



PRODUCT CATALOG

STAINLESS STEEL FLAT-1

THE CORROSION RESISTANT, IP69K RATED
SOLUTION FOR LOW PROFILE APPLICATIONS



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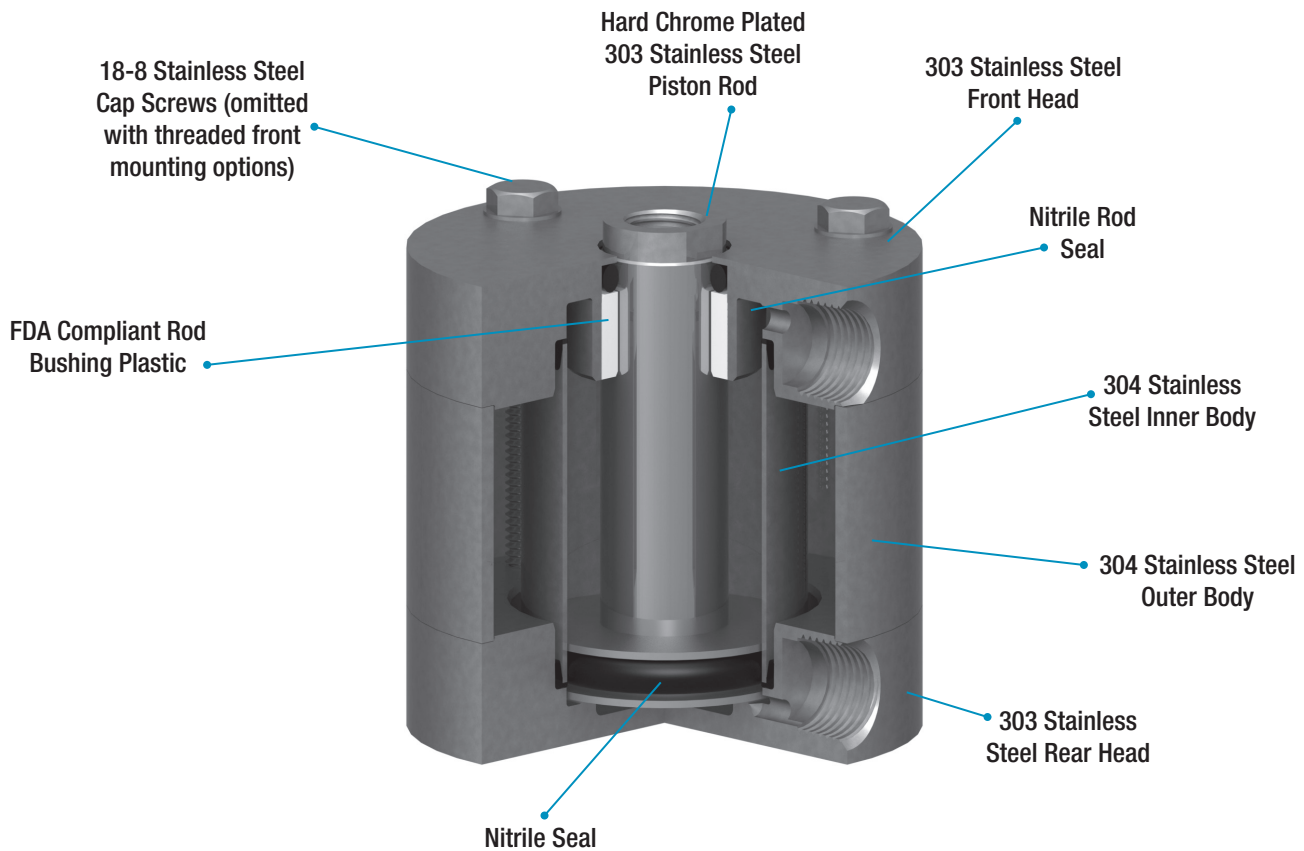
13 List Prices



STAINLESS STEEL FLAT-I

Stainless Steel Flat-I Cylinders are designed specifically for applications that require compact cylinders that will be exposed to frequent, corrosive wash down, as is common in a number of industries including food and beverage, health and beauty, and medical applications. The hygienic design includes a hard chrome-plated stainless steel cylinder rod, stainless steel end caps, and a stainless steel outer body assembled in a clean package that is easily cleaned by minimizing crevices that can catch and retain application residue that can foster the growth of unwanted bacteria. The end caps are designed to eliminate catch points by limiting the number of mounting holes to only those necessary to mount the cylinder.

