

# FAIL-SAFE DRY MATERIAL ROTARY PADDLE LEVEL SWITCHES

LVD-800 Series  
Starts at

**\$298**



- ✔ **Reliable Magnetic Technology (Patented)**
- ✔ **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

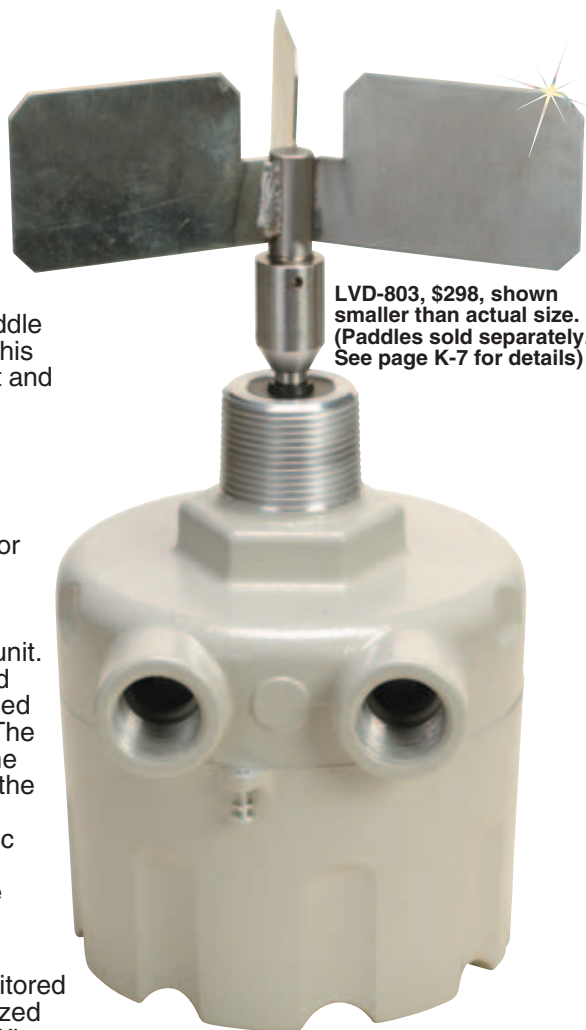
available units, the LVD-800 Series incorporates a feature that automatically shuts off its motor when the paddle is in a stalled condition. This extends the life of the unit and minimizes maintenance.

## 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 (patented). 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 (patented). 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



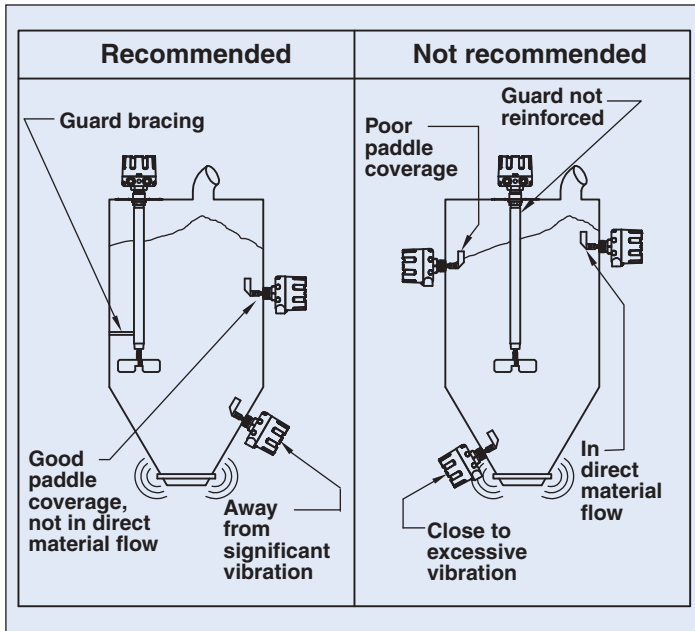
LVD-803, \$298, shown smaller than actual size. (Paddles sold separately. See page K-7 for details)

motor to its original running condition and is reactivated.

