

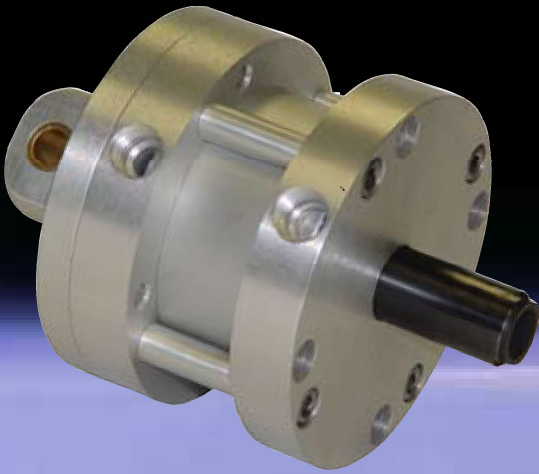


# STARCYL

AIR CYLINDERS

# SPACE ONE

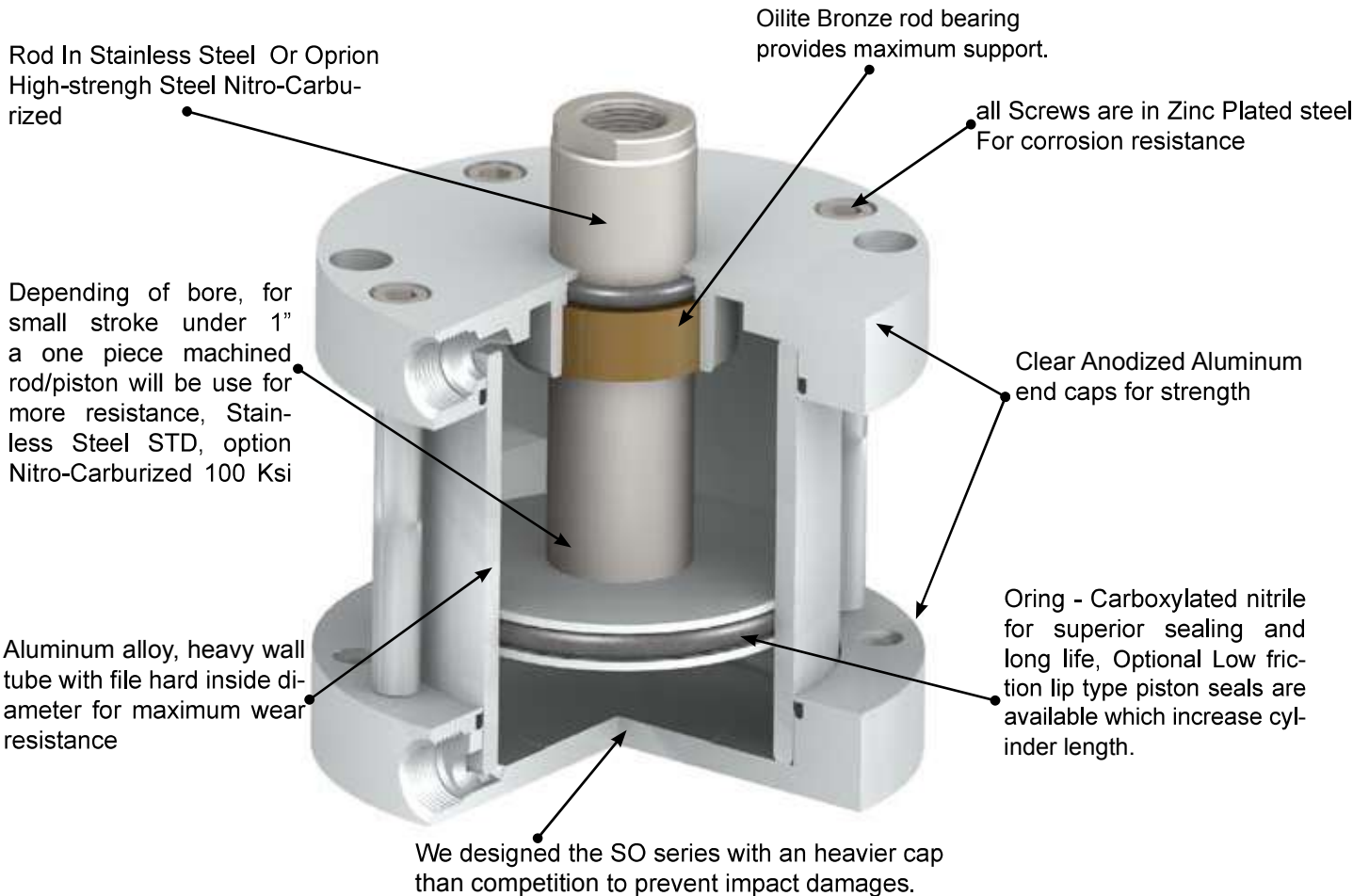
Space, The Final Frontier ...



