FAIL-SAFE DRY MATERIAL ROTARY PADDLE LEVEL SWITCHES

LVD-800 Series

1 YEAR WARRANTY

- **Reliable Magnetic Technology**
- **Twist On/Off Cover—No More Bolts!**
- **Wiring Access—2 Conduit Entrances**
- **Motor Shuts Off When Paddle is Impeded Significantly Extends Motor Life and Reduces Maintenance Costs**
- **Local Status Indicating Light on Most Models**
- **Standard Units Rated to 121°C (250°F)**
- **Hi-Temp Models Rated to 399°C (750°F)**

The LVD-800 Series fail-safe bin monitor is the state-of-the-art in rotary paddle technology. Utilizing magnetic sensing technology and a unique housing design, the LVD-800 Series fail-safe bin monitor is the most reliable, technician-friendly, rugged and economical truly fail-safe rotary paddle point level control sensor of its kind.

The LVD-800 Series fail-safe 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 LVD-800 Series fail-safe level sensor monitors its electrical and mechanical operating condition. This, in conjunction with separate outputs provided for material sense and unit status (fault conditions) makes this unit a "truly" fail-safe device.

While the LVD-800 Series fail-safe bin monitor is an evolution in rotary paddle technology, it continues to use tried-and-true operating techniques. Unlike many other available units, the LVD-800 Series 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 LVD-800 Series rotary paddle fail-safe bin monitor uses 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 manufacturers. 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. When the paddle is impeded by material, the shaft rotation stops. The motor rotates within the housing and magnetized sections of the motor mounting plate are detected. Use of these magnetic sensing techniques eliminates problems that may occur with fouling of the optical systems used by other brands.

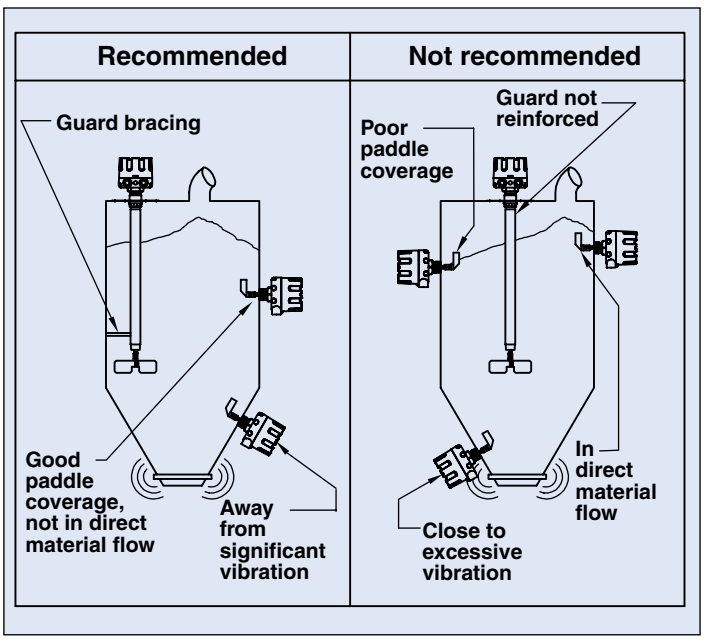
The built-in microcontroller performs self-diagnostics and monitors both shaft and motor mounting plate rotation. This allows the unit to easily distinguish between material presence and any electrical and mechanical failure of the unit. When material presence is detected, the SENSE relay changes state 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.

LVD-803 shown smaller than actual size.

