖螺栓或阀盖螺栓。操作旋塞应转动灵活、无卡滞。回装后进行密封性试验，确认无内外泄漏。

Part Three: Maintenance and Care Instructions

I. Routine and Periodic Maintenance

Visual and Leak Inspection: Perform regular inspections to check for rust, cracks, or leakage at the valve body, flange connections, valve stem packing gland, and lubricating fitting. If slight external leakage occurs, evenly tighten the packing bolts as appropriate. Check for loosened flange bolts.

Instrument Maintenance: Ensure that upstream and downstream pressure gauges are accurate and responsive.

Operational Flexibility Check: Regularly (e.g., monthly) perform a full-stroke opening and closing operation of the valve to confirm smooth rotation and no sticking.

Sealing Grease Inspection and Replenishment: Regularly check the condition of the sealing grease. If operating torque increases or sealing performance deteriorates, replenish sealing grease through the lubricating fitting in a timely manner.

Pressure Balance System Check: Regularly check that the pressure balance passages are unobstructed to ensure proper pressure balance function.

II. Plug Seal Maintenance (Core Procedure)

Safety Isolation and Depressurization: Close the shutoff valves upstream and downstream of the valve. Slowly open the downstream drain valve or system vent. Ensure that the valve cavity pressure drops to zero and no medium flows out before proceeding with subsequent operations. For high-temperature media, allow the valve body temperature to cool to ambient temperature before working.

Disassembly of Packing Gland or Valve Cover: Use appropriate tools to evenly and diagonally loosen and remove the packing gland bolts or valve cover bolts. Protect the sealing surfaces from scratches.

Removal and Inspection of Plug: Carefully remove the plug (if of a removable design). Inspect the plug and valve body sealing surfaces for scratches, corrosion pits, spalling, or foreign matter adhesion. Check whether the grease storage grooves and lubrication passages are unobstructed. Check whether the pressure balance passages are unobstructed. Check whether the packing has aged, hardened, or lost elasticity.

Cleaning of Sealing Surfaces: Wipe the sealing surfaces with a soft cloth and cleaning agent to remove

old sealing grease, scale, rust, or adhered matter. Clean the lubrication passages and pressure balance passages to ensure they are unobstructed. Do not strike or scratch the sealing surfaces with hard tools. For minor wear, use specialized lapping tools for restoration.

Inspection and Replacement of Sealing Components: All old packing and gaskets must be replaced. Check whether the lubricating fitting is intact and replace if necessary.

Reassembly and Testing: Properly reposition the plug, ensuring that the sealing surfaces are clean. Inject an appropriate amount of sealing grease through the lubricating fitting. Evenly and symmetrically tighten the packing gland bolts or valve cover bolts. The plug shall rotate smoothly without sticking. After reassembly, perform a sealing test to confirm no internal or external leakage.

三、常见故障与处理

故障现象/Fault Phenomenon	可能原因/Possible Causes	处理方法/Corrective Actions
阀门无法完全关闭，内漏严重 / Valve fails to close completely; severe internal leakage	1.旋塞与阀体密封面磨损或划伤 2.密封脂不足或干涸 3.密封面有异物卡滞 4.压力平衡通道堵塞导致密封比压不足 / 1.Wear or scratching of plug and valve body sealing surfaces 2.Insufficient or dried sealing grease 3.Foreign matter stuck between sealing surfaces 4.Pressure balance passage blocked causing insufficient sealing specific pressure	1.拆解检查密封面，进行研磨修复或更换旋塞 2.通过注脂阀补充密封脂 3.清洗密封面，清除异物 4.清理压力平衡通道 / 1.Disassemble and inspect sealing surfaces; perform lapping or replace the plug 2.Replenish sealing grease through lubricating fitting 3.Clean sealing surfaces to remove foreign matter 4.Clean pressure balance passages
阀杆填料处外漏 / External leakage at valve stem packing	1.填料螺栓松动 2.填料老化或磨损 3.阀杆表面划伤或腐蚀 / 1.Packing bolts loose 2.Packing aged or worn 3.Valve stem surface scratched or corroded	1.均匀拧紧填料螺栓 2.泄压后更换新填料 3.修复或更换阀杆 / 1.Evenly tighten packing bolts 2.Depressurize and replace packing 3.Repair or replace the valve stem
操作扭矩过大，转动困难 / Excessive operating torque; difficult rotation	1.密封脂不足或干涸 2.长期未操作，密封面粘连或结垢 3.填料压得过紧 4.注脂通道或压力平衡通道堵塞 5.压力平衡系统失效 / 1.Insufficient or dried sealing grease 2.Long period without operation; sealing surfaces stuck or scaled 3.Packing compressed too tightly 4.Lubrication passage or pressure balance passage blocked 5.Pressure balance system failure	1.补充密封脂 2.注入润滑剂或清洗密封面，反复转动直至灵活 3.适当松解填料压盖 4.清理注脂通道和压力平衡通道 5.检查并修复压力平衡系统 / 1.Replenish sealing grease 2.Inject lubricant or clean sealing surfaces; rotate repeatedly until smooth 3.Slightly loosen the packing gland 4.Clean lubrication passage and pressure balance passages 5.Check and repair pressure balance system
法兰连接处泄漏 / Leakage at flange connections	1.密封垫片老化或损坏 2.法兰螺栓松动 3.法兰密封面有划伤或腐蚀 / 1.Gasket aged or damaged 2.Flange bolts loose 3.Flange sealing surface	1.更换密封垫片 2.按对角线顺序均匀重新紧固螺栓 3.修复法兰密封面或更换阀门 / 1.Replace gasket 2.Evenly retighten bolts in diagonal sequence 3.Repair flange sealing

	scratched or corroded	surface or replace valve
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四、长期停用与存放

长期停用的阀门，应将其置于半开状态（约 15° ~30° 开启位）或按制造商建议的位置，避免密封面长期受压粘连。关闭系统进出口阀门，排除阀腔内及保温夹套内的积液和压力。

对阀杆外露表面、法兰密封面、注脂阀等加工表面进行防锈处理（如涂防锈脂）。

阀门进出口应用盲板或塑料盖封住，防止灰尘和异物进入阀腔。

注脂阀应保持关闭状态，并加以防护。

存放在干燥、通风的室内，不得露天堆放，避免受潮和机械损伤。

3、 Long term disuse and storage

For valves taken out of service for extended periods, place them in a partially open position (approximately 15° to 30° open) or as recommended by the manufacturer to prevent long-term compression sticking of the sealing surfaces. Close the system inlet and outlet valves, and drain any trapped pressure and liquid from the valve cavity.

Apply rust preventive treatment (e.g., anti-rust grease) to exposed valve stem surfaces, flange sealing surfaces, lubricating fitting, and other machined surfaces.

Cover the valve inlet and outlet with blind flanges or plastic caps to prevent dust and foreign matter from entering the valve cavity.

Keep the lubricating fitting in the closed position and protect it.

Store in a dry, well-ventilated indoor location. Outdoor storage is not permitted. Protect from moisture and mechanical damage.

非常感谢您的阅读！

Thank you very much for reading!

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