Rotary Paddle Level Switch

Product Overview

The Rotary Paddle Level Switch is an industrial field control instrument that uses the principle of a motor-driven rotating paddle to perform point-level detection of solid powders and granular materials. When the material rises and comes into contact with the paddle, the paddle stops rotating, outputs an on/off contact signal, and simultaneously cuts off the motor's power supply; when the material drops away from the paddle, the spring resets, the paddle resumes rotation, and it continues to detect changes in the material level.









Technical Specifications

Power Supply	220 VAC / 110 VAC / 24 VDC
Power Consumption	4W
Contact Rating	10A/250VAC SPDT (Single-Pole, Double-Throw)
Blade Speed	1 RPM
Torque	1.0 kg×cm
Specific Gravity of Applicable Materials	≥0.5 cm^3
Operating Temperature	-20°C to +80°C; High-Temperature Model: -20°C to +400°C
Insulation Resistance	≥100 MΩ (500 VDC)
Dielectric Strength	1500 V / 1 min
Protection Rating	IP65
Blade Material	SUS304 Stainless Steel
Installation Methods	Horizontal Installation / Vertical Installation
Housing Material	Die-cast aluminum alloy (standard) / stainless steel (optional)

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Key Benefits and Features of the Product

Reliable Operating Principle

The motor that drives the blade rotation runs continuously. When the material comes into contact with the blade and creates resistance, the blade stops, the motor is de-energized, and a signal is output—the entire process involves no electronic components for detection, eliminating issues such as drift or zero-point drift, and ensuring a stable and reliable signal.

Exceptional overload protection capability

It features a built-in mechanical overload clutch mechanism that automatically disengages when material becomes jammed in the blades, protecting the motor from burning out, significantly extending its service life, and reducing maintenance costs.

Unique Sealing Design

The motor compartment is designed to be isolated from the detection compartment. Combined with high-precision seals, this design achieves an IP65 protection rating, effectively preventing dust from entering the motor compartment and making it suitable for highly contaminated industrial environments.

Easy to install, low maintenance costs

When installed horizontally, the blades are angled 10° to 20° downward relative to the horizontal plane to reduce direct impact from the material.

If installation at the feed inlet is unavoidable, protective baffles can be installed to shield the blades.

The junction box's cable entry is designed to face vertically downward; when used with a rain cover, the unit can operate reliably even outdoors.

No calibration is required—simply plug it in and use it—which significantly reduces commissioning time.

Wide Range of Specifications and Configurations

Multi-voltage compatibility: 220V / 110V / 24V (50/60 Hz)

Multiple material options: SUS304 stainless steel blades (standard), 316L stainless steel (optional, resistant to strong acids and alkalis)

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High-temperature version: Supports operating temperatures up to 400°C (custom order required)

Various process connections: threaded, flanged (DN50/DN80, etc.)

Wide Range of Applications

Powders and granules with a bulk density of ≥0.5 cm^3 can be detected.

Typical industries: feed, food, pharmaceuticals, chemicals, plastics, construction, fertilizers, etc.

Compatible with horizontal pipe installation (requires installation of a guide sleeve).

Clear signal output

SPDT (Single Pole Double Throw) contacts provide both **normally open (NO) and normally closed (NC)** outputs, allowing direct connection to PLCs, DCS systems, alarms, or relay control systems.

Great value for the price

Compared to radio frequency admittance, capacitive, and tuning fork level switches, rotary paddle level switches offer the best value for money in applications involving granular materials. With low procurement and maintenance costs, they are the preferred solution for level detection in industrial silos.

Applications

Feed Industry: High-level alarms for raw material and finished product silos; prevents material overflow, protects equipment, and enhances automation.

Food Processing: Flour silos, powdered sugar silos, and additive silos; meets food hygiene standards and enables precise level control.

Pharmaceuticals and Chemicals: Reactors, raw material tanks, and powder storage tanks; safety monitoring in hazardous areas; explosion-proof models available for areas requiring explosion protection.

Plastics Manufacturing: PVC powder, ABS pellets, and nylon granule storage silos; visual level monitoring to prevent equipment damage caused by operating with empty silos.

Building Materials: Cement silos, fly ash silos, and stone powder silos; stable operation in high-dust and high-wear environments.

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Fertilizer Production: Urea granules, compound fertilizers, and blended fertilizer silos; level detection for large outdoor silos.

Grain and Oil Industry: Grain silos, oilseed silos; level monitoring for grain storage.

