

SafePoint®

FAIL-SAFE ROTARY PADDLE BIN MONITOR

- ▼ *Industry-First Magnetic Sensing
(patent pending)*
- ▼ *Unique Housing Design*
- ▼ *Microcontroller-based Reliability*
- ▼ *Material Sense and Fault Outputs*
- ▼ *Hazardous Location Approvals Available*



SafePoint®



"SETTING THE STANDARD FOR SUPPLIER EXCELLENCE"

BULLETIN 253

SafePoint® FAIL-SAFE ROTARY PADDLE BIN MONITOR

- ▼ **Reliable Magnetic Technology (patent pending)**
- ▼ **Twist On/Off Cover – No More Bolts**
- ▼ **Wiring Access - 2 Conduit Entrances**
- ▼ **Local status indicating light on most models**
- ▼ **Hazardous Approvals Available**

The **SafePoint**® fail-safe bin monitor is the state-of-the-art in rotary paddle technology. Utilizing patent-pending magnetic sensing technology and a new unique housing design, the **SafePoint** bin monitor is the most reliable, technician-friendly, rugged and economical fail-safe rotary paddle point level control sensor of its kind.

The **SafePoint** bin monitor provides the ultimate in performance wherever critical continuous operation must be ensured. Detection of both material presence and its own operational status is performed on a continuous basis. The **SafePoint** level sensor monitors its electrical and mechanical operating condition. Separate outputs are provided for material sense and unit status (fault conditions).

While the **SafePoint** bin monitor is an evolution in rotary paddle technology, it continues to use tried-and-true Monitor operating techniques. Unlike many other available units, the **SafePoint** incorporates a feature that automatically shuts off its motor when the paddle is in a stalled condition. This extends the life of the unit and minimizes maintenance.

PRINCIPLE OF OPERATION

The operation of the **SafePoint**® rotary paddle bin monitor uses Monitor's magnetic sensing technology to detect both material presence and operational status of the unit. This method is simple and more reliable than that used by other brands. The unit is installed through the wall of the vessel so that the paddle protrudes inside the vessel. A small electric motor drives the paddle, which rotates freely in the absence of material.

The rotation of the unit's shaft is continuously monitored by detection of a magnetized rotating disk (patent pending). When the paddle is



An installed **SafePoint**® unit in an aggregate application.

impeded by material, the shaft rotation stops. The motor rotates within the housing and magnetized sections of the motor mounting plate are detected (patent pending). Use of these magnetic sensing techniques eliminates problems that may occur with fouling of the optical systems used by other brands.

The built-in microcontroller monitors both shaft and motor mounting plate rotation. This allows the **SafePoint** to easily distinguish between material presence and any electrical and mechanical failure of the unit. When material presence is detected, the SENSE relay changes state and the drive motor is de-energized to extend motor life. This output is available to control a process function or alarm circuit. When the material level drops, a tension spring returns the drive motor to its original running condition and is reactivated.

A unit failure is detected by sensing a lack of shaft rotation while material presence has not been detected by rotation of the motor mounting plate. In a failure condition the independent FAULT relay will change state indicating that an error condition exists. Monitoring the state of both the SENSE and FAULT relays provides the most flexibility for control and fail-safe monitoring.

APPLICATIONS

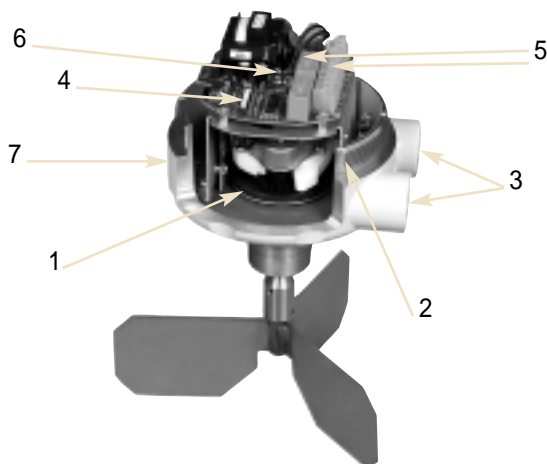
The rugged and reliable fail-safe design of the **SafePoint**® bin monitor makes it the best choice for critical level control applications. The unit is compatible with many granular, pelletized and powder bulk applications. It can be utilized for high level indication of materials over 10 lb/ft³ and for low and intermediate level indication for materials over 5 lb/ft³. The **SafePoint** bin level monitor can be installed almost anywhere dry bulk materials are stored including bins, hoppers, silos and tanks.

