

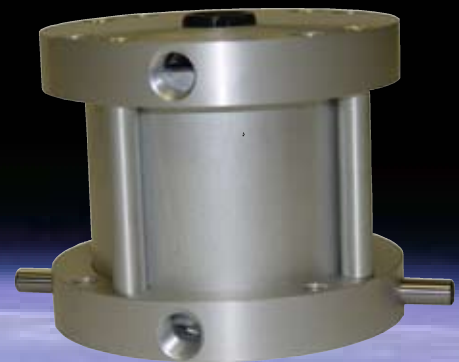


STARCYL

AIR CYLINDERS

SPACE ONE

Space, The Final Frontier ...



Space Saver Air Cylinders

SPACE ONE

DESIGN FEATURES...

Rod In Stainless Steel Or Option High-strength Steel Nitro-Carburized

Oilite Bronze rod bearing provides maximum support.

all Screws are in Zinc Plated steel For corrosion resistance

Depending of bore, for small stroke under 1" a one piece machined rod/piston will be use for more resistance, Stainless Steel STD, option Nitro-Carburized 100 Ksi

Clear Anodized Aluminum end caps for strength

Aluminum alloy, heavy wall tube with file hard inside diameter for maximum wear resistance

O-ring - Carboxylated nitrile for superior sealing and long life, Optional Low friction lip type piston seals are available which increase cylinder length.

We designed the SO series with an heavier cap than competition to prevent impact damages.

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 ²	0.50"	3.1 in ²	2.00"
.40 in ²	0.75"	5.0 in ²	2.50"
1.0 in ²	1.13"	7.0 in ²	3.00"
1.7 in ²	1.50"	12.5 in ²	4.00"

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

SO **P1** - **1.50** x **1.500** - **CB**

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 ends¹
- T1 Trunnion mount, front¹
- T2 Trunnion mount, rear¹
- X0 Threaded mounting holes, both ends²
- X1 Threaded mounting holes, front²
- X2 Threaded mounting holes, rear²
- S3 Screw clearance holes, both ends³
- S1 Screw clearance holes, front³
- S2 Screw clearance holes, rear³
- N1 Nose mount for SO, SOR, SOS⁴

¹ Not available in 1/2" bore

² for smaller tapped holes than the threaded holes standard with every SO

³ "Screw clearance" to allow bolt head to pass through; No Counter bore

⁴ Included heavy duty rear head and rod wiper

MOUNTING OPTIONS (PAGE 8)

- B Bumpers, both ends¹
- HB Bumpers, front only¹
- CB Bumpers, rear only¹
- 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 operation²
- 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)

¹ Stroke is reduced by .03 per end; .06 for option B; BR only for SOS; BF only for SOR

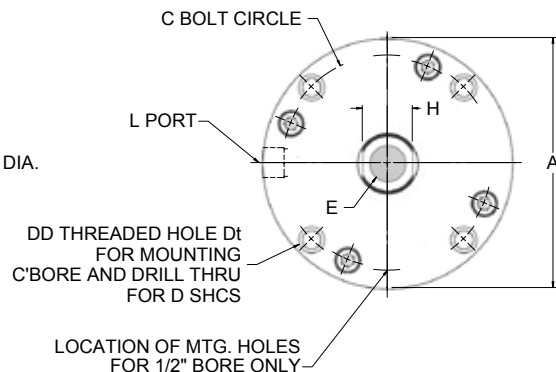
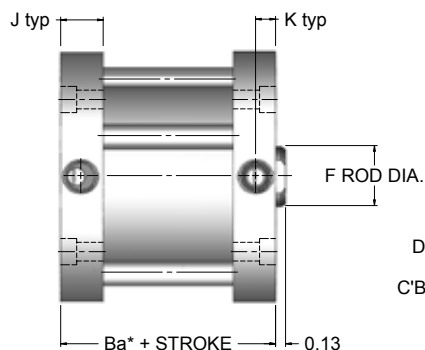
² Not available in 1/2" bore

SPACE ONE

BASIC DIMENSIONS...