**Space Saver  
Air Cylinders**

# SPACE ONE

## DESIGN FEATURES...



## 8 BORE SIZES 1/2" THRU 4"

STANDARD STROKE 1/8 - 1/4 - 1/2 - 3/4 - 1 - 1-1/4 - 1-1/2 - 1-3/4 - 2 - 3 - 4

SPECIFICATIONS	
Rod end:	Female thread with wrench flats
Ports:	Position #1
Seals:	Internally lubricated Buna-XNBR
Lubrication:	Magnalube®-G
Stroke tolerance:	± 1/64"
Media:	Air/Oil
Pressure rating, maximum:	250 psi
Minimum recommended operating pressure:	15 psi
Temperature rating Cylinder:	-25° to +225°F (-32° to +121°C)
Temperature rating Electronic sensors:	-5° to +175°F (-20° to +80°C)

PISTON AREA (For Cylinder Force)		
ex: 2" bore = 3.1 x shop pressure (90 psi) = 279 lbs		
1/2" (02)	=	0.25
3/4" (04)	=	0.40
1-1/8" (09)	=	0.90
1-1/2" (17)	=	1.70
2" (31)	=	3.10
2-1/2" (50)	=	5.00
3" (70)	=	7.00
4" (125)	=	12.50

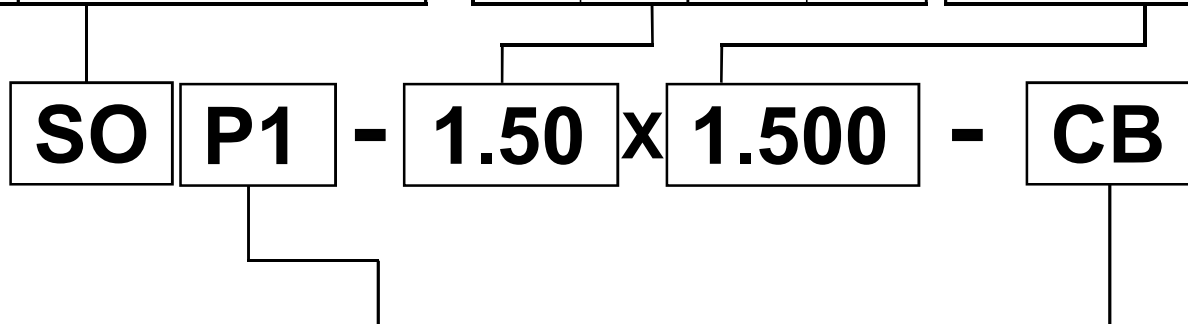
# SPACE ONE

## HOW TO ORDER...

SERIES	
SO	Double acting, single rod
SOD	Double acting, double rod
SOS	Single acting, spring retracted
SOR	Single acting, spring extended

BORE SIZE			
.20 in <sup>2</sup>	<b>0.50"</b>	3.1 in <sup>2</sup>	<b>2.00"</b>
.40 in <sup>2</sup>	<b>0.75"</b>	5.0 in <sup>2</sup>	<b>2.50"</b>
1.0 in <sup>2</sup>	<b>1.13"</b>	7.0 in <sup>2</sup>	<b>3.00"</b>
1.7 in <sup>2</sup>	<b>1.50"</b>	12.5 in <sup>2</sup>	<b>4.00"</b>

STROKE LENGTH	
0.125	1/8"
0.250	1/4"
0.375	3/8"
ETC.	



### MOUNTING OPTIONS (PAGES 6 & 7)

Counterbored & Tapped mounting holes are standard in the basic model and need not to be specified. For other mounting specify only one option number.

- P1 Pivot Mount
- P2 Pivot Mount 90° from standard
- T3 Trunnion mount, both ends<sup>1</sup>
- T1 Trunnion mount, front<sup>1</sup>
- T2 Trunnion mount, rear<sup>1</sup>
- X0 Threaded mounting holes, both ends<sup>2</sup>
- X1 Threaded mounting holes, front<sup>2</sup>
- X2 Threaded mounting holes, rear<sup>2</sup>
- S3 Screw clearance holes, both ends<sup>3</sup>
- S1 Screw clearance holes, front<sup>3</sup>
- S2 Screw clearance holes, rear<sup>3</sup>
- N1 Nose mount for SO, SOR, SOS<sup>4</sup>

- <sup>1</sup> Not available in 1/2" bore
- <sup>2</sup> for smaller tapped holes than the threaded holes standard with every SO
- <sup>3</sup> "Screw clearance" to allow bolt head to pass through; No Counter bore
- <sup>4</sup> Included heavy duty rear head and rod wiper

### MOUNTING OPTIONS (PAGE 8)

- B Bumpers, both ends<sup>1</sup>
- HB Bumpers, front only<sup>1</sup>
- CB Bumpers, rear only<sup>1</sup>
- FRC Coarse female thread, dimension E
- MRC Male rod end with coarse thread
- M Magnet on piston for position sensing (see length adder page 8) 3/8 stroke min.
- H Hollow rod, double rod end only
- HDR Heavy duty rear end
- FS Failsafe operation<sup>2</sup>
- LU Low friction seals
- MRF Male rod end, Fine thread
- #5 Plain rod end (Flush and chamfer)
- P2, P3, P4 Front port position other than standard
- LT Low temperature operation (-40°F)
- V Viton™ seals (-15°F to +225°F)
- W Rod wiper, Urethane
- RE Extra Rod Extension (RE0.5)