PRODUCT FEATURES



FEATURES AND BENEFITS

- Hygienic design is easy to clean and eliminates holes and crevices that can propagate bacterial growth.
- All stainless steel construction provides superior corrosion resistance.
- Hard chrome plated piston rod reduces wear on the rod seal.
- IP69K rated design features a sealed outer body which prevents the ingress of washdown chemicals and application matter.
- Food grade plastic rod bushing and food grade grease lubricant is ideal for food processing and packaging applications.

THE IDEAL SOLUTION FOR WASHDOWN AND OTHER CORROSIVE ENVIRONMENTS

The compact Stainless Steel Flat-I offers mounting styles to fit most every application!



Pivot Mount



Front Trunnion



Rear Trunnion



Threaded Front



Threaded Rear



F Series Front



F Series Rear



Basic

- Minimal mounting holes present only where specified reduces catch points
- Sealed outer body prevents outside contamination from penetrating cylinder body
- F Series provides a mounting interchange to competitive designs

Materials of Construction

End Caps: Stainless Steel

Outer Body: Stainless Steel

Piston Rod: Hard Chrome Plated Stainless Steel

Lubrication: Food Grade Grease

Seals: Buna-N Standard; High and Low Temperature (optional)

Engineering Specifications

Temperature: -20° F to 200° F Standard
-40° F to 200° F (Low Temperature)
0° F to 400° F (High Temperature)

Pressure Rating: 250 PSI

Ingress Protection Rating: IP69K

HOW IT WORKS

Maximum Stroke Lengths

MODEL	BORE SIZES	MAXIMUM STROKE
SSFO (Standard Seals)	02 and 04	10"
SSFO (Standard Seals)	09 through 125	16"
SSFO (Low Friction Seals)	02 and 04	9"
SSFO (Low Friction Seals)	09 through 125	15"
SSFOD	All bore sizes	16"
SSFOS	All bore sizes	4"
SSFOR	02 through 50	4"
SSFOR	70 and 125	3"

Cylinder Weights

Approximate Cylinder Weights (lbs.)

BORE	SSFO		SSFOD		SSFOR/SSFOS				
	0" STROKE	ADDER PER 1/8" OF STROKE	0" STROKE	ADDER PER 1/8" OF STROKE	0" STROKE (UP TO 1")	1" STROKE (UP TO 2")	2" STROKE (UP TO 3")	3" STROKE (UP TO 4")	ADDER PER 1/8" OF STROKE
9/16" (02)	0.1465	0.0121	0.1733	0.0121	0.1970	0.3575	0.5160	0.6753	0.0112
3/4" (04)	0.2681	0.0166	0.3090	0.0166	0.3389	0.5595	0.7779	0.9984	0.0152
1-1/16" (09)	0.6955	0.0260	0.7609	0.0260	0.7819	1.1378	1.4674	1.8485	0.0225
1-1/2" (17)	1.1955	0.0381	1.3468	0.0381	1.3384	1.8816	2.4265	2.9690	0.0326
2" (31)	1.6348	0.0459	1.8210	0.0459	1.8146	2.4470	3.0210	3.7168	0.0380
2-1/2" (50)	3.1332	0.0513	3.4417	0.0504	3.4227	4.5824	5.6288	6.7885	0.0434
3" (70)	3.9743	0.0656	4.3520	0.0646	4.3486	5.5820	7.0029	8.1878	0.0548
4" (125)	6.2040	0.3028	8.1732	0.0875	8.4850	9.9626	11.6301	13.0772	0.0734

Length Adders for Low Friction Seals

	BORE SIZE							
	9/16" (02)	3/4" (04)	1-1/16" (09)	1-1/2" (17)	2" (31)	2-1/2" (50)	3" (70)	4" (125)
Length adder (in.)	0.25	0.25	0.38	0.38	0.38	0.38	0.5	0.5

