

 **American**[®]

Corrosion Resistant Air Cylinders

 **CR[®] Series**

Original CR Series

9/16 inch through
2-1/2 inch bore

All Stainless CR Series

9/16 inch through
3 inch bore



American Cylinder Co., Inc.

TABLE OF CONTENTS

Original CR SERIES

Standard Features -----	01
How to Order -----	02
Non-Standard stroke lengths -----	03
Standard stroke lengths -----	04
SNSC & SVSC dimensional data -----	05
DNSC & DVSC dimensional data -----	06
Mounting accessories -----	08
Mounting accessories cont. -----	09

ALL STAINLESS CR SERIES

Standard Features -----	10
How to Order -----	11
Standard stroke lengths -----	12
DNSS & DVSS dimensional data -----	13
DESS & VCSS dimensional data -----	14
Mounting accessories -----	15
Mounting accessories cont. -----	16

OPTIONAL SENSING SWITCHES

Optional sensing switches -----	17
Optional sensing switches cont. -----	18
Switch part numbers -----	19

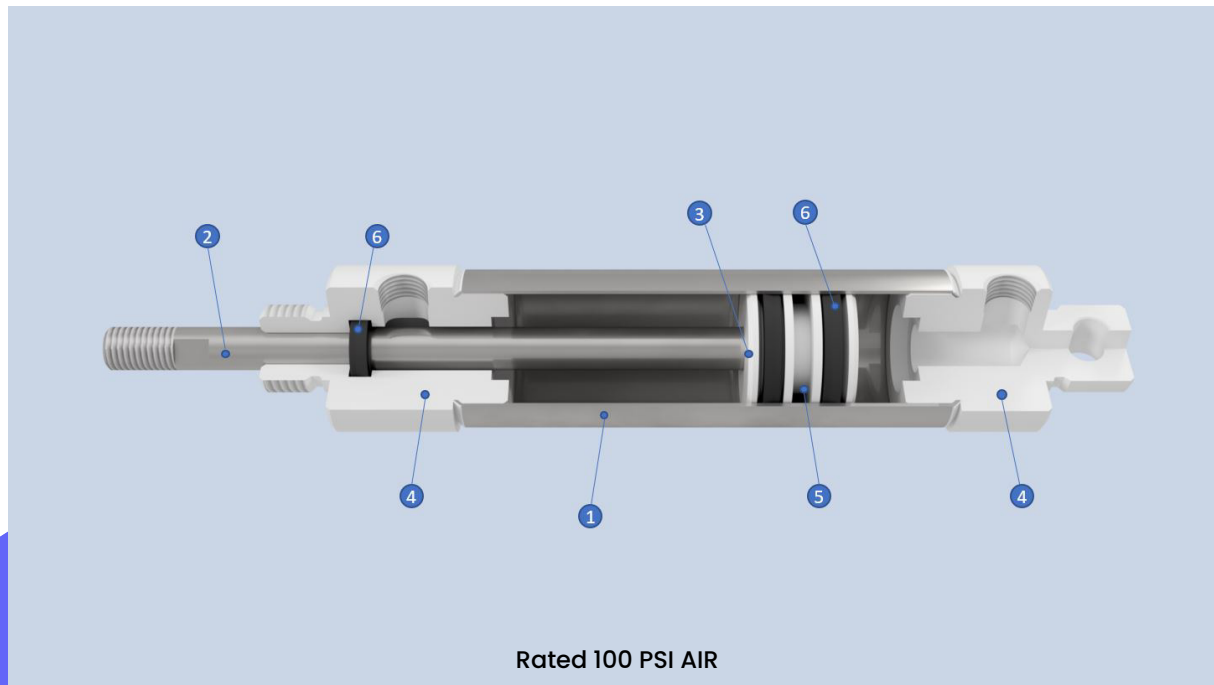
WARRANTY

Warranty Information -----	20
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ORIGINAL CR[®] SERIES

STANDARD FEATURES



1 Stainless Steel Cylinder Body:

Type 304 Stainless Steel manufactured to special mill specifications and tolerances to insure a long cylinder life.

2 Stainless Steel Rod:

Ground & Polished Type 303 Stainless Steel rods are standard.

3 Piston Rod Assembly:

Piston rods are threaded, anaerobically sealed, and machine staked into the piston.

4 End Caps (Rod Guide & Rear Head):

Made of acetal resin, a crystalline thermoplastic co-polymer made by the polymerization of formaldehyde.

5 Piston:

Pistons are made of acetal resin, a crystalline thermoplastic co-polymer made by the polymerization of formaldehyde.

Note: Pistons on double rod ends are made from a brass alloy.

6 Buna-N U-Cup Rod & Piston Seals:

Pressure energized lip type seals provide low breakaway friction and maximize cylinder life expectancy. Standard Buna-N seals are recommended for operating temperatures of -20° F (-25°C) to 200° F (95°C). FDA approved & FKM seal options are available.

7 Springs:

Springs for single action cylinders are made from stainless steel and designed for millions of cycles. Special spring forces are available.

8 Prelubricated:

All cylinders are factory lubricated with a special high endurance oil mixture. FDA approved lubrication is standard with the FDA seal Option (-35). Magnalube lubrication is standard with the FKM seal option.

9 Pre-Tested:

The quality of each cylinder is assured by testing each unit for leakage prior to shipment. Quality control provides added value to American cylinders.

Original CR® Series

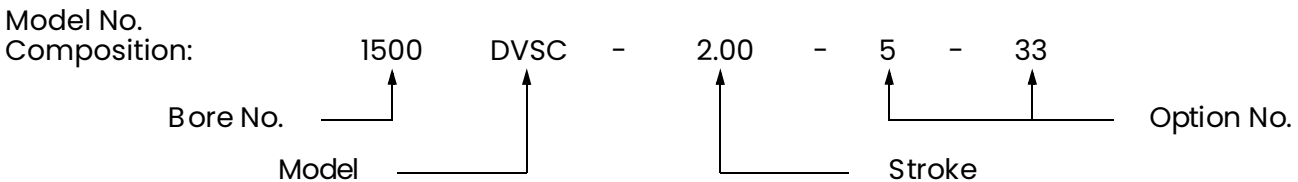
American Original CR® Series air cylinders are designed to withstand exposure to a wide range of moisture, lubricants and certain solvents. The major components of The Original CR Series air cylinders are acetal resin and stainless steel. The Original CR Series air cylinders are available in 9/16", 3/4", 1 1/16", 1 1/2", 2" and 2 1/2" bore sizes.

American Cylinder engineers and our Specials Department can design and manufacture special cylinders to meet the needs of your unusual or difficult applications. Contact your American Cylinder Distributor or the factory direct with your special requirements.

HOW TO ORDER:

Example: 1 1/2" Bore Double Acting Universal Mount Original CR® Series Cylinder
2" Stroke -Quad-X Wiper/Seal - Ports Rotated 90°

Model No.: 1500DVSC-2.00-5-33



Bore	No.	Model Description	Model	Standard Options	No.
9/16"	562	Single Acting Nose Mount	SNSC	1/8" Additional Rod Extension	1 ^d
3/4"	750	Single Acting Universal Mount	SVSC	Unmilled Threaded Rear Mtg. Stud	3
1 1/16"	1062	Double Acting Nose Mount	DNSC	Magnetic Field Piston	4
1 1/2"	1500	Double Acting Universal Mount	DVSC	Quad-X Wiper/Seal	5 ^b
2"	2000	Double End Rod	DESC	Magnalube® Lubrication	6
2 1/2"	2500	Volume Chamber	VCSC	No Rod Threads & Flats - Std. Rod Extension	9
				Fluoroelastomer Seals & Magnalube®	31 ^a
				Ports Rotated 90° (counterclockwise)	33
				FDA Seals & Lubrication	35
				Quad-X Seal in Front Piston Groove	51 ^c
				Side Port Rear Cap	38
				"UNC" Coarse Rod Threads	91

a. The specification of Fluoroelastomer Seals on Original CR® Series cylinders is for chemical compatibility only, not high temperature service.

b. In addition to standard U-Cup rod seal. Not available on 9/16" bore.

c. Not available on 9/16" bore. Also, not available on any Single acting models.

d. Only available on 1 1/16" bore.

NON-STANDARD STROKE LENGTHS

American Cylinder's Specials Department will produce cylinders with non-standard and fractional stroke lengths. Consult your local distributor for non-standard stroke cylinder pricing. Fractional stroke cylinder lengths can be determined as illustrated by the following examples:

Single Acting Cylinders

Calculate the length of the next longer whole inch increment of stroke and subtract the difference between desired stroke and the next longer whole inch increment of stroke.

Example: 1062 SVS - 1.75

Step 1: Calculate length for next largest whole inch increment.

$$\begin{array}{r}
 \text{1062 SVS Base Length, (Dim. A)} = 2.81'' \\
 \text{Plus: (Dim. B) x Stroke Increment} \\
 \quad 1.56 \times 2.00 = 3.12'' \\
 \hline
 \text{Length of 2'' Stroke} = 5.93''
 \end{array}$$

Step 2: Subtract desired stroke from stroke increment used above

$$\begin{array}{r}
 \text{Whole inch stroke used in Step 1} = 2.00'' \\
 \text{Less: 1.75'' Desired Stroke} = 1.75'' \\
 \hline
 \text{Stroke Difference} = 0.25''
 \end{array}$$

Step 3: Subtract stroke difference from length calculated in Step 1.

$$\begin{array}{r}
 \text{Length of 1062 SVS - 2.00, (Step 1)} = 5.93'' \\
 \text{Less: Stroke Difference, (Step 2)} = 0.25'' \\
 \hline
 \text{Length of 1062 SVS - 1.75} = 5.68''
 \end{array}$$

Note: Standard stroke lengths are listed on page 4

Double Acting Cylinders

Add desired stroke length to base length of the cylinder.