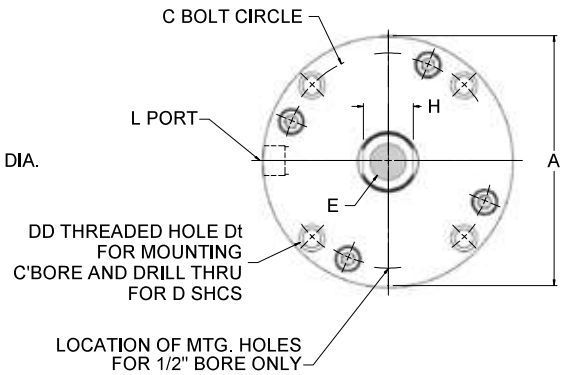
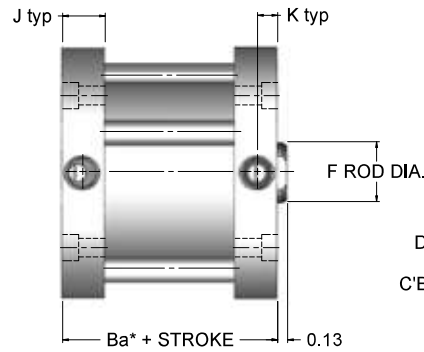
- <sup>1</sup> Stroke is reduced by .03 per end; .06 for option B; BR only for SOS; BF only for SOR
- <sup>2</sup> Not available in 1/2" bore

# SPACE ONE

## BASIC DIMENSIONS...

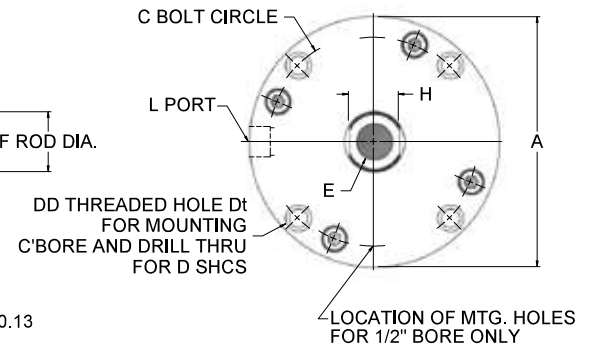
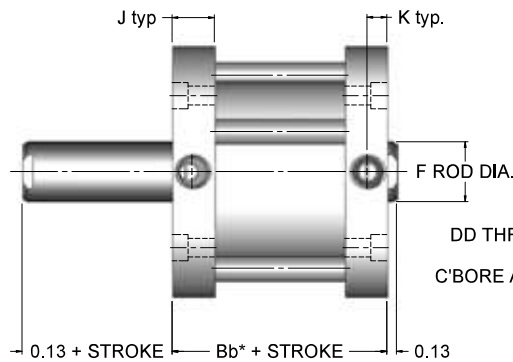
### MODEL SO

Double acting, Single Rod



### MODEL SOD

Double acting, Double Rod



### Dimensions

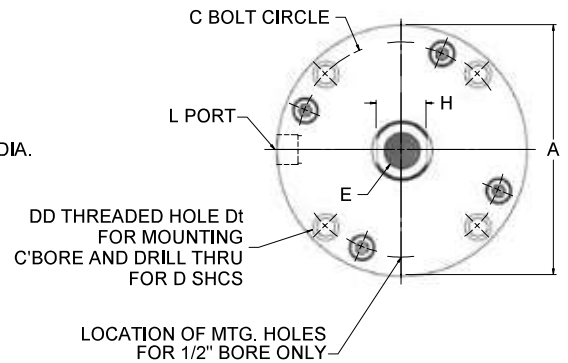
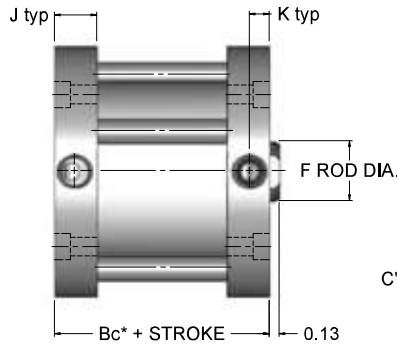
BORE	A	Ba*	Bb*	Bc* for Stroke Range				Bd* for Stroke Range				C	DD
				0-1	1.001-2	2.001-3	3.001-4	0-1	1.001-2	2.001-3	3.001-4		
1/2 (02)	1.12	0.56	0.69	0.81	1.38	1.96	2.52	1.06	1.62	2.14	3.21	.88	2
3/4 (04)	1.50	0.56	0.69	0.81	1.38	1.94	2.50	1.06	1.62	2.19	2.75	1.22	4
1-1/8 (09)	2.00	0.88	0.94	0.88	1.50	2.13	2.75	1.38	2.00	2.63	3.25	1.69	4
1-1/2 (17)	2.62	0.88	1.00	0.88	1.50	2.13	2.75	1.38	2.00	2.63	3.25	2.19	4
2 (31)	3.12	0.94	1.06	0.94	1.56	2.19	2.81	1.44	2.06	2.69	N/A	2.69	4
2-1/2 (50)	3.75	1.19	1.31	1.19	2.06	2.94	3.81	1.94	2.81	2.81	N/A	3.25	4
3 (70)	4.25	1.25	1.38	1.25	2.12	3.00	3.88	2.00	2.88	2.88	N/A	3.78	4
4 (125)	5.50	1.56	1.69	1.56	2.44	3.31	4.19	2.31	3.19	3.19	N/A	4.94	4

