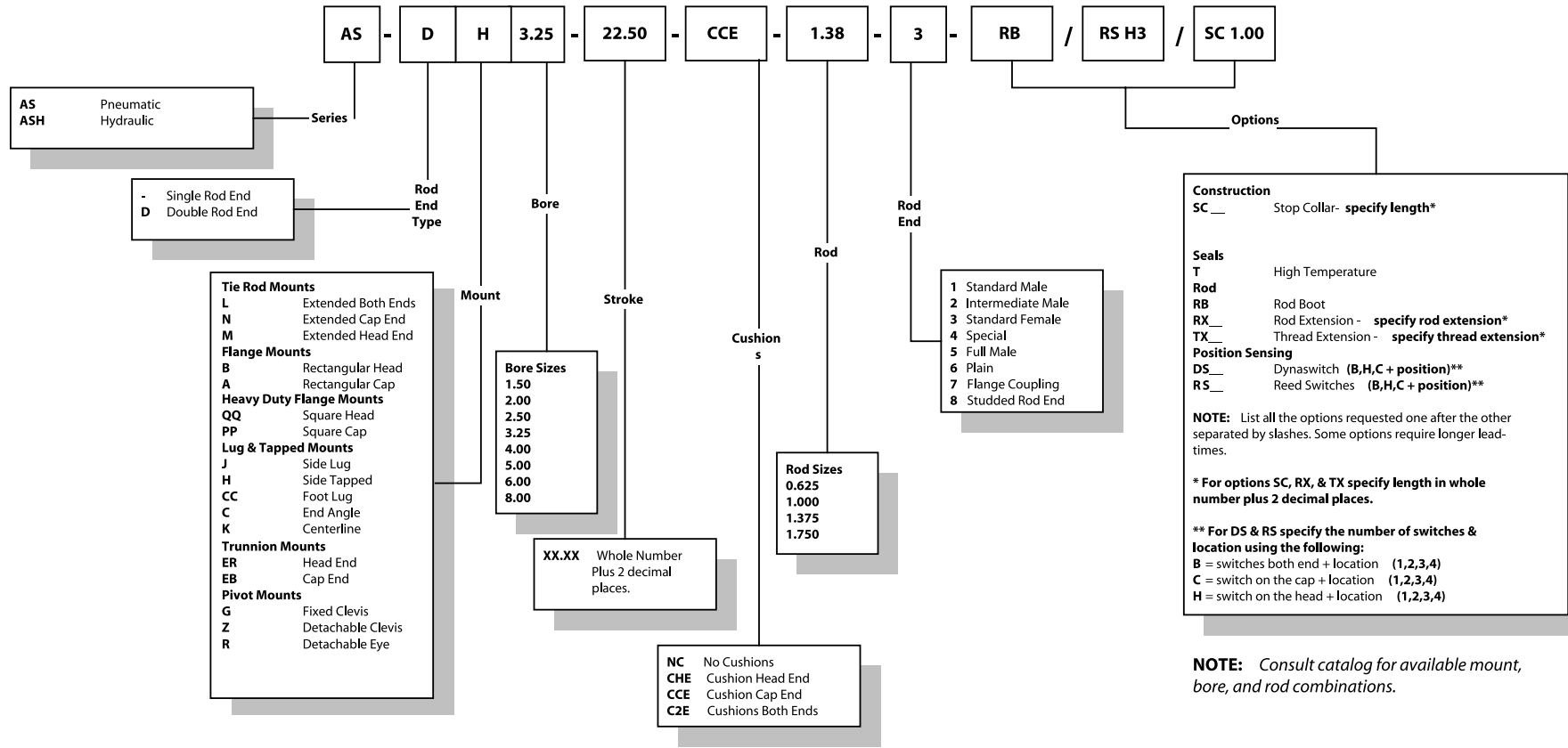


**AS/ASH SERIES ALUMINUM  
PNEUMATIC AND HYDRAULIC CYLINDERS ..... 6**



# ORDERING INFORMATION



AS-DH3.25-22.50-CCE-1.38-3-RB/RSH3/SC1.00

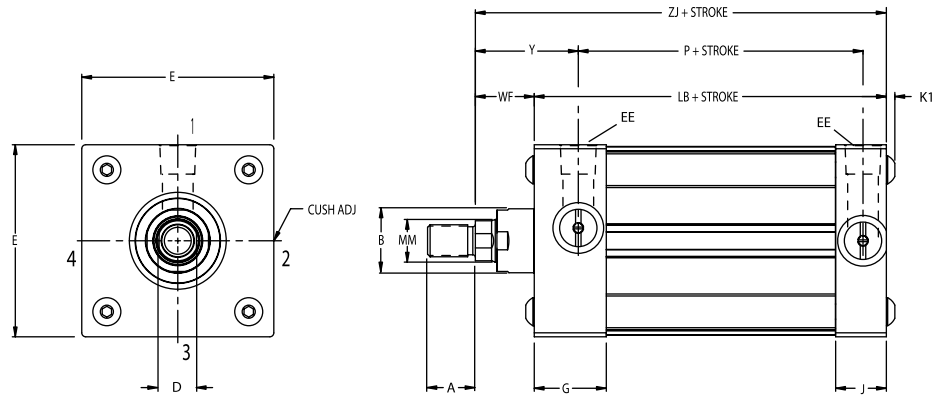
For Rod End Dimensions see back cover foldout...

# Series AS

## Basic Cylinder No Mount

### 1.50" to 4.00"

**STYLE O—Basic Plain Mount**  
(No Mounting)



BORE	AA	E	EE		F	G	J	K1	R	ADD STROKE	
			NPTF	SAE						P	LB
1½	2.02	2	¾	6	¾	1⅞	1⅞	⅞	1.43	2¼	3⅝
2	2.60	2½	¾	6	¾	1⅞	1⅞	⅝	1.84	2¼	3⅝
2½	3.10	3	¾	6	¾	1⅞	1⅞	⅝	2.19	2⅜	3¾
3¼	3.90	3¾	½	10	⅝	1⅞	1⅞	⅜	2.76	2⅝	4¼
4	4.70	4½	½	10	⅝	1⅞	1⅞	⅜	3.32	2⅝	4¼

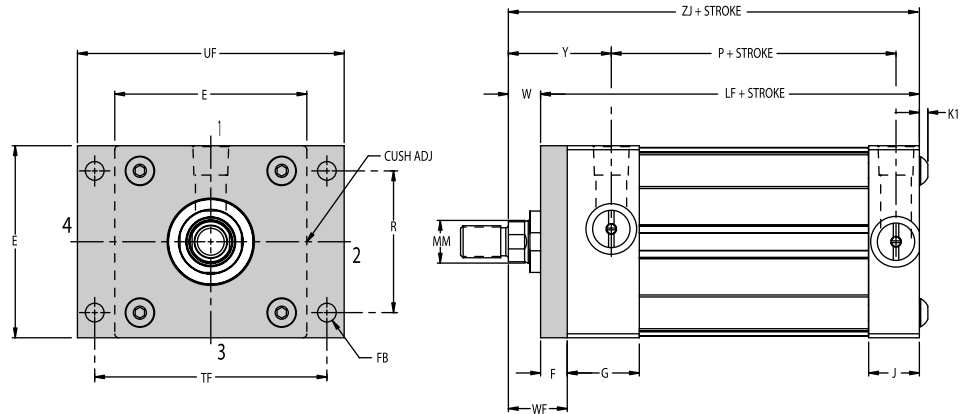
BORE	ROD DIA. MM	THREAD SIZE		ROD EXTENSIONS AND PILOT DIMENSIONS							ADD STROKE		
		KK	FF	A	+000 -002 B	C	D	NA	FA	VB	WF	Y	ZJ
1½	⅝	7/16-20	1/2-20	¾	1.124	¾	½	9/16	¾	⅝	1	1 <sup>15</sup> / <sub>16</sub>	4 <sup>5</sup> / <sub>8</sub>
	1	¾-16	7/8-14	1⅞	1.499	½	7/8	15/16	¾	7/8	1⅜	2 <sup>5</sup> / <sub>16</sub>	5
2½	⅝	7/16-20	1/2-20	¾	1.124	¾	½	9/16	¾	⅝	1	1 <sup>15</sup> / <sub>16</sub>	4¾
	1	¾-16	7/8-14	1⅞	1.499	½	7/8	15/16	¾	7/8	1⅜	2 <sup>5</sup> / <sub>16</sub>	5⅞
3¼	1	¾-16	7/8-14	1⅞	1.499	½	7/8	15/16	¾	7/8	1⅜	2 <sup>7</sup> / <sub>16</sub>	5⅞
	1⅜	1-14	1¼-12	1⅝	1.999	⅝	1⅞	15/16	⅝	1	1⅝	2 <sup>11</sup> / <sub>16</sub>	5 <sup>7</sup> / <sub>8</sub>
4	1	¾-16	7/8-14	1⅞	1.499	½	7/8	15/16	¾	7/8	1⅜	2 <sup>7</sup> / <sub>16</sub>	5⅞
	1⅜	1-14	1¼-12	1⅝	1.999	⅝	1⅞	15/16	⅝	1	1⅝	2 <sup>11</sup> / <sub>16</sub>	5 <sup>7</sup> / <sub>8</sub>

