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</tr>
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<td>Pump Leak Detectors page 334</td>
<td>Bin Vibrators/ Aerators pages 335-338</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Typical Applications

**Proximity™ Series PLS is used to indicate level status in pneumatic conveying systems.**

Pneumatic conveying systems use air to transport powder and dry bulk solids through conveying lines. The air is pressurized by positive pressure or vacuum to move the product through the lines into and out of silos, transporters, and receivers. Typical applications have high and low level indication in the storage bins to control the flow of product in or out. The PLS is perfect for level use in these storage bins. It has a rotating paddle that is inserted into the bin. As the product level builds up in the bin it stops the paddle from rotating and triggers the level output. The PLS is great for this application as it not affected by pressure changes in the bin.

**Mercoid® pump controller with level transmitter control pumps in wastewater lift stations.**

Lift stations are used to transmit wastewater to the treatment facility. Wastewater is transmitted by gravity feed so it has to be continually elevated to provide height to generate the flow. Lift stations are pits located at points in the wastewater system to collect the wastewater that usually have two submersible pumps. Wastewater in the lift station is pumped out to a higher level from where it can flow on to the next lift station or to the treatment facility. The Mercoid® Series MPC pump controller is used with the Series PBLT level transmitter to control the level in the lift station. The PBLT is a level transmitter that is submersed in the tank and sends a linear output of the height of wastewater above it. The MPC takes the height input and controls the pumps according to how it has been programmed.

**Grain hopper level controlled by Series PLS Paddle Level Switch.**

The supply of grain pneumatically conveyed to this dispensing hopper is controlled by two Proximity™ Series PLS paddle level switches. When the grain level falls to the low limit switch, the supply is turned on until the hopper fills to the level of the high limit switch which turns off the supply. Since grain dust is explosive, the explosion-proof Series PLS provides the required safety protection. The PLS is a paddle level switch and is not affected by the varying pressure in the hopper due to the cycling of the pneumatic conveying system.

**Custom level sensing devices are built to meet each customer’s specific requirements, providing visual indication, continuous measurement, and point level control.**

To meet various tank level measuring needs, Dwyer Instruments, Inc. offers custom-configured products built to customer specifications that provide visual indication, continuous level measurement, and multiple point level measurement. Series VR or MVR View-Rite Level Indicators are a safe way to keep the process isolated while providing true visible indication. Unlike sight glasses, which can crack or break, View-Rite Indicators contain liquids entirely within their stainless steel enclosure. For continuous level measurement needs, the Series CLT uses reed switch technology to offer a more economical solution than expensive ultrasonic, submersible or RT transmitters. Lastly, the Series F7-MQ can be used in virtually any tank to indicate high and low alarms or to control pumps and valves.
Typical Applications

Mercoid® displacer type level control is ideal for controlling industrial sump pumps.

Industrial sumps and other underground tanks are ideal applications for top-mounted Mercoid® displacer type level controls. Easily installed, these controls use porcelain displacers that do not float on the surface of liquids, but are suspended on a coil spring and cable. As the liquid in the tank reaches the level of the upper displacers, their weight decreases by an amount equal to the liquid displaced, allowing the spring to move the cable upward, actuating the switch and the pump is turned on. As the liquid level falls below the upper displacers they move only a small amount, staying within the switch deadband until the liquid level falls to the center of the bottom displacer. At this point the switch is deactivated stopping the pump. The pump will remain deactivated until the water level rises to the upper displacers, repeating the cycle. The displacers are not affected by turbulence, pressure or chemicals and are excellent for tanks with viscous or dirty liquids. The level differential is easily adjusted by repositioning of the displacers on the 316SS cable.

Low level float switch enables sensing in air conditioner drip pans and other shallow level applications.

Standard float switches require at least an inch of liquid to attain enough buoyancy to switch. This can be a problem in applications where low level sensing is required. The hat-shaped design of W.E. Anderson’s F7-LL provides necessary buoyancy for switching in only 5/8˝ of water. This is essential for air conditioner drip pans, low level sumps, and drains. The F7-LL is also ideal for low alarms, where running the process dry can result in catastrophic failure.

Mercoid® Model 123 level controls provide high and low alarm on large de-aerator tank.

Liquid level in the external piping equals level in the tank. When level rises to high limit, float in upper Model 123 is lifted, actuating switch to sound high level alarm. When level drops to low limit, lower Model 123 sounds low level alarm.

W.E. Anderson® Series OLS indicates level in heavy equipment radiator.

Many types of heavy industrial equipment use a liquid cooling system for the motor. A vibratory trench roller is a machine that compacts sub-bases for roads, parking lots, etc., and is an example of the type of equipment that would utilize this system. This machine incorporates a radiator cooling system. In the system, cooling liquid circulates through the engine preventing it from over heating. As the engine is cooled the cooling fluid heats up. The fluid returns to the radiator to cool down before being circulated through again. If there is not enough cooling fluid in the system the engine will not be cooled enough and damage will occur. A W. E. Anderson® Series OLS optical level switch is installed as a low level alarm. The level alarm is signaled by the OLS before the cooling fluid gets to a critical low level, warning the operator of the problem. The OLS uses an optical detection system superior for this application as float controls may trip from machine vibration. Also the compact insertion length is ideal for a small radiator.
Customize level indicators to meet application requirements. View-Rite level indicators are low maintenance, environmentally friendly, durable, and require no external power. Specify any indication length up to 96” (244 cm). View-Rite level indicators incorporate a pressure tight housing with internal float that magnetically activates external level indication flags, switches, or transmitter. Consult factory for pressure rating up to 700 psi (48 bar) or temperature rating to 750°F (339°C).

Price — Models are built to your specifications . . . Consult Website for Pricing

Example | VR | S | SS | 1 | TP | D | 0.8 | 150 | 080 | 080 | P | I | VR-SSS1-TPD-0.8-150-080-080P1-I
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
Construction | VR | S | View-Rite Level Indicator
Wetted Materials | SS | 316 L SS, Fluoroelastomer O-ring
Configuration | TB | Top/Bottom Connections
SS | Side/Side Connections
Process Connection | 1 | 2 | 4 | 5 | 6 | 7 | 1/2” NPT (Female on TB, and Male on SS Configuration)
1” NPT (Female on TB, and Male on SS Configuration)
1” 150# RF Flange
2” 150# RF Flange
2” 300# RF Flange

Float Access | TP | BM | TB | Top
SS | Bottom

Drain and Vent | N | D | V | B | None
SS | Drain, 1/2” female NPT (Only with SS Configuration)
1” female NPT (Only with SS Configuration)

Spec. Gravity | 0.0 | Specific Gravity of fluid, minimum 0.8

Operating Pressure | 000 | Operating Pressure, in psi. Maximum is 275 psi (18.9 bars)

Operating Temp. | 000 | Operating Temperature of the fluid, in °F. Maximum is 400°F (204°C)

Indicating Length, L1 | 000 | Length of level indicator, in whole inches. Maximum of 240” (6.1 m); Minimum of 6” (15.25 cm)

Indicating Flags | P | A | Plastic, white and orange [300°F (149°C) maximum]

Visual Indicating Scale | N | Feet and Inches
2 | Inches Only
Output Options | I | 4 to 20 mA transmitter of level [300°F (149°C) maximum]
V | 0 to 5 VDC transmitter of level

Optional Switch Modules
VR-S1, Maximum temperature is 300°F (148.9°C). Polysulfone with 1/4” female NPT conduit connection.
VR-S2, Maximum temperature is 750°F (399°C). 316 SS with 1/2” male NPT conduit connection.
VR-S3, Maximum temperature is 750°F (399°C). Explosion-proof terminal box with 1/2” female NPT conduit connection.
Mini View-Rite Level Indicator
Customized, Visual Level Indication, Compact Size

Miniature custom level indicators are ideal for high-visibility level indication in tight spaces. All SS housing provides rugged durability with a diameter of only 1-1/4˝ (32 mm). Select the mounting type that will best fit your application and an indication length of up to 96˝ (244 cm). View-Rite level indicators incorporate a pressure tight housing with internal float that magnetically activates external level indication flags, switches, or transmitter.

— Models are built to your specifications . . . .

SPECIFICATIONS
Service: Clean, low-viscosity liquids.
Pressure Limits: ≤300°F, 400 psi (27.6 bar); ≥ 300°F, 373 psi (25.7 bar).
Tube Diameter: 1-1/4˝ (32 mm).

OPTIONAL SWITCH MODULES
Clamp onto the level indicator. SPST, rated .17A @ 120 VAC, .08A @ 240 VAC, .13A @ 120 VDC, .06A @ 240 VDC.
MVR-S1, Maximum temperature is 300°F (148.9°C). Polysulfone with 1/4˝ female NPT conduit connection.
MVR-S2, Maximum temperature is 750°F (399°C). 316 SS with 1/2˝ male NPT conduit connection.
MVR-S3, Maximum temperature is 750°F (399°C). Explosion-proof terminal box with 1/2˝ female NPT conduit connection.

Example

<table>
<thead>
<tr>
<th></th>
<th>MVR</th>
<th>S</th>
<th>SS</th>
<th>I</th>
<th>TP</th>
<th>P</th>
<th>0.8</th>
<th>090</th>
<th>080</th>
<th>I</th>
<th>I</th>
</tr>
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<tbody>
<tr>
<td>Construction</td>
<td>MVR</td>
<td>SS</td>
<td>I</td>
<td>TP</td>
<td>D</td>
<td>150</td>
<td>590</td>
<td>080</td>
<td>P</td>
<td>I</td>
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<tr>
<td>Wetted Materials</td>
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<td>316 L SS Housing, 316 L SS Float, Fluoroelastomer O-ring</td>
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<tr>
<td>Configuration</td>
<td>Top Bottom Connections</td>
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<tr>
<td>Process Connection</td>
<td>TB SS</td>
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<tr>
<td>Float Access</td>
<td>TP BM TB</td>
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<tr>
<td>Float</td>
<td>Top Bottom</td>
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<tr>
<td>Bottom</td>
<td>Top and Bottom (Only with SS Configuration)</td>
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<td>Drain and Vent</td>
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<tr>
<td>Indicating Flags</td>
<td>Plastic, white and orange [300°F (149°C) maximum]</td>
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<td>Aluminum, silver and black</td>
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<tr>
<td>Visual Indicating Scale</td>
<td>Feet and Inches</td>
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<td>Output Options</td>
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<tr>
<td>4 to 20 mA transmitter of level [300°F (149°C) maximum]</td>
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<tr>
<td>0 to 5 VDC transmitter of level</td>
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</tbody>
</table>

CALL TO ORDER | 800-876-0036
The Series DTM is a manual, no electricity required indicator that is compact, providing uninterrupted liquid level indication for use in storage tanks or vessels. With a sturdy, lightweight design, the DTM is ideal for 30 or 55 gallon tanks. Stem and mounting fixtures are available in 316 SS or brass. Strong brass or stainless steel units are perfect for the use in water and oils offering the best temperature and pressure capabilities. The float and stem are the only parts of the DTM that make contact with the liquid, so the indication tape is always clean and easy to read. It is simple to customize the DTM level indicator in order to meet a particular application requirement. A custom configurable DTM is available in lengths ranging from 6 in (15.2 cm) up to 6 ft (182.9 cm). This level indicator is ideal for quick readouts taken periodically. The DTM is accurate to 1/16 of an inch or 1 mm, and is especially useful in remote areas where power is unavailable, or undesirable.

**PRINCIPLE OF OPERATION**

The float located on the DTM is equipped with a magnet that moves with the liquid level, vertically, along the stem, inside the storage vessel. Level reading is acquired by simply removing the protective cap located on the top of the unit and lifting the calibrated measuring tape until the magnetic interlock with the float causes a slight pull. The indicator tape remains at this point while the level is read where the calibration aligns with the top of the mounting. The indicator tape can then be lowered back inside the unit stem for storage and protection.

**SPECSIFICATIONS**

**Service:** Compatible liquids.

**Wetted Materials:** See model chart.

**Temperature Limits:**
- Buna N: -40 to 230°F (-40 to 110°C) for oil, up to 180°F (82.2°C) for water;
- 316 SS: -40 to 300°F (-40 to 148.8°C).

**Pressure Limits:** See model chart.

**Mounting Orientation:** Vertically in either vertical or horizontal tanks.

**Indication Markings:** 1/16 in or 1 mm increments.

**Example**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTM-B1F1N-17.50</td>
<td>Brass, Buna N float, 2” NPT, 30 gallon horizontal drum, 17.5”</td>
</tr>
<tr>
<td>DTM-B1F1N-22.00</td>
<td>Brass, Buna N float, 2” NPT, 55 gallon horizontal drum, 22”</td>
</tr>
<tr>
<td>DTM-B1F1N-26.50</td>
<td>Brass, Buna N float, 2” NPT, 30 gallon vertical drum, 26.5”</td>
</tr>
<tr>
<td>DTM-B1F1N-33.00</td>
<td>Brass, Buna N float, 2” NPT, 55 gallon vertical drum, 33”</td>
</tr>
<tr>
<td>DTM-S1F2N-17.50</td>
<td>316 SS, 2” NPT, 30 gallon horizontal drum, 17.5”</td>
</tr>
<tr>
<td>DTM-S1F2N-22.00</td>
<td>316 SS, 2” NPT, 55 gallon horizontal drum, 22”</td>
</tr>
<tr>
<td>DTM-S1F2N-26.50</td>
<td>316 SS, 2” NPT, 30 gallon vertical drum, 26.5”</td>
</tr>
<tr>
<td>DTM-S1F2N-33.00</td>
<td>316 SS, 2” NPT, 55 gallon vertical drum, 33”</td>
</tr>
</tbody>
</table>

**Length**

- 06.00: 6 to 72” (15.2 to 182.9 cm)*

*Order length must be in inches.

**Level Indicators**

**Dwyer Instruments, Inc.**
The Series DTP is a manual, no electricity required indicator that is compact, providing uninterrupted liquid level indication for use in storage tanks or vessels. With a sturdy, lightweight design, the DTP is ideal for 30 or 55 gallon tanks. Stem and mounting fixtures are available in PVC, PVDF, or polypropylene. With a choice of three highly resistant, engineered plastic materials, and large floats, the DTP provides rugged durability in almost any chemical tank. The float and stem are the only parts of the DTP that make contact with the liquid, so the indication tape is always clean and easy to read. It is simple to customize the DTP level indicator in order to meet a particular application requirement. A custom configurable DTP is available in lengths ranging from 6 in (15.2 cm) up to 6 ft (182.9 cm). This level indicator is ideal for quick readouts taken periodically. The DTP is accurate to 1/16 of an inch or 1 mm, and is especially useful in remote areas where power is unavailable, or undesirable.

### PRINCIPLE OF OPERATION

The float located on the DTP is equipped with a magnet that moves with the liquid level, vertically, along the stem, inside the storage vessel. Level reading is acquired by simply removing the protective cap located on the top of the unit and lifting the calibrated measuring tape until the magnetic interlock with the float causes a slight pull. The indicator tape remains at this point while the level is read where the calibration aligns with the top of the mounting. The indicator tape can then be lowered back inside the unit stem for storage and protection.

### SPECIFICATIONS

- **Service:** Compatible liquids.
- **Wetted Materials:** See model chart.
- **Temperature Limits:** 40 to 140°F (4.4 to 60°C).
- **Pressure Limit:** See model chart.
- **Mounting Orientation:** Vertically in either vertical or horizontal tanks.
- **Indication Markings:** 1/16 in or 1 mm increments.

### Series DTP

**Customizable, Lightweight, No Electricity Needed**

<table>
<thead>
<tr>
<th>Example</th>
<th>DTPP</th>
<th>F</th>
<th>N</th>
<th>6.00</th>
<th>DTP-PFF/FN-6.00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stem &amp; Connection Material</strong></td>
<td>PVC (only available with F1)</td>
<td>Polypropylene (only available with F2)</td>
<td>Polypropylene (only available with F3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>1</td>
<td>2</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Float Type</strong></td>
<td>F1</td>
<td>F2</td>
<td>F3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>PVC</td>
<td>Polypropylene</td>
<td>Polypropylene</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Min. s.g.</strong></td>
<td>0.83</td>
<td>0.46</td>
<td>0.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. Pressure</strong></td>
<td>50 psi (3.4 bar)</td>
<td>50 psi (3.4 bar)</td>
<td>50 psi (3.4 bar)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indication Markings</strong></td>
<td>N</td>
<td>C</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>6.00 to 72 (15.2 to 182.9 cm)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Order length must be in inches.

### Series DTV

**Customizable, Lightweight, No Electricity Needed**

<table>
<thead>
<tr>
<th>Example</th>
<th>DTV-P1F1N-6.00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>PVC, 1/2˝ NPT, 30 gallon horizontal drum, 17.5 psi</td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td>DTV-P1N-17.50</td>
</tr>
<tr>
<td><strong>Connection Type</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Indication Markings</strong></td>
<td>N</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>6.00</td>
</tr>
</tbody>
</table>

*Order length must be in inches.*
The Series WD3 Water Leak Detector protects equipment from water damage by detecting the presence of water in drip pans in air handler units, under raised floors in data centers, or on floors around sump pumps and drains. Water is detected once it reaches a level that bridges the two conductive strips on the bottom of the housing. Depending on the model ordered, audible and visual alerts provide local indication of the alarm condition and an internal switch will give remote indication or control to prevent further build up of water.

For applications where power is not available, the Model WD3-BP-D1-A is battery powered. Otherwise, either AC or DC supply voltages can be used to power the water detector. The sensing height can be adjusted to as low as 1/32” using the included adjustable mounting bracket. The mounting bracket can attach to any flat surface by either using the attached adhesive strips or mounting screws.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Power Requirements:</th>
<th>Audible Alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>WD3-BP-D1-A</td>
<td>Pilot duty rated 250 mA @ 24 VDC, External Powered Models: 1A @ 24 VAC/DC.</td>
<td>11 to 27 VAC/DC.</td>
<td>SPST NO SSR</td>
</tr>
<tr>
<td>WD3-LP-D2-A</td>
<td>Battery Powered Model: Pilot duty rated 30 mAh steady state / 3.0 mA during alarm condition; External Powered Models: 30 mA steady state / 85 mA during alarm condition.</td>
<td>11 to 27 VAC/DC.</td>
<td>DPDT Relay</td>
</tr>
</tbody>
</table>

**ACCESSORY**

A-WD3-BRK, Replacement Mounting Bracket

---

**SPECIFICATIONS**

Service: Water or conductive fluids. Minimum Sensing Gap: 1/32”.

Switch Type: Battery Powered Models: SPST NO SSR; External Powered Models: DPDT relay.

Visual Alarm: Red LED for water level; Yellow LED for low battery (battery powered models only); Green LED for power condition (external powered models only).

Temperature Limits: 32 to 122°F (0 to 50°C).

Power Requirements:

- Battery Powered Model: 9V CR2450 lithium metal battery, installed functional; user replaceable; External Powered Models: 11 to 27 VAC/DC.
- External Powered Models: 1A @ 24 VAC/DC.
- Battery Powered Model: Pilot duty rated 250 mA @ 24 VDC, External Powered Models: 1A @ 24 VAC/DC.
- Audible Alarm Models: Water-tight up to 3/4 of the body height; Non-Audible Alarm Models: NEMA 6P (IP 68) submersible

Battery Life:

- Battery Powered Model: 5 years steady state / 48 hours during alarm condition.
- External Powered Models: 5 years steady state / 48 hours during alarm condition.

Enclosure Rating:

- NEMA 6P (IP 68) submersible.

Enclosure Material:

- ABS and polycarbonate with flammability classification UL 94 V-0.

Weight:

- 8 oz (.23 kg).

Agency Approvals: CE, RoHS.

**Model WD**

Water Detector and Sensor Tape

Detects Low Levels Of Conductive Liquids

The small and discreet Model WD Water Detector is designed for dependable detection of low levels of conductive liquids. The module features a sturdy and reliable aluminum enclosure and is powered by 24 VAC or 24 to 30 VDC. Water sensing tape attaches to module and if any liquid comes in contact with the tape the resistance is changed and the alarm will be triggered. The tape is hydrophobic so it does not absorb any of the liquid it is detecting which makes for a faster drying time and faster return to service after a water leak.

The sensing tape is 1” wide and can be bought in lengths of 5’, 10’, 15’ and 25’. Multiple tapes can be connected together to extend the coverage area which makes it ideal for domestic as well as commercial applications. Features include power and alarm LED’s, alarm test switch, continuous tape integrity self check and extendable tape sensor.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WD</td>
<td>Water Module</td>
</tr>
<tr>
<td>TP05</td>
<td>5’ (1.52 m) Tape</td>
</tr>
<tr>
<td>TP10</td>
<td>10’ (3.05 m) Tape</td>
</tr>
<tr>
<td>TP15</td>
<td>15’ (4.57 m) Tape</td>
</tr>
<tr>
<td>TP25</td>
<td>25’ (7.62 m) Tape</td>
</tr>
</tbody>
</table>

**SPECIFICATIONS**

Service: Conductive liquid.

Switch Type: DPDT.

Electrical Rating: 1 A @ 24 VAC/VDC. Power Requirements: 24 VAC, 24 to 30 VDC. Power Consumption: 35 mA maximum.

Rugged and reliable, the Series L4 Flotect® Level switch operates automatically to indicate tank level. Perfect for starting or stopping pumps, opening or closing valves, or actuate level alarms. A unique magnetically actuated switching design gives superior performance. There are no bellows, springs, or seals to fail. Instead, the free-swinging float attracts a magnet within the solid metal switch body, actuating a snap switch by means of a simple lever arm. Float arm hinge design limits the arm angle to prevent vertical hangup.

