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帕普生 | 挠性轴螺杆泵

FLEXIBLE-SHAFT SCREW PUMP

致力于全球领先的流体输送技术
COMMITTED TO WORLD LEADING
FLUID TRANSPORT TECHNOLOGY



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PRODUCT INTRODUCTION

产品介绍

挠性轴螺杆泵

FLEXIBLE-SHAFT SCREW PUMP

挠性轴螺杆泵是一种高效、可靠的容积式转子泵，采用先进的挠性轴传动技术，通过旋转的螺杆与精密配合的定子衬套形成密封腔室，实现流体的稳定输送。其独特的设计兼具自吸能力强、耐腐蚀、无污染、维护简便等优点，适用于多种高粘度、含颗粒介质的输送场景，是工业流体处理领域的理想选择。

The flexible shaft screw pump is an efficient and reliable positive displacement rotor pump that utilizes advanced flexible shaft transmission technology. It forms a sealed chamber through the rotating screw and precisely fitted stator bushing, enabling stable fluid delivery. Its unique design combines strong self-priming ability, corrosion resistance, non-pollution, and easy maintenance, making it suitable for a variety of high-viscosity and particle-containing medium delivery scenarios. It is an ideal choice in the field of industrial fluid processing.

产品概述

PRODUCT OVERVIEW

本产品专为锂电池制造工艺量身打造，是一款集高洁净度、高计量精度、易维护于一体的挠性螺杆泵。

它突破了传统万向节螺杆泵结构复杂、成本高昂的局限，采用创新的挠性轴设计，完美适配从低粘度溶剂（如水）到高粘度膏体（如正负极浆料）的全范围流体输送。无论是配料、混合还是涂布工位，都能实现无脉动、定量的精准输送，显著降低总使用成本（TCO）并提升能效。

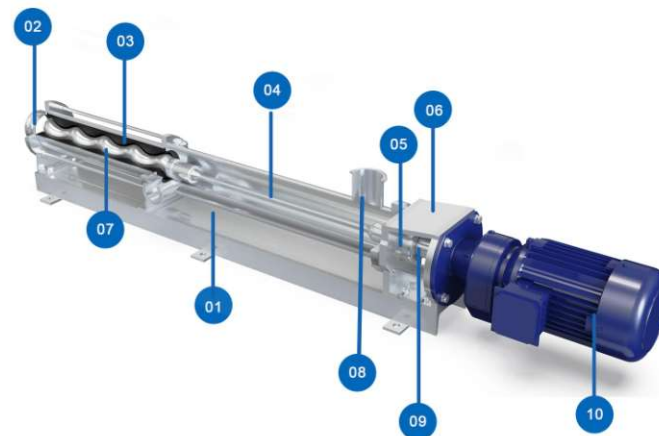
This product is tailor-made for the lithium battery manufacturing process, and it is a flexible screw pump that combines high cleanliness, high metering accuracy, and easy maintenance.

It breaks through the limitations of traditional gimbal screw pumps, which are complex in structure and expensive, by adopting an innovative flexible shaft design. This design perfectly adapts to the full range of fluid conveyance, from low-viscosity solvents (such as water) to high-viscosity pastes (such as positive and negative electrode slurries). Whether it is at the batching, mixing, or coating stations, it can achieve precise, pulsation-free, and quantitative conveyance, significantly reducing total cost of ownership (TCO) and enhancing energy efficiency.

PRODUCT STRUCTURE

产品结构

- | | |
|--------------------------|---------------------------------|
| 01 底座
Base | 06 直联支架
Direct-coupling rack |
| 02 排出口
Outlet | 07 转子
Rotor |
| 03 定子
Outlet | 08 吸入口
Direct-coupling |
| 04 挠性轴
Flexible shaft | 09 插入轴
Insertion Shaft |
| 05 轴封
Shaft seal | 10 减速电机（驱动）
Gear Motor |



CORE ADVANTAGES

核心优势

极致纯净，杜绝污染

UTMOST PURITY,
NO POLLUTION

材质升级：接触介质部件采用优质不锈钢及钛合金（或不锈钢）挠性轴，确保对昂贵原材料零污染。

洁净设计：专为高洁净度环境设计，无金属析出风险，满足电池级化学品输送的严苛标准。

Material upgrade: The components in contact with the medium are made of high-quality stainless steel and titanium alloy (or stainless steel) flexible shafts, ensuring zero contamination of expensive raw materials.

Clean design: Specifically designed for high-cleanliness environments, with no risk of metal precipitation, meeting the stringent standards for

低脉动输送：基于单螺杆工作原理，输出平稳，确保涂层厚度均一。

配方精准：极高的加料精度（溶剂输送精度可达 $\pm 1\%$ ），保障浆料配方的一致性，直接提升电池性能。

Low pulsation delivery: Based on the single screw working principle, it delivers a smooth and pulsation-free output, ensuring uniform coating thickness.