Example: 1062 DNS - 2.75

$$\begin{array}{r}
 \text{1062 DNS Base Length, (Dim. A)} = 3.12'' \\
 \text{Plus: Stroke Length} = 2.75'' \\
 \hline
 \text{Length of 1062 SVS - 1.75} = 5.87''
 \end{array}$$

STANDARD STROKE LENGTHS

Single Acting:

Models SNSC & SVSC - Page 5

Bore	Standard Stroke Lengths (in.)	Spring Forces		Length Adders Based on Options	Power Factor
		Rod Ret.	Rod Ext.	(-38)	
9/16"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4	2.0	4.0	0.09	0.25
3/4"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4	3.0	6.0	0.28	0.44
1 1/16"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4	3.0	6.0	0.25	0.89
1 1/2"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4	6.0	12.0	0.25	1.77

Double Acting:

Models DNSC & DVSC - Page 6 VCSC - Page 7

Bore	Standard Stroke Lengths (in.)	Length Adders		Based on Options		Power Factor	
		(-4)	(-32)	(-4) & (-32)	(-38)	Push	Pull
9/16"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4	0.00 ^a	0.12 ^a	0.12 ^a	0.09	0.25	0.22
3/4"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6	0.28 ^a	0.28 ^a	0.53 ^a	0.28	0.44	0.39
1 1/16"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6	0.00	0.25 ^a	0.25 ^a	0.25	0.89	0.81
1 1/2"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6	0.12 ^a	0.25 ^a	0.37 ^a	0.25	1.77	1.62
2"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6, 8, 10, 12	0.00	0.25 ^a	0.25 ^a	0.37	3.14	2.83
2 1/2"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6, 8, 10, 12	0.00	0.00 ^a	0.00 ^a	0.37	4.91	4.60

NOTES: a - Piston material will become Aluminum

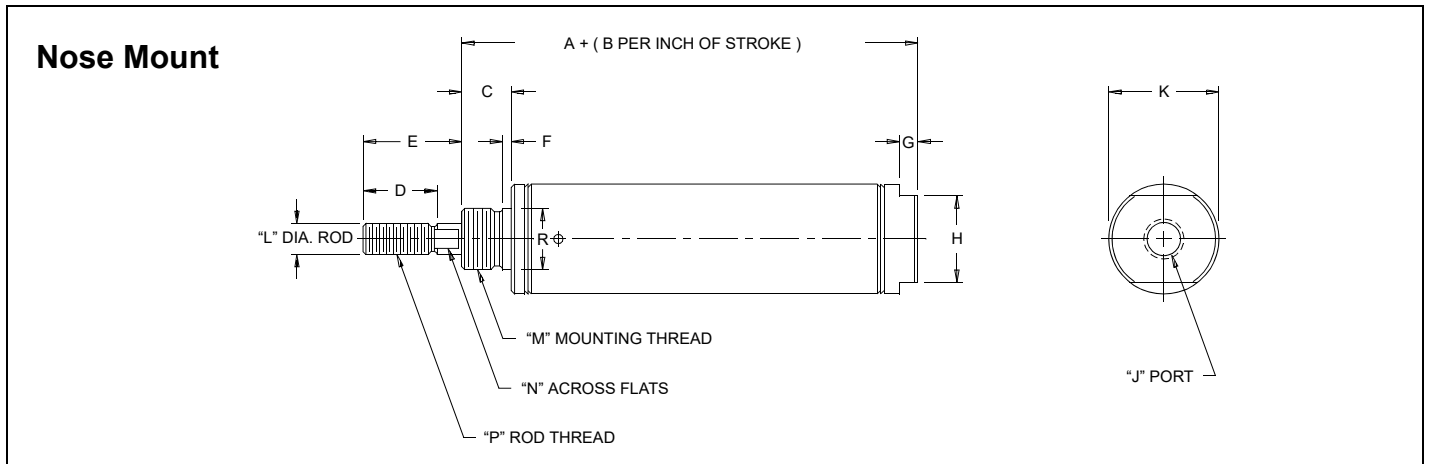
Models DESC - Page 7

Bore	Standard Stroke Lengths (in.)	Length Adders		Based on Options	Power Factor
		(-4)	(-32)	(-4) & (-32)	
9/16"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4	0.00	0.12	0.12	0.22
3/4"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6	0.00	0.00	0.25	0.39
1 1/16"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6	0.37	0.50	0.50	0.81
1 1/2"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6, 8, 10, 12	0.00	0.12	0.25	1.62
2"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6, 8, 10, 12	0.00	0.25	0.25	2.83
2 1/2"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6, 8, 10, 12	0.00	0.00	0.00	4.60

SINGLE ACTING:

Original CR® Series – Model SNSC

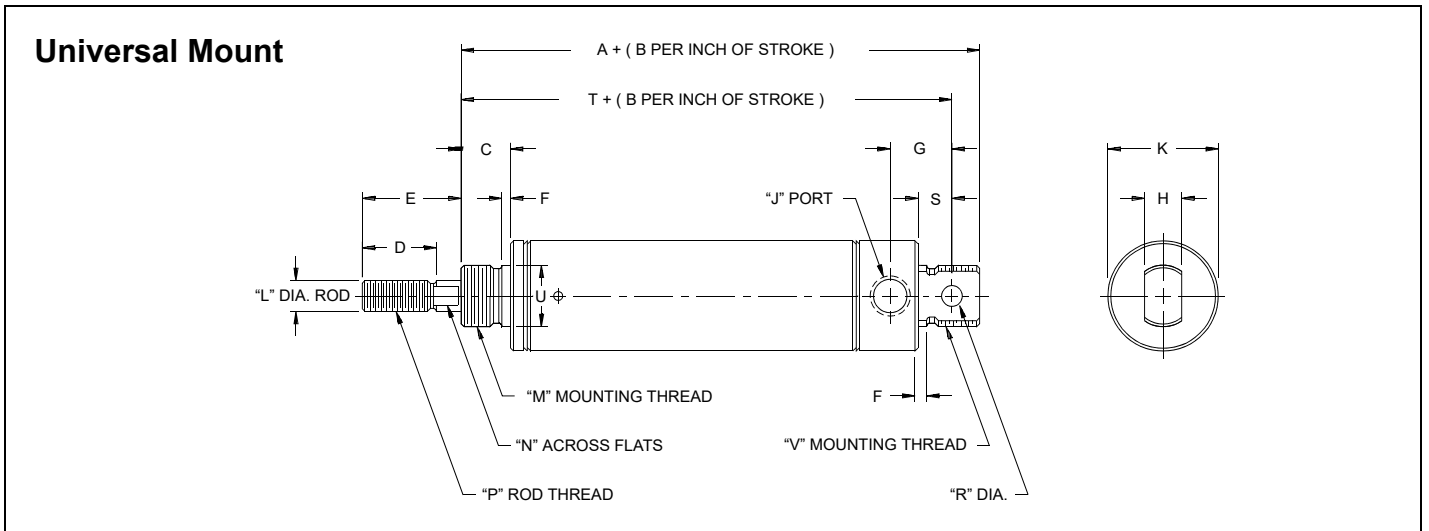
Single Acting Nose Mount



Dimension															Mounting Accessories		
Bore	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R*	Foot Bkt.	Mtg. Nut
9/16"	1.46	1.62	.37	.50	0.50	.05	.18	.50	10-32	0.62	.18	7/16-20	--	10-32	0.43	MS11SD	MS15SD
3/4"	1.65	1.68	.43	.50	0.50	.05	.18	.62	1/8 NPT	0.87	.25	1/2-20	.21	1/4-28	0.50	MS21SS	MS25SS
1 1/16"	1.93	1.56	.50	.50	0.50	.05	.18	.87	1/8 NPT	1.18	.31	5/8-18	.25	5/16-24	0.62	MS21	MS25
1 1/2"	2.12	1.68	.62	.75	1.00	.09	.18	.87	1/8 NPT	1.62	.43	1-14	.37	7/16-20	1.00	MS61	MS65

Original CR® Series – Model SVSC

Single Acting Universal Mount

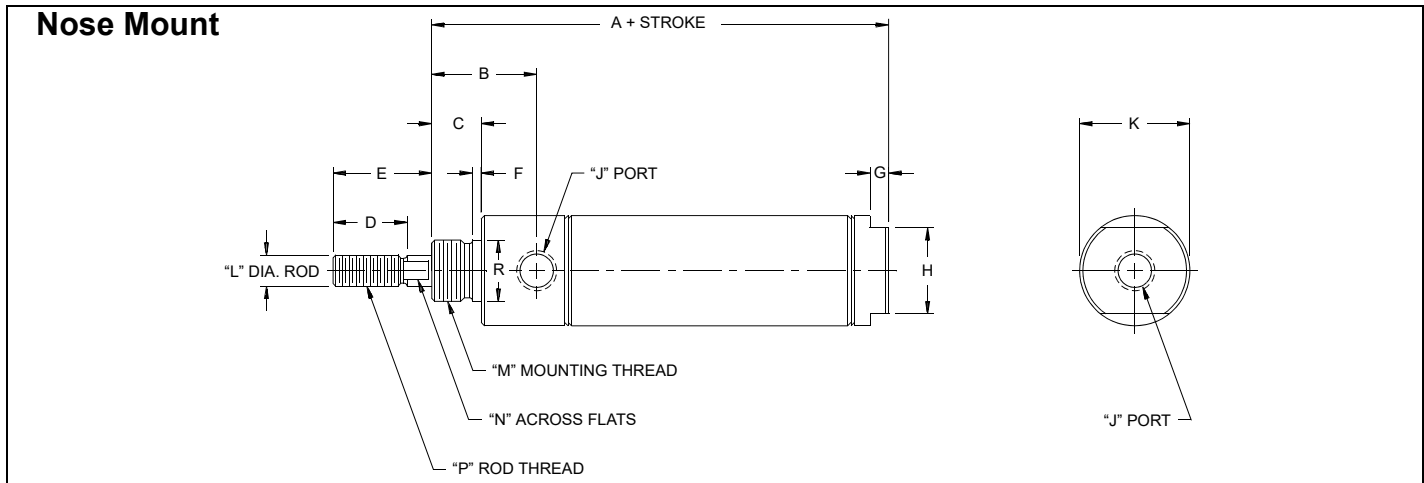


Dimension																		Mounting Accessories				
Bore	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U*	V	Foot Bkt.	Pivot Bkt.	Rod Clevis
9/16"	2.00	1.62	.37	.50	0.50	.05	.43	.31	10-32	.62	.18	7/16-20	--	10-32	.15	.25	1.81	0.43	7/16-20	MS11SD	MS15SD	MS14S
3/4"	2.56	1.68	.43	.50	0.50	.05	.62	.37	1/8 NPT	0.87	.25	1/2-20	.21	1/4-28	.25	.34	2.28	0.62	5/8-18	MS21SS	MS23SP	MS24S
1 1/16"	2.81	1.56	.50	.50	0.50	.05	.62	.37	1/8 NPT	1.18	.31	5/8-18	.25	5/16-24	.25	.34	2.53	0.62	5/8-18	MS21	MS23SP	MS24
1 1/2"	3.25	1.68	.62	.75	1.00	.09	.81	.62	1/8 NPT	1.62	.43	1-14	.37	7/16-20	.37	.50	2.87	1.00	1-14	MS61	MS63SP	MS64S