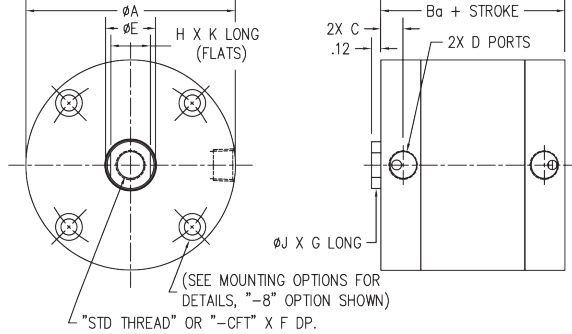
Enclosed Spring Forces

BORE	MAXIMUM FORCE (LB)	SPRING RATES			
		0.12 TO 1" STROKE (LB/IN)	1.001 TO 2" STROKE (LB/IN)	2.001 TO 3" STROKE (LB/IN)	3.001 TO 4" STROKE (LB/IN)
9/16" (02)	5.90	4.00	1.75	1.24	0.88
3/4" (04)	10.40	6.00	2.70	1.86	1.35
1-1/16" (09)	10.80	6.50	2.70	1.91	1.35
1-1/2" (17)	12.90	6.00	2.30	1.66	1.15
2" (31)	17.50	11.00	2.60	2.10	1.30
2-1/2" (50)	26.00	9.50	5.00	3.28	2.50
3" (70)	35.00	16.00	5.00	3.81	2.50
4" (125)	50.00	22.00	5.50	4.40	2.75

BASIC MODEL DIMENSIONS

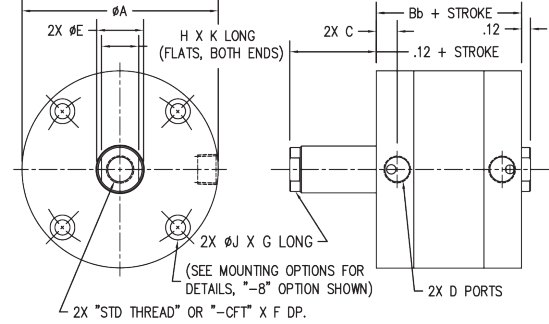
Model SSFO

(Double Acting Single End Rod)



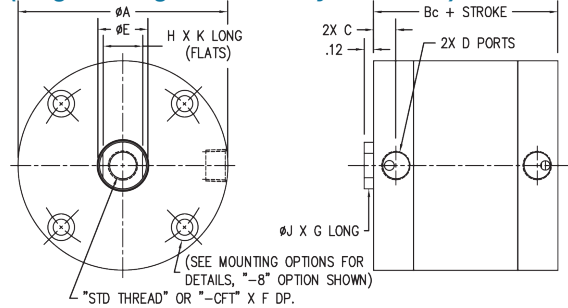
Model SSFOD

(Double Acting Double End Rod)



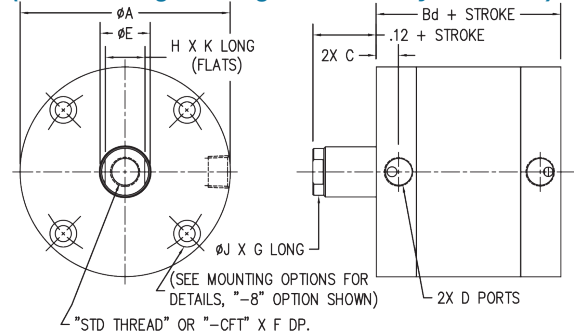
Model SSFOS

(Single Acting Rod Normally Retracted)



Model SSFOR

(Reverse Single Acting Rod Normally Extended)



BORE	A	Ba	Bb	Bc				Bd				C	D	E
				0-1"	1"-2"	2"-3"	3"-4"	0-1"	1"-2"	2"-3"	3"-4"			
9/16" (02)*	1.13	0.56	0.69	0.81	1.38	1.96	2.52	1.06	1.63	2.14	2.70	0.17	#10-32	0.250
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	0.17	#10-32	0.312
1-1/16" (09)	2.00	0.88	0.94	0.88	1.50	2.13	2.75	1.38	2.00	2.63	3.25	0.28	1/8 NPT	0.500
1-1/2" (17)	2.63	0.88	1.00	0.88	1.50	2.13	2.75	1.38	2.00	2.63	3.25	0.28	1/8 NPT	0.625
2" (31)	3.13	0.94	1.06	0.94	1.56	2.19	2.81	1.44	2.06	2.69	3.31	0.28	1/8 NPT	0.750
2-1/2" (50)	3.75	1.19	1.31	1.94	2.81	3.69	4.56	1.94	1.56	2.19	2.81	0.35	1/4 NPT	0.750
3" (70)	4.25	1.25	1.37	1.25	2.12	3.00	3.87	2.00	2.88	3.75	N/A	0.35	1/4 NPT	0.875
4" (125)	5.50	1.56	1.69	1.57	2.45	3.32	4.20	2.32	3.20	4.07	N/A	0.42	3/8 NPT	1.000

