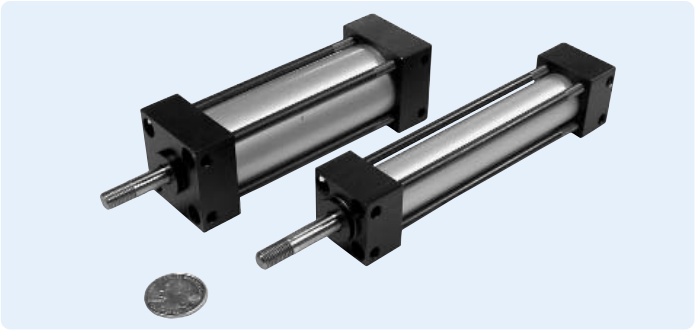
Small Bore Tie Rod



Cylinder Materials

Heads: Machined from solid aluminum; black anodized
Tubes: Aluminum hard anodized to 60 Rc (16 RMS finish)
Piston: Solid high alloy aluminum
Rod: Hard chrome plated ground and polished steel
Bearing: Long wearing oil impregnated porous bronze
Piston and Rod Seals: Wear compensating Buna N vee rings
Rod Wiper: PTFE
Tie Rods: High tensile steel torqued to allow for flexure

Double-Rod Cylinders

Cylinders having a common piston rod that protrudes from both ends are available in all bore sizes. In addition to providing a dual power source, double rod cylinders serve to minimize rod deflection and to facilitate the control and adjustment or rod travel.

Specify Cushions for Shock Absorption

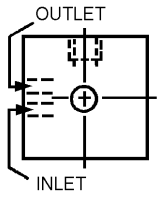
Model DM-112 is available with adjustable cushions that decelerate the piston rod over the last 11⁄16″ of stroke. They allow the user to set the degree of cushioning needed for each specific application.

Note: Cushions are not recommended for hydraulic use.

Pneumatic End-of-Stroke Sensors (Inter-Pilots®)

A miniature 3-way valve built into the cylinder head is actuated by the cylinder piston as it reaches the end of its stroke. Once contacted, the 3-way Inter-Pilot® valve emits an air signal. In this manner, sequencing is achieved without external limit switches and electric wiring.

Inter-Pilots® may be built (10-32 Ports) into either or both cylinder heads. They are not for hydraulic use. Cylinder operating pressure must not exceed pressure used to feed the Inter-Pilot®. Inter-Pilots® are not available on DM-075.



Operating Parameters

Bore Diam.	Thrust*	Thrust Mult.**	Rod Diam.(In.)	Max. Oper. Pressure Air	Oil‡
3⁄4″	44	.44	5⁄16	250	1000
1 1⁄8″	100	1.00	5⁄16	250	1000

*Pushing force of cylinder at 100 PSI inlet pressure. Pulling force will be about 10% less due to the displacement of the piston rod. Note: Actual realizable thrust could be somewhat lower due to side loading and internal friction. It is best to oversize your cylinder by about 25% to assure smooth operation.

** To determine thrust at other inlet pressures, multiply factor by the desired pressure.

‡ DM cylinders are not rated or approved for use in hydraulic circuit where an impulse or pressure spike may occur.

Operating Specifications	
Temp. Range:	-40 to +250°F (to +400°F on request)
Lubrication:	Not necessary, but will extend cylinder life when operated with dry air.
Filtration:	Not essential, but a standard 40 micron filter placed upstream will prolong seal life.

Pneumatic Stroke Completion Sensors (SCS)

Port mounted SCS valves emit an air signal when the cylinder rod has stopped even if the piston has not contacted the end cap. SCS valves are ideal for use in situations where the full cylinder stroke is not used. See pg. 57.

Accessories

	Bore Diameter	3⁄4″	1 1⁄8″
	Flex Rod Couplers	DMA-312	DMA-312
	Forged Rod Clevis	DMC-5	DMC-5
	Pivot Bracket	NA	DMP-7
	Clevis Bracket (with Pin)	NA	DMR-7

Self Aligning Rod Couplers

Rod couplers simplify cylinder alignment problems by compensating for 2° angular error and 1⁄16″ lateral misalignment on both extension and retraction strokes. Greater reliability is achieved by reducing cylinder and component wear. Order model # DMA-312 for these small bore cylinders. For other models, see page 45 for dimensions.

Part #	Rod Thread	Cylinder Type
DMA-312	5⁄16-24	C-112, DM-075, DM-112
DMA-375	3⁄8-24	No Standard
DMA-437	7⁄16-20	DM-150, DM2-150, HD1-150, DM-200, DM2-200, HD1-200, DM-250, DM2-250, HD1-250
DMA-500	1⁄2-20	C-150
DMA-625	5⁄18-18	C-250
DMA-750	3⁄4-16	DM-325, DM2-325, HD1-325, DM-400, DM2-400, HD1-400
DMA-875	7⁄8-14	No Standard
DMA-1000	1-14	C-300, DM-600, HD1-600
DMA-1250	1 1⁄4-12	No Standard

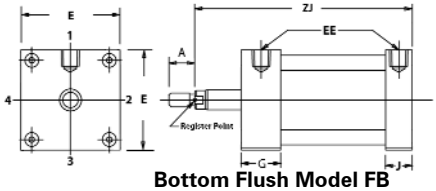
Small Bore Tie Rod Dimensions and Ordering Information

Bore	¾	1 ⅛
A	½	½
CB	-	⅝
CD	25/64	25/64
CR	2 ¼	2 ¼
CW	-	½
DD	13/64	13/64
E	1 ¼	1 ⅝
EB	1 7/16	1 7/16
EE(NPTF)	⅛	⅛
EF	11/32	11/32
EJ	13/64	13/64
F	-	⅛
FB	7/32	7/32
G	¾	¾
J	¾	¾
KK	5/16-24	5/16-24
FL	1 ⅛	⅝ Clevis 1¼ Pivot
M	-	⅜
MM	5/16	5/16
NT	13/64-Thru	13/64-Thru
R	13/16	1 ⅛
RT	10-32	10-32
ST	9/32	9/32
SV	5/16	5/16
TF	2 13/32	2 25/32
TN	13/16	1 ⅛
UF	2 29/32	3 9/32
W	½	½
XT	11/16	11/16
H	⅞	⅞
HA	1 ¼	1 ¼
HB	¼	¼
HC	⅝	⅝
HD	5/16	5/16
HE	¾	¾
SN*	1 ¾	1 ¾
XD*	3 ¾	3⅞ Pivot 3¼ Clevis
ZJ*	2 ⅝	2 ⅝
ZM**	3 ⅛	3 ⅛

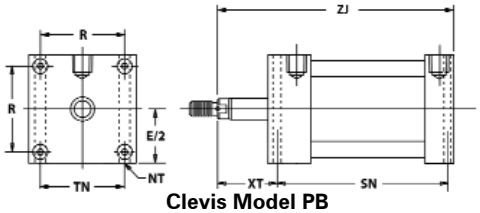
* Add Stroke Length to Dimension

** Add 2 x Stroke Length to Dimension

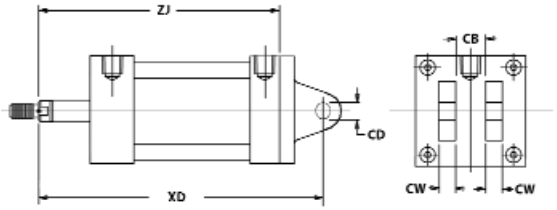
Basic Cylinder



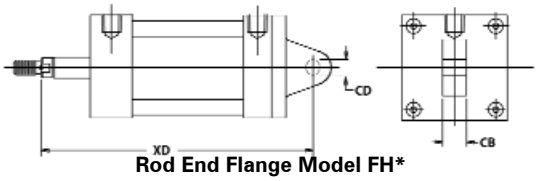
Bottom Flush Model FB



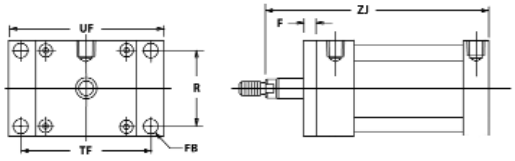
Clevis Model PB



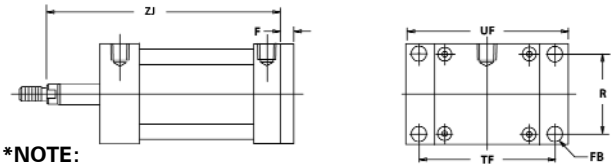
Pivot Model PE



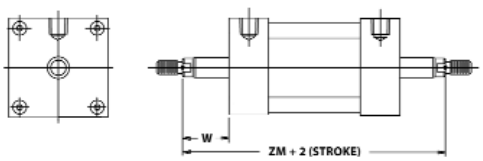
Rod End Flange Model FH*



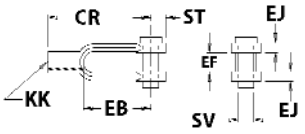
Blind End Flange Model FR*



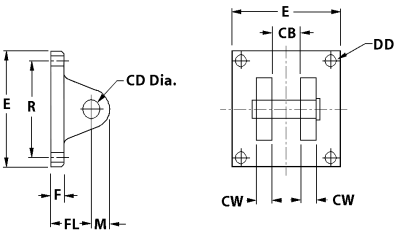
Double Rod Model DR



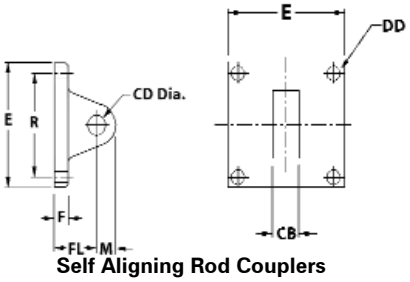
DMC Forged Rod Clevis w/Pin



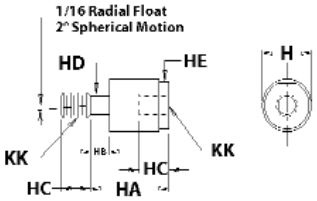
DMR Clevis Bracket w/Pin
1⅛" Only



DMP Pivot Bracket
1⅛" Only



Self Aligning Rod Couplers



***NOTE:**

(1) 1⅛" bore cylinders use two angle brackets for flange mounting. (no flange plate)

(2) On 1⅛" bore models with ram end cushions and/or Inter-Pilots®, 9/16" must be added to **G, ZB, SN, and XD** dimensions. For blind end cushions and/or Inter-Pilots®, ⅝" must be added to **J, ZJ, SN, and XD** dimensions.

(3) ¾" and 1⅛" bore cylinders use spacers for fractional strokes. For dimensioning, use the next even inch stroke. For true fractional stroke cylinders, specify **CL** (cut to length).

(4) ¾" and 1⅛" bore models have (4) 10-32 threaded holes for rear flush mounting.

How To Order

DM-112 x 10 - FB - DR

Base Model
DM-075 (3/4" Bore)
DM-112 (1 -1/8" Bore)

Stroke
State Fractional Strokes as decimals (i.e. 10.5)
Note: These cylinders use spacers for fractional stroke. For dimensioning, use the next even stroke. For true fractional stroke cylinders specify CT (i.e. , 10.5 CT)

Mounting

NOTE: DM-075 only available with FB Mount.

In addition to Models shown above the DM-112 is available in a Nose Mount (NS). Consult the factory for dimensional information.

