

# Rotary Level Indicators



**BMRX**  
Standard Rotary



**MAXIMA+**  
Genuine Fail-safe Rotary

## Simple, Rugged, Reliable Point Level Detection

BinMaster 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. BinMaster offers the widest selection of accessories to meet the challenges of all types of bulk solids applications. The standard BMRX and MAXIMA+ genuine fail-safe rotaries are designed and manufactured in BinMaster's ISO 9001:2008 certified facility in Lincoln, Nebraska, 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
- Triple thread 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



**BINMASTER**

[www.binmaster.com](http://www.binmaster.com)

# BinMaster Rotary Level Indicators for High & Low Level Detection

The rotary style level indicator is one of the most widely accepted and reliable point level switches used in powders and dry bulk solids. BinMaster's 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. Both the BMRX and MAXIMA+ fail-safe models provide the most cost-effective and easiest-to-implement solution for level indication. BinMaster constantly applies new technology and designs new innovations into its rotaries to create a significantly advanced and longer lasting rotary level indicator.



## Advanced Design

BinMaster engineers continually build advanced features into the BMRX and MAXIMA+ rotaries to ensure reliable, long-lasting performance.

**De-Energizing Motor:** BinMaster's 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, BinMaster rotaries are built with a four-bearing drive shaft assembly. This unique design reduces motor drag during paddle rotation.

**Screw-Off Cover:** BinMaster's 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.

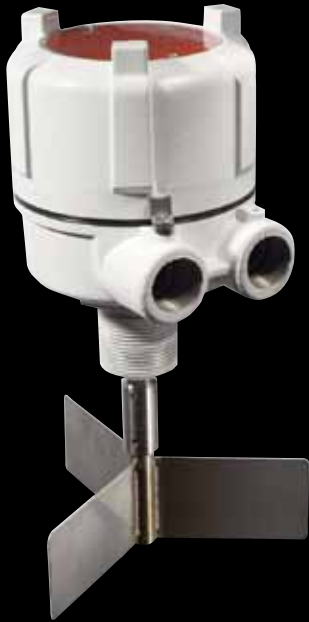
## Applications & Benefits

BinMaster 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<sup>3</sup> (30 kg/m<sup>3</sup>) and as high as 150 lb/ft<sup>3</sup> (68 kg/m<sup>3</sup>). By managing material storage and flow with BinMaster 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 unnecessary down time.



# BinMaster Builds a Better Rotary

Rotary level indicators have been around for more than 50 years and are the most frequently used point level device for dry bulk solids. However, not all rotaries are created equal. BinMaster rotaries are designed with the most advanced features, offer the widest variety of accessories and configuration options, and are built to Binmaster's ISO 9001:2008 certified processes to be the longest lasting, highest performance rotary on the market.



**BMRX**

## BMRX for Simple, Rugged, Reliable Operation

### **Advanced Rotary Design**

BinMaster has built 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. BinMaster builds the BMRX 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.

