

PLV 弹性座封偏心旋塞阀

PLV Flexible seat sealing eccentric plug valve

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

PLV 弹性座封偏心旋塞阀

型号: PLVL/PLVS/PLVP/PLVE 规格: DN50-DN800

公称压力: PN1.0

适用介质: 污水、原水、清水、空气、油 (MBR)

适用温度: 0~70℃

阀体材质: 球墨铸铁

连接方式: 法兰

驱动方式: 把手式、传动帽式、蜗轮、电动、气动

Model: PLVL/PLVS/PLVP/PLVE

Specification: DN50-DN800

Nominal pressure: PN1.0

Applicable medium: wastewater, raw water, clear water, air, oil(MBR)

Applicable temperature: 0~70℃

Valve body material: nodular cast iron

Connection method: flange

drive method: handle-model, worm gear-model, motor-model, pneumatic-model



PLV 弹性座封偏心旋塞阀产品图

PLV Flexible seat sealing eccentric plug valve Product Diagram

概述

PLV 弹性座封偏心旋塞阀是一种通过偏心设置的锥形或圆柱形旋塞（塞体）的旋转运动来实现流体通道的开启或关闭的阀门。该阀采用偏心设计，旋塞的回转中心与密封面中心形成偏心距，使得旋塞在启闭过程中与阀体密封面产生凸轮式动作，启闭时迅速脱离或压紧，从而大幅减少密封面的摩擦与磨损。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。阀体内部或密封面处衬覆有弹性材料（如橡胶、PTFE 等），形成弹性座封结构，通过旋塞的偏心运动与阀体密封面实现补偿式压紧，确保在介质压力波动或密封面微量磨损时仍能保持严密密封。该阀门依靠偏心机构的机械优势及弹性座封的补偿能力实现密封，操作扭矩小，密封性能稳定，耐磨性好，特别适用于含有颗粒杂质、易磨损或需频繁操作的工况。

Overview

The PLV resilient seated eccentric plug valve is a type of valve that opens or closes the fluid passage through the rotary motion of an eccentrically positioned tapered or cylindrical plug. The valve adopts an eccentric design, where the plug's center of rotation is offset from the center of the sealing surface, creating an eccentric distance. This causes the plug to engage in a cam-like action during opening and closing, rapidly disengaging from or pressing against the valve body

sealing surface, thereby significantly reducing friction and wear on the sealing surfaces. 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 body interior or sealing surfaces are lined with resilient materials (such as rubber, PTFE, etc.), forming a resilient seated structure. Through the eccentric motion of the plug, compensatory compression against the valve body sealing surface is achieved, ensuring tight sealing even under fluctuating medium pressure or minor wear of the sealing surfaces. The valve relies on the mechanical advantage of the eccentric mechanism and the compensatory capability of the resilient seat to achieve sealing, offering low operating torque, stable sealing performance, and good wear resistance. It is particularly suitable for applications involving particulate-laden media, abrasive conditions, or frequent operation.

特点

- 1、偏心密封结构：阀门采用偏心设计，旋塞回转中心与密封面中心形成偏心距，启闭时旋塞与阀座迅速脱离或压紧，产生凸轮式动作，大幅减少密封面摩擦与磨损，延长阀门使用寿命。
- 2、弹性座封技术：阀体密封面或旋塞表面衬覆弹性材料（如橡胶、PTFE 等），形成弹性座封结构。偏心运动使旋塞在关闭时对阀座产生补偿式压紧，即使介质压力波动或密封面发生微量磨损，仍能保持严密密封。
- 3、密封性能可靠：依靠偏心机构的机械优势及弹性座封的补偿能力实现密封，密封效果不受介质压力变化影响。启闭过程中密封面无滑动摩擦，操作扭矩小，密封性能稳定。
- 4、耐磨损与抗冲刷：阀体及旋塞可根据介质选用球墨铸铁、碳钢、不锈钢等材质，弹性密封面具有良好的抗磨损性能。偏心结构使旋塞在开启时与阀座完全脱离，避免介质冲刷密封面，特别适用于含颗粒杂质的工况。
- 5、操作轻便，启闭迅速：旋塞旋转 90 度即可完成启闭操作，启闭过程中密封面无摩擦阻力，操作扭矩小，手轮操作轻便。适用于需频繁操作的场合。
- 6、无升降结构，安装空间小：阀杆与旋塞一体旋转，无轴向位移，整体高度较低，适用于安装空间受限的管道系统。