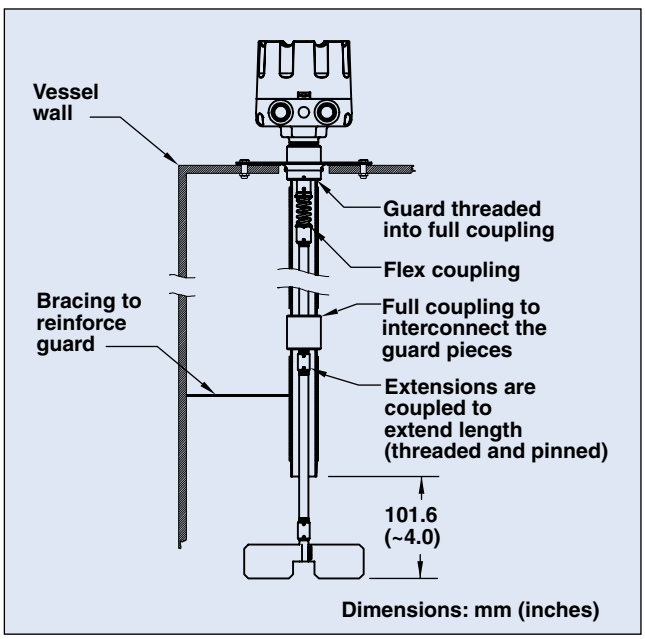
A unit failure is detected by sensing a lack of shaft rotation while material presence has not been detected by rotation of the motor mounting plate. In a failure condition the independent FAULT relay will change state indicating that an error condition exists. Monitoring the state of both the SENSE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

The rugged and reliable design of the LVD-800 Series fail-safe 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 160 kg/m^3 (10 lb/ft^3) and for low and intermediate level indication for materials over 80 kg/m^3 (5 lb/ft^3). The LVD-800 Series bin level monitor can be installed almost anywhere dry bulk materials are stored including bins, hoppers, silos and tanks.

Installation considerations



Extension and guard installation



SPECIFICATIONS

Power Requirements: 115 Vac (±15%); 9 VA; 50/60 Hz; 230 Vac (±15%); 9 VA; 50/60 Hz
Ambient Operating Temperature: -40 to 65°C (-40 to 150°F)
Internal Bin Temperature*:
Standard Unit: to 121°C (250°F)
Hi-Temp Unit: to 399°C (750°F)
Conduit Connection: Two (2) ¾ NPT

Outputs

Material Sense: One SPDT; 5A @ 250 Vac, 30 Vdc maximum
Unit Status (Fault): One SPDT; 5A @ 250 Vac, 30 Vdc maximum
Maximum Pressure: 30 psi (2 bar)
Sensitivity: 80 kg/m³ (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, NEMA-4, IP66
Housing Finish: Powder coating
Mounting Connection: 1¼ NPT
Weight: Approx. 3.9 kg (8.5 lb)

Materials of Construction/ Accessories

Flexible Couplings: 304 stainless steel
Mounting Plates: Carbon steel or 304 stainless steel
All Paddles Except Ex-Flex: 304 SS
Ex-Flex Belt: 304 SS coupling, rubber/fabric blend belt
Flexible Cable Extension: 304SS ¼" diameter

Listings/Approvals

Hazardous Locations: Class I, Div. Groups C, D; Class II, Div. 1 & 2, Groups E, F, G, CE Mark

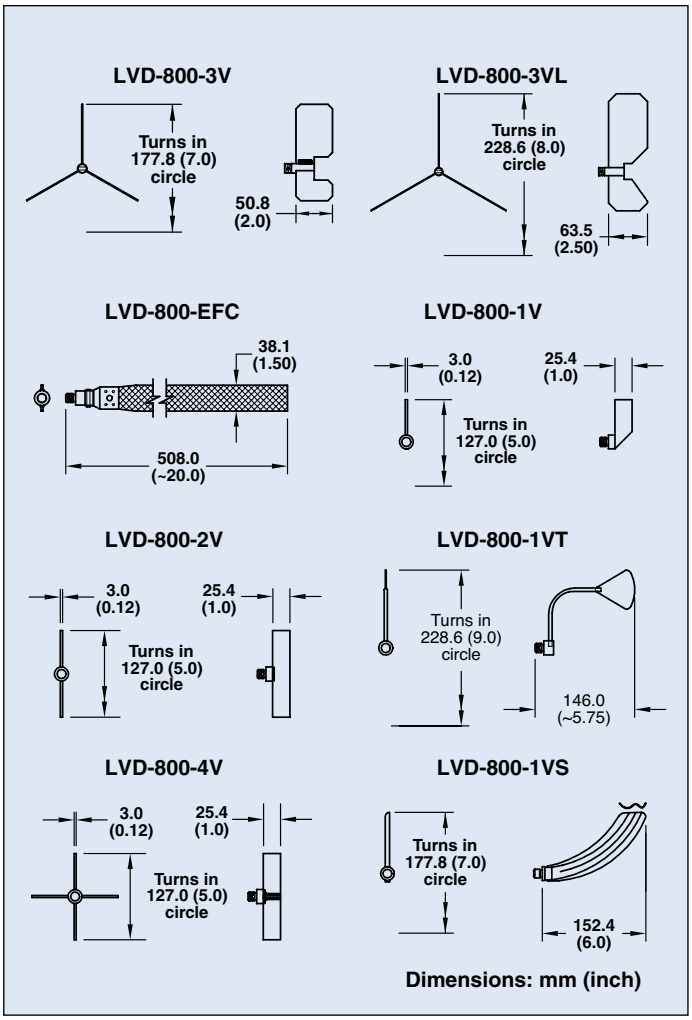
Typical Applications include, but are not limited to (density)