# SPACE ONE

## BASIC DIMENSIONS...

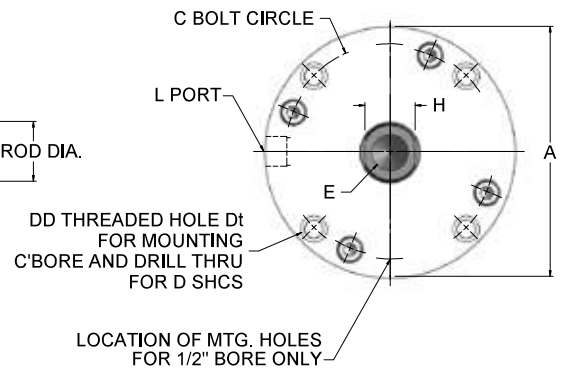
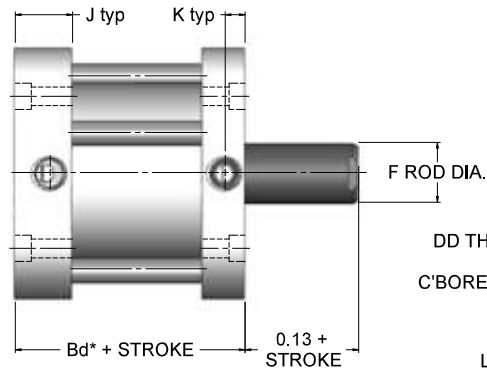
### MODEL SOS

Single acting, Spring Retracted



### MODEL SOR

Single acting, Spring Extended



### Dimensions

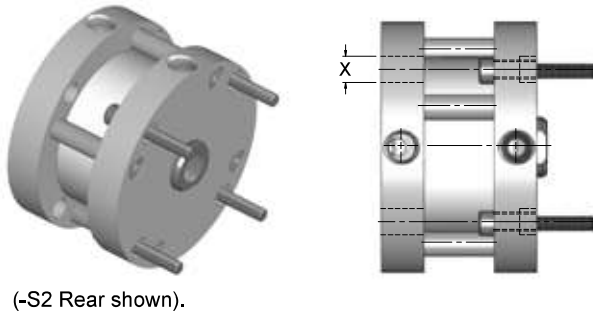
BORE	D	Dt	E (UNF)	E Depth for Stroke Range		F	H	J	K	L
				1/8 - 1/2	5/8 & +					
1/2 (02)	#4	#8-32	#8-32	0.30-0.46	0.46	0.25	0.22	0.34	0.14	#10-32
3/4 (04)	#6	#10-32	#10-32	0.30-0.46	0.46	0.31	0.25	0.34	0.14	#10-32
1-1/8 (09)	#6	#10-32	5/16-24	0.37-0.63	0.70	0.50	0.44	0.50	0.25	1/8 NPT
1-1/2 (17)	#10	1/4-28	3/8-24	0.37-0.70	0.70	0.63	0.50	0.50	0.25	1/8 NPT
2 (31)	#10	1/4-28	1/*2-20	0.30-0.63	0.70	0.75	0.63	0.53	0.25	1/8 NPT
2-1/2 (50)	1/4	5/16-24	1/2-20	0.42-0.70	0.70	0.75	0.63	0.66	0.33	1/4 NPT
3 (70)	1/4	5/16-24	5/8-18	0.45-0.73	0.73	0.88	0.75	0.69	0.33	1/4 NPT
4 (125)	5/16	3/8-24	3/4-16	0.40-0.70	0.80	1.00	0.88	0.84	0.42	3/8 NPT

# SPACE ONE

## MOUNTING OPTIONS...

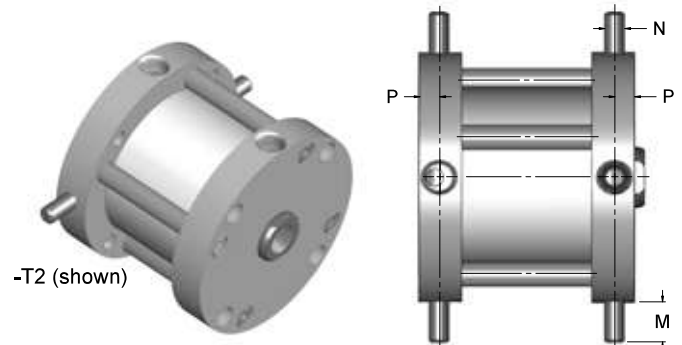
### Screw Clearance Holes

Available either or both ends.