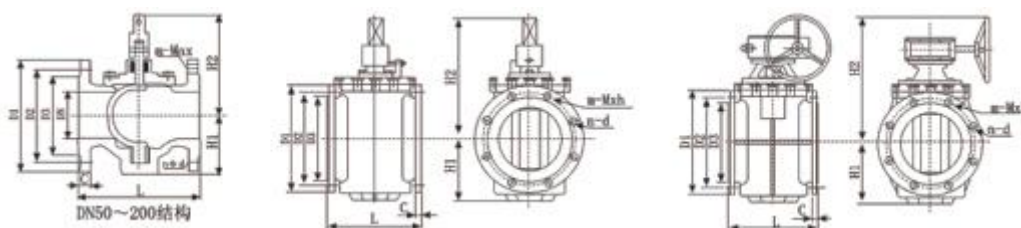
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1. Eccentric Sealing Structure: The valve adopts an eccentric design, where the plug's center of rotation is offset from the center of the sealing surface, creating an eccentric distance. During opening and closing, the plug rapidly disengages from or presses against the seat in a cam-like action, significantly reducing friction and wear on the sealing surfaces, thereby extending the valve's service life..
2. Resilient Seated Technology: The valve body sealing surface or the plug surface is lined with resilient materials (such as rubber, PTFE, etc.), forming a resilient seated structure. The eccentric motion enables the plug to apply compensatory compression against the seat when closed, maintaining tight sealing even under fluctuating medium pressure or minor wear of the sealing surfaces.
3. Reliable Sealing Performance: Sealing is achieved through the mechanical advantage of the eccentric mechanism and the compensatory capability of the resilient seat, unaffected by medium pressure variations. There is no sliding friction on the sealing surfaces during opening and closing, resulting in low operating torque and stable sealing performance.
4. Wear Resistance and Erosion Resistance: The valve body and plug can be made of ductile iron, carbon steel, stainless steel, or other materials depending on the medium. The resilient sealing

surface offers good wear resistance. The eccentric structure allows the plug to completely disengage from the seat when open, avoiding medium erosion on the sealing surface, making it particularly suitable for applications with particulate-laden media.

5. Light Operation and Quick Opening/Closing: A 90-degree rotation of the plug completes the opening or closing operation. There is no friction resistance on the sealing surfaces during operation, resulting in low operating torque and light handwheel operation. Suitable for frequent operation applications.

6. Non-Rising Stem Design, Compact Installation Height: The stem and plug rotate as one unit without axial movement, resulting in a low overall height, suitable for pipeline systems with limited installation space.



PLV 弹性座封偏心旋塞阀结构图

PLV Flexible seat sealing eccentric 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	阀体/valve body	球墨铸铁/nodular cast iron
2	阀盖/cover	球墨铸铁/nodular cast iron
3	压盖/gland	球墨铸铁/nodular cast iron
4	旋塞/plug	球墨铸铁/nodular cast iron
5	阀座/valve sea	纯镍、不锈钢或特种材料/pure nickle,stainless steel or special material
6	轴承/bearing	青铜、黄铜/bronze、brass
7	V 型密封圈/V-shaped sealing ring	NBR

