# From simple point level controls to advanced computer-based inventory management

**Smart Bob II**

## Level Monitors and Controls

**MEASURE. CONTROL. DETECT.**

# BINMASTER

## ENHANCES SAFETY

With bin level indicators installed, there is no need for climbing ladders or onto bin roofs to routinely check bin levels. This reduces the risk of accidents and helps companies avoid insurance claims due to falls and injuries. Plus, for volatile or dusty materials, many devices are offered with explosion-proof certifications to prevent accidents.

## SIMPLE OPERATION

BinMaster level, flow and dust detection controls are easy to install and operate. Designed with simplicity and convenience in mind, this array of devices does not require highly skilled technical or operational staff or continual reference to bothersome manuals. Over the long term, BinMaster equipment is designed for minimal, easy service.

## SAVES TIME

BinMaster level indicators require fewer people to do more work by eliminating frequent climbing and allowing multiple bins to be monitored from a central location. With systems to manage from one up to 120 bins, there is no time wasted going to each bin. Many devices also offer a "fail-safe" feature that gives an immediate warn-ing and instantaneous response in the event of a failure.

## REQUIRES LESS STAFF

Many facilities are challenged with having less staff than they need. Not only is the need for staff to climb bins greatly reduced, BinMaster's durable products require virtually no maintenance. These long-lasting products will provide years of trouble-free operation and infrequently need replacement. By design, the "de-energized" operation of the motor in BinMaster rotaries places less stress on the motor and prolongs motor life.

## PREVENTS BIN OVERFLOWS

Overfilling bins ruins materials, wastes time, makes a mess, and costs money. Installing bin level controls allows users to automatically monitor materials and control processes. By managing material storage and flow, users can prevent bin overflows, empty conditions, clogged chutes and jammed conveyors. This helps eliminate costly spills, material waste and unnecessary downtime.

## IMPROVES INVENTORY MANAGEMENT

From simple point level controls to advanced inventory management systems, BinMaster can help an operation run more efficiently. Inventory levels will be more accurate. Information regarding bin status will be timely, allowing for just-in-time replenishment and reducing the risk of shutting down operations if material should run out. Advanced systems like SmartBob allow users to view multiple bins at a glance, helping to alleviate stress on production and purchasing personnel.

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## OPTIMIZES STORAGE CAPACITY

A storage operation is at its best when bins are filled to capacity and promptly refilled. Bin level controls help to prevent empty conditions and allow for timely filling without overfilling. BinMaster has complete systems to help monitor the level of each bin from very small to even the largest operations. Plus, equipment used for reducing clogged chutes and jammed conveyors will keep trucks and railcars moving.

## HIGHLY COST EFFECTIVE

BinMaster features a comprehensive line of products, providing a solution for a wide variety of applications and every budget. Basic devices offered at a very low cost will pay for themselves quickly in labor savings alone. Optimizing storage capacity and replenishment cycles makes even the most advanced BinMaster system a fast return on the investment. To help save customers money, BinMaster systems are designed to use less equipment to monitor more bins, can be configured to tie into existing control systems, and feature low power consumption and operating costs.

## Devices Suitable for Pellets, Granulars, Powders and Most Other Bulk Solids

Grain, Seed & Feed
Chemical Processing
Aggregates & Cement
Food Processing
Bioenergy

Pulp & Paper
Petrochemicals
Plastics Manufacturing
Power Plants
Mining Operations

## SmartBob2 Inventory Management System

The SmartBob2 remote is the core component of a proven, reliable level measurement system for solids, powders, liquids or slurries using cable-based, dust-penetrating sensor technology. When combined with its powerful Windows-based eBob software program installed on a personal computer or remote push-button control consoles, SmartBob2 offers the strongest and smartest cable-based inventory measurement system on the market today – with the ability to manage from one up to 120 bins of heights up to 180 feet.

## SmartBob-TS1 Small Bin Sensor

The SmartBob-TS1 sensor is a cable-based, continuous level measurement sensor for bins up to 60 feet tall. The compact, rugged device weighs less than 10 pounds and is immune to airborne dust and filling noise that can interfere with other continuous level devices. Compatible with eBob software and consoles from BinMaster's SmartBob inventory tracking system, the SmartBob-TS1 is designed to reliably measure powders, granules, pellets, plastic resins, and dry bulk solids as well as liquids in smaller bins, tanks and silos.

## Non-Contact Ultrasonic & Pulse Radar

SmartSonic is an ultrasonic device designed for continuous, non-contact level measuring and monitoring of tanks, bins and silos. Its transmitter features high efficiency, narrow beam design technology using a wide frequency bandwidth to enhance operation in difficult applications, varying temperatures and harsh environments. Smart-Wave is a low-noise pulse radar transmitter for distances up to 100 feet. A display console, compatible with both devices, can be used for remote indication of bin levels for up to five bins.

## 3DLevelScanner Multiple-Point Measurement

BinMaster's 3DLevelScanner is a non-contact, dust-penetrating bin volume measurement system that uses patented, acoustics-based technology to measure bin contents at multiple points to determine the volume of material in the bin. Its 3DLevel Manager software sends detailed log reports to a personal computer for easy remote monitoring, with advanced models featuring optional surface mapping capabilities. It offers very low maintenance and is self-cleaning, making it ideal for high-dust environments.

## PROCAP Series Capacitance Probes

PROCAP capacitance probes offer interference-free, fail-safe operation and "Quick-Set" calibration. Working far below the RF level of 9 KHz at 6 KHz – PROCAP will not interfere with two-way radios or other equipment operating in the radio spectrum. Optional Class I and II hazardous location ratings, remote electronics and flush-mount designs combined with a wide assortment of probes and extensions make these capacitance probes appropriate for a variety of challenging applications in solid, liquid and slurry materials.

## Single Blade Vibrating Rods

With a unique single-rod probe design and a sword-shaped blade that prevents bridging of material, BinMaster vibrating rods are superior to typical "tuning fork" designs by allowing material to easily flow by, preventing buildup on the blade. BinMaster's standard 7-inch piezoelectric driven vibration type point level switch is suitable for both top and side mount applications, while rigid extended models can be custom built up to 13 feet of either galvanized or stainless steel, dependent on the application.