**TYPICAL APPLICATIONS INCLUDE,
BUT ARE NOT LIMITED TO:**

- | | | |
|-----------|----------------|----------------|
| ▼ Feed | ▼ Silica Sand | ▼ Rocks |
| ▼ Pellets | ▼ Wood | ▼ Calcium Dust |
| ▼ Rubber | ▼ Metals | ▼ Regrind |
| ▼ Coal | ▼ Peanuts | ▼ Malt |
| ▼ Clays | ▼ Resin | ▼ Limestone |
| ▼ Grain | ▼ Foundry Sand | ▼ Ingredients |
| ▼ Rawhide | ▼ Sawdust | ▼ Cement |

FEATURES

- ▼ ¹Use of magnetic sensing technology ensures reliable operation even in dusty environments where optical-based units may exhibit problems
- ▼ ²Twist on/off cover for convenient and easy access – No bolts to lose or hold.
- ▼ ³Two conduit connections provides easy wiring access
- ▼ ⁴Microcontroller-based electronics ensures consistent and reliable operation
- ▼ Fail-Safe operation detects electrical and mechanical status essential for critical applications
- ▼ ⁵Independent SPDT relays for material sense and fault outputs provides for flexible control wiring
- ▼ ⁶Indicating light (ordinary locations only) provides local visual indication of operating status
- ▼ ⁷Cast aluminum explosion-proof housing with rugged powder coat finish can be used in a wide range of applications
- ▼ High Temperature version available (up to 750°F)



AVAILABLE CONFIGURATIONS

MOTOR VOLTAGES

The **SafePoint**® fail-safe rotary paddle bin monitor is available in forms to serve most power requirements. Available forms include 115VAC, 230VAC and 24VAC/DC.

LOCAL VISUAL STATUS INDICATION



The **SafePoint** bin monitor incorporates a red and green LED to indicate material sense and unit status. A red LED illuminates when material presence is detected. A green LED illuminates when material is not present. The green LED will flash during initialization immediately following power-up. The red LED will flash during a failure mode. This indication can be viewed without removing the cover (units supplied for general purpose ordinary electrical locations only).

APPROVALS/LABELING

The **SafePoint** bin monitors are approved by third party agencies including CSA (CSA_{US/C} for North American use) and ISSeP (CENELEC). Approvals for either general purpose ordinary locations, dust-ignition-proof and/or explosion-proof hazardous area locations can be provided. In addition, all units carry the CE marking for Europe. Refer to "Specifications" section of this bulletin for specific details.

HIGH TEMPERATURE UNIT



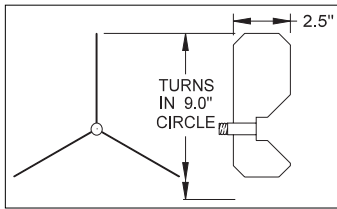
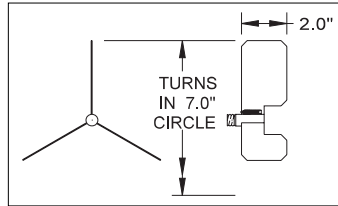
The **SafePoint** high temperature model incorporates all the standard features of the **SafePoint** bin monitor, but can be used in applications where internal bin temperatures reach as high as 750°F. The hi-temp models incorporate specially designed mounting plates, pipe extensions with air purge connections (recommended for all high temperature applications; must be used for 500°F+), shaft extensions, couplings and bushings. The hi-temp assembly is available in either a carbon steel or stainless steel version. Refer to "Ordering Information" for applicable part numbers.

ACCESSORIES

PADDLE ASSEMBLIES

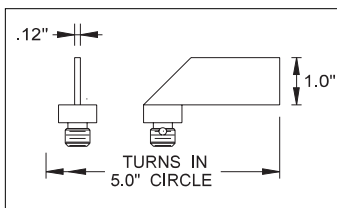
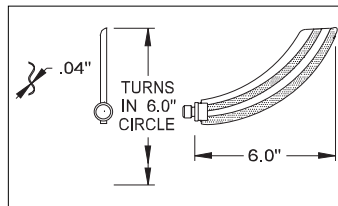
Monitor offers a variety of interchangeable paddle assemblies to meet the needs of a wide variety of applications. Different material densities, particle sizes and flow characteristics require specific paddles to provide optimum performance. See Monitor's Paddle Selection Guide for more detailed application recommendations.