# Series AS

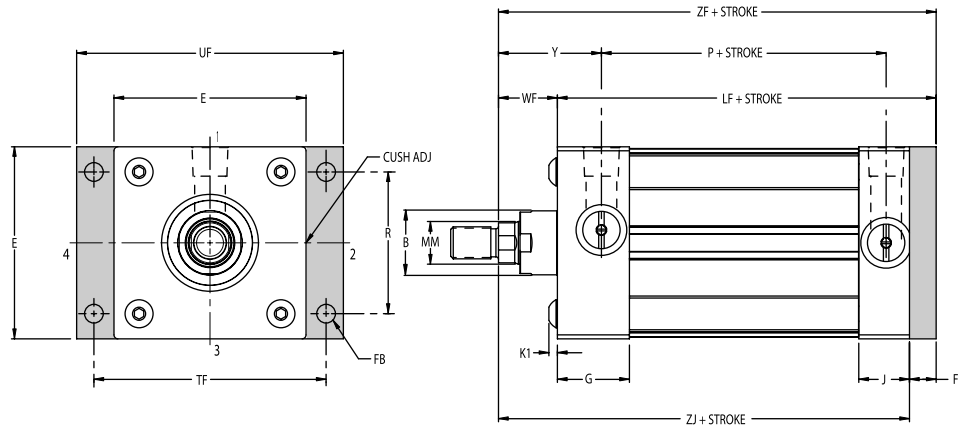
## Flange Mounted Cylinders

### 1.50" to 4.00"

**STYLE B—Rectangular Flange  
Mount Head End**  
(NFPA Mounting Style MF1)



**STYLE A—Rectangular Flange  
Mount Cap End**  
(NFPA Mounting Style MF2)

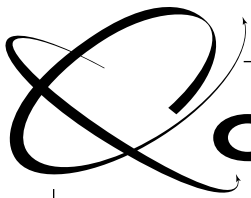


**Series AS  
Section 6**

BORE	AA	E	EE		F	G	J	K1	R	TF	UF	FB*	ADD STROKE		
			NPTF	SAE									P	LB	LF
1½	2.02	2	¾	6	¾	1 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	¼	1.43	2 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	¼	2 <sup>1</sup> / <sub>4</sub>	3 <sup>5</sup> / <sub>8</sub>	4
2	2.60	2½	¾	6	¾	1 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	5/32	1.84	3 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	5/16	2 <sup>1</sup> / <sub>4</sub>	3 <sup>5</sup> / <sub>8</sub>	4
2½	3.10	3	¾	6	¾	1 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	5/32	2.19	3 <sup>7</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>	5/16	2 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>8</sub>
3¼	3.90	3¾	½	10	5/8	1 <sup>11</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	3/16	2.76	4 <sup>11</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>2</sub>	3/8	2 <sup>5</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>4</sub>	4 <sup>7</sup> / <sub>8</sub>
4	4.70	4½	½	10	5/8	1 <sup>11</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	3/16	3.32	5 <sup>7</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>4</sub>	3/8	2 <sup>5</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>4</sub>	4 <sup>7</sup> / <sub>8</sub>

\*Mounting holes are 1/16" larger than bolt size shown.

BORE	ROD DIA. MM	THREAD SIZE		ROD EXTENSIONS AND PILOT DIMENSIONS								ADD STROKE			
		KK	FF	A	+000 -002 B	C	D	NA	FA	VB	W	WF	Y	ZF	ZJ
1½	5/8	7/16-20	1/2-20	¾	1.124	3/8	½	9/16	3/8	5/8	5/8	1	1 <sup>15</sup> / <sub>16</sub>	5	4 <sup>5</sup> / <sub>8</sub>
2	5/8	7/16-20	1/2-20	¾	1.124	3/8	½	9/16	3/8	5/8	5/8	1	1 <sup>15</sup> / <sub>16</sub>	5	4 <sup>5</sup> / <sub>8</sub>
	1	¾-16	7/8-14	1½	1.499	½	7/8	15/16	3/8	7/8	1	1 <sup>3</sup> / <sub>8</sub>	2 <sup>5</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>8</sub>	5
2½	5/8	7/16-20	1/2-20	¾	1.124	3/8	½	9/16	3/8	5/8	5/8	1	1 <sup>15</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1	¾-16	7/8-14	1½	1.499	½	7/8	15/16	3/8	7/8	1	1 <sup>3</sup> / <sub>8</sub>	2 <sup>5</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>8</sub>
3¼	1	¾-16	7/8-14	1½	1.499	½	7/8	15/16	3/8	7/8	¾	1 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>4</sub>	5 <sup>5</sup> / <sub>8</sub>
	1 <sup>3</sup> / <sub>8</sub>	1-14	1 <sup>1</sup> / <sub>4</sub> -12	1 <sup>5</sup> / <sub>8</sub>	1.999	5/8	1 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	5/8	1	1	1 <sup>5</sup> / <sub>8</sub>	2 <sup>11</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>2</sub>	5 <sup>7</sup> / <sub>8</sub>
4	1	¾-16	7/8-14	1½	1.499	½	7/8	15/16	3/8	7/8	¾	1 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>4</sub>	5 <sup>5</sup> / <sub>8</sub>
	1 <sup>3</sup> / <sub>8</sub>	1-14	1 <sup>1</sup> / <sub>4</sub> -12	1 <sup>5</sup> / <sub>8</sub>	1.999	5/8	1 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	5/8	1	1	1 <sup>5</sup> / <sub>8</sub>	2 <sup>11</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>2</sub>	5 <sup>7</sup> / <sub>8</sub>



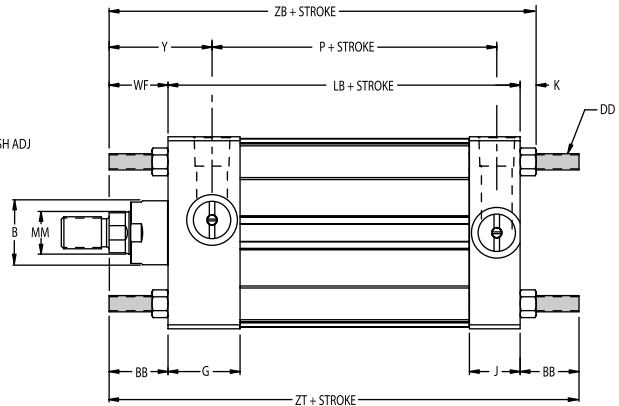
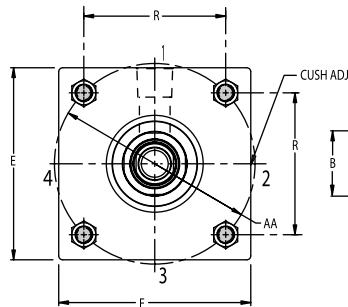
**Quincy**  
PORTMAN CYLINDERS

# Series AS

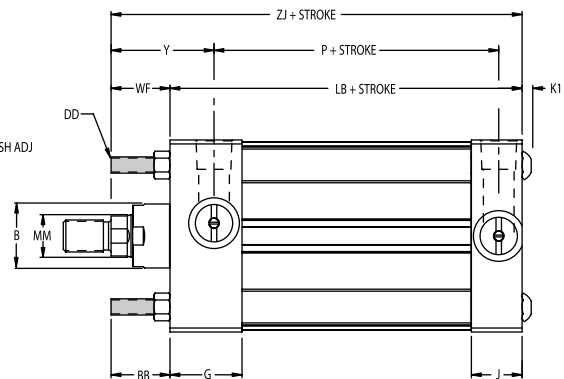
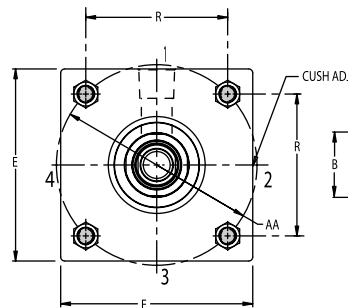
## Tie Rod Mounted Cylinders

### 1.50" to 4.00"

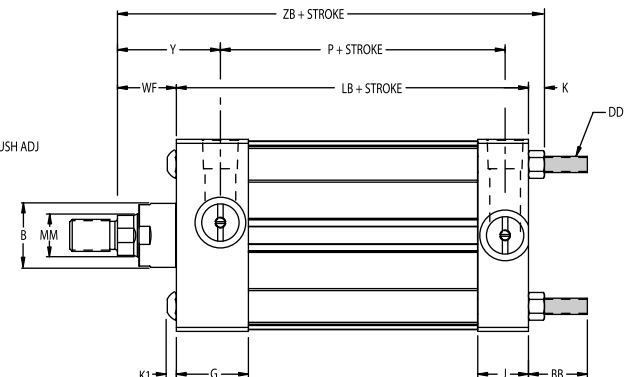
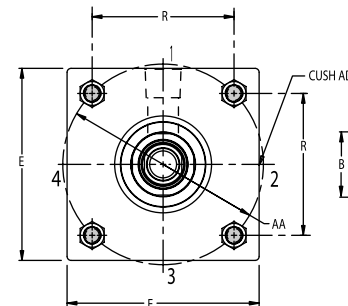
**STYLE L—Tie Rods  
Extended Both Ends**  
(NFPA Mounting Style MX1)