**FEATURES**
- Leak proof body machined from bar stock
- Choice of floats dependent on maximum pressure and specific gravity
- Weatherproof, designed to meet NEMA 4 (IP56)
- Explosion-proof (listings included in specifications)
- Installs directly and easily into tank with a thredolet or flange (see application drawings)
- Electrical assembly can be easily replaced without removing the unit from the installation so that the process does not have to be shut down
- Horizontal installation or optional top mount vertical installation

**APPLICATIONS**
- Direct pump control for maintaining level
- Automatic tank dump operations
- Control levels or process alarms in sumps, scrubber systems, hydro-pneumatic tanks, low pressure boilers, and various waste water/sewage treatment processes

**SPECIFICATIONS**

- **Service:** Liquids compatible with wetted materials.
- **Wetted Materials:** Float and Rod: 316 SS; Body: Brass or 316 SS standard, 316 SS or nickel optional.
- **Magnet Keeper:** 430 SS standard, 316 SS or nickel optional.
- **Temperature Limits:** 4 to 275°F (-20 to 135°C) standard, MT high temperature option 400°F (205°C) [MT option not UL, CSA, ATEX or IECEx]. ATEX and IECEx options: Ambient temperature -4 to 163°F (-20 to 73°C), Process temperature -4 to 163°F (-20 to 73°C).
- **Pressure Limit:** Brass body 1000 psig (69 bar), 316 SS body 2000 psig (138 bar)
- **Standard float rated 100 psig (6.9 bar). For other floats, see options.

**Agency Approvals:**
- ATEX, CE, CSA, FM, IECEx, UL**.

**OPTIONS FOR L4 SWITCHES ABOVE** — Add suffixes to model numbers

- **DPDT contacts,** add suffix -D
- **Gold Plated Contacts** option for dry circuits, add suffix -MV
- **High Temperature option rated 400°F (204°C), add suffix -MT**
- **Time Delay Relay** option with 2 SPDT contacts, adjustable from 0-1 to 0-31 minutes add suffix -TRD (increasing flow) or -TR (decreasing flow) (no listings or approvals)
- **316 SS Magnet Keeper** option to replace standard 430 SS add suffix -316
- **ATEX compliant construction, add suffix -AT**
- **IECEx certified construction, add suffix -IEC**
- **Top Mounted** option for vertical flange installation [distance from flange face to centerline of float to be specified, 20” (508 mm) max], add suffix -TOP...
- **Optional Floats (all 2-1/2” spherical):**
  - 304 SS rated 50 psig (3.5 bar) and 0.5 min. s.g., add suffix -50
  - 316 SS rated 150 psig (10.3 bar) and 0.7 min. s.g., add suffix -150
  - 304 SS rated 300 psig (20.7 bar) and 0.7 min. s.g., add suffix -300

Consult factory for price and availability of fittings for L4 installation. Threaded Branch Connection, bushings, and flanges are available in a variety of sizes and materials.

---

**APPLICATIONS**

- Horizontal, 2-1/2 Threaded Branch Connection with Optional 2-1/2 [64] Spherical Float

**FEATURES**

- Automatic tank dump operations
- Direct pump control for maintaining level
- Choice of floats dependent on maximum pressure and specific gravity
- Leak proof body, sidewall mounting, no housing

**APPLICATIONS**

- Vertical, Flange Installation

**SPECIFICATIONS**

- **Service:** Liquids compatible with wetted materials.
- **Wetted Materials:** Float and Rod: 316 SS; Body: Brass or 316 SS standard, 316 SS or nickel optional.
- **Magnet Keeper:** 430 SS standard, 316 SS or nickel optional.
- **Temperature Limits:** 4 to 275°F (-20 to 135°C) standard, MT high temperature option 400°F (205°C) [MT option not UL, CSA, ATEX or IECEx]. ATEX and IECEx options: Ambient temperature -4 to 163°F (-20 to 73°C), Process temperature -4 to 163°F (-20 to 73°C).
- **Pressure Limit:** Brass body 1000 psig (69 bar), 316 SS body 2000 psig (138 bar)
- **Standard float rated 100 psig (6.9 bar). For other floats, see options.

**Agency Approvals:**
- ATEX, CE, CSA, FM, IECEx, UL**.

**OPTIONS FOR L4 SWITCHES ABOVE** — Add suffixes to model numbers

- **DPDT contacts,** add suffix -D
- **Gold Plated Contacts** option for dry circuits, add suffix -MV
- **High Temperature option rated 400°F (204°C), add suffix -MT**
- **Time Delay Relay** option with 2 SPDT contacts, adjustable from 0-1 to 0-31 minutes add suffix -TRD (increasing flow) or -TR (decreasing flow) (no listings or approvals)
- **316 SS Magnet Keeper** option to replace standard 430 SS add suffix -316
- **ATEX compliant construction, add suffix -AT**
- **IECEx certified construction, add suffix -IEC**
- **Top Mounted** option for vertical flange installation [distance from flange face to centerline of float to be specified, 20” (508 mm) max], add suffix -TOP...
- **Optional Floats (all 2-1/2” spherical):**
  - 304 SS rated 50 psig (3.5 bar) and 0.5 min. s.g., add suffix -50
  - 316 SS rated 150 psig (10.3 bar) and 0.7 min. s.g., add suffix -150
  - 304 SS rated 300 psig (20.7 bar) and 0.7 min. s.g., add suffix -300

Consult factory for price and availability of fittings for L4 installation. Threaded Branch Connection, bushings, and flanges are available in a variety of sizes and materials.
### FEATURES
- Leak proof lower body machined from bar stock
- Choice of models for direct side wall mounting or mounted in a tee to act as an external float chamber
- Weatherproof
- Explosion-proof (listings included in specifications)
- Electrical assembly can be easily replaced without removing the unit from the installation so that the process does not have to be shut down
- Sensitive to level changes of less than 1/2” (12 mm)

### OPTIONS
- Gold Plated Contacts (option for dry circuits, add suffix -MV)
- High Temperature option rated 400°F (204°C), add suffix -HT (see electrical rating in specifications, no listings or approvals, only available on models with stainless steel floats)
- CSA and UL approved construction, includes weatherproof and explosion-proof junction box, add suffix -CSA
- ATEX compliant construction includes, weatherproof and explosion-proof junction box, add suffix -AT
- IECEx certified construction, add suffix -IEC
- DPDT contacts, change seventh character in model number to "D"

### SPECIFICATIONS
- **Service:** Liquids compatible with wetted materials.
- **Wetted Materials:**
  - **Float:** Solid polypropylene or 304 SS.
  - **Lower Body:** Brass or 303 SS.
- **Magnet:** Ceramic.
- **External Float Chamber (Tee):** Matches lower body choice of brass or 303 SS.
- **Other:** Lever Arm, Spring, Pin, etc.: 301 SS.
- **Temperature Limit:** -4 to 220°F (-20 to 105°C), Standard, MT high temperature option 400°F (204°C) (MT not UL, CSA, ATEX, IECEx and KC).
- **ATEX Standards:** EN 60079-0: 2009; EN60079-1: 2007.
- **IECEx Certificate:** IECEx DEK II.0039.
- **KTL Certificate Number:** 2012-2545-75.
- **Switch Type:** SPDT snap switch standard, SPDT snap switch optional.
- **Electrical Rating:** UL models: 5A @ 125/250 VAC (V~). CSA, ATEX and IECEx models: 5A @ 125/250 VAC (V~); 5A res., 3A Ind. @ 30 VDC (V~); MV option: 1@ @ 125 VAC (V~). [MT option not UL, CSA, ATEX or IECEx].
- **Electrical Connections:** UL models: 18 AWG, 18” (460 mm) long. ATEX/CSCA/IECEx models: terminal block.
- **Upper Body:** Brass or 303 SS.
- **Conduit Connection:** 3/4” male NPT standard, 3/4” female NPT on junction box models.
- **Process Connection:** 1” male NPT on models without external float chamber, 1” female NPT on models with external float chamber.
- **Mounting Orientation:** Horizontal with index arrow pointing down.
- **Weight:** Approximately 1 lb (0.5 kg) without external float chamber, 1.75 lb (.8 kg) with external float chamber.
- **Specific Gravity:** See chart.
- **Agency Approvals:** ATEX, CE, CSA, IECEx, KTL, UL.

### Model Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>L6EPS-B-S-3-O</td>
<td>Brass</td>
<td>Side Wall Mounting</td>
<td>Polypropylene Spherical 304 SS</td>
<td>1000 (69)</td>
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<td>L6EPS-B-S-3-A</td>
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<td>Side Wall Mounting</td>
<td>Polypropylene Spherical 304 SS</td>
<td>200 (13.8)</td>
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<td>Brass</td>
<td>Brass External Float Chamber (Tee)</td>
<td>Polypropylene Spherical 304 SS</td>
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<td>0.7</td>
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<tr>
<td>L6EPS-S-S-3-O</td>
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<td>Side Wall Mounting</td>
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<td>2000 (138)</td>
<td>0.9</td>
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<td>303 SS</td>
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<td>Brass External Float Chamber (Tee)</td>
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<td>2000 (138)</td>
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<tr>
<td>L6EPS-S-S-3-C</td>
<td>303 SS</td>
<td>Side Wall Mounting</td>
<td>Polypropylene Spherical 304 SS</td>
<td>250 (17.2)</td>
<td>0.7</td>
</tr>
</tbody>
</table>

**Model L6 with External Float Chamber**

**Model L6 with Spherical Float**

**Model L6 with Cylindrical Float**

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**Surprisingly compact,** the Series L6 Flotect® Level switch is designed and built for years of trouble-free service in a wide variety of process liquid level applications. Operation is simple and dependable with no mechanical linkage as the level switch is magnetically actuated. The float lever pivoted within the body moves when the process liquid displaces the float. A magnet on the opposite end of the float lever controls a second magnet on the switch actuating lever located in the switch housing.

**Lever Arm, Spring, Pin, etc.: 301 SS.**

**Options Not Shown:** 1-1/2” and 2” male NPT process connection, 2” female NPT connection tee, and top mount.

**Distributed by: M&M Control Service, Inc.**

**www.mmcontrol.com/Dwyer.php**

**800-876-0036   847-356-0566**
Model L8 Flotect® Liquid Level Switch features a leak proof body and float constructed from tough, durable polyphenylene sulfide which has excellent chemical resistance. Because the liquid level snap switch is magnetically actuated, there is no direct mechanical linkage to leak or fail, assuring longer life and decreased maintenance costs. This inexpensive unit is ideal for liquid level alarm, indication or control. Installation is quick and easy — simply install in a horizontal position with the index arrow pointing down. The L8 Flotect® Liquid Level Switch is UL recognized as an industrial motor controller per UL standard 508, suitable for mounting in a protected environment. This lightweight switch can be used in numerous chemical processes, industrial systems and similar applications where process conditions are compatible with polyphenylene sulfide, ceramic 8 and 316 SS. This liquid level switch provides accurate setpoint control of liquids with specific gravities as low as 0.6. This compact and reliable control is designed to handle temperatures up to 212°F (100°C) and pressures to 150 psig (10 bar).

APPLICATIONS
The Model L8 Flotect® Liquid Level Switch is ideal for predetermined liquid levels in tanks through pump control or solenoid valve control. It provides excellent liquid level alarm or indication when combined with the Series AN14 Indicating Annunciator.

- Environmental control
- Chemical/Petroleum processing
- Waste water
- Plating and washing tanks
- Scrubber systems
- Sewage treatment
- Holding tanks
- Car washes
- Cooling towers
- Remediation systems

SPECIFICATIONS

Service: Compatible liquids.

Wetted Materials:
- Float and body: Polyphenylene sulfide (PPS);
- Pin and spring: 316 SS or Inconel®;
- Magnet: Ceramic 8.

Temperature Limit: 212°F (100°C).

Pressure Limit: 150 psig (10.34 bar).

Enclosure Rating:
- General purpose. WP/WP2 option is weatherproof.

Switch Type:
- SPDT snap switch. MV option is a SPDT gold contact snap switch.

Electrical Rating:
- 5A @ 125/250 VAC, 5A resistive, 3A inductive @ 30 VDC. MV option: 1A @ 125 VAC, 1A resistive, 0.5A inductive @ 30 VDC.

Electrical Connections:
- 18 AWG, 18˝ (460 mm) long.

Conduit Connection:
- 1/2˝ male NPT, 1/2˝ female NPT on WP and WP2.

Process Connection:
- 1˝ male NPT.

Mounting Orientation: Horizontal with index arrow pointing down.

Weight: 5 oz (0.142 kg).

Agency Approvals: CE, cUR, UR.

Specific Gravity: 0.6 minimum.

CALL TO ORDER | 800-876-0036
The Mini-Series L10 Flotec® Level Switches combine low cost with high quality materials and construction for great value and years of reliable liquid level control. Wide media compatibility is assured with a choice of brass or SS bodies and external tees; polypropylene or SS floats. Two basic configurations are offered; with 1” male NPT threads for direct side mounting through a half coupling or with factory installed tee for external mounting.

All Series L10 switches feature a hermetically sealed, magnetically actuated SPST reed switch which is encased in a polypropylene housing. Units are quickly and easily adjusted for your choice of normally open or normally closed operation thanks to a unique design. Just loosen two screws and instantly slide the switch assembly to the action required. NO and NC markings are clearly visible. This feature also speeds switch replacement if damage occurs.

Three types of floats are offered to accommodate liquids with specific gravities as low as 0.5; max pressures to 2000 psig (137.8 bar). These controls are UL recognized and CSA listed.

### SPECIFICATIONS

**Service:** Compatible liquids.

**Wetted Materials:**
- Float: Solid polypropylene or 304 SS; Body: Brass or 303 SS; Magnet: Ceramic; External float chamber (tee): None, brass, or 304 SS; Other: Lever arm, pin, spring, etc.: 301 SS, 302 SS, 316 SS.
- Temperature Limits: 200°F (93°C).

**Pressure Limit:** See chart.

**Electrical Rating:** 0.7A @ 120 VDC, 0.9A @ 24 VDC.

**Switch Type:** SPST hermetically sealed reed switch. Field adjustable for normally open or normally closed.

**Agency Approvals:** CSA, UR.

### Multi-Level Switch Kit

One or Two Station Level Switch, Vertically Mount

**Model:** F7-MLK

**Weight:** Approximately 10 oz (0.283 kg) without external float chamber, 2.32 lb (1.05 kg) with external float chamber.

**Specific Gravity:** See chart.

**Switch Enclosure:** Nylon.

Customize a level system to suit your application requirements. The F7-MLK Multi-Level Switch Kit contains all the components necessary for the design and fabrication of a 1 or 2 station level switch for pipe plug mounting. User can customize stem length (maximum 36”), actuation point, distance between floats, and lead wire lengths. The switch kit is ideal for general purpose, low specific gravity, gas and oil applications. Model F7-MLK includes two level stations (switch, tube, and Buna-N float), two brass extension tubes 12” length, four brass tube unions, one end fitting, and one mounting plug.

### Model F7-MLK, Multi-Level Switch Kit

**Electrical Connections:** 18 AWG, 19”

**Process Connection:** 2 NPT (63.50 mm), 2000 (137.8)

**301 SS, 302 SS, 316 SS.**
## Series F6 & F7 Level Switches - Horizontal/Specialty

**Low Cost, Hermetically Sealed Contacts**

### Series F6 & F7 Horizontal Mount Level Switches

Distributed by: M&M Control Service, Inc.

F6-MHS

- F6-HPS-11: Internally mounted, for liquids with metal particles.
- F6-HPS-21: Internally mounted, for corrosives, high temperature/pressure.
- F6-HPS-31: Internally mounted, for liquids with metal particles, non-intrusive bottle type.

**Model available with Normally Closed Switch. Specify F7-EBNC**

F6-MHS2

- F7-HSS: Internal or external.
- F6-MHS2: Internally mounted, for corrosives, high temp/pressure.
- F6-MHS2: Internally mounted, for liquids with metal particles, non-intrusive bottle type.

**Specialty F7-SS6**

F7-LL

- F7-LL: Vertical/Outside tank mounting.
- F7-LL: Detect levels as low as 5/8”.

**Series F6 & F7 Specialty Level Switches**

- F7-EBX: Explosion proof model available with DPDT switch. Specify F7-EBX.
- F7-EBX: Explosion proof model available with Normally Closed Switch. Specify F7-EBNC.

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### Table: Specifications

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<tr>
<th>Model</th>
<th>Applications</th>
<th>Material</th>
<th>Float/Step</th>
<th>Temperature Limits</th>
<th>Pressure Limits</th>
<th>S.G.</th>
<th>Electrical Rating</th>
<th>Wire Leads</th>
<th>Weight (oz)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F6-HPS-11</td>
<td>Water, Oils, Chemicals</td>
<td>Polypropylene</td>
<td>1/2” NPT</td>
<td>176°F (80°C)</td>
<td>116 psig (8 bar)</td>
<td>0.60</td>
<td>240 VAC, 0.08 A @</td>
<td>20 AWG, 30 cm</td>
<td>1.23 (36)</td>
<td>34.5 (20)</td>
</tr>
<tr>
<td>F6-HPS-21</td>
<td>Water, Oils, Chemicals</td>
<td>Polypropylene</td>
<td>1/2” NPT</td>
<td>176°F (80°C)</td>
<td>116 psig (8 bar)</td>
<td>0.60</td>
<td>240 VAC, 0.08 A @</td>
<td>20 AWG, 30 cm</td>
<td>1.23 (36)</td>
<td>34.5 (20)</td>
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<td>F6-HPS-31</td>
<td>Water, Oils, Chemicals</td>
<td>Polypropylene</td>
<td>1/2” NPT</td>
<td>176°F (80°C)</td>
<td>116 psig (8 bar)</td>
<td>0.60</td>
<td>240 VAC, 0.08 A @</td>
<td>20 AWG, 30 cm</td>
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<td>34.5 (20)</td>
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<td>F6-MHS</td>
<td>Corrosives</td>
<td>Polypropylene</td>
<td>1/2” NPT</td>
<td>257°F (125°C)</td>
<td>218 psig (15 bar)</td>
<td>0.85</td>
<td>240 VAC, 0.08 A @</td>
<td>22 AWG, 30 cm</td>
<td>4.8 (136)</td>
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<td>F6-MHS2</td>
<td>Water, Oils, Chemicals</td>
<td>Polypropylene</td>
<td>1/2” NPT</td>
<td>257°F (125°C)</td>
<td>218 psig (15 bar)</td>
<td>0.85</td>
<td>240 VAC, 0.08 A @</td>
<td>22 AWG, 30 cm</td>
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<td>108 (57)</td>
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<td>F7-HSS†</td>
<td>High temp/pressure, corrosive, Expl.</td>
<td>Polypropylene</td>
<td>3/4”-24 UNF</td>
<td>392°F (200°C)</td>
<td>300 psig (20.7 bar)</td>
<td>0.60</td>
<td>240 VAC, 0.14 A @</td>
<td>22 AWG, 30 cm</td>
<td>3.6 (94)</td>
<td>52 (25)</td>
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<td>F7-SS6</td>
<td>Bent stem/ with metal particles</td>
<td>Polypropylene</td>
<td>3/4”-24 UNF</td>
<td>300°F (149°C)</td>
<td>100 psig (7 bar)</td>
<td>0.70</td>
<td>220 VAC, 0.08 A @</td>
<td>20 AWG, 30 cm</td>
<td>2.5 (81)</td>
<td>57 (20)</td>
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<td>F7-SS6B</td>
<td>Bent stem/ with metal particles</td>
<td>Polypropylene</td>
<td>3/4”-24 UNF</td>
<td>300°F (149°C)</td>
<td>100 psig (7 bar)</td>
<td>0.70</td>
<td>220 VAC, 0.08 A @</td>
<td>20 AWG, 30 cm</td>
<td>2.5 (81)</td>
<td>57 (20)</td>
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<td>F7-EB†**</td>
<td>Non-intrusive bottle type/ Non-intrusive bottle type/ Non-intrusive bottle type/</td>
<td>Polypropylene</td>
<td>3/4”-24 UNF</td>
<td>300°F (149°C)</td>
<td>500 psig (34 bar)</td>
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<td>18 AWG, (2)</td>
<td>5.0 (29)</td>
<td>112 (45)</td>
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<td>F7-LL</td>
<td>Detect levels as low as 5/8” Detect levels as low as 5/8” Detect levels as low as 5/8”</td>
<td>Polypropylene</td>
<td>3/4”-24 UNF</td>
<td>180°F (82°C)</td>
<td>50 psig (3 bar)</td>
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<td>22 AWG, 30 cm</td>
<td>10.8 (310)</td>
<td>240 (80)</td>
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<td>F7-WBB</td>
<td>25’ cable, stainless steel/ 25’ cable, stainless steel/ 25’ cable, stainless steel/</td>
<td>Polypropylene</td>
<td>3/4”-24 UNF</td>
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<td>240 VAC, 0.08 A @</td>
<td>22 AWG, 30 cm</td>
<td>10.8 (310)</td>
<td>240 (80)</td>
</tr>
</tbody>
</table>

† F7-HSS is rated explosion-proof for Class I, Groups A, B, C, D, Class II, Groups E, F, G, Class III.
‡ Explosion proof model available with DPDT switch. Specify F7-EBX.
** Model available with Normally Closed Switch. Specify F7-EBNC.

**CALL TO ORDER | 800-876-0036**
Level Switches - Vertical
Low Cost, Reliable and Compact, Hermetically Sealed Contacts

Series F6 & F7 compact level switches combine low cost and reliability with fast, simple installation. Hermetically sealed reed switches are actuated by magnets permanently bonded inside the float and can be easily adapted to open or close a circuit on rising or falling levels. Vertical mount models are shipped with normally open switch contacts which close as the float rises toward the mounting threads. Reverse switch action by removing the float, rotating it end-for-end and replacing it on the stem. Vertical models mount internally, oriented within 30° of vertical, or select optional fittings for external mounting. Switch ratings are suitable for many solid state control systems and monitors or alarms. Simple relay interfaces can be used for higher current applications.