BORE	STD THREAD	CFT	F	G	H	J	K
9/16" (02)*	#8-32 UNC-2B	N/A	0.46	0.14	0.22	0.24	0.13
3/4" (04)	#10-32 UNF-2B	#10-24 UNC-2B	0.46	0.14	0.25	0.29	0.13
1-1/16" (09)	5/16-24 UNF-2B	5/16-18 UNC-2B	0.70	0.14	0.44	0.48	0.13
1-1/2" (17)	3/8-24 UNF-2B	3/8-16 UNC-2B	0.70	0.14	0.50	0.59	0.13
2" (31)	1/2-20 UNF-2B	1/2-13 UNC-2B	0.70	0.14	0.62	0.71	0.13
2-1/2" (50)	1/2-20 UNF-2B	1/2-13 UNC-2B	0.70	0.14	0.62	0.71	0.13
3" (70)	5/8-18 UNF-2B	5/8-18 UNC-2B	0.73	0.14	0.75	0.84	0.13
4" (125)	3/4-16 UNF-2B	3/4-10 UNC-2B	0.80	0.14	0.87	0.96	0.13

HOW TO SPECIFY

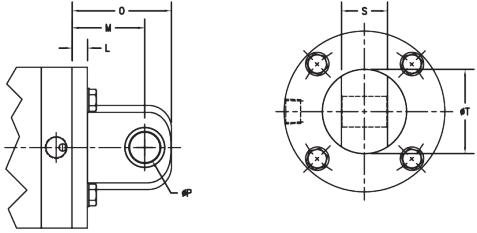
MOUNTING OPTIONS AND DIMENSIONS

Pivot Mount (Option 1 or 1N)

Available in standard or 90°

Complete with FDA compliant Pivot Bushing

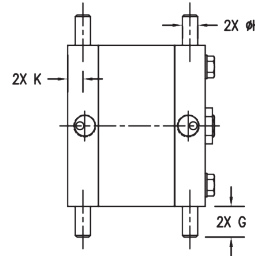
Option 1 is shown; not available as an accessory



Trunnion Mount (Option 2, 2F, or 2R)

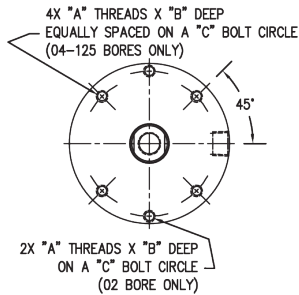
Available in Front, Rear, or Both Locations

Not available in 9/16" bore



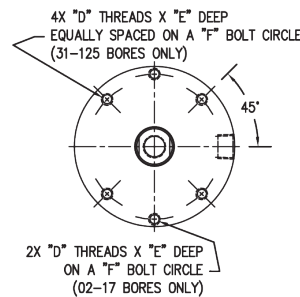
Threaded Mounting Holes (Option 3F and 3R)

Available in Front or Rear Locations



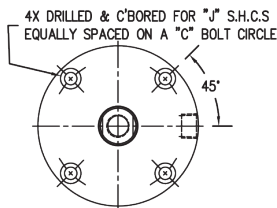
F Series Interchange Threaded Mounting Holes

(Option 7F and 7R) Available in Front or Rear Locations



Basic Model (Option 8)

Counterbored Mounting Holes Both Ends



Mounting Option Dimensions (in)

