

Stroke-to-GO™ Switch Models 7CX & 7DX Cylinder Position Sensor

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 operating pressures to 3,000 PSI 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 field proven in the most rigorous applications. This unique design offers the greatest benefits in cylinder position indication.

Unique Features

- Leakage current:** None
- Voltage Drop:** None
- Temperature Drift:** None
- Weld Field Immune:** Tested and exceeded General Motors EHS-320 specifications. Testing Agency - Candid Logic.
- Radio Frequency Interface (RFI):** No affect at any frequency.

Benefits

- 70 Series GO Switches are unaffected by weld fields and RF interference.
- 70 Series GO Switches may be mounted adjacent to or surrounded by ferrous metals however the proximity of ferrous metals will affect sensing distance. For the maximum rated sensing distance, avoid mounting near ferrous metals.
- GO Switches sense ferrous materials such as mild steel, 400 series and 17/4 stainless steel.
- Sensing and differential of switch may vary depending on target travel direction.
- Avoid contact between target and switch. Configure mounting of switch and/or target so that target passes within the sensing area. Sensing range will vary according to model number and mass of target used.

Benefits Continued

- For optimum performance, provide sufficient mass of target.
- Greater target mass and target movement fully into and out of sensing range will increase contact pressure. This is helpful in low current controls applications.
- For heavy or inductive loads, arc suppression devices or interposing relays are recommended for contact longevity. Contact factory for specifics.

Specifications

Housing
Size: Standard probe lengths: 1.025" (26 mm), and 1.250" (32 mm).

Materials: Stainless Steel bar stock
Conduit Outlet: 1/2"-14 NPT

Sensing

Target Material: Ferrous
Sensing Range: Approx. .090" (2 mm) end sensing (3,000 PSI) (Recommended air gap .015" - .040")

Contacts

Materials: Palladium silver with Sawtooth® surface configuration
Form: Single Pole, Double Throw (SPDT) Form C

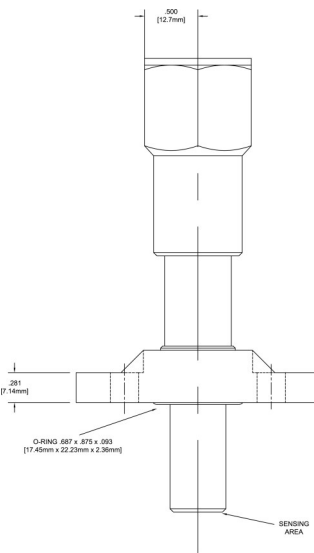
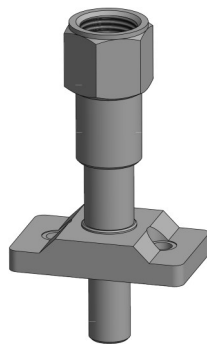


Electrical Ratings: Resistive

AC		DC	
Volts	Amps	Volts	Amps
120	4	24	3
240	2	48	*
480	*	125	0.5
		250	0.5

Performance

Repeatability: .002" (.05 mm) typical
Response Time: 8 milliseconds
Differential: Approximately .020" (.51 mm).
Operating Temperature: -40°F (-40°C) to 302°F (150°C)
Pressure Rating: Stainless steel 3,000 PSI operating.



Attachment of Conduit or Cable

- Attach conduit or cable correctly.
- When using long runs of conduit or cable, place supports close to the switch to avoid pulling switch out of position.
 - If switch is mounted on a moving part, be sure flexible conduit is long enough to allow for movement, and positioned to eliminate binding or pulling.
 - For installation in hazardous locations, check local electrical codes.
 - All conduit connected electrical devices, including GO Switches, must be sealed against water ingress through the conduit system. In figure 1, something common has occurred, the conduit system has filled with water. Over a period of time this may cause the switch to fail prematurely. In figure 2, the termination of the switch has been carefully filled with electronics grade RTV to prevent water ingress and to prevent premature switch failure. A drip loop with provision for water to escape has also been installed.

For hazardous locations install per Electrical Code. Dry contact devices, such as GO Switch, maybe installed intrinsically safe with matched barrier. When installed as explosion proof, lead seal fittings required within 18" of switch.