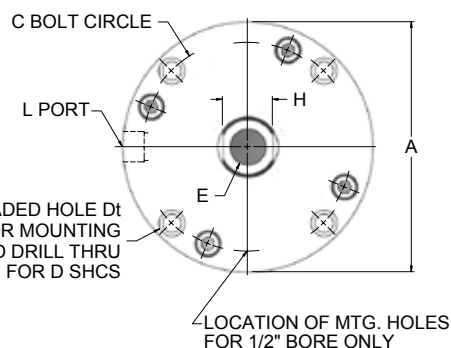
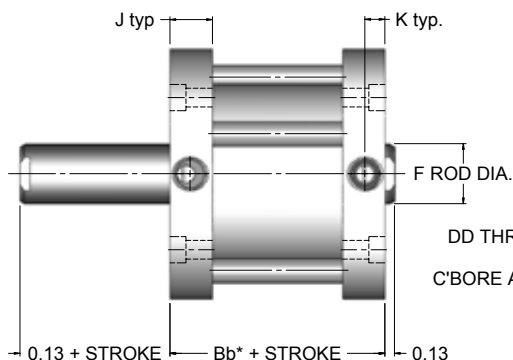
MODEL SO

Double acting, Single Rod



MODEL SOD

Double acting, Double Rod



Dimensions

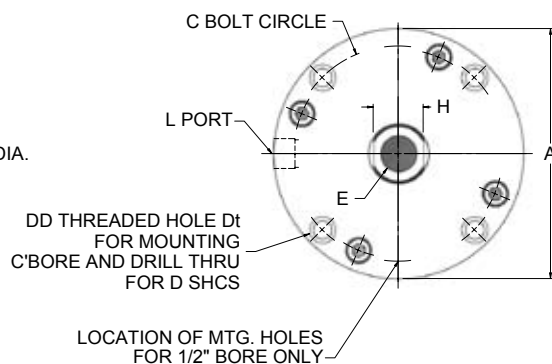
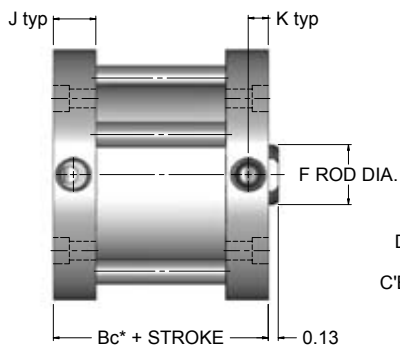
BORE	A	Ba*	Bb*	Bc* for Stroke Range				Bd* for Stroke Range				C	DD
				0-1	1.001-2	2.001-3	3.001-4	0-1	1.001-2	2.001-3	3.001-4		
1/2 (02)	1.12	0.56	0.69	0.81	1.38	1.96	2.52	1.06	1.62	2.14	3.21	.88	2
3/4 (04)	1.50	0.56	0.69	0.81	1.38	1.94	2.50	1.06	1.62	2.19	2.75	1.22	4
1-1/8 (09)	2.00	0.88	0.94	0.88	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...

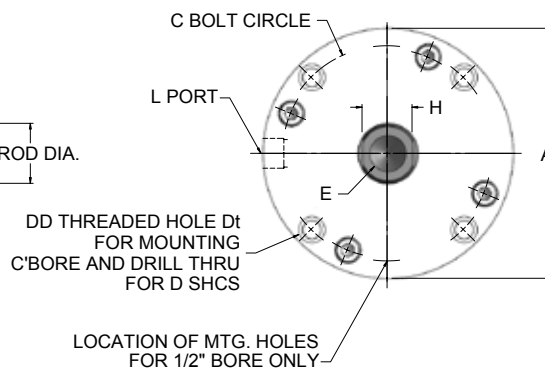
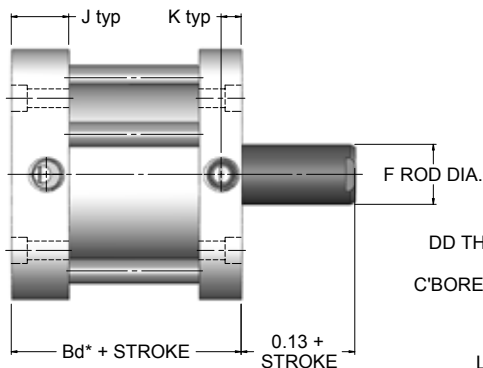
MODEL SOS