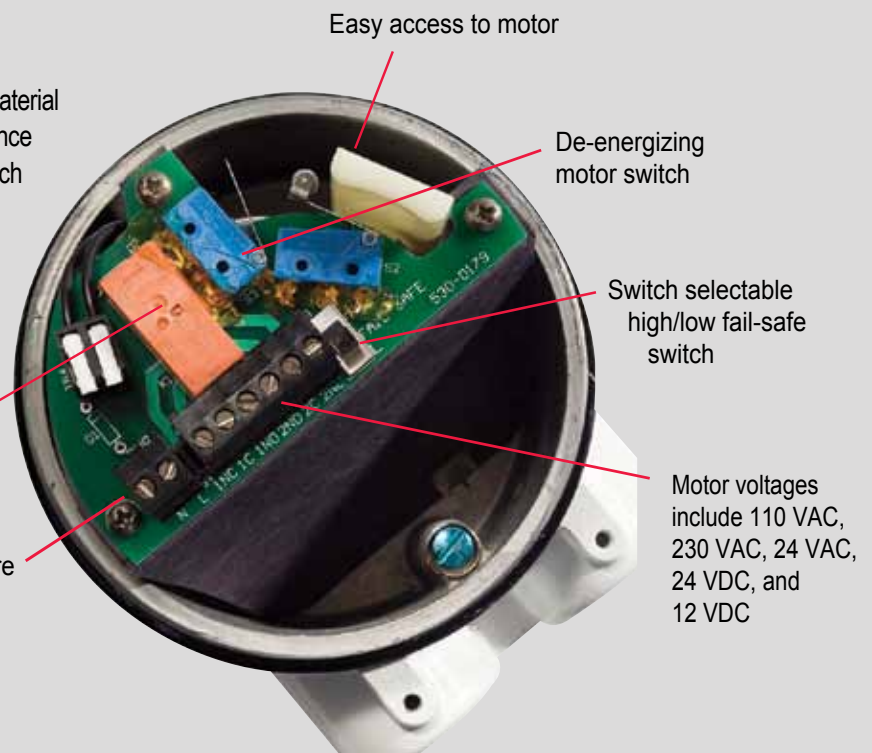
## Principle of Operation

### **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.



Easy access to motor

De-energizing motor switch

Switch selectable high/low fail-safe switch

DPDT 10 Amp relay

Removable wire terminals for easy wiring

Motor voltages include 110 VAC, 230 VAC, 24 VAC, 24 VDC, and 12 VDC

# MAXIMA+ Genuine Fail-Safe Rotary

## Innovative Fail-Safe design

The MAXIMA+ is BinMaster's state-of-the-art microprocessor-based, fail-safe and fool-proof rotary level indicator. It has all of the benefits of the BRMX, plus the ability to continuously self diagnose, and in the event of a failure, give an immediate warning and instantaneous corrective response. This distinguishing feature makes the MAXIMA+ the ideal rotary for operations where it is crucial to confirm the continuous operation of the unit.



**MAXIMA+**

## Immediate Status Notification

Knowing the status of the rotary saves both time and money by preventing overfilling and empty conditions. BinMaster's MAXIMA+ rotary offers status notification that alerts to paddle rotation, a covered condition, or fault condition via an LED light. A valuable feature not offered by every rotary manufacturer, the MAXIMA+ is the best choice for applications where it is essential that the user be knowledgeable of the unit status.

## Visual Monitoring of Motor Status

The microprocessor-based MAXIMA+ rotary is completely fail-safe for mechanical and power failures. The supervisory circuit monitors shaft rotation and determines if the paddles are not rotating because of a covered condition, mechanical failure, or a loss of power. The LED light has three functions. A blinking light represents an uncovered condition and a paddle that is turning. A solid light indicates a covered paddle or the switches are engaged. An unlit light indicates a failed condition.

## Process Control Capability

Today, users demand more from their level controls than just material detection—they also want genuine fail-safe response. MAXIMA+ is designed for integration into process control systems. Its advanced circuitry lets the user monitor material levels and automatically control the process system if there is an unexpected unit failure or power loss. This means the MAXIMA+ provides maximum protection and cost savings through added flexibility when designing a process control system.

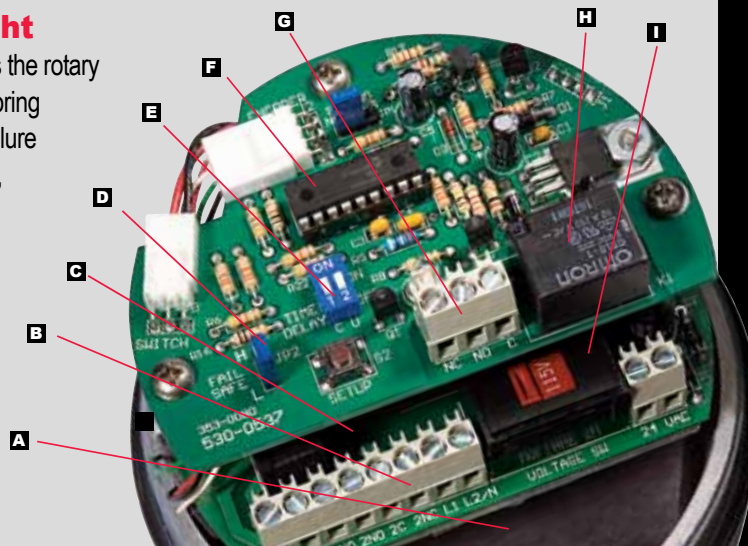
# Advanced Fail-Safe Protection

## Alerts to Rotary Status

The MAXIMA+ operates much like the BMRX with the added benefit of providing immediate status notification and corrective response. It is the best choice for applications where it is essential that continuous operation must be confirmed.

## Red LED Indicator Light

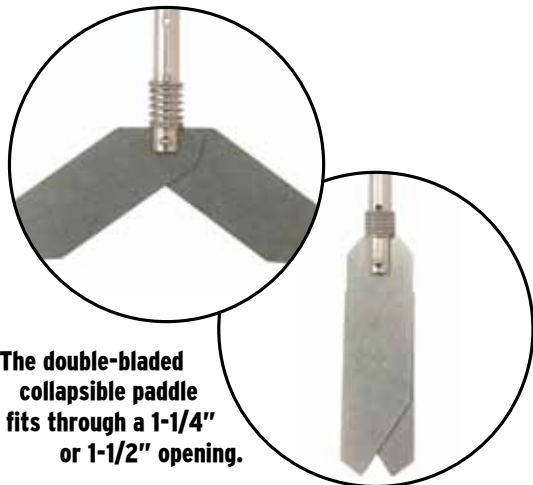
A light on the top of the unit indicates the rotary status, providing "at a glance" monitoring of the unit. In the event of a motor failure or if electricity is shut off to the rotary, an immediate alert is sent. It also provides a status notification when the paddle stops rotating and is in a covered condition and alerts again when the paddle begins to rotate as the bin is emptied and the paddle is uncovered.