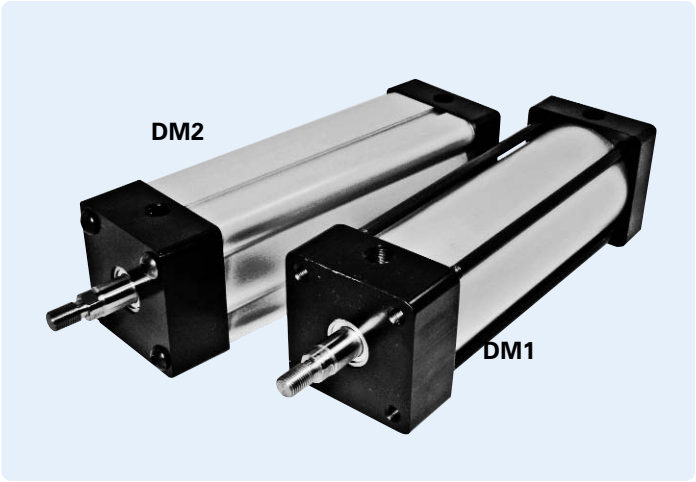
Options

DR		Double Rod
VI		Viton Seals
HY		Hydraulic Use

Options below are only available on DM-112

CF CR CB		Front Cushions Rear Cushions Cushions Both Ends
IPF IPR IPB		Interpilots - Front Head Interpilots - Rear Head Interpilots - Both Heads

Dyna-Mation Series: DM1 & DM2



Built to Last (Materials)

- Cylinder heads are machined from solid aluminum bar stock and black anodized
- Tubes (DM1) and Tube Extrusions (DM2) are aluminum hard anodized to 60 Rc (16 RMS finish)
- Pistons are solid high alloy aluminum
- Pistons have a PTFE wear band
- Dynamic seals are high quality wear-compensating Buna N block V rings
- Rods are hard chrome plated ground and polished steel
- Rod Wipers are PTFE
- Tie Rods (DM1) are high tensile steel torqued to allow for flexure

Dyna-Mation -vs- HD Models

Dyna-Mation cylinders are designed to generate high performance in most applications. However, when operating conditions are severe, heavy duty models (HD Series, see pages 38-47) are recommended. The HD Series boasts the added benefits of a large hard-coated outboard rod bearing. The following profiles illustrate the differences of the rod end head in all three types of cylinders:

DM2
Extruded Body Design with Internal Rod Bearing

DM1
Internal Bronze Rod Bearing Tie Rod Design

HD1
Heavy Duty Hard-Coated Rod Bearing

Two Designs To Meet Application Demands

Mead Dyna-Mation cylinders are available two design series, the DM1 and the DM2. The DM1 series incorporates tie-rod construction while the DM2 series cylinders are constructed with an extruded body design, making these cylinders better suited for wash down applications and clean environments.

Specify Cushions for Shock Absorption

Adjustable cushions that decelerate the piston rod over the last $^{11}/_{16}$" of stroke may be ordered in either or both ends of Dyna-Mation cylinders. They allow the user to set the degree of cushioning needed for each specific application.

A built-in check valve assures a fast getaway in the opposite direction. The tough cushion seal combines with the ultra-smooth control-stem to provide years of reliable service.

Operating Parameters

Bore Diam.	Thrust*	Thrust Mult.**	Rod Diam.(In.)	Max. Oper. Pressure Air	Oil‡
$1^1/_2$"	177	1.77	$^5/_8$	250	1000
2"	314	3.14	$^5/_8$	250	1000
$2^1/_2$"	491	4.91	$^5/_8$	250	1000
$3^1/_4$"	830	8.30	1	250	700
4"	1257	12.57	1	250	650
6"	2827	28.27	$1^3/_8$	250	435

*Pushing force of cylinder at 100 PSI inlet pressure. Pulling force will be about 10% less due to the displacement of the piston rod. Note: Actual realizable thrust could be somewhat lower due to side loading and internal friction. It is best to oversize your cylinder by about 25% to assure smooth operation.

** To determine thrust at other inlet pressures, multiply factor by the desired pressure.

‡ DM cylinders are not rated or approved for use in hydraulic circuit where an impulse or pressure spike may occur.

NOTE: 6" bore only available in DM1 Series.

Operating Specifications	
Temp. Range:	-40 to +250°F (to +400°F on request)
Lubrication:	Not necessary, but will extend cylinder life when operated with dry air.
Filtration:	Not essential, but a standard 40 micron filter placed upstream will prolong seal life.

Double-Rod Cylinders

Cylinders having a common piston rod that protrudes from both ends are available in all bore sizes. In addition to providing a dual power source, double rod cylinders serve to minimize rod deflection and to facilitate the control and adjustment of rod travel. See page 35 for ordering instructions.

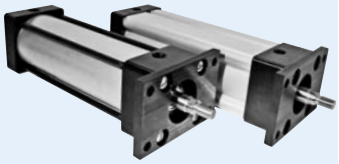
Right Angle Flow Controls

Control the speed of your cylinders with Mead Flow Control Valves. Right-angle flow controls can be found on page 63. For precise metering of air, see Mead Dyla-Trol Valves on page 66.


Pivot Mount


Clevis Mount

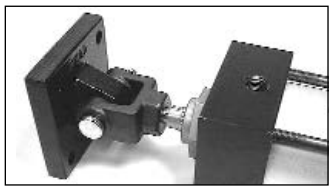

Rear Flange


Front Flange

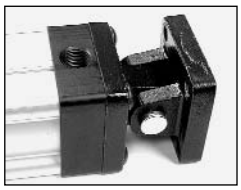
Accessories

Rod clevises, rod eyes, pivot brackets, clevis brackets, and pivot pins are available in each bore size to accomplish all four of the combinations illustrated below.

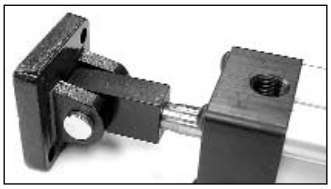
Rod Clevis and Pivot Bracket



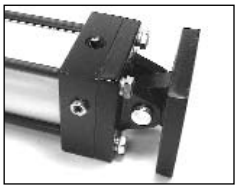
Clevis Bracket and PE Cylinder



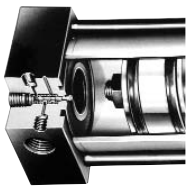
Rod Eye and Clevis Bracket



Pivot Bracket and PB Cylinder



Pneumatic End-of-Stroke Sensors (Inter-Pilots®)

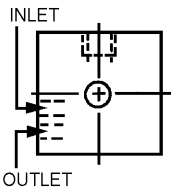


A miniature 3-way valve built into the cylinder head is actuated by the cylinder piston as it reaches the end of its stroke. Once contacted, the 3-way Inter-Pilot® valve emits an air signal. In this manner, sequencing is achieved without external limit switches and electric wiring.

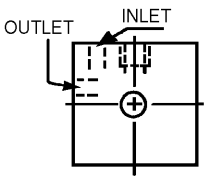
Inter-Pilots® may be built into either or both cylinder heads. They are not for hydraulic use. Cylinder operating pressure must not exceed pressure used to feed the Inter-Pilot®.

Inter-Pilot® Port Locations

For 1 ½" Bore Cylinders

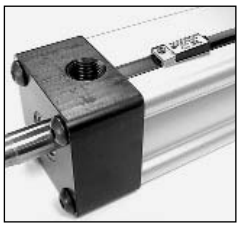


For 2"-4" Bore Cylinders



Note: Inter-Pilot® ports are 10-32.

Rod Position Sensors



Hall Effect and Reed Switches allow the cylinder user to sense rod position anywhere within the stroke. Switches are available for both models. For the DM1 series the switch attaches to any of the four tie-rods. For the DM2 series, a dovetail slot runs along the cylinder tube to facilitate fast and accurate position setting.

Hall Effect

Hall effect technology provides contactless switching. With contactless switching there are no moving parts; therefore, reliability and life expectancy are greatly increased. Hall Effect switches come with built-in indicator lights (3 wire), reverse polarity and surge protection standard. Order either sinking or sourcing depending on logic systems requirements. They have an IP67 protection rating.

Technical Information			
Operating Voltage:	5-28 DC	**Working Temp:**	23 to 194°F
Operating Time:	On 2 ms	**Repeatability:**	.001 ms
	Off .1 ms	**Max. Switching Current :**	.5A

Current Sinking: Load connected between output and positive supply.
Current Sourcing: Load is connected between output and common.

Reed

Mead Reed Switches are epoxy encapsulated and economically priced for reliable low cost position sensing. Reed switches come with wire leads. LED (2 wire) included.

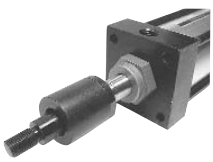
Note: Not for use with hydraulic cylinders.

Technical Information			
Operating Voltage:	240 AC Max.	**Working Temp:**	67 to 200°F
Switch Current:	.5 Amps Max.	**Operating Time:**	On .5 ms
	10 Watts Max.		Off .5 ms

Pneumatic Stroke Completion Sensors (SCS)

Port mounted SCS valves emit an air signal when the cylinder rod has stopped even if the piston has not contacted the end cap. SCS valves are ideal for use in situations where the full cylinder stroke is not used. SCS valves are available in ⅛" , ¼", ½" pipe sizes. See pg. 57.

Self Aligning Rod Couplers

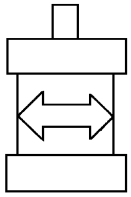


Rod couplers simplify cylinder alignment problems by compensating for 2° angular error and 1/16" lateral misalignment on both extension and retraction strokes. Greater reliability is achieved by reducing cylinder and component wear. All components are heat treated for wear and corrosion resistance.

* see page 30 for complete listing of Mead's self aligning rod couplers.

Ordering Dyna-Mation DM1 & DM2

STEP 1:

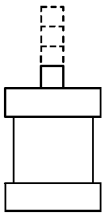


SELECT A BORE SIZE

Bore	1½″	2″	2½″	3¼″	4″	6″
Force*	177	314	491	830	1257	2827
Models	**DM1-150**	**DM1-200**	**DM1-250**	**DM1-325**	**DM1-400**	**DM-600**
Available	**DM2-150**	**DM2-200**	**DM2-250**	**DM2-325**	**DM2-400**	**NA**

* Maximum force output at 100 PSI inlet pressure (in lbs.)

STEP 2:



CHOOSE STROKE LENGTH

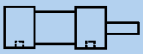
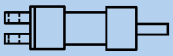
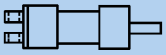
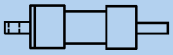
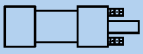
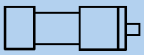
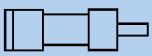
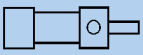
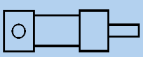
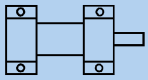
PISTON ROD DIAMETERS:						
Bore	1½″	2″	2½″	3¼″	4″	6″
Rod Diam.	⅝″	⅝″	⅝″	1″	1″	1⅜″

Non Standard Piston Rods: Special rod threads or extensions are available. Please enclose a sketch of what you require.

Note: Stroke costs vary with differing bore sizes. Extra charges may be incurred for fractional strokes and strokes over 12″.

STEP 3:

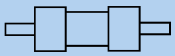
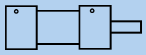
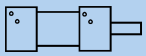
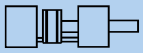
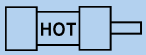
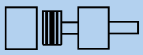
SELECT A MOUNTING STYLE

		Mead Code	Bore Diameter 1½″	2″	2½″	3¼″	4″	6″	NFPA Code	Description
Flush Bottom		**FB**	•	•	•	•	•	•	MS-4	Four tapped holes on bottom of cylinder.
Long Clevis		**PB**	•	•	•	•	•	•	MP-2	Two ears extend from rear head; (clevis is detachable)
Short Clevis		**PF**	•	•	•	•	•	NA	MP-1	Two ears extend from rear head (clevis is detachable).
Pivot		**PE**	•	•	•	•	•	•	MP-4	A single ear extends from rear head; (pivot is detachable)
Tie Rods Ext. Front		**TIF**	•	•	•	•	•	•	MX-3	All four tie-rods extend forward from cylinder face. Consult factory for rear extended tie-rods (or both ends).
Front Flange NFPA Std.		**FH**	•	•	•	•	•	•	MF-1	Flange plate extends beyond the front head.
Rear Flange		**FR**	•	•	•	•	•	•	MF-2	Flange plate extends beyond the rear head.
Trunnion Front		**TF**	•	•	•	•	•	•	MT-1	Two pivot bars extend from two sides of front head. Not available with front Inter-Pilots® or front cushions.
Trunnion Rear		**TR**	•	•	•	•	•	•	MT-2	Two pivot bars extend from two sides of rear head. Not available with rear Inter-Pilots® or rear cushions.
Foot		**FT**	•	•	•	•	•	•	Non Std.	A plate with two holes is mounted to the bottom of each head.