# Flow, and Dust Detection Controls

## Reliable Rotary Level Controls

Rotary level indicators are proven, widely used devices for point level detection and suitable for a wide range of powder and bulk solid materials. BinMaster rotaries feature a specialized motor design with "de-energized" operation, shutting down the motor when material is present, prolonging motor life and saving energy. A triple-thread, screw-off lid offers easy access to components and dual-conduit entries allow for simple installation. With options like "fail-safe" protection alerting to loss of power and models for hazardous locations, BinMaster rotaries are best-in-class for the industry.

## Basic Point Level Diaphragm Switch

A diaphragm switch provides simple, low-cost, automatic level indication of free flowing dry materials such as grain, feed, seed and other granular or pelleted materials. It operates by sensing material pressing against the diaphragm and activating a visual or audible alarm to start or stop a process or alert to high, medium or low levels in bins. BinMaster offers models for hazardous and non-hazardous environments, internal or external mounting, and either neoprene or silicone diaphragm covers.

## Tilt Switch High Level Indication

The BinMaster tilt switch is a versatile, cost-effective level indicator that can be used to alert to high levels, clogged chutes or used as a load sensor in a wide variety of applications and materials. The tilt switch is installed in a bin, or over an open pile or conveyor using a wire rope, chain or other flexible hanger. When material rises and the device is tilted at least 15 degrees, a steel ball inside of the device activates a microswitch, alerting the user to a high level or clogged status.

## Dust Detect Emissions Monitoring

BinMaster's single device dust detector is designed to continuously monitor the flow of particulate emissions from small stacks or other emission points being passed through a filter within an air filtration system. It easily installs in the exhaust ductwork and can be used in conjunction with various types of bag, ceramic, cartridge or cyclone filters. Its probe is designed to recognize abnormal particulate levels outside user-defined preset parameters, initiating an alarm when changes in emissions exceed these levels.

## Flow/No Flow Detection for Solids

Appropriate for solids or powders, BinMaster's flow detect system alerts users if the flow status has changed, power is lost, or communication is interrupted. This system consists of a remote sensor probe mounted in a pneumatic pipeline, gravity chute or feeder and a control console mounted in an area accessible to users. The non-intrusive sensor probe is an industrial grade instrument that senses flow / no-flow conditions using Doppler technology (microwave) to provide highly reliable and sensitive motion detection.

## Airbrator Combines Aeration & Vibration

Airbrator is a very effective flow aid for many types of difficult dry materials such as fly ash, cement, flour, lime, sand and salt. Using a combination of both aeration and vibration, its special self-cleaning design creates a vibration as the air flows between the pad's boot and the bin wall. Airbrator is appropriate for use in any type of bin or silo including food grade applications. It is extremely economical, quite easy to install, and does not require specific air pressure for operation.

# Continuous Inventory Management



**SmartBob2**
**Cable-Based Sensor**

**APPLICATIONS**
• Rugged, simple, and dependable inventory measurement system for solid, liquid and slurry materials in vessels up to 180 feet
• Works in dusty and very demanding applications
• Vendor-managed inventory
• Plastics, chemicals, coal, concrete, food ingredients, pharmaceuticals, feed/grain, aggregates and many other materials

**FEATURES**
• Economical, regardless of number of units installed
• 5th generation eBob PC-based inventory management software
• Output and display consoles for one up to 120 bins
• Requires no field calibration or adjustment
• Advanced microprocessor-based system with built-in measurement reliability
• Minimal ongoing operational and maintenance cost
• Hazloc approval Class II
• RS-485 network with wiring distance up to 4,000 ft.
• Simple daisy-chain wiring allows for easy installation
• External wireless options available

**SPECIFICATIONS**
**Power Requirements:** 115/230 VAC 50/60 Hz
**Ambient Temp:** -40°F to +185°F (-40°C to +85°C)
**Process Temp:** Up to 500°F (260°C)
**Measurement Range:** Up to 180'
**Measurement Rate:** 2 feet per second
**Accuracy:** ± 0.25% distance measurement accuracy
**Mounting:** 3"- 8" NPT
**Enclosure:** Molded polycarbonate
**Approvals & Certifications:** Listed for Class II, Groups E, F, & G Hazardous Locations
**Enclosure Type:** NEMA 4X, 5, 9 & 12

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**SmartBob-TS1**
**Cable-Based Sensor**

**APPLICATIONS**
• Rugged, simple, and dependable inventory measurement system for solid, liquid and slurry materials in vessels up to 60 feet
• Vendor-managed inventory
• Plastics, chemicals, coal, concrete, food ingredients, pharmaceuticals, feed/grain, aggregates and many other materials

**FEATURES**
• Economical, regardless of number of units installed
• 5th generation eBob PC-based inventory management software
• Output and display consoles for one up to 120 bins
• Requires no field calibration or adjustment
• Advanced microprocessor-based system with built-in measurement reliability
• Minimal ongoing operational and maintenance cost
• RS-485 network with wiring distance up to 4,000 ft.
• Simple daisy-chain wiring allows for easy installation
• Built-in wireless options available

**SPECIFICATIONS**
**Power Requirements:** 115/230 VAC 50/60 Hz
**Ambient Temp:** -20°F to +140°F (-29°C to +60°C)
**Process Temp:** Up to 140°F (60°C)
**Measurement Range:** 60 feet
**Measurement Rate:** 1 foot per second
**Accuracy:** ± 0.25% distance measurement accuracy
**Mounting:** Special bolt on or 3"- 6" NPT
**Enclosure:** Rotational molded polyethylene
**Approvals & Certifications:** NEMA 4X (IP65)

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**SmartSonic**
**Ultrasonic Transmitter**

**APPLICATIONS**
• Continuous, non-contact level monitoring of tanks, bins and silos
• Narrow beam design using a wide frequency bandwidth to enhance operation in difficult applications
• Smart signal processing to eliminate unwanted echoes
• Measuring range from 4 inches up to 90 feet
• Liquids, plastics, grain, sand, aggregates and many more applications

**FEATURES**
• Power control operation in transmitter
• Easy two-point, push-button calibration
• 4-20 mA signal output
• RS-485 communications with PC-based utility/diagnostic program
• Built-in temperature compensation
• Logarithmic receiver with very high dynamic range
• Uniform polar pattern
• Self-cleaning operation