Rubber and Plastics Industry: Rubber granule and color masterbatch silos; prevents production interruptions caused by raw material shortages.

Environmental Protection Industry: Fly ash, flue gas desulfurization agent silos; level monitoring for dust collection systems.

New Energy Industry: Lithium battery anode and cathode materials, silicon powder silos; automated feeding control for powdered materials.

Why Choose Us?

Expert Technical Team: Over 10 years of experience in R&D of mixing equipment, providing customized solutions

Quality Assurance: Rigorous quality control system; ISO 9001-certified company

After-Sales Service: Global service network, 24-hour response, and lifetime technical support

Success Stories: Serving over 500 companies across more than 20 countries and regions

FAQ

1.

Q: What is the minimum order quantity for your products?

A: For larger equipment such as mixers, our minimum order quantity is one unit; for smaller products such as valves and fittings, the minimum order quantity ranges from 50 to 100 pieces. Please contact our sales representatives to confirm the specific minimum order quantity.

2.

Q: From which port do you ship?

A: Since our company is located in Qingdao, most of our shipments depart from the Port of Qingdao.

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3.

Q: Are you a factory or a trading company?

A: We are a manufacturing company with our own factory; all our equipment is produced in our factory's production lines.

4.

Q: How does a rotary paddle level switch work?

A: Inside a rotary paddle level switch, a micro motor drives the paddle to rotate continuously (1 RPM). When the material rises and comes into contact with the paddle, the paddle encounters resistance and stops rotating; this triggers a microswitch, which outputs an on or off contact signal and simultaneously cuts off the motor's power supply. When the material drops away from the paddle, a spring mechanism returns the paddle to its original position, resuming rotation. This principle relies on purely mechanical detection, eliminating electronic drift and ensuring extremely high reliability.

5.

Q: What types of materials can a rotary paddle level switch detect?

A: They are primarily used to detect solid powders and granular materials. They are suitable for materials with a bulk density of ≥0.5 cm^3, including: corn starch, flour, powdered sugar, PVC pellets, ABS pellets, cement, fly ash, feed ingredients, plastic pellets, urea pellets, compound fertilizer pellets, and more. They are not suitable for flaky, fibrous, or liquid materials; in such cases, we recommend using a tuning fork level switch or a radio-frequency admittance level switch.

6.

Q: Can a rotary paddle level switch measure liquids?

A: We do not recommend it. Rotary paddle level switches are designed specifically for solid powders and granular materials. Liquid materials can saturate the paddle blades and cause motor damage. For liquid level detection, we recommend using a float level switch or a tuning fork level switch, both of which our company offers.

7.

Q: Do rotary paddle level switches require regular maintenance?

A: Rotary paddle level switches are designed to be maintenance-free and do not require regular maintenance under normal operating conditions. However, it is recommended to perform a visual inspection every 6 to 12 months:

Check the paddles for material buildup or deformation;

Check the seals for signs of aging (especially in high-temperature applications);

Check the terminal connections for looseness;

Check the housing for corrosion or damage.

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8.

Q: How do I adjust the sensitivity (torque) of a rotary paddle level switch?

A: There is a torsion spring inside the switch that is used to adjust the sensitivity of the trigger signal when the paddle is obstructed:

High-density material (e.g., metal pellets) → Set the torsion spring to the highest setting;

Low-density material (e.g., lightweight plastic pellets) → Set the torsion spring to the lowest setting.

Note: Do not arbitrarily change the torque spring specification, as this may cause false triggering (early or late signals).

9.

Q: What is the service life of a rotary paddle level switch?

A: Under normal operating conditions (no high temperatures, no strong corrosion, and no frequent material jams), the average service life of a rotary paddle level switch is 5 to 8 years. The main wear parts are the torsion spring and the seal ring; under high-temperature conditions, the service life of the seal ring will be correspondingly shortened. It is recommended to inspect the switch regularly and replace parts as needed.

10.

Q: Can a rotary paddle level switch be connected to a PLC? How is it connected?

A: Absolutely. The rotary paddle level switch outputs a passive dry contact signal (SPDT), which can be directly connected to the digital input module of any PLC without requiring an additional power supply:

24VDC PLC: Connect the COM terminal to the PLC's COM terminal, the NC (or NO) terminal to the DI input terminal, and the PLC's common terminal to the 0V power supply.

220 VAC PLC: Connect to the PLC's DI module after isolation via an intermediate relay (to protect the contacts).

It is recommended to include a debounce delay (100–500 ms) in the PLC program to prevent false triggers caused by momentary fluctuations due to material impact.

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