DOUBLE ACTING:

Original CR® Series – Model DNSC

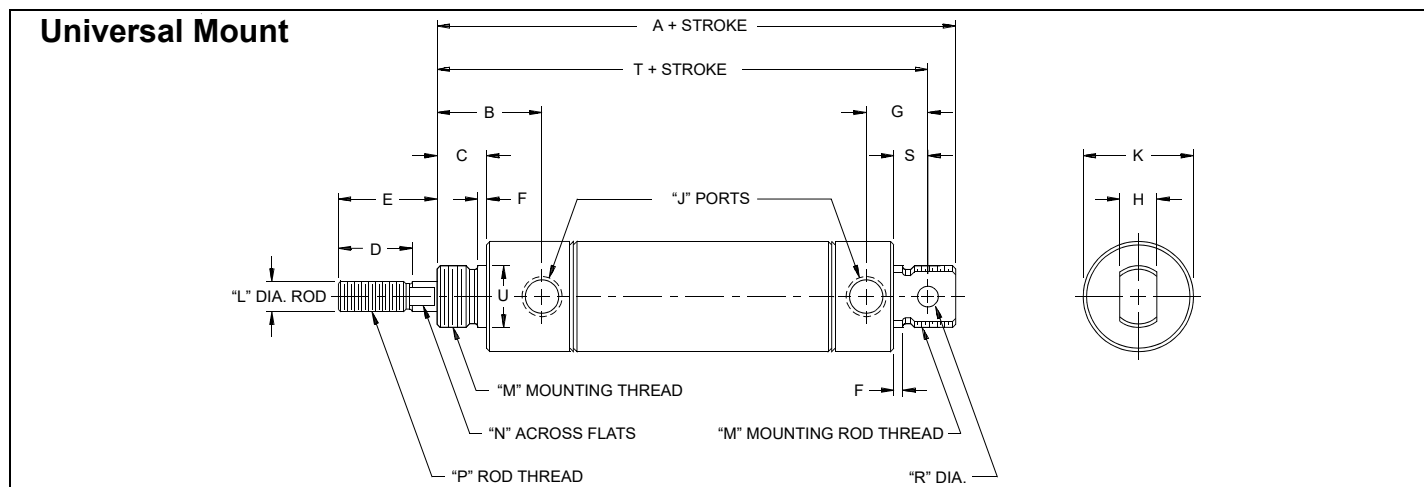
Double Acting Nose Mount



Bore	Dimension														Mounting Accessories		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R*	Foot Bkt.	Mtg. Nut
9/16"	2.21	0.75	.37	.50	0.50	.05	.18	0.50	10-32	0.60	.18	7/16-20	--	10-32	0.43	MS11SD	MS15SD
3/4"	3.18	0.96	.50	.50	0.50	.05	.18	0.62	1/8NPT	0.87	.25	5/8-18	.21	1/4-28	0.62	MS21	MS25
1 1/16"	3.25	1.03	.50	.50	0.50	.05	.18	0.87	1/8NPT	1.18	.31	5/8-18	.25	5/16-24	0.62	MS21	MS25
1 1/2"	3.37	1.12	.62	.75	1.00	.09	.18	0.87	1/8NPT	1.62	.43	1-14	.37	7/16-20	1.00	MS61	MS65
2"	4.31	1.50	.81	.87	1.25	.10	.25	1.25	1/4NPT	2.12	.62	1 1/4-12	.56	1/2-20	1.25	MS81S	MS85
2 1/2"	4.31	1.50	.81	.87	1.25	.12	.25	1.50	1/4NPT	2.61	.62	1 3/8-12	.56	1/2-20	1.50	MS91S	MS95

Original CR® Series – Model DVSC

Double Acting Universal Mount

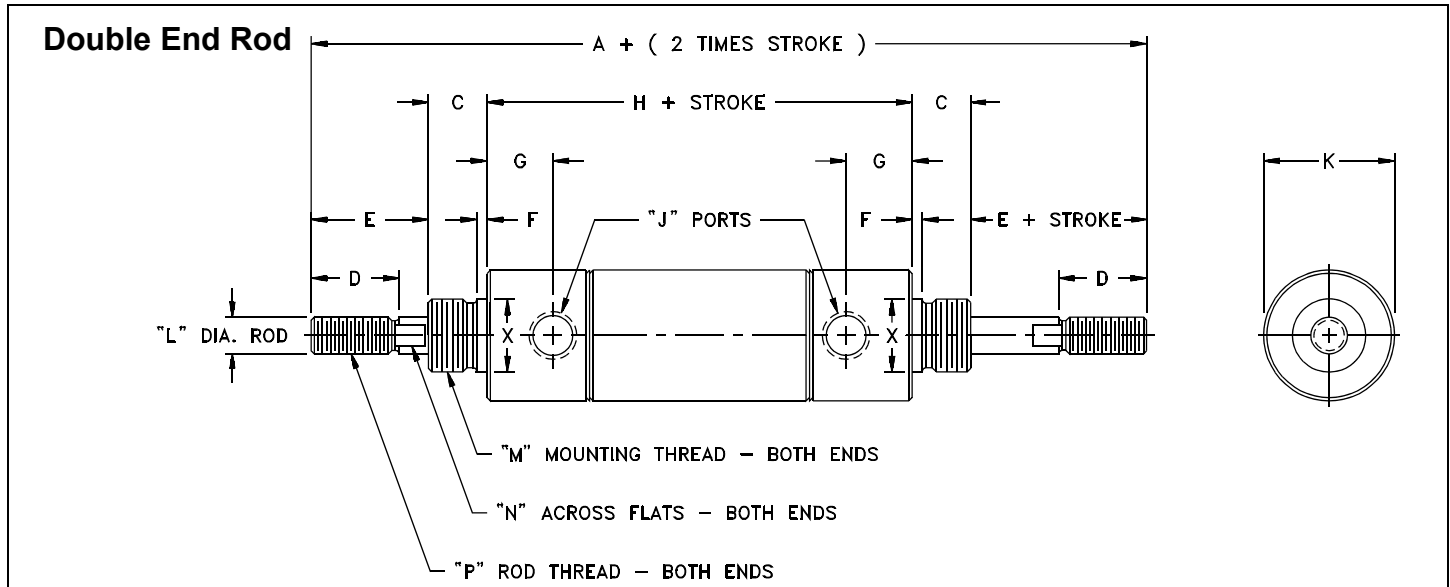


Bore	Dimension																Mounting Accessories				
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U*	Foot Bkt.	Pivot Bkt.	Rod Clevis
9/16"	2.75	0.75	.37	.50	0.50	.05	.43	.31	10-32	0.60	.18	7/16-20	--	10-32	.15	.25	2.56	0.43	MS11SD	MS15SD	MS14S
3/4"	4.09	0.96	.50	.50	0.50	.05	.62	.37	1/8NPT	0.87	.25	5/8-18	.21	1/4-28	.25	.34	3.81	0.62	MS21	MS23SP	MS24S
1 1/16"	4.12	1.03	.50	.50	0.50	.05	.62	.37	1/8NPT	1.18	.31	5/8-18	.25	5/16-24	.25	.34	3.84	0.62	MS21	MS23SP	MS24
1 1/2"	4.50	1.12	.62	.75	1.00	.09	.81	.62	1/8NPT	1.62	.43	1-14	.37	7/16-20	.37	.50	4.12	1.00	MS61	MS63SP	MS64S
2"	5.68	1.50	.81	.87	1.25	.10	.93	.75	1/4NPT	2.12	.62	1 1/4-12	.56	1/2-20	.37	.56	5.25	1.25	MS81S	MS93SP	MS94
2 1/2"	5.68	1.50	.81	.87	1.25	.12	.93	.75	1/4NPT	2.61	.62	1 3/8-12	.56	1/2-20	.37	.56	5.25	1.50	MS91S	MS95	MS94

DOUBLE ACTING:

Original CR® Series - Model DESC

Double End Rod

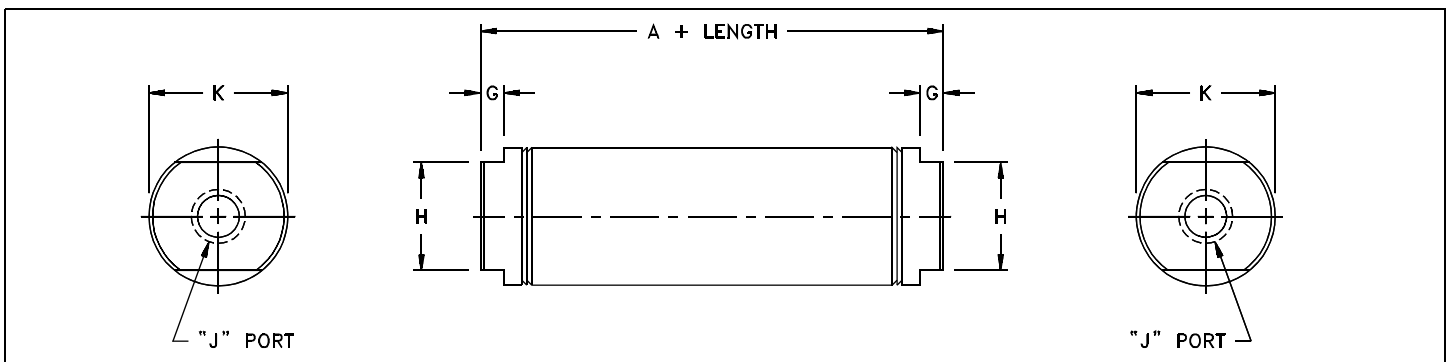


Dimension															Mounting Accessories		
Bore	A	C	D	E	F	G	H	J	K	L	M	N	P	X	Foot Bkt.	Rod Clevis	Mtg. Nut
9/16"	3.93	0.37	0.50	0.50	.05	.37	2.18	10-32	0.60	.18	7/16-20	--	10-32	0.43	MS11SD	MS14S	MS15SD
3/4"	5.56	0.50	0.50	0.50	.05	.46	3.56	1/8NPT	0.87	.25	5/8-18	.21	1/4-28	0.62	MS21	MS24S	MS25
1 1/16"	5.25	0.50	0.50	0.62	.05	.56	3.00	1/8NPT	1.18	.31	5/8-18	.25	5/16-24	0.62	MS21	MS24	MS25
1 1/2"	6.62	0.62	0.75	1.00	.09	.62	3.37	1/8NPT	1.62	.43	1-14	.37	7/16-20	1.00	MS61	MS64S	MS65
2"	8.31	0.81	0.87	1.25	.10	.68	4.18	1/4 NPT	2.12	.62	1 1/4-12	.56	1/2-20	1.25	MS81	MS94	MS85
2 1/2"	8.31	0.81	0.87	1.25	.12	.68	4.18	1/4 NPT	2.61	.62	1 3/8-12	.56	1/2-20	1.50	MS91S	MS94	MS95

VOLUME CHAMBERS:

Original CR® Series - Model VCSC*

Volume Chamber

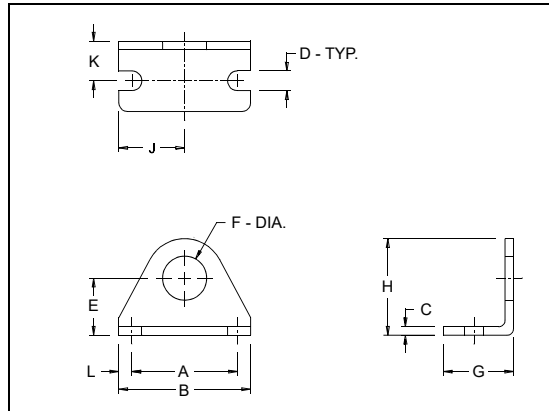


Dimension						Volume (In ³)
Bore	A	G	H	J	K	
9/16"	1.62	.18	0.50	10-32	0.60	.17 + .25 per Inch
3/4"	2.31	.18	0.62	1/8NPT	0.87	.38 + .44 per Inch
1 1/16"	2.37	.18	0.87	1/8NPT	1.18	.81 + .89 per Inch
1 1/2"	2.37	.18	0.87	1/8NPT	1.62	1.73 + 1.77 per Inch
2"	2.81	.25	1.25	1/4NPT	2.12	3.64 + 3.14 per Inch
2 1/2"	2.81	.25	1.50	1/4NPT	2.61	5.90 + 4.90 per Inch
NOTES	* Standard lengths for Volume Chambers are identical to the standard Double Acting stroke lengths.					

MOUNTING ACCESSORIES:

Dimensional Data

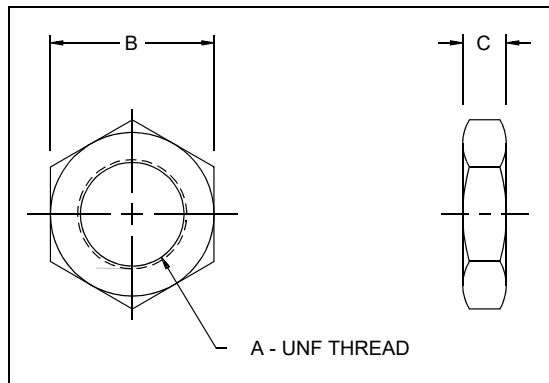
Foot Bracket



Bore	Foot Bkt. No.	Dimension										
		A	B	C	D	E	F	G	H	J	K	L
9/16"	MS11SD	1.00	1.37	.06	.18	0.56	0.43	0.62	0.93	0.68	0.31	.18
3/4" S.A.	MS21SS	1.25	1.62	.12	.18	0.68	0.50	0.75	1.09	0.81	0.43	.18
3/4"	MS21	1.50	1.87	.12	.28	0.81	0.62	1.00	1.37	0.93	0.56	.18
1 1/16"	MS21	1.50	1.87	.12	.28	0.81	0.62	1.00	1.37	0.93	0.56	.18
1 1/2"	MS61	1.87	2.37	.12	.28	1.18	1.00	1.37	2.06	1.18	0.78	.25
2"	MS81S	2.25	3.12	.25	.34	1.50	1.37	1.62	2.56	1.56	1.00	.43
2 1/2"	MS91S	2.87	3.75	.24	.34	1.75	1.50	1.62	3.06	1.87	1.00	.43

Note: One mounting nut is provided with each foot bracket ordered.

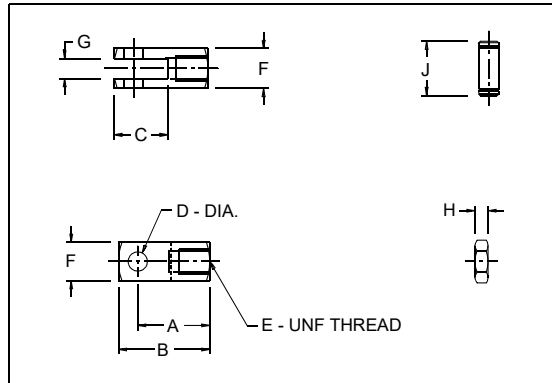
Mounting Nut



Bore	Mtg. Nut No.	Dimension		
		A	B	C
9/16"	MS15SD	7/16-20	0.68	.25
3/4" S.A.	MS25SS	1/2-20	0.74	.31
3/4"	MS25	5/8-18	0.93	.37
1 1/16"	MS25	5/8-18	0.93	.37
1 1/2"	MS65	1-14	1.50	.54
2"	MS85	1 1/4-12	1.87	.50
2 1/2"	MS95	1 3/8-12	1.87	.50

MOUNTING ACCESSORIES CONT:

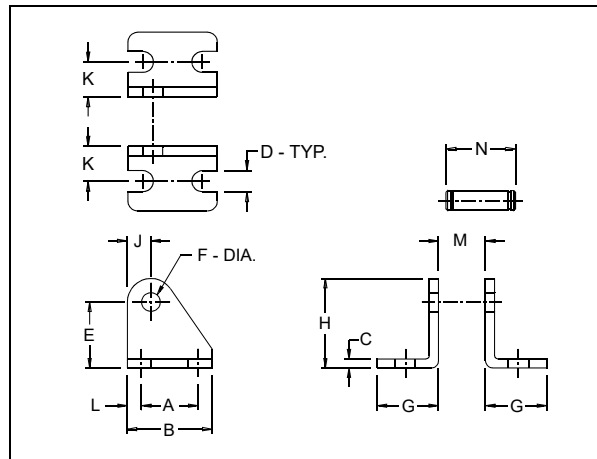
Rod Clevis



Bore	Rod Clevis No.	Dimension								
		A	B	C	D	E	F	G	H	J
9/16"	MS14S	0.75	0.93	.56	.18	10-32	.37	.18	.12	0.56
3/4"	MS24S	0.93	1.18	.68	.25	1/4-28	.50	.25	.15	0.68
1 1/16"	MS24	0.93	1.18	.68	.25	5/16-24	.50	.25	.18	0.68
1 1/2"	MS64S	1.31	1.68	.93	.37	7/16-20	.75	.37	.25	1.01
2"	MS94	1.31	1.68	.93	.37	1/2-20	.75	.37	.37	1.01
2 1/2"	MS94	1.31	1.68	.93	.37	1/2-20	.75	.37	.37	1.01

Note: Rod nut, pin and E-rings are provided with each rod clevis ordered.