**SPECIFICATIONS**
**Power Requirements:** AC units 115 VAC 60 Hz or 230 VAC 50 Hz; DC units 12 to 30 VDC 0.07 Amps
**Ambient Temp:** -40°F to +140°F (-40°C to +60°C)
**Process Temp:** Up to 200°F (93°C)
**Operation:** Ultrasonic
**Frequency:** 25 to 148 KHz
**Measurement Range Liquids:** 90' maximum
**Measurement Range Solids:** 40' maximum
**Accuracy:** ± 0.25%
**Beam Angle:** 6° - 12° conical at –3dB
**Temp Compensation:** Continuous in transducer
**Output:** 4-20 mA and RS-485
**Mounting:** 3" NPT
**Enclosure:** PVC-94VO
**Approvals & Certifications:** NEMA 4X (IP65)

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**SmartWave**
**Pulse Radar Transmitter**

**APPLICATIONS**
• Continuous, non-contact level monitoring of tanks, bins, and silos
• Self-adjusting
• Measuring range up to 100 feet using 6.3 GHz operating frequency
• Adapts to adverse conditions
• Food, beverages, water/wastewater, chemicals (with vapor), plastics, sand, grain, aggregates, hot asphalt and many more applications

**FEATURES**
• Low noise
• Accurate and reliable
• High sensitivity
• Self-adjusting amplitude and width of microwave pulse
• Easy two-point, push-button calibration
• 4-20 mA signal output
• RS-485 communications with PC-based utility/diagnostic program
• Uniform polar pattern
• No mounting influence

**SPECIFICATIONS**
**Power Requirements:** AC units 115 VAC 60 Hz or 230 VAC 50 Hz; DC units 12 to 30 VDC 0.07 Amp
**Ambient Temp:** -40°F to +140°F (-40°C to +60°C)
**Process Temp:** PP rod to 140°F (60°C); PTFE rod to 400°F (204°C)
**Operation:** Pulse radar
**Frequency:** 6.3 GHz
**Measurement Range Liquids:** 100' maximum
**Measurement Range Solids:** 50' maximum
**Accuracy:** ± 0.25%
**Transmitter Power:** 50 uW average
**Antenna:** Dielectric rod (Polypropylene & optional Teflon)
**Output:** 4-20 mA and RS-485
**Mounting:** 2" NPT
**Enclosure:** Aluminum-94VO (optional stainless steel)
**Approvals & Certifications:** NEMA 4X (IP65), explosion proof units available

## 3DLevelScanner
## Non-Contact Sensor

**APPLICATIONS**
- Suitable for pellets, granulars powders and most other bulk solids
- High dust environments needing reliable inventory measurement
- Bins, silos and open pits where the surface of materials is irregular or uneven
- For operations desiring non-contact technology to reduce risk of contamination
- Grain, seed, feed, food processing and bioenergy plants
- Plastics manufacturing, aggregates, cement, pulp/paper, petrochemicals and chemical processing
- For the power industry in materials like coal, fly ash or clinker

**FEATURES**
- Multiple-point bin volume measurement accounts for uneven material surface
- Measures virtually any powder or solid material with density of at least 12 lb./cu. ft.
- Maximum measuring range 200 feet
- Acoustical-based, low frequency technology is unaffected by dust
- Works where ultrasonic and radar have failed
- Sends bin data to a personal computer loaded with 3DLevel Manager software
- Optional surface mapping capability
- Communications via 4-20/HART, Modbus RTU or TCP/IP
- Easy to install and self-cleaning

**SPECIFICATIONS**
**Preferred Applications:** Powders and solids
**Measuring Range:** 200 feet (61 meters)
**Supply Voltage:** 20 - 32 VDC
**Process Temp:** -40°F to 185°F (-40°C to 85°C)
**Process Pressure:** -0.2 - 1bar (-2.9 to 14.5 psi)
**Signal Output:** 4-wire 4-20mA/HART/RS-485/ Modbus
**Emitting Frequency:** 3 KHz to 10 KHz
**Housing:** Aluminum die cast powder coated
**Approval:** ATEX II 1/2D, 2D, Ex ibD/iaD 20/21 T110˚C, ATEX II 2G Ex ia/ib IIB T4, FM Intrinsically Safe Class I, II, Division I, Groups C, D, E, F, G

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## Flow Detect 1000
## Microwave Flow Detection

**APPLICATIONS**
- Senses flow/no-flow conditions of solids and powders in pneumatic pipelines, gravity chutes and feeders
- Virtually unaffected by humidity, ambient light, pressure, vacuum, temperature, noise, vibration, electrical signals, non-metallic buildup or dust
- Used in food processing, plastics, grain, cement/aggregates, paper, mining and many other materials

**FEATURES**
- Consists of two components including remote sensor and control console
- Uses Doppler technology (microwave) to provide reliable motion detection
- Non-intrusive flush mounting senses through non-metallic surfaces
- Non-contact operation eliminates flow stream interruption and equipment wear
- Control settings can be made without accessing the remote sensor probe
- Fail-safe power protection and loop fault monitor
- "Quick-Set" selectable, single turn calibration
- Hazloc approval Class II
- Alarm for flow/no flow status
- High/low selectable sensitivity adjustment

**SPECIFICATIONS**
**Power Requirement:** 115 or 230 VAC 50/60 Hz, 5 VA
**Operating Temp Remote:** -22°F to +158°F (-30°C to +70°C)
**Operating Temp Console:** -31°F to +158°F (-35°C to +70°C)
**Process Temp:** 250°F (121°C) if ambient air temperature is below 150°F (65°C)
**Detection Range:** Up to 10 feet
**Frequency:** 24.125 GHz, less than 1mW/cm³ (OSHA limit is 10mW/cm³)
**Remote Enclosure:** Die cast aluminum
**Remote Approvals:** Listed for Class II, Groups E, F & G Hazardous Locations
**Enclosure Type:** NEMA 4X, 5, 9 & 12
**Output:** DPDT dry contacts, 5A @ 240 VAC, or 30 VDC
**Time Delay:** Single turn 0.1-15 sec

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## Dust Detect 1000
## Dust Detection

**APPLICATIONS**
- Continuous monitoring of emissions through an air filtration system
- Designed for general maintenance planning and process protection applications for baghouses, cartridge filters, bin vents and cyclones
- Used in metals, chemicals, fly ash, plastics, pharmaceuticals, food, utilities, mining, pulp/ paper and many more applications