Ordering Dyna-Mation DM1 & DM2

STEP 4:

SELECT CYLINDER OPTIONS

		Mead Code	Bore Diameter 1½″	2″	2½″	3¼″	4″	6″	Description
Double Rod		**DR**	●	●	●	●	●	●	Rod extends through both heads: (adds to cylinder rigidity)
Cushions (Not available with Trunnion Mount)		**Front CF Rear CR Both CB**	●	●	●	●	●	●	Dampen the impact and sound that occur at stroke completion; cushions are adjustable.
Inter-Pilots (Not available with Trunnion Mount)		**Front IPF Rear IPR Both IPB**	●	●	●	●	●	●	Inter-Pilots emit an air signal at the end of each stroke; Integral with cylinder head; Note: Not available on hydraulic cylinders.
Non-Rotating Rod (6″ Max.Stroke)		**NR**	NA	NA	NA	●	●	●	Internal bar prevents piston and rod rotation.
Non-Lube Seals		**NL**	●	●	●	●	●	●	Self-Lubricating seals are used in place of standard Buna N seals; Note: Not available on hydraulic cylinders.
High Temp. Seals (Viton)		**VI**	●	●	●	●	●	●	Viton™ seals are suitable for high temperature environments (400°F Max.)
Magnetic Pistons		**MP**	●	●	●	●	●	●	Enables Reed & Hall Effect switches to sense piston location. Note: Reed switch/Hall Effect not available on all hydraulic cylinders. (Contact Mead)

STEP 5:

When ordering Dyna-mation cylinders, list the:

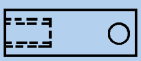
1. *Model Number*
2. *Stroke*
3. *Mounting Style*
4. *Options (If Needed)*

BUILD A MODEL NUMBER

Model Number		Stroke		Mounting Style		Options
DM2-200	**x**	**10**	**-**	**PB**	**-**	**CF**

2″ Bore
10″ Stroke
Clevis Mount (PB)
Cushioned Front (CF)

Accessories

	Bore Diameter	1½″	2″	2½″	3¼″	4″	6″
	Flex Rod Couplers	DMA-437	DMA-437	DMA-437	DMA-750	DMA-750	DMA-1000
	Forged Rod Clevis	DMC-1	DMC-1	DMC-1	NA	NA	NA
	Rod Clevis (NFPA Std.)	DMC-2	DMC-2	DMC-2	DMC-4	DMC-4	DMC-6
	Machined Rod Eye (NFPA Std.)	DME-1	DME-1	DME-1	DME-2	DME-2	DME-3
	Pivot Bracket	DMP-1	DMP-2	DMP-3	DMP-4	DMP-5	DMP-8
	Clevis Bracket (with Pin)	DMR-1	DMR-2	DMR-3	DMR-4	DMR-5	DMR-8

NOTE: DMP and DMR Pivot and Clevis backets do not include any mounting hardware. See page 41 for mount kits.

Hall Effect Switches

Sourcing
For DM1 series: CS-6200P
For DM2 series: CS-7003P
Sinking
For DM1 series: CS-6200N
For DM2 series: CS-7003N

Cylinders must have a magnetic piston (MP). For technical information, see page 33.

Reed Switches

For DM1 series: CS-6200R
For DM2 series: CS-7003R
Plain Wire Leads

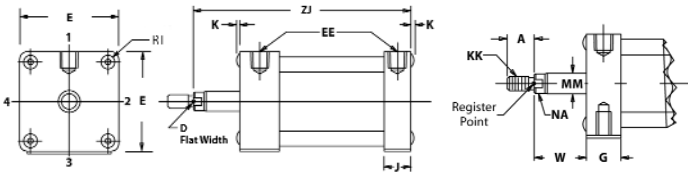
Cylinders must have a magnetic piston (MP). For technical information, see page 33.

Special Cylinders

We invite inquiries regarding non-standard cylinders. Please call 773-685-6800 or your local Mead representative.

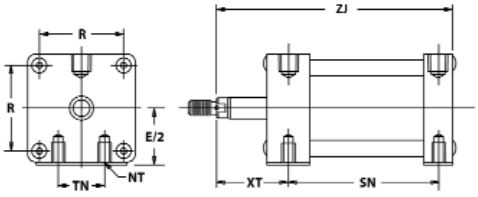
DM1 & DM2 Dimensions

Basic Cylinder

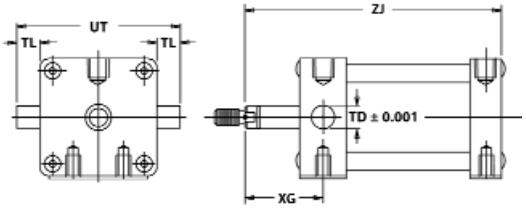


NOTE: DM1 Cylinders are constructed with sleeve nuts; use RT, K does not exist. DM2 use K; RT does not exist.

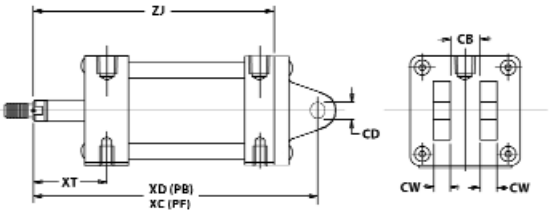
Bottom Flush Model FB



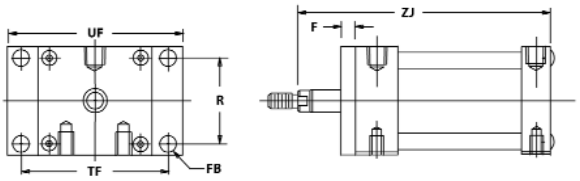
Rod End Trunnion Model TF



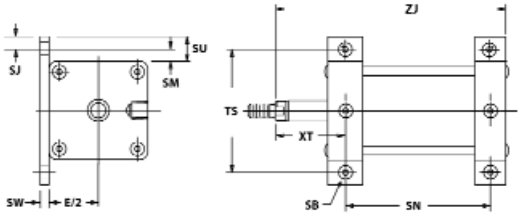
Clevis Model PB and PF



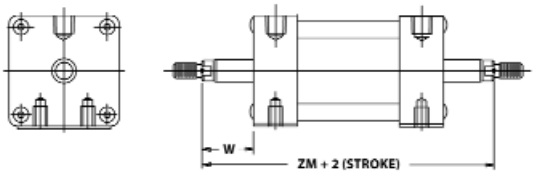
Rod End Flange Model FH*



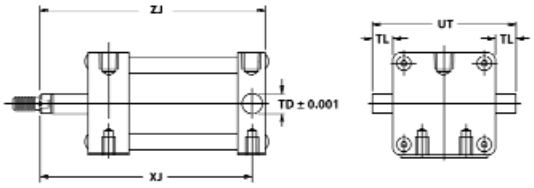
Foot Mount Plate Model FT



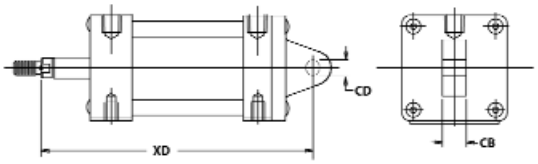
Double Rod Model DR



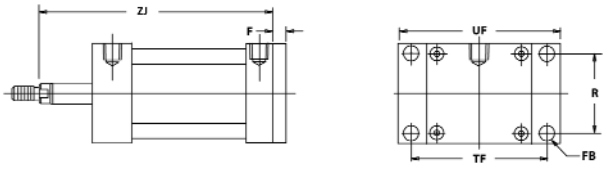
Blind End Trunnion Model TR



Pivot Model PE



Blind End Flange Model FR*



Note: For dimensions of nose mount and tie rod extended models, consult factory.

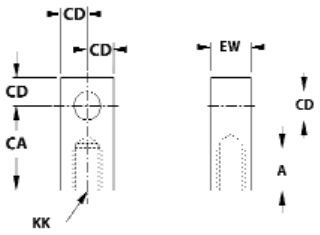
DM1 & DM2 Dimensions

Bore	1½	2	2½	3¼	4	6
A	¾	¾	¾	1 ⅛	1 ⅛	1 ⅝
CA	1 ½	1 ½	1 ½	2 1/16	2 1/16	1
CB	¾	¾	¾	1 ¼	1 ¼	1 ½
CD	½	½	½	¾	¾	1
CE	1 ½	1 ½	1 ½	2 ⅜	2 ⅜	3 ⅛
CW	½	½	½	⅝	⅝	¾
D	½	½	½	⅞	⅞	1 ⅛
DD	17/64	23/64	23/64	7/16	7/16	½-20
E	2	2 ½	3	3 ¾	4 ½	6 ½
EE(NPTF)***	¼	¼	¼	½	½	¾
F	⅜	⅜	⅜	⅝	⅝	¾
FB	5/16	⅜	⅜	7/16	7/16	9/16
FL	1 ⅛	1 ⅛	1 ⅛	1 ⅞	1 ⅞	2 ¼ Clevis
G	1 7/16	1 7/16	1 7/16	1 11/16	1 11/16	2
J	15/16	15/16	15/16	1 3/16	1 3/16	1 ½
K	⅛	5/32	5/32	3/16	3/16	3/16
KK	7/16-20	7/16-20	7/16-20	¾-16	¾-16	1-14
M	½	½	½	¾	¾	2 ¼ Clevis
MM	⅝	⅝	⅝	1	1	1 ⅜
NA	19/32	19/32	19/32	31/32	31/32	1 5/16
NT	¼-20	5/16-18	⅜-16	½-13	½-13	¾-10
R	1 7/16	1 27/32	2 3/16	2 ¾	3 21/64	4 ⅞
RT	¼-28	5/16-24	5/16-24	⅜-24	⅜-24	½-20
SB	17/64	21/64	25/64	33/64	33/64	33/64
SJ	⅜	⅜	⅜	½	½	11/16
SM	⅜	⅜	⅜	½	½	11/64
SU	¾	¾	¾	1	1	11/64
SW	3/16	3/16	¼	¼	¼	7/64
TD	1	1	1	1	1	1 ⅜
TF	2 ¾	3 ⅜	3 ⅞	4 11/16	5 7/16	7 5/8
TK	⅜	½	9/16	¾	¾	1 ⅛
TL	1	1	1	1	1	1 ⅝
TN	⅝	⅞	1 ¼	1 ½	2 1/16	3 ¼
TS	2 ¾	3 ¼	3 ¾	4 ¾	5 ½	7 ⅞
UF	3 ⅜	4 ⅛	4 ⅝	5 ½	6 ¼	8 ⅝
UT	4	4 ½	5	5 ¾	6 ½	9 ¼
W	1	1	1	1 ⅜	1 ⅜	1 ⅝
XT	1 15/16	1 15/16	1 15/16	2 7/16	2 7/16	2 13/16
XG	1 ¾	1 ¾	1 ¾	2 ¼	2 ¼	2 13/16
H	1 ¼	1 ¼	1 ¼	1 ¾	1 ¾	2 ½
HA	2	2	2	2 5/16	2 5/16	2 15/16
HB	½	½	½	½	½	½
HC	¾	¾	¾	1 ⅛	1 ⅛	1 ⅝
HD	⅝	⅝	⅝	31/32	31/32	1 ⅜
HE	1	1	1	1 ½	1 ½	2 ¼
HF	10,000	10,000	10,000	34,000	34,000	64,000
Note: * Add Stoke Length to Dimensions Below ** Add Twice Stroke to ZM Dimension						
SN*	2 ¼	2 ¼	2 ⅜	2 ⅝	2 ⅝	3 ⅛
XC*	5 ⅜	5 ⅜	5 ½	6 ⅞	6 ⅞	7 ⅞
XD*	5 ¾	5 ¾	5 ⅞	7 ½	7 ½	7 ½
XJ*	4⅛	4⅛	4¼	5	5	5 ⅞
ZJ*	4 ⅝	4 ⅝	4 ¾	5 ⅝	5 ⅝	6 ⅝
ZM**	6 ⅛	6 ⅛	6 ¼	7 ½	7 ½	8 ¾

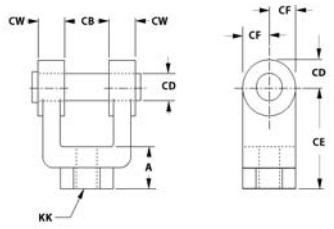
Note: For Inter-Pilot® port locations, see page 33.

