Cylinder Position Sensors
GO Switch Stroke-to-GO® cylinder position sensors use three permanent magnets and push-pull plunger assembly to control a set of dry contacts.

**TECHNOLOGY IN ACTION**

**Stroke-to-GO**

**LEVERLESS LIMIT SWITCH**

The center magnet simultaneously attracts the primary magnet and repels the bias magnet, pushing the connecting rod backward. As a result, the common contact rests in its unoperated position, closing a contact circuit.

When the ferrous cushion of a cylinder enters the sensing area of the switch, it attracts the primary magnet, which pulls the connecting rod forward. As a result, the common contact snaps to its operated position, closing the other contact circuit.

When the target is removed the common contact automatically returns to its original unoperated position.

**Options Available**

- SPST or SPDT
- HiTemp™ to 400°F
- SubSea™ Submersible

**Key Benefits**

- Bi-Color red and green LED position indicator increases safety and awareness for plant personnel.
- 360° rotatable head makes installation simple and easy.
- Versatile gold flashed contacts are suitable for high and low electrical loads, and can be wired AC or DC, N/O or N/C.
- All stainless steel construction makes this the most durable cylinder position sensor in the world.
- Sensing face is stainless steel rather than plastic, and is therefore more suitable for high pressure hydraulic cylinder applications.
- Multiple wiring options:
  - Lead Wires
  - Cable
  - Quick Disconnects
- Potting fills the entire switch cavity, forming a barrier against moisture.
- O-Ring seals in pressures up to 3,000 PSI
- Probe lengths ranging from 1" to 5" ensure a proper fit to virtually any cylinder.
- Permanent magnets never lose their strength, even when mounted on ferrous metal.

**A LOOK INSIDE - MODEL 7C**

**Unoperated**

**Operated**
**Models 7C, 7D, 7E & 7F**

With their solid stainless steel housings and leverless limit switch design, Stroke to Go switches have set the standard for reliability and durability in cylinder position sensing.

**Features:**
- SPDT 4A contacts
- Inherently Intrinsically Safe
- -40°F to 221°F operating temperature
- Options: -40°F to 400°F high temperature
- Quick disconnect connector
- Underwater capabilities

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**Approvals**

- 7C: Model 7C
- 7D: Model 7D
- 7E: Model 7E
- 7F: Model 7F

<table>
<thead>
<tr>
<th>Repeatability</th>
<th>Response Time</th>
<th>Differential</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.02&quot; (0.5 mm) typical</td>
<td>8 milliseconds</td>
<td>Approx. 0.02&quot; (0.5 mm)</td>
</tr>
</tbody>
</table>

**Operating Temperature:**
- -40°F to 160°F (-40°C to 71°C) with LEDs
- -40°F to 221°F (-40°C to 110°C) without LEDs

**Probe lengths:**
- 1.000" (26 mm)
- 1.250" (32 mm)
- 2.062" (52 mm)
- ≥ 144" (3658 mm)

**Contact Form Options:**
- Single Pole Single Throw (Form A)
- Single Pole Double Throw (Form C)

**Sensing Range:**
- 0.090" (2.3 mm) end sensing
- 3,000 PSI (20 MPa) force
- 1.000" (25 mm) end sensing

**Outlet Position:**
- Top outlet (Wiring must be D)
- Side outlet 360° adjustable

**Enclosure Material:**
- UL listed General Purpose
- CSA certified General Purpose

**Wiring Options:**
- Quick Disconnect
- Male Quick Disconnect only, potted-in connector

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**Sensing Range**

<table>
<thead>
<tr>
<th>Target Material: Ferrous steel</th>
</tr>
</thead>
</table>
| Sensing Range: 0.090" (2.3 mm) | sensing (0.330 PdB) (Recommended air gap: 0.115” - 0.340”)
| No conduct hub |

**Outlet Position**

- Side entry 360° adjustable (Wiring must be A, B, C, or F) No conduct hub
- Side outlet 360° adjustable with Quick Disconnect (Wiring must be B) (Approval must be F)
- Side outlet 360° adjustable with 1/16” NPT conduit hub (Wiring must be A, B, or F)
- Top outlet (Wiring must be SubSea)

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**Contact Form**

<table>
<thead>
<tr>
<th>Contact Material: Palladium silver with stainless steel surface configuration</th>
</tr>
</thead>
</table>