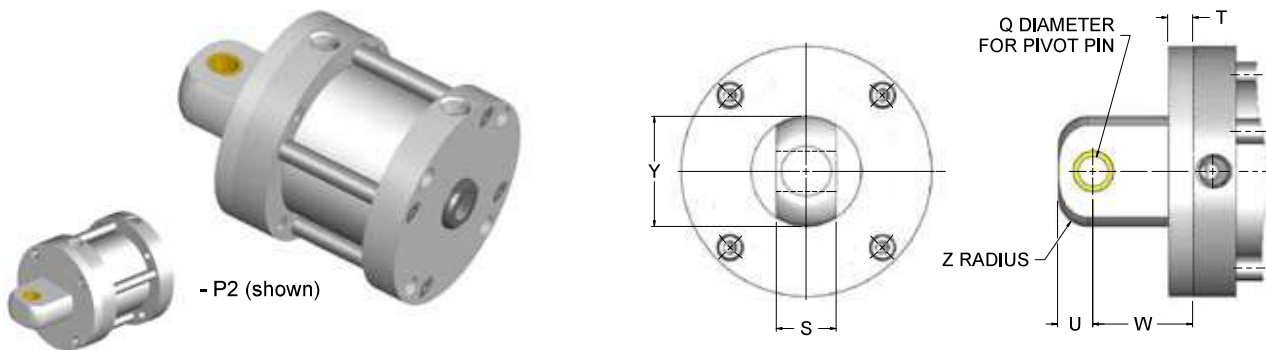
### Trunnion Mount

Available rear, front or both ends. Not available on 1/2" bore



### Pivot Mount (P1)

Complete with bronze pivot bushing. (Not available as an accessory)



### Dimensions

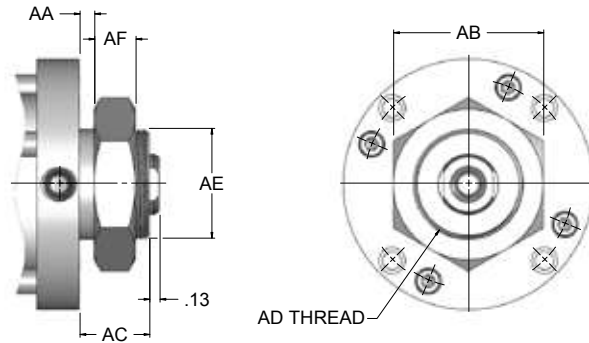
BORE	M	N	P	Q	S	T	U	W	X	Y	Z
<b>1/2 (02)</b>	N/A	N/A	N/A	0.19	0.38	0.19	0.25	0.75	0.17	0.63	0.19
<b>3/4 (04)</b>	0.31	0.125	0.17	0.19	0.38	0.19	0.25	0.75	0.23	0.75	0.19
<b>1-1/8 (09)</b>	0.50	0.250	0.25	0.19	0.38	0.25	0.25	0.81	0.25	0.75	0.19
<b>1-1/2 (17)</b>	0.50	0.250	0.25	0.38	0.75	0.25	0.44	1.19	0.34	1.38	0.38
<b>2 (31)</b>	0.50	0.250	0.25	0.38	0.75	0.31	0.44	1.25	0.34	1.38	0.38
<b>2-1/2 (50)</b>	0.63	0.312	0.33	0.38	0.75	0.38	0.44	1.31	0.41	1.38	0.38
<b>3 (70)</b>	0.63	0.312	0.33	0.63	1.00	0.38	0.56	1.69	0.41	1.88	0.38
<b>4 (125)</b>	0.75	0.375	0.42	0.63	1.00	0.44	0.56	1.75	0.50	1.88	0.38

# SPACE ONE

## OPTION DIMENSIONS...

### Nose Mount

Available on SO, SOS, SOR. (-N1 shown)

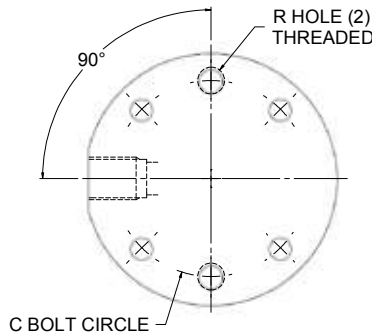


Includes rod wiper and heavy duty rear end see length adder

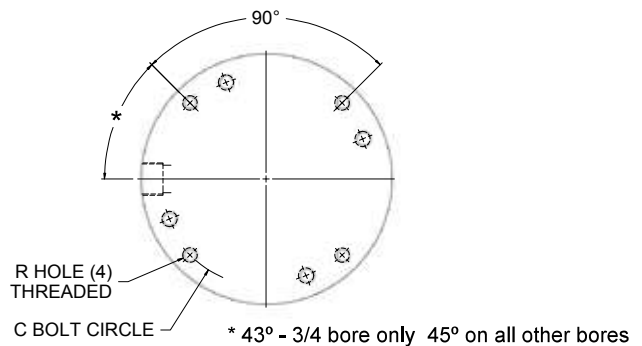
### Threaded Mounting Holes

#### 1/2" Bore

Available either or both ends (-X2 shown)