**FEATURES**
- Complies with US and International EPA regulations
- Emission readings are averaged, not smoothed, to eliminate false alarms
- Pre-warning indicator alerts to potentially hazardous situations
- Instantaneous alarm or one minute averaged readings
- Easy set-up
- Two SPDT relay outputs

**SPECIFICATIONS**
**Power Requirements:** 115 VAC, 50/60 Hz ±15%, 5 VA, 230 VAC optional
**Output Relay:** Two SPDT 10 Amp relays (warning & alarm)
**Ambient Temp:** -25°F to +160°F (-32°C to +71°C)
**Process Temp:** Up to 250°F (121°C)
**Pressure:** 500 PSI
**Housing Enclosure:** Cast aluminum, USDA approved powder coat finish
**Mounting:** 1-1/4" NPT or 3/4" NPT 316 SS
**Standard:** 1-1/4" NPT 316 stainless steel & sanitary flange optional
**Alarm:** Dual alarm (alarm is 2x pre-alarm) switch selectable for instantaneous or one minute averaged
**Sensitivity:** 1 mg/m (.0005 gr/SCF)

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## BM-30 LGX
## Particulate Monitor

**APPLICATIONS**
- Reliable dust collector emissions monitor and leak detector
- Designed for general maintenance planning and process protection applications for baghouses, cartridge filters, bin vents and cyclones
- Used in metals, chemicals, fly ash, plastics, pharmaceuticals, food, utilities, mining, pulp/ paper and many more applications

**FEATURES**
- Complies with US and International EPA regulations
- Simple absolute output correlates to mg/m³ or gr/cf
- Performs in tough applications (kilns, smelters, carbon black)
- Prevents the escape of valuable materials
- Convenient split-architecture design
- Repeatable in all applications
- Large LED display provides both logarithmic analog bar graph and an absolute digital readout
- Log scale enables observation of baseline and peaks

**SPECIFICATIONS**
**Power Requirements:** 115/230 VAC 50/60 Hz, or 24 VDC
**Output Relay:** Two SPDT, 5A @ 240 VAC
**Ranging:** Log or linear
**Resolution:** 5.0 pA
**Operating Temp Sensor:** Standard 250°F (120°C); optional 450°F (232°C)
**Operating Temp Console:** -13°F to +160°F (-25°C to + 70°C)
**Pressure:** Standard 10 PSI; optional 100 PSI
**Approvals & Certifications:** Standard Ordinary/General Purpose; optional Class I, II & III, Div I & II (Intrinsically Safe-CSA)
**Housing Enclosure:** Cast aluminum enclosure NEMA 4X
**Mounting:** 1/2" NPT standard; optional ANSI flange & quick-clamp
**Sensor Cable:** 300' maximum length, 450°F (232°C) maximum temp

# Point Level Indicators

## BMRX Rotary

**APPLICATIONS**
- Reliable point level detection for solids including powders, pellets and granular materials
- Used in bins, silos, chutes and conveyors
- Material density from 2 lb./cu. ft. to over 100 lb./cu. ft.
- Feed, seed, grain, food, sand, gravel, concrete, aggregates, plastics, chemicals, coal and many other materials

**FEATURES**
- Rugged construction and simple, dependable design
- Triple thread screw-off cover
- Switch selectable high/low fail-safe
- De-energizing motor for extended operational life
- Four-bearing shaft assembly reduces wear and increases reliability
- Internal, bi-directional clutch
- Various voltages available
- DPDT relay output, 250 VAC, 10 Amp
- Dual conduit entrance
- Removable wiring terminals
- Interchangeable with other rotaries
- Powder-coated finish
- Adjustable sensitivity

**SPECIFICATIONS**
**Power Requirements:** 24/115/230 VAC, 50/60 Hz; 24/ 12 VDC, 60/35 mA
**Output Contacts:** DPDT 10 Amp, 250 VAC
**Ambient Operating Temp:** -40°F to +185°F (-40°C to +85°C)
**Process Temp:** Up to +400°F (204°C)
**Pressure:** 1/2 micron, 30 PSI
**Approvals & Certifications:** CSA/US Class I, Groups C & D and Class II, Groups E, F & G
Ex II 2G 1D Ex d IIB T5 Ex tD A20 IP66 T93C (Ta = -20C to +85C)
**Enclosure Type:** NEMA 4X, 5, 7, 9 & 12
**Enclosure:** Die cast aluminum, USDA approved powder coat finish
**Mounting:** 1-1/4" NPT
**Conduit Connections:** 3/4" NPT
**Shaft and components:** Stainless steel

## MAXIMA+ Rotary

**APPLICATIONS**
- Reliable point level detection for bulk solids including powders, pellets and granular materials
- Used in bins, silos, chutes and conveyors
- Material density from 2 lb./cu. ft. to over 100 lb./cu. ft.
- Feed, seed, grain, food, sand, gravel, concrete, aggregates, plastics, chemicals, coal and many other materials

**FEATURES**
- Microprocessor-based fail-safe indicator eliminates spills and process shortages from power failures, motor or gear failures
- Visual LED indicates sensor status: uncovered, covered and fault conditions
- Supervise normal and fault conditions
- De-energizing motor for extended operational life
- Four-bearing drive shaft assembly reduces wear and increases reliability
- Triple thread screw-off cover
- Internal, bi-directional clutch
- Multiple voltages
- Interchangeable with other rotaries
- Powder-coated finish
- Adjustable sensitivity

**SPECIFICATIONS**
**Power Requirements:** 24/115/230 VAC, 50/60 Hz; 12/24 VDC, 60/35 mA
**Output Relay:** DPDT 10 Amp, 250 VAC
**Status Indicator Relay:** SPDT 10 Amp, 250 VAC (solid state relays optional)
**Ambient Operating Temp:** -40°F to +185°F (-40°C to +85°C)
**Process Temp:** Up to +400°F (204°C)
**Pressure:** 1/2 micron, 30 PSI
**Approvals & Certifications:** CSA/US Class II, Groups E, F, & G
Ex II 1D Ex tD A20 IP66 T93C (Ta = -20C to +85C)
**Enclosure Type:** NEMA 4X, 5, 9 &12
**Enclosure:** Die cast aluminum, USDA approved powder coat finish
**Mounting:** 1-1/4" NPT
**Conduit Connection:** 3/4" NPT
**Shaft and components:** Stainless steel