<table>
<thead>
<tr>
<th>Model</th>
<th>Applications</th>
<th>Material</th>
<th>Max. Float/Stem</th>
<th>Temp. Limits</th>
<th>Press. Limits</th>
<th>Min. S.G.</th>
<th>Electrical Rating</th>
<th>Wire Leads</th>
<th>Mtg NPT (M)</th>
<th>Weight oz (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F7-SB</td>
<td>General purpose</td>
<td>Buna-N &amp; Epoxy</td>
<td>316 SS</td>
<td>220°F (105°C)</td>
<td>150 psig</td>
<td>0.60</td>
<td>25 VA, 1A @ 220 VAC</td>
<td>22 AWG 18˝ (45 cm)</td>
<td>1/8</td>
<td>2.0 (36)</td>
</tr>
<tr>
<td>F7-SS2</td>
<td>High temp/pressure, corrosives</td>
<td>316 SS (CYC)/316 SS</td>
<td>300°F (149°C)</td>
<td>450 psig</td>
<td>0.75</td>
<td>25 VA, 1A @ 200 VAC</td>
<td>22 AWG 18˝ (45 cm)</td>
<td>1/8</td>
<td>1.2 (34)</td>
<td></td>
</tr>
<tr>
<td>F6-SS</td>
<td>Corrosives</td>
<td>316 SS</td>
<td>257°F (125°C)</td>
<td>218 psig</td>
<td>0.65</td>
<td>20 VA, 0.08A @ 240 VAC</td>
<td>20 AWG 11.8˝ (30 cm)</td>
<td>1/8</td>
<td>1.59 (45)</td>
<td></td>
</tr>
<tr>
<td>F7-MPP**</td>
<td>Broad chemical compatibility</td>
<td>Polypropylene/ Polypropylene</td>
<td>180°F (82°C)</td>
<td>100 psig</td>
<td>0.90</td>
<td>10 VA, 0.1A @ 100 VAC</td>
<td>22 AWG 24˝ (61 cm)</td>
<td>1/8</td>
<td>0.8 (23)</td>
<td></td>
</tr>
<tr>
<td>F7-MPP-NO**</td>
<td>Broad chemical compatibility</td>
<td>Polypropylene/ Polypropylene</td>
<td>178°F (81°C)</td>
<td>100 psig</td>
<td>0.90</td>
<td>50 VA, 0.2A @ 240 VAC</td>
<td>22 AWG 24˝ (61 cm)</td>
<td>1/8</td>
<td>0.8 (23)</td>
<td></td>
</tr>
<tr>
<td>F7-BT</td>
<td>Food/beverage, corrosives</td>
<td>Polypropylene/ Polypropylene &amp;</td>
<td>180°F (82°C)</td>
<td>100 psig</td>
<td>0.60</td>
<td>10 VA, 0.1A @ 100 VAC</td>
<td>22 AWG 24˝ (61 cm)</td>
<td>1/8</td>
<td>0.8 (23)</td>
<td></td>
</tr>
<tr>
<td>F7-K</td>
<td>Oils &amp; Fuels</td>
<td>Buna-N/Epoxy/</td>
<td>150°F (65°C)</td>
<td>100 psig</td>
<td>0.45</td>
<td>20 VA, 0.1A @ 240 VAC</td>
<td>22 AWG 24˝ (61 cm)</td>
<td>1/8</td>
<td>0.7 (20)</td>
<td></td>
</tr>
<tr>
<td>F7-C11</td>
<td>General purpose</td>
<td>Buna-N</td>
<td>180°F (82°C)</td>
<td>150 psig</td>
<td>0.45</td>
<td>50 VA, 0.25A @ 240 VAC</td>
<td>22 AWG 24˝ (61 cm)</td>
<td>1/8</td>
<td>1.5 (43)</td>
<td></td>
</tr>
<tr>
<td>F7-C21</td>
<td>Oils &amp; water, general purpose</td>
<td>Buna-N</td>
<td>180°F (82°C)</td>
<td>10 bar</td>
<td>0.45</td>
<td>20 VA, 0.08A @ 240 VAC</td>
<td>22 AWG 24˝ (61 cm)</td>
<td>1/8</td>
<td>1.5 (43)</td>
<td></td>
</tr>
<tr>
<td>F7-BB</td>
<td>High viscosity liquids</td>
<td>Buna-N</td>
<td>180°F (82°C)</td>
<td>150 psig</td>
<td>0.55</td>
<td>20 VA, 0.08A @ 240 VAC</td>
<td>22 AWG 24˝ (61 cm)</td>
<td>1/4</td>
<td>5.1 (140)</td>
<td></td>
</tr>
<tr>
<td>F7-PS</td>
<td>Water-based liquids, complies with FDA Chemical &amp; plating</td>
<td>Polysulfone/ Polysulfone</td>
<td>225°F (107°C)</td>
<td>50 psig</td>
<td>0.55</td>
<td>20 VA, 0.08A @ 240 VAC</td>
<td>22 AWG 24˝ (61 cm)</td>
<td>1/4</td>
<td>4 (110)</td>
<td></td>
</tr>
<tr>
<td>F7-PVC</td>
<td>Chemical &amp; plating</td>
<td>CPVC/ CPVC</td>
<td>180°F (82°C)</td>
<td>15 psig</td>
<td>0.85</td>
<td>20 VA, 0.08A @ 240 VAC</td>
<td>22 AWG 24˝ (61 cm)</td>
<td>1/4</td>
<td>5 (140)</td>
<td></td>
</tr>
<tr>
<td>F7-T1</td>
<td>Viscous, sticky or corrosive liquids</td>
<td>Polypropylene/ Polypropylene</td>
<td>300°F (149°C)</td>
<td>30 psig</td>
<td>0.80</td>
<td>20 VA, 0.08A @ 240 VAC</td>
<td>22 AWG 24˝ (61 cm)</td>
<td>1/4</td>
<td>6 (170)</td>
<td></td>
</tr>
<tr>
<td>F7-ST713</td>
<td>Oils, water &amp; chemicals</td>
<td>316 SS</td>
<td>300°F (149°C)</td>
<td>750 psig</td>
<td>0.80</td>
<td>20 VA, 0.08A @ 240 VAC</td>
<td>22 AWG 24˝ (61 cm)</td>
<td>1/4</td>
<td>6 (170)</td>
<td></td>
</tr>
</tbody>
</table>

†Distance between hex and liquid (S.G. = 1.0) level at actuation point will vary with specific gravity changes.
*PBT - Polybutylene Terephthalate.
†Includes 316 SS clip.
‡Spherical floats.
**F7-MPP is normally closed/F7-MPP-NO is normally open

UL Listed

300 DWYER INSTRUMENTS, INC.
Quick-Ship Multi-Station Level Switch

Fast Delivery, Customized, Up to Four Actuation Levels

Customize level switches to meet application requirements quickly and affordably. Switches can be configured with up to four different control points and stem lengths up to 72˝ (1.82 m). Stems and floats are available in 316 SS or brass.

---Models are built to your specifications . . . .

### Actuation Levels
Each switching point requires one float.
- **A** = Minimum distance from actuation point to bottom of mounting.
- **B** = Minimum distance between actuation levels.
- **D** = Minimum distance from end of unit to lowest actuation point.

### SPECIFICATIONS

**Service:** Compatible liquids.
**Temperature Limits:** F1 and F2 with water: 0 to 180°F (-18 to 82°C); Oil: -40 to 230°F (-40 to 110°C); F3: -40 to 300°F (-40 to 149°C).
**Electrical Connections:** 24˝ (61 cm) free leads; #22 AWG TFE and #18 AWG polymeric.
**Mounting Orientation:** Vertical ±30°.

### Float Dimensions

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 1-1/4</td>
<td>33.75</td>
<td>44.45</td>
</tr>
<tr>
<td>Ø 1-13/16</td>
<td>47.62</td>
<td>57.14</td>
</tr>
<tr>
<td>Ø 2-3/32</td>
<td>53.16</td>
<td>64.79</td>
</tr>
</tbody>
</table>

### Mounting Dimensions

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 NPT</td>
<td>1-1/4 NPT</td>
<td>2 NPT</td>
</tr>
<tr>
<td>1.000 SQ</td>
<td>25.40</td>
<td>63.50</td>
</tr>
</tbody>
</table>

### Example

<table>
<thead>
<tr>
<th>J</th>
<th>F7-MQB1-4F33-07.00-11.00-15.00-20.00-24.00-J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>Multi-station level, 1 to 4 switch points</td>
</tr>
<tr>
<td>Stem &amp; Connection Material</td>
<td>F7-MQ</td>
</tr>
<tr>
<td>Connection Type</td>
<td>S</td>
</tr>
<tr>
<td>Switch Points</td>
<td>3</td>
</tr>
<tr>
<td>Float Type</td>
<td>Buna-N, min. s.g. 0.75, 150 psi (10.3 bar) max. pres.</td>
</tr>
<tr>
<td>Switch Type</td>
<td>SPDT, 1/2 A @ 120 VAC, 1/2 A @ 240 VAC, 1/2 A @ 120 VDC, 1/2 A @ 240 VDC</td>
</tr>
<tr>
<td>Set Point Distance</td>
<td>L4: 0.00, L3: 0.00, L2: 0.00, L1: 0.00</td>
</tr>
<tr>
<td>Overall Length</td>
<td>L0: 0.00</td>
</tr>
<tr>
<td>Options</td>
<td>Junction box for wire leads, NEMA 4</td>
</tr>
</tbody>
</table>
Miniature Multi-Station Level Switch

Custom, Lightweight, Low Cost, 316 SS or Buna-N Floats

Series F7-MM

Mineral custom level switches with a sturdy, lightweight design are ideal for tanks less than four feet (1.2 m) deep. Control up to five different level points across a maximum length of 48” (121 cm). Stems and mounting fixtures are available in 316 SS or brass.

Actuation Levels
Each switching point requires one float.
A = Minimum distance from actuation point to bottom of mounting.
B = Minimum distance between actuation levels.
D = Minimum distance from end of unit to lowest actuation point.

Float Dimensions

Mounting Dimensions

**SPECIFICATIONS**

Service: Compatible liquids.

Wetted Materials: Stem, connection, and float.

Temperature Limits: F1 and F2: Water, 180°F (82.2°C); Oil, -40 to 250°F (-40 to 121.1°C). All other floats: -40 to 300°F (-40 to 148.9°C).

Electrical Connection: 24˝ (61 cm) free leads #22 AWG, TFE jacketed.


---

**Example**

<table>
<thead>
<tr>
<th>Construction</th>
<th>Stem &amp; Connection</th>
<th>Material</th>
<th>Connection Type</th>
<th>Switch Points</th>
<th>Float Type</th>
<th>Set Point Distance</th>
<th>Overall Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>F7-MMB1-5F11-03.00-07.00-11.00-15.00-20.00-25.00</td>
<td>Multi-station, 1 to 5 switch points</td>
<td>Brass with Sylmiderm copper stops</td>
<td>1/8 NPT</td>
<td>15</td>
<td>F1</td>
<td>00.00</td>
<td>00.00</td>
</tr>
</tbody>
</table>

---

---

---

---

---
Multi-Station Level Switch
Customize To Fit Application, Up to Six 316 SS or Buna-N Floats

Customize level switches to meet application requirements. These switches can be configured with up to six different control points and stem lengths up to 140" (3.56 m).

Stems and floats are available in 316 SS or brass.

---

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Stem, connection, and float.
Temperature Limits: Buna-N floats: 180°F (82.2°C) in water, -40 to 230°F (-40 to 110°C) in oil; SS floats: -40 to 300°F (-40 to 148.9°C).
Wire Leads: 24˝ (61 cm) free leads; #22 AWG, TFE jacketed, and #18 AWG polymeric.

---

Example

<table>
<thead>
<tr>
<th>Construction</th>
<th>F7-MS</th>
<th>B</th>
<th>S</th>
<th>F31</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-station level, 1 to 6 switch points</td>
<td>F7-MSB1-5F31-04.00-07.00-11.00-15.00-20.00-24.00-J</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Options

J Junction box for wire leads, NEMA 4 (Not available with Connection Type 1)
Level Switches, Float

LEVEL

Mercoid®

Series 123

Boiler Water Level Control
Heavy Duty, Cast Iron Chamber

A special snap action mechanism eliminates frequent operation due to surging water level. Visible operation adds convenience in servicing. SS trim and hand reset are available if required. Options include DPDT switch, two stage, and weatherproof housing.

APPLICATIONS
- Boiler low water cut-off
- Boiler feed-water control
- Condensate tanks
- Deaerators

<table>
<thead>
<tr>
<th>Model</th>
<th>Switch Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>123-153</td>
<td>SPDT Mercury</td>
</tr>
<tr>
<td>123-7000-153</td>
<td>SPDT Snap</td>
</tr>
</tbody>
</table>

SPECIFICATIONS

Service: Compatible liquids. Cast iron is not for use with lethal or flammable substances either liquid or gaseous.

Wetted Materials: Body: Cast iron; Float: 304 SS; Trim and packing gland: Brass; Packing: Carbon; Body gasket: Carbon.

Temperature Limit: 365°F (185°C).

Pressure Limit: 150 psig (10.34 bar).

Enclosure Rating: General purpose. Optional weatherproof.

Switch Type: SPDT snap switch or mercury switch. Optional DPDT or two stage.

Electrical Rating: Snap switch: 15A @ 120/240/480 VAC, 0.5A @ 120 VDC resistive; Mercury switch: 4A @ 120 VAC/DC, 2A @ 240 VAC/DC.

Electrical Connections: Screw terminal.

Conduit Connection: 7/8˝ (22.23 mm) hole for 1/2˝ (12.7 mm) conduit.

Process Connections: 1˝ female NPT.

Mounting Orientation: Vertical.

Weight: 20 lb (9.1 kg).

Agency Approvals: CSA, UL. (Snap switch is not rated).

Deadband: Approximately 1-1/2˝ (38.1 mm).

Specific Gravity: 0.88 min.

Options: Manual reset.

---

Mercoid®

Series 102

Flanged Chamber Type Level Control
Operating Pressures to 300 PSIG

Flanged inspection plate allows periodic inspection and clean-out of Model 102 float chamber, making this unit ideal for use in refineries, chemical plants, and other areas with potentially dirty liquids. Low cost cast iron chamber is standard. Carbon steel and SS chambers are available on special order. SS float is standard.

<table>
<thead>
<tr>
<th>Model</th>
<th>Switch Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>102-WT-4810-C-60</td>
<td>SPDT Mercury</td>
</tr>
<tr>
<td>102-WT-7810-C-60</td>
<td>SPDT Snap</td>
</tr>
<tr>
<td>102-WT-7810HM-C-60</td>
<td>SPDT Hermetically Sealed Snap</td>
</tr>
</tbody>
</table>

SPECIFICATIONS

Service: Compatible liquids. Cast iron is not for use with lethal or flammable substances either liquid or gaseous.

Wetted Materials: Body: Cast iron; Float: Optional cast steel or 316 SS; Float and trim: 303 SS, 304 SS, 316 SS, and 430 SS. Option of all 316 SS; Body gasket: Carbon.

Temperature Limit: 425°F (218°C).

Pressure Limit: 300 psig (20.7 bar). Optional rating to 400 psig (27.6 bar).

Enclosure Rating: NEMA 4X (IP66).

Switch Type: SPDT snap switch, hermetically sealed snap switch, or mercury switch. Optional DPDT or two stage.

Electrical Rating: Snap switch: 12A @ 120 VAC, 5A @ 240 VAC, 0.5A @ 125 VDC resistive, 0.25A @ 250 VDC resistive; Hermetically sealed snap switch: 5A @ 125 VAC, 5A @ 240 VAC, 5A @ 30 VDC resistive; Mercury switch: 4A @ 120 VAC/DC, 2A @ 240 VAC/DC. Higher contact ratings available for the mercury switch.

Electrical Connections: Screw terminal.

Conduit Connection: 3/4˝ female NPT.

Process Connections: 1˝ female NPT.

Mounting Orientation: Vertical.

Set Point Adjustment: ±1˝ (25.4 mm).

Weight: 35 lb (15.9 kg).

Agency Approvals: UL.

Specific Gravity: 0.6 min.

Options: Manual reset.
The Series CFS2 Cable Float Switch is a mechanically actuated floating switch intended to activate electrical components, usually pumps, to start and stop automatically. The CFS2 is perfect for simple level control of liquids for filling or draining reservoirs and tanks. Float switches such as the CFS2 are the most universally used for pump automation, due to their high reliability, economical pricing, and easy installation. Counterweights and cable hangers are available to suit a variety of mounting applications. Optional cables available include those with UL/CSA approval, higher chemical compatibility, high temperature durability, oil resistance, and drinking water suitability. Contact factory for available piggyback plug option, gold contact switch option and cable length options ranging from 10 to 70 ft (3.04 to 21.34 m).

The Series FSW2 Free-Floating Level Switch is a mercury-free self counter-weighted floating switch designed for the automation of pumps, specifically filling and draining of tanks, wells, and reservoirs. The FSW2 body is free of any irregularities making it ideal for use in sewage water applications. The polypropylene body consists of a double airtight chamber with high-pressure melted polypropylene re-injection sealing to ensure a perfect seal against infiltration. Cable hangers are available to suit a variety of mounting applications. Featuring CE approval and optional cables available that include higher chemical compatibility, high temperature durability, oil resistance, and drinking water suitability. Contact factory for piggyback plug option, and cable length options ranging from 10 to 70 ft (3.04 to 21.34 m).
**Optical Level Switch**

Low cost, rugged optical level switch provides rapid response while employing no moving parts for stable process control. The bright red and green LED's indicate the presence or absence of liquid for true, local indication. Three optional materials, 316 SS, polysulfone and PFA provide application flexibility. Compact switch can be quickly mounted vertically or horizontally for any installation.

**Principles of Operation**

The optical level switch employs an LED, which transmits infrared light. This light is sent through a prism and reflected back to a photo-transistor utilizing two 90° light reflections. With the prism surrounded by a gas, the light source is cast back to the photo-transistor. When a translucent liquid is introduced to the prism at or above the point where the light source makes contact with the prism, the light is reflected into the liquid, not allowing the photo-transistor to energize.

**Applications**

- Food and beverage systems
- Liquid holding tanks
- Hydraulic reservoirs
- Sumps
- Pharmaceutical systems
- Air conditioning systems

---

**Liquid Level Switches-Controls**

Top Mounted Displacer Type, Adjustable Setpoints, Magnetic Operation, Optional Hermetically Sealed Snap Switch

---

**Series B-190**

**SPECIFICATIONS**

- Service: Noncoating compatible liquids.
- Wetted Materials: See model chart.
- Temperature Limit: Process: OLS-10, 11: 200°F (93.3°C), OLS-12: 120°F (48.9°C).
- Pressure Limit: OLS-11: 120 psig (8.6 bar).
- Repeatability: ±0.02˝ (0.5 mm).
- Switch Type: NPN open collector.

**Power Requirements:**

- 10 to 28 VDC.
- Output Signal: Vout (max) = 28 VDC, Iout (max) = 100 mA.
- Current Consumption: 35 mA maximum.

**Electrical Connections:**

- 38´ (11.6 m) 3-conductor cable, 22 AWG wire.

**Process Connection:**

- 3/4˝ NPT.

**Dimensions for 1.0 s.g. @ 100°F (38°C)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Wetted Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>OLS-10</td>
<td>316 SS/Polysulfone</td>
</tr>
<tr>
<td>OLS-11</td>
<td>Polysulfone</td>
</tr>
<tr>
<td>OLS-12</td>
<td>PFA</td>
</tr>
</tbody>
</table>

**SPECIFICATIONS**

- Service: Noncoating compatible liquids.
- Wetted Materials: See model chart.
- Pressure Limit: OLS-11: 120 psig (8.6 bar).
- Repeatability: ±0.02˝ (0.5 mm).
- Switch Type: SPDT snap switch, hermetically sealed snap switch, or mercury switch. Optional DPDT or two stage.

**Electrical Connections:**

- Screw terminal.
- Conduit Connection: 3/4˝ female NPT.
- Process Connections: 4˝ 125 cast iron flange. Other material, size, and rating flanges are available.

**Mounting Orientation:**

- Vertical.

**Set Point Adjustment:**

- Adjustable by moving displacers see dimension chart for minimum and maximum values.

**Agency Approvals:**

- UL (None on HM switch).

**Deadband:**

- Adjustable by moving displacers see dimension chart for minimum and maximum values.

**Specific Gravity:**

- Standard is 1.0.

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**Inconel®** is a registered trademark of Huntington Alloys Corporation.
Series CLP Conductivity Level Probes are used to determine the presence of a conductive liquid at a set level by sensing conductivity. The Series CLP is coupled with the Series TSWB Temperature Level Controller for a complete level control system. These probes allow for the measurement of conductivity between the probe fitting and end, which is isolated by a ceramic insulator, or between the probe ends of two probes. The CLP can be mounted in any orientation in a tank, tee fitting, or any compatible threaded port. The probe end is solid stainless steel allowing substantial resistance to heat and corrosion.

**SPECIFICATIONS**

**Service:** Conductive liquids compatible with wetted materials.

**Wetted Materials:**
- Probe end: 430SS;
- Insulator: Ceramic;
- Fitting: Nickel-plated iron;
- Seal: Silicone.

**Temperature Limits:** 392°F (200°C).

**Pressure Limits:** 87 psi (6 bar).

**Electrical Connections:** Snap-type post.

**Process Connection:** 1/2˝ NPT.

**Mounting:** Threaded port, any orientation.

**Weight:** 2 oz (57 g).

**Model** CLP-1

| ø1/8 | 0.0318 |
| ø23/64 | 0.9203 |
| 3-35/64 | 0.9089 |
| 1/2˝ NPT | ø3/8 |

**Model** DPL110

**Dual Point Level Switch**

Tank High/Low Control, Conductivity Technology, Up to 72˝ Probes

Maintain liquid level high and low limits with the Model DPL Dual Point Level Switch. Units can be used for single or dual point level control in semi-solid liquids, industrial slurries or heavy-bodied liquids like wastewater. Standard 24 inch electrodes can be cut by the end-user to a shorter length or lengthened by adding up to two 24˝ extensions (sold separately) to reach the max recommended length of 72˝. Model DPL contains no moving parts to get stuck or wear out. Controller features adjustable sensitivity and DIN rail-mountable socket mount.

