Level Controls

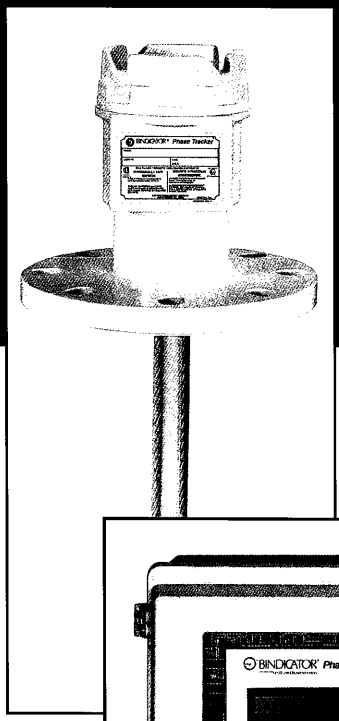
Point Level	Continuous Level
• Tuning Fork	• Phase Tracking
• Paddle Wheel	• Ultrasonic
• Diaphragm	• Hydrostatic
• Radio Frequency	• Capacitance
• Pressure	• Yo-Yo
• Ultrasonic	• Guided Wave Radar

Product Selection Chart

This chart is for reference only. Refer to our product literature for complete specifications or call us for assistance.

	Point Level									Continuous Level							Dry Flow	
	RF-4000/8000	RF-9100/9200	RF-17000/18000 (Remote)	RF-11000/12000 (Remote)	Pulse Point™ LP-100	Pulse Point™ LP-200T (Remote)	Roto-Bin-Dicator®	Bin-Dicator®	Liquid Level®	Level Data	Radar Tracker®	MS-2000™	Yo-Yo® (Mark III & GP)	Mach One™	Cap-Level® II/IIIA	Flo-Guard™	Flo-Commander™
Material																	
Powder	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓		✓	✓	✓
Granular	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓		✓	✓	✓
Slurry	✓	✓	✓	✓						✓	✓	✓		✓			
Liquid	✓	✓	✓	✓					✓	✓	✓	✓		✓	✓		
Material Density																	
Low		✓		✓	✓	✓						✓	✓			✓	✓
High	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓		✓	✓	✓
Material Moisture																	
Low		✓		✓	✓	✓	✓	✓				✓	✓		✓	✓	
High	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓		✓	✓	✓
Temperature																	
High			✓	✓		✓		✓					✓		✓	✓	✓
Pressure																	
Atmospheric	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low	✓	✓	✓	✓	✓	✓	✓				✓	✓		✓	✓	✓	✓
Medium	✓	✓	✓	✓	✓	✓					✓						
Vibration																	
Low			✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓
High			✓	✓		✓						✓			✓	✓	✓
Material Coating																	
Minimal	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heavy Build Up	✓	✓	✓	✓							✓	✓		✓			
Corrosive																	
Low	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓
High		✓		✓	✓	✓						✓		✓	✓		
Installation																	
Vert. (top mount)	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	na
Horiz.(side mount)	✓	✓	✓	✓	✓	✓	✓	✓								✓	na
Non-Contact												✓		✓			
Atmosphere																	
Dust	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓		✓	✓	✓
Steamy					✓	✓					✓	✓	✓	✓	✓		
Non-Air Vapor	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓

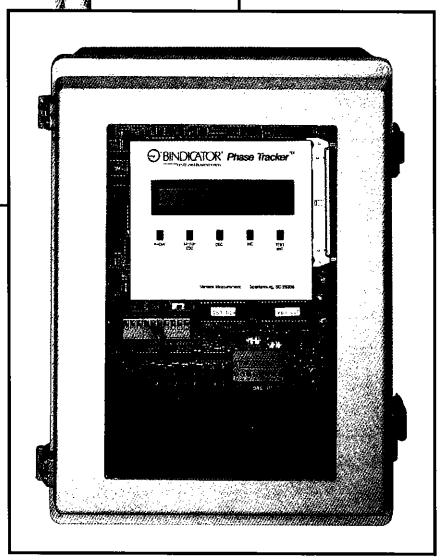
Phase Tracker Continuous Level Control



Bindicator's patented Phase Tracker technology is designed to solve the most challenging continuous level applications. Phase Tracker is ideal for the measurement of level of solids, liquids and slurries. Phase Tracker can accurately and reliably measure the level of bulk solids and powders during the fill cycle, regardless of dust or material variations in density or moisture. It is effective in foam, non-air vapor, fumes, abrasives and corrosives, as well as corrugated bins and tall, narrow silos.