Single acting, Spring Retracted



MODEL SOR

Single acting, Spring Extended



Dimensions

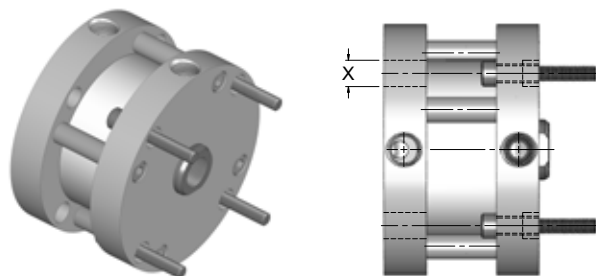
BORE	D	Dt	E (UNF)	E Depth for Stroke Range		F	H	J	K	L
				1/8 - 1/2	5/8 & +					
1/2 (02)	#4	#8-32	#8-32	0.30-0.46	0.46	0.25	0.22	0.34	0.14	#10-32
3/4 (04)	#6	#10-32	#10-32	0.30-0.46	0.46	0.31	0.25	0.34	0.14	#10-32
1-1/8 (09)	#6	#10-32	5/16-24	0.37-0.63	0.70	0.50	0.44	0.50	0.25	1/8 NPT
1-1/2 (17)	#10	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

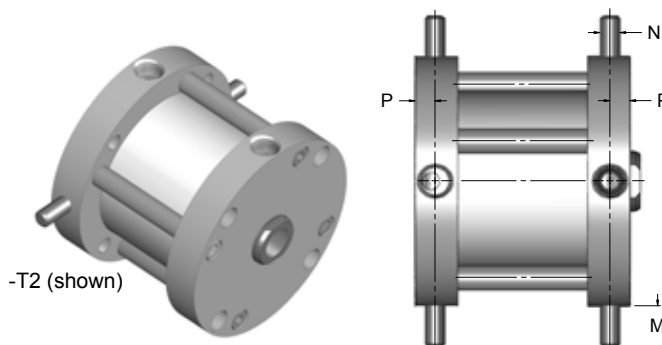
Available either or both ends.



(-S2 Rear shown).

Trunnion Mount

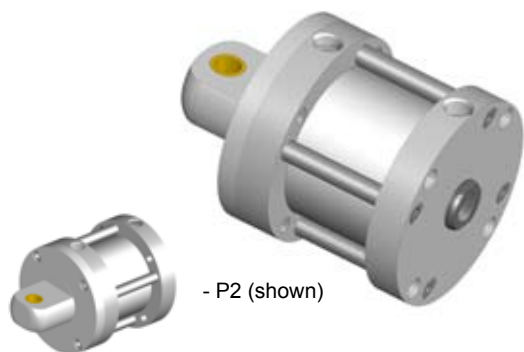
Available rear, front or both ends. Not available on 1/2" bore



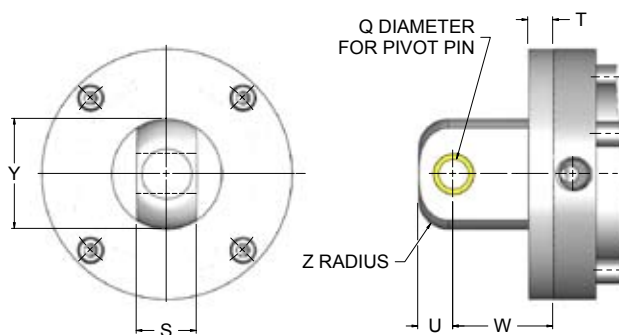
-T2 (shown)

Pivot Mount (P1)

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



- P2 (shown)



