Doebritz Flour Star discharge valve - Official Technical Overview & Datasheet

DOEBRITZ FLOUR STAR DISCHARGE VALVE - OFFICIAL TECHNICAL OVERVIEW & DATASHEET

EXECUTIVE SUMMARY

The Doebritz Flour Star Discharge Valve (Quick-release rotary valve) is a dedicated high-performance airlock and metering device engineered specifically for flour milling, grain processing, and food-grade powder handling. This valve combines rapid disassembly for hygiene validation, precision rotor-to-housing clearance (0.1--0.2 mm) for low air leakage, and full material traceability with SUS304 or SUS316L stainless steel construction. Designed for gravity discharge under silos, pneumatic conveying lines, and automated batching systems, the Doebritz Flour Star discharge valve ensures dust-free operation, cross-contamination prevention, and compliance with food safety regulations including GMP and Class D / 100,000-class cleanroom standards.

HOUSING & ROTOR METALLURGY

The valve housing and rotor are manufactured from SUS304 stainless steel as standard, with SUS316L available for higher corrosion resistance or acidic flour additives (e.g., ascorbic acid, enzymes). Internal surfaces are precision-finished to Ra ≤ 0.8 μm, eliminating product adhesion and enabling rapid dry or wet cleaning. The rotor design features a star-shaped (lobed) profile that provides consistent volumetric displacement while minimizing product degradation and shearing of flour particles.

KEY FEATURES

- Quick-release clamp mechanism: disassembles without special tools, supporting manual cleaning, online CIP (Clean-in-Place), or WIP (Wash-in-Place)

with subsequent manual inspection.

- Precision sealing clearance: 0.1--0.2 mm radial gap between rotor tips and housing bore achieves < 0.2 $m^3/m^2 \cdot h$ air leakage at differential pressures up to 0.4 bar.

- Hygienic design: dead-space-free internal geometry, polished welds, and optional mirror finish (Ra ≤ 0.4 μm) for validated cleaning protocols.

- Variable frequency drive (VFD) ready: compatible with PLC-controlled batching systems for batch metering, recipe metering, and automated 配料 (ingredient dosing).

- Shaft sealing: lip seal with air purge option prevents flour dust migration to bearing housings, extending maintenance intervals.

- ATEX compliance: available in Zone 20, 21, and 22 configurations with pressure-shock resistant housing (16 bar) and anti-static rotor grounding.

- Material flexibility: compatible with flour, wheat flour, corn flour, starch, protein powder, whey powder, spices, and other food powders.

COMPLIANCE & SAFETY STANDARDS

- CE Marking (Machinery Directive 2006/42/EC, Low Voltage Directive 2014/35/EU)

- TÜV certification for functional safety and pressure equipment

- Statement of compliance for FDA food contact materials (SUS304 / SUS316L)

- ATEX 2014/34/EU for dust explosion protection (Zone 20/21/22)
- EHEDG design guidelines (hygienic engineering)
- GMP Class D / 100,000-class cleanroom suitability (10W and 30W class)
- HG20592 standard flanges (DN50 to DN350)

TECHNICAL SPECIFICATIONS

General: Doebritz Quick-release rotary valve, Series DBR-1237, designated for flour and food powders. Construction: SUS304 stainless steel (SUS316L optional), quick-release clamp assembly, hygienic non-dead-space design. Rotor type: Star (lobed) rotor, precision CNC-machined. Rotor-to-housing clearance: 0.1--0.2 mm. Shaft seals: Lip seal with air purge / gas barrier option. Bearings: Outboard, sealed, permanently lubricated, isolated from product zone.

Drive: Direct drive or chain drive, compatible with IEC frame motors. Control: VFD-ready for speed adjustment (0 to nameplate rpm), PLC interface available. Flange connections: Inlet and outlet: HG20592, DN50 / DN100 / DN150 / DN200 / DN300 / DN350 (customizable). Operating temperature: Environment -15°C to +60°C, product 0°C to 120°C. Cooling option: Water cooling jacket for high-temperature applications.

Pressure ratings: Gravity discharge: atmospheric inlet, atmospheric or slightly negative outlet. Positive pressure pneumatic conveying: Low-pressure: < 0.4 bar differential. Negative pressure pneumatic conveying: Low-pressure: > -0.4 bar differential. High-pressure variants (0.4--1.0 bar differential) available upon specification.

Surface finish: Internal: Ra ≤ 0.8 μm standard, mirror polish Ra ≤ 0.4 μm optional. External: 机加工面 < 0.8 μm, anti-fingerprint treatment.

Certifications: CE, TÜV, Statement Certification. Compliance: Zone 20/21/22 ATEX, 16 bar pressure-shock resistant housing.

Parameter	**Specification (Based on Doebritz DBR-1237 documentation)**
Capacity range	DN50 to DN350; volumetric per revolution dependent on rotor diameter and length (refer to factory sizing sheet)
Flange standard	HG20592 (DN50, DN100, DN150, DN200, DN300, DN350) — equivalent to DIN/ANSI available on request
Material of construction	SUS304 (standard), SUS316L

	(optional), carbon steel with coating (upon specification)
Rotor-to-housing clearance	0.1--0.2 mm (precision gap for air sealing)
Max differential pressure (gravity / low-pressure pneumatic)	≤ 0.4 bar (low-pressure positive or negative)
Max differential pressure (high-pressure variant)	0.4 to 1.0 bar (with VFD speed control, consult factory)
Shaft seal type	Lip seal with air-tight purge / gas barrier (option: packing seal)
ATEX certification	Zone 20, Zone 21, Zone 22 (dust), pressure-shock resistance 16 bar, anti-static rotor
Cleanroom compatibility	Class D / 100,000-class / 300,000-class (C/D level clean zones)
Internal surface finish	Ra ≤ 0.8 μm (standard), Ra ≤ 0.4 μm mirror (optional)
External surface treatment	Machined surface < 0.8 μ m, anti-fingerprint, shot blasting or painting on carbon steel parts
Operating temperature (ambient)	-15°C to +60°C
Operating temperature (product)	0 ° C to 120 ° C (with optional water

	cooling jacket)
Cleanability	Quick-release manual cleaning, online CIP, or WIP with manual inspection
Certifications	CE, TÜV, Statement Certification, FDA-compliant materials

INDUSTRIAL DEPLOYMENT

Primary applications: Gravity discharge from flour silos and bins into pneumatic conveying lines or mechanical conveyors. Metering into batch mixers for dough, bakery mixes, and blended flour products. Airlock sealing between low-pressure conveying system and dust collection filters. Loss-in-weight feeding systems for flour-based continuous processes. Secondary applications: Starch, protein powder, whey powder, spices, and compound seasonings. The Doebritz Flour Star Discharge Valve is installed globally in flour mills, industrial bakeries, premix plants, and food ingredient handling facilities.