Phase Tracker sensing technology is independent of two of the most common problems that affect continuous level instrumentation: variation in the environment and changes in the product being measured. Phase Tracker can be applied throughout the processing, manufacturing, and material handling industries to solve tough measurement applications.

BINDICATOR®
LEVEL INSTRUMENTATION



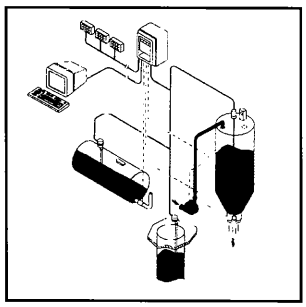
- No compensation needed for pressure or temperature
- Setup without emptying tank
- Measures product as light as 10 lbs. per cubic foot

How It Works

While it is often compared to Ultrasonic and Micro Impulse Radar (MIR) technologies, Phase Tracker differs dramatically because it uses a unique principle of measurement that cannot be duplicated by other technologies.

A two conductor flexible or rigid sensor is suspended vertically in the vessel, extending its full length. A high frequency electrical signal is transmitted downward into the sensor, towards the surface of the product. A portion of the signal's energy is echoed at the material surface due to the abrupt impedance change at that point. Detector circuitry at the top of the tank measures the phase difference between the transmitted and echoed signals. The phase difference is a function of the distance traveled by the signal and is used to determine the level in the tank.

Phase Tracker benefits, as does radar, from the fixed velocity of electromagnetic signals which are not effected by the environment in the vessel. Phase Tracker, however, employs a unique, patented method of extracting the time of flight rather than measuring the actual time delay. This method has proven highly effective in level control. Unlike radar, Phase Tracker avoids the complexity of resolving the extremely short sub-nanosecond time intervals required to generate useful level information with a signal traveling at the speed of light. A steady state low energy signal, at a frequency considerably lower than radar, is transmitted into the sensor. By slowly varying the signal frequency and simply observing the voltage variations at the input to the sensor caused by the simultaneous presence of the input and echoed signals, it is possible to get a very informative view into the vessel.



Applications

The LM7000 can be used in the most hazardous environments and measures levels accurately and continuously in dry powders, granular materials and liquids.

- Plastics
- Pharmaceutical
- Food & Grain
- Cement
- Chemical
- Petrochemical

LM7000 Phase Tracking Technology

Benefits

- Continuous on-line level tracking during filling and emptying.
- Dry powders and liquids can be controlled simultaneously from the same system.
- Readings independent of moisture content, density and particle size of the product being measured.
- Operation not dependent on tank temperature pressure.
- Unaffected by high dust concentration.
- Sees through light foam and vapors.
- Immunity to build-up on sensor inherent to Phase Tracking technique.
- No field calibration.
- Low cost easy installation.
- LAN configuration
- Remote relay and 4/20 output capability via RS485 for minimal cable and conduit costs.
- Sensors can be supplied with floor flush mounting.
- Software allows easy interface to existing systems and to control equipment.
- Integrated system—tank instrumentation, data collection and software—simplifies implementation.

Non-Contacting Ultrasonic Continuous Level Measurement — MS-2000 Series

Benefits

1. **Technology**
   - Non-contact ultrasonic
   - Model 2001, 1 or 2 channel
   - Model 2010, 10 channel
2. **For use with:** Various bulk materials, liquids, and slurries
3. **Features**
   - Patented DSP (Digital Signal Processing)
   - "Quick Cal"
   - Measurement to 100 ft. (30m)
   - Echo averaging
   - Sensor auto select
   - Engineering units in English or Metric
4. **Process Connections**
   1" NPT or optional flange mounting
5. **Enclosure**
   NEMA 4X polycarbonate display
6. **Sensing Material**
   PVC or PVC/Teflon®
7. **Output**
   - Up to 10, 4-20 mA
   - Up to 40, SPDT relays
8. **Temperature**
   Electronics:
   -40°F to +170°F (-40°C to +75°C)
   Sensors:
   -40°F to +185°F (-40°C to +85°C)
9. **Pressure** 50 psi (3.5 kg/cm2)

Bindicator has elevated ultrasonic measurement accuracy, reliability, and repeatability to a NEW LEVEL

The Bindicator MS-2001 and 2010 offers a significantly new and better way to measure inventory in "tall" tanks and silos without contacting the material.