## Mini Rotary

**APPLICATIONS**
- Reliable point level detection for bulk solids including powders, pellets and granular materials
- Used in small bins, silos, chutes and conveyors
- Material density from 2 lb./cu. ft. to over 30 lb./cu. ft.
- Feed, seed, grain, food, plastics, chemicals and many other materials

**FEATURES**
- Compact design ideal for small bins, hoppers and feeders
- Simple to install
- No calibration required
- De-energizing motor extends motor life
- Motor slip-clutch prevents gear damage
- Adjustable sensitivity
- 3/4" PF (pipe fitting)
- Optional 4-vane or bayonet type polycarbonate sensing paddles

**SPECIFICATIONS**
**Input Voltage:** 115/230 VAC, 50/60 Hz
**Power Consumption:** 1.5 Watts
**Switch:** SPDT
**Contact Rating:** 3A @ 250 VAC
**Rotary Speed:** 1 RPM
**Operating Temp:** -4°F to +140°F (-20°C to +60°C)
**Wiring Cable:** 18 AWG, 12 inch cable
**Mounting:** 3/4" PF (pipe fitting)
**Clutch:** Magnetic slip clutch prevents damage to motor gears
**Enclosure:** Polycarbonate, NEMA 1
**Weight:** 0.77 lb.

## Tilt Switch

**APPLICATIONS**
- Reliable high level detection for dense bulk solids
- Used in bins, vessels, chutes, silos or over conveyors and open pits where conventional level devices cannot be mounted
- Material density of 15 lb./cu. ft. and greater
- Grain, sand, gravel, concrete, aggregates, coal and many other materials

**FEATURES**
- Economical high level point detection
- Rugged construction and easy installation
- Simple design with one moving part
- Switch activated at 15 degrees
- Stainless steel paddle or plastic sphere options available

**SPECIFICATIONS**
**Switch Ratings:** 15 Amps @ 125 or 250 VAC, 1/8 HP @ 125 VAC, 1/4 HP @ 250 VAC, 1/2 Amp @ 125 VDC, 1/4 Amp @ 250 VDC
**Operating Temp:** -40°F to +300°F (-40°C to +149°C)
**Mounting:** Suspended by flexible hanger

# Point Level Indicators, Alarms and Aeration



**BM-45
Diaphragm Switch**

**APPLICATIONS**
• Reliable point level detection for free flowing dry materials
• Used in bins, vessels and some plugged chute applications
• Material density from 20 lb./cu. ft.
• Feed, seed, grain, food, rubber, plastics, light powders, granules and many other materials

**FEATURES**
• Rugged construction and simple design
• Very economical point level detection
• Neoprene or silicone diaphragm material
• Internal or external mount
• Multiple voltages

**SPECIFICATIONS**
**Switch Ratings:** 15 Amps @125, 250 or 480 VAC, 1/8 HP @ 125 VAC, ¼ HP @ 250 VAC, 1/2 Amp @ 125 VDC, 1/4 Amp @ 250 VDC
**Operating Temp:** -40°F to +300°F (-40°C to +149°C)
**Housing Enclosure:** Die cast aluminum
**Mounting:** Internal or external, 16 gauge galvanized mounting plate

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**BM-65
Diaphragm Switch**

**APPLICATIONS**
• Reliable point level detection for free flowing dry materials
• Used in bins, vessels and some plugged chute applications
• Material density from 20 lb./cu. ft.
• Feed, seed, grain, food, rubber, plastics, light powders, granules and many other materials

**FEATURES**
• Hazloc approval Class II
• Rugged construction and simple design
• Very economical point level detection
• Neoprene or silicone diaphragm material
• Internal or external mount
• Multiple voltages

**SPECIFICATIONS**
**Switch Ratings:** 15 Amps @125 or 250, 1/8 HP @ 125 VAC, ¼ HP @ 250 VAC, 1/2 Amp @ 125 VDC, 1/4 Amp @ 250 VDC
**Operating Temp:** -40°F to +300°F (-40°C to +149°C)
**Approvals & Certifications:** Listed for Class II, Groups E, F & G Hazardous Locations
**Enclosure Type:** NEMA 4, 5, 9 & 12
**Housing Enclosure:** Die cast aluminum
**Mounting:** Internal or external, 16 gauge galvanized mounting plate

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**Point Level
Alarm Panel**

**APPLICATIONS**
• Designed to monitor the level of multiple bins or tanks from one convenient location
• Operator can view when a bin is full, partially full or empty
• Helps manage filling and emptying of bins by alerting operator to level point via signal light and alarm
• Operates with a variety of point level indicators

**FEATURES**
• Available with 4, 8, 12, 16, 20 or 24 stations
• NEMA 4X enclosure
• Front panel LED alarm & power indication
• Indicates a level point by means of an eye-catching signal light and audible alarm
• Modules on the alarm panel can also be connected to an external common alarm (horn)

**SPECIFICATIONS**
**Input Voltage:** 115 VAC ± 10%, 50/60 Hz, 3 VA. 230 VAC ± 10%, 50/60 Hz, 3 VA. 24-48 VDC, 2 W maximum
**Relay:** SPDT, 2 Amp 240 VAC
**Enclosure:** NEMA 4X
**Operating Temp:** -4°F to +158°F (-20°C to +70°C)
**Warranty:** One year

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**Airbrator
Aeration & Vibration**

**APPLICATIONS**
• Eliminates packing and maintains flow of finely-ground dry bulk materials
• Indoor and outdoor applications in bins and storage vessels
• Used in high temperature, corrosive applications
• Flour, seed, grain, flakes, sawdust, cement, PVC resin, fly ash, carbon black, lime, sand, cornstarch, gypsum, sugar and other materials

**FEATURES**
• Special design provides dual-action flow aid through aeration and vibration
• Requires fewer pads than diffuser type devices because of unique design
• Uses high or low pressure
• Not affected by moisture or temperature
• Self-cleaning
• Simple to install in any type vessel
• Suitable for abrasive material
• Check valve to keep material out of air line