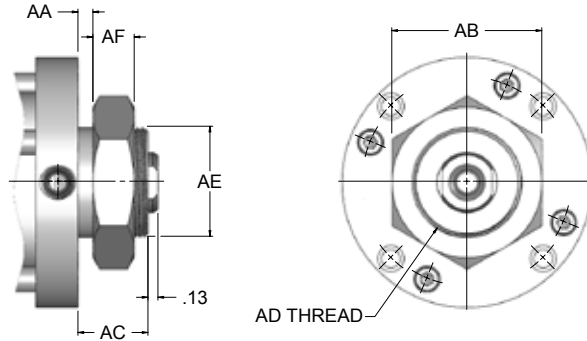
Dimensions											
BORE	M	N	P	Q	S	T	U	W	X	Y	Z
1/2 (02)	N/A	N/A	N/A	0.19	0.38	0.19	0.25	0.75	0.17	0.63	0.19
3/4 (04)	0.31	0.125	0.17	0.19	0.38	0.19	0.25	0.75	0.23	0.75	0.19
1-1/8 (09)	0.50	0.250	0.25	0.19	0.38	0.25	0.25	0.81	0.25	0.75	0.19
1-1/2 (17)	0.50	0.250	0.25	0.38	0.75	0.25	0.44	1.19	0.34	1.38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

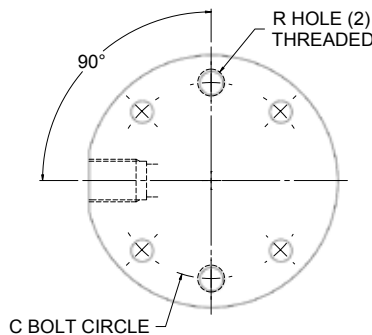


Includes rod wiper and heavy duty rear end see length adder

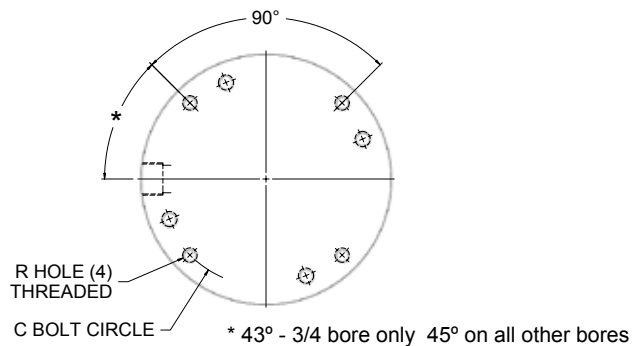
Threaded Mounting Holes

1/2" Bore

Available either or both ends (-X2 shown)



3/4" Bore & Up



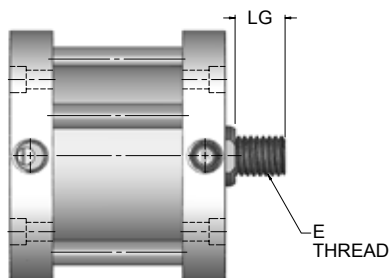
Dimensions									MAXIMUM TORQUE FOR NOSE MOUNT (Foot-Pounds)
BORE	AA	AB	AC	AD	AE	AF	C	R	
1/2 (02)	.06	0.75	0.38	1/2-20	0.50	0.31	0.88	#4-40	12
3/4 (04)	.06	0.75	0.38	5/8-18	0.62	0.25	1.22	#6-32	28
1-1/8 (09)	.13	1.50	0.75	1-14	1.00	0.55	1.69	#6-32	100
1-1/2 (17)	.13	1.88	0.75	1-1/4-12	1.25	0.52	2.19	#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

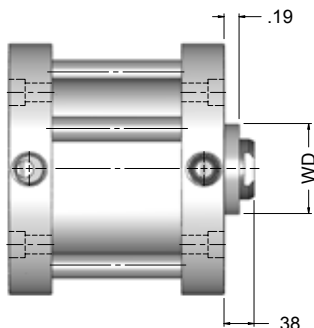
Options MRF or MRC



Thread Sizes			
BORE	E Thread		LG
	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	5/18-11	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.