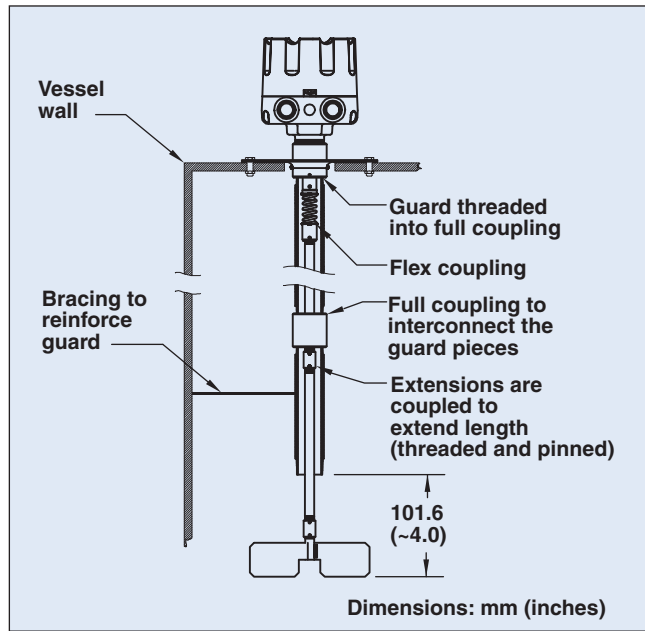
A unit failure is detected by sensing a lack of shaft rotation while material presence has not been detected by rotation of the motor mounting plate. In a failure condition the independent FAULT relay will change state indicating that an error condition exists. Monitoring the state of both the SENSE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

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<sup>3</sup> (10 lb/ft<sup>3</sup>) and for low and intermediate level indication for

**Installation considerations**



**Extension and guard installation**



materials over 80 kg/m<sup>3</sup> (5 lb/ft<sup>3</sup>). The LVD-800 Series bin level monitor can be installed almost anywhere dry bulk materials are stored including bins, hoppers, silos and tanks.

**SPECIFICATIONS**

- Power Requirements:** 115 Vac (±15%); 9 VA; 50/60 Hz; 230 Vac (±15%); 9 VA; 50/60 Hz
- Ambient Operating Temp:** -40 to 65°C (-40 to 150°F)
- Internal Bin Temp\*:**
  - 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 max
- Unit Status (Fault):** One SPDT; 5A @ 250 Vac, 30 Vdc max
- Maximum Pressure:** 30 psi (2 bar)
- Sensitivity:** 80 kg/m<sup>3</sup> (5 lb/ft<sup>3</sup>) 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**

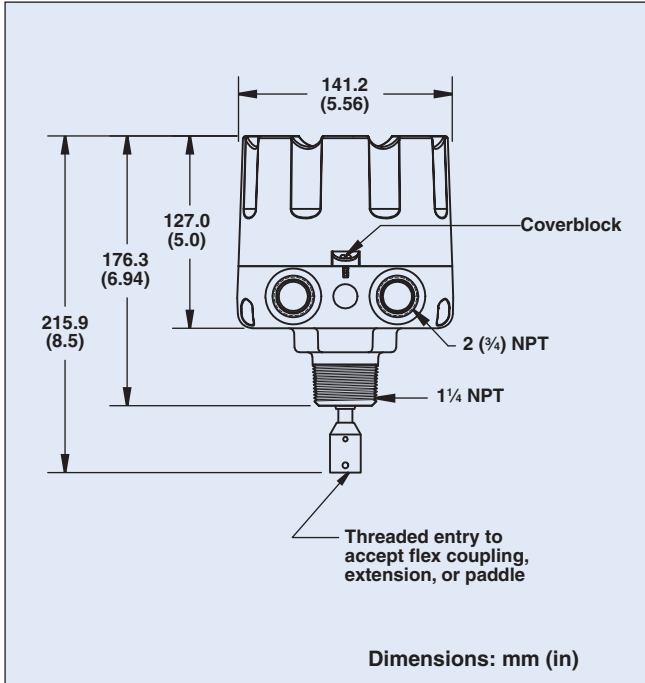
- Flexible Couplings:** 304 stainless steel
- Mounting Plates:** Carbon steel or 304 stainless steel
- All Paddles Except Ex-Flex:** 304 SS
- Ex-Flex Belt:** 304 SS coupling, rubber/fabric blend belt
- Flexible Cable Extension:** 304SS ¼" diameter
- LISTINGS/APPROVALS**
  - Ordinary Locations:** CSA<sup>US/C</sup>
  - 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 pages Z-60 to Z-70 for additional information