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	0-70	℃

外形尺寸标准要求

- 1、阀门的结构长度按 GB-12221-89 标准之系列 3
- 2、连接法兰按 GB/T17241.6 的标准

Standard requirements for external dimensions

1. The structural length of the valve shall be in accordance with Series 3 of standard GB-12221-89

2. Connecting flanges according to GB/T17241.6 standard

外形尺寸表 Outline dimension table

DN	D1	D2	D3	C	n-d	m-MXn	L	H1	H2				
									PLVL 型 model	PLVS 型 model	PLVG 型 model	PLVE 型 model	PLVP 型 model
50	165	125	99	19	4-φ19	-	178	84	143	225	265	315	265
65	185	145	118	19	4-φ19	-	190	93	143	225	265	315	265
80	200	160	132	19	4-φ19	4-M16 通孔 viahole	203	109	174	225	312	373	340
100	220	180	156	19	8-φ19	-	229	128	174	225	312	373	340
125	250	210	184	19	8-φ19	-	254	128	174	225	312	373	340
150	285	240	211	21	4-φ23	4-M20 通孔 viahole	267	165	-	-	444	481	488
200	340	295	266	21	4-φ23	4-M20 通孔 viahole	292	198	-	-	464	508	558
250	395	350	319	24	8-φ23	4-M20 深 depth 30	330	249	-	-	527	630	728
300	445	400	370	25	8-φ23	4-M20 深 depth 30	356	290	-	-	710	666	798
350	505	460	429	26	12-φ23	4-M20 深 depth 30	432	330	-	-	723	767	-
400	565	515	480	28	12-φ29	4-M24 深 depth 36	450	355	-	-	749	881	-
450	615	565	530	28	16-φ28	4-M24 深 depth 36	450	355	-	-	749	881	-
500	670	620	582	29	12-φ28	8-M24 深 depth 36	660	427	-	-	903	1015	-
600	780	725	682	30	12-φ31	8-M27 深 depth 40	762	567	-	-	1015	1202	-

700	895	840	794	32.5	16-φ31	8-M27 深 depth 40	865	633	-	-	1393	1351	-
800	1015	950	901	35	16-φ34	8-M30 深 depth 45	965	633	-	-	1393	1351	-

PLV 弹性座封偏心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（通常为球墨铸铁、铸钢或不锈钢）符合设计要求。检查旋塞与阀体弹性座封密封面有无划伤、变形或异物，并清点法兰密封垫片及连接件。

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弹性座封密封面。

方向与姿势：PLV 阀为双向密封阀门，无严格介质流向限制。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。阀门可任意角度安装，但应确保留有足够的维护空间。

Part 1: Installation Instructions

I. Preparation before Installation

Verification: Check the valve nameplate to confirm that the nominal pressure, nominal diameter, and body material (typically ductile iron, cast steel, or stainless steel) meet the design requirements. Inspect the plug and valve body resilient seated sealing surfaces for scratches, deformation, or foreign matter. Count the flange gaskets and 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 resilient seated sealing surfaces.

Orientation and Position: The PLV valve is a bidirectional sealing valve with no strict flow direction restriction. 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. The valve can be installed at any angle, but sufficient space shall be reserved for maintenance.

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、手轮作为承力点。

位置选择：建议安装在需频繁操作、介质含颗粒杂质或易磨损的管段中，如泵出口、循环管路或污水处理系统上游。阀门应尽量靠近需保护的设备。

支撑与仪表：大口径或重型阀门需有管道独立支撑，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，通过压差判断密封面磨损或阀门开启状态。

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 or handwheel as lifting or load-bearing points.

Location Selection: The valve should be installed in pipeline sections requiring frequent operation, where the medium contains particulate matter, or where wear is a concern, such as at pump outlets, circulation

pipelines, or upstream of wastewater treatment systems. The valve shall be positioned as close as possible to the equipment to be protected.

Supports and Instruments: Large-diameter or heavy 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 seal wear or valve opening status through differential pressure.

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，检查阀体与管道连接处、阀杆填料处有无渗漏。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。

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。PLV 阀采用偏心结构，正常操作扭矩较小且稳定。当扭矩明显增大时，表明密封面可能发生粘连、异物卡滞或填料过紧，应及时检查处理。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。PLV 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。偏心结构使旋塞在开启时与阀座完全脱离，启闭过程无摩擦，特别适用于频繁操作场合。

定期操作：长期处于固定位置的阀门，建议每月进行一次全行程旋转，防止密封面粘连或沉积物积聚。

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 connections and valve stem packing. Record the initial operating torque as a baseline value. Observe and confirm that there is no internal leakage when the valve is closed.