*** For the 1-1/2", 2" and 2-1/2" Bores: 3/8" Ports Available Consult Factory.

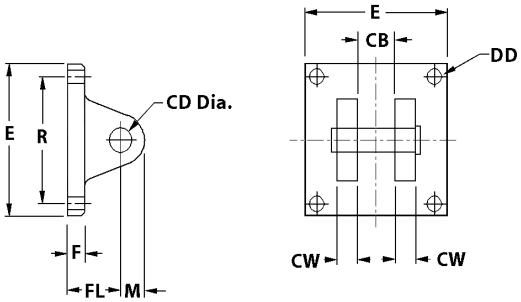
DME Interchangeable Rod Eye



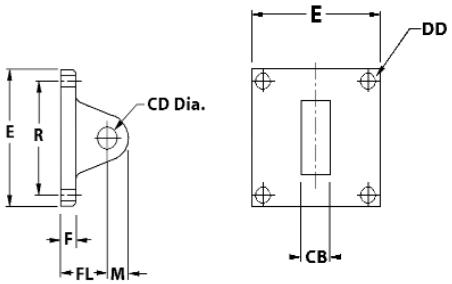
DMC Interchangeable Rod Clevis with Pin



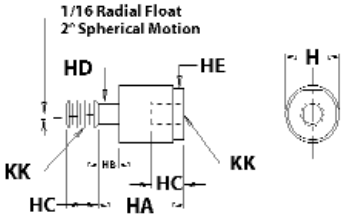
DMR Clevis Bracket w/Pin



DMP Pivot Bracket

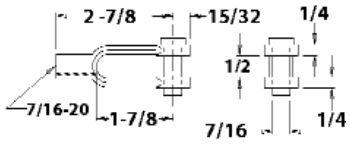


Self Aligning Rod Couplers



DMC-1 Forged Rod Clevis w/Pin

1½" through 2½" bores



HD1 Cylinders

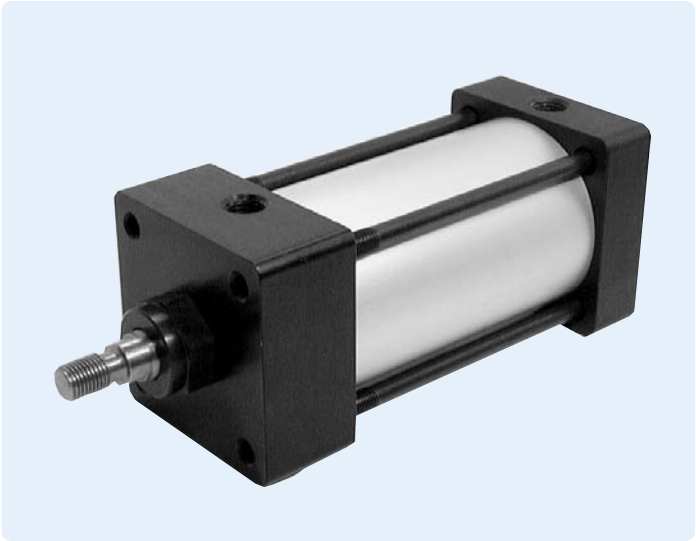
Cylinders For Abusive Conditions

Combining NFPA dimensional interchangeability and high quality components, the "HD" Series offers excellent performance and long service life, even in the most severe of conditions.

External Bearing Ensures Smooth Motion

HD cylinders are fitted with a heavy-duty external rod bearing in the rod end head. Teflon®-impregnated and hardcoat anodized, this bearing ensures smooth rod motion while maintaining rod rigidity and stability. The entire rod gland and bearing may be quickly removed and replaced without disassembling the cylinder.

Operating Specifications	
Temperature Range:	-40°F to +250°F (to +400°F on request)
Lubrication:	For maximum cylinder life, non-detergent petroleum based oil is recommended. Non-lube seals avail.
Filtration:	Not essential, but a standard 40 micron filter placed upstream will prolong seal life.



Operating Parameters

Bore Diam.	Thrust*	Thrust Mult.**	Rod Diam.	Max. Oper. Pressure Air	Oil ‡
1 ½″	177	1.77	⅝″ or 1″	250	1000
2″	314	3.14	⅝″ or 1″	250	1000
2 ½″	491	4.91	⅝″ or 1″	250	1000
3 ¼″	830	8.30	1″ or 1 ⅜″	250	700
4″	1257	12.57	1″ or 1 ⅜″	250	650
6″	2827	28.27	1 ⅜″ or 1 ¾″	250	435

*Pushing force of cylinder at 100 PSI inlet pressure. Pulling force will be about 10% less due to the displacement of the piston rod. Note: Actual realizable thrust could be somewhat lower due to side loading and internal friction. It is best to oversize you cylinder by about 25% to assure smooth operation.

**To determine cylinder thrust at other inlet pressures, multiply this factor times the desired inlet pressure.

‡HD Cylinders are not rate or approved for use in a hydraulic circuit where an impulse or pressure spike may occur.

Cylinder Construction

Rod Bearing:
Teflon-impregnated, hardcoated aluminum

Heads:
Machined from solid aluminum bar; black anodized

Tubes:
Aluminum hard anodized to 60 Rc (16 RMS finish)

Piston:
Solid high alloy aluminum and fitted with a PTFE Wear Band.*

Piston Rod:
High tensile ground and polished hard chrome plated steel

Piston and Rod Seals:
Wear compensating Buna N vee rings. Non-lube seals are also available (see Option NL).

Tube Seals:
Buna N o-rings

Rod Wiper
Dupont Teflon®

Tie Rods:
High tensile steel torqued to allow for flexure.

NOTE: 6″ Bore Cylinders do not have wear bands.

Customize Your Cylinder

The HD Series offers numerous accessories and design options. With hundreds of possible combinations available, you can "design" your own cylinder for any application.

Cushions (CR, CF, CB)

For end-of-stroke load deceleration, specify cushions in either or both ends of your cylinder. Cushions decelerate the piston rod over the last 11⁄16" of stroke. Adjustable, they allow you to set the degree of cushioning needed for each specific application.

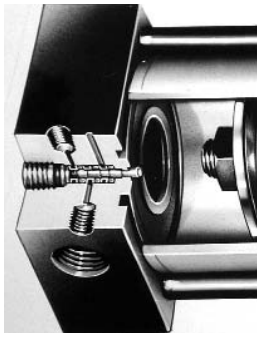
A built-in check valve assures a fast getaway in the opposite direction. A pre-lubricated nitrile cushion seal provides years of reliable service.

Note: Cushions are not recommended on hydraulic cylinders.

Double Rod (DR)

Double rod cylinders have a common piston rod that protrudes from both ends of the cylinder. In addition to providing a dual power source, double rod cylinders serve to minimize rod deflection and to facilitate the control and adjustment of rod travel.

Inter-Pilots® (IP)

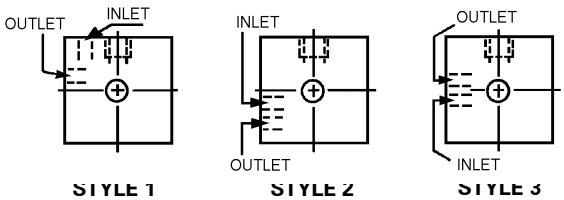


Mead's Inter-Pilot® is a miniature 3-way valve built in the cylinder head. Actuated by the cylinder's piston as it reaches the end of its stroke, the valve emits an air signal. Thus, sequencing is achieved without external limit switches and electric wiring.

Inter-Pilots may be built into either or both cylinder heads. They are not for hydraulic use. Cylinder operating pressure must not exceed pressure used to feed the Inter-Pilot®.

INTER-PILOT® PORT LOCATIONS (Port Size = 10-32)
Inter-Pilot port location style that is offered with each cylinder head

Bore (Either Head)	1 1/2"	2"	2 1/2"	3 1/4"	4"	6"
Non-Cushion	2	1	1	1	1	3
Cushion	2	1	1	1	1	3



Non-Rotating Rod (NR)

For prevention of piston and rod rotation, an internal rod is embedded internally into both cylinder heads. This rod also passes through the piston and acts as a linear guide for the piston. Note: NR option available on 3 1⁄4" , 4" and 6" bore cylinders only.

Viton™ Seals (VI)

For high temperature environments, Viton™ seals can be specified to replace standard Buna N seals. While HD cylinders are normally rated to 250°F, cylinders with Viton seals are rated to 400°F.

Low Breakaway Option (NL)

For non-lube service, polyurethane seals replace standard piston and rod seals. These specially formulated seals have an inherent lubricity that provides low breakaway between the piston and tube. Note: NL seals are not available on hydraulic cylinders.

Magnetic Piston (MP)

If you will be using either Hall Effect or Reed switches for sensing rod position, you will need to order your cylinder with a magnetic piston.

Mead's Hall Effect and Reed switches allow the cylinder user to sense rod position anywhere within the stroke. They emit an electrical signal when the magnetized piston reaches a point opposite their location. Tie rod mounting facilitates fast and accurate position setting.

Oversized Rod (OR)

Available on all models; the HD-150, 200 and 250, you can order a 1" rod diameter rather than the standard 5⁄8" diameter; the HD-325 and HD-400 with a 1-3⁄8" rather than the standard 1"; the HD-600 with a 1-3⁄4" rather than the standard 1-3⁄8".

Accessories

Pneumatic Stroke Completion Sensors (SCS)

Port mounted SCS valves emit an air signal when the cylinder rod has stopped even if the piston has not contacted the end cap. Ideal for use in situations where the full cylinder stroke is not used. See pg. 57.

Self Aligning Rod Couplers

Rod couplers simplify cylinder alignment problems by compensating for 2° angular error and 1⁄16" lateral misalignment on both extension and retraction strokes. Greater reliability is achieved by reducing cylinder and component wear. All components are heat treated for wear and corrosion resistance.
* see page 30 for complete listing of Mead's self aligning rod couplers.

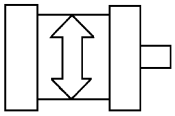
Flow Control Valves

Dyla-Trol® - For unprecedented smoothness in cylinder speed control, use Mead's Dyla-Trol® valves with a perfectly tapering flow. Where needle type flow controls generate turbulence as they close, Dyla-Trol maintains an even 360 laminar flow regardless of the setting. Pg. 59.

Right Angle Flow Controls (RAF) - RAF flow controls feature push-in-fittings, pre-applied Teflon® based thread sealant, a recessed screw driver adjustment and convenient swivel for ease of tubing alignment. See page 66.

Order HD1 Cylinder

STEP 1:

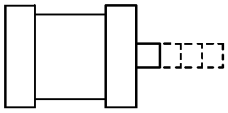


Select A Bore Size

Bore	1½″	2″	2½″	3¼″	4″	6″
Force*	177	314	491	830	1257	2827
Model	**HD1-150**	**HD1-200**	**HD1-250**	**HD1-325**	**HD1-400**	**HD1-600**

* Maximum force output (lbs.) at 100 PSI inlet pressure

STEP 2:



Choose Stroke Length

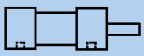
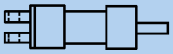
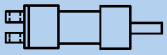
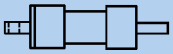
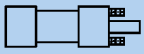
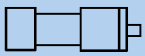
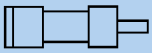
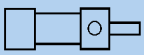
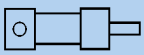
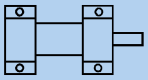
PISTON ROD DIAMETERS:

Bore Diam.	1½″	2″	2½″	3¼″	4″	6″
Rod Diam.	⅝″ or 1″	⅝″ or 1″	⅝″ or 1″	1″ or 1⅜″	1″ or 1⅜″	1⅜″ or 1¾″

Non-Standard Piston Rods: Special rod threads or extensions are available. Please enclose a sketch of what you require.

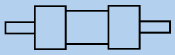
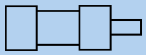
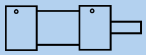
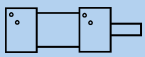
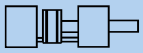
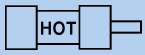
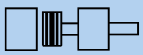
STEP 3:

Select A Mounting Style

		Mead Code	Bore Diameter 1½″	2″	2½″	3¼″	4″	6″	NFPA Code	Description
Flush Bottom/Front Rear		**FB**	●	●	●	●	●	●	MS-4	Four tapped holes in bottom and in both cylinder faces (front and rear). Rear sleeve nuts standard.
Long Clevis		**PB**	●	●	●	●	●	●	MP-2	Two ears extend from rear head (clevis is detachable).
Short Clevis		**PF**	●	●	●	●	●	NA	MP-1	Two ears extend from rear head (clevis is detachable).
Pivot		**PE**	●	●	●	●	●	NA	MP-4	A single ear extends from rear head (pivot is detachable).
Tie Rods Ext. Front		**TIF**	●	●	●	●	●	●	MX-3	All four tie-rods extend forward from cylinder face. Consult factory for rear extended tie-rods (or both ends).
Front Flange NFPA Std.		**FH**	●	●	●	●	●	●	MF-1	Flange plate extends beyond the thicker front head.
Rear Flange		**FR**	●	●	●	●	●	●	MF-2	Flange plate extends beyond the rear head.
Trunnion Front		**TF**	●	●	●	●	●	●	MT-1	Two pivot bars extend from two sides of front head.; not available with front Inter-Pilots® or front cushions.
Trunnion Rear		**TR**	●	●	●	●	●	●	MT-2	Two pivot bars extend from two sides of rear head. Not available with rear Inter-Pilots® or rear cushions.
Foot		**FT**	●	●	●	●	●	●	Non Std.	A plate with two holes is mounted to the bottom of each head.