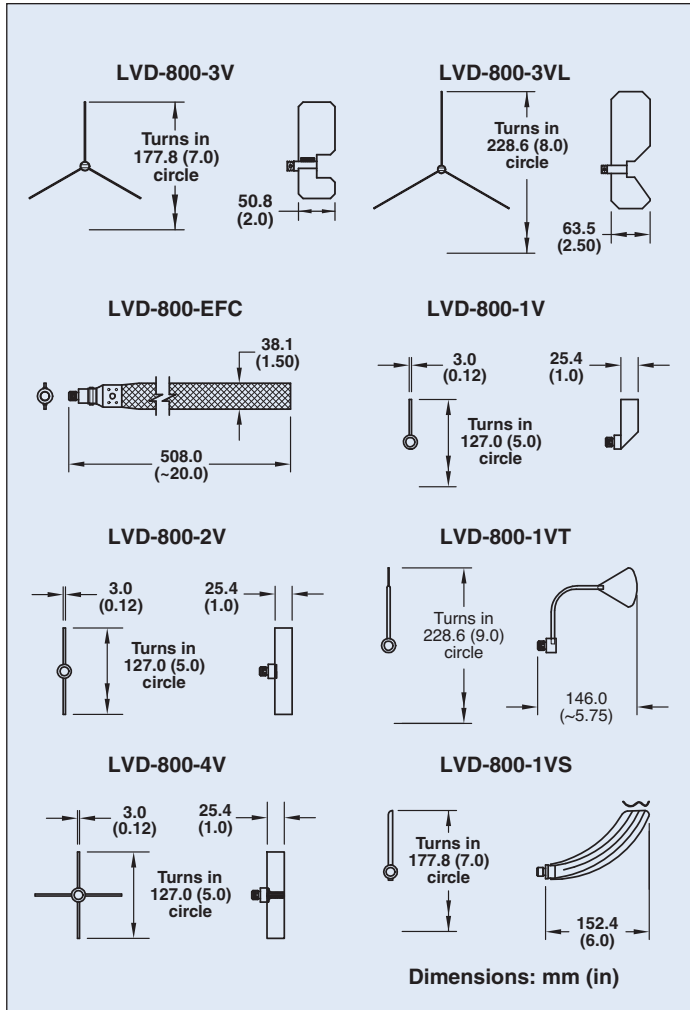
<b>Feed – Ground Corn</b> 560 kg/m <sup>3</sup> (35 lb/ft <sup>3</sup> )	<b>Silica Sand</b> 1520 kg/m <sup>3</sup> (95 lb/ft <sup>3</sup> )
<b>Rocks – Limestone Crushed</b> 1360 to 1520 kg/m <sup>3</sup> (85 to 95 lb/ft <sup>3</sup> )	<b>Pellets – Polypropylene</b> 544 to 576 kg/m <sup>3</sup> (34 to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