**SPECIFICATIONS**
**Pad Material:** Durable molded silicone or neoprene rubber construction
**Shaft:** Stainless steel center shaft
**Process Temp:** Up to 250°F (121°C)
**Air Pressure:** From 5 PSIG to 60 PSIG
**Air Consumption:** Dependent on application

# Point Level Indicators



**PROCAP I & II
Capacitance Probe**

**APPLICATIONS**
• Point level detection and process control for solid, liquid and slurry materials
• Used in bins, vessels, tanks, chutes and conveyors
• Plastics, chemicals, coal/fly ash, concrete, food ingredients, pharmaceuticals, feed/grain, mining, foundries, wood/paper processing, many other materials

**FEATURES**
• "Quick-Set" simple calibration
• Triple thread screw-off cover
• Dual conduit entrance
• Unsurpassed sensitivity 0.5 pF
• PRO-Shield compensates for material buildup
• Operates below RF range, temperature stable calibration and protection from RF interference
• Fail-safe, switch selectable high/low
• Adjustable time delay to 30 seconds
• Optional sensing probes: Delrin or Teflon sleeved, bare, food grade, flush mount, solid and flexible extensions
• Visual LED indicates sensor status: uncovered, covered or power failure

**SPECIFICATIONS**
**PROCAP I Power Requirements:** Universal power supply 24 to 240 VAC/VDC
**PROCAP II Power Requirements:** Selectable 115/230 VAC
**Output Relay:** DPDT 10 Amp at 250 VAC
**Ambient Temp:** -40°F to +185°F (-40°C to +85°C)
**Process Temp:** To 250°F Delrin/Bare probe (121°C); to 500°F Teflon probe (260°C)
**Pressure:** 500 PSI
**Approvals & Certifications:** Listed for Class II, Groups E, F & G Hazardous Locations
**Enclosure Type:** NEMA 4X, 5, 9 & 12
**Housing Enclosure:** Die cast aluminum, USDA approved powder coat finish
**Mounting:** 1-1/4" NPT or 3/4" NPT 316 SS standard; 1-1/4" NPT 316 SS & sanitary flange optional

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**PROCAP IX & IIX
Capacitance Probe**

**APPLICATIONS**
• Point level detection and process control for solid, liquid and slurry materials
• Used in bins, vessels, tanks, chutes and conveyors where an explosion rated sensor is necessary
• Plastics, chemicals, coal/fly ash, concrete, food ingredients, pharmaceuticals, feed/grain, mining, foundries, wood/paper processing, many other materials

**FEATURES**
• Explosion proof design for Class I hazardous location applications
• "Quick-Set" simple calibration
• Triple thread screw-off cover
• Dual conduit entrance
• Unsurpassed sensitivity 0.5 pF
• PRO-Shield compensates for material buildup
• Operates below RF range, temperature stable calibration and protection from RF interference
• Fail-safe, switch selectable high/low
• Adjustable time delay to 30 seconds
• Optional sensing probes: Delrin or Teflon sleeved, food grade, flush mount, solid and flexible extensions

**SPECIFICATIONS**
**PROCAP IX Power Requirements:** Universal power supply 24 to 240 VAC/VDC
**PROCAP IIX Power Requirements:** Selectable 115/230 VAC
**Output Relay:** DPDT 10 Amp at 250 VAC
**Ambient Temp:** -40°F to +185°F (-40°C to +85°C)
**Process Temp:** To 250°F Delrin probe (121°C); to 500°F Teflon probe (260°C)
**Pressure:** 500 PSI
**Approvals & Certifications:** Listed for Class I, Groups C & D and Class II, Groups E, F & G Hazardous Locations
**Enclosure Type:** NEMA 4X, 5, 7, 9 & 12
**Housing Enclosure:** Die cast aluminum, USDA approved powder coat finish
**Mounting:** 1-1/4" NPT or 3/4" NPT 316 SS standard; 1-1/4" NPT 316 SS & sanitary flange optional

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**PROCAP I & II 3-A
Capacitance Probe**

**APPLICATIONS**
• Point level detection and process control for solid, liquid and slurry materials
• Used in bins, vessels, tanks, chutes and conveyors where 3-A and/or USDA approvals are necessary
• Dairy products, food, pharmaceuticals, and many other materials requiring 3-A or USDA approvals

**FEATURES**
• 3-A approved, food grade design
• "Quick-Set" simple calibration
• Triple thread screw-off cover
• Dual conduit entrance
• Unsurpassed sensitivity 0.5 pF
• PRO-Shield compensates for material buildup
• Operates below RF range, temperature stable calibration and protection from RF interference
• Fail-safe, switch selectable high/low
• Adjustable time delay to 30 seconds
• Visual LED indicates sensor status: uncovered, covered or power failure

**SPECIFICATIONS**
**PROCAP I 3-A Power Requirements:** Universal power supply 24 to 240 VAC/VDC
**PROCAP II 3-A Power Requirements:** Selectable 115/230 VAC
**Output Relay:** DPDT 10 Amp at 250 VAC
**Ambient Temp:** -40°F to +185°F (-40°C to +85°C)
**Process Temp:** To 250°F Delrin probe (121°C); to 500°F Teflon probe (260°C)
**Pressure:** 500 PSI
**Approvals & Certifications:** Listed for Class II, Groups E, F & G Hazardous Locations
**Enclosure Type:** NEMA 4X, 5, 9 & 12
**Housing Enclosure:** Die cast aluminum, USDA approved powder coat finish
**Mounting:** 1" or 2.5" sanitary flange

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**PROCAP I & II FL
Capacitance Probe**

**APPLICATIONS**
• Point level detection and process control for solid, liquid and slurry materials
• Used in bins, vessels, tanks, chutes and conveyors where a non-intrusive flush mounted sensor is necessary
• Plastics, chemicals, coal/fly ash, concrete, food ingredients, pharmaceuticals, feed/grain, mining, foundries, wood/paper processing, many other materials

**FEATURES**
• "Quick-Set" simple calibration
• Triple thread screw-off cover
• Dual conduit entrance
• Unsurpassed sensitivity 0.5 pF
• PRO-Shield compensates for material buildup
• Optional high-temperature sensing probe
• Operates below RF range, temperature stable calibration and protection from RF interference
• Fail-safe, switch selectable high/low
• Adjustable time delay to 30 seconds
• Visual LED indicates sensor status: uncovered, covered or power failure