STEP 4:

Select Cylinder Options

		Mead Code	Bore Diameter 1½″	2″	2½″	3¼″	4″	6″	Description
Double Rod		**DR**	●	●	●	●	●	●	Rod extends through both heads (adds to cylinder rigidity)
Oversized Rod		**OR**	●*	●	●	●	●	●	Standard rod is replaced by larger diameter rod.
Cushions (Not available with Trunnion)		**Front (CF) Rear (CR) Both (CB)**	●*	●	●	●	●	●	Dampen the impact and sound that occur at stroke completion; Adjustable; Note: Not available on hydraulic cylinders.
Inter-Pilots® (Not available with Trunnion)		**Front (IPF) Rear (IPR) Both (IPB)**	●	●	●	●	●	●	Inter-Pilots® emit an air signal at the end of each stroke; Integral with cylinder head; Note: Not available on hydraulic cylinders.
Non-Rotating Rod (6″ Max.Stroke)		**NR**	NA	NA	NA	●	●	●	Internal bar prevents piston and rod rotation.
Non-Lube Seals		**NL**	●	●	●	●	●	NA	Self-Lubricating seals are used in place of standard Buna N seals; Note: Not available on hydraulic cylinders.
High Temp. Seals		**VI**	●	●	●	●	●	NA	Viton™ seals are suitable for high temperature environments (400°F Max.)
Magnetic Pistons		**MP**	●	●	●	●	●	●	Enables Reed & Hall Effect switches to sense piston. Note: Reed switch/Hall Effect not available on all hydraulic cylinders. (Contact Mead)

* Cushions or Inter-Pilots® are not available on the rod end head of 1½″ bore cylinders with oversized rod.

STEP 5:

When ordering Dyna-mation cylinders, list the:

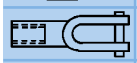
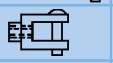
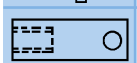
1. *Base Model*
2. *Stroke*
3. *Mounting Style*
4. *Options (If Needed)*

Build A Model Number

Base Model		Stroke		Mounting Style		Options
HD1-200	-	**10**	-	**PB**	-	**CF**

2″ Bore
10″ Stroke
Clevis Mount (PB)
Cushioned Front (CF)

Accessories

		Rod Size	Bore Diameter: 1½″	2″	2½″	3¼″	4″	6″
	Flex Rod Couplers	STD	DMA-437	DMA-437	DMA-437	DMA-750	DMA-750	DMA-1000
		OR	DMA-750	DMA-750	DMA-750	DMA-1000	DMA-1000	DMA-1250
	Forged Rod Clevis	STD	DMC-1	DMC-1	DMC-1	NA	NA	NA
		OR	NA	NA	NA			
	Rod Clevis (NFPA Std.)	STD	DMC-2	DMC-2	DMC-2	DMC-4	DMC-4	DMC-6
		OR	DMC-4	DMC-4	DMC-4	DMC-6	DMC-6	DMC-?
	Machined Rod Eye (NFPA Std.)	STD	DME-1	DME-1	DME-1	DME-2	DME-2	DME-3
		OR	DME-2	DME-2	DME-2	DME-3	DME-3	DME-?
	Pivot Bracket Kit	ALL	HD40-150	HD40-200	HD40-250	HD40-325	HD40-400	DMP-8 Bracket Only
 Clevis Bracket Mounting Kits	Short Clevis (with Pin)	ALL	HD35S-150	HD35S-200	HD35S-250	HD35S-325	HD35S-400	NA
	Long Clevis (with Pin)	ALL	HD35-150	HD35-200	HD35-250	HD35-325	HD35-400	DMR-8 Bracket Only
Flange Mounting Kits (for front* or rear flanges)		ALL	HD45-150	HD45-200	HD45-250	HD45-325	HD45 400	NA

NOTE: All Kits include mounting hardware; for DMC-1 Dimensions see page 37; all others see page 45.

Hall Effect Switches

Model CS-6200P
Sourcing
Model CS-6200N
Sinking

Cylinders must have a magnetic piston (MP). For technical information, see page 33.

Reed Switches

Model CS-6200R
Wire Leads

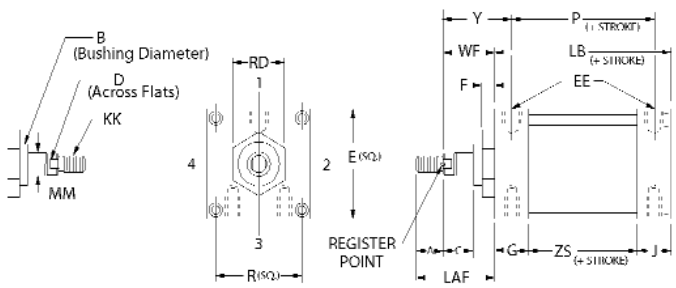
Cylinders must have a magnetic piston (MP). For technical information, see page 33.

Special Cylinders

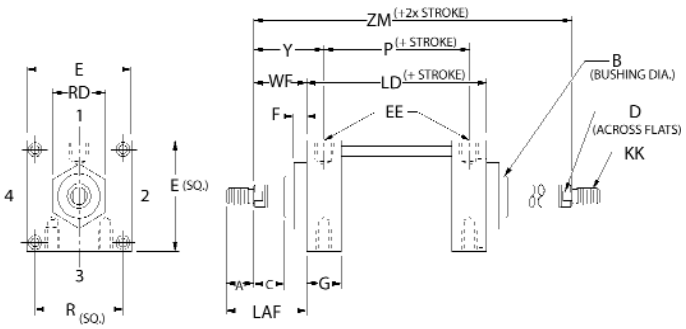
We invite inquiries regarding non-standard cylinders. Please call 773-685-6800 or your local Mead representative.

HD1 Dimensions

Basic Cylinder NFPA: MXO



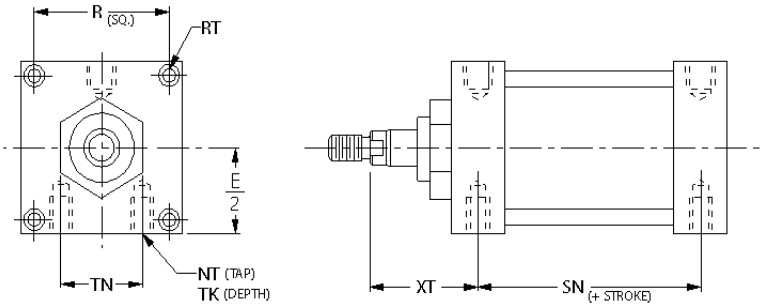
Double Rod NFPA: MDXO



* 6" bore HD cylinders have a rear tie rod nut, shown below as the "K" dimension. K = 7/16"

BORE	MM ROD	A	B	C	D	E	EE	F	G	J	K	KK	LAF	LB	LD	P	R	WF	Y	ZS	ZM	RD
1½	5/8	3/4	1 1/8	3/8	1/2	2	1/4	3/8	1 7/16	15/16	-	7/16-20	1 3/4	3 5/8	4 1/8	2 1/4	1 7/16	1	1 15/16	1 1/4	6 1/8	1 1/8
	1	1 1/8	1 1/2	5/8	7/8							3/4-16	2 1/2					1 3/8	2 5/16		6 1/2	
2	5/8	3/4	1 1/8	3/8	1/2	2 1/2	1/4	3/8	1 7/16	15/16	-	7/16-20	1 3/4	3 5/8	4 1/8	2 1/4	1 27/32	1	1 15/16	1 1/4	6 1/8	1 1/8
	1	1 1/8	1 1/2	5/8	7/8							3/4-16	2 1/2					1 3/8	2 5/16		6 1/2	
2½	5/8	3/4	1 1/8	3/8	1/2	3	1/4	3/8	1 7/16	15/16	-	7/16-20	1 3/4	3 3/4	4 1/4	2 3/8	2 3/16	1	1 15/16	1 3/8	6 1/4	1 1/2
	1	1 1/8	1 1/2	5/8	7/8							3/4-16	2 1/2					1 3/8	2 5/16		6 5/8	
3¼	1	1 1/8	1 1/2	3/8	7/8	3 3/4	1/2	5/8	1 11/16	1 3/16	-	3/4-16	2 1/2	4 1/2	4 3/4	2 5/8	2 3/4	1 3/8	2 7/16	1 3/8	7 1/2	1 3/4
	1 3/8	1 5/8	2	1/2	1 1/8							1-14	3 1/4					1 5/8	2 11/16		7 3/4	
4	1	1 1/8	1 1/2	1/2	7/8	4 1/2	1/2	5/8	1 11/16	1 3/16	-	3/4-16	2 1/2	4 1/2	4 3/4	2 5/8	3 21/64	1 3/8	2 7/16	1 3/8	7 1/2	1 3/4
	1 3/8	1 5/8	2	5/8	1 1/8							1-14	3 1/4					1 5/8	2 11/16		7 3/4	
6	1 3/8	1 5/8	2	5/8	1 1/8	6 1/2	3/4	3/4	2	1 1/2	7/16	1-14	3 1/4	5	5 1/2	3 1/8	4 7/8	1 5/8	2 13/16	1 1/2	8 3/4	2
	1 3/4	2 1/4	2 3/8	3/4	1 1/2							1 1/4-12	3 7/8					1 7/8	3 1/16		9	

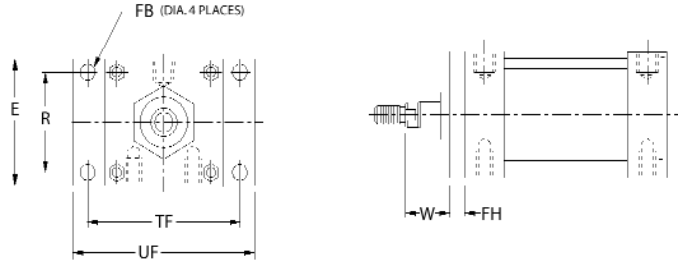
Rear, Front & Bottom Tapped (FB) NFPA Code: MS4



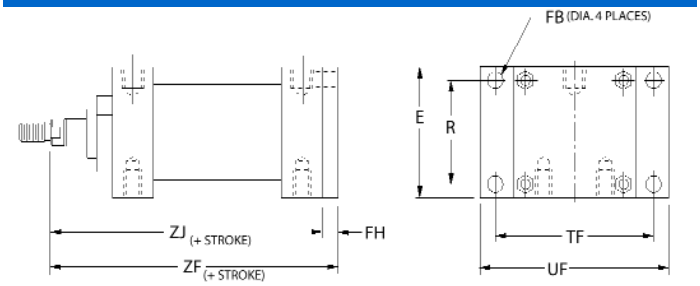
BORE	MM ROD DIA.	NT	RT	TK	TN	SN	XT
1½	5/8	1/4-20	1/4-28	3/8	5/8	2 1/4	1 15/16
	1						2 5/16
2	5/8	5/16-18	5/16-24	1/2	7/8	2 1/4	1 15/16
	1						2 5/16
2½	5/8	3/8-16	5/16-24	9/16	1 1/4	2 3/8	1 15/16
	1						2 5/16
3¼	1	1/2-13	3/8-24	3/4	1 1/2	2 5/8	2 7/16
	1 3/8						2 11/16
4	1	1/2-13	3/8-24	3/4	2 1/16	2 5/8	2 7/16
	1 3/8						2 11/16
6	1 3/8	3/4-10	1/2-20	1 1/8	3 1/4	3 1/8	2 13/16
	1 3/4						3 3/16

HD1 Dimensions

Front Flange (FH) NFPA: MF1

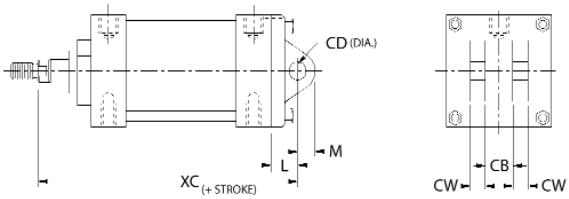


Rear Flange (FR) NFPA: MF2

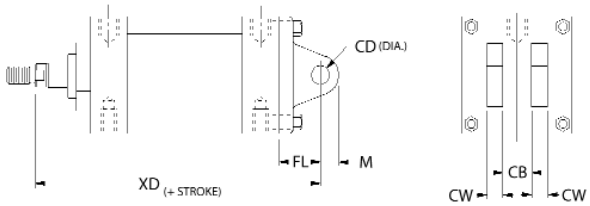


BORE	MM ROD DIA.	E	FB (BOLT)	FH	R	TF	UF	W	ZJ	ZF
1½	⅝	2	⅝16	⅜	1 7/16	2¾	3⅜	⅝	4⅝	5
	1							1	5	5⅜
2	⅝	2½	⅜	⅜	1 27/32	3⅜	4⅛	⅝	4⅝	5
	1							1	5	5⅜
2½	⅝	3	⅜	⅜	2 3/16	3⅞	4⅝	⅝	4¾	5⅛
	1							1	5⅛	5½
3¼	1	3¾	7/16	⅝	2¾	4 11/16	5½	¾	5⅝	6¼
	1⅜							1	5⅞	6½
4	1	4½	7/16	⅝	3 21/64	5 7/16	6¼	¾	5⅝	6¼
	1⅜							1	5⅞	6½
6	1⅜	6½	9/16	¾	4⅞	7⅝	8⅝	⅞	6⅝	7⅜
	1¾							1⅛	6⅞	7⅝