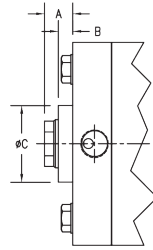
BORE	FRONT/REAR MOUNT															
	A	B	C	D	E	F	G	H	J	K	L	M	O	P	S	T
9/16" (02)*	#4-40 UNC-2B	0.22	0.875	#6-32 UNC-2B	0.20	0.875	N/A	N/A	#4	N/A	0.187	0.750	0.999	0.190	0.375	0.625
3/4" (04)	#6-32 UNC-2B	0.20	1.218	#8-32 UNC-2B	0.20	1.188	0.31	0.125	#6	0.171	0.187	0.750	0.999	0.190	0.375	0.750
1-1/16" (09)	#6-32 UNC-2B	0.36	1.688	#10-32 UNF-2B	0.30	1.688	0.50	0.250	#6	0.250	0.250	0.812	1.062	0.190	0.375	0.750
1-1/2" (17)	#10-24 UNC-2B	0.30	2.187	#10-32 UNF-2B	0.30	2.375	0.50	0.250	#10	0.250	0.250	1.187	1.625	0.380	0.750	1.375
2" (31)	1/4-20 UNC-2B	0.33	2.687	1/4-20 UNC-2B	0.31	2.810	0.50	0.250	#10	0.250	0.312	1.250	1.687	0.380	0.750	1.375
2-1/2" (50)	1/4-20 UNC-2B	0.42	3.250	1/4-20 UNC-2B	0.42	3.250	0.63	0.312	1/4	0.330	0.375	1.312	1.750	0.380	0.750	1.375
3" (70)	1/4-20 UNC-2B	0.44	3.781	1/4-20 UNC-2B	0.44	3.812	0.63	0.312	1/4	0.330	0.375	1.687	2.250	0.625	1.000	1.875
4" (125)	5/16-18 UNC-2B	0.57	4.937	1/4-20 UNC-2B	0.59	5.000	0.75	0.375	5/16	0.420	0.437	1.750	2.312	0.630	1.000	1.875

*=only 2 holes

CYLINDER OPTIONS AND DIMENSIONS

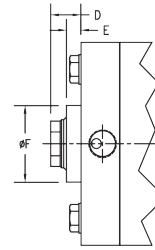
Rod Wiper (Option W)

WIPER (-W OPTION)



Metallic Rod Scraper (Option Z)

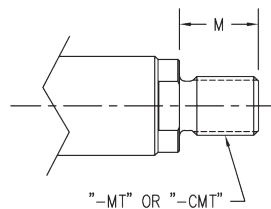
SCRAPER (-Z OPTION)



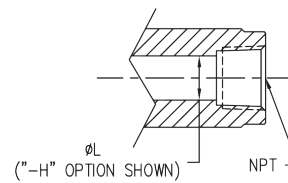
BORE	WIPER/SCRAPER					
	A	B	C	D	E	K
9/16" (02)*	0.50	0.30	0.65	0.45	0.27	0.56
3/4" (04)	0.50	0.30	0.74	0.45	0.27	0.68
1-1/16" (09)	0.55	0.37	0.93	0.45	0.27	0.87
1-1/2" (17)	0.48	0.30	1.06	0.38	0.19	0.99
2" (31)	0.48	0.30	1.18	0.38	0.19	1.12
2-1/2" (50)	0.48	0.30	1.18	0.38	0.19	1.12
3" (70)	0.37	0.30	1.37	0.38	0.19	1.24
4" (125)	0.48	0.30	1.43	0.38	0.19	1.37

*=only 2 holes

Male Rod End Dimension for MT or CMT Options



NPT Thread Dimensions for FOD Cylinders



BORE	ROD THREAD				
	MT	CMT	NPT	L	M
9/16" (02)*	#8-32 UNC-2A	N/A	N/A	0.14	0.38
3/4" (04)	#10-32 UNF-2A	#10-24 UNC-2A	N/A	0.14	0.38
1-1/16" (09)	5/16-24 UNF-2A	5/16-18 UNC-2A	1/8 NPT	0.22	0.50
1-1/2" (17)	3/8-24 UNF-2A	3/8-16 UNC-2A	1/8 NPT	0.28	0.50
2" (31)	1/2-20 UNF-2A	1/2-13 UNC-2A	1/8 NPT	0.38	0.63
2-1/2" (50)	1/2-20 UNF-2A	1/2-13 UNC-2A	1/4 NPT	0.38	0.63
3" (70)	5/8-18 UNF-2A	5/8-11 UNC-2A	3/8 NPT	0.44	0.75
4" (125)	3/4-16 UNF-2A	3/4-10 UNC-2A	1/2 NPT	0.50	0.75