#### 3/4" Bore & Up



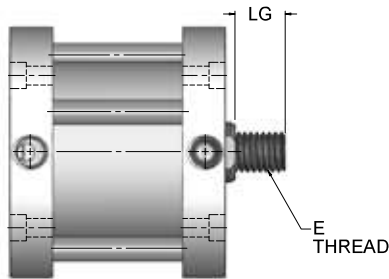
Dimensions									
BORE	AA	AB	AC	AD	AE	AF	C	R	MAXIMUM TORQUE FOR NOSE MOUNT (Foot-Pounds)
1/2 (02)	.06	0.75	0.38	1/2-20	0.50	0.31	0.88	#4-40	12
3/4 (04)	.06	0.75	0.38	5/8-18	0.62	0.25	1.22	#6-32	28
1-1/8 (09)	.13	1.50	0.75	1-14	1.00	0.55	1.69	#6-32	100
1-1/2 (17)	.13	1.88	0.75	1-1/4-12	1.25	0.52	2.19	#10-24	120
2 (31)	.19	1.88	0.88	1-3/8-12	1.38	0.52	2.69	#10-24	130
2-1/2 (50)	.25	1.88	1.00	1-3/8-12	1.38	0.52	3.25	1/4-20	130
3 (70)	.25	1.88	1.00	1-3/8-12	1.38	0.52	3.78	1/4-20	130
4 (125)	.19	2.62	1.12	1-3/4-12	1.75	0.88	4.94	5/16-18	150

# SPACE ONE

## OPTIONS DIMENSIONS...

### Male Rod Ends

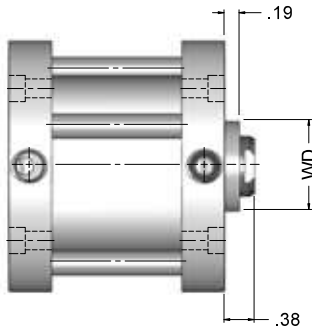
Options MRF or MRC



BORE	Thread Sizes		LG
	E Thread		
	MRF (fine)	MRC (coarse)	
1/2 (02)	#8-32	n/a	0.38
3/4 (04)	#10-32	#10-24	0.38
1-1/8 (09)	5/16-24	5/16-18	0.50
1-1/2 (17)	3/8-24	3/8-16	0.50
2 (31)	1/2-20	1/2-13	0.63
2-1/2 (50)	1/2-20	1/2-13	0.63
3 (70)	5/8-18	5/8-11	0.75

### Rod Wiper

Options W



Thread Sizes	
BORE	WD
1/2 (02)	0.56
3/4 (04)	0.69
1-1/8 (09)	0.88
1-1/2 (17)	1.00
2 (31)	1.13
2-1/2 (50)	1.13
3 (70)	1.25
4 (125)	1.38

Length adder Options						Hollow Rod	
BORE	Low friction Seals (LU)	Heavy Duty Rear end* (HDR)	Magnetic Piston** (M)			Hole Diameter	
			SO, SOD	SOS	SOR	Female Rod Thread	Male Rod Thread
1/2 (02)	0.25	0.13	0.88	0.63	0.38	0.14	n/a
3/4 (04)	0.25	0.13	0.88	0.88	0.88	0.14	0.09
1-1/8 (09)	0.38	0.19	0.88	0.88	0.88	0.22	0.16
1-1/2 (17)	0.38	0.19	0.88	0.88	0.88	0.28	0.19
2 (31)	0.38	0.19	0.88	0.88	0.88	0.38	0.25
2-1/2 (50)	0.38	0.25	0.88	0.88	0.88	0.38	0.25
3 (70)	0.50	0.25	0.88	0.88	0.88	0.44	0.31
4 (125)	0.50	0.38	0.88	0.88	0.88	0.50	0.38

\* Heavy Duty rear end is recommended for applications where the cylinder is mounted on the face or trunnion-mounted, and impact loading occurs between the piston and rear end. It increases the overall length of the cylinder as shown.

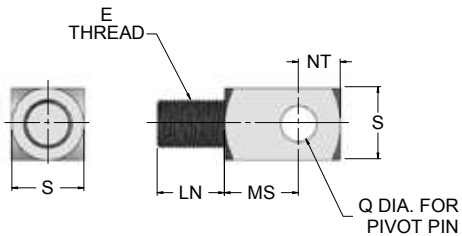
\*\*A minimum stroke of 0.38 inches is required to sense extending end-of-stroke position. For low friction seals used in conjunction with magnetic piston, use M length adder only