**ACCESSORY**

Model DPL5, Electrode Extensions includes three 24˝ (610 mm) electrode extensions and mounting hardware.

**SPECIFICATIONS**

**Electrodes:** 1/8˝ dia, 24˝ (609.6 mm) L, standard.

**Wetted Materials:** 316 SS; polypropylene.

**Mounting, Sensor Head:** 1˝ male NPT.

**Pressure Limits:** 30 psig (2.06 bar).

**Temperature Limits:** 212°F (100°C).

**Probe Enclosure:** NEMA 6 (IP67).

**Maximum Probe Length:** 72˝ (1.8 m) with optional extensions.

**Connecting Cable, Probe to Controller:** 10˝ (3.0 m).

**Sensing Voltage:** 12 VAC.

**Power Supply:** 120 VAC 50/60 Hz.

**Output:** SPDT, 5 A @ 240 VAC.

**Mounting, Controller:** Standard octal socket or 35 mm DIN rail.

**Weight, Probe Assembly:** 1.5 lb (0.68 kg).

**Weight, Controller:** 1.0 lb (0.45 kg).
The CLS2 is a capacitive technology level switch that does not have any moving parts. There are no jams, no wear, nothing to break, and no maintenance. The capacitive level technology in the CLS2, using impulse RF admittance measurement combined with an active guard, provides excellent level measurement and stability while being insensitive to material buildup. This technology also provides immunity to external RF sources like walkie-talkies and cell phones as well as minimal interference with radio communication or other electronic systems.

Capacitive level technology can be used for liquids, powders, and bulk materials and is great for difficult applications such as slurries, coating products, and liquids with solids. The CLS2 is ideal for level indication in silos, receivers, and transporters in pneumatic conveying systems. The CLS2 can also be used for liquid interface applications to detect the level of two immiscible liquids that have different dielectric constants such as oil and water. Wetted materials of PVDF and 316 SS assure great chemical compatibility and meet food grade requirements.

**FEATURES**

- **Automatic Calibration:** No need to turn calibration pots, just push the calibration button. The CLS2 even has an external magnet to activate the calibration without having to open the enclosure.
- **Universal Power Supply:** One model works from 12 to 240 VAC/DC without any jumpers or settings.
- **Coat Guard:** Unit is not affected by sticky, dusty, or clinging materials that coat or build up on the probe, preventing false alarms.
- **FailSafe Setting:** Output switches can be set for NO or NC condition on loss of power.
- **Status Indication:** Ultra bright high brightness external red LED switch status indicator, and internal indicators for power, sensor, and switch status that can be seen externally with window cap option (external LED on weatherproof model only).
- **Time Delay:** Prevent false alarms from material splashing, agitation, etc.
- **Removable Terminals:** Removable terminal block snaps in and out enabling easy wiring outside of the enclosure.

**Example Models**

CLS2-W11RK1-019

---

**SPECIFICATIONS**

**Service:** Liquids, powder, and bulk materials compatible with wetted materials.

**Wetted Materials:** 316 SS and polyvinylidene fluoride (PVDF).

**Temperature Limits:** Ambient: -40 to 185°F (-40 to 85°C), -4 to 185°F (-20 to 85°C) with under 24 VAC/DC power supply; Process: -40 to 250°F (-40 to 121°C).

**Pressure Limit:** 365 psi (25 bar).

**Enclosure Rating:** Weatherproof, NEMA 4X (IP66).

**Switch Type:** DPDT (two form C).

**Electrical Rating:** 8A @ 120/240 VAC res., 30 VDC, 1/2 hp @ 120 VAC and 1/4 hp @ 240 VAC ind.

**Power Requirements:** 12 to 240 VAC/DC.

**Power Consumption:** 2.8 watts max.

**Electrical Connection:** 1/2˝ NPT conduit opening, screw termination with removable terminal block.

**Process Connection:** See model chart.

**Mounting Orientation:** Vertical or horizontal.

**Set Point Adjustment:** Trips when product touches probe. Cut or extend probe to length of desired trip point. Can be cut as short as 1˝ and can be extended by welding on to probe. (Minimum length will be effected by material being sensed.)

**Response Time:** 0.2 seconds.

**Time Delay:** Adjustable, 0 to 60 seconds.

**Spark/Static Protection:** 10 MΩ dissipation resistance with spark gap. Surge current to 100A max.

**Sensitivity:** 8 Selectable settings, 1, 2, 4, 6, 8, 10, 14, 20 pF (at 30 pF nominal free capacitance).

**Agency Approvals:** CE, cUL, UL.

---

**Example Models**

<table>
<thead>
<tr>
<th>Series</th>
<th>CLS2-W11RK1-019</th>
<th>CLS2-W11RK1-18-M20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enclosure</strong></td>
<td>W</td>
<td>Weatherproof</td>
</tr>
<tr>
<td><strong>Switch</strong></td>
<td>S</td>
<td>DPDT rated 8A @ 12/240 VAC, 30 VDC res.</td>
</tr>
<tr>
<td><strong>Power Supply</strong></td>
<td>K</td>
<td>12-240 VAC/DC</td>
</tr>
<tr>
<td><strong>Probe Type</strong></td>
<td>X</td>
<td>Standard Rod: 316 SS, 375˝ diameter Threaded Rod: 316 SS (can attach field extensions) Cable: 316 SS with weight</td>
</tr>
<tr>
<td><strong>Insulator Material</strong></td>
<td>C</td>
<td>PVDF</td>
</tr>
<tr>
<td><strong>Process Connection</strong></td>
<td>1</td>
<td>3/4˝ male NPT</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1˝ male NPT</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>1-1/2˝ male NPT</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>3/4˝ BSPT</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>1˝ BSPT</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>1-1/2˝ BSPT</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>1-1/2˝ sanitary clamp</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>2˝ sanitary clamp</td>
</tr>
<tr>
<td><strong>Probe Length</strong></td>
<td>XXX</td>
<td>Insertion length in inches. Example 019 is 19˝ length. (Minimum length is 6”, with 3/4˝ sensing tip)</td>
</tr>
<tr>
<td><strong>Options</strong></td>
<td>M20</td>
<td>M20 conduit connection with cable gland</td>
</tr>
<tr>
<td></td>
<td>WC</td>
<td>Window Cap</td>
</tr>
</tbody>
</table>
The Model FCLS Flush Capacitance Level Switch is ideal for level measurement of liquids and bulk solids to trigger an alarm or close a filler inlet. No probe design allows for installation where space is constrained or where material flow or material build up would damage a probe. With no moving parts, this level switch assures no jams, no wear, nothing to break, and no maintenance. Comes standard with IP65 housing with a maximum pressure limit of 285 psi (19.7 bar).

**Model FCLS-01, Flush Capacitance Level Switch**

**SPECIFICATIONS**
- **Service:** Liquids, powder, and bulk materials compatible with wetted materials.
- **Wetted Materials:** 304 SS.
- **Insulated Materials:** PTFE.
- **Temperature Limits:** Ambient: -4 to 140°F (-20 to 60°C); Process: -4 to 176°F (-20 to 80°C).
- **Pressure Limit:** 285 psi (19.7 bar).
- **Power Requirements:** 110 or 220 VAC.
- **Power Consumption:** 2 W.
- **Enclosure:** Aluminum, painted.
- **Enclosure Rating:** IP65.
- **Switch Type:** SPDT.
- **Electrical Rating:** 3 A @ 250 VAC.
- **Electrical Connections:** Screw terminals.
- **Conduit Connection:** 2 x 1/2˝ female NPT.
- **Process Connection:** 2.5˝ - x 5 kg/cm² JIS flange.
- **Mounting Orientation:** Side mount.
- **Fail Safe:** Selectable fail high or fail low.
- **Adjustable Sensitivity:** 1 to 20 pF.
- **Time Delay:** 0 to 6 s.
- **Weight:** 7.1 lb (3.2 kg).

**Model CLS1 Capacitance Level Switch** provides reliable point level measurement of solids, liquids or slurries in metallic or non-metallic tanks and vessels. Model CLS1 detects the presence or absence of material in contact with the probe by sensing a change in the capacitance. Electronics provide highly sensitive measurement detection (requires less than a 1 picofarad shift from ambient). State of the art technology ignores material build-up on the vessel sidewall or along the probe assembly. One time calibration is simple with a single multturn potentiometer. Red LED on housing indicates sensor status. Unit features an adjustable 1-30 second time delay and a 5 amp, SPDT fail-safe relay output. Model CLS1 can be mounted vertically or horizontally.

**APPLICATIONS**
- High or low level detection in bins, silos, tanks, hoppers, chutes and other vessels where liquids, solids or slurries are stored.

**Model CLS1, Capacitance Level Switch**

**SPECIFICATIONS**
- **Service:** Solids, liquids, or slurries.
- **Wetted Material:** CPVC.
- **Temperature Limits:** Process: -40 to 240°F (-40 to 116°C); Ambient: -40 to 185°F (-40 to 85°C).
- **Enclosure Rating:** NEMA 4X (IP66), PVC, dust tight, water resistant.
- **Switch Type:** SPDT.
- **Electrical Rating:** 5A @ 250 VAC.
- **Power Requirements:** 120 VAC, 1.5VA.
- **Conduit Connection:** 3/4˝ female NPT.
- **Process Connection:** 1˝ male NPS.
- **Mounting Orientation:** Vertical or horizontal.
- **Sensitivity:** Adjustable to <1 pF.
- **Fail-Safe:** Switch selectable, high/Low.
- **Time Delay:** Adjustable 1 to 30 seconds.
- **Weight:** 2.0 lb (0.91 kg).
The Series LTS Tilt Switch Probes are able to sense either the presence or absence of material when other sensors won’t work due to bin vibration, or actual walls aren’t available for mounting other types of measuring units. The probes are designed for use where the bulk material to be sensed is exposed or open. Typical applications include high or low level detection in large hoppers, silos, crushers, or trippers, high level control under stackers, and detection of plugged conditions at conveyor transfer points. Series LTS probes can also be used to detect the presence or absence of bulk material on belt conveyors, on chutes to indicate product flow, and to aid in loading rail cars or trucks.

All probe models are airtight, dust tight, and waterproof. The compact probe should be used for applications involving small bins and hoppers where space is limited, while the heavy duty probe should be used for applications where a heavy duty abrasion-resistant probe is necessary.

### PROXIMITY® Series LTS Tilt Switch Probe

**Non-Mercury Probes**

<table>
<thead>
<tr>
<th>Model</th>
<th>Size</th>
<th>Probe Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTS-N11G-025</td>
<td>Standard</td>
<td>9” (22.86)</td>
</tr>
<tr>
<td>LTS-N21G-025</td>
<td>Compact</td>
<td>6” (15.24)</td>
</tr>
<tr>
<td>LTS-N12G-025</td>
<td>Standard</td>
<td>9” (22.86)</td>
</tr>
<tr>
<td>LTS-N22G-025</td>
<td>Compact</td>
<td>6” (15.24)</td>
</tr>
</tbody>
</table>

Consult factory for custom cable lengths.

### SPECIFICATIONS

**Service:** Powder and bulk.

**Temperature Limit:** -40 to 150°F (-40 to 66°C).

**Switch Type:** SPST, normally closed.

**Electrical Rating:** 0.25 A max, 60 V max, 3 VA max.

**Electrical Connection:** 16-3 type SO connection cable.

**Cable Length:** 25´ (7.6 m).

**Probe Length:** Standard: 9” (23 cm); Compact: 6” (15 cm).

**Signal Voltage:** 15 VDC (when used with LTC controller).

**Actuation Angle:** 25° from vertical.

**Material:** Steel or SS.

**Switch Surrounding:** Epoxy encapsulated.

**Mounting Orientation:** Vertical.

**Weight:** Standard: 4.75 lb (2.15 kg); Compact: 2.5 lb (1.13 kg).

**Features:** Fittings for hangers.

**Enclosure Rating:** Meets NEMA 4 (IP56).

### Tilt Switch Control Unit

**Series LTC Adjustable Time Delay**

The Series LTC Tilt Probe Control Units feature an adjustable time delay and a logic selector switch. The logic selector switch determines when the output relay actuates and de-actuates, thus while in position one, the relay is energized when the probe is in the vertical position and de-energizes when the probe is in the tilted position, and while in position two, the actions are opposite. In addition, an adjustable time-delay feature may be assigned to either the vertical or the tilt position to prevent false signals. The relay assumes the de-energized position upon reaching the end of the delay period as well as upon failure of power to the controller.

### SPECIFICATIONS

**Temperature Limit:** 125°F (52°C).

**Power Requirements:** 115 VAC @ 50/60 Hz.

**Power Consumption:** 10W.

**Switch Type:** DPDT.

**Electrical Rating:** 10 A @ 115 VAC.

**Enclosure:** None or NEMA 4 (IP68).

**Electrical Connections:** Screw terminal.

**Conduit Connection:** None.

**Indicator Lights:** Green (when relay is energized and probe vertical), Red (when relay is de-energized and probe tilted).

**Light Power Required:** 18 VDC.

**Time Delay:** 1 to 10 sec. Adjustment will delay output relay action.
Tuning Fork Level Switch
Perfect for Sensing Low Bulk Density or Low Dielectric Materials

**Series TFLS**

**SPECIFICATIONS**

- **Service:** Dry powder or bulk materials compatible with wetted materials. Can detect bulk materials submerged in liquid.
- **Sensitivity:** Minimum bulk density of 1.8 lb/ft³ (30 g/l), max particle size 0.4” (10 mm).
- **Wetted Materials:** 316 SS.
- **Temperature Limits:** Ambient: -4 to 140°F (-20 to 60°C); Process: -4 to 176°F (-20 to 80°C).
- **Pressure Limit:** 145 psig (10 bar).
- **Power Requirement:** 90 to 265 VAC, 50/60 Hz; 24 VDC.
- **Power Consumption:** 4 VA.
- **Enclosure:** Aluminum, powder coated.
- **Enclosure Rating:** Weatherproof, NEMA 4X (IP66).
- **Switch Type:** SPDT.
- **Electrical Rating:** 5A @ 230 VAC.
- **Conduit Connection:** 3/4˝ female NPT.
- **Conduit Size:** 1-1/2˝ male NPT.
- **Weight:** 5.5 lb (2.5 kg).
- **Indication Lights:** External: Red LED; Internal: Green and red LED’s.
- **Sensing Delay:** (Max) covered probe: 2 seconds; Uncovered probe: 3 to 7 seconds.
- **Time Delay:** Separate settings for covering and uncovering the probe. Adjustable from 2 to 20 s.

**APPLICATIONS**

- Lime, styrofoam, tobacco, dry cereals, sugar, animal feed, milk powder, flour, insulation, cement, paper shavings, plastic granules, sawdust, carbon black, light fibers, detergent powders, dyes, chalk, silica, sand, wood chips.

**FEATURES**

- No calibration required
- Vibrating fork design: Great for low bulk density and low dielectric constant products. Will detect products down to 1.8 lb/ft³ (30 g/l)
- Universal power supply: One model works with 90 to 265 VAC and 24 VDC
- Adjustable sensitivity: Can be set to ignore lighter bulk density products and only detect heavier products, such as sand in water
- Status indicator: External LED switch indicator, and internal indicators for normal and alarm status
- Failsafe setting: Output switch can be set for NO or NC condition on loss of power
- Time delay: Prevent false alarms from material surges

**SERIES TFLS TUNING FORK LEVEL SWITCH**

SERIAL:

MOD TFLS-

ø4-7/16

[112.73]

4-7/8

[123.83]

3-5/8

[92.08]

COVER REMOVAL

4-7/32

[107.14]

3/4 CONDUIT

CONNECTION

1-1/2 NPT

CALL TO ORDER | 800-876-0036

Contact factory for fork extension options in carbon steel or stainless steel.
**The Model TFLS2 Compact Tuning Fork Level Switch** is an ideal choice for level control for powders. The TFLS2 incorporates a piezoelectric crystal that vibrates the fork at its natural frequency. When the fork comes in contact with a material, the vibration is dampened and the switch changes state. As the material is removed from the fork, the switch changes back to its normal state. Featured in the TFLS2 is a selectable fail-safe operation of the contacts. The unit is not affected by vibration from conveying systems, motors, or the movement of material. Its compact size allows for mounting in places a larger tuning fork level switch may not fit, providing great versatility.

The Model TFLS2 is easy to use with adjustable calibration, and no mechanical moving parts means no routine maintenance. The TFLS2 is not affected by the dielectric constant of the sensed material, making it superior to a comparable capacitance level switch for applications where the dielectric constant is low, more than one material is being used in the single vessel, and when material moisture content can change. The level switch is also great for applications when the bulk density is too low for a rotating paddle level switch, making it the ideal choice for low density bulk solids and liquids.

**APPLICATIONS**

- Lime, styrofoam, tobacco, dry cereals, sugar, animal feed, milk powder, flour, insulation, cement, paper shavings, plastic granules, sawdust, carbon black, light fibers, detergent powders, dyes, chalk, silica, sand, wood chips.

**SPECIFICATIONS**

- **Model CTF-01**, Mini Tuning Fork Level Switch
  - Service: Dry powder compatible with wetted materials.
  - Sensitivity: Min. bulk solid density: 4.4 lb/ft³ (70 g/l); Max. particle size: 0.4” (10 mm).
  - Wetted Materials: 316 L SS.
  - Temperature Limits:
    - Ambient: -40 to 140°F (-40 to 60°C);
    - Process: -40 to 212°F (-40 to 100°C).
  - Pressure Limit: 600 psi (40 bar).
  - Power Requirement: 20 to 250 VAC, 50/60 Hz.
  - Power Consumption: 10 VA.
  - Weight: 2.4 lb (1.09 kg).

- **Model TFLS2-01**, Compact Tuning Fork Level Switch
  - Service: Dry powder compatible with wetted materials.
  - Sensitivity: Min. bulk solid density: 4.4 lb/ft³ (70 g/l); Max. particle size: 0.4” (10 mm).
  - Wetted Materials: 316 L SS.
  - Temperature Limits:
    - Ambient: -40 to 140°F (-40 to 60°C);
    - Process: -40 to 266°F (-40 to 130°C).
  - Pressure Limit: 600 psi (40 bar).
  - Power Requirement: 2.4 lb (1.09 kg).
  - Weight: 2.2 lb (1.0 kg).

**APPLICATIONS**

- Lime, styrofoam, tobacco, dry cereals, sugar, animal feed, milk powder, flour, insulation, cement, paper shavings, plastic granules, sawdust, carbon black, light fibers, detergent powders, dyes, chalk, silica, sand, wood chips.

**SPECIFICATIONS**

- **Model CTF-01**, Mini Tuning Fork Level Switch
  - Service: Dry powder compatible with wetted materials.
  - Sensitivity: Min. bulk solid density: 4.4 lb/ft³ (70 g/l); Max. particle size: 0.4” (10 mm).
  - Wetted Materials: 316 L SS.
  - Temperature Limits:
    - Ambient: -40 to 140°F (-40 to 60°C);
    - Process: -40 to 212°F (-40 to 100°C).
  - Pressure Limit: 600 psi (40 bar).
  - Power Requirement: 2.4 lb (1.0 kg).
  - Weight: 2.2 lb (1.09 kg).

- **Model TFLS2-01**, Compact Tuning Fork Level Switch
  - Service: Dry powder compatible with wetted materials.
  - Sensitivity: Min. bulk solid density: 4.4 lb/ft³ (70 g/l); Max. particle size: 0.4” (10 mm).
  - Wetted Materials: 316 L SS.
  - Temperature Limits:
    - Ambient: -40 to 140°F (-40 to 60°C);
    - Process: -40 to 266°F (-40 to 130°C).
  - Pressure Limit: 600 psi (40 bar).
  - Power Requirement: 2.4 lb (1.09 kg).
  - Weight: 2.2 lb (1.0 kg).
The Model VRLS Vibrating Rod Level Switch is an economical choice in level detection of powders and bulk solids. The VRLS utilizes a piezoelectric crystal that vibrates the rod at a natural frequency. Once the rod comes in contact with the material, the vibration will be dampened and the switch will change state. Once the rod is uncovered by the material, the switch will revert to its normal state. Perfect for silo or hopper applications, its probe design allows for self-cleaning, ensuring no build-up or bridging of material and accurate detection. Sensitivity is adjustable for detection ranging from large granular material to small powders with low bulk densities. The failsafe mode can be set for failure on high level or failure on low level using a selector switch in the enclosure.

**APPLICATIONS**

Lime, styrofoam, tobacco, dry cereals, sugar, animal feed, milk powder, flour, insulation, cement, paper shavings, plastic granules, sawdust, carbon black, light fibers, detergent powders, chalk, silica, and wood chips.

**SPECIFICATIONS**

- **Service:** Dry powder or bulk materials compatible with wetted materials.
- **Sensitivity:** Min. bulk density of 20 lb/ft³ (320 kg/m³).
- **Wetted Materials:** 304 SS.
- **Temperature Limits:** Ambient: -40 to 140°F (-40 to 60°C); Process: -40 to 176°F (-40 to 80°C).
- **Pressure Limit:** 150 psi (10 bar).
- **Power Requirement:** 20 to 250 VAC/VDC, 50/60 Hz.
- **Power Consumption:** 15 VA.
- **Enclosure:** Aluminum, painted.
- **Enclosure Rating:** IP65.
- **Switch Type:** SPDT.
- **Electrical Rating:** 5 A @ 250 VAC.
- **Electrical Connections:** Screw terminals.
- **Conduit Connection:** 1/2˝ female NPT x 2.
- **Process Connection:** 1˝ male NPT.
- **Indication Lights:** Internal: green and red LED.
- **Sensing Delay:** 0 to 6 s.
- **Weight:** 4.4 lb (2.0 kg).