Unsurpassed accuracy and reliability

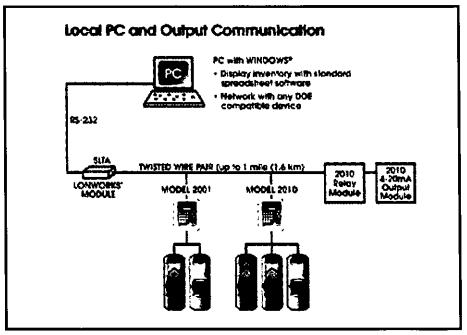
The MS-2000 Series display employs a Motorola® 16-bit microprocessor in combination with Bindicator's patented Digital Signal Processing (DSP) to provide the most advanced and dependable ultra-sonic level measurement system on the market.

The MS-2000 Series now has a LOWORKS® Bus.

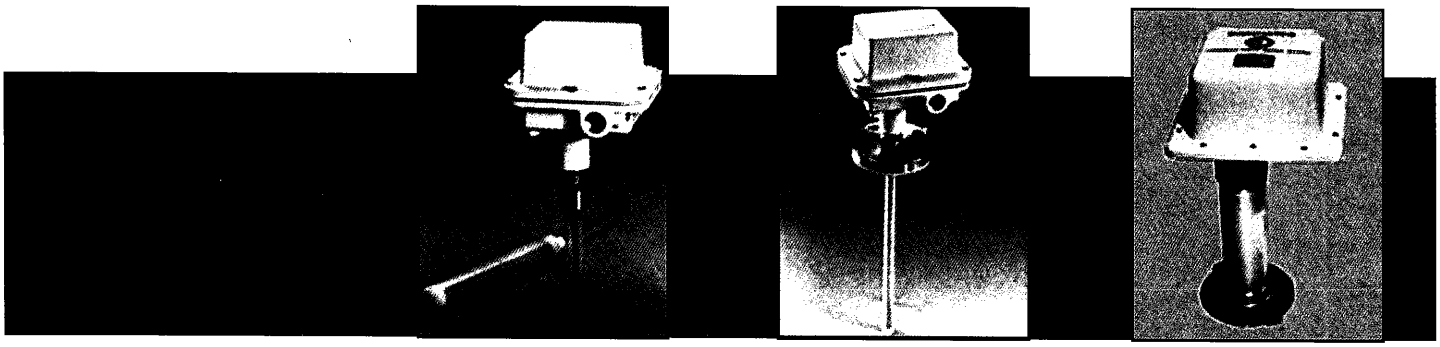
One twisted pair of wires controls relays and analog outputs in remote locations up to 1 mile (1.6km) away.