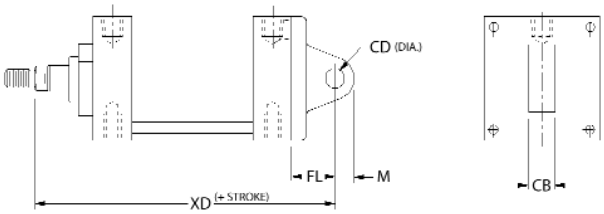
Short Clevis (PF) NFPA: MP1



Long Clevis (PB) NFPA: MP2



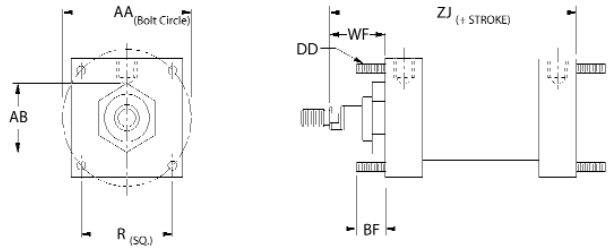
Pivot (PE) NFPA: MP4



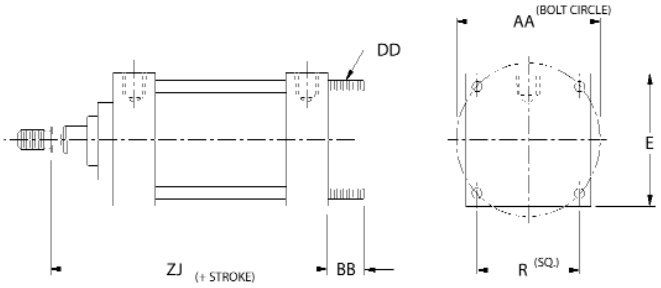
BORE	MM ROD DIA.	CB	CD	CW	FL	L	M	XC	XD
1½	⅝	¾	½	½	1⅛	¾	½	5⅜	5¾
	1							5¾	6⅛
2	⅝	¾	½	½	1⅛	¾	½	5⅜	5¾
	1							5¾	6⅛
2½	⅝	¾	½	½	1⅛	¾	½	5½	5⅞
	1							5⅞	6¼
3¼	1	1¼	¾	⅝	1⅞	1¼	¾	6⅞	7½
	1⅜							7⅛	5¾
4	1	1¼	¾	⅝	1⅞	1¼	¾	6⅞	7½
	1⅜							7⅛	7¾
6	1⅜	1½	1	¾	2¼ Clevis	-	1⅛ Clevis	NA	8⅞
	1¾								9⅛

HD1 Dimensions

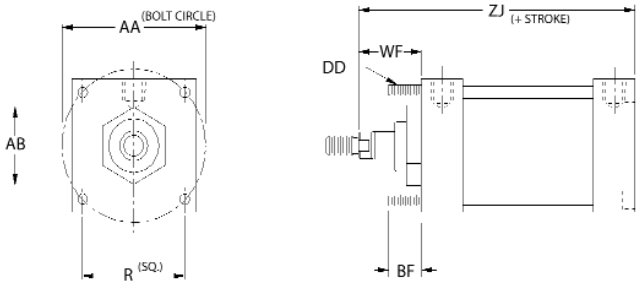
Extended Tie Rods, Both Ends (TIB) — NFPA Code: MX1



Back End (TIR) — NFPA: MX2

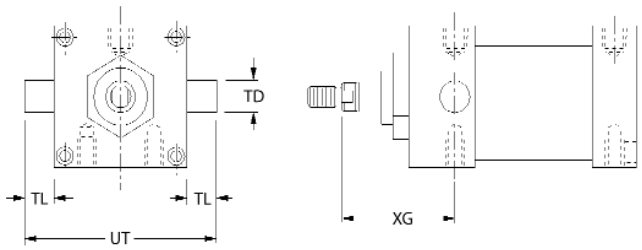


Rod End (TIF) — NFPA: MX3

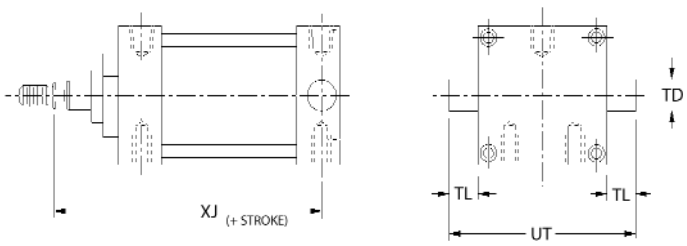


BORE	MM ROD DIA.	AA	BB	AB	BF	DD	R	ZJ
1½	⅝	2.02	1	1 5/16	1⅜	¼-28	1 7/16	4⅜
	1							5
2	⅝	2.6	1⅛	1 5/16	1½	5/16-24	1 27/32	4⅝
	1							5
2½	⅝	3.1	1⅛	1¾	1½	5/16-24	2 3/16	4¾
	1							5⅛
3¼	1	3.9	1⅜	2 1/32	2	⅜-24	2¾	5⅝
	1⅜							5⅞
4	1	4.7	1⅜	2 1/32	2	⅜-24	3 21/64	5⅝
	1⅜							5⅞
6	1⅜	6.9	1 13/16	2 5/16	2 9/16	½-20	4⅞	6⅝
	1¾							6⅞

Front Trunnion (TF) — NFPA: MT1



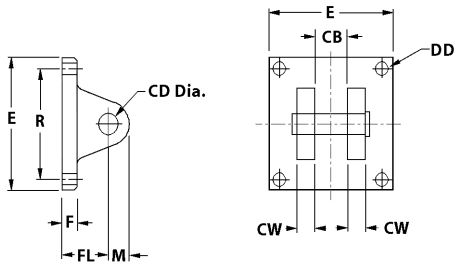
Rear Trunnion — NFPA: MT2



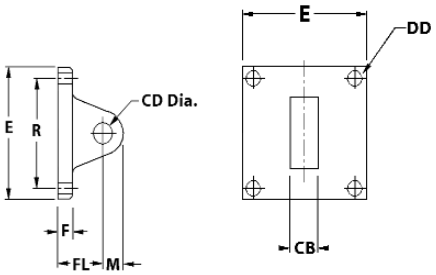
BORE	MM ROD DIA.	TD±.001	TL	UT	XG	XJ
1½	⅝	1	1	4	1¾	4⅛
	1				2⅛	4½
2	⅝	1	1	4½	1¾	4⅛
	1				2⅛	4½
2½	⅝	1	1	5	1¾	4¼
	1				2⅛	4⅝
3¼	1	1	1	5¾	2¼	5
	1⅜				2½	5¼
4	1	1	1	6½	2¼	5
	1⅜				2½	5¼
6	1⅜	1⅜	1⅜	9¼	2⅝	5⅞
	1¾				2⅞	6⅛

HD1 Cylinder Dimensions

Clevis Bracket

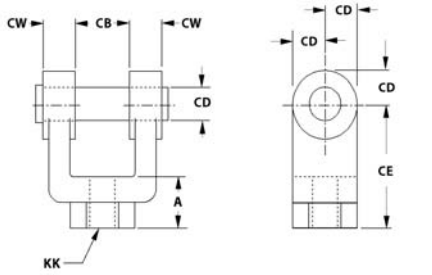


Pivot Bracket

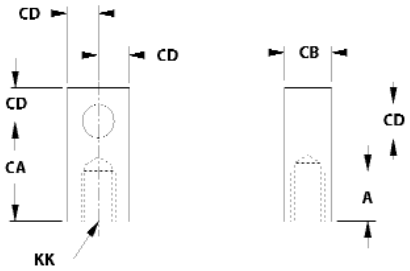


BORE	CB	CD	CW	DD	E	FL	M	R
1½	¾	½	½	17/64	2	1⅛	½	1 7/16
2	¾	½	½	23/64	2½	1⅛	½	1 27/32
2½, 2½*	¾	½	½	23/64	3	1⅛	½	2 3/16
3¼	1¼	¾	⅝	7/16	3¾	1⅞	¾	2¾
4	1¼	¾	⅝	7/16	4½	1⅞	¾	3 21/64
6	1½	1	¾	17/32 Clevis 21/32 Pivot	6½ Clevis 4½ Pivot	2¼	1⅛ Clevis 1¼ Pivot	4⅞

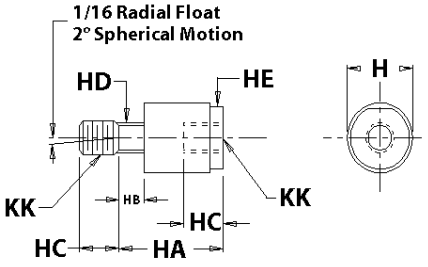
Rod Clevis



Rod Eye



Rod Coupler



Part # Rod Clevis Rod Eye Rod Coupler	Cylinder	A	CA	CB	CD	CE	CW	KK	H	HA	HB	HC	HD	HE
DMC-2 DME-1 DMA-437	HD1-150 HD1-200 HD1-250	¾	1½	¾	½	1½	½	7/16-20	1¼	2	½	¾	⅝	1⅛
DMC-4 DME-2 DMA-750	HD1-150 OR HD1-200 OR HD1-250 OR HD1-325 HD1-400	1⅛	2 1/16	1¼	¾	2⅜	⅝	¾-16	1¾	2 5/16	5/16	1⅛	31/32	1½
DMC-6 DME-3 DMA-1000	HD1-325 OR HD1-400 OR HD-600	1⅝	2 13/16	1	1	3⅛	¾	1-14	2½	2 15/16	½	1⅝	1⅜	2¼
DMC-7 DME-4 DMA-1250	HD-600 OR	1⅝	3 7/16	2	1⅜	4⅛	1	1¼-12	2½	2 15/16	½	1⅝	1⅜	2¼

HD1 Large Bore Tie Rod

Large Bore Cylinders For Abusive Conditions

Combining NFPA dimensional interchangeability and high quality components, the HD1 Large Bore Series offers excellent performance and long service life, even in the most severe of conditions. Mead offers 5", 8" , 10" and 12" bore sizes to meet your needs.

Bore Diam.	Thrust*	Thrust Mult.**	Rod Diam.	Max. Oper. Pressure Air	Oil ‡
5"	1964	19.64	1" or 1 3/8"	250	900
8"	5027	50.27	1 3/8" or 1 3/4"	200	500
10"	7854	78.54	1 3/4" or 2"	200	400
12"	11310	113.1	2" or 2 1/2"	200	400

*Pushing force of cylinder at 100 PSI inlet pressure. Pulling force will be about 10% less due to the displacement of the piston rod. (Use 15% when Oversized Rods are chosen) Note: Actual realizable thrust could be somewhat lower due to side loading and internal friction. It is best to oversize you cylinder by about 25% to assure smooth operation.

**To determine cylinder thrust at other inlet pressures, multiply this factor times the desired inlet pressure.

‡HD1 Cylinders are not rate or approved for use in a hydraulic circuit where an impulse or pressure spike may occur.

Large Bore Cylinder Construction

Rod Bearing:
Easily removable, held in place by socket head screws to assure easy replaceability without taking entire cylinder apart

Heads:
Precision broached steel blocks

Tubes:
Aluminum hard anodized to 60 Rc (16 RMS finish)

Piston:
Solid high alloy aluminum

Piston Rod:
100,000 PSI minimum yield steel, ground and polished hard chrome plated steel

Piston and Rod Seals:
Wear compensating Buna N vee rings.