The Mini-Bin provides reliable level sensing for dry bulk solids where mounting space is limited. This compact, side mount control reports high, intermediate, and low level conditions, eliminating overflows, choking, clogs or empty vessels. Model DBLM Mini-Bin operates by using a 1 rpm synchronous motor to rotate a four vane, plastic paddle. When material surrounds paddle and impedes rotation, the motor is de-energized and triggers a SPDT snap switch. Mount the Mini-Bin with optional 1-1/4” to 3/4” reducer to replace standard size units.

**SPECIFICATIONS**

- **Service:** Dry bulk solids.
- **Wetted Materials:** Polycarbonate paddle, SS shaft, PTFE washer.
- **Temperature Limits:** -4 to 140°F (-20 to 60°C).
- **Enclosure Rating:** Polycarbonate, NEMA 1 (IP10).
- **Switch Type:** SPDT snap switch.
- **Electrical Rating:** 3A @ 250 VAC.
- **Power Requirements:** 110 VAC, 50/60 Hz, 220 VAC optional, consult factory.
- **Power Consumption:** 1.5 Watts.
- **Electrical Connections:** 18 AWG, 12˝ leads wrapped in conduit.
- **Process Connection:** 3/4” male NPT, optional flange and 1-1/4˝ to 3/4˝ reducer.
- **Mounting Orientation:** Side mount.
- **Weight:** 0.77 lb (350 g).
- **Agency Approvals:** CE.
The Series PLS2 is an electromechanical level switch designed for level monitoring of bulk materials. The rotating measuring vane is driven by a brushless synchronous motor at one revolution per minute. As product builds up, the paddle rotation is impeded and the resulting motor torque activates the output switch and stops the motor. A spring mechanism reactivates the motor and returns the switch to normal state when the material no longer impedes the paddle rotation. A torque adjusting mechanism eliminates the need for different sized paddles. The PLS2 is designed with the industry standard 1-1/4˝ male NPT connection and unit can be side or top mounted.

**FEATURES**
- 3 sensitivity settings
- Top or side mountable
- Brushless synchronous motor: Assures long term reliability and efficiency
- Motor shuts off when paddle stalls
- Screw cover: For easy access with no worries about losing bolts or screws

**APPLICATION**
- Level monitoring of bulk materials

**SERIES PLS2 PADDLE LEVEL SWITCH**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLS2-E-1-1</td>
<td>Explosion-proof paddle level switch, 115 VAC power supply</td>
</tr>
<tr>
<td>PLS2-E-1-2</td>
<td>Explosion-proof paddle level switch, 230 VAC power supply</td>
</tr>
<tr>
<td>PLS2-E-1-3</td>
<td>Explosion-proof paddle level switch, 24 VDC power supply</td>
</tr>
</tbody>
</table>

Models include single sided non-spring paddle.

**SPECIFICATIONS**
- **Service:** Dry powder or bulk materials compatible with wetted materials.
- **Wetted Materials:**
  - Paddle: 304 SS;
  - Exposed shaft: 303 SS;
  - Shaft seal: NBR;
  - Process connection: Aluminum.
- **Temperature Limits:**
  - Process: -13 to 176°F (-25 to 80°C);
  - Ambient: -4 to 140°F (-20 to 60°C).
- **Pressure Limit:** 11.6 psi (0.8 bar).
- **Power Requirement:** Select by model number: 115 VAC, 230 VAC or 24 VDC.
- **Power Consumption:**
  - AC versions: 4 VA; DC version: 2.5 watt.
- **Enclosure:**
  - Aluminum, powder coated.
- **Enclosure Rating:** NEMA 4 (IP66);
  - Rated for Class II & III, Div. 1, Group E, F, G.
- **Switch Type:** SPDT micro switch.
- **Electrical Rating:** 5 A @ 250 VAC, 3 A @ 30 VDC.
- **Electric Connections:** Screw terminals.
- **Conduit Connection:** 3/4˝ female NPT.
- **Process Connection:** 1-1/4˝ male NPT.
- **Mounting Orientation:** Side or top mounting.
- **Sensitivity:** Min. material density of 6 lb/ft³ (96 kg/m³).
- **Permitted Mechanical Loading:**
  - Standard shaft: 67 lbf (300 N) max;
  - Optional extension: 22 lbf (100 N) max.
- **Weight:** 2.6 lb (1.2 kg).
- **Agency Approvals:** CE, FM.

**ACCESSORIES**
- PLS2-PL1, Single Sided Spring Paddle
- PLS2-PL2, Double Sided Spring Paddle
- PLS2-EX1, 8.5˝ Shaft Extension
- PLS2-EX2, 19.6˝ Shaft Extension
- PLS2-EX3, 39.4˝ Shaft Extension
- PLS2-EX4, 78.7˝ Shaft Extension
**PLS Series**

Paddle Level Switch

Economical Rotary Paddle Level Control, Top or Side Mounting for Dry Bulk Materials

**FEATURES**

- Modular design to allow field installation of any paddle, flanges, shaft extensions, etc.
- Screw cover on the enclosure for easy access with no worries about losing bolts or screws.
- Status indication light on weatherproof models.
- Motor shuts-off when paddle stalls increasing motor life, preventing motor burnout.
- Magnetic drive that isolates and completely seals the control head from the process connection and mounting flanges.

**SPECIFICATIONS**

- Service: Dry powder or bulk materials compatible with wetted materials.
- Sensitivity: Min material density of 5 lb/ft³ (80 kg/m³), max of 200 lb/ft³ (3200 kg/m³).
- Wetted Materials:
  - Paddles: 316 SS; Exposed shaft: 316 SS; Shaft seal: PTFE.
  - Mounting boss: Aluminum; Flexible coupling: 316 SS.
- Mounting flanges: Carbon steel or 316 SS.
- Shaft extension and shaft guards: Galvanized steel or 316 SS.
- Temperature Limits:
  - Standard construction: Process: -40 to 300°F (-40 to 149°C).
  - High temperature option: Process: -40 to 500°F (-40 to 260°C).
- Pressure Limit: 30 psig (2.07 bar) max for .5 micron or larger material.
- Power Requirement: Select by part number: 110 to 120 VAC, 230 VAC, 24 VAC, 48 VAC, 12 VDC, or 24 VDC.
- Power Consumption: Weatherproof models: 5 watts; Explosion-proof models: 3 watts.
- Enclosure: Aluminum, powder coated.
- Enclosure Rating: Weatherproof (W, WH construction): NEMA 4X (IP66); Explosion-proof (E, EH construction): NEMA 4X (IP66) and rated for Class I, Div. 1 & 2, Groups C & D, Div. 1 & 2, Groups E, F, & G.
- Switch Type: SPDT or optional DPDT snap switch.
- Electrical Connections: Screw terminals.
- Conduit Connection: 3/4” female NPT.
- Process Connection: 1-1/4” male NPT. Optional flange.
- Weight: Control head only: 4 lb (1.81 kg).
- Indication Light: Red LED that activates when switch is made or when switch is not made with RL option (Not available on explosion-proof models).
- Options: Time delay relay, high temperature construction, top mount, shaft extensions, shaft shields, flexible couplings, other power voltages, reversed light.
- Agency Approvals: cUL approved as an auxiliary device or as an auxiliary device for hazardous locations.

**Control Assemblies**

<table>
<thead>
<tr>
<th>Description</th>
<th>Weatherproof construction, SPDT switch, 120 VAC power supply. Order paddles and flanges separately.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLS-W-S-1-0-0-0-0</td>
<td>Weatherproof construction, SPDT switch, 120 VAC power supply. Order paddles and flanges separately.</td>
</tr>
<tr>
<td>PLS-W-S-1-3-0-0-0</td>
<td>Weatherproof construction, SPDT switch, 120 VAC power supply, includes PDL-3 paddle.</td>
</tr>
<tr>
<td>PLS-W-S-1-2-CSH-0-0</td>
<td>Weatherproof construction, SPDT switch, 120 VAC power supply, includes PDL-1 paddle and FLG-CSH flap.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Paddles</th>
<th>Price</th>
<th>Flanges</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDL-1</td>
<td>$29.75</td>
<td>FLG-CSH</td>
<td>Carbon Steel with Half Coupling</td>
</tr>
<tr>
<td>PDL-2</td>
<td>28.50</td>
<td>FLG-CSF</td>
<td>Carbon Steel with Full Coupling</td>
</tr>
<tr>
<td>PDL-3</td>
<td>29.75</td>
<td>FLG-SSH</td>
<td>316 SS with Half Coupling</td>
</tr>
<tr>
<td>PDL-4</td>
<td>28.50</td>
<td>FLG-SSF</td>
<td>316 SS with Full Coupling</td>
</tr>
</tbody>
</table>

Contact the factory for pricing of shaft extensions, protective shields, and other options. More detailed information available in our Measurement & Control for Powder, Dust, and Bulk Materials Catalog.

**Product Video**

Scan here to watch product video.

Distributed by: M&M Control Service, Inc.

www.mmcontrol.com/Dwyer.php

800-876-0036   847-356-0566

315_Layout 1  7/15/14  3:58 PM  Page 315
Explosion-Proof Ultra Mag™ Level Switches

For Powder & Bulk Solids

A unique **Magnetic Linkage** isolates the electrical compartment from controlled product, reducing maintenance and improving sensitivity. The sealed switch compartment and sealed leads yield the utmost in reliable operation. A wide selection of diaphragms and switches are available with choices of flange or suspension mounting to fit your specific application. The dry level Ultra-Mag™ Level Switch is extremely sensitive and very economical. The magnetic linkage makes this simple explosion-proof diaphragm switch the most rugged and reliable level control for a variety of products (see cut-away above).

**Mounting Selection:** A choice of either suspension or flange mounting is available to match your application. Flange mounting is the best choice for control of low or intermediate level in vessels containing granular product that does not “bridge”, “rathole”, or otherwise build up on vessel walls. Choose suspension mounting for high level in vessels and for better operation with “bridging” product.

**Diaphragm Selection:** A wide variety of diaphragms are available to match product bulk density, flowability, abrasiveness and temperature requirements while providing maximum sensitivity. The best choice for vessels subject to pressure or vacuum is “breathable” fabric (**P Series**), requiring no venting. Non-porous elastomer (**G Series**) type diaphragms are the best choice for more abrasive product and broader temperature range applications. Venting is always required with the **G Series** and if used in pressurized vessels, venting to the tank atmosphere is required to allow pressure equalization. A slide rule “Diaphragm Selector” is available from the factory to help you choose the diaphragm best suited to your application.

**SPECIFICATIONS**

**Service:** Compatible powder or bulk solids.

**Wetted Materials:**
- Mounting Flange: See model chart. Aluminum or 304 SS;
- Diaphragm: See model chart. Urethane, Buna-N, PTFE, silicone rubber, polyester, fluorooelastomers, white Buna-N (food grade), or EPDM.

**Temperature Limits:** Depends on diaphragm material, see model chart.
- Standard switch: -40 to 185°F (-40 to 85°C);
- High temperature switch: -40 to 350°F (-40 to 176°C).

**Pressure Limit:** 60 psig (4.14 bar).

**Enclosure Rating:** General purpose or weatherproof and explosion-proof. See model chart.

**Switch Type:** See model chart.

**Electrical Rating:** See model chart.

**Electrical Connections:** 18 gage solid core, 600 volt TEW 105°C, style 1015. Epoxy sealed at conduit entrance. 12” (304.8 mm) long.

**Conduit Connection:** 1/2” female NPT.

**Process Connection:** For flanged models standard is 8-3/8” (212.725 mm) diameter bolt hole circle.

**Mounting Orientation:** Flange mount or suspend depending on model.

**Set Point Adjustment:** Internal screw.

**Weight:** 7 lb (3.18 kg).

**Options:** Suspension kits and flange adapter rings.

**Agency Approvals:** CSA and UL.

**Suspension and Flange Mounting Kits:** See page 317 (Ultra Mag™)

**Part Number:** See page 317 (Ultra Mag™)
Diaphragm Selection Guide

<table>
<thead>
<tr>
<th>Product</th>
<th>Suggested Diaphragm</th>
<th>Product</th>
<th>Suggested Diaphragm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abrasive</td>
<td>3D</td>
<td>Polypropylene Powder</td>
<td>7A</td>
</tr>
<tr>
<td>Aggregate</td>
<td>3D</td>
<td>Polyethylene Resin</td>
<td>17</td>
</tr>
<tr>
<td>Alumina</td>
<td>3D</td>
<td>Polyethylene Beads</td>
<td>3D</td>
</tr>
<tr>
<td>Ash, Dry</td>
<td>3D</td>
<td>Pot Ash</td>
<td>3D</td>
</tr>
<tr>
<td>Baking Powder</td>
<td>7B</td>
<td>Powdered Metal</td>
<td>3D</td>
</tr>
<tr>
<td>Baking Soda</td>
<td>7B</td>
<td>Powdered Ore</td>
<td>3D</td>
</tr>
<tr>
<td>Barite</td>
<td>3D</td>
<td>PVC Powder</td>
<td>7A</td>
</tr>
<tr>
<td>Bark, Ground</td>
<td>6G</td>
<td>PVC Resin</td>
<td>17</td>
</tr>
<tr>
<td>Barclay, Ground or Meal</td>
<td>17</td>
<td>Rice</td>
<td>17</td>
</tr>
<tr>
<td>Barclay, Whole</td>
<td>4B</td>
<td>Rice</td>
<td>3D</td>
</tr>
<tr>
<td>Beans, Edible</td>
<td>4B</td>
<td>Salt</td>
<td>3D</td>
</tr>
<tr>
<td>Bentonite</td>
<td>3D</td>
<td>Sand, Dry</td>
<td>3D</td>
</tr>
<tr>
<td>Bond, Foundry</td>
<td>17</td>
<td>Sand, Dry Silicone</td>
<td>3D</td>
</tr>
<tr>
<td>Carbon Black</td>
<td>7A</td>
<td>Sand, Foundry Prepared</td>
<td>5A</td>
</tr>
<tr>
<td>Cement, Klinker</td>
<td>8A</td>
<td>Sand, Shake Out</td>
<td>3D</td>
</tr>
<tr>
<td>Cement, Portland</td>
<td>4B</td>
<td>Sawdust, Dry</td>
<td>6G</td>
</tr>
<tr>
<td>Chips, Hulled Fuel</td>
<td>6G</td>
<td>Sea Coal</td>
<td>3D</td>
</tr>
<tr>
<td>Coal</td>
<td>3D</td>
<td>Silica, Flour</td>
<td>3D</td>
</tr>
<tr>
<td>Compost</td>
<td>5A</td>
<td>Shale, Crushed</td>
<td>3D</td>
</tr>
<tr>
<td>Core Sand, Foundry</td>
<td>3D</td>
<td>Silica, Seed</td>
<td>3D</td>
</tr>
<tr>
<td>Corn, Shelled</td>
<td>8A</td>
<td>Sludge, Sewage Dried</td>
<td>1A</td>
</tr>
<tr>
<td>Diaphragmatic Acid</td>
<td>7A</td>
<td>Sludge, Sewage, Ground</td>
<td>3A</td>
</tr>
<tr>
<td>Drill Mud</td>
<td>3D</td>
<td>Soda Ash</td>
<td>3D</td>
</tr>
<tr>
<td>Flour</td>
<td>7B</td>
<td>Soybeans, Cracked</td>
<td>3D</td>
</tr>
<tr>
<td>Fly Ash</td>
<td>3D</td>
<td>Soybean, Flake</td>
<td>7A</td>
</tr>
<tr>
<td>Glass Batch</td>
<td>3D</td>
<td>Soybean, Flour</td>
<td>7A</td>
</tr>
<tr>
<td>Gravel</td>
<td>3D</td>
<td>Soybean Meal</td>
<td>3D</td>
</tr>
<tr>
<td>Iron Ore, Crushed</td>
<td>3D</td>
<td>Soybean, Whole</td>
<td>3D</td>
</tr>
<tr>
<td>Kaolin Clay</td>
<td>3D</td>
<td>Sugar Beets, White</td>
<td>6H</td>
</tr>
<tr>
<td>Lime, Hydrated</td>
<td>5A</td>
<td>Sugar Refined</td>
<td>7B</td>
</tr>
<tr>
<td>Lime, Stony</td>
<td>3D</td>
<td>Sunflower Seed</td>
<td>7A</td>
</tr>
<tr>
<td>Oats</td>
<td>4B</td>
<td>Taconite Pellets</td>
<td>3D</td>
</tr>
<tr>
<td>Peanuts in Shell</td>
<td>7A</td>
<td>Talcum Powder</td>
<td>3D</td>
</tr>
<tr>
<td>Peanuts, Shelled</td>
<td>3D</td>
<td>Walnut Shells, Crushed</td>
<td>3D</td>
</tr>
<tr>
<td>Pewter</td>
<td>7A</td>
<td>Wheat</td>
<td>8A</td>
</tr>
<tr>
<td>Phosphate, Rock</td>
<td>3D</td>
<td>Wheat, Wet</td>
<td>5A</td>
</tr>
<tr>
<td>Polystyrene Powder</td>
<td>7A</td>
<td>Wood, Chips</td>
<td>6G</td>
</tr>
<tr>
<td>Polystyrene Resin</td>
<td>17</td>
<td>Wood, Dust</td>
<td>6G</td>
</tr>
<tr>
<td>Polystyrene Fluff</td>
<td>7A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Diaphragm codes become 4th and 5th characters in model number.

Suspension Mounting is normally used for high level monitoring in vessels. For product over 20 lb/ft², the level switch (diaphragm face) should be located about 1/3 of the distance from the vessel wall to the point of entry of the product. For product less than 20 lb/ft², the unit should be located closer to the point of entry of the product, about 1/2 the distance from the vessel wall to the point of entry.

Pressure required to depress the diaphragm and trip the switch is in the range of 5 to 15 oz in the horizontal direction (perpendicular to the diaphragm). Suspension mounting provides the easiest vertical adjustment capability, greatest sensitivity and best maintenance conditions.

Suspension Assembly Kits: Pre-assembled kits are available from the factory, or you can build your own kits using standard pipe fittings shown in our Proximity Bill of Materials (Form No. 101). Pipes and fittings are normally galvanized steel, but aluminum and SS pipes and fittings are available. Units are secured to a steel cover plate that rests on a rectangular steel flange welded into the top of the vessel. Aluminum and stainless coverplates and flanges are also available. Standard 48” L x 1” pipe provides working depth (WD) up to 48”. Longer pipe (to provide greater WD) is available. GS Series switches have upper (L₁ - 28” standard) and lower (L₂ - 20” standard) 1” pipes, with a tee (for stilling pot) in between. A stilling pot is required to equalize pressure and keep dirt from building up behind the diaphragm. PS Series require a 1/2” conduit in 1” suspension pipe for explosion-proof applications. The 1/2” conduit (56” standard length) is a standard part of the GS series assembly.

Complete Model Chart (Consult factory for pricing on UltraMag™ switches)

<table>
<thead>
<tr>
<th>PREFIX - Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
</tr>
<tr>
<td>P</td>
</tr>
</tbody>
</table>

1ST DIGIT - Basic Magnetic Pressure Sensing Series

<table>
<thead>
<tr>
<th>1</th>
<th>48˝ L x 1˝ pipe (standard) 1˝ pipe (56” standard length) galvanized steel pipe, explosion proof, standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>D = Aluminum, Anodized</td>
</tr>
<tr>
<td>E</td>
<td>E = Aluminum, Epoxy Coated</td>
</tr>
</tbody>
</table>

2ND DIGIT - Mounting (Top = Suspension/Side = Flanged)

<table>
<thead>
<tr>
<th>S</th>
<th>Suspended (for series require suspension vent fittings)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Flanged, Aluminum standard</td>
</tr>
<tr>
<td>T</td>
<td>Flanged, 304 SS</td>
</tr>
</tbody>
</table>

3RD DIGIT - Housing Material

| D | D = Aluminum |
| A | A = Aluminum, Anodized |
| E | E = Aluminum, Epoxy Coated |

4TH & 5TH DIGITS - Diaphragm Material (Temperature) (Bulk Density)

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Polyethylene Resin</td>
</tr>
<tr>
<td>A</td>
<td>Phosphate, Rock</td>
</tr>
<tr>
<td>P</td>
<td>Perlite</td>
</tr>
<tr>
<td>T</td>
<td>Talcum Powder</td>
</tr>
</tbody>
</table>

6TH DIGIT - Switch Type

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Standard, SPDT, 15A @ 125, 250 VAC; 1A @ 24 VDC (*)</td>
</tr>
<tr>
<td>T</td>
<td>High temp, SPDT, 5A @ 125, 250 VAC; 250 VAC (**), 24 VDC</td>
</tr>
<tr>
<td>G</td>
<td>Gold contacts, SPDT, 1A @ 125, 250 VAC, 1/2 A @ 24 VDC</td>
</tr>
</tbody>
</table>

Suffix - Special Controls

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Weatherproof control (with 3/4” dia. diaphragm only)</td>
</tr>
<tr>
<td>A3</td>
<td>High sensitivity actuator (for very light product)</td>
</tr>
</tbody>
</table>

Call to Order

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>901-409</td>
<td>Series Suspension Assembly includes 1/2” pipe (56” standard length), 1” pipe (48” standard length), 1” pipe coupling, 1-1/2 NPT strain relief on 1” pipe. Galvanized mild steel pipe, explosion proof, standard.</td>
</tr>
<tr>
<td>901-412</td>
<td>Series Suspension Assembly includes 1/2” pipe (56” standard length), waterline strain relief and 1” coupling, upper 1” pipe (28” standard length), lower 1” pipe (20” standard length), strain relief with 1-1/2” NPT, 1” x 1” tee, 1” street elbow and 1” pipe - 4” long Stilling Pot. Galvanized steel pipe, explosion proof, standard.</td>
</tr>
</tbody>
</table>

Specials include aluminum or stainless steel assemblies. Flange port and cover assemblies are sold separately. CONSULT FACTORY for details.
**Submersible Level Transmitters**

**Perfect for Ground Water and Wells, Lightning Protected**

**Features**
- Excellent chemical compatibility
- Lightning and surge protection on SBLT2 models
- Maintenance free vent filter
- UL approved intrinsically safe on SBLTX models
- Slim design for tight applications

**Applications**
- Well monitoring
- Ground water monitoring
- Environmental remediation
- Surface water monitoring
- Down hole
- Water tanks

**Specifications**
- **Service:** Compatible liquids.
- **Wetted Materials:** 316 SS, 316L SS, epoxy; Cable: Polyurethane or ETFE;
- **Bullet nose:** PVC.
- **Accuracy:** ±0.25% of full-scale.
- **Temperature Limit:** SBLT2: 0 to 176°F (-18 to 80°C);
  SBLTX: 0 to 176°F (-18 to 80°C).
- **Response Time:** 50 ms.
- **Max. Loop Resistance:** 900 Ω at 30 VDC.
- **Electrical Connections:** 4 to 20 mA DC, 2-wire.
- **Electrical Protection:** SBLT2: Lightning and surge protection; SBLTX: None.
- **Agency Approvals:** SBLT2: None; SBLTX: CE, cUL Intrinsically safe for Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III Div. 1. (According to control drawing 01-700797-00).