**STYLE M—Tie Rods  
Extended Head End**  
(NFPA Mounting Style MX3)

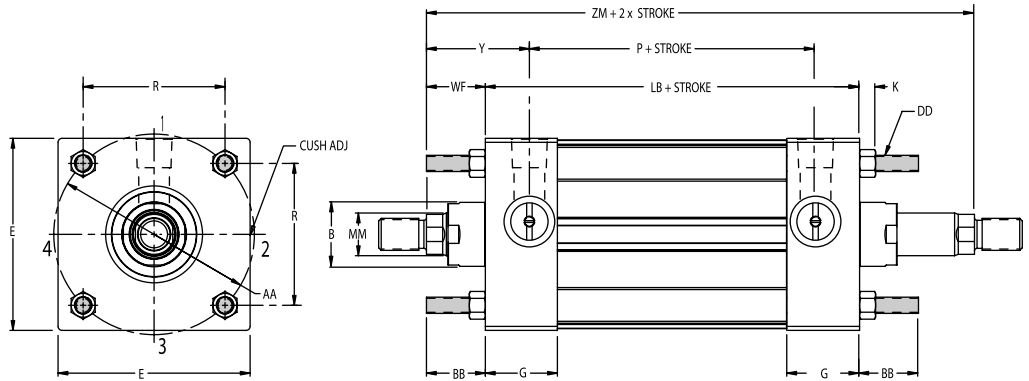


**STYLE N—Tie Rods  
Extended Cap End**  
(NFPA Mounting Style MX2)



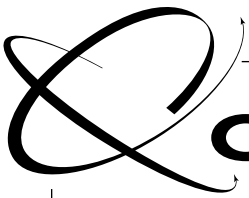
**Series AS  
Section 6**

**STYLE DL—Tie Rods**  
**Extended Both Ends Double**  
**Rod End Cylinder**  
 (NFPA Mounting Style MDX1)



BORE	AA	BB	DD	E	EE		F	G	J	K	K1	R	ADD STROKE	
					NPTF	SAE							P	LB
1½	2.02	1	¼-28	2	¾	6	¾	1⅞	1⅞	¼	⅛	1.43	2¼	3⅝
2	2.60	1⅛	⅝-24	2½	¾	6	¾	1⅞	1⅞	⅝	⅝	1.84	2¼	3⅝
2½	3.10	1⅛	⅝-24	3	¾	6	¾	1⅞	1⅞	⅝	⅝	2.19	2⅝	3¾
3¼	3.90	1⅜	⅜-24	3¾	½	10	⅝	1⅞	1⅞	⅜	⅜	2.76	2⅝	4¼
4	4.70	1⅜	⅜-24	4½	½	10	⅝	1⅞	1⅞	⅜	⅜	3.32	2⅝	4¼

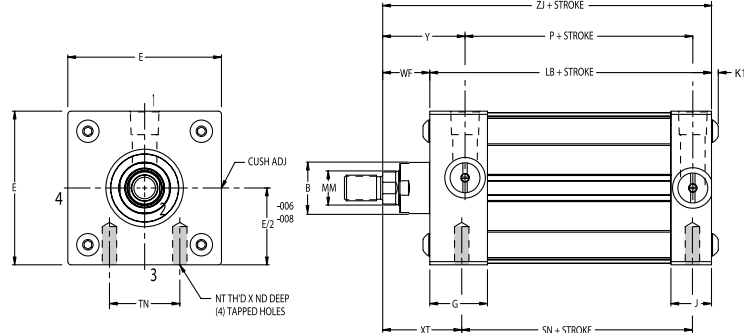
BORE	ROD DIA.	THREAD SIZE		ROD EXTENSIONS AND PILOT DIMENSIONS							ADD STROKE			ADD 2X STK.		
	MM	KK	FF	A	+000 -002 B	C	D	NA	FA	VB	WF	Y	ZJ		ZB	ZT
1½	⅝	⅞-20	½-20	¾	1.124	¾	½	⅑	⅜	⅝	1	1⅞	4⅝	4⅞	5⅝	6⅞
	1	¾-16	⅞-14	1⅛	1.499	½	⅞	⅑	⅜	⅞	1⅜	2⅞	5	5⅞	6⅞	6⅞
2½	⅝	⅞-20	½-20	¾	1.124	¾	½	⅑	⅜	⅝	1	1⅞	4¾	5⅞	5⅞	6¼
	1	¾-16	⅞-14	1⅛	1.499	½	⅞	⅑	⅜	⅞	1⅜	2⅞	5⅞	5⅞	6¼	7
3¼	1	¾-16	⅞-14	1⅛	1.499	½	⅞	⅑	⅜	⅞	1⅜	2⅞	5⅞	6	7	7½
	1⅜	1-14	1¼-12	1⅝	1.999	⅝	1⅞	⅑	⅜	1	1⅝	2⅞	5⅞	6¼	7¼	8
4	1	¾-16	⅞-14	1⅛	1.499	½	⅞	⅑	⅜	⅞	1⅜	2⅞	5⅞	6	7	7½
	1⅜	1-14	1¼-12	1⅝	1.999	⅝	1⅞	⅑	⅜	1	1⅝	2⅞	5⅞	6¼	7¼	8



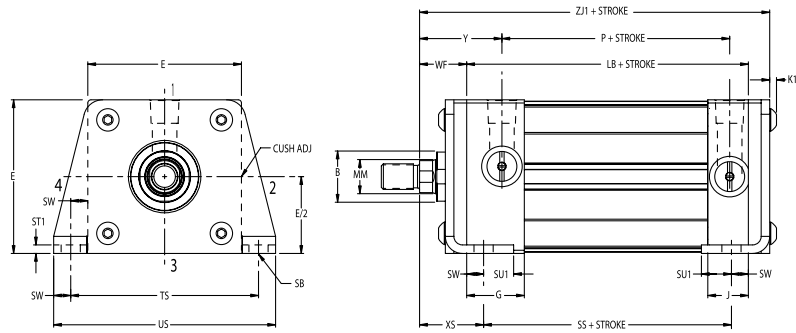
**Quincy**  
PORTMAN CYLINDERS

# Series AS Foot Mounted Cylinders 1.50" to 4.00"

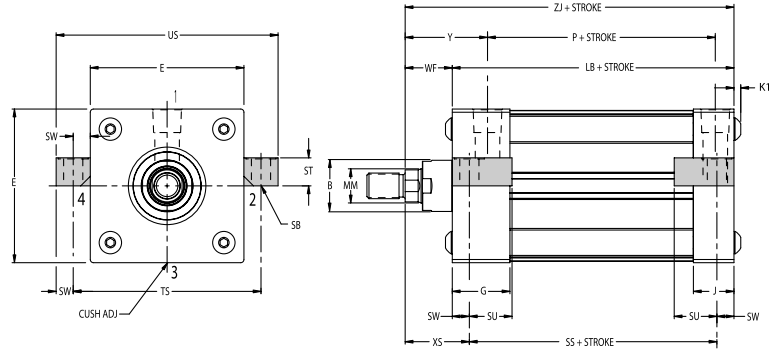
**STYLE H—**  
(NFPA Mounting Style MS4)



**STYLE J—Side Lug Mount**  
(NFPA Mounting Style MS2)



**STYLE K—Center Line Mount**  
(NFPA Mounting Style MS3)



**Series AS  
Section 6**

BORE	AA	E	EE		F	G	J	K1	TN	NT	R	SB*	ST	ST1	SU	SU1	SW	TS	ADD STROKE			
			NPTF	SAE															P	LB	SN	SS
1½	2.02	2	¾	6	¾	17/16	1 1/16	1/8	5/8	1/4-20	1.43	¾	1/2	0.18	15/16	0.75	¾	2¾	2¼	3⅝	2¼	2⅝
2	2.60	2½	¾	6	¾	17/16	1 1/16	5/32	7/8	5/16-18	1.84	¾	1/2	0.25	15/16	0.69	¾	3¼	2¼	3⅝	2¼	2⅝
2½	3.10	3	¾	6	¾	17/16	1 1/16	5/32	1¼	¾-16	2.19	¾	1/2	0.25	15/16	0.69	¾	3¾	2⅝	3¾	2⅝	3
3¼	3.90	3¾	1½	10	5/8	1 11/16	1 3/16	3/16	1½	1½-13	2.76	1½	¾	0.25	1¼	0.88	1/2	4¾	2⅝	4¼	2⅝	3¼
4	4.70	4½	1½	10	5/8	1 11/16	1 3/16	3/16	2 1/16	1½-13	3.32	1½	¾	0.25	1¼	0.88	1/2	5½	2⅝	4¼	2⅝	3¼

BORE	ROD DIA. MM	THREAD SIZE		ROD EXTENSIONS AND PILOT DIMENSIONS											ADD STROKE			
		KK	FF	A	+000 -002 B	C	D	NA	FA	VB	WF	Y	ND	XS	XT	ZJ	ZJ1	
1½	5/8	7/16-20	1½-20	¾	1.124	¾	1/2	9/16	¾	5/8	1	15/16	¾	1 3/8	15/16	4 5/8	5	
	1	¾-16	7/8-14	1 1/8	1.499	1/2	7/8	15/16	¾	7/8	1 3/8	2 5/16	7/16	1 3/4	2 5/16	5		
2	5/8	7/16-20	1½-20	¾	1.124	¾	1/2	9/16	¾	5/8	1	15/16	7/16	1 3/8	15/16	4 5/8		
	1	¾-16	7/8-14	1 1/8	1.499	1/2	7/8	15/16	¾	7/8	1 3/8	2 5/16	9/16	1 3/4	2 5/16	5 1/8		
2½	5/8	7/16-20	1½-20	¾	1.124	¾	1/2	9/16	¾	5/8	1	15/16	9/16	1 3/8	15/16	4 3/4		
	1	¾-16	7/8-14	1 1/8	1.499	1/2	7/8	15/16	¾	7/8	1 3/8	2 5/16	9/16	1 3/4	2 5/16	5 1/8		
3¼	1	¾-16	7/8-14	1 1/8	1.499	1/2	7/8	15/16	¾	7/8	1 3/8	2 7/16	¾	1 7/8	2 7/16	5 5/8	6 1/4	
	1 3/8	1-14	1¼-12	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	1	1 5/8	2 11/16	¾	2 1/8	2 11/16	5 7/8	6 1/2	
4	1	¾-16	7/8-14	1 1/8	1.499	1/2	7/8	15/16	¾	7/8	1 3/8	2 7/16	¾	1 7/8	2 7/16	5 5/8	6 1/4	
	1 3/8	1-14	1¼-12	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	1	1 5/8	2 11/16	¾	2 1/8	2 11/16	5 7/8	6 1/2	

\*Mounting holes are 1/16" larger than bolt size shown.