Model 2001 provides 1 or 2 channel operation

Model 2010 displays and controls up to 10 tanks or silos

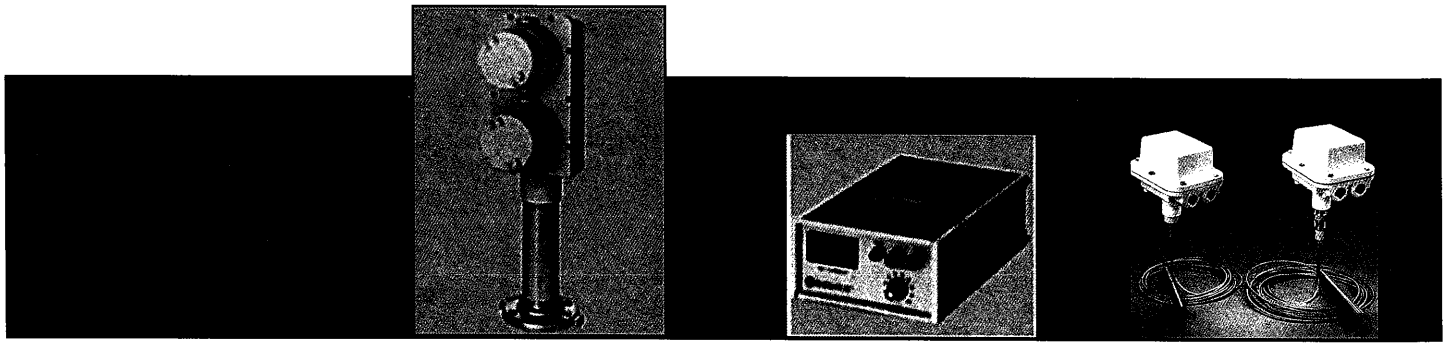


Continuous Level Controls



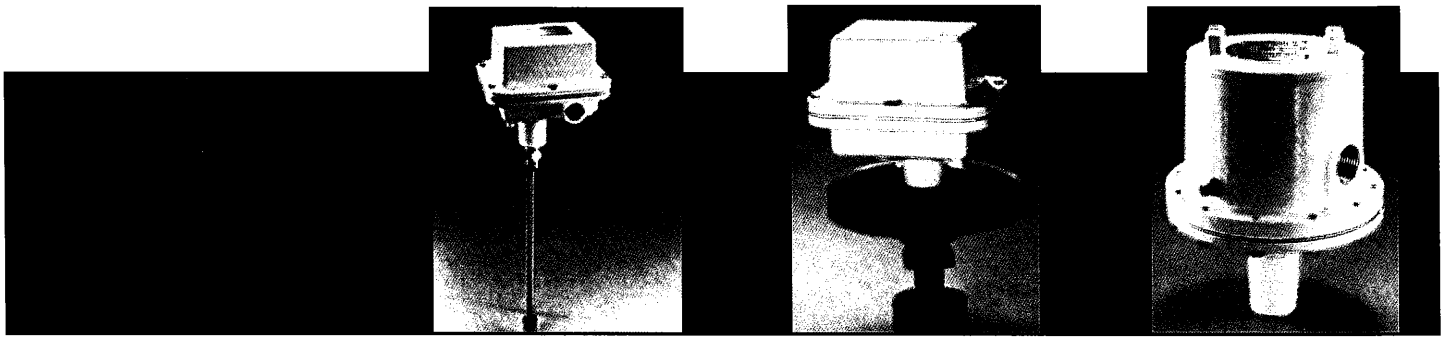
	Cap-Level® II	Cap-Level® II A	GP Yo-Yo® and GP II Yo-Yo®
1. Technology	Radio Frequency sensing technique producing 4-20mA output	Two-wire continuous radio frequency level transmitter	Raising/lowering of sensing weight provides cable measurement
2. For use with:	Conductive & non-conductive solids/liquids	Conductive & non-conductive solids/liquids	Dry or liquid materials
3. Features	• High reliability • 4-20mA output • Hi/Lo alarm relays w/adjustable hysteresis (depending on model) • Rigid or cable probes	• High reliability • 4-20mA output • Optional remote electronics • Flanges are available • Rigid or cable probes • Intrinsically safe when used with approved barriers	• PLC/computer tie-in • Solid state CMOS • Pulse output • Depths up to 75 ft. • 4-20mA or 20-4mA • Easy to install
4. Process Connections	Vertical: 3/4" NPT, 1 1/4" NPT, or 1" sanitary	Vertical: 3/4" NPT, 1 1/4" NPT, 1" sanitary, or flange	Sensor: top-of-vessel information transmitted to remote display/readout/ computer or PLC
5. Enclosure	NEMA 4X, NEMA 7/9 polyester coated aluminum	NEMA 4X, FM approved	NEMA 4/5, CSA listed molded minlon/polyethylene
6. Sensing Material	316 stainless steel and/or jacketed with Teflon®	316 stainless steel and/or jacketed with Teflon®	Digestible polyethylene, stainless steel, or ABS
7. Output	4-20mA into 400 Ω Max.	4-20mA	Pulses to Bindicator readout/computer/PLC
8. Temperature	Electronics: -40°F to +160°F (-40°C to +71°C) Probe: -40°F to +250°F (-40°C to +120°C)	Electronics: -40°F to +160°F (-40°C to +71°C) Probe: -40°F to +250°F (-40°C to +120°C)	-30°F to +140°F (-34°C to +60°C) with heater
9. Pressure	Consult factory	Consult factory	Atmospheric