**Models and Options**
- **SBLT2-5-40-ETFE**
- **SBLT2-10-40-ETFE**
- **SBLT2-15-60-ETFE**
- **SBLT2-20-60-ETFE**
- **SBLT2-2.5M-5M**
- **SBLT2-3.5M-5M**
- **SBLT2-10M-18M**

**Options**
- Intrinsically Safe Approval - Change model number from SBLT2 to SBLTX . . .
- Custom ranges or Cable Lengths

**Accessories**
- MTL5041, intrinsically safe galvanic isolator
- MTL7706, intrinsically safe zener barrier
- A-297, Desiccant Filter for vent tube. Removes humidity for protection of the sensor. Changes color to show saturation
- A-625, 316 SS Cable Hanger use with NPT option for attaching chain for easy pulling out of application
**Miniature Submersible Level Transmitter**

Only 0.63” in Diameter, Perfect for Wells and Boreholes, Up to ±0.10% Accuracy

**SPECIFICATIONS**

- **Service:** Compatible liquids.
- **Wetted Materials:** Body and nose: 316 SS; Cable: Polyether polyurethane or ETFE.
- **Seals:** Fluoroelastomer; Label: Polyethylene polyamid.
- **Accuracy:** ±0.25% FS (10” w.c. range is ±0.30% FS) or ±0.10% FS.
- **Temperature Limits:** -4 to 176°F (-20 to 80°C).
- **Compensated Temperature Limits:** ±0.25%: ±0.30% FS.
- **Temperature Effect:** 0.25%: ±0.45% FS.
- **Pressure Limit:** 2 x FS.
- **Power Requirements:** 10 to 33 VDC.
- **Output Signal:** 4 to 20 mA. DC 2-wire.
- **Response Time:** < 50 ms.
- **Max Loop Resistance:** 1000 Ω @ 30 VDC.
- **Electrical Connections:** Wire pigtail. Mounting Connection: Suspended below point being monitored.
- **Electrical Protection:** Surge/lightning protected per EN61000-4-5, Class 5.
- **Weight:** Body: 0.235 lb (0.107 kg); Cable: 0.037 lb (0.09 kg) per foot.
- **Agency Approval:** CE.

**APPLICATIONS**

Ballast tanks, ground water monitoring, surface water monitoring, dewatering, down hole, remediation and other environmental monitoring applications.

**OPTIONS**

Custom ranges, cable lengths, or ETFE cable . . . Contact the website for pricing. For factory calibration certificate, add suffix -FC to model numbers.

Example: MBLT-2SB-IVPF-20-40-FC . . . . . . . . . . . . . . . . . . . . . . .

<table>
<thead>
<tr>
<th>Model ±0.10%</th>
<th>Price</th>
<th>Model ±0.25%*</th>
<th>Range psi (w.c.)</th>
<th>Cable Length</th>
<th>Cable Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>MBLT-2SC-IVPF-5-40</td>
<td>5.1 (11.54)</td>
<td>40 ft</td>
<td>Polyether polyurethane</td>
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<td>-</td>
<td>-</td>
<td>MBLT-2SC-IVPF-15-40</td>
<td>14.2 (32.81)</td>
<td>40 ft</td>
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<td>-</td>
<td>-</td>
<td>MBLT-2SC-IVPF-10-12.2</td>
<td>22.0 (45.72)</td>
<td>106 m</td>
<td>Polyether polyurethane</td>
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<td>-</td>
<td>-</td>
<td>MBLT-2SC-IVPF-350-370</td>
<td>7.10 (16.40)</td>
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<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
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<td>-</td>
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<td>-</td>
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<td>-</td>
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<td>25.58 (586.17)</td>
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<td>-</td>
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<td>-</td>
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<td>-</td>
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<td>25.58 (586.17)</td>
<td>206 m</td>
<td>Polyether polyurethane</td>
</tr>
</tbody>
</table>

*4.3 to 4.9 psi (10 to 11.54 in w.c.) configured ranges ±0.30% FS accuracy

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**A-297, Desiccant Filter**

- For vent tube. Removes humidity for protection of the sensor. Changes color to show saturation . . .

---

**Contact the website for pricing.**
PBLT2 and PBLTX Submersible Level Transmitters are manufactured for years of trouble free service in the harshest applications. Both measure the height of liquid above the position in the tank referenced to atmospheric pressure. The transmitters consist of a piezoresistive sensing element, encased in a 316 SS housing. Perfect for wastewater and slurry applications with features to protect the unit from these demanding applications.

Large diameter 316 SS diaphragm seal is non-clogging and damage resistant to floating solids. The PBLT2 incorporates lightning and surge protection utilizing dual arrestor technology, grounded to case, eliminating both power supply surges and lightning ground strike transients (surge protection is not guaranteed and is not covered by warranty). The PBLTX is UL approved intrinsically safe for use in hazardous locations when used with proper barrier. Units come equipped with a 270-pound tensile strength shielded and vented cable. Ventilation tube in the cable automatically compensates for changes in atmospheric pressure above the tank. The vent is protected with a maintenance free filter eliminating particulate or water droplets from entering the transducers.

FEATURES
- Excellent chemical compatibility with 316 construction and ETFE cable
- Lightning and surge protection
- Maintenance free vent filter
- UL approved intrinsically safe on PBLTX models
- Large diameter, non-clogging, damage resistant, 316 SS diaphragm seal

APPLICATIONS
Wastewater: Sludge pits, clarifiers, digesters; Alum tanks; Chemical storage tanks; Oil tanks; Lime slurry; Sumps; Reservoirs.

SPECIFICATIONS
Service: Compatible liquids.
Wetted Materials: 316 SS, 316L SS, epoxy, cable: ETFE or polyurethane.
Accuracy: ±0.05% full-scale (includes linearity, hysteresis, and repeatability).
Temperature Limit: PBLT2: 0 to 200°F (-18 to 93°C); PBLTX: 0 to 176°F (-18 to 80°C).
Compensated Temperature Range: PBLT2: 0 to 180°F (-18 to 82°C); PBLTX: 0 to 176°F (-18 to 80°C).
Thermal Effect: ±0.02°F/°F.
Pressure Limit: 100% extension with 2X full-scale.
Temperature Limit: 0 to 200°F (-18 to 93°C); PBLTX: 0 to 176˚F (-18 to 93°C);
Compensated Temperature Range: PBLT2: 0 to 176°F (-18 to 80°C); PBLTX: 0 to 176°F (-18 to 80°C).
Compensation Temperature Range: PBLT2: 0 to 200°F (-18 to 93°C); PBLTX: 0 to 176°F (-18 to 80°C).
TYP 60˚ Compensated Temperature: PBLT2: 0 to 200˚F (-18 to 93°C); PBLTX: 0 to 176˚F (-18 to 93°C).
Pressure Limit: 100% extension with 2X full-scale.
Power Requirement: PBLT2: 13 to 30 VDC, PBLTX: 10 to 28 VDC.

OPTIONS
Intrinsically Safe Approval - Change model number from PBLT2 to PBLTX

ACCESSORIES
MTL5041, intrinsically safe galvanic isolator
MTL7706, intrinsically safe zener barrier

A-297, Dissuicnt Filter for vent tube. Removes humidity for protection of the sensor. Changes color to show saturation
A-625, 316 SS Cable Hanger use with NPT option for attaching chain for easy pulling out of application
### Series FBLT

**Flush Tip Submersible Level Transmitter**

*Perfect for Sludge and Slurries, Lightning Protected, ±0.25% Accuracy*

---

#### Applications

- Sewage lift stations
- Industrial slurries
- Industrial sumps
- Landfill leachate
- Reservoirs
- Sludge pits
- Oil tanks, etc.

#### SPECIFICATIONS

- **Service:** Compatible liquids.
- **Wetted Materials:**
  - Body: 316 SS
  - Cable: Polyether polyurethane or ETFE
  - Diaphragm: PTFE coated FKM fluoroelastomer
  - Label: Polyethylene polyamid
- **Accuracy:** ±0.25% FS (10’ w.c. range ±0.30% FS).
- **Temperature Limits:** -4 to 176°F (-20 to 80°C).
- **Compensated Temperature Limits:** 32 to 140°F (0 to 60°C).
- **Pressure Limit:** 2x range.
- **Temperature:** ±0.0075%/°F (±0.0135%/°C).
- **Pressure Limit:** ±0.0075%/°F (±0.0135%/°C).
- **Response Time:** ≤ 50 ms.
- **Max Loop Resistance:** 1000 Ω @ 30 VDC.
- **Output Signal:** 4 to 20 mA DC 2-wire.
- **Power Requirements:** 12 to 33 VDC.
- **Agency Approval:** CE.
- **Electrical Protection:** Surge/lightning protected per EN61000-4-5, Class 5.

#### OPTIONS

- **NPT connection.** Add suffix -NPT, for a 1/2” NPT connection to connect conduit, piping, or cable hanger. All 316 SS.
- **Other ranges are available and can be ordered in psi, ft w.c., or m w.c.**

---

#### ACCESSORIES

- **A-297, Desiccant Filter** for vent tube. Removes humidity for protection of the sensor. Changes color to show saturation.

---

#### CALL TO ORDER

800-876-0036  847-356-0566

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### Table

<table>
<thead>
<tr>
<th>Model</th>
<th>Range psi (w.c.)</th>
<th>Cable Length</th>
<th>Cable Type</th>
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</table>

*4.3 to 4.9 psi (10 to 11.54 in w.c.) configured ranges ±0.30% FS accuracy*

---

**Cables can be ordered shorter or longer in polyurethane or ETFE.**

**Other ranges are available and can be ordered in psi, ft w.c., or m w.c.**
The Series CRF2 is a level transmitter providing a two-wire 4 to 20 mA output to indicate level of liquids, powders, and bulk materials. State of the art sensing technology in the CRF2, using impulse RF admittance measurement provides excellent accuracy and stability. The CRF2 senses capacitance changes resulting from the height of the material in the tank between the probe and the tank wall. In non-metallic tanks or tanks that do not have the wall parallel to the probe a ground reference must be used.

The CRF2 comes with either a rigid or flexible probe depending on application installation need and probe length required. Custom order the CRF2 to any length probe that you need for your application. FEP covered probe is ideal for use with corrosive media. This technology also provides immunity to external RF sources like walkie-talkies and cell phones as well as minimal interference with radio communication or other electronic systems.

The CRF2 is perfect for level indication in bins, hoppers, or small silos of powder and bulk materials. State of the art sensing technology in the CRF2 supports a wide range of applications including level indication in bins, hoppers, or small silos of powder and bulk materials. The CRF2 is perfect for level indication in bins, hoppers, or small silos of powder and bulk materials.

Example Models:
- CRF2-WR01T-072
- CRF2-WR01T-096

Options
- Probe Length
- Connection
- Process
- Ground
- Enclosure
- Example

SPECIFICATIONS
- Service: Liquids, powders, and bulk materials compatible with wetted materials.
- Capacitance Range: 0 to 2000 pF.
- Sensitivity: ±0.15 pF.
- Minimum Span: 8 pF.
- Accuracy: ±0.5 pF or ±0.25% of span, whichever is greater.
- Repeatability: ±0.25 pF or ±0.1% of span, whichever is greater.
- Temperature Limits: Ambient: -40 to 185°F (-40 to 85°C); Process: -40 to 250°F (-40 to 121°C).
- Spark/Static Protection: 106 Ω weather-tight/corrosion resistant.
- Surge Limit: 100 psi (6.9 bar).
- Power Requirements: 12 to 35 VDC.
- Output Signal: 4 to 20 mA or 20 to 4 mA, 2 wire.
- Response Time: 0.5 seconds.
- Electrical Connection: Screw terminal.
- Conduit Connection: 1/2” NPT female.
- Process Connection: Standard: 3/4” NPT male; Optional: See model chart.
- Enclosure Rating: NEMA 4X (IP66) weather-tight/corrosion resistant.
- Weight: 6 ft rod type: 3.6 lb (1.63 kg).
The Model LDL2-030 Vented Water Level Data Logger has a vented cable and end cap to allow it to automatically compensate for atmospheric pressure fluctuations. The data logger measures water level up to 30 ft (9.14 m) and has an internal temperature sensor that accurately records temperatures between -40 to 176°F (-40 to 80°C). The innovative design makes it ideal for use in wastewater treatment facilities as well as monitoring well and ground water levels. The battery-powered data logger can store over 16,000 measurements per channel, and the software allows for user selectable sampling rates. The easy to use DL700 software allows the LDL2-030 to be easily started and stopped from a PC or delayed to start up to six months in advance.

**Model LDL2-030, Vented Water Level Data Logger**

**ACCESSORIES**
- DL700, Software, Manual and USB Interface Cable
- TL-2150, Replacement battery for Series LDL2-030

**Ultrasonic Level Transmitter**

Integrated LCD Display, Automatic Temperature Compensation, Non-Contact Level Sensing

The Series ULB is a direct-install level transmitter designed for non-contact measurement of solid levels. The ULB utilizes ultrasonic technology paired with automatic temperature compensation to provide reliable and accurate measurements in virtually all conditions. Sophisticated algorithms are used to overcome acoustic interferences and false echoes. An integrated LCD screen and four push buttons allow for quick and easy programming on a simple menu structure. Diagnostic capabilities and a failsafe output signal make the ULB an essential choice in critical applications.

**FEATURES**
- Direct installation
- Integral LCD display
- High accuracy (0.25% of max. range)
- Automatic ambient temperature compensation

**SPECIFICATIONS**
- **Service**: ULB: Bulk solids; ULL: Compatible liquids.
- **Wetted Materials**: Sensor: Polypropylene; Acoustic window: ECTFE.
- **Ranges**: ULB-11: 0.8 to 11.5 ft (0.25 to 3.5 m); ULB-12: 1.96 to 23 ft (0.6 to 8.5 m); ULL-1XXX: 0.82 to 16.4 ft (0.25 to 5 m); ULL-2XXX: 1.96 to 49.2 ft (0.6 to 15 m).
- **Accuracy**: 0.25% of max. range (at 20°C).
- **Resolution**: 0.04” (1 mm).
- **Blind Zone**: ULB-11: 0.8’ (25 cm); ULB-12: 1.96’ (0.6 m); ULL-1XXX: 0.8’ (25 cm); ULL-2XXX: 1.96’ (0.6 m).
- **Beam Angle**: 5° @ 3 db point.
- **Temperature Limits**: -40 to 158°F (-40 to 70°C); ULL-2XXX: 1.96° (0.6 m).
- **Temperature Compensation**: Automatic.


**Power Requirements**: 3.6 V TL2150 lithium metal battery, installed functional, user replaceable.

**Battery Life**: 1 yr (approx).

**Interface**: USB port (interface cable required).

**Wetted Materials**: 303 SS; Cable: Polyurethane.

**Weight**: 3 lb (1.4 kg).

**Agency Approvals**: CE.

**Windows®, Windows NT®, and Windows Vista® are registered trademarks of Microsoft Corporation.**
Series ULT Ultrasonic Level Transmitter provides reliable, accurate, noncontact measurement of liquid levels. Ultrasonic non-contact technology offers no moving parts to wear, jam, corrode, or get coated like contact technologies. Mapping software makes effective measuring surface only a 3˝ diameter column. No concerns with ladders, pipes, or other tank intrusions in the remaining sound cone. Unit is FM approved explosion-proof making it ideal for use in hazardous locations. The ULT features easy programming with 6 digit LCD display and simple menu structure. Output range is adjustable with choices of inputting tank dimensions or just fill and empty the tank while calibrating and it automatically scales to levels it senses. Window cover allows early viewing of display. Failsafe output options and diagnostic capabilities makes the ULT a good choice for critical applications.

**SPECIFICATIONS**

**Service:** Compatible fluids. Not for use with powder and bulk solids.

**Wetted Materials:**
- Sensor: PVDF;
- Process connection: 303 SS;
- O-ring: fluoroelastomer.

**Ranges:**
- 24.6´ (7.5 m), 32.8´ (10 m).

**Accuracy:** ±0.2% of max range.

**Resolution:** 0.079˝ (2 mm).

**Blind Zone:** Under 8˝ (20 cm).

**Beam Width:** 3˝ (7.6 cm) diameter.

**Temperature Limits:**
- Ambient: -40 to 140°F (-40 to 60°C);
- Process: -4 to 140°F (-20 to 60°C).

**Temperature Compensation:** -40 to 140°F (-40 to 60°C).

**Pressure Limits:**
- 30 psi (2 bar) up to 25°C (77°C). Above 25°C (77°F), rating decreases 1.667 psi per 1°C increase. See chart.

**Power Requirement:** 18 to 28 VDC (Two-wire).

**Output Signal:** 4 to 20 mA or 20 to 4 mA (Two-wire).

**Max. Loop Resistance:** 250 Ω at 24 VDC.

**Electrical Connections:** Screw terminal.

**Conduit Connection:** 1/2˝ NPT female (two) or optional M20.

**Enclosure Rating:** Weather-proof meets NEMA 4X (IP66), explosion-proof rated Class I, Div. 1, Groups B, C, D; Class II/III, Div. 1, Groups E, F, G.

**Mounting Orientation:** Vertical.

**Failsafe:** On lost echo after 30 seconds, user selectable to 4, 20, 21, 22 mA or last signal.

**Memory:** Non-volatile.

**Display:** 6 character LCD.

**Units:** In, cm, ft, m, percent.

**Programming:** 4 button.

**Weight:** 4.0 lb (1.8 kg).

**Agency Approvals:** CE, FM.
Series UTC Ultrasonic Liquid Transmitter Controller provides reliable, accurate, non-contact measurement of liquid level and open channel flow even under extremely harsh conditions. Overcoming vapors, agitators or light foam, with no moving parts to wear or jam. It supports a full range of process monitoring and storage level measurement applications, such as high process tanks and large storage vessels. The UTC has a 6-digit LCD display and a simple menu structure with multiple indications, making programming simple. Its dual part system allows for the control unit to be located up to 656 ft (200 m) away from sensor (model UTS purchased separately), and installation is simple with included mounting bracket. In addition, this series also supports the Modbus RTU* communication protocol, and offers RS-232 and 4 to 20 mA communications. Featuring five independent SPDT relays and embedded firmware for volume and flow totalization, this series is perfect for liquid level and open channel flow applications.

*Controller only, Series UTS sensor must be purchased in conjuction. Controller UTC-1XX-XXX-X compatible with sensor UTS-1XX-XXX-X only; Controller UTC-2XX-XXX-X compatible with sensor UTS-2XX-XXX-X only.

**UTC-1XX-XXX-X modbus read only

### SPECIFICATIONS

| Ranges: (Series UTS Sensor Dependent) | 2 to 82 ft (0.6 to 25 m). |
| Accuracy: | 0.25% of max. range. |
| Resolution: | 0.04˝ (1 mm). |
| Temperature Limits: | UTC-XXX-1XX-X: -40 to 140°F (-40 to 60°C); UTC-XXX-2XX-X: -4 to 140°F (-20 to 60°C). |
| Temperature Compensation: | Automatic. |
| Power Requirement: | UTC-XXX-1XX-X: 18 to 30 VDC 6 W; UTC-XXX-2XX-X: 100 to 240 VAC 50/60 Hz. |
| Switch Type: | 5 SPDT relays. |
| Electrical Rating: | 1 A @ 300 VAC, 1 A @ 150 VDC. |
| Output Signal: | 4 to 20 mA. |
| Max. Loop Resistance: | 750 Ω @ 24 VDC. |
| Electrical Connections: | Screw terminal. |
| Enclosure Material: | ECTFE. |
| Enclosure Rating: | NEMA 4X (IP65). |
| Mounting Orientation: | Vertical. |
| Memory: | Non-volatile. |
| Display: | LCD (6 digit). |
| Units: | m, in, ft, m3/hr, GPM interchangeable. |
| Programming: | 4 button. |
| Weight: | (3.5 lb) 1.6 kg. |

### Model UTC Ultrasonic Level Transmitter Sensor

Model UTC Ultrasonic Level Transmitter Sensor is a series of sensors made to accompany Dwyer Instrument, Inc.’s Series UTC Ultrasonic Level Controllers. This series has two different transducer frequencies, and a variety of measuring lengths and materials.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTS-121-1102-1</td>
<td>25 kHz Sensor, Polypropylene, Standard Range, 2” NPT Connection, 50 ft (15 m) Cable</td>
</tr>
</tbody>
</table>

### SPECIFICATIONS

| Service: | Compatible liquids. |
| Wetted Materials: | Polypropylene. |
| Range: | 2 to 82 ft (0.6 to 25 m). |
| Blind Zone: | 2 ft (0.6 m). |
| Beam Width: | 3” (7.6 cm) diameter. |
| Beam Angle: | 5° @ 3 db point. |
| Temperature Limits: | -40 to 176°F (-40 to 80°C). |
| Temperature Compensation: | Automatic. |
| Pressure Limits: | Atmospheric. |
| Transducer Frequency: | 25 kHz. |
| Process Connection: | 2” male NPT, 2” male BSP (optional). |
| Electrical Connection: | 16.4” (5 m) 5 conductor 0.75 mm² cable. |
| Enclosure Rating: | NEMA 4 (IP65). |
| Weight: | (3.5 lb) 1.6 kg. |

CALL TO ORDER | 800-876-0036
Model ULTM is a level transmitter with embedded cellular communications. This product is fit for any site where SMS is available and features flexibility for customized alerts and reports. It features a cellular (GSM) link for transmission of measured data, supporting SMS and GPRS, as well as a USB for quick set up and local monitoring. The Model ULTM provides periodic reports on the hour, and SMS reports to assigned personnel on demand. There are no on-going fees for this model’s control software due to complete data ownership. It houses an embedded, as well as an optional external temperature sensor, making it ideal for situations where rapid temperature variations may occur. The Model ULTM is a cost-effective solution perfect for remote monitoring in applications such as fuel theft detection and river flood alerts.