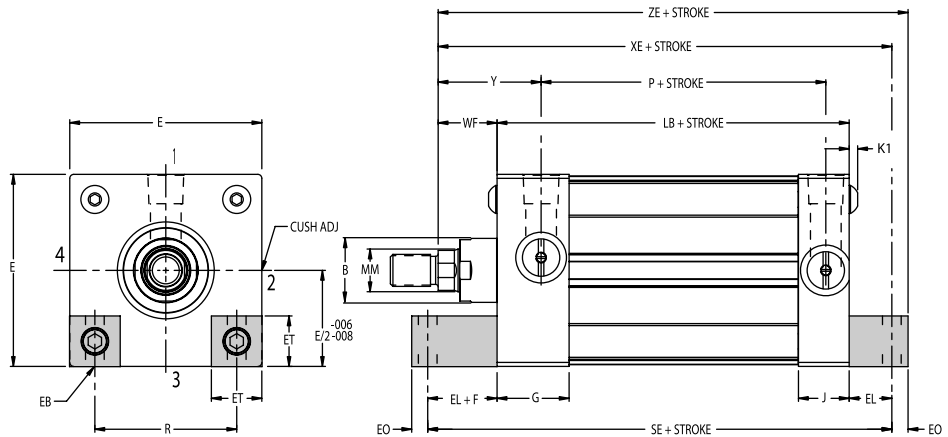
# Series AS

## Foot Mounted Cylinders

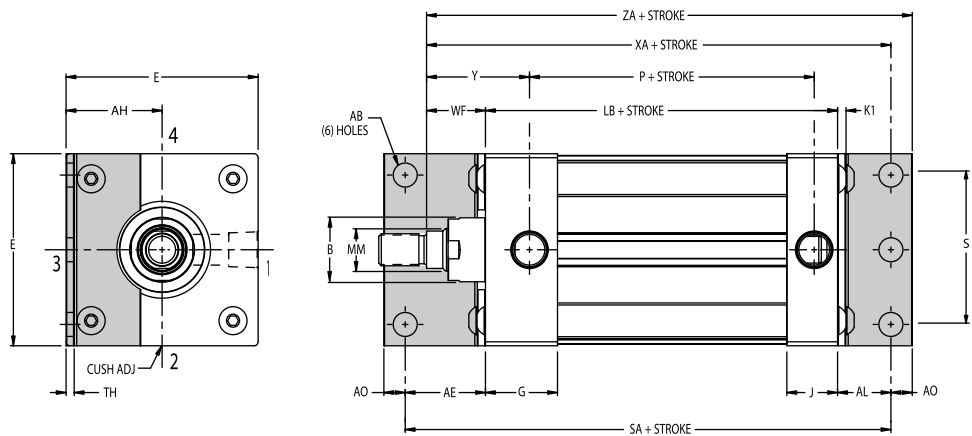
### 1.50" to 4.00"

For pressure rating refer to Page 9.

**STYLE CC—Foot Mount**  
(NFA Mounting Style MS7)



**STYLE C—End Angle Bracket**  
(NFA Mounting Style MS1)



BORE	AA	E	EE		F	G	J	K1	R	AB*	AE	AH	AL	AO	EB*	EF	EL	EO	ET	S	TH	ADD STROKE			
			NPTF	SAE																		P	LB	SA	SE
1½	2.02	2	3/8	6	3/8	17/16	11/16	1/8	1.43	7/16	13/8	1.19	1	3/8	1/4	11/8	3/4	1/4	9/16	1.25	.12	21/4	35/8	6	51/2
2	2.60	2½	3/8	6	3/8	17/16	11/16	5/32	1.84	7/16	13/8	1.44	1	3/8	5/16	13/16	15/16	5/16	11/16	1.75	.12	21/4	35/8	6	57/8
2½	3.10	3	3/8	6	3/8	17/16	11/16	5/32	2.19	7/16	13/8	1.63	1	3/8	5/16	17/16	11/16	5/16	13/16	2.25	.12	23/8	33/4	61/8	61/4
3¼	3.90	3¾	1/2	10	5/8	111/16	131/16	3/16	2.76	9/16	17/8	1.94	1¼	1/2	3/8	13/8	7/8	3/8	1	2.75	.12	25/8	41/4	73/8	65/8
4	4.70	4½	1/2	10	5/8	111/16	131/16	3/16	3.32	9/16	17/8	2.25	1¼	1/2	3/8	15/8	1	3/8	13/16	3.50	.12	25/8	41/4	73/8	67/8

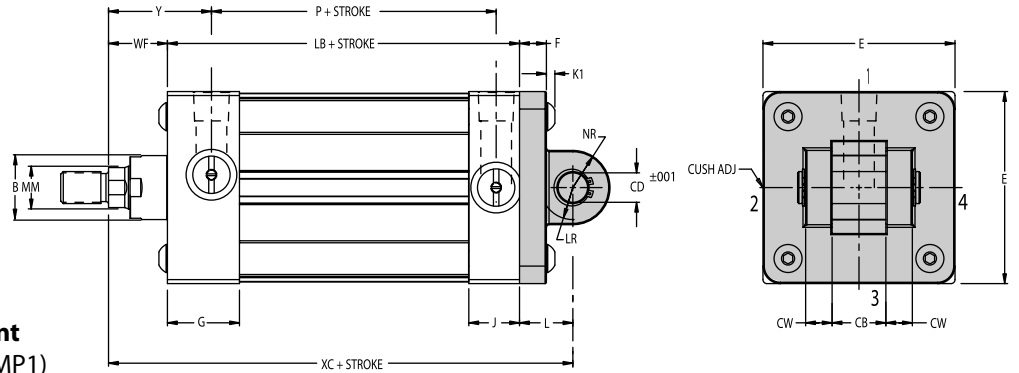
\*Mounting holes are 1/16" larger than bolt size shown.

BORE	ROD DIA.	THREAD SIZE		ROD EXTENSIONS AND PILOT DIMENSIONS							ADD STROKE						
		MM	KK	FF	A	+000 -002 B	C	D	NA	FA	VB	WF	Y	XA	XE	ZA	ZE
1½	5/8	7/16-20	1/2-20	3/4	1.124	3/8	1/2	9/16	3/8	5/8	1	115/16	55/8	53/8	6	55/8	43/8
	5/8	7/16-20	1/2-20	3/4	1.124	3/8	1/2	9/16	3/8	5/8	1	115/16	55/8	59/16	6	57/8	43/8
2	1	3/4-16	7/8-14	11/8	1.499	1/2	7/8	15/16	3/8	7/8	13/8	25/16	6	515/16	63/8	61/4	5
	5/8	7/16-20	1/2-20	3/4	1.124	3/8	1/2	9/16	3/8	5/8	1	115/16	53/4	513/16	61/8	61/8	43/4
2½	1	3/4-16	7/8-14	11/8	1.499	1/2	7/8	15/16	3/8	7/8	13/8	25/16	61/8	63/16	61/2	61/2	51/8
	5/8	7/16-20	1/2-20	3/4	1.124	3/8	1/2	9/16	3/8	5/8	1	115/16	53/4	513/16	61/8	61/8	43/4
3¼	1	3/4-16	7/8-14	11/8	1.499	1/2	7/8	15/16	3/8	7/8	13/8	25/16	67/8	61/2	73/8	67/8	55/8
	13/8	1-14	11/4-12	15/8	1.999	5/8	11/8	15/16	5/8	1	15/8	211/16	71/8	63/4	75/8	71/8	55/8
4	1	3/4-16	7/8-14	11/8	1.499	1/2	7/8	15/16	3/8	7/8	13/8	25/16	67/8	65/8	73/8	7	55/8
	13/8	1-14	11/4-12	15/8	1.999	5/8	11/8	15/16	5/8	1	15/8	211/16	71/8	67/8	75/8	71/4	55/8

# Series AS

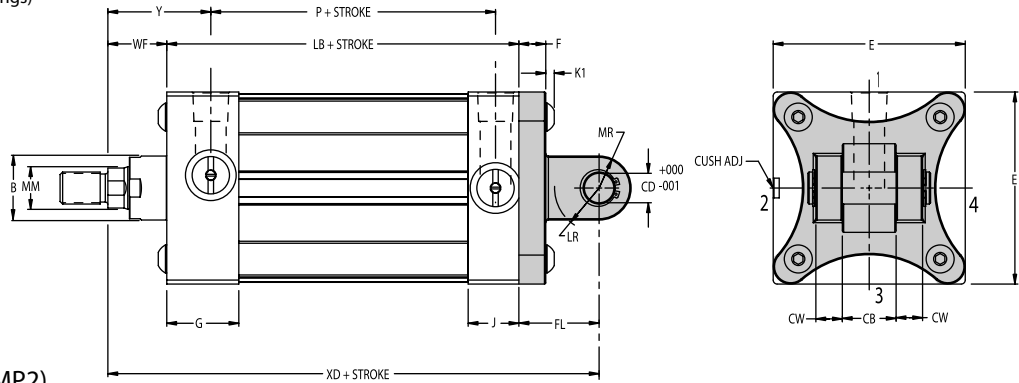
## Pivot Mounted Cylinders

### 1.50" to 4.00"



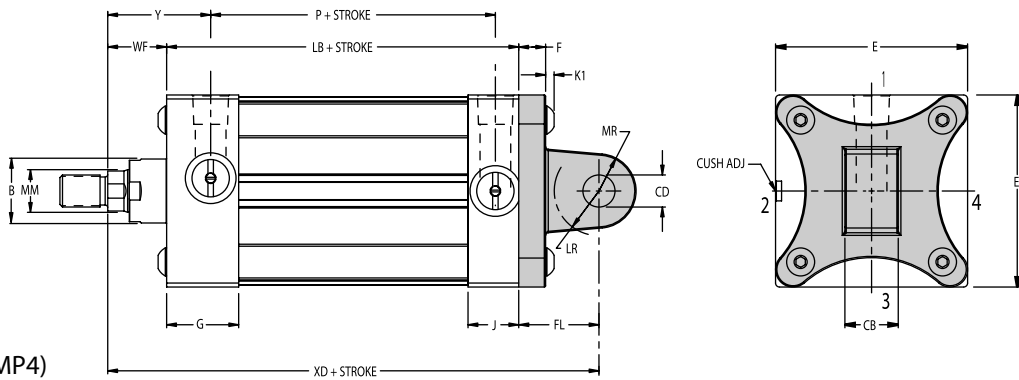
**STYLE G—Clevis Mount**  
(NFPA Mounting Style MP1)

Clevis pin assembly (with Snap Rings) is supplied with cylinder.