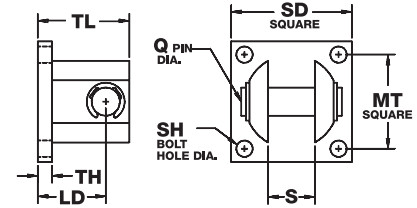
*=only 2 holes

HOW TO ACCESSORIZE

ACCESSORY OPTIONS AND DIMENSIONS

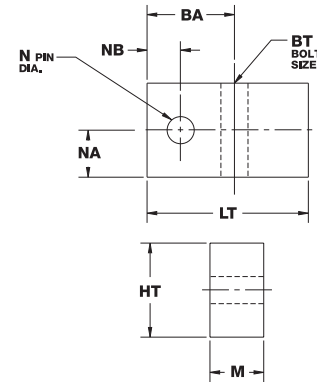
Stainless Steel Clevis Bracket complete with Stainless Steel Pin;
designed for use with Pivot Mounted Cylinder (Option 1 or 1N)

BORE	MODEL	LD	MT	Q	S	SH	SD	TH	S
9/16" (02)	BC-1	0.56	0.75	0.19	0.39	#6	1.00	0.16	0.78
3/4" (04)	BC-1	0.56	0.75	0.19	0.39	#6	1.00	0.16	0.78
1-1/16" (09)	BC-1	0.56	0.75	0.19	0.39	#6	1.00	0.16	0.78
1-1/2" (17)	BC-2	0.94	1.38	0.38	0.75	#10	1.75	0.22	1.34
2" (31)	BC-2	0.94	1.38	0.38	0.75	#10	1.75	0.22	1.34
2-1/2" (50)	BC-2	0.94	1.38	0.38	0.75	#10	1.75	0.22	1.34
3" (70)	BC-3	1.25	2.00	0.63	1.00	0.25	2.50	0.25	1.81
4" (125)	BC-3	1.25	2.00	0.63	1.00	0.25	2.50	0.25	1.81



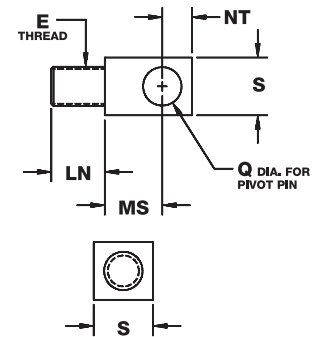
Stainless Steel Trunnion Bracket (2 pieces)

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



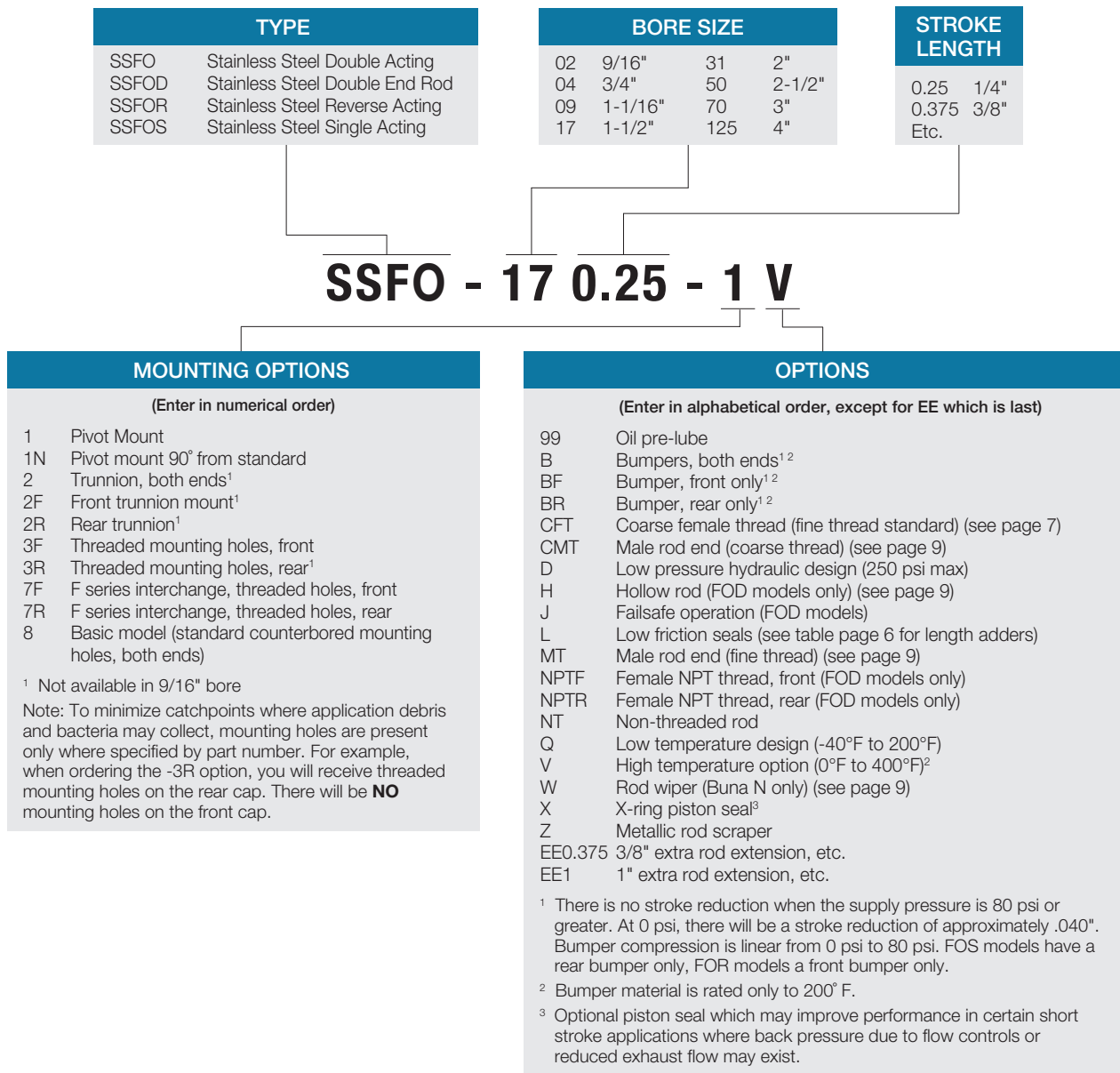
Stainless Steel Rod Pivot; complete with Stainless Steel Nut