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

**Enclosure dimensions**



**Accessory (paddles sold separately)**



**MOST POPULAR MODELS HIGHLIGHTED!**

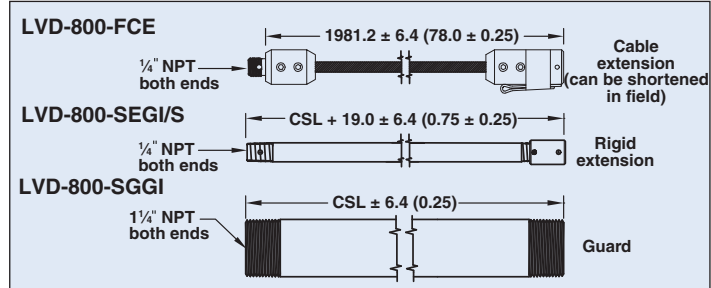
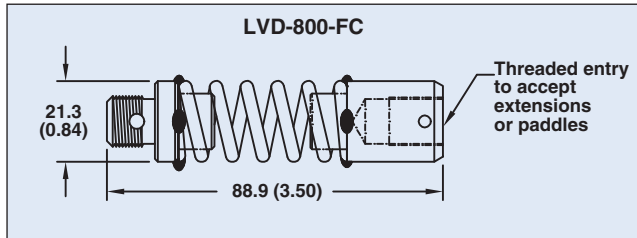
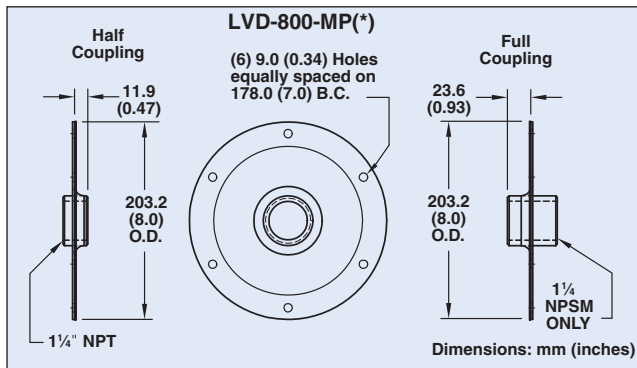
<b>To Order (Specify Model Number)*</b>		
<b>FAIL SAFE Models</b>	<b>Price</b>	<b>Description</b>
<b>LVD-803</b>	<b>\$298</b>	Dry level switch, 115 Vac, 1 1/4 NPT
<b>LVD-803-EXP</b>	<b>328</b>	Dry level switch, class 1, div. 1 and 2, groups C, D; class II, div. 1 and 2, groups E, F, G
<b>LVD-804</b>	<b>303</b>	Dry level switch, 230 Vac, 1 1/4 NPT

\* Order paddles separately.

**Paddles (Required) See pages Z-60 to Z-70 for reference**

<b>Model No.</b>	<b>Price</b>	<b>Description</b>
<b>LVD-800-1V</b>	<b>\$23</b>	1 Vane insertable** for low level control of avg. weight [ $>320 \text{ kg/m}^3$ (20 lb/ft <sup>3</sup> )] material or low to high level control of heavy materials 38 mm (1 1/2") diameter
<b>LVD-800-3V</b>	<b>22</b>	3 Vane standard for average weight [ $>240 \text{ kg/m}^3$ (15 lb/ft <sup>3</sup> )] materials
<b>LVD-800-3VL</b>	<b>25</b>	3 Vane large for light weight material [ $>160 \text{ kg/m}^3$ (10 lb/ft <sup>3</sup> )]
<b>LVD-800-1VS</b>	<b>25</b>	1 Vane insertable** scimitar for light to average weight [ $>320 \text{ kg/m}^3$ (20 lb/ft <sup>3</sup> )] material
<b>LVD-800-2V</b>	<b>21</b>	2 Vane for heavy materials [ $>1200 \text{ kg/m}^3$ (75 lb/ft <sup>3</sup> )] under 1 1/2" in diameter
<b>LVD-800-4V</b>	<b>25</b>	4 Vane for use with average to heavy weight materials [ $>1200 \text{ kg/m}^3$ (75 lb/ft <sup>3</sup> )]
<b>LVD-800-1VT</b>	<b>32</b>	1 Vane triangular for light to average weight material; top down mount only for long fibrous materials
<b>LVD-800-EFC</b>	<b>44</b>	Ex-flex 3-ply 508 mm (20") belt vane for heavy materials over 51 mm (2") in diameter (top mount only) [ $>1200 \text{ kg/m}^3$ (75 lb/ft <sup>3</sup> )]

