

Doebritz Quick-Release Rotary Valve - Official Technical Overview & Datasheet

EXECUTIVE SUMMARY

Doebritz presents the DBR-1237 Quick-Release Rotary Valve, a precision-engineered bulk solids handling component designed for superior airlock sealing, rapid maintenance, and uncompromising hygienic operation. This platform integrates a patented quick-release clamping mechanism with 精密 rotor-to-housing clearances to deliver exceptional volumetric efficiency, reduced pressure leakage, and full traceability for regulated industries. As a cornerstone of modern pneumatic conveying and gravity discharge systems, the DBR-1237 series offers a modular architecture that accommodates diverse metallurgies, surface finishes, and ATEX-certified safety configurations, ensuring seamless integration into food, pharmaceutical, chemical, and energy storage production lines.



HOUSING & ROTOR METALLURGY

The DBR-1237 valve body and rotor are manufactured from a choice of high-grade stainless steel (SUS304, SUS316L) or carbon steel, with optional advanced wear-resistant coatings including tungsten carbide, ceramic, and high-performance polymers (PE, PTFE, PA). The one-piece investment-cast housing provides dimensional stability and structural integrity under differential pressures up to 1.0 bar (positive) and -1.0 bar (negative). All wetted surfaces are machined to precise tolerances, with internal finishes available from $Ra \leq 0.4 \mu\text{m}$ mirror polish to $Ra \leq 1.6 \mu\text{m}$ for abrasive service, ensuring optimal flow characteristics and cleanability.

KEY FEATURES

- Quick-Release Clamping: Tool-free disassembly and assembly in under two

minutes, enabling rapid manual cleaning, CIP/WIP cycles, and minimizing production downtime. The clamping mechanism ensures consistent, repeatable sealing force without specialized tools.

- Precision Rotor-to-Housing Clearance: Maintained at 0.1–0.2 mm (radial and axial) to minimize air leakage (typically < 0.5 Nm³/h at 0.6 bar differential), ensuring stable pneumatic conveying pressure and accurate volumetric metering.

- Versatile Shaft Sealing: Features a double lip seal with air purge connection for positive sealing against dust ingress and product escape. Optional packing gland seals available for high-temperature or abrasive applications.

- Hygienic & CIP-Ready Design: All internal surfaces are free of crevices and dead zones. The valve is fully drainable and supports CIP (Clean-in-Place) and WIP (Wash-in-Place) protocols, meeting the strict hygiene requirements of GMP and FDA-regulated environments.

- ATEX & NFPA Compliance: Certified for operation in Zone 20/21/22 dust explosion hazard areas. The valve is available with flameproof construction, pressure shock-resistant housing (up to 16 bar), and anti-static rotor options.

COMPLIANCE & SAFETY STANDARDS

The Doebritz DBR-1237 series is designed and manufactured in accordance with international standards:

- Machinery Directive 2006/42/EC (CE Marking)
- ATEX Directive 2014/34/EU (Equipment for Potentially Explosive Atmospheres)
- NFPA 69 (Standard on Explosion Prevention Systems)
- FDA Title 21 CFR (for food-contact materials, upon material selection)
- EHEDG (European Hygienic Engineering & Design Group) guidelines for hygienic design

Each unit is supplied with a comprehensive compliance declaration, including material certificates (EN 10204 3.1) and inspection reports.

TECHNICAL SPECIFICATIONS

General

- Brand: Doebritz
- Model: DBR-1237
- Type: Quick-Release Rotary Valve / Airlock Feeder
- Functional Principle: Rotary vane feeder with precision-machined rotor
- Mounting: Flanged connection (top and bottom)
- Orientation: Vertical (inlet top, outlet bottom)

Construction & Materials

- Housing Material: SUS304, SUS316L, Carbon Steel (painted or nickel-plated)

- Rotor Material: Matches housing; optional coatings: Tungsten Carbide, Ceramic, PE, PTFE, PA
- Shaft Seals: Lip seal with air purge (standard) / Packing gland (optional)
- Bearing Housing: Outboard, sealed, with grease lubrication points