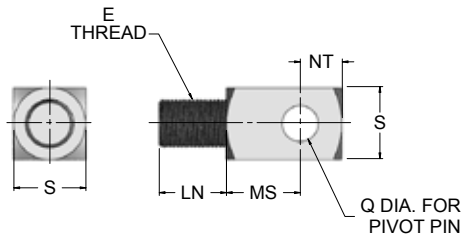
**A minimum stroke of 0.38 inches is required to sense extending end-of-stroke position. For low friction seals used in conjunction with magnetic piston, use M length adder only

SPACE ONE

ACCESSORIES ...

Rod Pivot

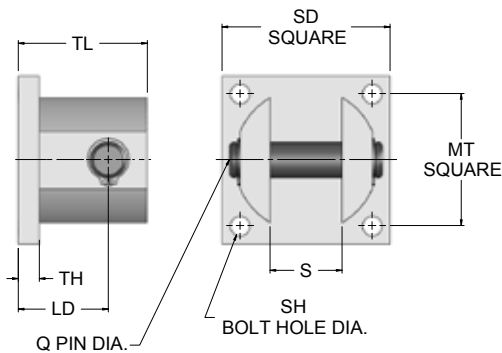
Nitrocarburized, high strength steel



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

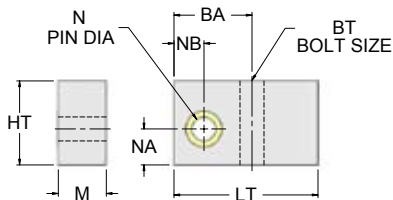


BORE	MODEL	LD	MT	Q	S	SH	SD	TH	TL
1/2 (02)	SOBC-1	0.56	0.75	0.19	0.39	#6	1.00	0.16	0.78
3/4 (04)									
1-1/8 (09)									
1-1/2 (17)	SOBC-2	0.94	1.38	0.38	0.75	#10	1.75	0.22	1.34
2 (31)									
2-1/2 (50)									
3 (70)	SOBC-3	1.25	2.00	0.63	1.00	1/4	2.50	0.25	1.81
4 (125)									

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)	SOBT-3	0.94	5/16	1.00	1.63	0.63	0.31	0.45	0.38
2-1/2 (50)									
3 (70)	SOBT-4	1.06	3/8	1.25	1.88	0.75	0.38	0.55	0.44
4 (125)									

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

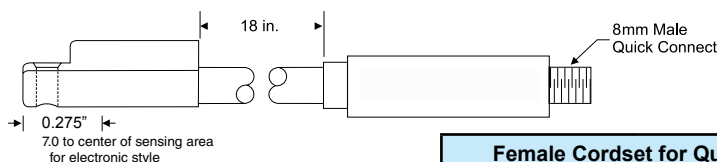
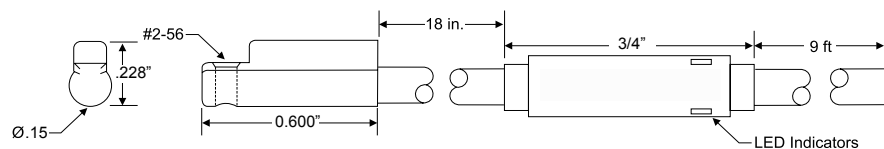
The Starcyl Switch Series 9B62 combines an ultra-miniature sensor with an in-line module. The 9B62 is designed to exceed stringent customer requirements for miniature size without sacrificing features associated with much larger sensors. Those features include reverse polarity protection, surge suppression, 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 # ¹	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.

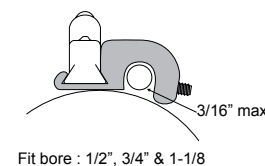
(Order Sensors and Clamps Separately)

DIMENSIONS

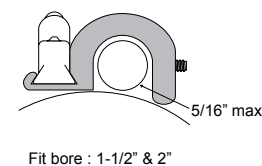


Female Cordset for Quick Connect	
Length	Part Number
6 ft	862-8MM-2
15 ft	862-8MM-5

Clamp # SOC-1

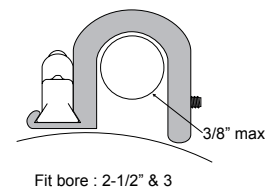


Clamp # SOC-2

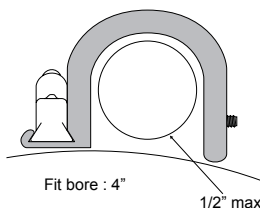


(Order Sensors and Clamps Separately)

