

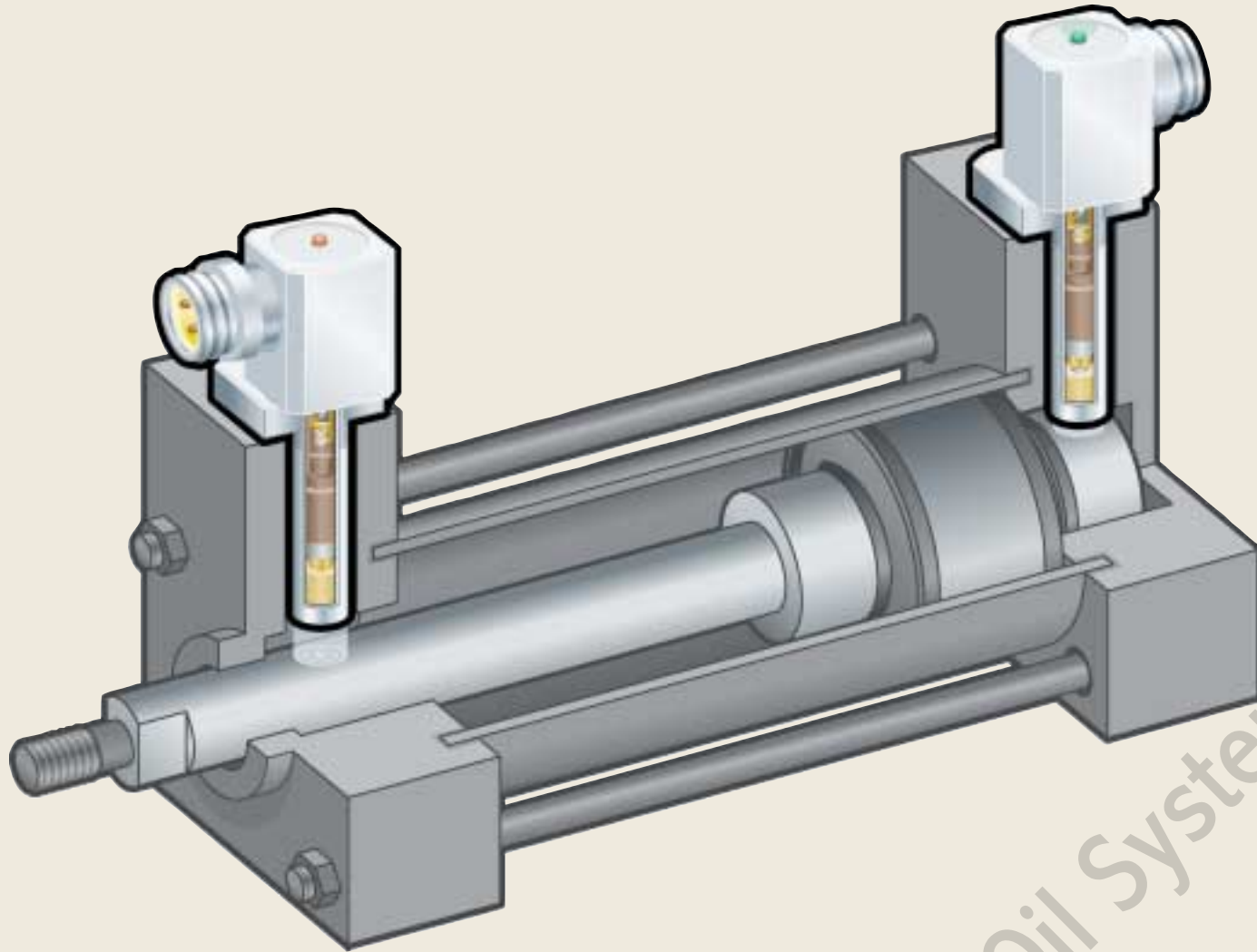
Air-Oil Systems, Inc. [www.airoil.com](http://www.airoil.com)

## Cylinder Position Sensors

TECHNOLOGY IN ACTION  
**Stroke-to-GO**

LEVERLESS LIMIT SWITCH

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



**Unoperated**

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.