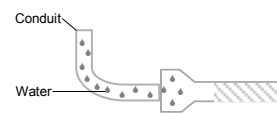


Figure 1. Incorrect

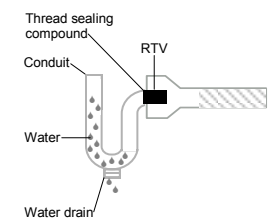


Figure 2. Correct

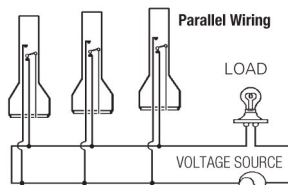
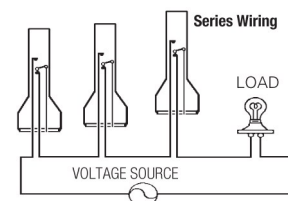
All GO Switches are "pure" contact switches, meaning they have no voltage drop when closed, nor do they have any leakage current when open. For multi-unit installation, switches may be wired in series or parallel, as shown below.

Series Wiring

Any number of GO Switches may be wired in series, without voltage drop. By contrast, solid state switches have about two volts drop across the switch when operated. In a 12 volt solid state system with four switches in series, 8 volts is dropped across the switches. Only 4V is left to operate the load. When using GO Switches, 12V is still available to operate the load. (Except 7L - approx. 5V drop)

Parallel Wiring

When solid state switches are placed in parallel, there is about 100 microamps leakage through each switch. If ten solid state switches were wired in parallel, the total leakage current would be 1000 microamps or one milliamp - sufficient current to indicate an "ON" condition to a programmable logic controller (PLC). **Any number of GO™ Switches may be wired in parallel, with no current leakage and without drawing operating current.** (Except 7L - approx. 5V drop)



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GLOBAL SUPPORT OFFICES

Americas
3300 Fern Valley Road
Louisville, Kentucky 40213 USA
+1 502 969 8000

Asia-Pacific
1 Pandan Crescent
Singapore 128461
+65 6891 7550

Europe
Horsfield Way
Bredbury Industrial Estate
Stockport SK6 2SU
United Kingdom
+44(0)161 406 5155

Middle East
P.O. Box 17033
Jebel Ali Free Zone
Dubai 17033
United Arab Emirates
+971(4) 811 8100

Africa
24 Angus Crescent
Longmeadow Business Estate East
Modderfontein
Gauteng
South Africa
+27 011 451 3700



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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 .125" from piston rod for proper switch reset. This may at times require an air gap distance greater than .040".
- For cushion diameters less than .50", air gap should be .015" to .025".