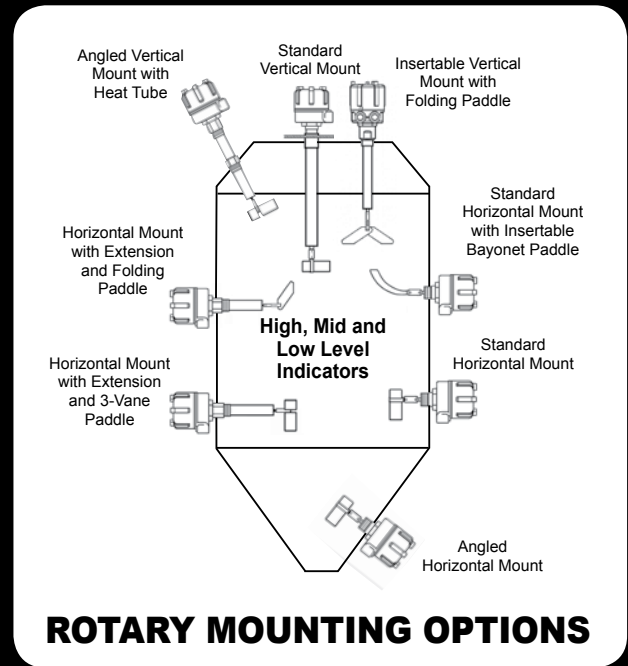
- A** Easy access to motor
- B** Wire terminals for easy wiring
- C** DPDT 10 Amp relay
- D** Switch selectable high/low fail-safe switch
- E** Time delay for both covered & uncovered conditions
- F** Microcontroller-based electronics ensures consistent and reliable operation
- G** LED light provides local visual indication (MAXIMA+ only)
- H** Supervisory and pulse status relay
- I** Motor voltages include 115 VAC, 230 VAC, 24 VAC, 24 VDC, & 12 VDC

# Installation **WITHOUT** **ENTERING** **THE BIN**

BinMaster makes 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 BinMaster's many steel or aluminum extensions, the BMRX or MAXIMA+ can be installed easily by squeezing the paddle and inserting it through the opening. The paddle automatically springs open 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



*Sealed bearing prevents packing.*

## Sealed Rotary Extension

BinMaster's 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 either the BinMaster MAXIMA+ or 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, BinMaster 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 BinMaster's "no packing" seal at the end of the shaft. Standard lengths of 6", 8", 10", or 12" are available for both the MAXIMA+ or BMRX rotaries.



*Extension with collapsible paddle.*

# Rotaries for Challenging Applications

## Heat Tubes for High Temp Applications

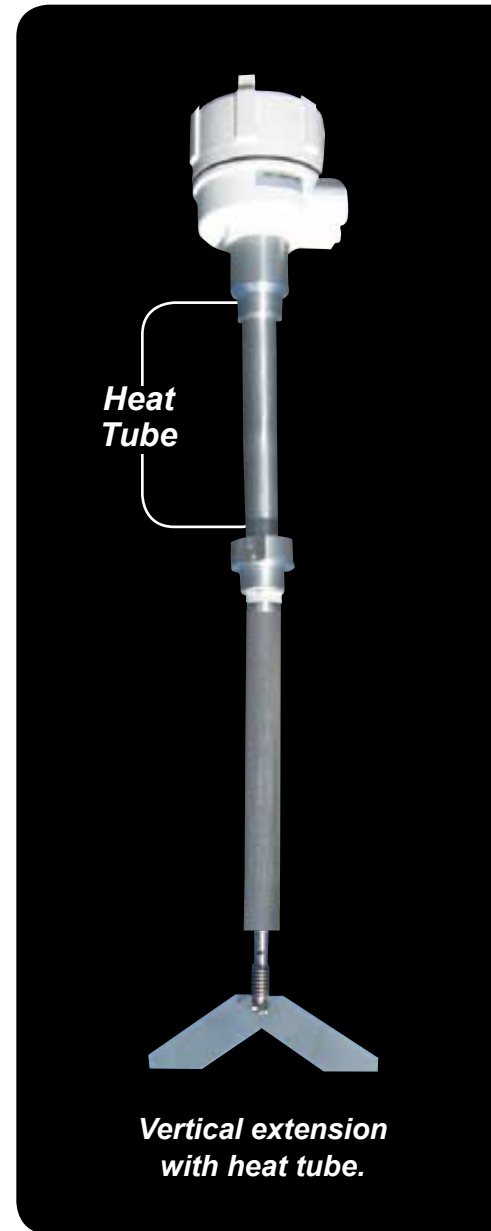
When the external temperature outside the bin exceeds 140°F (60°C), an optional heat tube can be added to distance the electronics of the unit away from a heat source. They can also be used to extend the rotary beyond insulation on the outside of the bin. Heat tubes can be used for top or side mounted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

## Stainless Steel Process Connection for Corrosive Materials

BinMaster's optional 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.*



*Vertical extension with heat tube.*

	<b>BMRX</b>	<b>MAXIMA+</b>
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	Ex II 2G 1D Ex d IIB T5 Ex tD A20 IP66 T93C (Ta = -20C to +85C)	Ex II 1D Ex tD A20 IP66 T93C (Ta = -20C to +85C)
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



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