Pivot Brackets

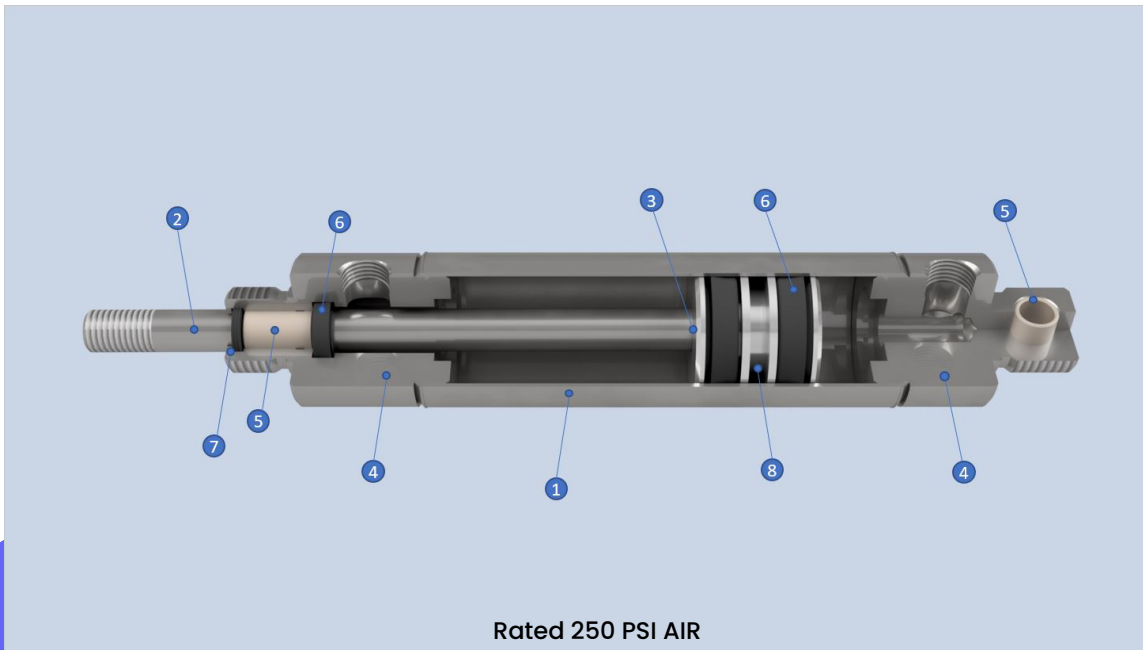


Bore	Pivot Bkt. No.	Dimension												
		A	B	C	D	E	F	G	H	J	K	L	M	N
9/16"	MS13SP	0.50	0.75	.06	.18	0.56	.15	0.50	0.77	.20	.28	.12	.31	0.62
3/4"	MS23SP	0.75	1.12	.12	.26	0.87	.25	0.81	1.18	.31	.43	.18	.37	0.87
1 1/16"	MS23SP	0.75	1.12	.12	.26	0.87	.25	0.81	1.18	.31	.43	.18	.37	0.87
1 1/2"	MS63SP	1.00	1.50	.12	.26	1.37	.37	1.00	1.75	.37	.62	.25	.62	1.18
2"	MS93	1.00	1.50	.12	.26	1.37	.37	1.00	1.75	.37	.62	.25	.75	1.31
2 1/2"	MS93	1.00	1.50	.12	.26	1.37	.37	1.00	1.75	.37	.62	.25	.75	1.31

Note: Pivot pin and E-rings are provided with each bracket ordered.

ALL STAINLESS CR® SERIES

STANDARD FEATURES



Rated 250 PSI AIR

1 Stainless Steel Cylinder Body:

Type 304 Stainless Steel manufactured to special mill specifications and tolerances to insure a long cylinder life.

2 Stainless Steel Rod:

Ground & Polished Type 303 Stainless Steel rods are standard.

3 Piston Rod Assembly:

Piston rods are threaded, anaerobically sealed, and machine staked into the piston for triple protection.

4 End Caps :

End caps are made of 303 stainless steel.

5 Rod/Pivot Bushings:

All bushings used are an FDA complaint composite material. They are compatible with all seal/lubrication options.

6 Buna-N U-Cup Rod & Piston Seals:

Pressure energized lip type seals provide low breakaway friction and maximize cylinder life expectancy. Standard Buna-N seals are recommended for operating temperatures of -20° F (-25°C) to 200° F (95°C). FDA approved seals are available as a standard Option (-35).

7 Urethane Wiper Seal:

Precision machined rod seal groove provides a smooth sealing surface while positively retaining the seal without requiring additional components and relying on press fit containment.

8 Piston:

Pistons are made of a high strength aluminum alloy. Note: Pistons on double rod end models are a brass alloy material.

9 Pre-lubricated:

All cylinders are factory lubricated with an FDA approved grease as standard. A high temp grease is substituted when the high temp FKM seal option (-31) is selected.

10 Pre-Tested:

The quality of each cylinder is assured by testing each unit for leakage prior to shipment. Quality control provides added value to American cylinders.

Product enhancements resulting from our quality improvement program may necessitate changes in specifications without notice.

All Stainless CR® Series

American All Stainless CR® Series air cylinders are designed to withstand exposure to a wide range of moisture, lubricants and certain solvents. All cylinders include the wiper option (-5) as a standard. Air cylinders are available in 9/16", 3/4", 11/16", 1 1/2", 2" and 3" bore sizes.

American Cylinder engineers and our Specials Department can design and manufacture special cylinders to meet the needs of your unusual or difficult applications. Contact your American Cylinder Distributor or the factory direct with your special requirements.

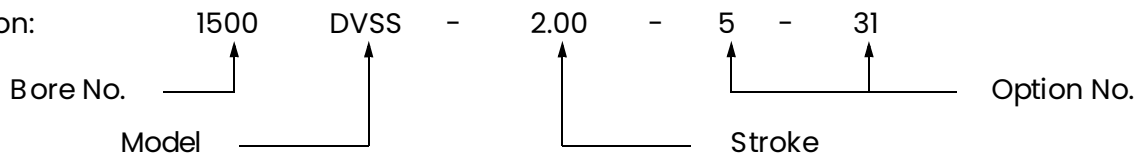
HOW TO ORDER:

Example: 1 1/2" Bore Double Acting Universal Mount All Stainless Corrosion Resistant Cylinder
2" Stroke -Quad-X Wiper/Seal - Fluoroelastomer Seals & Magnalube

Model No. 1500DVSS-2.00-5-31

Model No.

Composition:



Bore	No.	Model Description	Model	Standard Options	No.
9/16"	562	Double Acting Nose Mount	DNSS	1/8" Additional Rod Extension	1 ^a
3/4"	750	Double Acting Universal Mount	DVSS	Unmilled Threaded Rear Mtg. Stud	3
11/16"	1062	Double End Rod	DESS	Magnetic Field Piston	4 ^b
1 1/2"	1500	Volume Chamber	VCSS	Quad-X Wiper/Seal (Standard)	5 ^d
2"	2000			Magnalube® Lubrication	6
3"	3000			No Rod Threads & Flats - Std. Rod Extension	9
				Fluoroelastomer Seals & Magnalube®	31
				FDA Seals & Lubrication	35
				Quad-X Seal in Front Piston Groove	51 ^c

- a. 1 1/16" bore only.
- b. Not available on 3" bore.
- c. Not available on 9/16" bore.
- d. standard on all bore sizes.

STANDARD STROKE LENGTHS:

Double Acting:

Models DNSS & DVSS - Page 13

VCSS - Page 14

Bore	Standard Stroke Lengths (in.)	Length Adders		Based on Options	Power Factor	
		(-4)	(-32)	(-4) & (-32)	Push	Pull
9/16"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4	0.00	0.12	0.06	0.25	0.22
3/4"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6, 8, 10, 12	0.00	0.00	0.25	0.44	0.39
1-1/16"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6, 8, 10, 12	0.00	0.12	0.12	0.89	0.81
1-1/2"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6, 8, 10, 12, 14, 16, 18	0.00	0.12	0.25	1.77	1.62
2"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24	0.00	0.25	0.25	3.14	2.83
3"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24	N/A	0.25	N/A	7.06	6.62

NOTES: Stroke lengths in blue ONLY apply to DVSS & VCSS models

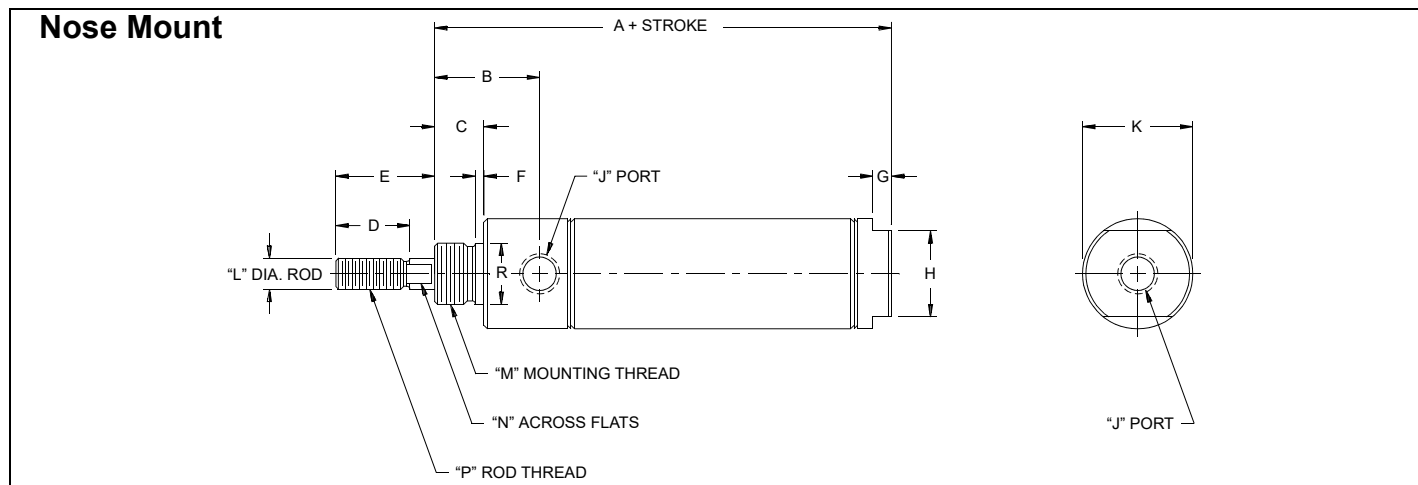
Models DESS - Page 14

Bore	Standard Stroke Lengths (in.)	Length Adders		Based on Options	Power Factor
		(-4)	(-32)	(-4) & (-32)	
9/16"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4	0.00	0.12	0.12	0.22
3/4"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6	0.00	0.00	0.25	0.39
1-1/16"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6	0.37	0.50	0.50	0.81
1-1/2"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6, 8, 10, 12	0.00	0.12	0.25	1.62
2"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6, 8, 10, 12	0.00	0.25	0.25	2.83
3"	1/2, 1, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 4-1/2, 5, 6, 8, 10, 12	N/A	0.25	N/A	6.62

DOUBLE ACTING:

