Rotary Level Indicators

BMRX

Standard Rotary

Simple, Rugged, Reliable Point Level Detection

Rotaries are a proven, long-lasting solution for detecting low, mid, and high levels in bins, tanks, and silos. A wide selection of three-vane, two-vane, collapsible, insertable, and bayonet-style paddles are available to address materials from one pound per cubic foot to 150 pounds per cubic foot. The widest selection of accessories to meet the challenges of all types of bulk solids applications. The standard BMRX fail-safe rotaries are designed and manufactured in the USA.

BMRX & MAXIMA+

Designed for Ease-of-Use and Years of Reliable Operation

- De-energizing motor operation extends motor life
- Built-in motor slip-clutch protects gears
- DPDT relay output for switching versatility
- Screw on/off cover
- Switch selectable high/low fail-safe
- No calibration
- Dual conduit entrance
- Four-bearing design
- Durable, powder coat finish
- Available in multiple voltages
- Fail-safe circuitry

KC SUPPLY
Knowledgeable Customer Service

Dec 18, 2015

The rotary style level indicator is one of the most widely accepted and reliable point level switches used in powders and dry bulk solids. Rotary indicators can be built to work in almost any dry bulk material when configured with a variety of paddles, couplers and extension options. They are designed to provide trouble-free installation, easy access to all components, and reliability through advanced circuitry. The BMRX and fail-safe models provide the most cost-effective and easiest-to-implement solution for level indication.

Advanced Design

De-Energizing Motor: Specially designed synchronous motor features "de-energized" operation which shuts the motor down when material is present rather than remaining in a "stalled" condition. This reduces wear and operating temperature, which extends motor life.

Built-In Slip Clutch: The motor has a built-in bi-directional slip-clutch that protects the gear assembly from damage due to over rotation.

Four-Bearing Drive Shaft: Unlike other rotary level indicators, Rotaries are built with a four-bearing drive shaft assembly. This unique design reduces motor drag during paddle rotation.

Screw-Off Cover: Enclosure features a twist-off cover with no-bolt access to the internal components of the rotary, making the unit easy to open for wiring or service.

Applications & Benefits

Rotaries are designed for controlling dry bulk material storage and flow in bins, hoppers, tanks, chutes, and conveyors. Typical applications include grain, feed, seed, food processing, cement, aggregates, plastics, chemicals, and wood products. These rotaries can be used in materials with a bulk density as low as 1 lb/ft^3 (30 kg/m^3) and as high as 150 lb/ft^3 (68 kg/m^3). By managing material storage and flow with Rotaries, you prevent bin overflows and costly spills, empty conditions, clogged chutes, and jammed conveyors. This eliminates the need to climb bins to check levels, reduces material waste, and shortens down time.




BMRX for Simple, Rugged, Reliable Operation

Advanced Rotary Design

Advanced technology and design features into the BMRX to create a significantly advanced rotary level indicator that exceeds the performance of competitive rotaries. The BMRX is designed to provide security from system power failure, easy access to all components, and reliability for a long life. An explosion-proof housing is standard on all rotaries. The BMRX is cost-effective and the easiest-to-implement solution for reliable point level control.

Built for Long Life

A rotary level indicator is only as reliable as its motor. BMRX are built with a specially designed synchronous motor that features “de-energized” operation. The motor automatically shuts down when material is present rather than remaining in a “stalled” condition. This reduces “wear & tear” and the operating temperature which extends motor life. Plus, the motor features a built-in bi-directional slip-clutch that protects the gear assembly from damage due to over rotation. Also standard is a four-bearing drive shaft assembly that reduces motor drag during paddle rotation.