II. Operation Monitoring and Handling

Torque Monitoring (Basis for Scientific Maintenance): Regularly record the operating torque when opening or closing the valve. The PLV valve adopts an eccentric design, and the normal operating torque is low and stable. A significant increase in torque indicates possible sticking, foreign matter obstruction, or over-tightened packing on the sealing surfaces, which should be inspected and addressed promptly. Forced operation is prohibited.

Opening and Closing Operation: Rotate the handwheel or actuator slowly when opening or closing the valve. The PLV 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. The eccentric structure allows the plug to completely disengage from the seat when open, resulting in frictionless operation, making it particularly suitable for frequent operation applications.

Periodic Operation: For valves remaining in a fixed position for extended periods, a full-stroke rotation is recommended once per month to prevent sealing surface sticking or sediment accumulation.

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。

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。

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)。检查旋塞与阀体弹性座封密封面有无划伤、腐蚀、变形或异物粘连。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, 清除结垢、锈蚀或粘连物。严禁用硬物敲击或刮擦弹性密封面。

更换密封件: 必须更换所有旧填料和密封垫片。如弹性座封损坏或老化, 应更换整个旋塞或密封组件(按制造商建议)。

回装与调试: 将旋塞准确复位, 确保密封面清洁。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, and valve stem packing gland. If slight external leakage occurs, evenly tighten the packing bolts as appropriate.

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.

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 resilient seated sealing surfaces for scratches, corrosion, deformation, or foreign matter adhesion. 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 scale, rust, or adhered matter. Do not strike or scratch the resilient sealing surfaces with hard tools.

Replacement of Sealing Components: All old packing and gaskets must be replaced. If the resilient seat is damaged or aged, replace the entire plug or seal assembly (as recommended by the manufacturer).

Reassembly and Testing: Properly reposition the plug, ensuring that the sealing surfaces are clean. 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.

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	- 弹性座封密封面磨损、划伤或老化。 - 密封面有异物卡滞。 - 偏心机构磨损导致关闭不到位。/1. Resilient seated sealing surface worn, scratched, or aged. - Foreign matter stuck between sealing surfaces. - Eccentric mechanism worn causing incomplete closure.	- 检查并更换弹性座封组件或旋塞。 - 清洗密封面，清除异物。 - 检查偏心机构，必要时更换阀门。/1. Inspect and replace resilient seat assembly or plug. - Clean sealing surfaces to remove foreign matter. - Inspect eccentric mechanism; replace valve if necessary.
阀杆填料处外漏/External leakage at valve stem packing	- 填料螺栓松动。 - 填料老化或磨损。 - 阀杆表面划伤或腐蚀。/1. Packing bolts loose. - Packing aged or worn. - Valve stem surface scratched or corroded.	- 均匀拧紧填料螺栓。 - 泄压后更换新填料。 - 修复或更换阀杆。/1. Evenly tighten packing bolts. - Depressurize and replace packing. - Repair or replace the valve stem.
操作扭矩过大，转动困难/Excessive operating torque; difficult rotation	- 密封面粘连或沉积物积聚。 - 填料压得过紧。 - 偏心机构卡滞或损坏。/1. Sealing surfaces stuck or sediment accumulated. - Packing compressed too tightly. - Eccentric mechanism stuck or damaged.	- 清洗密封面，反复转动直至灵活。 - 适当松解填料压盖。 - 检查偏心机构，必要时维修或更换阀门。/1. Clean sealing surfaces; rotate repeatedly until smooth. - Slightly loosen the packing gland. - Inspect eccentric mechanism; repair or replace valve if necessary.
阀门关闭后仍有少量泄漏/Slight leakage after valve closed	- 弹性座封轻微磨损。 - 介质压力过低，偏心压紧力不足。/1. Minor wear of resilient seat. - Low medium pressure resulting in insufficient eccentric compression force.	- 检查并更换弹性座封。 - 检查工况，确保在允许压力范围内使用。/1. Inspect and replace resilient seat. - Check operating conditions; ensure use within allowable pressure range.

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，避免弹性座封长期受压变形。关闭系统进出口阀门，排除阀腔内积液和压力。

对阀杆外露表面、法兰密封面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。

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 deformation of the resilient seat. 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, 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.

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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