1.) Standard Stainless Steel Three Vane Paddle - The most popular of all paddles. For use with average weight materials. P/N 1-4146



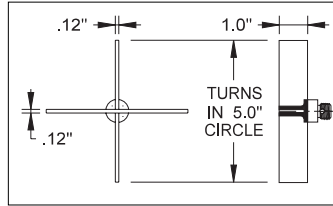
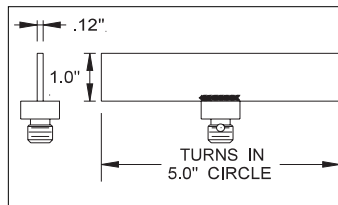
2.) Large Stainless Steel Three Vane Paddle - 9" diameter provides accurate level control for lightweight materials. P/N 1-4141

3.) Insertable* Stainless Steel, Scimitar Single Vane Paddle - Provides low and high level control for light to average weight materials. P/N 1-4193



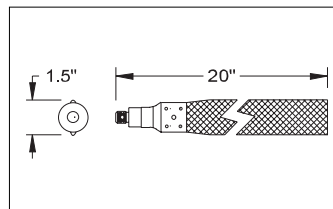
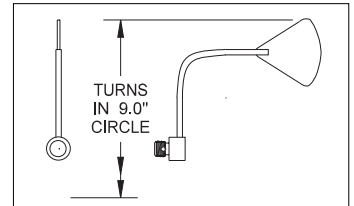
4.) Insertable*, Stainless Steel Single Vane Paddle - Provides low level control for average weight materials and low to high level control for heavy materials under 1-1/2" in diameter. P/N 1-4145

5.) Stainless Steel, Two Vane Paddle - Provides low and high level control for heavy materials under 1-1/2" in diameter. P/N 1-4135



6.) Stainless Steel Four Vane Paddle - For use with average to heavy weight materials in low and high level control installations. P/N 1-4156

7.) Stainless Steel Triangular Arc Single Vane Paddle - Provides low and high level control for light to average weight materials. P/N 1-4144

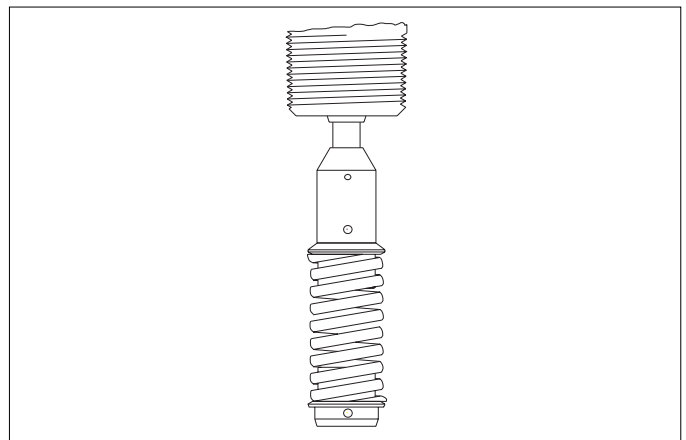


8.) Ex-Flex Three-Ply 20" Belt Vane Paddle - Provides low and high level control for heavy materials over 2" in diameter. Top mount only. P/N 1-4137

** Insertable paddles eliminate the need for a mounting plate. Paddle is insertable through 1/2 of a 1-1/4" coupling, that is welded to the bin wall.*

FLEXIBLE COUPLING

The flexible coupling works to absorb heavy loads, side loads and loads caused by product surges, thus protecting the internal workings and extending the life of the paddle unit. A flexible coupling should be used with heavy materials and in top mount installations where a shaft extension is used. Monitor offers the following coupling option: Spring-Flex: P/N 1-3335