Continuous Level Controls *(continued)*



	Mark III Yo-Yo®	Yo-Yo® Readout	Radar Tracker®
1. Technology	Raising/lowering of sensing weight provides cable measurement	Displays readings from Yo-Yo inventory systems	Utilizes the recently developed MIR (micro impulse radar) technology
2. For use with:	Dry or liquid materials	All Yo-Yo sensors	Connects to all popular display devices
3. Features	• Local start-up switch • PLC/computer tie-in • Pulse output • 4-20mA or 20-4mA • Easy to install • Depths up to 150 ft. (special)	• Digital display • Up to 10 vessels • "Ft. 50" or "Ft. Of" • Computer tie-In • 1 mile from Yo-Yos	• Unaffected by minor coatings, vapors, changes in density or conductivity • Operates independently of liquid dielectric • Accurate, low cost • Application "independent"
4. Process Connections	Sensor: top-of-vessel information transmitted to remote display/ readout/computer or PLC	NEMA 1 — control room environments NEMA 4 — optional	3/4" NPT SS or 1-1/4" NPT Aluminum
5. Enclosure	NEMA 4/5 NEMA 7,9 polyester coated aluminum, FM listed	NEMA 1 — control room environments NEMA 4 — optional	NEMA 4, 4X, 5 aluminum w/polyester powder coating NEMA 4X 304 SS optional
6. Sensing Material	Digestible polyethylene, stainless steel, or ABS	Not applicable	Stainless steel
7. Output	Pulses to Bindicator readout/computer/PLC	Analog, LED display	4-20mA into 700 ohms
8. Temperature	-32°F to +140°F (-34°C to +60°C) with heater	-30°F to +120°F (-34°C to +49°C)	-40°F to +165°F Consult factory >140°F
9. Pressure	Atmospheric	Atmospheric	1000 psi @ 250°F maximum

Liquid Level Controls



	Leveldata	Mach One™	Liquid Level Bin-Dicator®
1. Technology	Hydrostatic two-wire level transmitter	Non-contact ultrasonic	Pressure-sensitive diaphragm actuates switch
2. For use with:	Compatible with most liquids and slurries	Liquids and slurries	All non-coating liquids
3. Features	• The Bubbleless Bubbler • Automatic compensation for pressurized vessels • Install without emptying tank • Sensing range to 30 feet (9.23 m) • Non-fouling sensor design • FM approved (intrinsic safety); UL approved (general purpose)	• Non-contact level measurement to 30 ft. (9.23m) • EDS – echo discrimination software • Menu driven programming • Automatic temperature compensation • Non-volatile memory • Multiple unit networking — Sensorlink • CSA certified	• Low cost • Compact design • Few moving parts • Corrosion resistant • Long life, reliability
4. Process Connections	3/4" NPT, 316 stainless steel (top-of-vessel mounting only)	3 or 4 inch, ANSI 150 lb. flange; sanitary	Top-of-vessel mounting
5. Enclosure	NEMA 4X with corrosion-resistant polyester coating	NEMA 4X/7/9	NEMA 4/5, NEMA 7,9 UL listed. Polyester coated interior/exterior aluminum
6. Sensing Material	Rigid impulse tube; 1/8" schedule 80, 316 I stainless steel	PVC/Buna-N®, CPVC, 316 stainless steel, Teflon®	Neoprene coated with Teflon®
7. Output	4-20mA into 600 Ω maximum at 24 VDC	4-20mA or RS 485	SP/DT, 20 Amp
8. Temperature	-40°F to 200°F (-40°C to 94°C)	-40°F to 185°F (-40°C to 85 °C)	30°F to +160°F (-34°C to +71°C)
9. Pressure	2 psi normal (.14 kg/cm2)	100 psi (7 kg/cm²)	Atmospheric

Electro-Mechanical Point Level Controls

New! Heavy-Duty Motor Available

Important Application Information

1. **Technology** — Rotating paddle torque actuates switch(es) or DP/DT relay.

2. **For use with** dry bulk materials of varying densities or liquid/solid interface.

3. **Process connections** – Units can be top-of-bin or side-of-bimounted by 1-1/4" NPT or optional mounting plate. Exception: Mini-Roto mounts on 3/4" NPT or with a mounting plate.

4. **Enclosures** — Polyester coated aluminum, UL listed as NEMA 4X, 7, 9. Exception: Mini-Roto has a 4X injection molded enclosure.

5. **Sensing material** — Paddles and shafts are stainless steel. Optional shaft couplings include Neoprene or silicon. Shaft length can be extend for top-of-bin mounted units. Exception: Mini-Roto uses nylon, Ryton® or polysulfone paddles.