\*\* Insertable paddles eliminate the need for mounting plate. **LVD-800-1VS** is insertable through either a half or full 1/4" coupling, that is welded to the bin wall. **LVD-800-1V** is insertable through a half 1/4" coupling.



### Accessories

Model No.	Price	Description
LVD-800-FC	\$32	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††	21	†Shaft guard 1/4" pipe, SCH40, galvanized iron (\$0.75 per additional inch)
LVD-800-SGSS-6††	36	†Shaft guard 1/4" pipe, SCH40, stainless steel (\$1.90 per additional inch)
LVD-800-FCE	130	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 (\$1.90 per additional inch)
LVD-800-SEGI-6††	19	††Solid shaft extension: 1/4" pipe, SCH40, galvanized (\$0.50 per additional inch)
LVD-800-SESS-6††	26	††Solid shaft extension: 1/4" pipe, SCH40, stainless steel (\$0.80 per additional inch)
LVD-800-MPHCS	20	Mounting plate with 1/4 NPT half coupling, carbon steel, for side mount installations
LVD-800-MPFCS	22	Mounting plate with 1/4 NPT full coupling, carbon steel, for top mount installations where a shaft extension and shaft guards are required
LVD-800-MPHSS	54	Mounting plate with 1/4 NPT half coupling, stainless steel, for side mount installations
LVD-800-MPFSS	63	Mounting plate with 1/4 NPT full coupling, stainless steel, for top mount installations where a shaft extension and shaft guards are required
LVD-800-MPA	40	Mounting plate with 1/4 NPT heavy duty aluminum for flat surfaces or thin walled vessels where extra strength is required
CE-1911	175	Reference Book: Circular Storage Tanks and Silos

† 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 or 24 Vac power add suffix "-24V" to LVD-803 model number, and \$32 to price.

For SS (top or vertical mount only) add suffix "-HT" to model number for high temp version (750°F), add \$266 to price.

**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/ft<sup>3</sup>) material, \$328 + 22 = \$350.

LVD-803, switch, 115 Vac, and LVD-800-1V, 1 vane insertable paddle for average weight (20 lb/ft<sup>3</sup>) material, \$298 + 23 = \$321.

### Replacement Parts

Model No.	Price	Description
LVD-800-SR	\$1	Spiral roll pin, 3.18 x 4.76 mm (1/8 x 3/16") SS (connects paddle to solid shaft coupling)
LVD-800-GDP	1	Grooved dowel pin, 3.18 x 15.88 mm (1/8 x 5/8") SS (connects solid shaft coupling to shaft)
LVD-800-DM115	50	Drive motor assembly for LVD803 (115 Vac, 50/60 Hz)
LVD-800-DM230	50	Drive motor assembly for LVD803 (230 Vac, 50/60 Hz)
LVD-800-DM24	58	Drive motor assembly for LVD803 (24 Vac/dc, 50/60 Hz)
LVD-800-MS	6	Micro seal
LVD-800-MMP	13	Motor mounting plate assembly
LVD-800-B	9	Bearings (2 required per unit)
LVD-800-DS	15	Stainless steel drive shaft with slip clutch and gear assembly
LVD-800-RR	1	Retaining ring (for retaining the motor mounting plate to drive shaft)
LVD-800-RS	1	Return spring assembly

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