FLEX COUPLING

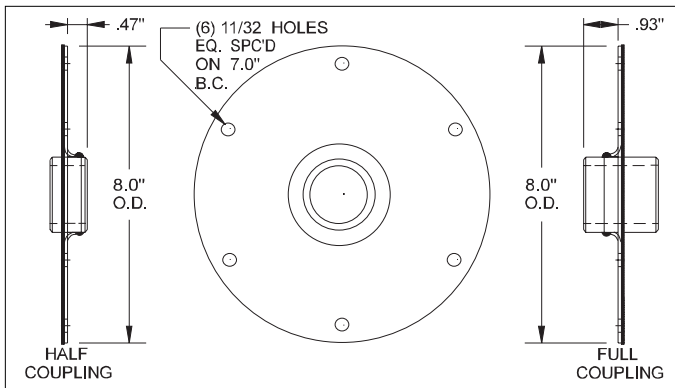


MOUNTING PLATES

Mounting plates allow the paddle units to be mounted from the outside of a vessel to curved or flat surfaces. All mounting plates featured below mount via six bolts.

1.) Half Coupling Flexible Mounting Plate - For use in side mount installations. Available in powder coated carbon steel for general purpose applications and stainless steel for use in corrosive environments. Stainless Steel Plate: P/N 1-0112
Carbon Steel Plate: P/N 1-0101

2.) Full Coupling Flexible Mounting Plate - For use in top mount installations where a shaft extension and shaft guards are required. Available in powder coated carbon steel for general purpose applications and stainless steel for use in corrosive environments. Stainless Steel Plate: P/N 1-0113
Carbon Steel Plate: P/N 1-0102



3.) K-Flange Aluminum Mounting Plate - For flat surfaces or thin walled vessels where extra strength is required. Ideal for semi-corrosive environments, including outdoors. P/N 1-3316

SHAFT EXTENSIONS

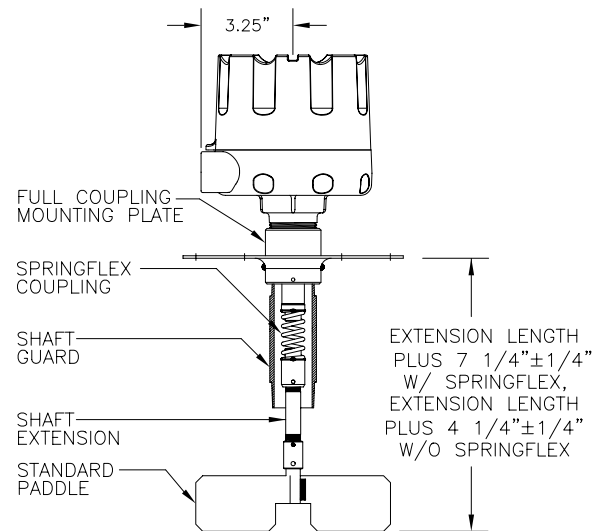
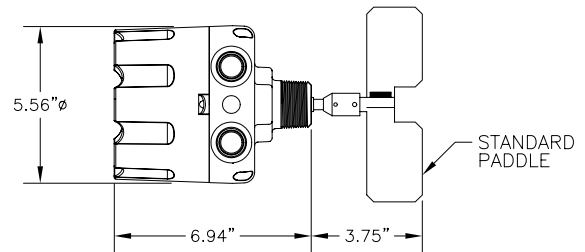
Many top mount installations require that the paddle extends into the vessel to a predetermined level. Monitor shaft extensions are available in a variety of lengths up to 144" to meet these demands.

SHAFT GUARDS

Shaft guards are recommended for use with shaft extensions to limit the movement caused by side loading that would otherwise damage the working components of the paddle unit. Shaft guards should be the same length as the extension and should always be used when the extension meets or exceeds 18" in length.