# SPACE ONE

## ACCESSORIES ...

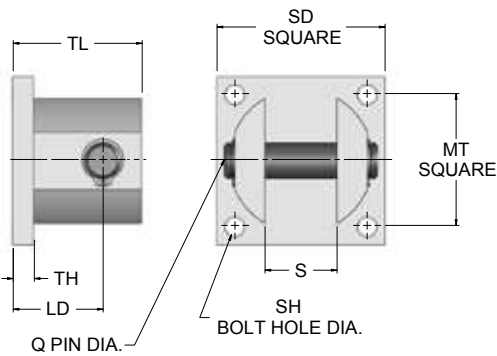
### Rod Pivot



Nitrocarburized, high strength steel

BORE	MODEL	E	LN	MS	NT	Q	S
1/2 (02)	SORP-1/2	#8-32	0.38	0.47	0.25	0.19	0.38
3/4 (04)	SORP-1	#10-32	0.38	0.47	0.25	0.19	0.38
1-1/8 (09)	SORP-2	5/16-24	0.63	0.47	0.25	0.19	0.38
1-1/2 (17)	SORP-3	3/8-24	0.63	0.72	0.44	0.38	0.75
2 (31)	SORP-4	1/2-20	0.63	0.72	0.44	0.38	0.75
2-1/2 (50)							
3 (70)	SORP-5	5/8-18	0.70	1.00	0.63	0.63	1.00
4 (125)	SORP-6	3/4-16	0.75	1.00	0.63	0.63	1.00

### Clevis Bracket



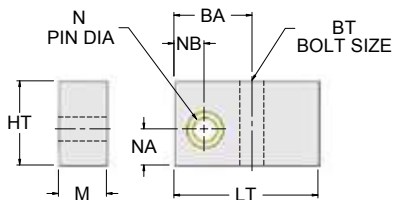
Anodized aluminum alloy, complete with pin

BORE	MODEL	LD	MT	Q	S	SH	SD	TH	TL
1/2 (02)	SOBC-1	0.56	0.75	0.19	0.39	#6	1.00	0.16	0.78
3/4 (04)									
1-1/8 (09)									
1-1/2 (17)	SOBC-2	0.94	1.38	0.38	0.75	#10	1.75	0.22	1.34
2 (31)									
2-1/2 (50)									
3 (70)	SOBC-3	1.25	2.00	0.63	1.00	1/4	2.50	0.25	1.81
4 (125)									

Bracket are intended to mount with either rod pivot or pivot mount, not directly to the cylinder rear end.

### Trunnion Brackets (2)

Anodized aluminum alloy, complete with bronze pivot bushings



BORE	MODEL	BA	BT	HT	LT	M	N	NA	NB
3/4 (04)	SOBT-1	0.56	#10	0.63	1.12	0.31	0.13	0.30	0.22
1-1/8 (09)	SOBT-2	0.81	1/4	0.88	1.50	0.50	0.25	0.38	0.31
1-1/2 (17)									
2 (31)									
2-1/2 (50)	SOBT-3	0.94	5/16	1.00	1.63	0.63	0.31	0.45	0.38
3 (70)									
4 (125)	SOBT-4	1.06	3/8	1.25	1.88	0.75	0.38	0.55	0.44

# SPACE ONE

## POSITION SENSING SWITCHES...

### Features:

- Indicator Light
- Corrosion and Washdown resistance
- Electronic sensing (no moving parts)
- Inline wire outlet for close mounting
- Quick Connect Option
- Temperature range From 0 to 175 °F



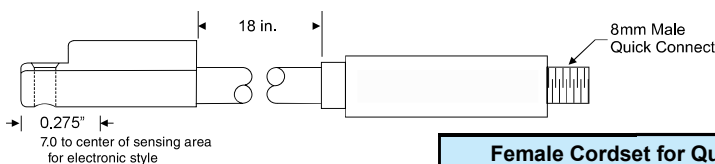
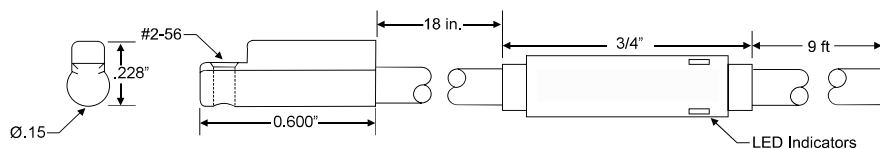
### Series 9B62 - Ultra Miniature Magnetic Sensor

The Starcyl Switch Series 9B62 combines an ultra-miniature sensor with an in-line module. The 9B62 is designed to exceed stringent customer requirements for miniature size without sacrificing features associated with much larger sensors. Those features include reverse polarity protection, surge suppression, and indicator lights. The 9B62 also features accurate and repeatable sensing, with reduced dead-band and hysteresis on all standard pneumatic cylinders. The unique molding process along with state of the art surface mount and solid state technologies provides extensive life expectancy and reliability. This switch is ideally suited for use with modern programmable controllers. The unit is available in either sinking or sourcing electrical outputs with wire leads or 8 mm connector versions for connection. The 9B62 is fully encapsulated in engineered polymers and is designed to meet NEMA 6 / IP 67 environmental specifications.

Switches Specification Chart (Order Sensors and Clamps Separately)								
Sensor Type	wired 9 ft. Part #	Quick Disconnect Part # <sup>1</sup>	Wire Leads	Function	Switching Voltage	Switching Power	Switching Speed	Voltage Drop
Electronic	9B62-000-031	9B62-000-331	3	Normally open PNP	6 - 24 VDC	4.8 Watts Max.	1.5 us operate 0.5 us release	1.0 Volts Max.
Electronic	9B62-000-032	9B62-000-332	3	Normally open NPN	6 - 24 VDC	4.8 Watts Max.	1.5 us operate 0.5 us release	1.0 Volts Max.