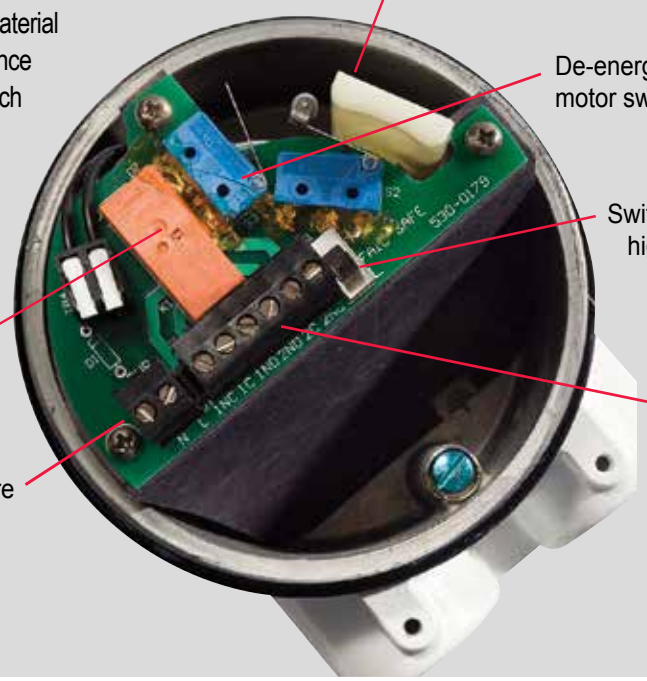
Principle of Operation

High Level Control During Filling

As a high level control, the paddle rotates continually when material is not present. When material reaches the paddle, the resistance causes the motor to rotate an actuator arm over to a limit switch that is wired to some type of alarm or process equipment.

Low Level Control When Emptying

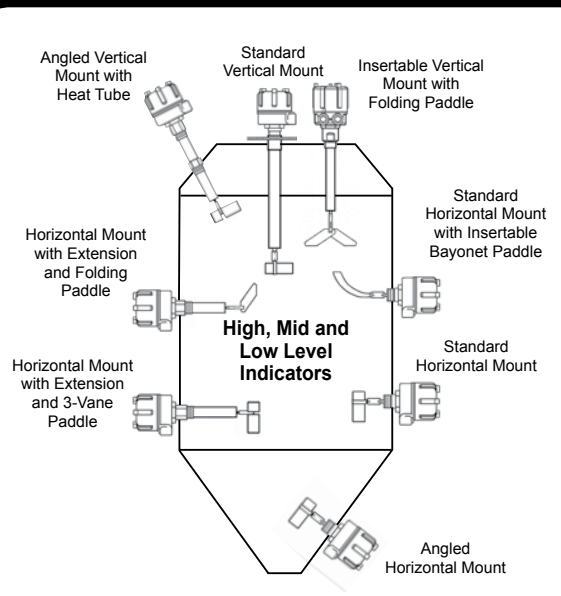
As a low level control, the paddle is stopped and the motor is “de-energized” when material is present. When material drops below the paddle, an actuator arm springs back into place, causing the motor to “re-energize” and the paddle starts rotating. This will send an alert to an alarm or automatically start up a process system.



Installation WITHOUT ENTERING THE BIN

We make installation of rotaries easy with a single-blade or double-blade insertable paddle that collapses to fit through a standard 1-1/4" or 1-1/2" coupling, so there is no need to enter the bin to install the rotary paddle. Whether used with a standard rotary or with one of the many steel or aluminum extensions, the BMRX can be installed easily by squeezing the paddle and inserting it through the opening. The paddle automatically springs opens when it enters the bin. Then the rotary can be installed by screwing the rotary into the coupling or mounting plate. The rotary can also be easily removed by pulling the folding paddle back through the opening. This is ideal for concrete silos that have thick walls or when a rotary is used to replace a capacitance probe or vibrating rod.

The double-bladed collapsible paddle fits through a 1-1/4" or 1-1/2" opening.



ROTARY MOUNTING OPTIONS

Squeeze the insertable paddle and guide it through the opening.

The paddle automatically springs open after it is through the wall.

The rotary can then be mounted by screwing it into the coupling or mounting plate.

Custom Options & Configurations

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Sealed bearing prevents packing.

Sealed Rotary Extension

The special rotary extension design includes a protective bearing at the bottom of the shaft that forms a seal between the rotary shaft and the shaft guard. This bearing prevents bin material from getting packed up into the extension and causing the rotary to give a false “full” signal when the paddle stops turning. A rotary extension can be integrated with the BMRX rotaries. An extended rotary can also be used when side mounting or on angled rooftops.