**Operated**

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.

**A LOOK INSIDE - MODEL 7C**

**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**

Three magnet design provides **snap action** and solid contact pressure, eliminating 'contact teasing' and 'contact chatter' in high vibration applications.

**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.

**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.

**Options Available**

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

**Key Benefits**

**Stroke-to-GO cylinder position sensors are simple and built to last.**

**With only one moving part and no metal-to-metal contact forcing it to move, there is nothing to wear out!**



**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° to 221°F operating temperature

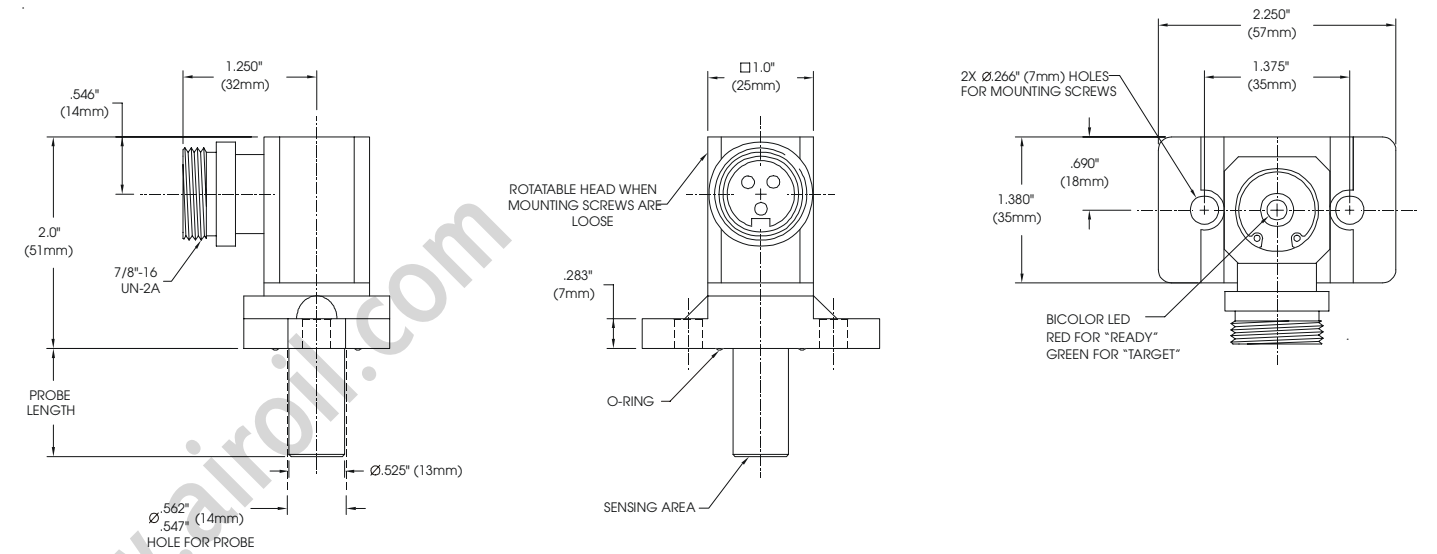
**Options:**

- 40° to 400°F high temperature
- Quick disconnect connector
- Underwater capabilities

**FAST TRACK DELIVERY**

SPST	SPDT
<b>7C-23658-DCA</b> 1.025" Probe Mini Connector	<b>7C-43658-DCA</b> 1.025" Probe Mini Connector
<b>7D-23658-DCA</b> 1.250" probe Mini Connector	<b>7D-43658-DCA</b> 1.250" probe Mini Connector
<b>7E-23658-DCA</b> 2.062" probe Mini Connector	<b>7E-43658-DCA</b> 2.062" probe Mini Connector

**Dimensions**



**Model**

**Repeatability:** .002" (.05 mm) typical  
**Response Time:** 8 milliseconds  
**Differential:** Approx. .020" (.51 mm)  
**Operating Temperature:** -40° to 160°F (-40° to 71°C) with LEDs -40° to 221°F (-40° to 105°C) without LEDs; HiTemp™ option to 400°F (204°C)