**STYLE Z—Detachable Clevis Mount**  
(NFPA Mounting Style MP2)

Clevis pin assembly (with Snap Rings) is supplied with cylinder.



**STYLE R—Detachable Pivot Mount**  
(NFPA Mounting Style MP4)

**Series AS**  
**Section 6**

BORE	AA	E	EE		F	G	J	K1	R	CD	CB	CW	FL	L	LR	MR	NR	ADD STROKE	
			NPTF	SAE														P	LB
1½	2.02	2	¾	6	¾	1 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	1/8	1.43	1/2	¾	1/2	1 <sup>1</sup> / <sub>8</sub>	¾	5/8	1/2	5/8	2 <sup>1</sup> / <sub>4</sub>	3 <sup>5</sup> / <sub>8</sub>
2	2.60	2½	¾	6	¾	1 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	5/32	1.84	1/2	¾	1/2	1 <sup>1</sup> / <sub>8</sub>	¾	5/8	1/2	5/8	2 <sup>1</sup> / <sub>4</sub>	3 <sup>5</sup> / <sub>8</sub>
2½	3.10	3	¾	6	¾	1 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	5/32	2.19	1/2	¾	1/2	1 <sup>1</sup> / <sub>8</sub>	¾	5/8	1/2	5/8	2 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>
3¼	3.90	3¾	1/2	10	5/8	1 <sup>11</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	3/16	2.76	¾	1¼	5/8	1 <sup>7</sup> / <sub>8</sub>	1¼	15/16	¾	7/8	2 <sup>5</sup> / <sub>8</sub>	4¼
4	4.70	4½	1/2	10	5/8	1 <sup>11</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	3/16	3.32	¾	1¼	5/8	1 <sup>7</sup> / <sub>8</sub>	1¼	15/16	¾	7/8	2 <sup>5</sup> / <sub>8</sub>	4¼

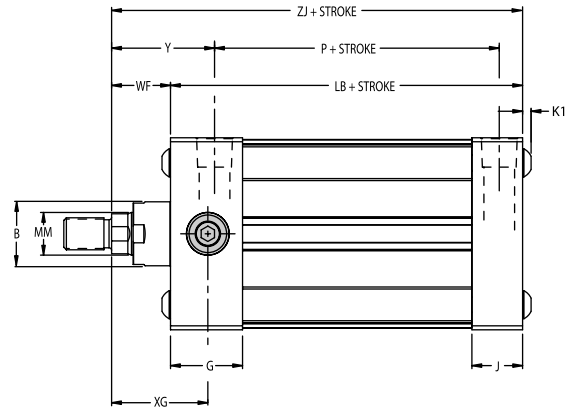
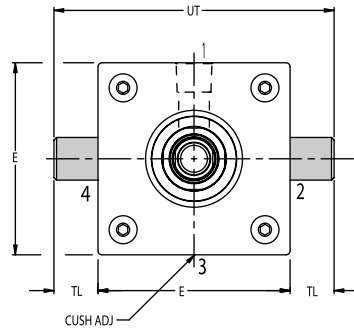
BORE	ROD DIA.	THREAD SIZE		ROD EXTENSIONS AND PILOT DIMENSIONS							ADD STROKE				
	MM	KK	FF	A	+000 -002 B	C	D	NA	FA	VB	WF	Y	XC	XD	ZJ
1½	5/8	7/16-20	1/2-20	¾	1.124	¾	1/2	9/16	¾	5/8	1	1 <sup>15</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>4</sub>	4 <sup>5</sup> / <sub>8</sub>
2	5/8	7/16-20	1/2-20	¾	1.124	¾	1/2	9/16	¾	5/8	1	1 <sup>15</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>4</sub>	4 <sup>5</sup> / <sub>8</sub>
	1	¾-16	7/8-14	1 <sup>1</sup> / <sub>8</sub>	1.499	1/2	7/8	15/16	¾	7/8	1 <sup>3</sup> / <sub>8</sub>	2 <sup>5</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>8</sub>	5
2½	5/8	7/16-20	1/2-20	¾	1.124	¾	1/2	9/16	¾	5/8	1	1 <sup>15</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>2</sub>	5 <sup>7</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>4</sub>
	1	¾-16	7/8-14	1 <sup>1</sup> / <sub>8</sub>	1.499	1/2	7/8	15/16	¾	7/8	1 <sup>3</sup> / <sub>8</sub>	2 <sup>5</sup> / <sub>16</sub>	5 <sup>7</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>8</sub>
3¼	1	¾-16	7/8-14	1 <sup>1</sup> / <sub>8</sub>	1.499	1/2	7/8	15/16	¾	7/8	1 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	6 <sup>7</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>2</sub>	5 <sup>5</sup> / <sub>8</sub>
	1 <sup>3</sup> / <sub>8</sub>	1-14	1¼-12	1 <sup>5</sup> / <sub>8</sub>	1.999	5/8	1 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	5/8	1	1 <sup>5</sup> / <sub>8</sub>	2 <sup>11</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>	7 <sup>3</sup> / <sub>4</sub>	5 <sup>7</sup> / <sub>8</sub>
4	1	¾-16	7/8-14	1 <sup>1</sup> / <sub>8</sub>	1.499	1/2	7/8	15/16	¾	7/8	1 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	6 <sup>7</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>2</sub>	5 <sup>5</sup> / <sub>8</sub>
	1 <sup>3</sup> / <sub>8</sub>	1-14	1¼-12	1 <sup>5</sup> / <sub>8</sub>	1.999	5/8	1 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	5/8	1	1 <sup>5</sup> / <sub>8</sub>	2 <sup>11</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>	7 <sup>3</sup> / <sub>4</sub>	5 <sup>7</sup> / <sub>8</sub>

# Series AS

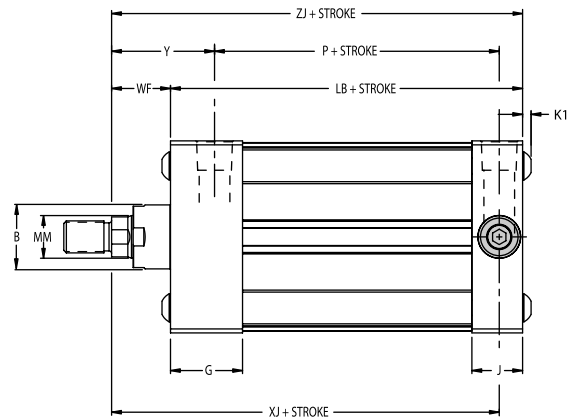
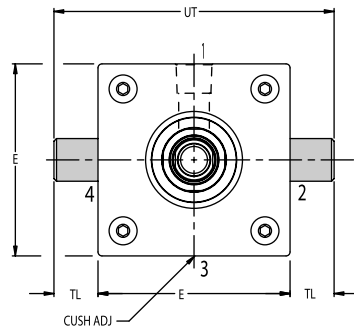
## Trunnion Mounted Cylinders

### 1.50" to 4.00"

**STYLE ER—Trunnion  
Mount Head End**  
(NFPA Mounting Style MT1)



**STYLE EB—Trunnion  
Mount Cap End**  
(NFPA Mounting Style MT2)



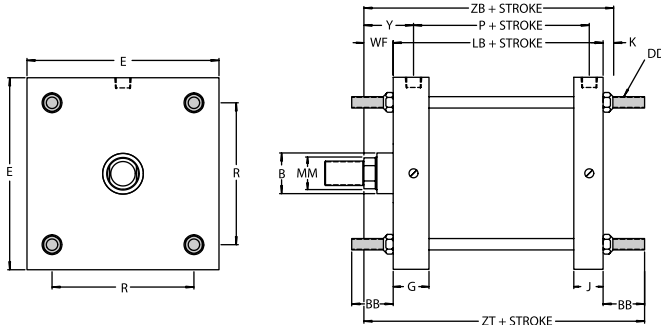
Pintles on AS trunnion mounted cylinders are removable.

**Series AS  
Section 6**

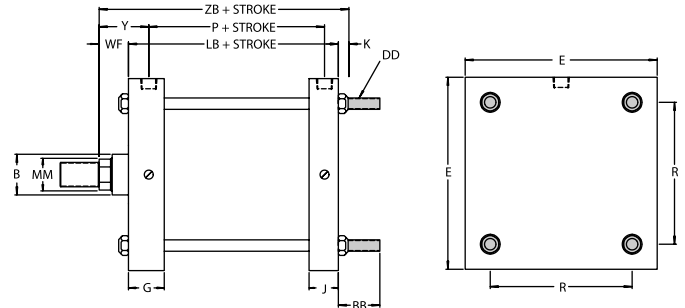
BORE	AA	E	EE		F	G	J	K1	R	TD	TL	TG	TM	TW	UM	ADD STROKE		
			NPTF	SAE												UT	P	LB
1½	2.02	2	¾	6	¾	1 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	1.43	1	1	2½	2½	1¼	4½	4	2¼	3 <sup>5</sup> / <sub>8</sub>
2	2.60	2½	¾	6	¾	1 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>32</sub>	1.84	1	1	3	3	1½	5	4½	2¼	3 <sup>5</sup> / <sub>8</sub>
2½	3.10	3	¾	6	¾	1 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>32</sub>	2.19	1	1	3½	3½	1½	5½	5	2 <sup>3</sup> / <sub>8</sub>	3¼
3¼	3.90	3¾	½	10	5 <sup>5</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	2.76	1	1	4¼	4½	2	6½	5¾	2 <sup>5</sup> / <sub>8</sub>	4¼
4	4.70	4½	½	10	5 <sup>5</sup> / <sub>8</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	3.32	1	1	5	5¼	2	7¼	6½	2 <sup>5</sup> / <sub>8</sub>	4¼

