

Doebritz Soy Protein Powder Star Discharge Valve - Official Technical Overview & Datasheet

DOEBRITZ SOY PROTEIN POWDER STAR DISCHARGE VALVE

OFFICIAL TECHNICAL OVERVIEW & DATASHEET

ENGINEERING HIGHLIGHTS

The Doebritz Quick-Release Rotary Valve (Star Discharge Valve) is a precision-engineered airlock and metering device specifically configured for the unique handling characteristics of soy protein powder. This equipment is part of the DBR-1237 series and is designed to function as a critical interface between upstream process equipment and pneumatic conveying or gravity discharge systems. The valve combines a quick-release disassembly structure with precision clearances to ensure stable volumetric feeding, effective system pressure isolation, and rapid sanitation access.

This equipment addresses the specific challenges of soy protein powder handling: its tendency to bridge, its requirement for sanitary processing environments, and the need for consistent, low-pulsation feeding into downstream conveying lines. The valve is constructed from high-grade stainless steel (SUS304 / SUS316L) with all product-contact surfaces polished to a hygienic finish, meeting the stringent requirements of food and supplement

manufacturing .



STRUCTURAL ROTOR OVERVIEW

The rotary assembly consists of a precision-machined rotor with multiple vanes rotating within a close-tolerance housing. The rotor pockets are designed to capture a consistent volumetric charge of soy protein powder from the inlet hopper and discharge it at the outlet with each revolution, while simultaneously acting as an airlock to minimize system gas leakage .

The rotor and housing are manufactured from high-grade stainless steel (SUS304 or SUS316L) and are available with a range of coatings for specific wear or corrosion requirements, such as tungsten carbide or ceramic layers, for highly abrasive product variants .

KEY FEATURES

- Quick-Release (Side-Extractable) Design: The internal rotor can be extracted from the side of the valve without unbolting the main pipeline. This enables rapid inspection, manual cleaning, and maintenance, drastically reducing downtime during product changeovers or sanitation procedures .
- Hygienic Construction: All internal surfaces that contact the product are polished to a roughness of $Ra \leq 0.8 \mu m$. This mirror-like finish prevents powder adhesion, eliminates dead zones, and facilitates thorough cleaning, which is critical for food-grade soy protein processing .
- Precision Clearances for Effective Airlock: The rotor-to-housing clearance is precisely controlled between 0.1 and 0.2 mm. This tight tolerance minimizes air leakage across the valve, ensuring stable system pressure and efficient pneumatic conveying .
- Stable, Anti-Jamming Conveying: The precision-machined rotor pockets and optimized internal geometry prevent material bridging and pulsation. This ensures a uniform, consistent discharge rate, essential for accurate downstream metering and blending .

- Versatile Drive and Control Options: The valve can be equipped with variable frequency drives (VFD) and integrated into a PLC control system. This allows for precise flow control, batch metering, and recipe-based automated 配料 (automated batching) .

SUPPORTED POWDERS & INDUSTRIAL DEPLOYMENT

This valve is specifically suited for soy protein powder but is also broadly applicable to a range of food, pharmaceutical, and chemical powders with similar flow characteristics.

- Food & Supplement Applications: Soy protein isolate, soy protein concentrate, textured vegetable protein (TVP), milk powder, whey powder, flour, starch, cocoa powder, and other fine food ingredients .

- Pharmaceutical Applications: Antibiotic powders, vitamin premixes, probiotic powders, and excipients like microcrystalline cellulose and lactose powder .

- Chemical & Industrial Applications: Fine chemicals, pigments, carbon black, and other non-abrasive to moderately abrasive powders where a sanitary design is beneficial.

PERFORMANCE SPECIFICATIONS

The following parameters define the operational envelope of the Doebritz Star Discharge Valve for soy protein powder applications.

PARAMETER REGISTRY

Pressure Range: -0.5 to 2 bar

Temperature Range: -10°C to 150°C

Maximum Capacity: Up to 634 L/min

Flange Standard: DIN PN10 / ANSI 150

Drive Configuration: Direct Drive or Chain Drive with VFD/PLC control

Mounting Position: Horizontal

Parameter	Specification
Capacity / Volume	Up to 634 L/min

Working Pressure Range	-0.5 to 2 bar
Working Temperature Range	-10°C to 150°C
Flange Standard	DIN PN10 / ANSI 150
Drive Configuration	Chain Drive / Direct Drive, with VFD/PLC
Material (Product Contact)	SUS304 / SUS316L Stainless Steel
Surface Finish (Internal)	Ra ≤ 0.8 μm (Polished/Mirror)
Rotor-to-Housing Clearance	0.1 – 0.2 mm
Mounting Orientation	Horizontal
Sealing Type	Labyrinth Seal / Lip Seal

CERTIFICATIONS MATRIX

- CE, TÜV, and Statement certifications
- ATEX certification for use in explosive dust atmospheres (ZONE 20/21/22)
- Conforms to hygienic standards for food and pharmaceutical processing

SYSTEM INTEGRATION & MAINTENANCE LOGIC

For optimal performance, the valve should be integrated with a suitable upstream hopper or silo, a downstream pneumatic conveying line or gravity chute, and an appropriate drive and control system. The valve is specifically designed for horizontal installation .

Maintenance and cleaning are facilitated by the quick-release design. For routine cleaning, the valve can be disassembled without tools for manual inspection and washing. For highly sanitary applications, the design is compatible with online CIP (Clean-in-Place) and WIP (Wash-in-Place) procedures, followed by a manual inspection of critical surfaces .