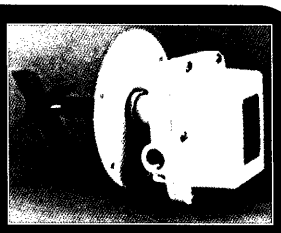
6. **Output** — Varies according to Roto type; SP/DT switch(es) or DP/DT relay.

7. **Temperature** — -30° F to 200° F (-34° C to 93° C) Exception: MBA-5 and MBA-7; maximum temperature, 480° F (250° C).

8. **Pressure** — 30 psi (2.1kg/cm) Optional 90 psi (6 bar) seal available on some models. Exception: MBA-5 and MBA-7; maximum pressure, 145 psi (10 bar).

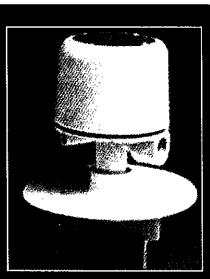
Roto-Bin-Dicator®

- Input 120 VAC or 240 VAC
- Available outputs of one or two SP/DT switches
- UL, CSA and BASEEFA listed for NEMA 4, 7, 9
- Available with stainless steel enclosure



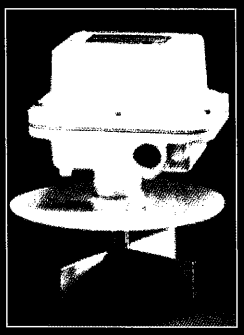
Mini-Roto™

- Low cost
- Will detect materials from 5 lbs/cu ft to 65 lbs/cu ft (816 Kg/m³ – 1041 Kg/m³)
- Install in small hoppers or bins where there is limited mounting space
- External alarm LED
- Input 120 VAC or 240 VAC
- SP/DT 10 amp switch output



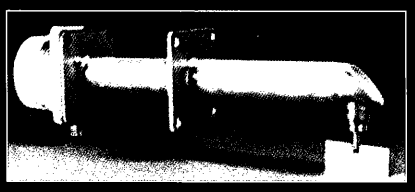
Super-Safe Plus Roto-Bin-Dicator®

- External function test with fob card
- Adjustable time delay
- Fail-safe selection (high or low level)
- Optical pulse sensing
- External power and alarm LEDs
- 1-1/4" NPT or mounting plate
- Input available: 120 VAC, 240 VAC or 24 VDC
- Relay output
- UL and CSA listed for NEMA 4X



MBA-7

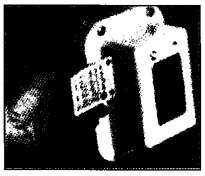
- Heavy-duty design
- Use in high-temperature applications 480° F (250° C)
- Use in high-pressure applications 145 psi (10 bar)
- Units are shipped with mounting flange
- MBA-7 units mount on side of bin only
- MBA-5 units mount of top of bin only
- Input 120 VAC or 240 VAC
- Output: Two SP/DT switches
- Units are CSA certified



Radio Frequency RF Point Level Controls

Important Application Information

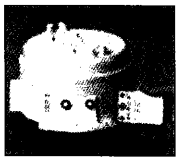
1. **Technology** — Radio Frequency sensing technique which actuates relay. (Exception-RF-6000, 4 or 20mA).
2. **For use with** liquid, solid and slurry materials.
3. **Process connections** — 1 1/4" NPT, 3/4" NPT, flange or sanitary. Remote systems available.
4. **Enclosures** — Polyester coated aluminum or stainless steel.
5. **Agency Approvals** — Include General Purpose NEMA 4X; NEMA 7, 9 with UL/C-UL listings, or BASEEFA.
6. **Sensing material** — 316 SS with Ryton®, polysulfone, Kynar®, or Teflon®. Ceramic probe available.
7. **Output** — DP/DT 5 Amp @ 120 VAC. RF-6000 Series: 6-10mA with material present, 17-20mA when no material is present (field reversible logic).
8. **Temperature:**
   - Electronics — -40°F to +160°F (-40°C to +71°C)
   - Probe — 450°F (232°C); RF Remote Series ceramic probe is rated to 1000°F (537°C).
9. **Pressure** — Consult factory for applications in vapors or applications over 60 psi (4 bar).



Bindicator RF level sensors with integral or remote electronics are used in all industries where liquids, slurries or solids are stored, processed or packaged. These sensors will detect high or low levels, as well as detect plugged chutes. Matched with Bindicator's sixty plus years of experience in level control engineering and manufacturing, you are assured of receiving the best level control system available.