Stroke-to-GO Wiring Diagrams

LEADS	
Contact Forms	UL
4 -SPDT	COM Black
Form C	N/O Blue
	N/C Red
	GND Green

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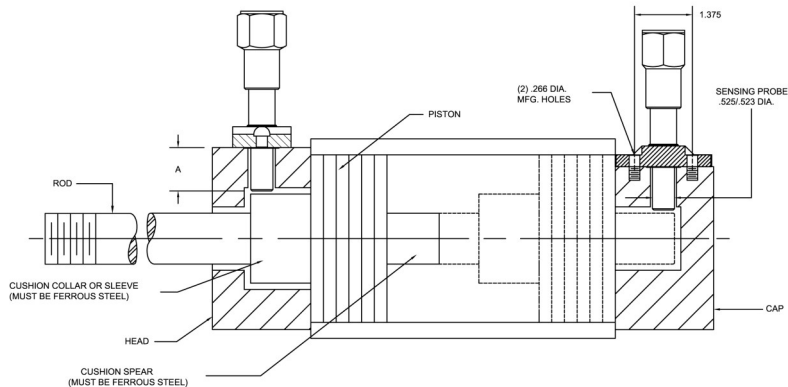
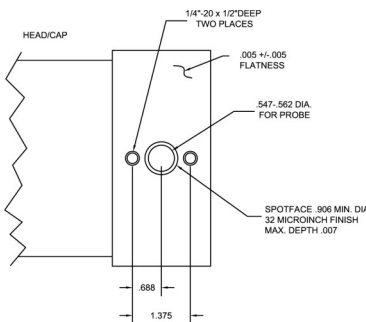
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5. LIMITED WARRANTY: Subject to the limitations contained in Section 6 herein, Seller warrants that the licensed firmware embodied in the Goods will execute the programming instructions provided by Seller, and that the Goods manufactured or Services provided by Seller will be free from defects in materials or workmanship under normal use and care. The foregoing warranties will apply until the expiration of the applicable warranty period. All other Goods are warranted for twelve (12) months from the date of shipment by Seller. Consumables and Services are warranted for a period of 90 days from the date of shipment or completion of the Services. Products purchased by Seller from a third party for resale to Buyer ("Resale Products") shall carry only the warranty extended by the original manufacturer. Buyer agrees that Seller has no liability for Resale Products beyond making a reasonable commercial effort to arrange for procurement and shipping of the Resale Products. If Buyer discovers any warranty defects and notifies Seller thereof in writing during the applicable warranty period, Seller shall, at its option, correct any errors that are found by Seller in the firmware or Services or repair or replace F.O.B. point of manufacture that portion of the Goods or firmware found by Seller to be defective, or refund the purchase price of the defective portion of the Goods/Services. All replacements or repairs necessitated by inadequate maintenance, normal wear and usage, unsuitable power sources or environmental conditions, accidents, misuse, improper installation, modification, repair, use of unauthorized replacement parts, storage or handling, or any other cause not the fault of Seller are not covered by this limited warranty, and shall be at Buyer's expense. Seller shall not be obligated to pay any costs or charges incurred by Buyer or any other party except as may be agreed upon in writing in advance by Seller. All costs of dismantling, reinstallation and freight and the time and expenses of Seller's personnel and representatives for site travel and diagnosis under this warranty clause shall be borne by Buyer unless accepted in writing by Seller. Goods repaired and parts replaced by Seller during the warranty period shall be in warranty for the remainder of the original warranty period or ninety (90) days, whichever is longer. This limited warranty is the only warranty made by Seller and can be amended only in a writing signed by Seller. THE WARRANTIES AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE.



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8. TAXES: Any tax or governmental charge payable by the Seller because of the manufacture, sale or delivery of the Goods, or provision of Services, may at Seller's option be added to the price herein specified. The foregoing shall not apply to taxes based upon Seller's net income.

Special Conditions for Safe Use and Possible Misuse

-The oversheathed or individual conductors must be suitably protected against mechanical damage and terminated within a terminal or junction facility suitable for the conditions of use.

-Three wire devices are not provided with an external connection facility for the earthing or bonding conductor. It is the user's responsibility to ensure adequate earth continuity via the mounting arrangements.

-The proximity switches do not require a connection to earth for safety purposes, but an earth connection is provided which is directly connected to the metallic enclosure. Normally an intrinsically safe circuit may be earthed at one point only. If the earth connection is used, the implications of this must be fully considered in any installation. i.e. by the use of a galvanically isolated interface.

-The switch must be supplied from a Certified Ex ia IIC intrinsically safe source.

-The flying leads must be terminated in a manner suitable for the zone of installation.

-An external ground connection must be protected by an external mounting device and / or cable connections / conduits.

9. TERMS OF PAYMENT: Subject to the approval of Seller's Credit Department, terms are F.O.B. shipping point, net 30 days from date of Seller's invoice in U.S. currency, except for applicable milestone payments covered below or export shipments for which Seller may require other arrangements. Freight charges may include shipping and handling charges, and Buyer shall pay all such charges. If any payment owed to Seller hereunder is not paid when due, it shall bear interest at a rate 1-1/2% per month interest from the date on which it is due until it is received and future shipments may be placed on hold. Seller shall have the right, among other remedies, either to terminate the Agreement or to suspend further deliveries under this and/or other agreements with Buyer in the event Buyer fails to make any payment hereunder when due. Buyer shall be liable for all expenses attendant to collection of past due amounts, including attorneys' fees. Unless otherwise provided in Seller's written quotation, periodic milestone payments shall be made by Buyer when the purchase price of this Agreement exceeds \$100,000. In such cases, invoices shall be issued by Seller and paid by Buyer based on the following milestones: Milestone 1: 30% of price upon acceptance of order by Seller. Milestone 2: 30% of price upon release by Seller of approved bills of material to manufacturing for assembly. Milestone 3: 40% of price upon shipment of the Goods by Seller. Seller reserves the right to designate additional Milestones where the Agreement provides for Services in excess of \$50,000.