**SPECIFICATIONS**
**PROCAP I FL Power Requirements:** Universal power supply 24 to 240 VAC/VDC
**PROCAP II FL Power Requirements:** Selectable 115/230 VAC
**Output Relay:** DPDT 10 Amp at 250 VAC
**Ambient Temp:** -40°F to +185°F (-40°C to +85°C)
**Process Temp:** 150°F standard (65°C); 450°F high temp (232°C)
**Pressure:** 250 PSI
**Approvals & Certifications:** Listed for Class II, Groups E, F & G Hazardous Locations
**Enclosure Type:** NEMA 4X, 5, 9 & 12. Units also available in Class I, Groups C & D
**Housing Enclosure:** Die cast aluminum, USDA approved powder coat finish
**Mounting:** Flush

# Point Level Indicators

## PRO REMOTE Capacitance Probe

**APPLICATIONS**
- Point level detection and process control for solid, liquid and slurry materials
- Used in bins, vessels, tanks, chutes and conveyors with high temperature/high vibration conditions
- Electronics may be located up to 75' from sensing probe
- Plastics, chemicals, coal/fly ash, concrete, food ingredients, pharmaceuticals, feed/grain, mining, foundries, wood/paper processing, many other materials

**FEATURES**
- "Quick-Set" simple calibration
- Unsurpassed sensitivity 0.5 pF
- PRO-Shield compensates for material buildup
- Operates below RF range, temperature stable calibration and protection from RF interference
- Fail-safe, switch selectable high/low
- Adjustable time delay to 10 seconds
- Optional sensing probes: Delrin or Teflon sleeved, food grade, flush mount, solid and flexible extensions
- Internal LED indicates material in contact with probe

**SPECIFICATIONS**
**Power Requirements:** 115/230 VAC, 50/60 Hz ±15%, 5 VA
**Output Relay:** DPDT 10 Amp at 250 VAC
**Ambient Temp:** -40°F to +185°F  (-40°C to +85°C)
**Process Temp:** To 250°F Delrin probe (121°C); to 500°F Teflon probe (260°C)
**Pressure:** 500 PSI
**Approvals & Certifications:** CSA Listed, Intrinsically Safe Class I, NEMA 4X, 5 & 12
**Probe Enclosure:** Die cast aluminum, USDA approved powder coat finish
**Electronic Enclosure:** Polycarbonate or aluminum
**Mounting:** 1-1/4" NPT or 3/4" NPT 316 stainless steel
**Standard:** 1-1/4" NPT 316 stainless steel & sanitary flange optional

## PRO AUTO CAL Capacitance Probe

**APPLICATIONS**
- Point level detection and process control for solid, liquid and slurry materials
- Used in bins, vessels, tanks, chutes and conveyors where low voltage DC power is necessary
- Plastics, chemicals, coal/fly ash, concrete, food ingredients, pharmaceuticals, feed/grain, mining, foundries, wood/paper processing, many other materials

**FEATURES**
- Auto-calibration and external test
- Unsurpassed sensitivity 0.5 pF
- PRO-Shield compensates for material buildup
- Operates below RF range, temperature stable calibration and protection from RF interference
- Fail-safe, switch selectable high/low
- Adjustable time delay to 10 seconds
- Optional sensing probes: Delrin or Teflon sleeved, bare, food grade, flush mount, solid and flexible extensions
- Visual LED indicates sensor status: uncovered, covered or power failure

**SPECIFICATIONS**
**Power Requirements:** 115/230 VAC, 50/60 Hz ±15%, 5 VA
**Output Relay:** DPDT 10 Amp at 250 VAC
**Ambient Temp:** -40°F to +185°F (-40°C to +85°C)
**Process Temp:** To 250°F Delrin/bare probe (121°C); to 500°F Teflon probe (260°C)
**Pressure:** 500 PSI
**Approvals & Certifications:** Listed for Class II, Groups E, F & G Hazardous Locations
**Enclosure Type:** NEMA 4X, 5, 9 & 12
**Housing Enclosure:** Die cast aluminum, USDA approved powder coat finish
**Mounting:** 1-1/4" NPT or 3/4" NPT 316 stainless steel standard; 1-1/4" NPT 316 stainless steel & sanitary flange optional

## Compact PRO Capacitance Probe

**APPLICATIONS**
- Point level detection and process control in liquid, powder, granular and pelleted materials
- Used in smaller bins, vessels, tanks and chutes
- Plastics, chemicals, concrete, food ingredients, pharmaceuticals, feed/grain, wood/paper processing, many other materials
- Works where Proximity Switches don't

**FEATURES**
- PRO-Shield feature ignores material buildup
- LED on housing indicates sensor status: covered or uncovered
- Easy "one-time" calibration
- Compact design; simple to install
- For metal, plastic or other non-metallic vessels

**SPECIFICATIONS**
**Power Requirements:** 115, 230 VAC or 24 VDC
**Output Relay:** SPDT 5 amp at 250 VAC
**Ambient Temp:** -40°F to +185°F (-40°C to +85°C)
**Process Temp:** To 240°F (116°C)
**Pressure:** 150 PSI
**Approvals & Certifications:** NEMA 4X, 5 & 12
**Enclosure:** PVC
**Probe:** CPVC
**Mounting:** 1" NPS (1-1/4" adapter available)
**LED:** Indicates material presence or absence

## PRO HTRC-20 Capacitance Probe

**APPLICATIONS**
- Point level detection and process control for solid, liquid and slurry materials
- Used in bins, vessels, tanks, chutes and conveyors when process temperature exceeds 500°F
- Plastics, chemicals, coal/fly ash, concrete, food ingredients, pharmaceuticals, feed/grain, mining, foundries, wood/paper processing, many other materials

**FEATURES**
- "Quick-Set" simple calibration
- Unsurpassed sensitivity 0.5 pF
- PRO-Shield compensates for material buildup
- Operates below RF range, temperature stable calibration and protection from RF interference
- Fail-safe, switch selectable high/low
- Adjustable time delay to 10 seconds
- Internal LED indicates material in contact with probe