See Material Characteristics Guide for additional information.

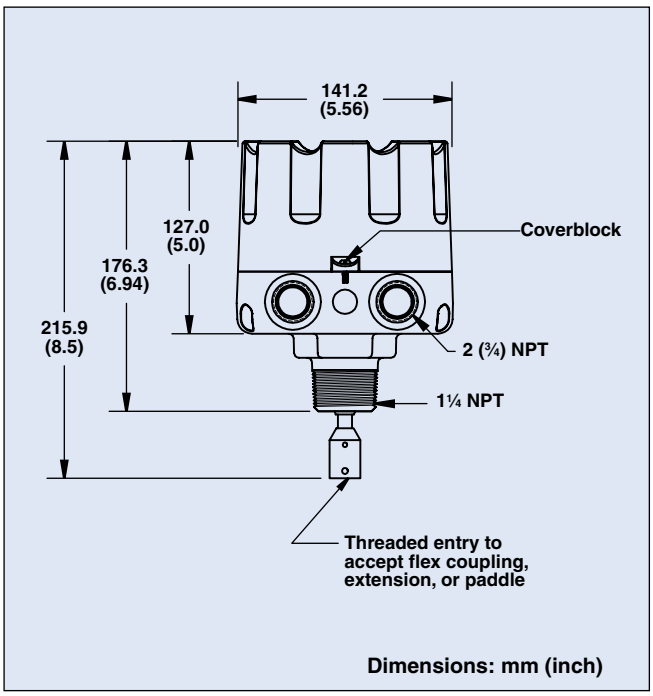
Feed – Ground Corn 560 kg/m³ (35 lb/ft³)	**Silica Sand** 1520 kg/m³ (95 lb/ft³)
Rocks – Limestone Crushed 1360 to 1520 kg/m³ (85 to 95 lb/ft³)	**Pellets – Polypropylene** 544 to 576 kg/m³ (34 to 36 lb/ft³)
Wood Shavings 48 to 160 kg/m³ (3 to 10 lb/ft³)	**Coffee – Roasted Beans** 352 to 480 kg/m³ (22 to 30 lb/ft³)
Rubber – Ground 400 to 800 kg/m³ (25 to 50 lb/ft³)	**Metals – Iron Chips** 2640 kg/m³ (165 lb/ft³)
Tea Leaves 192 kg/m³ (12 lb/ft³)	**Coal – Lump** 400 to 800 kg/m³ (25 to 50 lb/ft³)
Peanuts – Shelled 560 to 720 kg/m³ (35 to 45 lb/ft³)	**Malt – Ground – Dry** 320 kg/m³ (20 lb/ft³)
Clays – Kaoline 320 to 960 kg/m³ (20 to 60 lb/ft³)	**Ash – Coal Dry** 560 to 720 kg/m³ (35 to 45 lb/ft³)
Talcum Powder 736 to 992 kg/m³ (46 to 62 lb/ft³)	**Grain – Oats** 400 to 560 kg/m³ (25 to 35 lb/ft³)
Acrylic Resin 528 kg/m³ (33 lb/ft³)	**Sugar – Granulated** 880 kg/m³ (55 lb/ft³)
Flour – Wheat 480 to 560 kg/m³ (30 to 35 lb/ft³)	**Sawdust** 64 to 192 kg/m³ (4 to 12 lb/ft³)
Cement Powder – Portland 1360 to 1520 kg/m³ (85 to 95 lb/ft³)	