- 7C** Model 7C  
1.025" (26 mm) probe length
- 7D** Model 7D  
1.250" (32 mm) probe length
- 7E** Model 7E  
2.062" (52 mm) probe length
- 7F** Custom probe lengths  
1.000" (26 mm) - 5.000" (127 mm)\*

\*Probe lengths shorter than 1.000" require a taller upper switch housing

**Ordering Guide**  
Fill in the boxes to create your 'ordering number.'

Model

**Contact Form**

**Contact Material:** Palladium silver with sawtooth surface configuration  
**Form:** SPDT, Form C (with or without LED indication) Single Pole, Single Throw (with or without LED indication) Form A or Form B

**Ratings: Resistive**

Without LED's				With LED's			
AC Volts	DC Volts	AC Amps	DC Amps	AC Volts	DC Volts	AC Amps	DC Amps
120	4	24	3	120	0.5	24	0.5
240	2	48	*	240	0.5	48	0.5
480	-	125	0.5	480	-	125	0.5
		250	0.5			250	0.5

- 1** Single Pole Double Throw (Form C)
- 2** Single Pole Single Throw (Form A) (N/O output with bi-color LED indication) (Operating voltage: 24 - 120V AC/DC) (Optional voltage: 48 - 240V AC/DC) (Leakage current is 1.0mA)
- 3** Single Pole Single Throw (Form B) (N/C output with bi-color LED indication) (Operating voltage: 24 - 120V AC/DC) (Optional voltage: 48 - 240V AC/DC) (Leakage current is 1.0 mA)
- 4** Single Pole Double Throw (Form C) (without LED) (No leakage)
- 5** Single Pole Double Throw (Form C) (with dual LED's) (Operating voltage: 24 - 240V AC/DC) (No leakage current)
- 7** Single Pole Single Throw (Form A) N/O output w/o LED indication; No leakage
- 8** Single Pole Single Throw (Form B) N/C output w/o LED indication; No leakage

Contact Form

**Sensing Range**

**Target Material:** Ferrous steel  
**Sensing Range:** .090" (2.3 mm) end sensing (3,000 PSI) (Recommended air gap .015" - .040")

- 3** Standard sensing - approx. .090" (2.3 mm) end sensing

**Need Accessories?**  
See pp. 93-104 for:  
Range Extending  
Target Magnets  
Mounting Brackets  
Connectors and more!

Sensing Range  
3

**Outlet Position**

- 2** Side entry 360° adjustable (Wiring must be A, B, C, or F) No conduit hub
- 6** Side outlet 360° adjustable with Quick Disconnect (Wiring must be D) (Approval must be 7)
- 7** Side outlet 360° adjustable with 1/2" NPT conduit hub (Wiring must be A, B, or F)
- 8** Top outlet (Wiring must be SubSea)

Outlet Position

**Enclosure Material**

**Stainless Steel type 303**  
**5** Stainless steel (rated 3,000 PSI operating) (3 to 1 safety factor applies to standard probe lengths)

Enclosure Material  
5

**Approvals**

- 2** High temperature to 400°F (204°C) with Teflon™ insulated leads (Wiring must be F) (Contact form must be 4, 7, or 8)
- 7** CSA certified General Purpose
- 8** UL listed General Purpose

Approvals

**Wiring Options**

**Lead Wires** 18 Gauge (.110" dia) potted-in PVC insulated AWM / TEW stranded lead wires, rated at 221°F (105°C) 600V UL / CSA listed  
**A2** 36" (914 mm)  
**A3** 72" (1829 mm)  
**A4** 144" (3658 mm)  
**A\_ \_ \_** Lengths greater than 144" (Specify length in feet (e.g. A150 = 150 ft. of leads))

**Cable** 18 Gauge (.250" dia.) potted-in PVC cable, rated at 176°F (80°C) 300V, UL / CSA listed  
**B2** 36" (914 mm)  
**B3** 72" (1829 mm)  
**B4** 144" (3658 mm)  
**B\_ \_ \_** Lengths greater than 144" (Specify length in feet (e.g. B150 = 150 ft. of cable))

**Water Resistant** 18 Gauge (.250" dia.) PVC cable rated at 176°F (80°C) 300V with water-resistant squeeze connector.  
**C2** 36" (914 mm)  
**C3** 72" (1829 mm)  
**C4** 144" (3658 mm)  
**C\_ \_ \_** Lengths greater than 144" (Specify length in feet (e.g. C150 = 150 ft. of cable))

**Quick Disconnect** Male Quick Disconnect only, potted-in connector. (CSA requires a case ground) (Approvals must be 7 or 8) Refer to pp. 93-104 for mating cable assemblies and Aura Light Adapters.