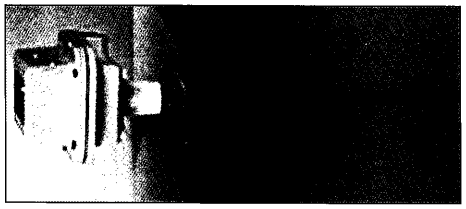
Test-In-Place

This patented feature allows you to test the RF level sensor without removing the cover while it is installed in the vessel. **These controls are the only Radio Frequency units on the market that can be safely tested in place, in a hazardous environment, without removing the cover.** Test-In-Place can be accomplished by pushing a button, turning a key, using a magnetic fob or even through your computer. This feature could save you thousands of dollars in the cost of a material spill and EPA fines for emitting fugitive emissions.



EZ-CAL® Calibration

Eliminate the tedious task of calibrating your level control. The patented EZ-CAL® feature allows you to calibrate your sensor without moving the material in and out of the vessel. It can be accomplished in less than 30 seconds by one of the many calibration options available. This digital calibration may also be accomplished through your computer.

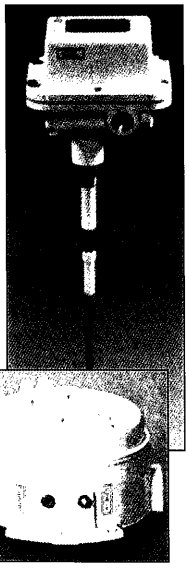


Pro-Guard

The PRO-GUARD section of the probe cancels out the effects of material coating on the probe, preventing false indications. The PRO-GUARD disregards the effects of probe coating due to sticky, dusty or clinging materials. The RF control will alarm only when the actual bulk of material (either dry or liquid) comes in contact with the probe.

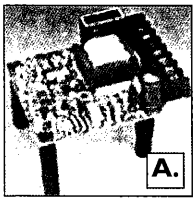
Calibration and Alarm Lights

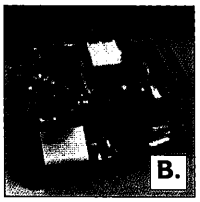
Bindicator's unique cover design allows you to determine the alarm or functional status of the level sensor without removing the cover. An illuminated green LED tells you that the unit is properly calibrated and is ready to sense the level of material. The red LED, when illuminated, indicates that the unit is alarmed. A blinking green LED signals a calibration change. A "no-light" condition is evidence that power has been lost or the unit needs calibration.

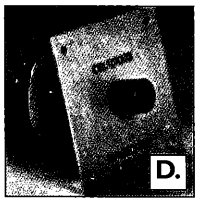


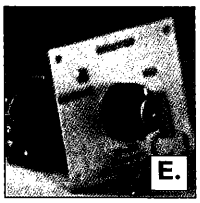
Calibration Options:

A. Two-Step Manual
B. One-Step Pushbutton
C. Fob and/or Magnet
D. One-Step Remote, Pushbutton
E. One-Step By Remote Keyswitch









More Radio Frequency Features

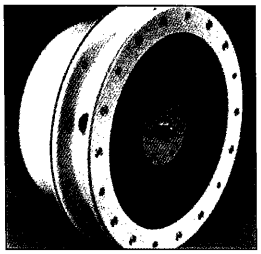
RF Series	Remote or Integral Unit	Mode of Calibration	External Cal. and Alarm Lights	Remote Cal. and Test Feature	Test-In-Place	Type of Output
RF-4000	Integral	Manual	NO	NO	NO	SP/DT relay
RF-6000	Integral	Manual	YES*	NO	YES/Fob	4 or 20mA
RF-8000	Integral	Manual	NO	NO	NO	DP/DT relay
RF-8200	Integral	Manual	YES**	NO	YES/Fob	DP/DT relay
RF-9000	Integral	Push-button	NO	YES	YES/ Push-button	DP/DT relay
RF-9100	Integral	Spring Magnet	YES	NO	YES/Spring	DP/DT relay
RF-9200	Integral	Fob Magnet	YES	NO	YES/Fob	DP/DT relay
RF-10000	Remote	Push-button	NO	YES	YES/ Push-button	DP/DT relay
RF-11000	Remote	Spring Magnet	YES	NO	YES/Spring	DP/DT relay
RF-12000	Remote	Fob Magnet	YES	NO	YES/Fob	DP/DT relay
RF-17000	Remote	Manual	NO	NO	NO	DP/DT relay
RF-18000	Remote	Manual	YES	NO	YES/Fob	DP/DT relay

