In 1981, a change appeared in the National Electrical Code in the form of an exception for conduit runs of 1 1/2 inches and smaller: "Apparatus which may produce arcs or sparks need not be sealed if the current interrupting contacts are enclosed within a chamber hermetically sealed against the entrance of gases or vapors." This exception in the Code offered large savings by the elimination of costly external seal fittings.

Silver Bullet™

The utilization of Magnum Silver Bullet hermetically sealed sensors is not only cost-effective but adds circuit reliability in the form of corrosion resistance and contact integrity. By utilizing hermetically sealed sensors in lieu of potted switches, up-front costs are reduced $300 per single installation and extend to a total savings of $30,000 per one hundred control valves.

Environment

Careful consideration was given to the environment in which the sensor will operate. Caustics, acids, chlorides and saltwater can be a daily occurrence. The Silver Bullet, supported by UL and CSA Hazardous Location, Division 1 & 2 certification, isolates these critical interior contact areas from moisture and corrosion intrusion. Housed in a 316 stainless jacket, the highly corrosion-resistant tungsten contacts are hermetically sealed in an inert atmosphere, then encapsulated in a plastic coating to cushion the sensor in case of shock and vibration and then re-encapsulated in a premium grade polymer impervious to moisture, chemicals and solvents. Contact reliability is maintained against the adverse effects of transients through the sensors inherent capabilities of withstanding momentary surges of up to 5 amps.

Commitment

Our confidence in this product is reflected in our decision to firmly stand behind the Silver Bullet with an unconditional five year warranty. A warranty that confirms our commitment to excellence in the performance of your equipment.
**Silver Bullet™**

**COMPARATIVE COST ANALYSIS**

<table>
<thead>
<tr>
<th>CONVENTIONAL METHOD</th>
<th>MAGNUM SILVER BULLET™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potting</td>
<td>Hermetic Seal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>2 switches</th>
<th>$322</th>
<th>2 sensors</th>
<th>$264</th>
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<tr>
<td>junction box</td>
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<td>junction box</td>
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<td>seal fittings</td>
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<td>wire, conduit</td>
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<td>$125</td>
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<td><strong>TOTAL COST</strong></td>
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<td></td>
<td><strong>TOTAL COST</strong></td>
<td><strong>$454</strong></td>
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</table>

* Not Required

Comparative costs were based upon list prices from major manufacturers.

National Electrical Code (1987):

**Article 501-5(a) & (b). Conduit Seals, Class I, Div. 1 & 2**

In each conduit run entering an enclosure for switches which may produce arcs, seals shall be placed no more than 18 inches from such enclosures.

**Exception:** Conduit runs 1½ inches and smaller entering an explosion-proof enclosure for switches need not be sealed if the current-interrupting contacts are enclosed within a chamber hermetically sealed against the entrance of gases or vapors.

Note: For conformance to U.L. and CSA requirements, all conduit runs in Class 1, Division 1 hazardous locations must have a sealing fitting connected within 18 inches of the enclosure.

**Start-Up**

All of a sensors capabilities are made and broken at the contact point. Sensors that are set for position at the factory do not always remain that way after arriving in the field or being connected to pipelines and conduit systems. Final field adjustment is usually a difficult task when sensors are firmly held in place by rigid conduit. A simply engineered slide-action Fieldset™ arm takes this fact into consideration by providing a unique double upper and lower trigger for ease of final field setting.

**Maintenance**

All Silver Bullets are bolted to heavyduty stainless steel brackets. Sensor triggering is accomplished by stainless steel encapsulated ferromagnetic actuators. Eventually, as valve seats wear, a slight readjustment of position sensors becomes necessary. The Fieldset™ triggering system allows fast resetting by the simple turning of a bolt rather than the disconnecting of rigid conduit systems.