Tube Seals:
Buna N o-rings

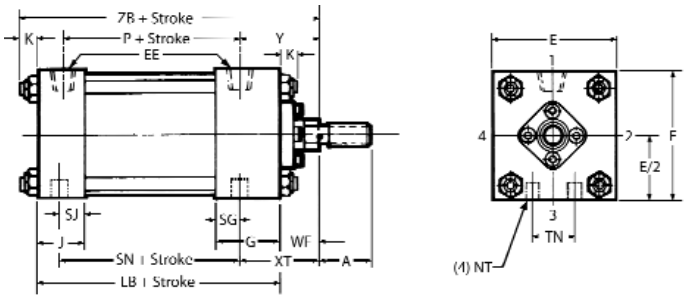
Rod Wiper
Dupont Teflon®

Tie Rods:
Alloy steel for maximum strength.

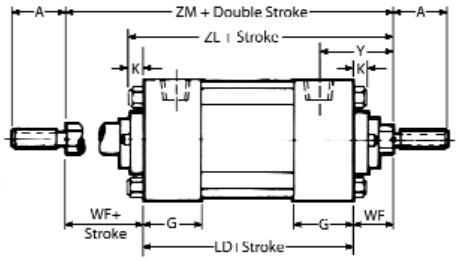
Finish:
Black Paint

Dimensions

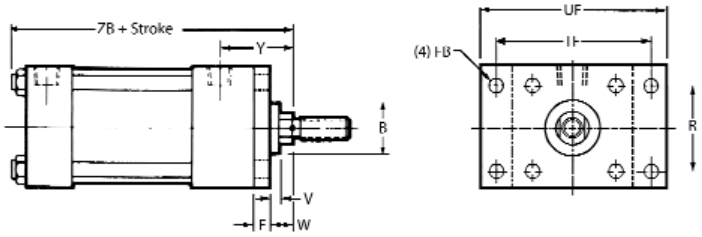
Bottom Flush Model FB



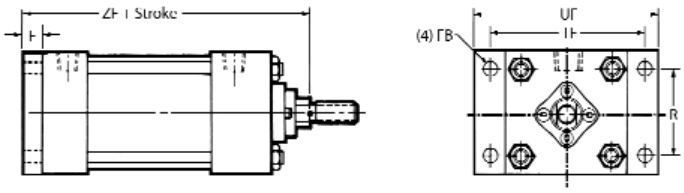
Double Rod Model DR



Rod End Flange Model FH (5"Bore Only)



Blind End Flange Model FR (5"Bore Only)



BORE	MM ROD	A	B	E	EE	F	FB+	G	J	K	KK	L	LB*	LD*	NT	P*	R	SG	SJ	SN*	TF	TN	UF	W	WF	XT	Y	ZF*	ZL	ZM**
5	1	1 1/8	1 1/2	5 1/2	1/2	5/8	1/2	1 3/4	1 3/4	1/2	3/4-16	1 1/4	4 1/2	5	5/8-11	2 3/4	4.10	11/16	11/16	2 7/8	6 5/8	2 11/16	7 5/8	3/4	1 3/8	2 7/16	2 1/2	6 1/2	6 7/8	7 3/4
	1 1/8	1 5/8	2								1-14													1	1 5/8	2 11/16	2 3/4	6 3/4	7 1/8	8 1/4
8	1 3/8	1 5/8	-	8 1/2	3/4	7/8	-	2	1 1/2	5/8	1-14	1 1/2	5 1/8	5 1/8	3/4-10	3 1/4	6.44	13/16	13/16	3 1/4	-	4 1/2	-	-	1 5/8	2 13/16	2 13/16	-	7 7/8	8 7/8
	1 3/4	2									1 1/4-12														1 7/8	3 1/16	3 1/16		8 1/8	9 3/8
10	1 3/4	2	-	10 5/8	1	7/8	-	2 1/4	2	3/4	1 1/4-12	2 1/8	6 3/8	6 5/8	1-8	4	7.92	1	1	4 1/8	-	5 1/2	-	-	1 7/8	3 1/8	3 3/16	-	9 1/4	10 3/8
	2	2 1/4									1 1/2-12														2	3 1/4	3 5/16		9 3/8	10 5/8
12	2	2 1/4	-	12 3/4	1	-	-	2 1/4	2	3/4	1 1/4-12	2 1/4	6 7/8	7 1/8	1-8	4 1/2	9.40	1	1	4 5/8	-	7 1/4	-	-	2	3 1/4	3 5/16	-	9 7/8	11 1/8
	2 1/2	3									1 7/8-12														2 1/4	3 1/2	3 9/16		10 1/8	13 5/8

NOTES: + Indicates maximum bolt diameter; * Indicates add stroke length to dimension; ** Indicates add 2x stroke length to dimension.

HD1 Large Bore Tie Rod

How To Order

HD1-800 x 10 - FB - DR

Base Model
HD1-500 (5″ Bore)
HD1-800 (8″ Bore)
HD1-1000 (10″ Bore)
HD1-1200 (12″ Bore)

Stroke
State Fractional Strokes as decimals (i.e. 10.5)

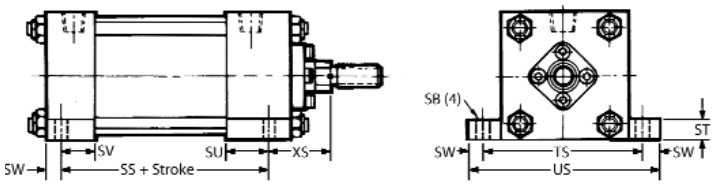
Mounting

	Description	NFPA Code	Restrictions
FB	Four tapped holes in bottom	MS-4	None
FH	Flange Plate extends beyond front head	MF-1	5″ Bore Only
FR	Flange Plate extends beyond rear head	MF-2	5″ Bore Only
FT	Lugs extend from bottom of head	MS-2	None
PB	Two Ears extend from rear head (detachable)	MP-1	12″ Not Available
PF	Two Ears extend from rear head	MP-2	None
TIF	Four Tie Rods extend forward	MX-3	None
TF	Pivot bars extend from two sides of front head	MT-1	None
TR	Pivot bars extend from two sides of rear head	MT-2	None

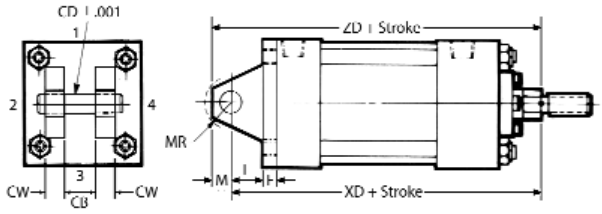
Options

DR		Double Rod
VI		Viton Seals
CF CR CB		Front Cushions Rear Cushions Cushions Both Ends
OR		Oversized Rod

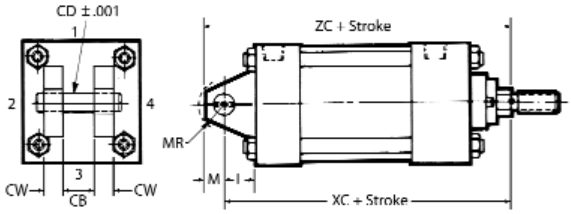
Foot Mount Model FT



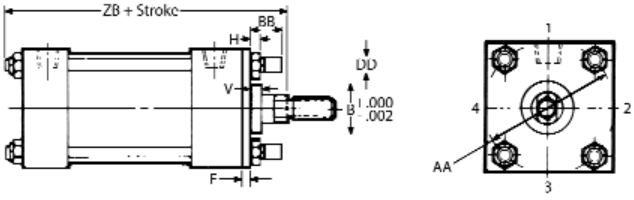
Clevis Mount Model PB



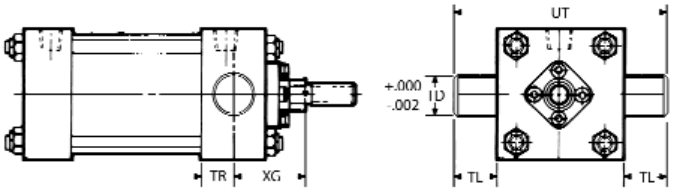
Clevis Mount Model PF



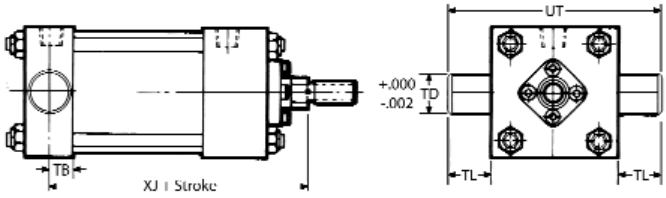
Tie Rods Extended Front Model TIF



Trunnion Front Mount Model TF



Trunnion Rear Mount Model TR



NOTE: **Rod gland maybe square or round pattern depending upon mount chosen. Contact factory if further dimensional data is needed.**

BORE	MM ROD	AA	BB	CB	CD	CW	DD	M	MR	SB	SS*	ST	SU	SV	SW	TB	TD	TL	TR	TS	US	UT	V	XC*	XD*	XG	XJ*	XS	ZB*	ZC*	ZD*
5	1 1 3/8	5.80	1 3/4	1 1/4	3/4	5/8	1/2-20	3/4	7/8	3/4	3 1/8	1	1 1/16	9/16	11/16	5/8	1	1	7/8	6 7/8	8 1/4	7 1/2	1/4 3/8	7 1/8 7 3/8	7 3/4 8	2 1/4 2 1/2	5 1/4 5 1/2	2 1/16 2 5/16	6 3/8 6 5/8	7 7/8 8 1/8	8 1/2 8 3/4
8	1 3/8 1 3/4	9.10	2 1/4	1 1/2	1	3/4	5/8-18	1	1 1/4	3/4	3 3/4	1	1 5/16	1 3/16	11/16	3/4	1 3/8	1 3/8	1	9 7/8	11 1/4	11 1/4	-	8 1/4 8 1/2	9 1/8 9 3/8	2 5/8 2 7/8	6 6 1/4	2 5/16 2 9/16	7 3/8 7 5/8	9 1/4 9 1/2	10 1/8 10 3/8
10	1 3/4 2	11.31	2 5/8	2	1 3/8	1	3/4-16	1 3/8	1 5/8	1	4 5/8	1 1/4	1 3/8	1 1/8	7/8	1	1 3/4	1 3/4	1 1/8	12 3/8	14 1/8	14 1/8	-	10 3/8 10 1/2	11 1/4 11 3/8	3 3 1/8	7 1/4 7 3/8	2 3/4 2 7/8	9 9 1/8	11 3/4 11 7/8	12 5/8 12 3/4
12	2 2 1/2	13.30	2 11/16	2 1/8	1 3/4	1 1/4	3/4-16	1 3/4	2	1	5 1/8	1 1/4	1 3/8	1 1/8	7/8	1	1 3/4	1 3/4	1 1/8	14 1/2	16 1/4	16 1/4	-	11 1/8 11 3/8	-	3 1/8 3 3/8	7 1/8 8 1/8	2 7/8 3 1/8	9 5/8 9 7/8	12 7/8 13 1/8	-

NOTE: * Indicates add stroke length to dimension.

Centaur

C-112 PB

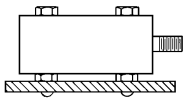
C-150 NS

Low Cost Mounting

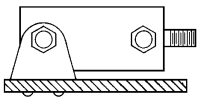
Flush bottom cylinder mounts directly onto a base plate with only two bolts...needs no mounting brackets or other hardware. The pivot bracket is built-in for easy pivoting at the inlet axis. The bracket pivots within the cylinder length to save space and to eliminate one entire bracket that would be needed to mount other cylinders.

Because Centaur's trunnions serve both as mounts and as assembly elements, they cost less than any other trunnion mount on the market.

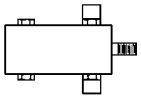
Flush Bottom (FB)



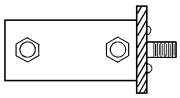
Pivot Bracket (PB)



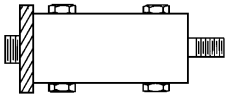
Trunnion Rear (TR)
Trunnion Front (TF)



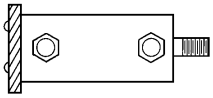
Flush Front (FF)
1½", 2", 2½" & 3" bores only



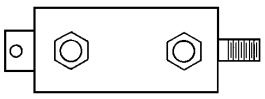
Flush Rear (FR)
1⅛" bore only



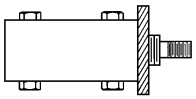
Flush Rear (FR)
1½", 2", 2½" & 3" bores only



Pivot Extended (PE)
1⅛", 1½" & 2" bores only



Threaded Nose (NS)
Std. on all 1⅛" bore mounts
1⅛", 1½" & 2" bores only



Technical Specifications	
Pressure :	150 PSI Air, 250 PSI Hydraulic
Bore Sizes:	1⅛", 1½", 2", 2½" and 3"
Body:	Hard Coated Aluminum
Rod Bearing:	Oil Impregnated Porous Bronze
Temperature Range:	-40°F to +250°F (to +400°F on request)

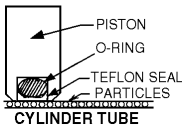
Economical & Repairable

Mead Centaur cylinders are built to match tie-rod performance, but are up to 45% less expensive and offer lubrication-free service. Centaur cylinders are not permanently crimped like most other round cylinders...so they can be disassembled for maintenance.