BORE	ROD DIA.	THREAD SIZE		ROD EXTENSIONS AND PILOT DIMENSIONS							ADD STROKE				
	MM	KK	FF	A	+000 -002 B	C	D	NA	FA	VB	WF	Y	XG	XJ	ZJ
1½	5 <sup>5</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>16</sub> -20	1 <sup>1</sup> / <sub>2</sub> -20	¾	1.124	¾	½	9 <sup>9</sup> / <sub>16</sub>	¾	5 <sup>5</sup> / <sub>8</sub>	1	1 <sup>15</sup> / <sub>16</sub>	1¾	4 <sup>4</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>
2	5 <sup>5</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>16</sub> -20	1 <sup>1</sup> / <sub>2</sub> -20	¾	1.124	¾	½	9 <sup>9</sup> / <sub>16</sub>	¾	5 <sup>5</sup> / <sub>8</sub>	1	1 <sup>15</sup> / <sub>16</sub>	1¾	4 <sup>4</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>
	1	¾-16	7 <sup>7</sup> / <sub>8</sub> -14	1 <sup>1</sup> / <sub>8</sub>	1.499	½	7 <sup>7</sup> / <sub>8</sub>	1 <sup>15</sup> / <sub>16</sub>	¾	7 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	2 <sup>5</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>8</sub>	4½	5
2½	5 <sup>5</sup> / <sub>8</sub>	7 <sup>7</sup> / <sub>16</sub> -20	1 <sup>1</sup> / <sub>2</sub> -20	¾	1.124	¾	½	9 <sup>9</sup> / <sub>16</sub>	¾	5 <sup>5</sup> / <sub>8</sub>	1	1 <sup>15</sup> / <sub>16</sub>	1¾	4¼	4¾
	1	¾-16	7 <sup>7</sup> / <sub>8</sub> -14	1 <sup>1</sup> / <sub>8</sub>	1.499	½	7 <sup>7</sup> / <sub>8</sub>	1 <sup>15</sup> / <sub>16</sub>	¾	7 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	2 <sup>5</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>
3¼	1	¾-16	7 <sup>7</sup> / <sub>8</sub> -14	1 <sup>1</sup> / <sub>8</sub>	1.499	½	7 <sup>7</sup> / <sub>8</sub>	1 <sup>15</sup> / <sub>16</sub>	¾	7 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	2¼	5	5 <sup>5</sup> / <sub>8</sub>
	1¾	1-14	1¼-12	1 <sup>5</sup> / <sub>8</sub>	1.999	5 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>	1	1 <sup>5</sup> / <sub>8</sub>	2 <sup>11</sup> / <sub>16</sub>	2½	5¼	5 <sup>7</sup> / <sub>8</sub>
4	1	¾-16	7 <sup>7</sup> / <sub>8</sub> -14	1 <sup>1</sup> / <sub>8</sub>	1.499	½	7 <sup>7</sup> / <sub>8</sub>	1 <sup>15</sup> / <sub>16</sub>	¾	7 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	2¼	5	5 <sup>5</sup> / <sub>8</sub>
	1¾	1-14	1¼-12	1 <sup>5</sup> / <sub>8</sub>	1.999	5 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>	1	1 <sup>5</sup> / <sub>8</sub>	2 <sup>11</sup> / <sub>16</sub>	2½	5¼	5 <sup>7</sup> / <sub>8</sub>

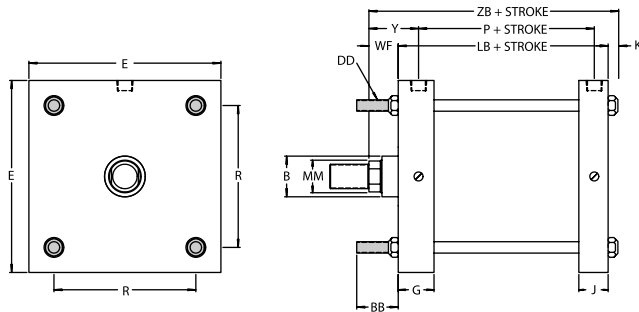
# Series AS Tie Rod Mounts 5.00" to 8.00"



**Style L**



**Style N**



**Style M**

OFF Mounting Style	NFPA Mounting Style	DESCRIPTION
L	MX1	Tie rods extended both ends (above left)
M	MX3	Tie rods extended head end (rod end)
N	MX2	Tie rods extended cap end (blind end)
DL	MDX1	Tie rods extended both ends (above right)
DM	MDX3	Tie rods extended one end

Double rod cylinders are available in all styles\* except A, AA, EB, and G. Dimensions for other styles are the same as above with mounting added. Add prefix D to style when ordering. Example: DB AIR CYL.

BB is standard tie rod extension on Styles L, M, N, DL and DM, but will be increased or decreased when specified. To do this, specify BB to be (so many) inches. Extra nuts are available for tie rod ends.

\*Consult factory on availability of Style DCC cylinder.

### ENVELOPE AND MOUNTING DIMENSIONS

BORE	AA	BB	DD	E	EE NPTF	F	G	J	K	R	ADD STROKE		
											LB	LD	P
5	5.8	1 <sup>13</sup> / <sub>16</sub>	1/2-20	5 <sup>1</sup> / <sub>2</sub>	1/2	5/8	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	7/16	4-10	4 <sup>1</sup> / <sub>2</sub>	5	2 <sup>7</sup> / <sub>8</sub>
6	6.9	1 <sup>13</sup> / <sub>16</sub>	1/2-20	6 <sup>1</sup> / <sub>2</sub>	3/4	3/4	2	1 <sup>1</sup> / <sub>2</sub>	7/16	4.88	5	5 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>8</sub>
8	9.1	2 <sup>5</sup> / <sub>16</sub>	5/8-18	8 <sup>1</sup> / <sub>2</sub>	3/4	—	2	1 <sup>1</sup> / <sub>2</sub>	9/16	6.4	5 <sup>1</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>4</sub>

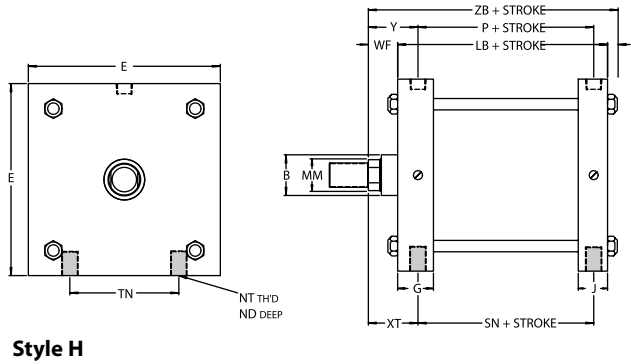
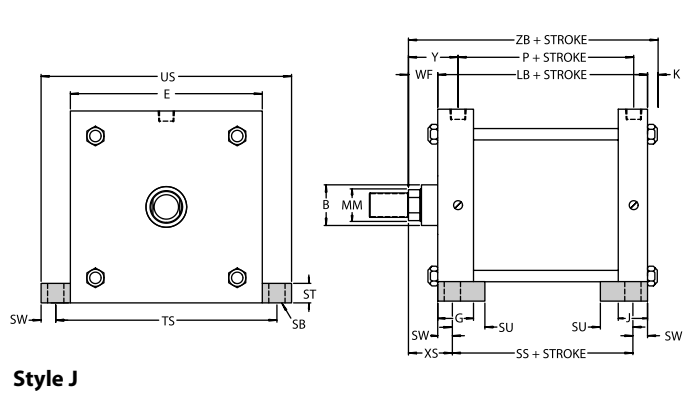
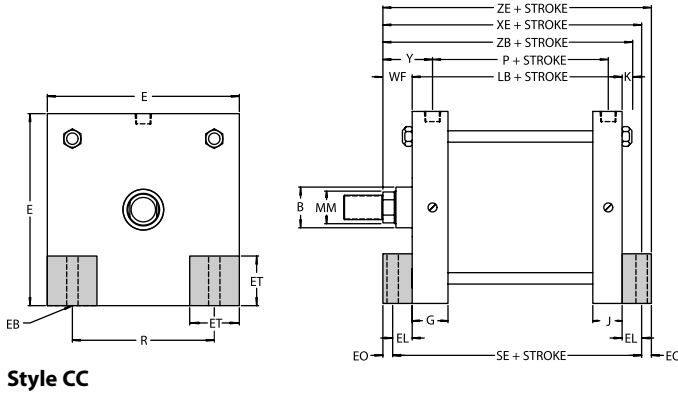
### ROD END DIMENSIONS