**Fieldset™ Triggering System**

Adjustable Trigger

Fieldset Arm
Silver Bullet™

**MATERIALS OF CONSTRUCTION**

- Full Metal Jacket: 316 Stainless Steel
- Hermetically Sealed Capsule
- UL / CSA Haz. Loc: Cert. Nema 4, 4X, 7, 9 All Classes & Groups, Divisions 1 & 2
- Epoxy Resin Potting
- Solid Tungsten Contacts: 600,000 cycles (full rated load)
- Target: Ferromagnetic Actuation

**TECHNICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hermetically Sealed</td>
<td>corrosion-resistant / cost-effective</td>
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<tr>
<td>High Current</td>
<td>3 amps/120VAC; 2amps/24VDC</td>
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<tr>
<td>Full Metal Jacket</td>
<td>316 stainless steel</td>
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<tr>
<td>Agency Certification</td>
<td>UL, CSA, NEMA 4, 4X, 7, 9 Class I, Groups A, B, C, D; Class II, Groups E, F, G, Div 1 &amp; 2</td>
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<td>Repeatability</td>
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<td>Hysteresis</td>
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<tr>
<td>Trigger</td>
<td>Ferromagnetic (stainless steel encapsulated)</td>
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<tr>
<td>Operational Life</td>
<td>600,000 cycles (full rated load)</td>
</tr>
</tbody>
</table>
Silver Bullet™

ORDERING GUIDE

SILVER BULLET

MODEL 316
SPDT

MODEL 316DB
DPDT

316 Stainless Steel
NEMA 1, 3, 4, 4X, 6, 7, 9, 12, 13
UL Listed, CSA certified 4, 4X, 7, 9
Hazardous Location
Class I, Groups A, B, C, D;
Class II, Groups E, F, & G;
Divisions 1 & 2

Suggested Specification

SILVER BULLET™

Valve position sensors shall be
Westlock Controls Silver Bullet Model
_________. Sensor shall be Hermetically
sealed (UL & CSA Recognized) and
rated at 3 amps/120 VAC, 2 amps/
24 VDC, with Fieldset™ triggering
mechanism. 316 Stainless Steel
housing shall meet all NEMA 4, 4X, 7,
9 requirements having as standard one
1/2" conduit entrance.

Testing

Every electrical component in every
Silver Bullet is 100% tested at incoming
inspection and every unit then receives
a final, complete functional test.

Warranty

5 year unconditional warranty

DIMENSIONS (inches/ mm)

MECHANICAL

Full Metal Outer Jacket: 316 Stainless Steel
Hermetic Seal: Glass (vacuum)
Coating: Acid / Alkali Resistant
Potting: Epoxy Resin
Contacts: Solid Tungsten
NEMA Rating: 1, 3, 4, 4X, 6, 7, 9, 12, 13
IP Rating: 65, 67
Temp. Range (°F): -40°F to 220°F
Operational Life: 600,000 cycles (full rated load)
Sensor Actuation: Ferromagnetic (stainless steel encapsulated)
Sensing Distance: 0.100" (2.54mm) end sensing

ELECTRICAL

Contact Arrangement: SPDT, Form C (normally open), DPDT Form CC (normally open)
Contacts: Solid Tungsten
Current Rating: 3 Amps / 120 VAC, 2 Amps / 24 VDC
Agency Certification: Underwriters Labs, Canadian Standards, NEMA 4, 4X, 7, 9
Class I, Groups A, B, C & D. Class II, Groups E, F & G, Division 1 & 2
Operating Time: 3.0 m Sec.
Initial Contact Resistance: .50 ohms (Max)
Repeatability: .005 in
Hysteresis: .040 in
Conduit Connection: 1/2" - 14 NPT
Leads: Factory Sealed with 18" minimum, 4 conductor PVC insulated
Contact Ratings: SPDT, Form C (Normally Open) 3 amps/120 VAC, 2 amps/24 VDC
Wire: 4 conductor, 18AWG
DPDT, Form CC (Normally Open) 3 amps/120 VAC, 2 amps/24 VDC
Wire: 7 conductor, 18AWG

ADAPTION

Bracket: Stainless Steel
Hardware: Stainless steel
Actuation Trigger: Ferromagnetic (stainless steel encapsulated)
Sensing Distance: .100" (2.54 mm) end sensing
Trigger Arm: Dual Fieldset™ Adjustment

Westlock reserves the right to change product designs and specifications
without notice, and is not responsible for errors and omissions.