Clamp # SOC-3



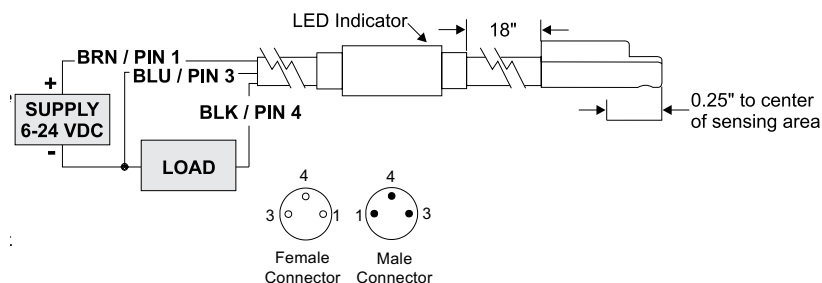
Clamp # SOC-4



SPACE ONE

SWITCH WIRING DIAGRAM...

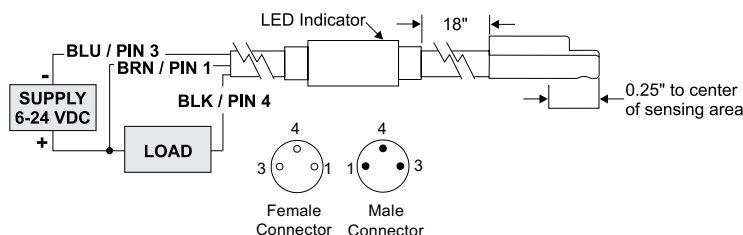
9B62-000-031



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

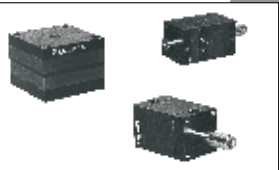
OPTIONS	SEAL KIT PART NUMBER							
	1/2"	3/4"	1-1/8"	1-1/2"	2"	2-1/2"	3"	4"
Standard	SOSK-0.50	SOSK-0.75	SOSK-1.13	SOSK-1.50	SOSK-2.00	SOSK-2.50	SOSK-3.00	SOSK-4.00
Viton (V)	SOSKV-0.50	SOSKV-0.75	SOSKV-1.13	SOSKV-1.50	SOSKV-2.00	SOSKV-2.50	SOSKV-3.00	SOSKV-4.00
Low Temp (Q)	SOSKQ-0.50	SOSKQ-0.75	SOSKQ-1.13	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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...To boldly go where no cylinder
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STARCYL
AIR CYLINDERS

**NFPA
ROD LOCK
CYLINDER**



**ST3RL
option**

FEATURES	BENEFITS
No Rod Displacement on Engagement	Maintains Accurate Positioning
Large Clamping Surface	Consistent Clamping Force
1/2" Rod Lock (vs. 1/4" Rod Lock)	Suitable for Wash-Down Areas
Fast Response Time	High Cycle Rate, Accuracy
Extremely Low Backlash	Precision Holding
Spring-Engaged Units	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

STARCYL
AIR CYLINDERS

MULTI-STAGES



**M3
SERIES**

MULTI-STAGES NFPA STYLE MOUNT

HEAVY DUTY - HIGH FLOW

NOMINAL PRESSURE: AIR 250 PSI

STANDARD BORE SIZES 1.5" THROUGH 10"

STROKE UP TO 18"

NFPA STYLE MOUNT

TWO-YEAR WARRANTY

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STAINITE AVAILABLE ON EVERY STEEL PARTS

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**HEAVY DUTY
Hydraulic Cylinders**



**STAR6
SERIES**

HEAVY DUTY SERVICES

INDUSTRIAL TIE ROD CONSTRUCTION

NOMINAL PRESSURE: 3000 PSI

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PISTON ROD DIAMETERS 5.5" THROUGH 4"

18 STANDARD MOUNTING STYLES

STAINITE AVAILABLE ON EVERY STEEL PARTS

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