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

Accessory (paddles sold separately)



Enclosure dimensions



To Order

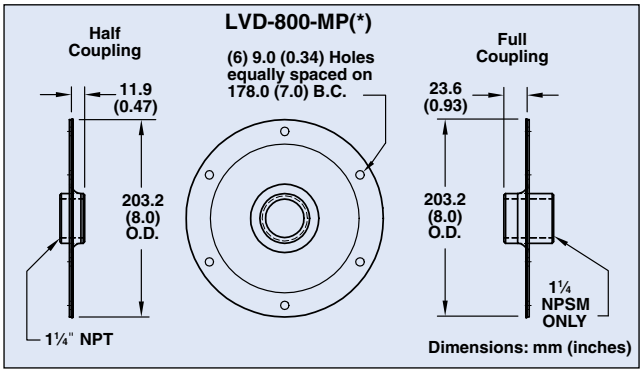
FAIL SAFE Models	Description
LVD-803	Dry level switch, 115 Vac, 1¼ NPT
LVD-803-EXP	Dry level switch, class 1, div. 1 and 2, groups C, D; class II, div. 1 and 2, groups E, F, G
LVD-804	Dry level switch, 230 Vac, 1¼ NPT

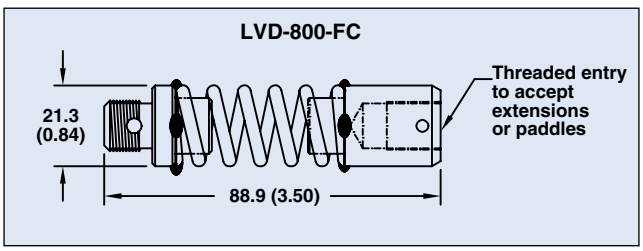
***** *Order paddles separately.*
Comes complete with operator's manual.
*For 24 Vdc power add suffix "**-24VDC**" to **LVD-803** model number, for additional cost.*
*For SS (top or vertical mount only) add suffix "**-HT**" to model number for high temp version (750°F), for additional cost.*

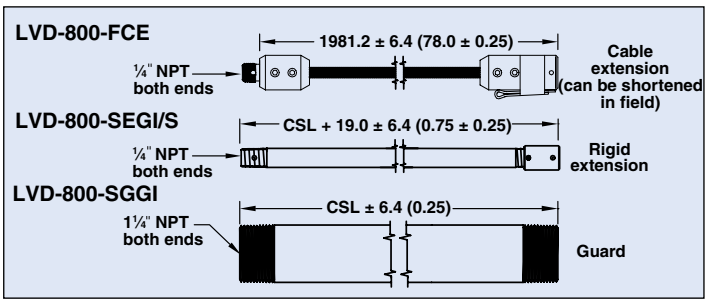
Paddles (Required) *See Material Characteristics Guide for reference.*

Model No.	Description
LVD-800-1V	1 Vane insertable** for low level control of avg. weight [>320 kg/m³ (20 lb/ft³)] material or low to high level control of heavy materials 38 mm (1½") diameter
LVD-800-3V	3 Vane standard for average weight [>240 kg/m³ (15 lb/ft³)] materials
LVD-800-3VL	3 Vane large for light weight material [>160 kg/m³ (10 lb/ft³)]
LVD-800-1VS	1 Vane insertable** scimitar for light to average weight [>320 kg/m³ (20 lb/ft³)] material
LVD-800-2V	2 Vane for heavy materials [>1200 kg/m³ (75 lb/ft³)] under 1½" in diameter
LVD-800-4V	4 Vane for use with average to heavy weight materials [>1200 kg/m³ (75 lb/ft³)]
LVD-800-1VT	1 Vane triangular for light to average weight material; top down mount only for long fibrous materials
LVD-800-EFC	Ex-flex 3-ply 508 mm (20") belt vane for heavy materials over 51 mm (2") in diameter (top mount only) [>1200 kg/m³ (75 lb/ft³)]