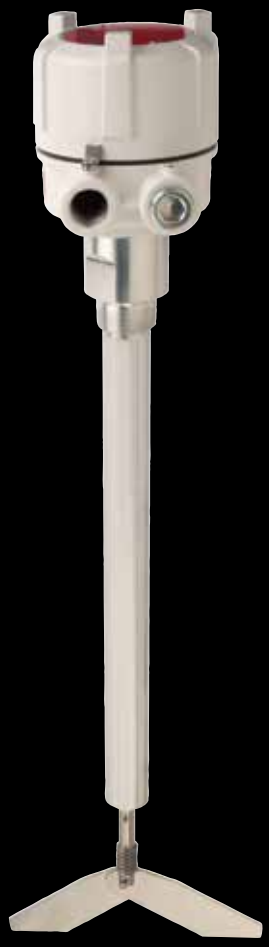
Vertical Rotary Extension for High Level Detection

Top-of-bin mounting for rotaries is ideal when the rotary is used as a high level alarm. Solid material will tend to be higher at the filling point and most operators don’t want any bin filled to the very top and need to allow for a specified amount of headroom in the bin. For top-of-bin applications, The manufactures to the length requested by the customer, offering custom lengths up to 144”.

Horizontal extension for thick concrete bin walls.

Horizontal Rotary Extension for Thick Bin Walls

The horizontal rotary extension provides the ability to install a rotary on the side of a bin wall, such as those in concrete silos, up to 12” thick. This extension design allows for rotaries to be side-mounted with minimal risk of damage during operations. This optional assembly includes an extended drive shaft with a protective shaft guard that keeps the shaft centered and “no packing” seal at the end of the shaft. Standard lengths of 6”, 8”, 10”, or 12” are available for the BMRX rotaries.



Extension with collapsible paddle.

Rotaries for Challenging Applications

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Stainless Steel Process Connection for Corrosive Materials

ptional stainless steel process connection was designed for corrosive applications and can be used in conjunction with either the BMRX or MAXIMA+ rotary. The 304 SS solid stainless steel fitting is available in both 1-1/4" and 1-1/2" NPT sizes and comes with a stainless steel seal/bearing carrier. Rotaries equipped with this connection are configured so all materials that come into contact with the bin are stainless steel, making it ideal for applications such as food processing or in caustic materials.

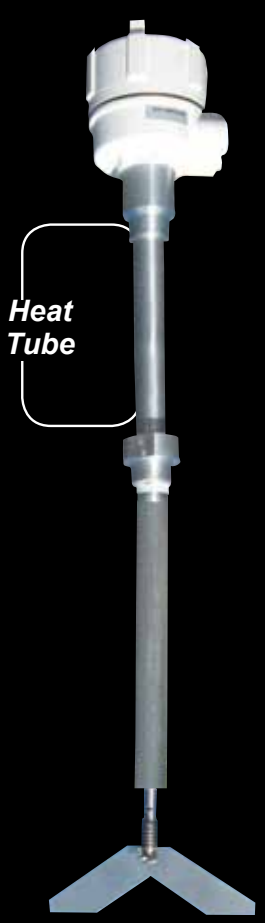
Stainless steel connection for corrosive materials.

Heat Tubes for High Temp Applications

When the external temperature outside the bin exceeds 140°F (60°C), an optional heat tube can be added to distance the electronics of the unit away from a heat source. They can also be used to extend the rotary beyond insulation on the outside of the bin. Heat tubes can be used for top or side mounted applications with either the BMRX or MAXIMA+. They are available in 8" or 12" lengths in either aluminum or stainless steel.

Adjustable Top Mount Rotary

The adjustable top mount rotary features a coupling that can be moved up and down the length of the shaft. The shaft can be adjusted from 6" to 72", which allows the rotary to accommodate differing material levels in the bin or silo. The indicator can be used in most materials in conjuction with a compatible paddle and is installed through the top of the bin.



Vertical extension with heat tube.