All Stainless CR® Series – Model DNSS

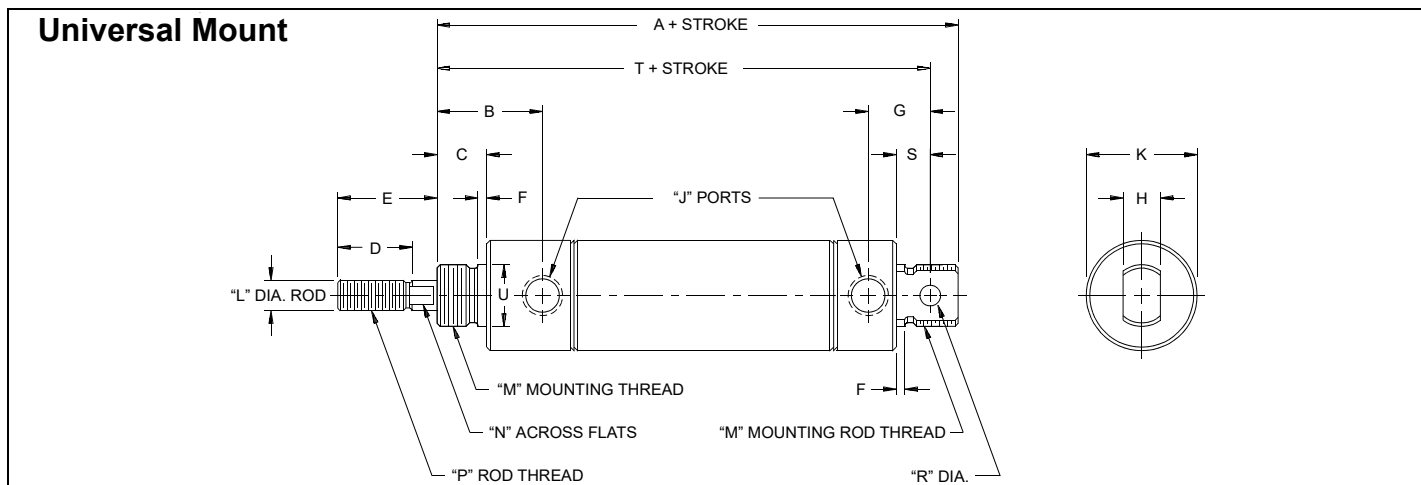
Double Acting Nose Mount



Dimension																Mounting Accessories	
Bore	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R*	Foot Bkt.	Mtg. Nut
9/16"	2.21	0.75	0.37	0.50	0.50	.05	.18	0.50	10-32	0.62	.18	7/16-20	--	10-32	0.43	MS11SD	MS15SD
3/4"	2.96	0.96	0.50	0.50	0.50	.06	.18	0.62	1/8NPT	0.86	.25	5/8-18	.21	1/4-28	0.62	MS21	MS25
1 1/16"	3.12	1.06	0.50	0.50	0.50	.09	.18	0.87	1/8NPT	1.12	.31	5/8-18	.25	5/16-24	0.62	MS21	MS25
1 1/2"	3.43	1.25	0.62	0.75	1.00	.09	.25	0.87	1/8NPT	1.56	.43	3/4-16	.37	7/16-20	0.75	MS61S	MS45
2"	4.31	1.50	0.81	0.87	1.25	.10	.25	1.25	1/4NPT	2.09	.62	1 1/4-12	.56	1/2-20	1.37	MS81S	MS85
3"	4.87	1.71	1.00	1.25	1.62	.18	.31	2.00	3/8NPT	3.12	.75	1 1/2-12	.62	5/8-18	1.62	MS101S	MS105S

All Stainless CR® Series – Model DVSS

Double Acting Universal Mount

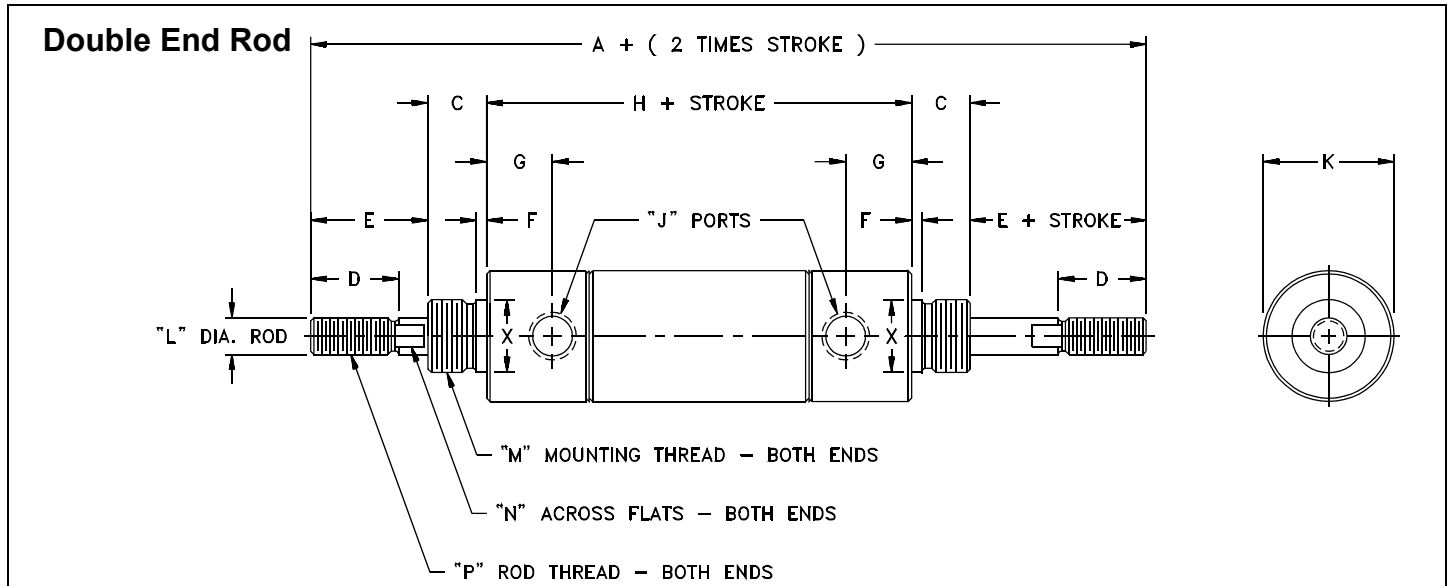


Dimension																Mounting Accessories					
Bore	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U*	Foot Bkt.	Pivot Bkt.	Rod Clevis
9/16"	2.75	0.75	0.37	0.50	0.50	.05	0.43	.31	10-32	0.62	.18	7/16-20	--	10-32	.15	.25	2.56	0.43	MS11SD	MS13SP	MS14S
3/4"	4.03	0.96	0.50	0.50	0.50	.06	0.62	.37	1/8NPT	0.86	.25	5/8-18	.21	1/4-28	.25	.34	3.75	0.62	MS21	MS23SP	MS24S
1 1/16"	4.00	1.06	0.50	0.50	0.50	.09	0.62	.37	1/8NPT	1.12	.31	5/8-18	.25	5/16-24	.25	.34	3.71	0.62	MS21	MS23SP	MS24
1 1/2"	4.50	1.25	0.62	0.75	1.00	.09	0.81	.62	1/8NPT	1.56	.43	3/4-16	.37	7/16-20	.37	.50	4.12	0.75	MS61S	MS63SP	MS64S
2"	5.68	1.50	0.81	0.87	1.25	.10	0.93	.75	1/4NPT	2.09	.62	1 1/4-12	.56	1/2-20	.37	.56	5.25	1.37	MS81S	MS93SP	MS94
3"	6.75	1.71	1.00	1.25	1.62	.18	1.34	.87	3/8NPT	3.12	.75	1 1/2-12	.62	5/8-18	.50	.81	6.12	1.62	MS101S	MS103SP	MS104S

DOUBLE ACTING:

All Stainless CR® Series – Model DESS

Double End Rod

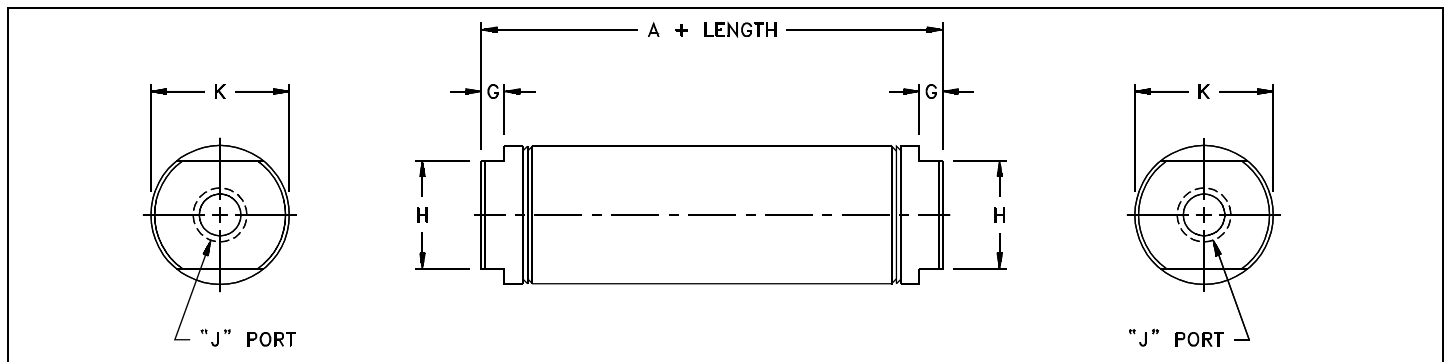


Dimension															Mounting Accessories		
Bore	A	C	D	E	F	G	H	J	K	L	M	N	P	X	Foot Bkt.	Rod Clevis	Mtg. Nut
9/16"	3.93	0.37	0.50	0.50	.06	.37	2.18	10-32	0.62	.18	7/16-20	--	10-32	0.43	MS11SD	MS14S	MS15SD
3/4"	5.00	0.50	0.50	0.50	.06	.46	3.00	1/8NPT	0.86	.25	5/8-18	.21	1/4-28	0.62	MS21	MS24S	MS25
1 1/16"	5.00	0.50	0.50	0.62	.09	.56	2.75	1/8NPT	1.12	.31	5/8-18	.25	5/16-24	0.62	MS21	MS24	MS25
1 1/2"	6.62	0.62	0.75	1.00	.09	.62	3.37	1/8NPT	1.56	.43	3/4-16	.37	7/16-20	0.75	MS61S	MS64S	MS45
2"	8.31	0.81	0.87	1.25	.10	.68	4.18	1/4NPT	2.09	.62	1 1/4-12	.56	1/2-20	1.37	MS81	MS94	MS85
3"	9.81	1.00	1.25	1.62	.18	.71	4.56	3/8NPT	3.12	.75	1 1/2-12	.62	5/8-18	1.62	MS101S	MS104S	MS105S