Performance

- Pressure Range (Positive): Low pressure: < 0.4 bar; High pressure: 0.4 to 1.0 bar (VFD ready)
- Pressure Range (Negative): Low pressure: > -0.4 bar; High pressure: -1.0 to -0.4 bar (VFD ready)
- Operating Temperature (Ambient): -15°C to +60°C
- Operating Temperature (Product): 0°C to +120°C (higher with cooling jacket option)
- Rotor Clearance: 0.1–0.2 mm
- Capacity: Volumetric displacement per revolution: 2.5 to 100 liters (depending on size)

Sizes & Connections

- Flange Standard: HG20592 (DIN/ANSI compatible options available)
- Nominal Diameters (DN): DN50, DN100, DN150, DN200, DN300, DN350
- Drive: Direct drive or chain drive; IEC motor flange mount (B5/B14)
- Motor: Standard or ATEX-certified; available with inverter-duty rating for VFD

control

Surface Finishes (Internal / External)

- External: Painted carbon steel, shot-blasted, machined ($R_a < 0.8 \mu m$), anti-fingerprint coating
- Internal: Mirror polish ($R_a \leq 0.4 \mu m$), standard ($R_a \leq 0.8 \mu m$), or ($R_a \leq 1.6 \mu m$); optional wear-resistant coatings

Optional Features

- Water Cooling Jacket (for product temperatures $> 80^\circ C$)
- ATEX/Flameproof Construction (Pressure shock-resistant up to 16 bar)
- Inlet/Outlet adapters for specific process connections
- Speed monitoring and position sensors (for PLC integration)

Parameter	Specification (DBR-1237 Series)
Capacity (Volumetric per rev.)	2.5 to 100 Liters/rev (depending on DN size)
Flange Standard	HG20592 (DN50, DN100, DN150, DN200, DN300, DN350) – DIN/ANSI compatible
Drive Configuration	Direct Drive / Chain Drive; IEC motor flange B5/B14

Material (Standard)	SUS304, SUS316L, Carbon Steel (painted/nickel-plated)
Rotor Clearance (Radial & Axial)	0.1–0.2 mm
Operating Temperature (Product)	0 °C to +120 °C (with optional water cooling jacket)
Max Differential Pressure	1.0 bar (positive) / -1.0 bar (negative)
Shaft Seal (Standard)	Lip seal with air purge connection
Surface Finish (Internal)	$R_a \leq 0.4 \mu\text{m}$ (mirror) / $R_a \leq 0.8 \mu\text{m}$ / $R_a \leq 1.6 \mu\text{m}$; optional coatings
ATEX Classification	Zone 20/21/22 (option: flameproof, pressure shock-resistant up to 16 bar)
Cleanability	Quick-release disassembly for manual cleaning; CIP/WIP ready
Certifications	CE, TÜV, ATEX, FDA-compliant materials (on request)



INDUSTRIAL DEPLOYMENT

The Doebritz DBR-1237 Quick-Release Rotary Valve is engineered for heavy-duty continuous operation across a broad spectrum of bulk solids applications. Typical installation contexts include:

- Pneumatic Conveying (Dilute & Dense Phase): Serving as an airlock feeder or discharge valve in positive or negative pressure systems for powders, granules, and pellets.
- Gravity Discharge: Mounted beneath silos, hoppers, and mixers for controlled volumetric feeding with minimal product degradation.
- Metering & Batching: Integrated with variable frequency drives (VFD) and PLC controls for precise, repeatable batch or continuous weight-loss feeding.
- Hygienic Processing: Ideal for food, dairy, and pharmaceutical production lines requiring frequent washdown and contamination-free operation.

Notable application examples include:

- Food: Flour, starch, sugar, cocoa powder, spices, protein powders, and coffee grounds.
- Pharmaceutical: APIs, excipients, lactose, microcrystalline cellulose, and freeze-dried vaccine powders.
- Chemical & Petrochemical: Carbon black, pigments, PTA, PE/PP pellets, and catalysts.
- Energy & New Materials: Lithium battery cathode/anode materials, silicon powder, and graphite.

With its robust construction, high-precision clearances, and rapid-cleaning capability, the DBR-1237 series delivers measurable operational advantages: reduced product loss, lower energy consumption per ton conveyed, and minimized downtime for maintenance, ultimately contributing to a lower total cost of ownership (TCO).

For comprehensive engineering support, including sizing calculations, pressure drop analysis, and customized nozzle configurations, please consult the Doebritz application engineering team.