Precise formula: Highly accurate material feeding (solvent delivery accuracy up to $\pm 1\%$) ensures consistency in the slurry formula, directly enhancing battery performance.

模块化设计：采用卡箍接口，支持快速拆装；旋转单元可独立拆卸，易损件更换无需大动干戈。

寿命更长：挠性轴替代传统万向节，结构简化，在输送高粘度、高含固率介质时，使用寿命显著延长。

Modular design: Utilizing clamp interfaces, it supports quick disassembly and assembly; the rotating unit can be independently dismantled, and the replacement of wear parts does not require major effort.

Longer service life: The flexible shaft replaces the traditional universal joint, simplifying the structure. When conveying media with high viscosity and high solid content, the service life is significantly extended.

维护简便，降本增效

EASY TO MAINTAIN,
COST REDUCTION AND
EFFICIENCY IMPROVEMENT

运行安全，灵活配置

OPERATIONAL SAFETY,
FLEXIBLE CONFIGURATION

化学兼容性：密封形式多样可选，确保原材料纯净，降低HSE（健康、安全、环境）风险。

安装灵活：泵体设有顶部进料口和端部出料口，支持直联或轴承箱驱动，完美适配现场管路布局。

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DESCRIPTION OF APPLICABLE MATERIALS

适用物料描述

一、正负极浆料（高粘度、高含固率）

Cathode and anode slurries (high viscosity, high solid content)

二、隔膜涂覆液

Separator coating slurry

三、各类封装胶水

Various encapsulation adhesives

四、化学添加剂、凝聚剂等计量添加介质

Chemical additives, flocculants, and other metered dosing media

五、从低粘度水到高粘度膏状物均可适应

Adaptable to media ranging from low-viscosity liquids (e.g., water, $\sim 1 \text{ mPa} \cdot \text{s}$) to high-viscosity pastes ($> 30,000 \text{ mPa} \cdot \text{s}$)

氧化铝



不锈钢



APPLICATION SCENARIOS 应用场景

① 制浆与混合工位：高精度计量输送 PULPING AND MIXING STATION: HIGH-PRECISION METERING AND CONVEYING

- 工况描述：将PVDF、SBR、CMC等辅料及NMP溶剂/纯水，按精确比例加入搅拌罐。
解决方案：作为计量泵使用，确保溶剂输送精度达±1‰，保障电池性能一致性。
- Operating condition description: Add auxiliary materials such as PVDF, SBR, CMC, and solvents like NMP/pure water into the mixing tank according to precise proportions.
Solution: When used as a metering pump, ensure the solvent delivery accuracy reaches ±1‰ to guarantee the consistency of battery performance.

② 制浆与混合工位：高粘度浆料输送 PULPING AND MIXING STATION: HIGH VISCOSITY SLURRY CONVEYING

- 工况描述：输送混合完成的正负极浆料（高粘度、高固含量膏状流体）至缓存罐或中转罐。
解决方案：应对高磨损介质，低脉动输送防止浆料性质改变，结构坚固耐用。
- Operating condition description: Transfer the mixed positive and negative electrode slurry (high-viscosity, high-solid content paste-like fluid) to the buffer tank or transfer tank.
Solution: For handling high-wear media, ensure low pulsation during transportation to prevent changes in the slurry's properties, and the structure should be sturdy and durable.

③ 涂布工位：供料与循环 COATING STATION: MATERIAL SUPPLY AND CIRCULATION

- 工况描述：向涂布机模头稳定供料，或在主管路与旁通管路间建立循环回路防止沉降。
解决方案：超低脉动保证极片涂层厚度均匀；配合流量闭环控制，实现精确的面密度控制。
- Operating condition description: Stably supply material to the coating machine die, or establish a circulation loop between the main pipeline and the bypass pipeline to prevent sedimentation.
Solution: Ultra-low pulsation ensures uniform coating thickness on the electrode plate; coupled with flow closed-loop control, precise areal density control is achieved.

PRODUCT SPECIFICATIONS 产品参数

型号	流量范围 (m³/h)	最大输送压力 (bar)	适用粘度 (cp)
PCF1	0.2 ~ 1	24	0 ~ 1,000,000
PCF2	0.5 ~ 1.8	24	0 ~ 1,000,000
PCF5	1 ~ 4.2	36	0 ~ 1,000,000
PCF10	3 ~ 8	48	0 ~ 1,000,000
PCF17	5 ~ 12	48	0 ~ 1,000,000
PCF26	10 ~ 23	48	0 ~ 1,000,000
PCF35	20 ~ 30	48	0 ~ 1,000,000