**SPECIFICATIONS**
**Power Requirements:** 115 or 230 VAC, 50/60 Hz ±15%, 5 VA
**Output Relay:** DPDT 5 Amp at 250 VAC
**Ambient Temp:** -40°F to +185°F (-40°C to +85°C)
**Process Temp:** to 1112°F (600°C)
**Pressure:** 100 PSI
**Approvals & Certifications:** NEMA 4X, 5 & 12
**Probe Enclosure:** Die cast aluminum, USDA approved powder coat finish
**Electronic Enclosure:** Metal
**Mounting:** 1-1/4" NPT

# Point Level Indicators

## VR-21 Vibrating Rod

**APPLICATIONS**
- Suitable for high and low level indication, or plugged chute detection
- Detects extremely light, fluffy materials and materials with low dielectric constants
- Materials densities from 1.25 lb./cu. ft.
- Carbon black, plastics, fly ash, feed, seed, grain, food, chemicals and other materials

**FEATURES**
- Unique "blade" probe design reduces false alarms caused by buildup
- No calibration required
- Wear and maintenance free
- No moving parts
- Three sensitivity adjustments
- Universal power supply
- Self-cleaning sensor
- Remote electronics available
- Switch selectable high/low fail-safe

**SPECIFICATIONS**
**Power Requirements:** Wide range 20-250V AC/DC
**Relay:** SPDT relay, 5A @ 250 VAC (optional DPDT relay available)
**Time Delay:** 1 second from stop of vibration, 2 to 5 seconds for start of vibration
**Ambient Temp:** -4°F to +140°F (-20°C to +60°C)
**Process Temp:** To 176°F standard (80°C); to 284°F high temp (140°C)
**Pressure:** 145 psi
**Enclosure:** Die cast aluminum, NEMA 4, 5 & 12
**Probe:** 304 stainless steel, 7.37" insertion length
**Mounting:** 1-1/2" NPT
**Material Densities:** From 1.25 lb./cu. ft.
**Approvals:** CSA hazardous location approvals for Class II, Groups E, F & G (optional)

## VR-41 Vibrating Rod

**APPLICATIONS**
- Suitable for high and low level indication, or plugged chute detection
- Detects extremely light, fluffy materials and materials with low dielectric constants
- Material densities from 1.25 lb./cu. ft.
- Carbon black, plastics, fly ash, feed, seed, grain, food, chemicals and other materials

**FEATURES**
- Unique "blade" probe design reduces false alarms caused by buildup
- No calibration required
- Wear and maintenance free
- No moving parts
- Three sensitivity adjustments
- Universal power supply
- Self-cleaning sensor
- Remote electronics available
- Insertion length from 13" to 13'
- Switch selectable high/low fail-safe

**SPECIFICATIONS**
**Power Requirements:** Wide range 20-250V AC/DC
**Relay:** SPDT relay, 5A @ 250 VAC (optional DPDT relay available)
**Time Delay:** 1 second from stop of vibration, 2 to 5 seconds for start of vibration
**Ambient Temp:** -4°F to +140°F (-20°C to +60°C)
**Process Temp:** To 176°F standard (80°C); to 284°F high temp (140°C)
**Pressure:** 145 psi
**Enclosure:** Die cast aluminum, NEMA 4, 5 & 12
**Probe:** 304 stainless steel, 13" to 13' insertion length
**Mounting:** 1-1/2" NPT
**Materials Densities:** From 1.25 lb./cu. ft.
**Approvals:** CSA hazardous location approvals for Class II, Groups E, F & G (optional)

## CVR-600 Vibrating Rod

**APPLICATIONS**
- Compact design for reliable point level sensing in small bins and hoppers that contain plastics, food, seed, chemicals, and many other powder and bulk solid materials
- Material densities from 3.5 lb./cu. ft.

**FEATURES**
- Compact design ideal for small bins, hoppers, and feeders
- Single rod design
- No calibration required
- Wear and maintenance free
- No moving parts
- High and low level fail-safe
- Three sensitivity adjustments
- Universal power supply
- Self-cleaning sensor
- 1" NPT mounting
- 6" insertion length
- Remote electronics available
- Process temperatures up to 300°F
- Screw-top enclosure

**SPECIFICATIONS**
**Power Requirements:** Wide range 20-250V AC/DC
**Power Consumption:** 3 VA
**Relay:** SPDT 5A 250 VAC
**Time Delay:** 1 second from stop of vibration, 2 to 5 seconds for start of vibration
**Ambient Temp:** -4°F to +150°F (-40°C to +65°C)
**Process Temp:** To 176°F standard (80°C); to 300°F high temp (150°C)
**Pressure:** 145 psi
**Wiring Cable:** 1/2"
**Mounting:** 1" NPT
**Enclosure:** Die cast aluminum, NEMA 4, 5 & 12
**Probe:** 304 stainless steel, 6" insertion length
**Material Density:** From 3.5 lb./cu. ft.

## SHT-120/140 Vibrating Rod

**APPLICATIONS**
- Suitable for high and low level indication, or plugged chute detection
- Built specifically for higher process temperatures up to 482°F (250°C)
- Detects extremely light, fluffy materials and materials with low dielectric constants
- Material densities from less than 1.25 lb./cu. ft.
- Carbon black, plastics, fly ash, feed, seed, grain, food, chemicals and many other materials

**FEATURES**
- Single stainless steel rod design
- No calibration required
- Wear and maintenance free
- No moving parts
- High and low level fail-safe
- Three sensitivity adjustments
- Universal power supply
- Self-cleaning sensor
- 1-1/2" NPT mounting
- Remote electronics available
- Insertion length from 7.37" to 13'
- Lagged design to locate electronics away from heat source

**SPECIFICATIONS**
**Power Requirements:** Wide range 20-250V AC/DC
**Power Consumption:** 3 VA
**Relay:** SPDT 5A 250 VAC (optional DPDT relay available)
**Time Delay:** 1 second from stop of vibration, 2 to 5 seconds for start of vibration
**Ambient Temp:** -4°F to +150°F (-40°C to +65°C)
**Process Temp:** To 482°F (250°C)
**Pressure:** 145 psi
**Wiring Cable:** 1/2"
**Mounting:** 1-1/2" NPT
**Enclosure:** Die cast aluminum, NEMA 4, 5 & 12
**Probe:** 304 stainless steel, (SHT-120 7.37" insertion length, SHT-140 14" to 13' insertion length)
**Material Density:** From 1.25 lb./cu. ft.