**Sensitivities:**
- Resistive: ±0.5% of full-scale
- Inductive: ±1.25% of full-scale

**Options:**
- Mini Connector

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**Lead Wires**

- 18 Gauge (.110” dia) potted-in PVC insulated leads (Operating voltage: 24 - 120V AC/DC) (Leakage current is 1.0mA) (Leakage factor applies to standard outlet sensing) (with dual LED’s) (Operating voltage: 24 - 120V AC/DC) (Optional voltage: 48 - 240V AC/DC)

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**Wiring Connectors**

- Mini-change® Micro-change®
- 4 pin Mini-change® type 4D
- 5 pin Mini-change® type 5D

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**Dimensions**

- CONTACT WIDTH: 0.240" (6.10 mm)
- CONTACT GAP: 0.015” - 0.040”

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**Approvals**

- CSA certified General Purpose
- UL listed General Purpose

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**Wiring Options**

- Quick Disconnect: Male Quick Disconnect only, potted-in connector
- CSA requires a ground (Approvals must be 7 or 8)
- Quick Connect: Male Quick Disconnect only, potted-in connector

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**Ordering Guide**

*Fill in the boxes to create your ordering number.*

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**Contact Form**

- Single Pole Double Throw (Form C)
- Single Pole Single Throw (Form A)
- Single Pole Double Throw (Form C)
- Single Pole Single Throw (Form A)
- Single Pole Single Throw (Form A)
- Single Pole Single Throw (Form A)
- Single Pole Single Throw (Form A)
- Single Pole Single Throw (Form A)

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**Need Accessories?**

See pp. 10-14 for:
- Range Extending
- Target Magnets
- Mounting Brackets
- Connectors and more

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**Dimensions**

- CONTACT LENGTH: 0.240” (6.10 mm)
- CONTACT GAP: 0.015” - 0.040”

---

**Approvals**

- CSA certified General Purpose
- UL listed General Purpose
Cylinder Position Sensors

Stroke-To-GO® Switches provide precise end-of-stroke position indication on pneumatic and hydraulic cylinders. Designed to exceed automotive industry standards, the housing is machined from stainless steel bar stock to handle pressures to 3,000 PSI operating (tested to UL’s 3X burst requirement) while withstanding the extreme external conditions such as weld slag, coolants, cutting fluids, physical abuse and even high temperatures. Stroke-To-GO® Switches incorporate the same 70 Series GO® Switch mechanism that has been tested to over 200 million mechanical cycles and field proven in the most rigorous applications. This unique design offers the greatest benefits in cylinder indication.

Unique Features

- Mechanical life: >200,000,000 cycles
- Leakage current: Without LEDs - none With LEDs - <1mA (SPST)
- Voltage Drop: Without LEDs - none With LEDs - 2.8 volts (SPST)
- Temperature drift: none
- Washdown: designed to withstand 1,000 PSI washdown and NEMA 6P with Mini-Change® type connector option
- Underwater: rated to 10,000 PSI with deep sea connector option
- Weld Field Immune: tested and exceeded General Motors EHS-320 specifications. Testing Agency - Candid Logic
- Radio Frequency Interference (RFI): no affect at any frequency

Application Considerations

- Cylinder cushion must be ferrous.
- Air gap between switch sensing face and cushion should be .015" to .040" (outside this range please consult factory).
- Largest diameter of target (cushion) should cover at least 75% of probe sensing face.
- Sensing face of Stroke-To-GO® Switch must be at least 1/2" from piston rod for proper switch meet. This may at times require an air gap distance greater than .040".
- For cushion diameters less than .50", air gap should be .105" to .250".
- Mounting hardware is 1/4"-20 grade microinch finish.

Probe Selection Chart

<table>
<thead>
<tr>
<th>Code</th>
<th>MIN MAX PROBE LENGTH PROBE CODE</th>
<th>MIN MAX PROBE LENGTH PROBE CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.060 2.015 2.075</td>
<td>2.060 2.015 2.075</td>
</tr>
</tbody>
</table>

EXAMPLE: If "A" = 2.000", then:

Dimension A is measured from the outside surface of the cylinder block to the Top Dead Center (TDC) of the ferrous cushion. Distance A may differ at each end.