NOTE: *Green LED on RF-6000 is a loop power indicator
**Does not include external calibration

Bin-Dicator® Diaphragm Point Level Controls

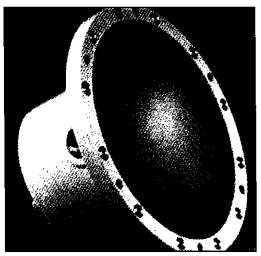
Important Application Information

1. **Technology** — Diaphragm senses material pressure and actuates switches.
2. **For use with** dry bulk materials.
3. **Features** —
   - Compact design
   - Many diaphragms
   - Suitable for many applications
   - Low cost
4. **Process Connections** — External on side-of-bin or on underslopes. Plug chutes.
5. **Enclosures** — NEMA 4/5.
6. **Output** — SP/DT 15 amp — DP/DT (Model "A" only).
7. **Pressure** — Atmospheric.



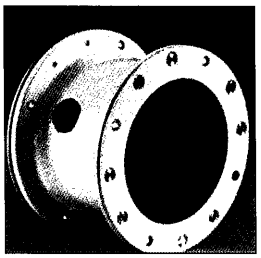
Model "A" Bin-Dicator®

- Available diaphragm materials: Neoprene®, Teflon®, silicon, canvas, fiberglass
- Optional high temperature, snap-action, general-purpose and explosion-proof switches
- Temperature: -40°F to 800°F (-40°C to 425°C)



Auto-Bin-Dicator®

- Available diaphragm materials: Neoprene® or 302 stainless steel
- Optional high-temperature, snap-action switches
- Temperature: -40°F to 800°F (-40°C to 425°C)
- CSA certified and UL listed



Bantam Bin-Dicator®

- Available diaphragm materials: Neoprene® or Neoprene coated with Teflon®
- Temperature: 40°F to 185°F (-40°C to 85°C)

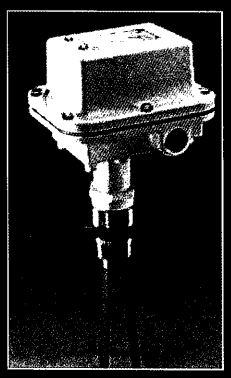
Tuning Fork Level Controls

Important Application Information

1. **Technology** — Oscillating tuning fork.
2. **For use with** dry granular solids, powders from 2lbs./cu. ft. (32kg/m³)
3. **Process Connections** — 1 1/2" NPT, mounting plate or flange mount.
4. **Enclosures** — NEMA 4X cast aluminum or stainless steel. NEMA 7/9 FM & CSA approved.
5. **Sensing Material** — 316 stainless steel, coated with Rilsan® or Teflon®.
6. **Output** — DP/DT 5 amp @ 125VAC or 28VDC
7. **Temperature** —
   - Electronics -40°F to +175°F (-40°C to +80°C)
   - Tuning Fork — 55°F to +212°F (-48°C to +100°C)
8. **Pressure**—150 psi (10.5 kg/cm²) ambient temperature

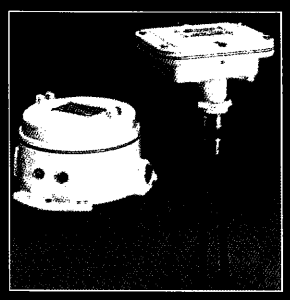
Pulse Point™ 100 Series

- Light materials - 2 lbs./cu. ft. (32kg/m³)
- No calibration required
- Integral electronics
- Selectable failsafe
- Pipe extended units



Pulse Point™ 200 Series

- Remote electronics
- For high vibration applications
- No calibration required
- Light materials - 2 lbs./cu. ft.(32kg/m³)
- Selectable failsafe
- Pipe extended units



Pulse Point™ LP-30

- Bindicator reliability at a very affordable price
- No calibration required
- Senses densities as low as 2 lbs/ft³ (32kg/m³)
- Selectable Failsafe and Time Delay
- Euro-Style Dual Conduit Entry
- Consult factory for approvals
- SP/DT relay
- Tuning Fork rated to 248°F (120°C)