Fixed Speed Rotary Valve - Official Technical Overview & Datasheet

EXECUTIVE SUMMARY

The Doebritz Fixed Speed Rotary Valve represents the pinnacle of precision airlock and metering technology for dilute phase pneumatic conveying, dust collection, and gravimetric feeding systems. Engineered for the plastics, chemical, food, and pharmaceutical industries, this valve provides consistent volumetric discharge with minimal gas leakage, ensuring system efficiency and process stability. With its robust fixed-speed drive train, the valve delivers repeatable, maintenance-free operation in continuous-duty applications up to 150,000 cycles per year.

Unlike conventional rotary valves that rely on variable frequency drives, the Doebritz fixed-speed platform is optimized for constant-throughput environments where reliability and uptime outweigh speed adjustment. Its primary value proposition lies in zero drive drift, simplified controls architecture, and extended mean time between failures (MTBF). Whether sealing against pressure differentials up to 1.5 bar(g) or handling abrasive pellets and hygroscopic powders, this valve sets the benchmark for predictable, dust-tight rotary feeding.

HOUSING & ROTOR METALLURGY

The housing is precision cast from GJS-500-7 nodular cast iron (standard) or investment cast AISI 316L stainless steel for sanitary and corrosive applications. All castings undergo 100% X-ray inspection to verify porosity-free structures. CNC machining achieves a true cylindrical bore with surface roughness Ra ≤ 0.8 µm, while the rotor is dynamically balanced and fitted with 8 to 12 vanes. Standard rotor clearances are held to 0.10–0.15 mm (0.004–0.006 inches) to optimize the airlock seal, with optional close-clearance (0.05 mm) for high-pressure differentials or fine powders. Rotor tips feature hardened edges or optional PTFE-tipped vanes for abrasive media.

KEY FEATURES

- Outboard Bearing Support: Bearings are isolated from the product zone by long shaft spans and dual labyrinth seals, preventing dust ingress and allowing high-temperature operation up to 250°C without lubricant degradation.

- Fixed-Speed IEC Gearmotor: Direct-coupled to the rotor shaft via a C-face hollow bore. Fixed 10:1 ratio (or custom) delivers constant 5–60 RPM with zero belt slippage or chain wear; rated for continuous duty (S1) with IP66 enclosure.

- Dual Lip Seals with Air Purge Option: Primary and secondary PTFE / Viton™ lip seals create a positive barrier against leakage. Optional compressed air purge (0.2–0.5 bar) pressurizes the seal cavity for abrasive or hygroscopic products.

- Removable End Covers: All bearing housings are fitted with quick-removable covers allowing on-site inspection without disconnecting the rotor or drive, cutting maintenance time by 40%.

- NFPA/NBR Deflagration Venting (optional): Integrated rupture panel holders meet NFPA 69 standards for pneumatic conveying of combustible dusts, with flame-quenched venting paths.

COMPLIANCE & SAFETY STANDARDS

Doebritz Fixed Speed Rotary Valves are fully ATEX certified for dust and gas environments: Zone 20 (continuous dust), Zone 21 (high probability), and Zone 22 (low probability) with temperature classes T4–T6. All units carry CE marking and meet EHEDG hygienic design guidelines for food contact (FDA compliant elastomers available). Optionally, valves are certified to NFPA 68/69 for deflagration venting and ASME B31.3 for process piping integration. Third-party certification by DNV and CRN registration for Canadian pressure vessels is available on request.

TECHNICAL SPECIFICATIONS

All parameters are based on factory acceptance testing according to DIN EN 14466 (rotary valve performance). Performance data at differential pressure 0.8 bar(g) with air and polyethylene pellets (bulk density 560 kg/m³).

Parameter	**Specification**
Capacity / Volume	2.5 to 100 Liters/rev (standard rotors)
Flange Standard	DIN PN10 / ANSI 150# RF / JIS 10K
Drive Configuration	Fixed speed IEC gearmotor, direct drive (5, 10, 15, 20, 30, 40, 50, 60 RPM)
Max Pressure Differential	1.5 bar(g) (standard), 2.5 bar(g) (high-pressure version)

Temperature Range	-20 ° C to +250 ° C (with high-temp seals)
Housing Materials	GJS-500-7 nodular iron / CF8M (AISI 316L) stainless steel
Rotor Clearance	0.10 mm (standard) / 0.05 mm (close tolerance)
Certifications	ATEX Zone 20/21/22, CE, EHEDG, FDA (optional NFPA/CRN)