VOLUME CHAMBERS

All Stainless CR® Series – Model VCSS

Volume Chamber

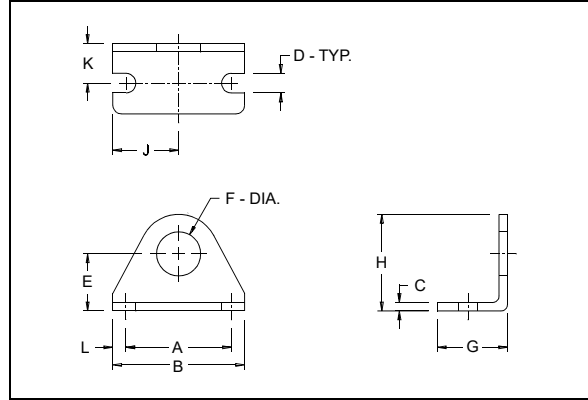


Dimension						
Bore	A	G	H	J	K	Volume (In ³)
9/16"	1.56	.18	0.50	10-32	0.62	.17 + .25 per Inch
3/4"	1.90	.18	0.62	1/8NPT	0.81	.44 + .44 per Inch
1 1/16"	2.12	.18	0.87	1/8NPT	1.12	.85 + .89 per Inch
1 1/2"	2.25	.25	0.87	1/8NPT	1.56	1.92 + 1.77 per Inch
2"	2.81	.25	1.25	1/4NPT	2.09	3.95 + 3.14 per Inch
3"	3.18	.31	2.00	3/8NPT	3.12	10.38 + 3.14 per Inch
NOTES	Standard lengths for Volume Chambers are identical to the standard Double Acting stroke lengths.					

MOUNTING ACCESSORIES:

Dimensional Data

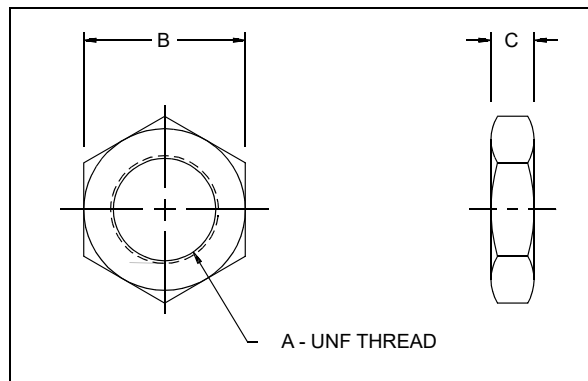
Foot Bracket



Bore	Foot Bkt. No.	Dimension										
		A	B	C	D	E	F	G	H	J	K	L
9/16"	MS11SD	1.00	1.37	.06	.21	.56	.44	.62	.93	.68	.31	.18
3/4"	MS21	1.50	1.87	.12	.28	.81	.62	1.00	1.37	.93	.56	.18
1 1/16"	MS21	1.50	1.87	.12	.28	.81	.62	1.00	1.37	.93	.56	.18
1 1/2"	MS61S	1.87	2.50	.15	.28	1.00	.75	1.50	1.75	1.25	.75	.31
2"	MS81S	2.25	3.12	.25	.34	1.50	1.37	1.62	2.56	1.56	1.00	.43
3"	MS101S	3.00	4.37	.25	.34	1.87	1.62	1.62	3.14	2.18	1.00	.43

Note: One mounting nut is provided with each foot bracket ordered.

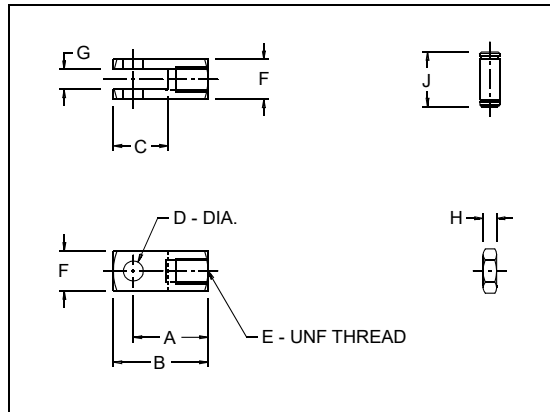
Mounting Nut



Bore	Mtg. Nut No.	Dimension		
		A	B	C
9/16"	MS15SD	7/16-20	0.68	.25
3/4"	MS25	5/8-18	0.93	.37
1 1/16"	MS25	5/8-18	0.93	.37
1 1/2"	MS45	3/4-14	1.12	.42
2"	MS85	1-1/4-12	1.87	.50
3"	MS105S	1-1/2-12	2.25	.50

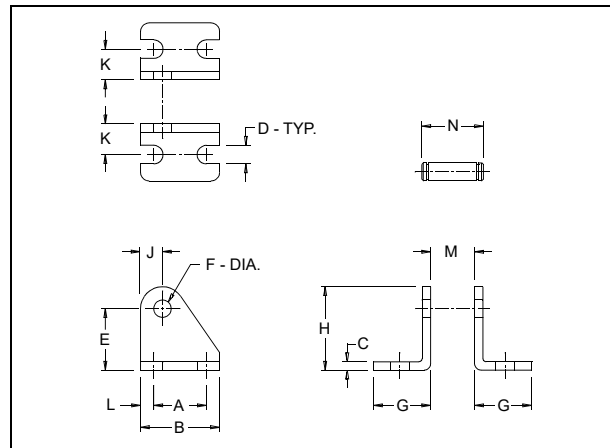
MOUNTING ACCESSORIES CONT:

Rod Clevis



Bore	Rod Clevis No.	Dimension								
		A	B	C	D	E	F	G	H	J
9/16"	MS14S	0.75	0.93	0.56	.18	10-32	0.37	.18	.12	0.56
3/4"	MS24S	0.93	1.18	0.68	.25	1/4-28	0.50	.25	.15	0.68
1 1/16"	MS24	0.93	1.18	0.68	.25	5/16-24	0.50	.25	.18	0.68
1 1/2"	MS64S	1.31	1.68	0.93	.37	7/16-20	0.75	.37	.25	1.01
2"	MS94	1.31	1.68	0.93	.37	1/2-20	0.75	.37	.37	1.01
3"	MS104S	2.25	2.75	1.50	.50	5/8-18	1.00	.51	.37	1.37

Pivot Bracket



Bore	Pivot Bkt. No.	Dimension												
		A	B	C	D	E	F	G	H	J	K	L	M	N
9/16"	MS13SP	0.50	0.75	.06	.18	0.56	.15	0.50	0.77	.20	.28	.12	.31	0.62
3/4"	MS23SP	0.75	1.12	.12	.26	0.87	.25	0.81	1.18	.31	.43	.18	.37	0.87
1 1/16"	MS23SP	0.75	1.12	.12	.26	0.87	.25	0.81	1.18	.31	.43	.18	.37	0.87
1 1/2"	MS63SP	1.00	1.50	.12	.26	1.37	.37	1.00	1.75	.37	.62	.25	.62	1.18
2"	MS93	1.00	1.50	.12	.26	1.37	.37	1.00	1.75	.37	.62	.25	.75	1.31
3"	MS103SP	1.25	1.75	.25	.26	1.75	.50	1.50	2.25	.50	.87	.25	.87	1.25

OPTIONAL SENSING SWITCHES

All cylinders ordered with the MFC (Option No. 4) can be used in conjunction with Reed or Solid State switches for position sensing. Clamping bands are included with each switch ordered and are pre-sized for easy installation. Switches must be ordered separate from cylinders as an accessory item.

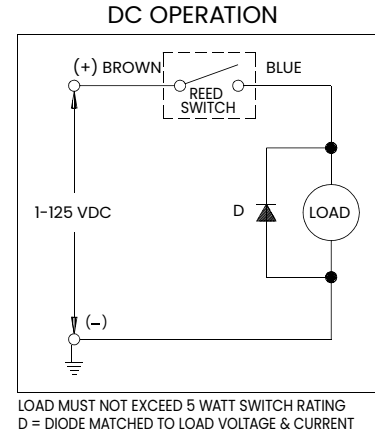
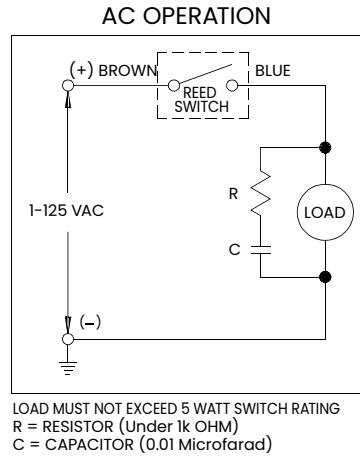
Reed Switches (AC or DC)

American's Reed Switches can be used on either AC or DC applications and are available with or without an LED indicator. In order to avoid premature contact deterioration, always operate within switch specifications listed below. Switch life can be maximized by implementing protection circuits as indicated.