APPLICATIONS
Model ULTM is ideal for managing fuel tanks at remote sites for various uses such as fuel theft and leakage detection, inaccurate refueling, and continuous inventory with the use of the programmable switch tracking. Due to its low power option with the use of external battery, it features a long battery life based operation. The Model ULTM can be useful for wastewater monitoring, 24/7 monitoring of sewer junctions, and identification of overflow or blockage. The Model ULTM requires no road digging and is fit for harsh weather conditions, making installation simple in a variety of locations.

Note:
• Does not include SIM card or any cellular package.
• Works with AT&T and T-Mobile SIM cards in the U.S. Please make sure it will work with your cellular carrier before purchasing.
• Must be a mini-SIM card.

Model ULTM-00, Level Transmitter .................................

ACCESSORIES*
ULTM-EXT, External Thermistor, NTC 10KΩ 5% .......................... ULTM-PTS, Programmable Timer Switch ..............................

*ULTM-00 only supports one accessory at a time. External battery not included.

SPECIFICATIONS
Service: Compatible solids and liquids.
Wetted Materials: PVDF.
Range: 
Liquids: 26.25’ (8 m);
Solids: 19.69’ (6 m).
Accuracy: ±0.5 cm (±0.2”) or 0.2% of max. range.
Repeatability: 0.2% of measured range.
Resolution: 0.04˝ (1 mm).
Blind Zone: 5.91˝ (15 cm).
Beam Angle: 5° @ 3 db point.
Temperature Limits: -4 to 158°F (-20 to 70°C).
Temperature Compensation: Automatic.
Power Requirements: 8 to 33 VDC.
Current Consumption: 
Continuous: 10 mA @ 24 VDC;
SMS Transmission: 40 mA @ 24 VDC;
Switch Output: 160 mA @ 24 VDC.
Process Tracking Rate (max.): 0.55 ft/s (10 m/min).
Electrical Connections: Screw terminal.
Conduit Connections: 1/2˝ female NPT.
Enclosure Material: Plastic PC/ABS+UV.
Enclosure Rating: IP65/IP67, IP68 (96 hours at 5.91’ (1.8 m) water depth).
Mounting Orientation: Vertical.
Memory: Non-volatile.
Display: 64 x 128 graphic LCD.
Units: m, m/min, °F or °C (selectable).
Programming: 4-button.
Weight: 1.95 lb (884.51 g).

CELLULAR MODEM
Band: Quad band 850/900/1800/1900 mHz.
Output Power: Class 4 (33 dBm) for EGSM850/EGSM900; Class 1 (30 dBm) for GSM1800/GSM1900.
SMS: Point-to-point MO and MT.
GPRS: Multi-slot class 10.
Reports Display: Level, volume, temperature.
SMS Resolution: 0.04˝ (1 mm).
Report Type: Empty, full, theft alert, refilling alert and periodic report.
Accuracy: 
0.5 to 2’ (0.15 to 0.6 m): ±0.6” (±1.5 mm);
2 to 16.5’ (0.6 to 5 m): ±0.3% of measured range;
16.5 to 26.25’ (5 to 8 m): ±0.2% of max. range.
The Model ULSS Ultrasonic Level Sensor provides non-contact, continuous ultrasonic level measurement of fluids for short range applications. Ultrasonic technology paired with automatic temperature compensation provides accurate and reliable measurements in almost all conditions. The Model ULSS has failsafe logic that is easily configured to custom applications via free software removing the need for target calibration. Using the free software, the Model ULSS can be programmed to transmit an output signal as well as set the four relays for control applications. This rugged design comes with a NEMA 6P submersible enclosure rating to ensure a long lasting unit.

**FEATURES**
- Selectable deadband
- Fail-safe logic for control applications
- Four programmable relays
- Narrow beam width and short dead band
- Automatic temperature compensation

**APPLICATIONS**
- Dirty, corrosive, or sticky fluids
- Bulk containers
- Sump and process tanks
- Small tanks

**SPECIFICATIONS**
- **Service:** Compatible fluids.
- **Wetted Materials:** Sensor: PVDF; O-ring: FKM.
- **Ranges:** 4.1’ (1.25 m).
- **Accuracy:** 0.125” (3 mm).
- **Resolution:** 0.019” (0.5 mm).
- **Blind Zone:** 2” (5 cm).
- **Beam Width:** 2” (5 cm).
- **Temperature Limits:**
  - Process: 20 to 140°F (-7 to 60°C);
  - Ambient: -31 to 140°F (-35 to 60°C).
- **Temperature Compensation:** Automatic.
- **Pressure Limit:** 30 psi (2 bar).
- **Power Requirement:** 12 to 28 VDC.
- **Output Signal:** 4 to 20 mA, 2-wire;
  - Invert: 4 to 20 mA or 20 to 4 mA;
  - Fail-safe: 4 mA, 20 mA, 21 mA, 22 mA, or hold last.
- **Loop Resistance:** 400 Ω max.
- **Electrical Connections:** 4’ (1.2 m) 9 conductor shielded cable.
- **Contact Type:** 4 SPST relays.
- **Contact Rating:** 1 A max @ 28 VDC max.
- **Deadband:** Selectable (no hysteresis, 1/4”, 1/2”, 1”, 1/2 cm, 1 cm, 2 cm, 5 cm or not available).
- **Process Connection:** 1” NPT, 1” BSPP (optional).
- **Memory:** Non-volatile.
- **Failsafe:** Contact: Power loss: Holds Last contact;
  - Power on: Open, close, or last contact.
- **Programming:** Free PC software download (USB adapter required).
- **Weight:** 1 lb (0.45 kg).
- **Agency Approvals:** CE, RoHS.

**ACCESSORIES**
- **ULS-ACC-USB,** USB Adapter for Calibration
- **ULS-ACC-121,** 1” x 1” NPT Reducer Bushing Fitting (Sch. 40), PVC
- **ULS-ACC-122,** 1” x 1” NPT Reducer Bushing Fitting (Sch. 80), PVC
- **ULS-ACC-221,** 2” Socket x 1” NPT Reducer Bushing Fitting (Sch. 40), PVC
- **ULS-ACC-222,** 2” Socket x 1” NPT Reducer Bushing Fitting (Sch. 80), PVC
- **ULS-ACC-510,** 1” NPT Polypropylene Side Mount Bracket
The Model ULSM Ultrasonic Level Sensor provides non-contact, continuous ultrasonic level measurement of fluids for medium range applications. Ultrasonic technology paired with automatic temperature compensation provides accurate and reliable measurements in almost all conditions. The Model ULSM has failsafe logic that is easily configured to custom applications via free software removing the need for target calibration. Using the free software, the Model ULSM can be programmed to transmit an output signal as well as set the four relays for control applications. This rugged design comes with a NEMA 6P submersible enclosure rating to ensure a long lasting unit.

**FEATURES**
- Selectable deadband
- Fail-safe logic for control applications
- Four programmable relays
- Narrow beam width and short dead band
- Automatic temperature compensation

**APPLICATIONS**
- Dirty, corrosive, or sticky fluids
- Bulk containers
- Sump and process tanks

**SPECIFICATIONS**
- **Service:** Compatible fluids.
- **Wetted Materials:** Sensor: PVDF; O-ring: FKM.
- **Ranges:** 9.8’ (3 m).
- **Accuracy:** ±0.2% of range.
- **Resolution:** 0.039˝ (1 mm).
- **Blind Zone:** 6˝ (15 cm).
- **Beam Width:** 5º (13 cm).
- **Temperature Limits:**
  - Process: 20 to 140°F (-7 to 60°C);
  - Ambient: -31 to 140°F (-35 to 60°C).
- **Temperature Compensation:** Automatic.
- **Pressure Limits:** 30 psi (2 bar).
- **Power Requirement:** 12 to 28 VDC.
- **Output Signal:** 4 to 20 mA, 2-wire;
  - Invert: 4 to 20 mA or 20 to 4 mA;
  - Fail-safe: 4 mA, 20 mA, 21 mA, 22 mA, or hold last.
- **Loop Resistance:** 400 Ω max.
- **Electrical Connections:** 4’ (1.2 m) 9 conductor shielded cable.
- **Contact Type:** 4 SPST relays.
- **Contact Rating:** 1 A max @ 28 VDC max.
- **Deadband:** Selectable (no hysteresis, 1/4˝, 1/2˝, 1˝, 1/2 cm, 1 cm, 2 cm, 5 cm or not available).
- **Process Connection:** 1” NPT, 1” BSPP (optional).
- **Memory:** Non-volatile.
- **Failsafe:**
  - Contact: Power loss: Hold last contact;
  - Power on: Open, close, or last contact.
- **Programming:** Free PC software download (USB adapter required).
- **Weight:** 1 lb (0.68 kg).
- **Agency Approvals:** CE, RoHS.

**ACCESSORIES**
- ULS-ACC-USB, USB Adapter for Calibration
- ULS-ACC-121, 1” x 1” NPT Reducer Bushing Fitting (Sch. 40), PVC
- ULS-ACC-122, 1” x 1” NPT Reducer Bushing Fitting (Sch. 80), PVC
- ULS-ACC-221, 2” Socket x 1” NPT Reducer Bushing Fitting (Sch. 40), PVC
- ULS-ACC-222, 2” Socket x 1” NPT Reducer Bushing Fitting (Sch. 80), PVC
- ULS-ACC-510, 1” NPT Polypropylene Side Mount Bracket

*USB Adapter necessary for calibration. One adapter can program multiple units."
The Model ULSL Ultrasonic Level Sensor provides non-contact, continuous ultrasonic level measurement of fluids for short range applications. Ultrasonic technology paired with automatic temperature compensation provides accurate and reliable measurements in almost all conditions. The Model ULSL has failsafe logic that is easily configured to custom applications via free software removing the need for target calibration. Using the free software, the Model ULSL can be programmed to transmit an output signal as well as set the four relays for control applications. This rugged design comes with a NEMA 6P submersible enclosure rating to ensure a long lasting unit.

**FEATURES**
- Selectable deadband
- Fail-safe logic for control applications
- Four programmable relays
- Narrow beam width and short dead band
- Automatic temperature compensation

**APPLICATIONS**
- Dirty, corrosive, or sticky fluids
- Bulk containers
- Sump and process tanks

**SPECIFICATIONS**
- **Service:** Compatible fluids.
- **Wetted Materials:** Sensor: PVDF; O-ring: FKM.
- **Ranges:** 18’ (5.5 m).
- **Accuracy:** ±0.2% of range.
- **Resolution:** 0.079˝ (2 mm).
- **Blind Zone:** 8˝ (20 cm).
- **Beam Width:** 3˝ (7.62 cm).
- **Temperature Limits:**
  - Process: 20 to 140°F (-7 to 60°C);
  - Ambient: -31 to 140°F (-35 to 60°C).
- **Temperature Compensation:** Automatic.
- **Pressure Limits:** 30 psi (2 bar).
- **Power Requirement:** 12 to 28 VDC.
- **Output Signal:** 4 to 20 mA, 2-wire.
  - Invert: 4 to 20 mA or 20 to 4 mA;
  - Fail-safe: 4 mA, 20 mA, 21 mA, 22 mA, or hold last.
- **Loop Resistance:** 400 Ω max.
- **Electrical Connections:** 4’ (1.2 m) 9 conductor shielded cable.
- **Contact Type:** 4 SPST relays.
- **Contact Rating:** 1 A max @ 28 VDC max.
- **Deadband:** Selectable (no hysteresis, 1/4˝, 1/2˝, 1˝, 1/2 cm, 1 cm, 2 cm, 5 cm or not available).
- **Process Connection:** 2˝ NPT, 2˝ BSPP (optional).
- **Enclosure Rating:** NEMA 6P (IP68).
- **Enclosure Material:** Polycarbonate; Gland: TPE.
- **Mounting Orientation:** Vertical.
- **Memory:** Non-volatile.
- **Failsafe:**
  - Contact: Power loss: Hold last contact;
  - Power on: Open, close, or last contact.
- **Programming:** Free PC software download (USB adapter required).
- **Weight:** 3 lb (1.36 kg).
- **Agency Approvals:** CE, RoHS.
Continuous Level Transmitters

Customize To Fit Application, 316 SS or Buna-N Floats

Continuous Output Level Transmitters provide up to the minute tank level monitoring. Customize level transmitters to meet application requirements. Transmitters can be configured for 4 to 20 mA or proportional voltage output, stainless steel or Buna-N floats, and lengths up to 72˝ (183 cm).

Models are built to your specifications . . . .

---

**SPECIFICATIONS**

- **Service:** Compatible liquids.
- **Resolution:** 1/4˝.
- **Temperature Limits:** Buna-N floats: 180°F (82°C) in water, -40 to 230°F (-40 to 110°C) in oil; SS floats: -40 to 230°F (-40 to 110°C).
- **Pressure Limits:** Buna-N floats: 150 psig (10 bar); SS floats: 300 psig (21 bar).
- **Power Requirements:** Proportional voltage output models: 10 to 30 VDC; 4-20 mA output models: 10 to 40 VDC.
- **Loop Resistance:** 1.4 kΩ max.
- **Electrical Connections:** Proportional voltage output: 24˝ (61 cm) free leads #22 AWG, TFE jacketed; 4-20 mA output: Junction box.
- **Enclosure Rating:** 4-20 mA models, NEMA 4 (IP56) junction box.
- **Mounting Orientation:** Vertical ±20°.

---

**Example Construction**

<table>
<thead>
<tr>
<th>Level</th>
<th>Material</th>
<th>Min s.g.</th>
<th>Max Pres. psi (bar)</th>
<th>Float Factor in (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLT</td>
<td>Buna N</td>
<td>0.55</td>
<td>150 (10.3)</td>
<td>2.0 (50.8)</td>
</tr>
<tr>
<td>V</td>
<td>Buna N</td>
<td>0.55</td>
<td>150 (10.3)</td>
<td>2.5 (63.5)</td>
</tr>
<tr>
<td>S</td>
<td>316 SS</td>
<td>0.75</td>
<td>300 (20.7)</td>
<td>3.5 (52.4)</td>
</tr>
</tbody>
</table>

---

**Indication Length**

Length that the unit sends an output for level. Maximum is 68˝ (173 cm).

**Top Float Stop C**

Distance from bottom of mounting connection to upper float stop. Minimum is 1/4˝ (6.4 mm).

**Length “B”**

To calculate overall length, add Indication Length, Top Float Stop Dimension “C”, and Float Factor. Maximum length is 72˝ (1.82 m).
The Series DBOB is a low maintenance, electromechanical device designed for the continuous measurement of level or volumes in silos, tanks, or hoppers. The DBOB utilizes an internal motor that drives a weight suspended by a firm stainless steel tape down to the bulk material level. Upon reaching the material, the unit reverses and the weight is drawn back into the upper stop position. The distance the weight descends is electronically measured based on the internal rotations of the unwinding tape. The DBOB is user-programmable to output either a height signal or a volumetric signal based on the vessel geometry. The unit’s two programmable relays offer even more customization. The 1-1/2˝ NPT process connection allows for simple installation on horizontal surfaces and an optional aiming flange is available for inclines. The integrated tape cleaner keeps the internal process protected from difficult material and the tough cast housing protects and an optional aiming flange is available for inclines. With an easy to understand measurement principle and inherent low maintenance qualities, the Series DBOB is perfect for your level measuring needs.

FEATURES
- Measurement range up to 100 ft (30 m)
- Optional aiming flange for versatile mounting
- Accurate measurement
- Independent of bulk material properties
- Tangle free tape-based system

SPECIFICATIONS
Service: Powder and bulk materials compatible with wetted materials.
Wetted Materials:
- Mounting Thread: Aluminum
- Aiming flange: Aluminum and 304 SS
- Tape: 301 SS
- Sensor weight: PVC or 303 SS
- Fixing elements between tape and sensor weight: Aluminum and 303 SS
Other Material: Housing: Powder-coated aluminum
Temperature Limits:
- Process temperature: -40 to 176°F (-40 to 80°C)
- Ambient temperature: -4 to 140°F (-20 to 60°C) (Relative humidity: 0 to 100%)
Pressure Limit: -3.0 to 3.0 psi (-0.2 to 0.2 bar)
Enclosure Rating: NEMA 4 (IP66)
Electrical Rating: 2 A @ 250 VAC
Power Requirements: 115 VAC, 50/60 Hz
Output Signal: 4 to 20 mA
Accuracy of Output Requirement: 1% of measured length
Power Consumption: AC model: 150 VA
Electrical Connection: One 3/4˝ NPT and two 1/2˝ NPT conduit opening, screw termination with removable terminal block
Connection Terminals: AWG 26 to 14 (0.14 to 2.5 mm²)
Process Connection: 1-1/2˝ male NPT
Mounting Orientation: Vertical
Deviation of Vertical Mounting: Max. 2°
Set Point Adjustment: Trips when weight reaches product
Sensitivity: Min. powder density: 18 lb/ft³ (300 g/l)
Measuring Range: 100 ft (30 m)
Measuring Speed: Average 0.6 ft/sec (0.2 m/s)
Maximum Permitted Tractive Force: 180 lbf (800 N)
Maximum Altitude: 6562 ft (2000 m) for CE approval
Display: LCD
Indication Light: LED: Power on, relay, failure
Memory: Non-volatile: >10 years data retention (no backup battery required)
Weight: 20 lb (9 kg)
Approvals: CE, FM Class. II, III Div. 1 Gr. E-G.
The Mercoid® MPC Pump Controller provides versatile level control in a standard 1/4 DIN package. Designed for use with almost any style level transmitter the unit displays the present level and main set point value. Incorporated in the MPC is programmable level differential for on/off control of one or two pumps, valves, or other devices through two SPDT relays. Also featured are two additional programmable alarm contacts with front alarm light indication.

The MPC is flexible and incorporates a user-friendly programming menu. The front face meets NEMA 4X (IP66) for outdoor panel mounting. So many features are combined into the MPC that it eliminates many components in a pump control system.

FEATURES

• Selectable pump alternation when used with two pumps to minimize pump wear. With alternation “on” a seal failure or over temperature condition will force the non-failed pump to lead status and stop alternation.
• When used with a submersible pump including a moisture sensor th MPC has alarm light indication of seal failure.
• When used with a pump including a thermostat the MPC has alarm light indication of pump over temperature and removes the pump from service. The pump can be brought back into service automatically or by manual reset when the pump has cooled down.
• Alarms can be programmed for output indication of pump seal failure or over temperature.
• Selectable time delay, for pump two, on power up to prevent both pumps from starting at the same time. If power is lost, upon regaining power a time delay of up to 60 seconds can be selected to prevent too large of a current draw.
• Integral 24 VDC power supply for level transmitter.
• Displays pump run time from a front panel button.
• Test system function that simulates the process input to ensure the pumps are operating or to test programming.
• User selectable security lock-out of programming and/or set points.
• Process input retransmission as a current (4 to 20 mA) or voltage (2 to 10 VDC) analog signal*.

*S*andard model MPC is set for current retransmission. For voltage retransmission add suffix “-RV”.

ACCESSORY

Weatherproof Enclosures, NEMA 4X (IP66).

OPTIONS

RS-232 Modbus®-RTU Serial Communications.
Add suffix – 232 .........................................................

RS-485 Modbus®-RTU Serial Communications.
Add suffix – 485 .........................................................

SPECIFICATIONS

Inputs: 4 (or 0) to 20 mA DC or 2 (or 0) to 10 VDC selectable.
Input Impedance: Current = 10 Ω; Voltage = 100 K Ω.
Output Ratings:
Control relays: SPDT, rated 10A @ 240 VAC res., 1/4 hp @ 120 VAC, 1/3 hp @ 240 VAC;
Alarm relays: SPST, 3A @ 240 VAC res., 1/10 hp @ 120 VAC.
Control Type: On/off, reverse (pump out) or direct (pump in) acting.
Power Requirements: 100 to 240 VAC nominal, +10%-15%; 50 to 400 Hz, single phase; 132 to 240 VDC nominal, +10%-15%.
Power Consumption: 7.5 VA maximum.
Accuracy: ±0.25% of span, ±1 least significant digit.
Display: Two 4 digit, 7 segment 0.56” high LED’s.
Display Resolution: 1 count.
Memory Backup: Nonvolatile memory (no batteries required).
Serial Communications: Optional RS-232 or RS-485 with Modbus® protocol.
Ambient Operating Temperature/RH: 14 to 131°F (-10 to 55°C)/0 to 90% up to 104°F (40°C) non-condensing, 10 to 50% at 131°F (55°C) non-condensing.
Weight: 16 oz. (454 g).
Front Panel Rating: Meets UL Type 4X (92 X 92 MM, +0.8/-0.0).
Allow for 0.5 IN (13 MM) CLEARANCE AT THE REAR OF THE INSTRUMENT.