BORE	ROD DIA. MM	THREAD SIZE		ROD EXTENSIONS AND PILOT DIMENSIONS								ADD STROKE		ADD 2X STK.
		KK	FF	A	+000 -002 B	C	D	NA	VB	WF	Y	ZB	ZT	
5	1	3/4-16	7/8-14	1 <sup>1</sup> / <sub>8</sub>	1.499	1/2	7/8	15/16	7/8	1 <sup>3</sup> / <sub>8</sub>	2 <sup>7</sup> / <sub>16</sub>	6 <sup>5</sup> / <sub>16</sub>	7 <sup>11</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>4</sub>
	1 <sup>3</sup> / <sub>8</sub>	1-14	1 <sup>1</sup> / <sub>4</sub> -12	1 <sup>5</sup> / <sub>8</sub>	1.999	5/8	1 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	1	1 <sup>5</sup> / <sub>8</sub>	2 <sup>11</sup> / <sub>16</sub>	6 <sup>9</sup> / <sub>16</sub>	7 <sup>15</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>4</sub>
6	1 <sup>3</sup> / <sub>8</sub>	1-14	1 <sup>1</sup> / <sub>4</sub> -12	1 <sup>5</sup> / <sub>8</sub>	1.999	5/8	1 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	1	1 <sup>5</sup> / <sub>8</sub>	2 <sup>13</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>16</sub>	8 <sup>7</sup> / <sub>16</sub>	8 <sup>3</sup> / <sub>4</sub>
	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub> -12	1 <sup>1</sup> / <sub>2</sub> -12	2	2.374	3/4	1 <sup>1</sup> / <sub>2</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>16</sub>	7 <sup>5</sup> / <sub>16</sub>	8 <sup>11</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>4</sub>
8	1 <sup>3</sup> / <sub>8</sub>	1-14	1 <sup>1</sup> / <sub>4</sub> -12	1 <sup>5</sup> / <sub>8</sub>	1.999	5/8	1 <sup>1</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	1	1 <sup>5</sup> / <sub>8</sub>	2 <sup>13</sup> / <sub>16</sub>	7 <sup>5</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>16</sub>	8 <sup>7</sup> / <sub>8</sub>
	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub> -12	1 <sup>1</sup> / <sub>2</sub> -12	2	2.374	3/4	1 <sup>1</sup> / <sub>2</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>8</sub>	1 <sup>7</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>16</sub>	7 <sup>9</sup> / <sub>16</sub>	9 <sup>5</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>4</sub>

# Series AS

## Foot Mounted Cylinders

### 5.00" to 8.00"

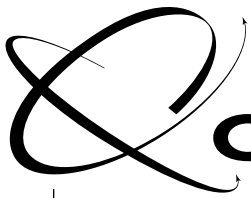


#### ENVELOPE AND MOUNTING DIMENSIONS

BORE	E	EB*	EE NPTF	EL	EO	ET	F	G	J	K	NT	R	SB*	ST	SU	SW	TN	TS	US	ADD STROKE				
																				LB	P	SE	SN	SS
5	5 1/2	1/2	1/2	1 1/16	1/2	1 3/8	5/8	1 3/4	1 1/4	7/16	5/8-11	4.10	3/4	1	1 9/16	11/16	2 11/16	6 7/8	8 1/4	4 1/2	2 7/8	7 1/4	2 7/8	3 1/8
6	6 1/2	1/2	3/4	1	1/2	1 5/8	3/4	2	1 1/2	7/16	3/4-10	4.88	3/4	1	1 9/16	11/16	3 1/4	7 7/8	9 1/4	5	3 1/8	7 3/4	3 1/8	3 5/8
8	8 1/2	5/8	3/4	1 1/8	5/8	2 1/16	—	2	1 1/2	9/16	3/4-10	6.44	3/4	1	1 9/16	11/16	4 1/2	9 7/8	11 1/4	5 1/8	3 1/4	7 3/8	3 1/4	3 3/4

#### ROD END DIMENSIONS

BORE	ROD DIA. MM	THREAD SIZE		ROD EXTENSIONS AND PILOT DIMENSIONS						ADD STROKE							
		KK	FF	A	+000 -002 B	C	D	NA	VB	WF	Y	ND	XS	XT	XE	ZB	ZE
5	1	3/4-16	7/8-12	1 1/8	1.499	1/2	7/8	15/16	7/8	1 3/8	2 7/16	15/16	2 1/16	2 1/16	6 15/16	6 7/16	7 1/16
	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	1 5/16	1	1 5/8	2 11/16	15/16	2 5/16	2 11/16	7 3/16	6 9/16	7 11/16
6	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	1 5/16	1	1 5/8	2 13/16	1 1/8	2 5/16	2 13/16	7 5/8	7 1/16	8 1/8
	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	1 11/16	1 1/8	1 7/8	3 1/16	1 1/8	2 9/16	3 1/16	7 7/8	7 5/16	8 3/8
8	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	1 5/16	1	1 5/8	2 13/16	1 1/8	2 5/16	2 13/16	7 7/8	7 5/16	8 1/2
	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	1 11/16	1 1/8	1 7/8	3 1/16	1 1/8	2 9/16	3 1/16	8 1/8	7 9/16	8 3/4

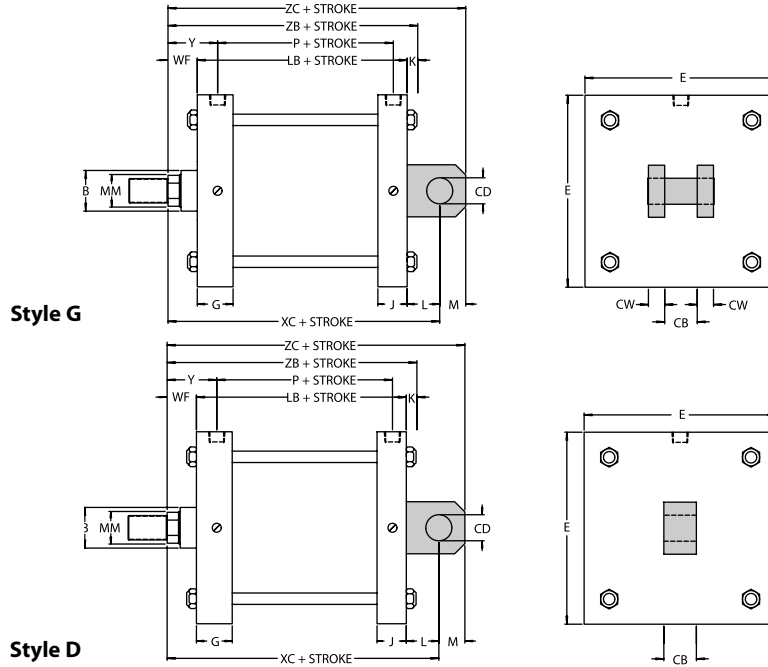


**Quincy**  
PORTMAN CYLINDERS

# Series AS

## Pivot Mounted Cylinders

### 5.00" to 8.00"



#### ENVELOPE AND MOUNTING DIMENSIONS

BORE	CB	CD	CW	E	EE NPTF	G	J	K	L	LR	M	N	NR	ADD STROKE	
														LB	P
5	1 1/4	3/4	5/8	5 1/2	1/2	1 3/4	1 1/4	7/16	1 1/4	15/16	3/4	1 1/4	27/32	4 1/2	2 7/8
6	1 1/2	1	3/4	6 1/2	3/4	2	1 1/2	7/16	1 1/2	1 5/16	1	1 1/2	1 1/8	5	3 1/8
8	1 1/2	1	3/4	8 1/2	3/4	2	1 1/2	9/16	1 1/2	1 5/16	1	1 1/2	1 1/8	5 1/8	3 1/4

**Series AS**  
**Section 6**

#### ROD END DIMENSIONS

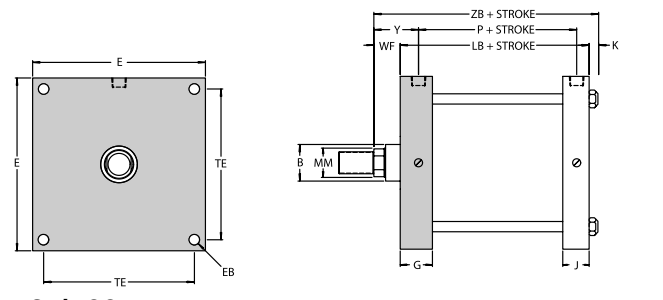
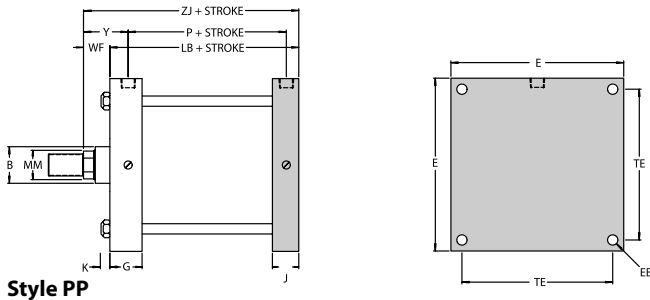
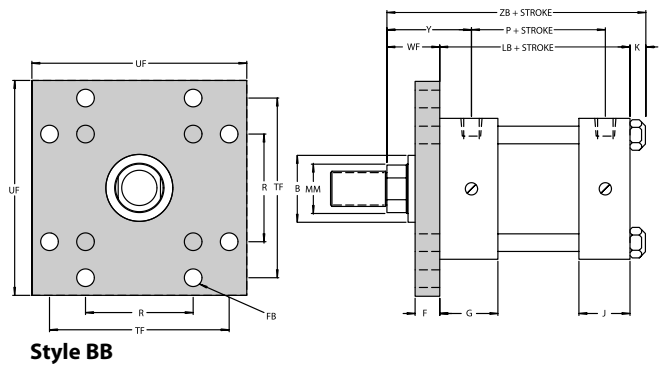
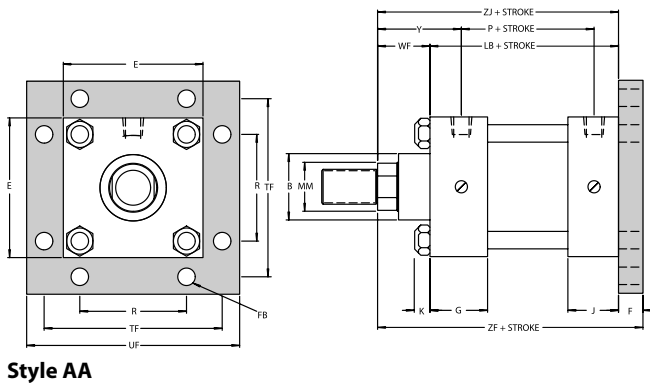
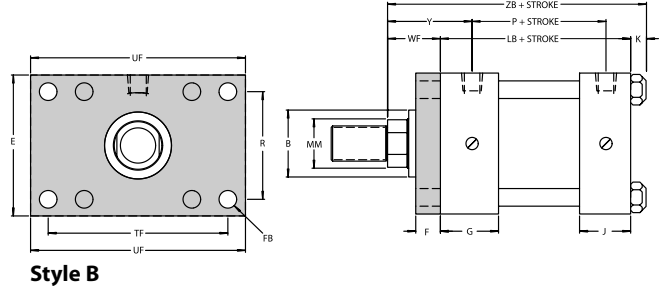
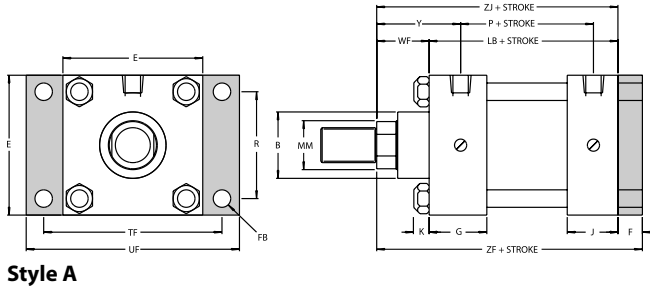
BORE	ROD DIA. MM	THREAD SIZE		ROD EXTENSIONS AND PILOT DIMENSIONS							ADD STROKE						
		KK	FF	A	+000 -002 B	C	D	NA	FA	VB	WF	Y	XG	XC	ZC	XH	ZH
5	1	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	15/16	3/8	7/8	1 3/8	2 7/16	2 1/4	7 1/8	7 7/8	7 1/8	7 7/8
	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	1	1 5/8	2 11/16	2 1/2	7 3/8	8 1/8	7 3/8	8 1/8
6	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	1	1 5/8	2 13/16	2 5/8	8 1/8	9 1/8	8 1/8	9 1/8
	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	1 11/16	5/8	1 1/8	1 7/8	3 1/16	2 7/8	8 3/8	9 3/8	8 3/8	9 3/8
8	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	1 5/16	5/8	1	1 5/8	2 13/16	2 5/8	8 1/4	9 1/4	8 1/4	9 1/4
	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	1 11/16	5/8	1 1/8	1 7/8	3 1/16	2 7/8	8 1/2	9 1/2	8 1/2	9 1/4