SPECIFICATIONS

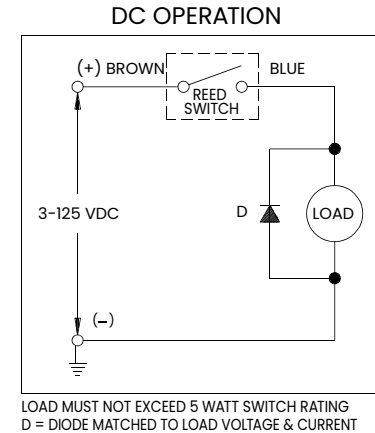
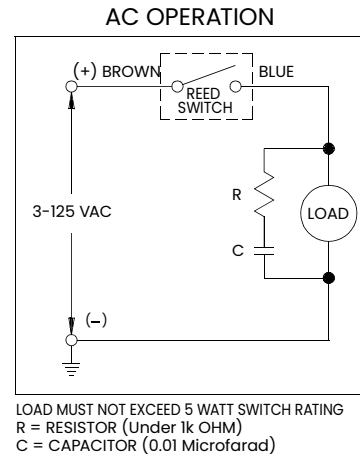
Non-LED Reed Switch

Switching Logic	Normally Open
Contact Type.....	Single Pole Single Throw
Contact Rating:	
Power	5 Watts
Voltage	1 to 125V (AC or DC)
Switching Current.....	1mA to 100mA
Breakdown Voltage.....	250 Volts
Ambient Temperature	14 °F to 140°F
Indicator	None
Plain End Lead Wire	39 in.
Enclosure Rating.....	IEC Standard IP67
DC Polarity.....	Pos. (brown) Neg. (blue)



LED Reed Switch

Switching Logic	Normally Open
Contact Type.....	Single Pole Single Throw
Contact Rating:	
Power	5 Watts
Voltage	3 to 125V (AC or DC)
Switching Current.....	10mA to 40mA
Breakdown Voltage.....	250 Volts
Ambient Temperature.....	14°F to 140°F
Indicator.....	Red LED
Plain End Lead Wire.....	39 in.
M8 Pigtail Connector	6 in.
Enclosure Rating.....	IEC Standard IP67
DC Polarity.....	Pos. (brown) Neg. (blue)



Special Notes:

- All switches are pretested at the manufacturer.
- The use of an ohmmeter is recommended whenever field testing is required. Do not use an incandescent light bulb or any other testing device which may subject the switches to inrush loads beyond their ratings.
- Do not exceed 2.5 in.-lbs. tightening torque on lock nut.
- Use integral circuits as described to maximize Reed Switch life.
- The LED Switches require a minimum current flow of 10mA for LED illumination.
- Polarity must be observed in DC applications.
- Solid State Switches have DC capability only.

OPTIONAL SENSING SWITCHES (Continued)

Solid State Switches (DC only)

American's Solid State Switches are designed for DC applications only. With no mechanical parts to wear out or arc, the solid state circuitry provides a compact, reliable positioning switch for extended service life when used within the specified parameters.

SPECIFICATIONS

Solid State Switch

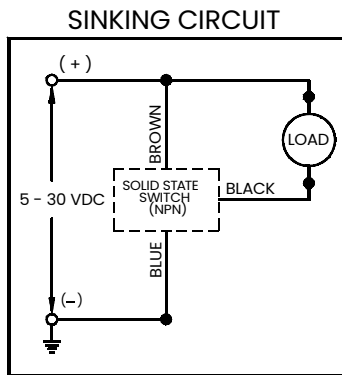
Sinking (NPN)

Switching Logic Normally Open
 Switching Voltage 5 VDC to 30 VDC
 Switching Current 100mA Max. @ 5 VDC
 200mA Max. @ 12 VDC
 200mA Max. @ 24 VDC
 Current Consumption 10mA Max. @ 12 VDC
 20mA Max. @ 24 VDC
 Ambient Temperature 14°F to 140°F
 Indicator Red LED
 Plain End Lead Wire 39 in.
 M8 Pigtail Connector 6 in.
 Enclosure Rating IEC Standard IP66

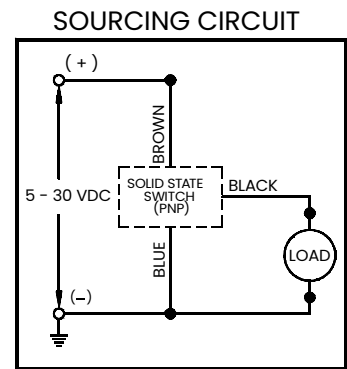
Sourcing (PNP)

Switching Logic Normally Open
 Switching Voltage 5 VDC to 30 VDC
 Switching Current 100mA Max. @ 12 VDC
 200mA Max. @ 24 VDC
 Current Consumption 7mA Max. @ 12 VDC
 14mA Max. @ 24 VDC
 Ambient Temperature 14°F to 140°F
 Indicator Green LED
 Plain End Lead Wire 39 in.
 M8 Pigtail Connector 6 in.
 Enclosure Rating IEC Standard IP66

Wiring Diagram:



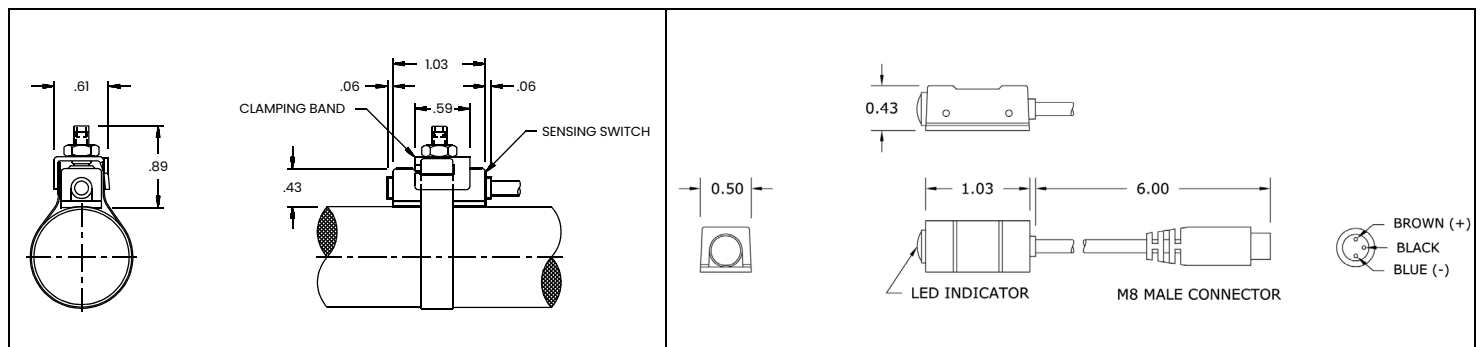
Wiring Diagram:



SWITCH DIMENSIONAL DATA

Std. Lead Wires w/Bands

Pigtail Connection Type w/Bands



SWITCH PART NUMBERS

Reed Switches

Complete with band.

Bore	Std. Lead Wires - w/Bands			Pigtail Connection Type - w/Bands			Band Only
	Non-LED 39"	LED 39"	LED 72"	LED Switch w/6" Pigtail	LED Pigtail Switch w/2M (78") Cable	LED PigtailSwitch w/5M (196") Cable	
9/16"	M16S	M16SL	M16SL-72	M16SL-PT	M16SL-PT-78	M16SL-PT-196	590-003-0
3/4"	M26S	M26SL	M26SL-72	M26SL-PT	M26SL-PT-78	M26SL-PT-196	290-008-0
1 1/16"	M36S	M36SL	M36SL-72	M36SL-PT	M36SL-PT-78	M36SL-PT-196	390-008-0
1 1/2"	M66S	M66SL	M66SL-72	M66SL-PT	M66SL-PT-78	M66SL-PT-196	690-015-0
2"	M86S	M86SL	M86SL-72	M86SL-PT	M86SL-PT-78	M86SL-PT-196	890-023-0
2 1/2"	M96S	M96SL	M96SL-72	M96SL-PT	M96SL-PT-78	M96SL-PT-196	990-115-0
Switch & Cable (no band)	MS-6	MSL-6	MSL-S-72	MSL6-PT	MSL6-PT-78	MSL6-PT-196	
Cables Only for Pigtail Switches							
					2M (78")	PT-78	
					5M (196")	PT-196	

Solid State Switches

Complete with band.

Bore	Std. Lead Wires w/ Bands		Pigtail Connection Type w/Bands						Band Only
	Sinking (NPN)	Sourcing (PNP)	Switches w/6" Pigtail		Pigtail Switch w/2M (78") Cable		PigtailSwitch w/5M (196") Cable		
			Sinking (NPN)	Sourcing (PNP)	Sinking (NPN)	Sourcing (PNP)	Sinking (NPN)	Sourcing (PNP)	
9/16"	M16SH	M16SHP	M16SH-PT	M16SHP-PT	M16SH-PT-78	M16SHP-PT-78	M16SH-PT-196	M16SHP-PT-196	590-003-0
3/4"	M26SH	M26SHP	M26SH-PT	M26SHP-PT	M26SH-PT-78	M26SHP-PT-78	M26SH-PT-196	M26SHP-PT-196	290-008-0
1 1/16"	M36SH	M36SHP	M36SH-PT	M36SHP-PT	M36SH-PT-78	M36SHP-PT-78	M36SH-PT-196	M36SHP-PT-196	390-008-0
1 1/2"	M66SH	M66SHP	M66SH-PT	M66SHP-PT	M66SH-PT-78	M66SHP-PT-78	M66SH-PT-196	M66SHP-PT-196	690-015-0
2"	M86SH	M86SHP	M86SH-PT	M86SHP-PT	M86SH-PT-78	M86SHP-PT-78	M86SH-PT-196	M86SHP-PT-196	890-023-0
2 1/2"	M96SH	M96SHP	M96SH-PT	M96SHP-PT	M96SH-PT-78	M96SHP-PT-78	M96SH-PT-196	M96SHP-PT-196	990-115-0
Switch & Cable (no band)	MSHL-6	MSHP-6	MSH6-PT	MSHP6-PT	MSH6-PT-78	MSHP6-PT-78	MSH6-PT-196	MSHP6-PT-196	
Cables Only for Pigtail Switches									
					2M (78")	PT-78			
					5M (196")	PT-196			



American Cylinder Co., Inc.
Peotone, Illinois 60468-9116
708/258-3935
FAX 708/258-3980

http://www.americancylinder.com
E-MAIL: amcyl@americancylinder.com

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