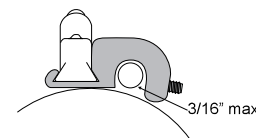
(Order Sensors and Clamps Separately)

### DIMENSIONS



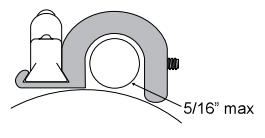
Female Cordset for Quick Connect	
Length	Part Number
6 ft	862-8MM-2
15 ft	862-8MM-5

Clamp # SOC-1



Fit bore : 1/2", 3/4" & 1-1/8"

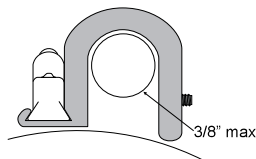
Clamp # SOC-2



Fit bore : 1-1/2" & 2"

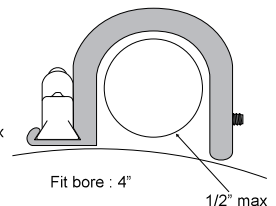
(Order Sensors and Clamps Separately)

Clamp # SOC-3



Fit bore : 2-1/2" & 3"

Clamp # SOC-4

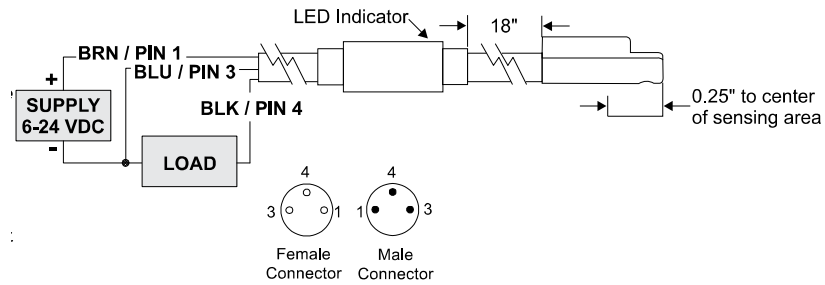


Fit bore : 4"

# SPACE ONE

## SWITCH WIRING DIAGRAM...

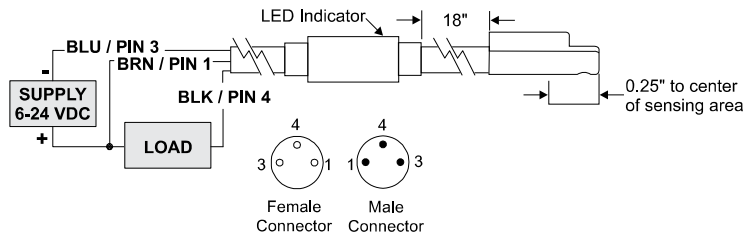
**9B62-000-031**



**9B62-000-331**

**9B62-000-032**

*-Warning-  
Power Supply  
Polarity MUST be  
observed.  
Do not exceed  
24 VDC.  
Permanent damage  
to sensor may occur.*



**9B62-000-332**

OPTIONS	SEAL KIT PART NUMBER							
	1/2"	3/4"	1-1/8"	1-1/2"	2"	2-1/2"	3"	4"
Standard	SOSK-0.50	SOSK-0.75	SOSK-1.13	SOSK-1.50	SOSK-2.00	SOSK-2.50	SOSK-3.00	SOSK-4.00
Viton (V)	SOSKV-0.50	SOSKV-0.75	SOSKV-1.13	SOSKV-1.50	SOSKV-2.00	SOSKV-2.50	SOSKV-3.00	SOSKV-4.00
Low Temp (Q)	SOSKQ-0.50	SOSKQ-0.75	SOSKQ-1.13	SOSKQ-1.50	SOSKQ-2.00	SOSKQ-2.50	SOSKQ-3.00	SOSKQ-4.00
Low Friction (L)	SOSKL-0.50	SOSKL-0.75	SOSKL-1.13	SOSKL-1.50	SOSKL-2.00	SOSKL-2.50	SOSKL-3.00	SOSKL-4.00
Low Friction/Viton (L,V)	SOSKLV-0.50	SOSKLV-0.75	SOSKLV-1.13	SOSKLV-1.50	SOSKLV-2.00	SOSKLV-2.50	SOSKLV-3.00	SOSKLV-4.00

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- Two Year Warranty
- Economic design

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- Adjustable Air Cushion Standard
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- Economic Design

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FEATURES	BENEFITS
No Rod Displacement on Engagement	Maintains Accurate Positioning
Large Clamping Surface	Consistent Clamping Force
180° Rotated (standard) NFPA A1E	Suitable for High-Temp Areas
Fast Response Time	High Cycle Rates, Accuracy
Extremely Low Backlash	Precision Holding
Spring-Engaged Links	Holds Load During Power/Pressure Loss
Rated for 2,750,000 Cycles	Long, Maintenance-Free Life
4 bar (60 psi) Release Pressure	Compact Unit, Easy Integration
	Broad Application

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**MULTI-STAGES NFPA STYLE MOUNT**

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