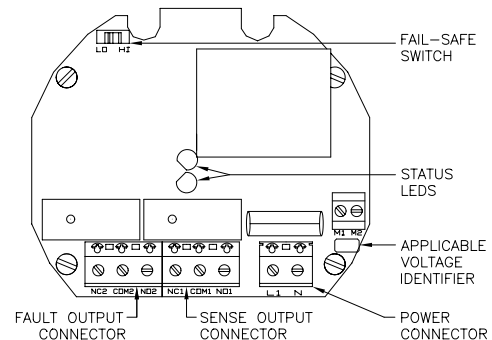
MECHANICALS

TYPICAL SIDE MOUNT UNIT



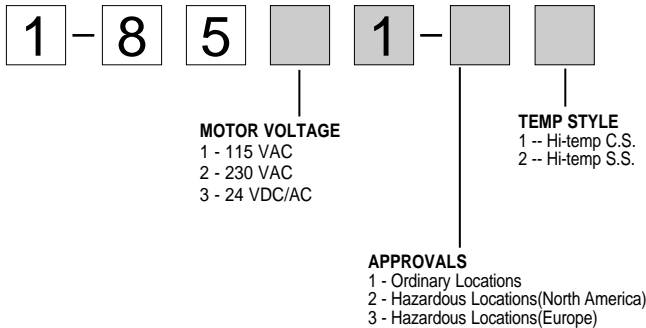
TYPICAL TOP MOUNT UNIT

WIRING DIAGRAM



BULLETIN 253 SafePoint®

ORDERING INFORMATION



NOTE:
External lights are not available with hazardous location approvals

ACCESSORIES

Paddles:
See Paddle Assemblies Under "Accessories Section"

Flexible Coupling:
1-3335 Spring Flex

Mounting Plates:
1-0101 Mounting Plate w/ Half Coupling, Carbon Steel
1-0102 Mounting Plate w/ Full Coupling, Carbon Steel
1-0112 Mounting Plate w/ Half Coupling, Stainless Steel
1-0113 Mounting Plate w/ Full Coupling, Stainless Steel
1-3316 Mounting Plate w/ K-Flange, Aluminum

Shaft Extensions:
1-1175-1-#* 1/4" Pipe, SCH-40, Galvanized
1-1175-2-#* 1/4" Pipe, SCH-40, Stainless Steel

Shaft Guards:
1-1174-1-#* 1-1/4" Pipe, SCH-40, Galvanized
1-1174-2-#* 1-1/4" Pipe, SCH-40, Stainless Steel

* # = Extension and Guard Lengths. Lengths not to exceed 144". See Bulletin 217B for additional extension and guard ordering information.

SPECIFICATIONS

General:

Power Requirements: 115 VAC (+/- 15%); 9 VA; 50/60 Hz
230 VAC (+/- 15%); 9 VA; 50/60 Hz
24 VAC/DC (+/- 15%); 11 VA

Ambient Operating Temp: -40°F (-40°C) to +150°F (65°C)

*Internal Bin Temp:

Standard Unit: to +250°F (+121°C)

Hi-Temp Unit: to +750°F (+399°C)

Conduit Connection: Two(2) 3/4" NPT connections

Outputs:

Material Sense: One SPDT; 5A @ 277 VAC, 30 VDC max

Unit Status (Fault): One SPDT; 5A @ 277 VAC, 30 VDC max

Maximum Pressure: 30 PSI

Sensitivity: 5 lb./ft³ minimum material density
(when using large 3-vane paddle)

Indicators: Red and green high intensity LEDs indicate
material sense and unit status conditions
(Ordinary Location unit only)

Housing: Die cast alum., IP66, NEMA 4

Housing Finish: Powder coating

Mounting Connection: 1-1/4" NPT threaded male hub

Weight: Approx. 8-1/2 lb. (3.9 kg)

Materials of construction/accessories:

Flexible Couplings: 304 stainless steel

Mounting Plates: Carbon steel or 304 stainless steel

All Paddles except Ex-Flex: 304 stainless steel

Ex-Flex Belt: 304 stainless steel coupling, rubber/fabric
blend belt

Listings/Approvals: CSA_{USC}: Ordinary Locations
CSA_{USC}: Class I, Div. 1 & 2, Groups C, D
Class II, Div. 1 & 2, Groups E, F, G
CENELEC EEx d IIB T6 (pending)
CE Mark

*Influenced by mounting, material thermal conductivity and ambient temp.

Patents Pending

WARRANTY

Monitor Technologies LLC warrants each **SafePoint®** rotary paddle bin indicator it manufactures to be free from defects in material and workmanship under normal use and service within two (2) years from the date of purchase within North America, and within one (1) year from date of purchase outside of North America. The purchaser must give notice of any defect to Monitor within the warranty period, return the product intact and prepay transportation charges. The obligation of Monitor Technologies LLC under this warranty is limited to repair or replacement at its factory. This warranty shall not apply to any product which is repaired or altered outside of the Monitor Technologies LLC factory, or which has been subject to misuse, negligence, accident, incorrect wiring by others or improper installation. Monitor Technologies LLC reserves the right to change the design and/or specifications without prior notice.

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