# Series AS

## Flange Mounted

### 5.00" to 8.00"

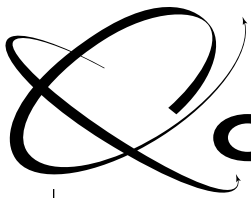


#### ENVELOPE AND MOUNTING DIMENSIONS

BORE	E	EE NPTF	F	FB*	G	J	K	R	TF	TE	UF	ADD STROKE		
												LF	P	LB
5	5 1/2	1/2	5/8	1/2	1 3/4	1 1/4	7/16	4.10	6 5/8	—	7 5/8	5 1/8	2 7/8	4 1/2
6	6 1/2	3/4	3/4	1/2	2	1 1/2	7/16	4.88	7 5/8	—	8 5/8	5 3/4	3 1/8	5
8	8 1/2	3/4	—	5/8	2	1 1/2	9/16	—	—	7.57	—	5 1/8	3 1/4	5 1/8

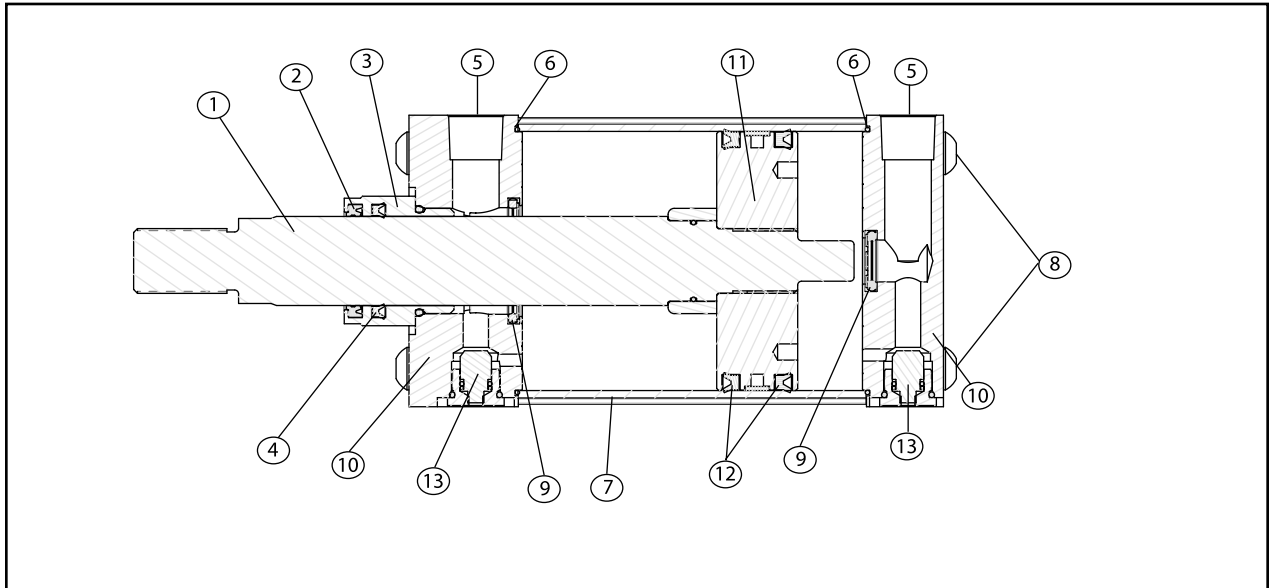
#### ROD END DIMENSIONS

BORE	ROD DIA.	THREAD SIZE		ROD EXTENSIONS AND PILOT DIMENSIONS						ADD STROKE					
		MM	KK	FF	A	+000 -002 B	C	D	NA	VB	WF	Y	W	ZJ	ZB
5	1	3/4-16	7/8-14	1 1/8	1.499	1/2	7/8	15/16	7/8	1 3/8	2 7/16	3/4	5 7/8	6 1/16	6 1/2
	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	1 5/16	1	1 5/8	2 11/16	1	6 1/8	6 9/16	6 3/4
6	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	1 5/16	1	1 5/8	2 13/16	7/8	6 5/8	7 1/16	7 3/8
	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	1 11/16	1 1/8	1 7/8	3 1/16	1 1/8	6 7/8	7 5/16	7 5/8
8	1 3/8	1-14	1 1/4-12	1 5/8	1.999	5/8	1 1/8	1 5/16	1	1 5/8	2 13/16	—	6 3/4	7 5/16	—
	1 3/4	1 1/4-12	1 1/2-12	2	2.374	3/4	1 1/2	1 11/16	1 1/8	1 7/8	3 1/16	—	7	7 9/16	—



**Quincy**  
PORTMAN CYLINDERS

## Series AS Air Cylinder Features



**1. Piston Rods**— $\frac{5}{8}$ " thru 4" diameter are medium carbon steel with 100,000 psi minimum yield. Piston rods over 4" diameter have yield strengths between 50,000 and 90,000 psi. Sizes  $\frac{4}{8}$ " thru  $3\frac{1}{2}$ " diameter are induction case hardened to 54 Rockwell C. All piston rods are hardchrome plated and highly polished.

**2. Rod Wiper**—Polyurethane, double lip type wiper designed to protect the piston rod, bearing and rod seal, is standard for all rod sizes. Also metallic scrapers and Viton wipers are available for all rod sizes.

**3. Rod Gland Cartridge**—The cartridges can be removed without removing mounts or bolts. This eliminates the necessity of cylinder disassembly to replace the rod seals or rod bearing.

**Rod Bearing**—Aluminum bronze material insures low friction, high load capabilities and long life.

**4. Rod Seal**—Buna compound, flexible lip type rod seal has excellent break away. Inherent characteristics of the material and design assure leakproof performance and long life.

**5. Ports**—Large unrestricted ports permit maximum flow with minimum

pressure drop. Heads may be rotated independently at 90° intervals for convenient port location.

**6. Tube Seals**—Positive sealing synthetic rubber "O" ring.

**7. Tube**—Aluminum precision extrusion, anodized bore for light weight, high strength, with excellent corrosion-resisting characteristics. Dovetail grooves along all four sides of the tube extrusion allow for quick installation of switches.

**8. Assembly Bolts**—High strength steel bolts treated for corrosion resistance.

**9. Cushions**—Self-aligning, synthetic rubber type seals provide a positive leak-proof cushion. This, together with adjustable cushion needle valve, offers an extremely accurate means of obtaining most efficient cushion characteristics for a variety of loads and speeds.

**10. Heads and Caps**—Aluminum accurately machined to assure perfect alignment of piston rod bearing, piston rod, piston, and tube. Heads and caps pilot on tube O.D. to prevent "breathing" and provide additional insurance against leakage.

**11. Piston**—High grade aluminum,  $1\frac{1}{2}$ " thru 4" bores. Pistons are one piece, pilot fitted to piston rod and locked.

**12. Piston Seals**—Flexible lip type piston seals provide positive sealing, low friction and long life.

**13. Needle valves**—Flush type needle valves are supplied. Large drilled passages provide maximum control of cushioning effect and assure rapid full power starts at beginning of stroke. Self contained, durable, high pressure design assures leak free operation.

**Wrench Flats**—Large wrench flats are chamfered to protect rod gland packing in installation. All standard piston rods through  $5\frac{1}{2}$ " diameter are furnished with two wrench flats. Additional flats are available upon request.

**Pre-lubricated**—A specially compounded tenacious lubricant permits operation on non-lubricated air. This assures long life under normal operating conditions. This ecological feature eliminates exhausting oil mist into the atmosphere.

**JIC**—These cylinders are designed to conform to JIC standards.

**NFPA**—The dimensioning and identification of the cylinders in this catalog are in accordance with the NFPA recommended dimension code for fluid power cylinders.

**Series AS  
Section 6**