BORE	MODEL	E	LN	MS	NT	Q	S
9/16" (02)	RP-1/2	#8-32 UNC	0.38	0.47	0.25	0.19	0.38
3/4" (04)	RP-1	#10-32 UNF	0.38	0.47	0.25	0.19	0.38
1-1/16" (09)	RP-2	5/16-24 UNF	0.63	0.47	0.25	0.19	0.38
1-1/2" (17)	RP-3	3/8-24 UNF	0.63	0.72	0.44	0.38	0.75
2" (31)	RP-4	1/2-20 UNF	0.75	0.72	0.44	0.38	0.75
2-1/2" (50)	RP-4	1/2-20 UNF	0.75	0.72	0.44	0.38	0.75
3" (70)	RP-5	5/8-18 UNF	0.88	1.00	0.63	0.63	1.00
4" (125)	RP-6	3/4-16 UNF	0.88	1.00	0.63	0.63	1.00



HOW TO ORDER

The Model Number for all Stainless Steel Flat-I cylinders consists of three alphanumeric clusters. These designate type, bore size, and stroke length, and mounting and special options. Please refer to the charts below for an example of Model Number SSFO-170.125-1V. This is a stainless steel, double acting, 1-1/2" bore, 1/8" stroke, pivot mount cylinder with high temperature option.



HOW TO CUSTOMIZE

COMMON CYLINDER DESIGN MODIFICATIONS

This table shows common modifications to our standard design which have been provided to customers. Please contact your local distributor for information on pricing and delivery for these special options.

FEATURE	DEVIATION FROM STANDARD MODEL
Rod	Thread modification, non-standard threads on existing rod diameter
Lubrication	Customer specified non-standard lubricants
Seals	Special compounds, EPDM, internally lubricated, Teflon coated
Mounting Dimensions	Special hole patterns and sizes, mounting flanges and plates
Non-Rotating Rod	Square piston rod prevents piston rod rotation

NOTES

The top of the page features a dark blue background with a repeating pattern of white technical drawing icons, including various mechanical parts, electrical components, and tools. The word "NOTES" is printed in white, bold, uppercase letters in the upper right corner of this blue section.

NOTES

Your stocking distributor is:



Bimba Manufacturing Headquarters

P.O. Box 68 Monee, Illinois 60449-0068

Phone: 708-534-8544 Toll Free: 800-44-BIMBA Fax: 708-235-2014

Email: cs@bimba.com www.bimba.com