*** Insertable paddles eliminate the need for mounting plate.*
***LVD-800-1VS** is insertable through either a half or full 1¼" coupling, that is welded to the bin wall.*
***LVD-800-1V** is insertable through a half 1¼" coupling.*







Accessories

Model No.	Description
LVD-800-FC	Flexible coupling spring flex for absorbing heavy loads, side loads and protect internal workings which extends the life of the paddle
LVD-800-SGGI-6††	†Shaft guard 1¼" pipe, SCH40, galvanized iron (additional cost per inch)
LVD-800-SGSS-6††	†Shaft guard 1¼" pipe, SCH40, stainless steel (additional cost per inch)
LVD-800-FCE	Flexible cable extension, 304SS, 1.98 m (78") (can be cut in field) eliminates the need for a mounting plate, extension guard and flexible coupling (additional cost per inch)
LVD-800-SEGI-6††	††Solid shaft extension: ¼" pipe, SCH40, galvanized (additional cost per inch)
LVD-800-SESS-6††	††Solid shaft extension: ¼" pipe, SCH40, stainless steel (additional cost per inch)
LVD-800-MPHCS	Mounting plate with 1¼ NPT half coupling, carbon steel, for side mount installations
LVD-800-MPFCS	Mounting plate with 1¼ NPT full coupling, carbon steel, for top mount installations where a shaft extension and shaft guards are required
LVD-800-MPHSS	Mounting plate with 1¼ NPT half coupling, stainless steel, for side mount installations
LVD-800-MPFSS	Mounting plate with 1¼ NPT full coupling, stainless steel, for top mount installations where a shaft extension and shaft guards are required
LVD-800-MPA	Mounting plate with 1¼ NPT heavy duty aluminum for flat surfaces or thin walled vessels where extra strength is required

† Shaft guards are required for use with solid 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 460 mm (18") in length.

†† Extension and guard lengths [not to exceed 3.6 m (144") in length]

Comes complete with operator's manual.

*For 24 Vdc power add suffix "**-24VDC**" to **LVD-803** model number, for additional cost.*

*For SS (top or vertical mount only) add suffix "**-HT**" to model number for high temp version (750°F), for additional cost.*

***Ordering Examples: LVD-803-EXP,** switch, 115 Vac class I, div. 1 and 2 groups C & D; class II, div. 1 and 2, groups E, F, G rated and **LVD-800-3V,** 3 vane paddle for average weight (15 lb/ft³) material.*

***LVD-803,** switch, 115 Vac, and **LVD-800-1V,** 1 vane insertable paddle for average weight (20 lb/ft³) material.*

Replacement Parts

Model No.	Description
LVD-800-SR	Spiral roll pin, 3.18 x 4.76 mm (⅛ x 3⁄16") SS (connects paddle to solid shaft coupling)
LVD-800-GDP	Grooved dowel pin, 3.18 x 15.88 mm (⅛ x ⅝") SS (connects solid shaft coupling to shaft)
LVD-800-DM115	Drive motor assembly for LVD803 (115 Vac, 50/60 Hz)
LVD-800-DM230	Drive motor assembly for LVD803 (230 Vac, 50/60 Hz)
LVD-800-DM24DC	Drive motor assembly for LVD803 (24 Vdc)
LVD-800-MS	Micro seal
LVD-800-MMP	Motor mounting plate assembly
LVD-800-B	Bearings (2 required per unit)
LVD-800-DS	Stainless steel drive shaft with slip clutch and gear assembly
LVD-800-RR	Retaining ring (for retaining the motor mounting plate to drive shaft)
LVD-800-RS	Return spring assembly