Agency Approvals:
CE, cUL, UL.

Series MPC, Pump Controller .................................................................

Modbus® is a registered trademark of Schneider Automation, Inc.
Compatible Level Transmitters: See page 318 (Series SBLT2)
See page 320 (Series PBLT2)
Additional Digital Control Panel Meters: See page 346 (Series APM)
See page 347 (Series MPM)
See page 348 (Series PPM)

See page 351 (Series A-900 & A-901)
The Mercoid® MPC Junior Pump Controller provides versatile level control in a standard 1/4 DIN package. Designed for use with almost any style level transmitter the unit displays the present level and main set point value. Incorporated in the MPC Jr. is programmable level differential for on/off control of one or two pumps, valves, or other devices through two SPDT relays. Also featured are two additional programmable alarm contacts with front alarm light indication.

The MPC Jr. is flexible and incorporates a user-friendly programming menu. The front face meets NEMA 4X (IP66) for outdoor panel mounting.

FEATURES

- Selectable pump alternation when used with two pumps to minimize pump wear.
- Integral 24 VDC power supply for transmitter.
- User selectable security lock-out of programming and/or set points.
- Optional process input retransmission as a current (4 to 20 mA) or voltage (2 to 10 VDC) analog signal.
- Analog output of pump “on” condition for activation of separate pump run time meters.

SPECIFICATIONS

Inputs: 4 (or 0) to 20 mA DC or 2 (or 0) to 10 VDC selectable.
Input Impedance: Current = 10 Ω; Voltage = 5 K Ω.
Output Ratings:
  - Control relays: SPDT, rated 10A @ 240 VAC res., 1/4 hp @ 120 VAC, 1/3 hp @ 240 VAC;
  - Alarm relays: SPST, 3A @ 240 VAC res., 1/10 hp @ 120 VAC;
  - Others: 15 VDC @ 20 mA for output one and output two.
Control Type: On/off, reverse (pump out) or direct (pump in) acting.
Power Requirements: 100 to 240 VAC nominal, +10%-15%, 50 to 400 Hz, single phase; 132 to 240 VDC nominal, +10%-15%.
Power Consumption: 7.5 VA maximum.
Accuracy: ±0.25% of span, ±1 least significant digit.
Display: Two 4-digit, 7 segment 0.56˝ high LED's.
Display Resolution: 1 count.
Memory Backup: Nonvolatile memory (no batteries required).
Serial Communications: Optional RS-232 or RS-485 with Modbus® protocol.
Ambient Operating Temperature/RH: 14 to 131°F (-10 to 55°C)/0 to 90% up to 104°F (40°C) non-condensing, 10 to 50% at 131°F (55°C) non-condensing.
Weight: 16 oz (454 g).
Front Panel Rating: Meets UL Type 4X (IP66).
Loop Power Supply (isolated): 24 VDC @ 50 mA, regulated.
Agency Approvals: CE, cUL, UL.

Series MPCJR, Pump Controller

OPTIONS

- Retransmission of input, 4 to 20 mA,
  Add suffix – RC
- Retransmission of input, 0 to 10 VDC,
  Add suffix – RV
- RS-232 Modbus®-RTU Serial Communications
  Add suffix – 232
- RS-485 Modbus®-RTU Serial Communications
  Add suffix – 485

ACCESSORY

Weatherproof Enclosures, NEMA 4X (IP66).
Dwyer Instruments, Inc.

**Series DLD Dual Channel Leak Detection Relay**

**Shaft Seal Leak Protection**


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**Dwyer**

**Panel Meters and Pump Controllers**

**Open Channel Flow, Rate and Total, Multi-Pump Control**

---

**The Series APM Analog Panel Meter** is a 1/8 DIN digital panel meter perfect for displaying flow rate and total simultaneously from several analog inputs such as a 4 to 20 mA or 0 to 10 V from any flow transmitter. When utilized with an ultrasonic level transmitter, such as the Mercoid Series ULT, this series provides an economical way to measure open channel flow. The dual line display can be configured to read flow rate, total, grand total, as well as engineering units.

**The Series MPM Multi Pump Meter** is also a 1/8 DIN digital panel meter but for multi-pump alternation control. This series features, non-latching, sampling, and fail-safe action in addition to its ability to alternate up to four pumps. This series is also capable of linearizing nonlinear inputs with a variety of pre-programmed math functions. This is helpful in applications where volume is monitored in odd shaped tanks as well as open channel flow monitoring. It accepts 0 to 20 mA, 4 to 20 mA, 0 to 5 V, 1 to 5 V or 0 to ±10 V standard.

**The Series PPM Pulse Panel Meter** is a 1/8 DIN digital panel meter specifically designed for a variety of pulse inputs. This series is particularly well-suited for flow applications with its large six-digit, dual-line display that can display flow rate and total simultaneously with up to 4 programmable relay options and 4 to 20 mA output. This series features latching, non-latching, sampling, and fail-safe action in addition to its pump alternation function.

---

**Series DLD Dual Channel Leak Detection Relay** is used to monitor the shaft seals of two submersible pumps to detect a leak before pump failure. A leak is detected by sensing the status of a float or conductivity switch installed in the seal cavity. When this resistance drops below the set sensitivity, the output relay energizes and the corresponding LED indicator illuminates. The DLD offers normally open relay contacts to energize an alarm or de-energize the pump in the event of a leak. When the seal failure condition clears, the relay automatically resets.

**SPECIFICATIONS**

- **Power Requirement:** 120 VAC, 50/60 Hz.
- **Power Consumption:** 2 VA (approximate).
- **Isolation Voltage:** 2500 V.
- **Temperature Limits:**
  - Operating: -4 to 131°F (-20 to 55°C);
  - Storage: -40 to 185°F (-40 to 85°C).
- **Switch Type:** (2) N.O. SPST.
- **Switch Voltage:** 9 VDC.
- **Electrical Rating:** 5 A @ 120 VAC resistive, 345 VA inductive.
- **Response Times:**
  - Energize: 6 ms (approximate);
  - Release: 2.5 ms (approximate).
- **Indicators:** Respective red LED illuminates when leak is detected.
- **Enclosure:** Polycarbonate dual cover.
- **Mounting:** 8-pin octal.
- **Weight:** 8 oz (227 g).
- **Agency Approvals:** cUR, UR.

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For more information on these products: See page 346 (APM)  See page 347 (MPM)  See page 348 (PPM)
**Bin Aerator Pad**

Inexpensive, Quiet Operation

Series BAP Bin Aerator Pad provides positive flow of dry, finely ground materials from any bin using the proven principle of aeration. Low pressure air is introduced into the product, restoring its natural ability to flow. In this way congestion, bridging and rat-holing are overcome without resorting to brute force. Series BAP is non-clogging and provides equal distribution and consumption of air. The aerator pads feature simple and quick installation, are inexpensive, and adapt to any bin configuration. Aeration gives the best results on materials with a 60 mesh size or smaller and with a 3% or less moisture content.

**SPECIFICATIONS**

Temperature Limit:
- BAP-C and BAP-SSC: 180°F (82°C);
- BAP-F and BAP-SSF: 600°F (316°C).

Supply Pressure: 3 to 5 psi (0.2 to 0.3 bar).

Air Connection: 1/8” NPT male.

Materials: See model chart.

---

**Fluidizer Disks**

Self-Cleaning, Abrasion-Resistant, Easy to Install

The Model FD-1 & MFD-1 Fluidizer Disks combine aeration and vibration to solve the most difficult bulk solid flow applications. Made from FDA approved materials, the special design creates a vibration as the air flows between the disk boot and bin wall. This provides a very effective flow aid for all types of dry products. The MFD is half the size of the FD, making it capable of fitting into tight locations. Your pneumatic system pressure can range from 29 to 87 psi.

**SPECIFICATIONS**

Temperature Limits: -40 to 340°F (-40 to 170°C).

Air Connection:
- FD-1: 3/8” female BSP and 1/2” male BSP;
- MFD-1: 1/4” male BSP and 1/4” ID compression fitting.

Air Supply: 29 to 87 psi (2 to 6 bar).

Air Consumption: See chart.

Material: Consult factory.

Weight:
- FD-1: 7.9 oz (0.23 kg);
- MFD-1: 2.5 oz (0.07 kg).

**Air Consumption Guide**

<table>
<thead>
<tr>
<th>Air Pressure, psi (bar)</th>
<th>CFM (lpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (0.07)</td>
<td>4.2 (118.9)</td>
</tr>
<tr>
<td>2 (0.14)</td>
<td>5.7 (161.4)</td>
</tr>
<tr>
<td>3 (0.21)*</td>
<td>6.5 (184.1)</td>
</tr>
<tr>
<td>4 (0.28)</td>
<td>7.1 (201.0)</td>
</tr>
<tr>
<td>5 (0.34)</td>
<td>7.6 (215.2)</td>
</tr>
</tbody>
</table>

*Recommended for most applications.

---

**BAP Aerator Mounting Hardware**

CALL TO ORDER | 800-876-0036

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc Plated Steel with Gal. Steel Mesh &amp; Cotton Diffuser</td>
</tr>
<tr>
<td>316SS with 316SS Mesh &amp; Cotton Diffuser</td>
</tr>
<tr>
<td>Zinc Plated Steel with Gal. Steel Mesh &amp; Fiberglass Diffuser</td>
</tr>
<tr>
<td>316SS with 316SS Mesh &amp; Fiberglass Diffuser</td>
</tr>
<tr>
<td>Optional External Mounting Kit</td>
</tr>
</tbody>
</table>

---

**Models**

FD-1  MFD-1

**Silo cutaway showing in use.**
**Series BPV Pneumatic Ball Vibrators**

Small Size and Light Weight

Series BPV Pneumatic Ball Vibrators are the best choice for bridge-break in thin walls and small tanks. This model can be used in vibrating separators, vibrating conveyors, and against electroplating build up. It can also be used on material compacted while packing or sand compacted while molding. The aluminum body is equipped with a steel ring and ball inside that is tightly closed by plastic side covers. Vibration is caused when the internal ball, pushed by compressed air, runs in a rotary motion to produce centrifugal force.

**SPECIFICATIONS**

- Frequency Limits: 212°F (100°C).
- Noise Level: 75 to 95 dBA.
- Supply Pressure: 29 to 87 psi (2 to 6 bar).
- Air Consumption: See model chart.

Air Connections: 1/8” BSPT female with 1/4” OD push to connect adapter on BPV-1, BPV-2, BPV-3, BPV-4 and BPV-5; 3/8” BSPT female with 3/8” OD push to connect on BPV-6. Also includes muffer for exhaust port.

Housing Material: Aluminum.

**Series PRV Pneumatic Roller Vibrators**

Prevent Material Jams

Series PRV Pneumatic Roller Vibrators have a high vibration frequency feature that can prevent material jams in pipe delivery. It can also be applied for bridge-break or concrete injection operation conditions. The special aluminum body is equipped with a roller and ring with multi-nozzles. It is tightly closed by plastic side covers. Vibration is caused when the roller pushed by compressed air runs in a rotary motion to produce centrifugal force.

**SPECIFICATIONS**

- Temperature Limit: 212°F (100°C).
- Noise Level Range: 75-100 dBA.
- Supply Pressure: 29 to 87 psi (2 to 6 bar).
- Air Consumption: See model chart.

Air Connection: 1/8” BSPT female with 1/4” OD push to connect adapter on PRV-1; 1/8” BSPT female with 1/4” OD push to connect adapter on PRV-2 and PRV-3; 3/8” BSPT female with 3/8” OD push to connect adapter on PRV-4.
There are air-breathing tubes located in both ends of the cylinder. Compressed air accumulated inside of pipes or tanks. It allows direct impact on the tank with low specific vibration. It can help to get rid of dust or material delivery problems. It can also be applied on vibrating separators and conveyors. The piston will strike directly on the bottom side of the body to produce a strong vibration. When compressed air impacts the tangent of the turbine to make it move. The operation vibration is produced by centrifugal force which arises from the imbalance of movement.

**PTV Series Specifications**

**Model**
- PTV-1
- PTV-2
- PTV-3
- PTV-4 & PTV-5
- PTV-6

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency (V.P.M.)</th>
<th>Pressure Input</th>
<th>Force lbf (N)</th>
<th>Pressure Input</th>
<th>Air Consumption cfm (l/min)</th>
<th>Pressure Input</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTV-1</td>
<td>760 (3380)</td>
<td>29 psi (2 bar)</td>
<td>3044 (13542)</td>
<td>175 (780)</td>
<td>4.9/64 (150.17)</td>
<td>212°F (100°C)</td>
<td>3996 (17776)</td>
</tr>
<tr>
<td>PTV-2</td>
<td>7799 (34692)</td>
<td>58 psi (4 bar)</td>
<td>3044 (13542)</td>
<td>175 (780)</td>
<td>4.9/64 (150.17)</td>
<td>212°F (100°C)</td>
<td>3996 (17776)</td>
</tr>
<tr>
<td>PTV-3</td>
<td>789 (3510)</td>
<td>29 psi (2 bar)</td>
<td>3044 (13542)</td>
<td>175 (780)</td>
<td>4.9/64 (150.17)</td>
<td>212°F (100°C)</td>
<td>3996 (17776)</td>
</tr>
<tr>
<td>PTV-4</td>
<td>1277 (5701)</td>
<td>58 psi (4 bar)</td>
<td>3044 (13542)</td>
<td>175 (780)</td>
<td>4.9/64 (150.17)</td>
<td>212°F (100°C)</td>
<td>3996 (17776)</td>
</tr>
<tr>
<td>PTV-5</td>
<td>1287 (5789)</td>
<td>58 psi (4 bar)</td>
<td>3044 (13542)</td>
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<td>4.9/64 (150.17)</td>
<td>212°F (100°C)</td>
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</tr>
<tr>
<td>PTV-6</td>
<td>1300 (5792)</td>
<td>58 psi (4 bar)</td>
<td>3044 (13542)</td>
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<td>4.9/64 (150.17)</td>
<td>212°F (100°C)</td>
<td>3996 (17776)</td>
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</tbody>
</table>

**APV Series Specifications**

**Model**
- APV-1
- APV-2
- APV-3
- APV-4
- APV-5
- APV-6

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency (V.P.M.)</th>
<th>Pressure Input</th>
<th>Force lbf (N)</th>
<th>Pressure Input</th>
<th>Air Consumption cfm (l/min)</th>
<th>Pressure Input</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>APV-1</td>
<td>7799 (34692)</td>
<td>58 psi (4 bar)</td>
<td>3044 (13542)</td>
<td>175 (780)</td>
<td>4.9/64 (150.17)</td>
<td>212°F (100°C)</td>
<td>3996 (17776)</td>
</tr>
<tr>
<td>APV-2</td>
<td>789 (3510)</td>
<td>29 psi (2 bar)</td>
<td>3044 (13542)</td>
<td>175 (780)</td>
<td>4.9/64 (150.17)</td>
<td>212°F (100°C)</td>
<td>3996 (17776)</td>
</tr>
<tr>
<td>APV-3</td>
<td>1277 (5701)</td>
<td>58 psi (4 bar)</td>
<td>3044 (13542)</td>
<td>175 (780)</td>
<td>4.9/64 (150.17)</td>
<td>212°F (100°C)</td>
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<tr>
<td>APV-4</td>
<td>1287 (5789)</td>
<td>58 psi (4 bar)</td>
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<td>212°F (100°C)</td>
<td>3996 (17776)</td>
</tr>
<tr>
<td>APV-5</td>
<td>1300 (5792)</td>
<td>58 psi (4 bar)</td>
<td>3044 (13542)</td>
<td>175 (780)</td>
<td>4.9/64 (150.17)</td>
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<td>3996 (17776)</td>
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<tr>
<td>APV-6</td>
<td>1333 (5906)</td>
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<td>3044 (13542)</td>
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<td>4.9/64 (150.17)</td>
<td>212°F (100°C)</td>
<td>3996 (17776)</td>
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</tbody>
</table>

**Piston Vibrator**

*Series APV* Piston Vibrators are air cushioned to provide low noise. This makes it suitable for quiet area applications. It is a good solution to prevent clogs on tank walls and material delivery problems. It can also be applied on separating vibrators and conveyors.

*Series AP-V Impact Version* Piston Vibrators can help to get rid of dust or material accumulated inside of pipes or tanks. It allows direct impact on the tank with low specific gravity and high moisture materials inside. It also helps prevent material buildup, pipe clogs, and rust.

**How They Operate**

There are air-breathing tubes located in both ends of the cylinder. Compressed air pushes the piston from one side to the other. The vibration power arises when the piston moves back and forth in the body. In APV-C air cushion at both ends produced by the to-and-fro motion will keep the piston from striking the body. Therefore, the piston will not produce much noise. In APV-I, air cushion at the top end is produced by the to-and-fro compression. This will keep the piston from striking onto the body top. The piston will strike directly on the bottom side of the body to produce a strong impact.

**Air Connection:** See model chart.

**Housing Material:** Aluminum.

**Temperature Limit:** 212°F (100°C).

**Noise Level Range:** APV-C: 60-75 dBA; APV-I: 80-115 dBA.

**Supply Pressure:** 29 to 87 psi (2 to 6 bar).

**Air Consumption:** See model chart.

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency (V.P.M.)</th>
<th>Pressure Input</th>
<th>Force lbf (N)</th>
<th>Pressure Input</th>
<th>Air Consumption cfm (l/min)</th>
<th>Pressure Input</th>
<th>Weight</th>
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<tr>
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<td>600 (2481)</td>
<td>29 psi (2 bar)</td>
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<td>4.9/64 (150.17)</td>
<td>212°F (100°C)</td>
<td>3996 (17776)</td>
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<tr>
<td>APV-2</td>
<td>650 (2655)</td>
<td>58 psi (4 bar)</td>
<td>3044 (13542)</td>
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<td>3996 (17776)</td>
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<td>APV-3</td>
<td>700 (2812)</td>
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<td>3044 (13542)</td>
<td>175 (780)</td>
<td>4.9/64 (150.17)</td>
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<td>3996 (17776)</td>
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<tr>
<td>APV-4</td>
<td>750 (2969)</td>
<td>58 psi (4 bar)</td>
<td>3044 (13542)</td>
<td>175 (780)</td>
<td>4.9/64 (150.17)</td>
<td>212°F (100°C)</td>
<td>3996 (17776)</td>
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<tr>
<td>APV-5</td>
<td>800 (3126)</td>
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<td>3044 (13542)</td>
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<td>APV-6</td>
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<td>3044 (13542)</td>
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<td>4.9/64 (150.17)</td>
<td>212°F (100°C)</td>
<td>3996 (17776)</td>
</tr>
</tbody>
</table>

**V.P.M. = vibrations per minute**
**Series IPV Air Hammer**

**Adjustable Vibration Intensity**

**Features**
- Single impact wave caused by one shot
- High strength aluminum structure
- Impact force and interval timing can be set based on needs
- Magnetic hammer stores magnetic strength to increase the piston’s impact power

**Specifications**
- **Temperature Limit:** 212°F (100°C).
- **Noise Level Ranges:** 60 to 75 dBA.
- **Supply Pressure:** 43.5 to 87 psi (3 to 6 bar).
- **Air Connection:** 1/4” BSPT female with 1/4” OD push to connect adapter on IPV-1, IPV-2 and IPV-3; 3/8” BSPT female with 3/8” OD push to connect adapter on IPV-4. Also includes muffler for exhaust port.

**How It Operates**
The IPV series air hammer contains a powerful magnet inside the hammer. The hammer and magnet are tightly closed before activation. As the inlet air pressure gets higher than the force, this tightens the hammer and magnet. The hammer and magnet will separate and cause more strength for impact power. The spring will bring the hammer back to the initial position automatically after the impact. By doing this, the air pressure will be released and the strength of the air pressure will be delivered to the target impact container. It will help to smooth the flow and prevent accumulation inside the container.

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**Series EBV Electric Bin Vibrator**

**Adjustable Vibration Intensity**

**Specifications**
- **Power Requirements:** 120 VAC.
- **Power Consumption:** See model chart.
- **Temperature Limits:** -4 to 104°F (-20 to 40°C).
- **Enclosure Rating:** NEMA 4X (IP66).
- **Noise Level:** 20 dB.
- **Electrical Connection:** Electrical junction box.
- **Rotational Speed:** 3600 RPM.
- **Weight:** See model chart.

**Features**
- Continuous operation at 100% force output
- NEMA 4X (IP66)
- Robust aluminum body
- Silent operation (20 dB)
- Adjustable centrifugal force

---

**Table:**

<table>
<thead>
<tr>
<th>Model</th>
<th>Impulse</th>
<th>Air Consumption</th>
<th>Weight</th>
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<tbody>
<tr>
<td>IPV-1</td>
<td>2.25 (1.0)</td>
<td>1.71 (0.028)</td>
<td>2.43 (1.1)</td>
</tr>
<tr>
<td>IPV-2</td>
<td>0.30 (2.8)</td>
<td>0.0 (0.082)</td>
<td>3.97 (1.8)</td>
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<tr>
<td>IPV-3</td>
<td>1.66 (7.4)</td>
<td>0.0 (0.228)</td>
<td>8.2 (4.0)</td>
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<tr>
<td>IPV-4</td>
<td>2.81 (12.5)</td>
<td>27.8 (0.455)</td>
<td>18.52 (8.4)</td>
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---

**Table:**

<table>
<thead>
<tr>
<th>Model</th>
<th>Max Power</th>
<th>Centrifugal Force</th>
<th>Current</th>
<th>Weight</th>
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<tbody>
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