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12. EXPORT/IMPORT: Buyer agrees that all applicable import and export control laws, regulations, orders and requirements, including without limitation those of the United States and the European Union, and the jurisdictions in which the Seller and Buyer are established or from which items may be supplied will apply to its receipt and use of Goods and Services. In no event shall Buyer use, transfer, release, import, export, or re-export Goods in violation of such applicable laws, regulations, orders, or requirements.



Ex d IIC, Gb T6 (-40°C ≤ Ta ≤ +50°C)
or T4 (-40°C ≤ Ta ≤ +100°C)
or T3 (-40°C ≤ Ta ≤ +150°C)
Ex tb IIIc Db T85°C (-40°C ≤ Ta ≤ +50°C) IP66
or T135°C (-40°C ≤ Ta ≤ +100°C)
or T200°C (-40°C ≤ Ta ≤ +150°C)



Ex ia IIC T6 Ga, (-40°C ≤ Ta ≤ +50°C)
Ex ia IIIc T85°C Da (-40°C ≤ Ta ≤ +50°C)

Ex ia IIC T4 Ga, (-40°C ≤ Ta ≤ +100°C)
Ex ia IIIc T135°C Da, (-40°C ≤ Ta ≤ +100°C)

Ex ia IIC T3 Ga, (-40°C ≤ Ta ≤ +150°C)
Ex ia IIIc T200°C Da (-40°C ≤ Ta ≤ +150°C)

Reference Baseefa Certificate for special conditions.
All area classifications are dictated by the model number.
Reference GO Switch brochure for complete listing.



CL I DIV 1 & 2 GROUPS A-D, CL II DIV 1&2 GROUPS E-G

- **Warning-Explosion Hazard**- Substitution of components may impair suitability for Class 1, Division 2.

- **Warning-Explosion Hazard** - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

13. GENERAL PROVISIONS: (a) Buyer shall not assign its rights or obligations under the Agreement without Seller's prior written consent; (b) there are no understandings, agreements or representations, express or implied, not specified in the Agreement; (c) no action, regardless of form, arising out of transactions under the Agreement, may be brought by either party more than two years after the cause of action has accrued; (d) any modification of these terms and conditions must be set forth in a written instrument signed by a duly authorized representative of Seller; (e) the Agreement is formed and shall be construed, performed and enforced under the laws of the State of Missouri (however, Buyer and Seller agree that the proper venue for all actions arising under the Agreement shall be only in the State where the Goods involved in such actions were manufactured; (f) The 1980 United Nations Convention on Contracts for the International Sale of Goods does not apply to this Agreement; (g) If any provision of the Agreement is invalid under any statute or rule of law, such provision, to that extent only, shall be deemed to be omitted without affecting the validity of the remainder of the Agreement; (h) Seller specifically objects to the application of any Federal Acquisition Regulation ("FAR") or other governmental procurement provision or clause to the Agreement; (i) UNLESS OTHERWISE SPECIFICALLY PROVIDED IN SELLER'S QUOTATION, GOODS AND SERVICES HEREUNDER ARE NOT INTENDED FOR USE IN ANY NUCLEAR OR NUCLEAR RELATED APPLICATIONS. Buyer (i) accepts Goods and Services in accordance with the restriction set forth in the immediately preceding sentence, (ii) agrees to communicate such restriction in writing to any and all subsequent purchasers or users and (iii) agrees to defend, indemnify and hold harmless Seller from any and all claims, losses, liabilities, suits, judgments and damages, including incidental and consequential damages, arising from use of Goods and Services in any nuclear or nuclear related applications, whether the cause of action be based in tort, contract or otherwise, including allegations that the Seller's liability is based on negligence or strict liability; (j) The rights, remedies and protections afforded to Seller under this Agreement, including but not limited to indemnification of Seller, limitation of remedy and liability and limited warranty shall extend to Seller and to its affiliates, subsidiaries, or related companies performing or supplying work, services, or products under this Agreement or any agreement into which it is incorporated by reference; and (k) Seller does not agree to: (i) indemnify Buyer; or (ii) name Buyer as an additional insured.