Mini-change®		Micro-change®	
<b>DCA</b>	3 - pin Mini-change® type	<b>DBA</b>	3 - pin Micro-change® type
<b>DCD</b>	4 - pin Mini-change® type	<b>DBD</b>	4 - pin Micro-change® type
<b>DCG</b>	5 - pin Mini-change® type		

**SubSea Underwater Connector** (Outlet position must be 8)  
**3DD** 3 pin, certified not to leak underwater  
**4DD** 4 pin, certified not to leak underwater  
**3DE** 3 pin right-angle, certified not to leak underwater  
**4DE** 4 pin right-angle, certified not to leak underwater

**HiTemp Leads** 18 gauge (.070" dia. potted-in Teflon™ insulated leads rated at 482°F (250°C) 600V UL / CSA listed (Approval must be 2, 7, or 8)  
**F2** 36" (914 mm)  
**F3** 72" (1829 mm)  
**F4** 144" (3658 mm)  
**F\_ \_ \_** Lengths greater than 144" (Specify length in feet (e.g. F150 = 150 ft. of leads))

Wiring Options



## Agency Approvals

Approvals	(2) HiTemp	(7) CSA General Purpose	(8) UL General Purpose
<b>Termination Options</b>			
A - Potted PVC Leads		X	X
B - Potted PVC Cable		X	X
C - Water squeeze connector		X	X
D - Quick Disconnect		X	X
D - SubSea™ Connector		X	X
F - HiTemp™ Leads	X	X	X

X = Approvals Available

## NEMA Ratings

Models 7C, 7D, 7E, 7F	Non-Hazardous				Hazardous	
	4	4X	6	6P	7	9
<b>NEMA CLASSES</b>						
A - Potted PVC leads	X	X				
B - Potted PVC cable	X	X				
C - PVC Cable w/ squeeze	X	X	X	X		
D - Quick Disconnect	X	X	X	X		
D - SubSea™ Connector	X	X	X	X		
F - HiTemp™ Teflon leads	X	X				

X = Designed to meet respective NEMA specifications

CONTACT FORMS		Leads		Cable		Water-Resistant		HiTemp
		UL	CSA	UL	CSA	UL	CSA	
2 - SPST Form A N/O w/ LED	COM	Black	Black	Black	Black	Black	Black	N/A
	N/O	Blue	Blue	White	White	White	White	
	GND	Green	Green	Red	Red	Red	Red	
3 - SPST Form B N/C w/ LED	COM	Black	Black	Black	Black	Black	Black	N/A
	N/C	Red	Red	Red	Red	Red	Red	
	GND	Green	Green	White	White	White	White	
4 - SPDT Form C No LED	COM	Black	Black	Black	Black	Black	Black	Black Blue Red
	N/O	Blue	Blue	White	White	White	White	
	N/C GND	Red Green	Red Green	Red Green	Red Green	Red Green	Red Green	
5 - SPDT Form C Dual LEDs	COM	Black	Black	Black	Black	Black	Black	N/A
	N/O	Blue	Blue	White	White	White	White	
	N/C GND	Red Green	Red Green	Red Green	Red Green	Red Green	Red Green	
7 - SPST Form A N/O w/o LED	COM	Black	Black	Black	Black	Black	Black	Black Blue Green
	N/O	Blue	Blue	White	White	White	White	
	GND	Green	Green	Red	Red	Red	Red	
8 - SPST Form B N/O w/o LED	COM	Black	Black	Black	Black	Black	Black	Black Red Green
	N/C	Red	Red	Red	Red	Red	Red	
	GND	Green	Green	White	White	White	White	