Leverless Limit Switches

A two digit code is required for ordering the correct custom probe length. All Application Considerations below must be met. For any discrepancies please consult factory. Please follow these steps:

1. Measure dimension A from both ends of your cylinder or retrieve from specification drawings.
2. Locate the Min/Max range that dimension A falls within on the Custom Probe Length Chart.
3. Locate probe length requirement and Probe Code in the next two Columns to the right.
4. Enter the probe code into the corresponding spaces of the Stroke-To-GO® Part Number.

Application Considerations

- Cylinder cushion must be ferrous.
- Air gap between switch sensing face and cushion should be .015" to .040" (outside this range please consult factory).
- For cushion diameters less than .50", air gap should be .105" to .250".
- Mounting hardware is 1/4"-20 grade microinch finish.
### Leverless Limit Switches

<table>
<thead>
<tr>
<th>CONTACT FORMS</th>
<th>Leads</th>
<th>Cable</th>
<th>Water-Resistant</th>
<th>HiTemp</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - SPST Form A</td>
<td>COM N/O</td>
<td>Black</td>
<td>Black</td>
<td>Black</td>
</tr>
<tr>
<td>N/C w/ LED</td>
<td>GND Blue</td>
<td>Blue</td>
<td>White</td>
<td>Red</td>
</tr>
<tr>
<td>3 - SPST Form B</td>
<td>COM N/C</td>
<td>Black</td>
<td>Black</td>
<td>Black</td>
</tr>
<tr>
<td>N/C w/ LED</td>
<td>GND Red</td>
<td>Red</td>
<td>White</td>
<td>Red</td>
</tr>
<tr>
<td>4 - SPDT Form C</td>
<td>N/O</td>
<td>Black</td>
<td>Black</td>
<td>Black</td>
</tr>
<tr>
<td>N/C w/ LED</td>
<td>Red</td>
<td>Blue</td>
<td>White</td>
<td>Red</td>
</tr>
<tr>
<td>5 - SPDT Dual LEDs</td>
<td>N/C</td>
<td>Red</td>
<td>Blue</td>
<td>Green</td>
</tr>
<tr>
<td>GND</td>
<td>Red</td>
<td>Green</td>
<td>Red</td>
<td>Green</td>
</tr>
<tr>
<td>7 - SPST Form A</td>
<td>COM N/O</td>
<td>Black</td>
<td>Black</td>
<td>Black</td>
</tr>
<tr>
<td>N/O w/o LED</td>
<td>GND Blue</td>
<td>Blue</td>
<td>White</td>
<td>Red</td>
</tr>
<tr>
<td>8 - SPDT Form B</td>
<td>N/C</td>
<td>Black</td>
<td>Black</td>
<td>Black</td>
</tr>
<tr>
<td>N/O w/o LED</td>
<td>GND Red</td>
<td>Red</td>
<td>White</td>
<td>Red</td>
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</table>

### Agency Approvals

<table>
<thead>
<tr>
<th>Approvals</th>
<th>(2) HiTemp</th>
<th>(7) CSA General Purpose</th>
<th>(8) UL General Purpose</th>
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<tbody>
<tr>
<td>Terminations Options</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A - Potted PVC leads</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>B - Potted PVC Cable</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>C - Water squeeze connector</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>D - Quick Disconnect</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>E - SubSea™ Connector</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>F - HiTemp™ Leads</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>G - 4 Pin Micro Change with or without LED</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIN 1</td>
<td>GND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIN 2</td>
<td>COM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIN 3</td>
<td>N/O</td>
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</table>

### NEMA Ratings

<table>
<thead>
<tr>
<th>Models 7C, 7D, 7E, 7F</th>
<th>Non-Hazardous</th>
<th>Hazardous</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEMA CLASSES</td>
<td>4</td>
<td>4X</td>
</tr>
<tr>
<td>A - Potted PVC leads</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>B - Potted PVC cable</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>C - PVC Cable w/ squeeze</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>D - Quick Disconnect</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>E - SubSea™ Connector</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>F - HiTemp™ Teflon leads</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X = Designed to meet respective NEMA specifications</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Termination Options

- A - Potted PVC Leads
- B - Potted PVC Cable
- C - Water squeeze connector
- D - Quick Disconnect
- E - SubSea™ Connector
- F - HiTemp™ Leads
- X = Approvals Available