Adjustable Top Mount Rotary

	BMRX	MAXIMA+
Power Requirements	24/115/230 VAC 50/60 Hz; 5.5VA 24/12 VDC, 1W	24/115/230 VAC 50/60 Hz; 8VA 24/12 VDC, 60/35 mA, 4V4
Output Contacts	DPDT 10 Amp 250 VAC	DPDT 10 Amp 250 VAC
Status Indicator Relay		Standard: SPDT 10 Amp 250 VAC, Optional: DC Solid State Relay 1A 60 VDC Optional: AC Solid State Relay 1A 250 VAC
Operating Temperature	-40°F to +185°F, (-40°C to +85°C) ATEX -4°F to +185°F (-20°C to +85°C)	-40°F to +185°F (-40°C to +85°C) ATEX -4°F to +185°F (-20°C to +85°C)
Process Temperature	to 400°F (to 204°C)	to +400°F (to +204°C)
Pressure	1/2 micron, 30 PSI	1/2 micron, 30 PSI
Approvals & Certifications CSA / US	Class I, Groups C & D and Class II, Groups E, F & G Hazardous Locations. Enclosure Type NEMA 4X, 5, 7, 9, & 12 IP66	Class II Groups E, F & G Hazardous Locations. Enclosure Type NEMA 4X, 5, 9, & 12 IP66
ATEX	Please see www.binmaster.com for latest ATEX certifications	Please see www.binmaster.com for latest ATEX certifications
Fail-Safe Mode	Switch selectable between high & low	Switch selectable between high & low
Time Delay		Dual Independent Time Delay Selectable 5 seconds; Programmable to 25 seconds
Enclosure	Die cast aluminum, FDA recognized powder coat finish	Die cast aluminum, FDA recognized powder coat finish
Mounting	1-1/4” NPT	1-1/4” NPT
Conduit Connections	3/4” NPT	3/4” NPT
Shaft and Components	Stainless Steel	Stainless Steel
Paddles	Stainless Steel	Stainless Steel

1.0 INTRODUCTION

BMRX is a rotating paddle style level sensor which provides reliable point level detection for bulk solids, including powder, pellet, and granular materials. The unit has a switch selectable fail-safe relay that will fall to a "safe" condition in the event of a power failure.

The BMRX motor rotates the drive shaft and paddle at 1 RPM. When the vessel material fills to the level of the indicator paddle, the material causes the paddle to stop rotating indicating a covered condition. When the material falls away, the paddle starts rotating again to indicate an uncovered condition.

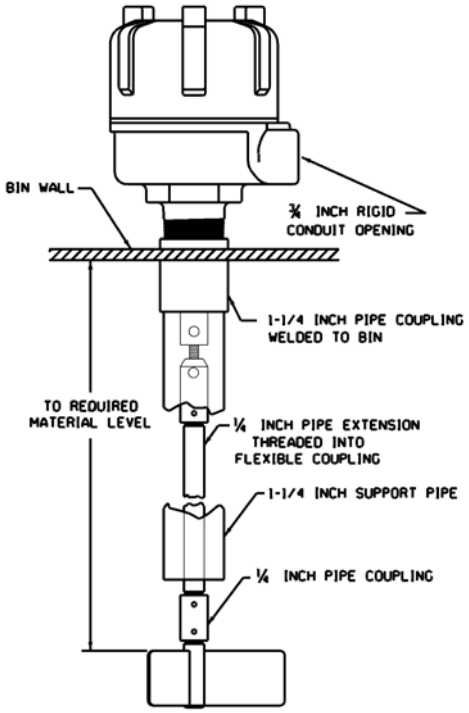
2.0 INSTALLATION

2.1 Location and Mounting

TOP MOUNT (For **mounting plate options** see figure 4 on page 6)

Figure 1

1. Locate and cut hole in top of bin to fit outside diameter of 1 1/4" pipe coupling (1.950").
2. Position coupling halfway into bin and weld.
3. Turn unit so conduit opening is in desired location.
4. Add 1/4" extension pipe to desired length with standard 1/4" coupling on bottom end.
5. Cut 1 1 /4" support pipe approximately 4" shorter than overall length of 1/4" pipe shaft when used with flexible coupling.
6. Insert 1 1/4" pipe into coupling and tighten.
7. Insert paddle into 1/4" coupling and drill holes for lock pins.



SIDE MOUNT (For **mounting plate options** see figure 5 on page 6)

Figure 2

1. Locate and cut hole in side of bin to fit outside diameter of 1 1/4" pipe coupling.
2. Weld on half of standard 1 1/4" pipe coupling to bin wall flush with inside of bin.
3. Insert hub into coupling and turn to desired conduit position.
4. Screw paddle into place and replace lock pin.
5. Shaft and paddle should be shielded in low level mounting when subjected to material flow.
6. For side mount, a solid coupler is recommended.