### 3 Pin Micro Change with or without LED

SPST, Form A, N/O	
PIN 1	GND
PIN 2	COM
PIN 3	N/O

SPST, Form B, N/C	
PIN 1	GND
PIN 2	COM
PIN 3	N/C

SPDT, Form C	
PIN 1	COM
PIN 2	N/C
PIN 3	N/O

### 4 Pin Micro Change with or without LED

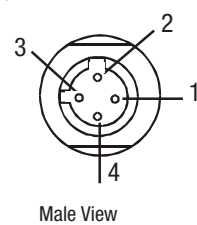
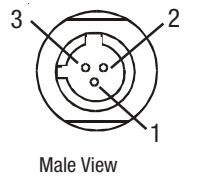
SPST, Form A, N/O	
PIN 1	COM
PIN 2	N/O
PIN 3	INACTIVE
PIN 4	GND

SPST, Form B, N/C	
PIN 1	COM
PIN 2	INACTIVE
PIN 3	N/C
PIN 4	GND

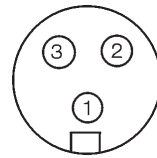
  

SPDT, Form C	
PIN 1	COM
PIN 2	N/O
PIN 3	N/C
PIN 4	GND



### 3 Pin Mini Change with or without LED

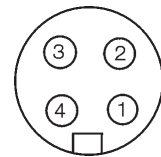
SPST, Form A, N/O	
PIN 1	GND
PIN 2	COM
PIN 3	N/O
SPST, Form B, N/C	
PIN 1	GND
PIN 2	COM
PIN 3	N/C
SPDT, Form C	
PIN 1	COM
PIN 2	N/C
PIN 3	N/O



Male View

### 4 Pin Mini Change with or without LED

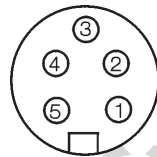
SPST, Form A, N/O	
PIN 1	COM
PIN 2	N/O
PIN 3	INACTIVE
PIN 4	GND
SPST, Form B, N/C	
PIN 1	COM
PIN 2	INACTIVE
PIN 3	N/C
PIN 4	GND
SPDT, Form C	
PIN 1	COM
PIN 2	N/O
PIN 3	N/C
PIN 4	GND



Male View

### 5 Pin Mini Change with or without LED

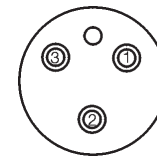
SPST, Form A, N/O	
PIN 1	N/O
PIN 2	Inactive
PIN 3	GND
PIN 4	Inactive
PIN 5	COM
SPST, Form B, N/C	
PIN 1	Inactive
PIN 2	N/C
PIN 3	GND
PIN 4	Inactive
PIN 5	COM
SPDT, Form C	
PIN 1	N/O
PIN 2	N/C
PIN 3	GND
PIN 4	Inactive
PIN 5	COM



Male View

### 3 Pin SubSea without LED

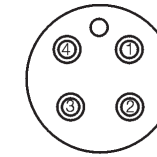
SPST, Form A, N/O	
PIN 1	COM
PIN 2	N/O
PIN 3	GND
SPST, Form B, N/C	
PIN 1	COM
PIN 2	N/C
PIN 3	GND
SPDT, Form C	
PIN 1	N/C
PIN 2	COM
PIN 3	N/O



Male View

### 4 Pin SubSea without LED

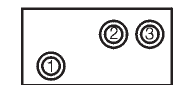
SPST, Form A, N/O	
PIN 1	COM
PIN 2	N/O
PIN 3	INACTIVE
PIN 4	GND
SPST, Form B, N/C	
PIN 1	COM
PIN 2	INACTIVE
PIN 3	N/C
PIN 4	GND
SPDT, Form C	
PIN 1	COM
PIN 2	N/O
PIN 3	N/C
PIN 4	GND



Male View

### 3 Pin SubSea - Right Angle without LED

SPST, Form A, N/O	
PIN 1	COM
PIN 2	N/O
PIN 3	GND
SPST, Form B, N/C	
PIN 1	COM
PIN 2	N/C
PIN 3	GND
SPDT, Form C	
PIN 1	COM
PIN 2	N/O
PIN 3	N/C



Male View