Teflon® Seals Create Smooth Breakaway

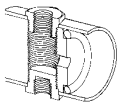
Centaur's unique Teflon® piston seal eliminates the forward lurch that occurs when rubber seals breakaway from the cylinder tube surface. Rod motion remains smooth throughout the stroke.

Non-Lube



During the cylinder break-in period, molecules from the unique graphite-filled Teflon® piston seal became embedded in the pores of the hard coated aluminum cylinder tube. This forms a long-lasting, super-smooth, self-lubricated surface.

Built-In Bumpers Absorb Impact



Rubber bumpers are built into each cylinder head to eliminate the metallic "clank" that occurs at stroke completion.

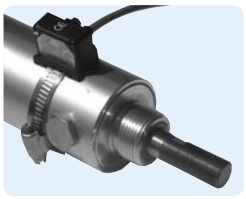
Self Aligning Rod Couplers

Rod couplers simplify cylinder alignment problems by compensating for 2° angular error and 1/16" lateral misalignment on both extension and retraction strokes.

* see page 30 for complete listing of Mead's self aligning rod couplers.

Model	C-112	C-150	C-200	C-250	C-300
Rod Coupler	DMA-312	DMA-500	DMA-625	DMA-750	DMA-1000

Proximity Switches



Hall Effect & Reed switches can sense rod position anywhere within the stroke. A stainless steel clamp facilitates mounting at any location along the cylinder tube. Switches may be used singly or in multiples and positioned at any point around the cylinder tube. The cylinder must have a magnetic piston. For technical information see pg. 33.

Model	C-112	C-150	C-200	C-250	C-300
Sinking	N/A	CS-6100N-150	CS-6100N-200	CS-6100N-250	CS-6100N-300
Sourcing	N/A	CS-6100P-150	CS-6100P-200	CS-6100P-250	CS-6100P-300
Reed	N/A	CS-6100R-150	CS-6100R-200	CS-6100R-250	CS-6100R-300

Flow Controls

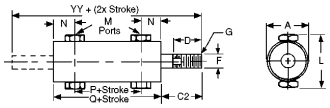
Control the speed of your cylinders with Mead Flow Control Valves. Right-angle flow controls can be found on page 66. For precise metering of air, see Mead Dyla-Trol valves on page 59.

Double Rod Cylinders

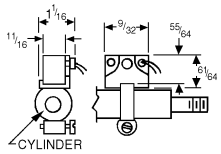
Centaur cylinders may be ordered with a one piece piston rod protruding from both ends of the cylinder for convenient stroke adjustment and for increased rigidity.

Centaur Dimensions and Ordering Information

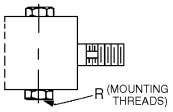
Basic Dimensions



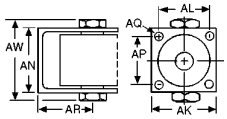
Hall Effect



Flush Bottom (FB)

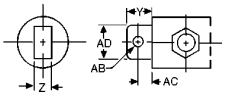


Pivot Bracket (PB)



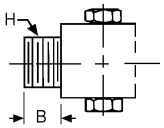
Pivot Extended (PE)

1⅛", 1½" & 2" bores only



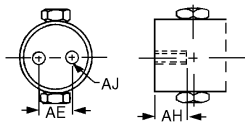
Flush Rear (FR)

1⅛" bore only



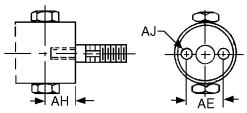
Flush Rear (FR)

1½", 2", 2½" & 3" bores only



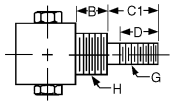
Flush Front (FF)

1½", 2", 2½" & 3" bores only

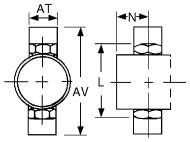


Threaded Nose (NS)

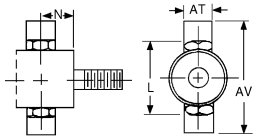
Std. on all 1⅛" bore mounts
1⅛", 1½" & 2" bores only



Trunnion Rear (TR)



Trunnion Front (TF)



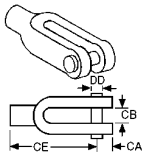
	Bore Sizes				
	1⅛"	1½"	2"	2½"	3"
A	1 3/8	1 3/4	2 1/4	2 3/4	3 1/4
B	5/8	13/16	13/16	-	-
C1	5/8	1 5/8	1 7/8	-	-
C2	-	1 7/16	1 11/16	1 3/4	2 1/16
D	1/2	1 1/4	1 1/2	1 1/2	1 3/4
F	5/16	1/2	5/8	3/4	1
G	5/16-24	1/2-20	5/8-18	3/4-16	1-14
H	3/4-16	1-14	1 1/4-12	-	-
L	2 3/32	2 1/8	2 5/8	3 1/8	3 5/8
M	1/8NPT*	1/4NPSF	1/4NPSF	1/4NPSF	1/4NPSF
N	7/16	51/64	51/64	51/64	51/64
P+Stroke	1 21/64	1 27/32	1 59/64	2 3/64	2 11/64
Q+Stroke	2 13/64	3 7/16	3 1/2	3 5/8	3 3/4
R	10-32	3/8-24	3/8-24	3/8-24	3/8-24
Y	5/8	15/16	1 1/8	-	-
Z	3/8	11/16	3/4	-	-
AB	1/4	3/8	1/2	-	-
AC	3/8	9/16	5/8	-	-
AD	5/8	1	1 1/4	-	-
AE	-	1 1/8	1 1/2	1 3/4	2
AH	-	1/2	5/8	3/4	7/8
AJ	-	1/4-28	5/16-24	3/8-24	1/2-20
AK	1 5/8	2 1/4	2 1/4	2 7/8	3 1/8
AL	1 1/4	1 5/8	1 5/8	2 1/8	2 3/8
AN	1 3/4	2 13/32	2 29/32	3 13/32	3 29/32
AP	1	1 1/8	1 5/8	2 1/8	2 5/8
AQ	13/64	9/32	9/32	9/32	9/32
AR	31/32	1 9/16	1 13/16	1 15/16	2 5/16
AT	.418	.731	.731	.731	.731
AV	2 5/32	3 5/8	4 1/8	4 5/8	5 1/8
AW	2 17/64	2 13/16	3 5/16	3 13/16	4 5/16
YY+ (2 X STK)	4 23/32	6 5/16	6 7/8	7 1/8	7 1/8

* 1⅛ bore model with trunnion mounts has ¼-28 ports.

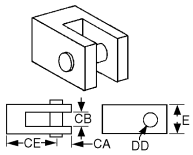
Accessories

Rod Clevis w/Pin (CEC)

1⅛" & 1½" bores

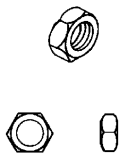


2" & 3" bores



Nose Nuts (CN)

1⅛", 1½" & 3" bores only



Note: For DMC-4, refer to pages 45.

Rod Clevis Accessory Dimensions

Bore	E	CA	CB	CE	DD
1⅛"	-	19/64	11/32	1 3/16	5/16
1½"	-	15/32	9/16	1 13/16	1/2
2"	1 1/4	7/16	5/8	2 1/16	1/2
2½"	1 1/2	3/4	1 1/4	2 3/8	3/4
3"	1 1/4	7/16	5/8	2 1/16	1/2

Model Numbers

Bore Sizes / Accessory	1⅛"	1½"	2"	2½"	3"
Rod Clevis, Pin	CEC-112	CEC-150	CEC-200	DMC-4	CEC-300
Nose Nut	CN-112	CN-150	CN-200	-	-

Air Reservoirs

Two Centaur rear heads and a tube form an economical air tank. Consult factory for more information. Simply add AR to model.

Ordering Information

When ordering Centaur cylinders, list the model number, stroke length and mounting option(s) required. Please consult the factory for stainless steel rods, air reservoirs or any special cylinder need.

C-112 - 4 - NS

1⅛" Bore
4" Stroke
Threaded Nose Mount

Bore / Model	1⅛" C-112	1½" C-150	2" C-200	2½" C-250	3" C-300
Nose Mount (NS)	•	•	•	NA	NA
Flush Bottom (FB)	•	•	•	•	•
Flush Front (FF)	NA	•	•	•	•
Flush Rear (FR)	•	•	•	•	•
Pivot Bracket (PB)	•	•	•	•	•
Pivot Extended (PE)	•	•	•	NA	NA
Trunnion Front (TF)	•	•	•	•	•
Trunnion Rear (TR)	•	•	•	•	•
Other Options:					
Double Rod (DR)	•Δ	•	•	•	•
Dupont Viton™ Seals(VI)	•	•	•	•	•
Magnetic Piston (MP)	NA	•	•	•	•
Air Reservoir (AR)	•	•	•	•	•

Δ Nose (NS) mounts standard on both ends of 1⅛" bore model with double rod.

Space Saver™

SS-300

SS-250

Full Power In Half The Space

Space Saver™ cylinders provide the power and stroke of standard cylinders in less than half the space. They are ideally suited for use in machinery where space and weight are at a premium. Best of all, Space Saver™ cylinders cost up to 50% less than standard models.

Built To Last

- Oil impregnated sintered bronze rod bearing and hard chrome plated piston rod work together to prolong cylinder life.
- Hard coated cylinder bore eliminates cylinder wall scoring.

Offers A Wide Range Of Power

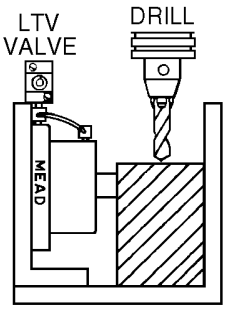
Bore	¾″	1⅛″	1½″	2″	2½″	3″	4″
Force @ 100 PSI (lbs.)	44	100	177	314	491	707	1257

NOTE: Pull force is approximately 10% less.

Mounting Options

Uniform base thickness makes mounting easy regardless of stroke.

Perfect For Tooling



Space Saver cylinders are ideal for use on drill fixtures and other automated tooling to provide compact, lightweight holding power.

Valving

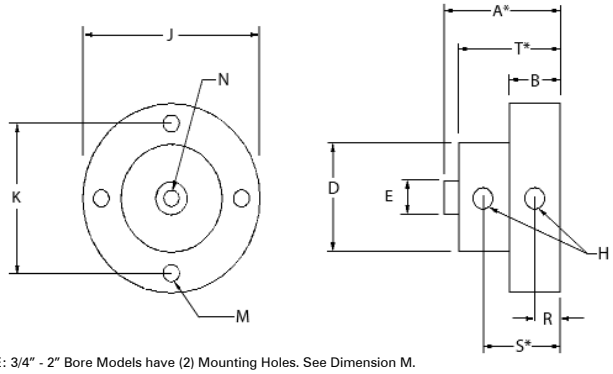
Efficient 4-way LTV valves, shown on pages 24-25, are perfect as actuators of Space Saver cylinders. Valve hookup is made easy because the top cylinder port swivels 360°.

Stroke Availability

Model	Bore	Stroke Lengths ⅛	3/16	¼	⅜	½	⅝	¾	1	1½	2	2½	3
SS-075	¾″	X*	-	X*	X	X	X	X	X	X	X	-	-
SS-112	1⅛″	X*	X*	X*	-	X	-	X	X	X	X	X	X
SS-150	1½″	X*	-	X	-	X	-	X	X	X	X	X	X
SS-200	2″	X	-	X	-	X	-	X	X	X	X	X	X
SS-250	2½″	X	-	X	-	X	-	X	X	X	X	X	X
SS-300	3″	X	-	X	-	X	-	X	X	X	X	X	X
SS-400	4″	X	-	X	-	X	-	X	X	X	X	X	X

* Includes special fitting
Note: To obtain a ⅛″ or 3/16″ stroke on ¾″ or 1⅛″ bore models, a ¼″ stroke cylinder is used and spacers are added.
Non-standard strokes subject to special machining charge.

Dimensions



NOTE: 3/4″ - 2″ Bore Models have (2) Mounting Holes. See Dimension M.

Bore	¾″	1⅛″	1½″	2″	2½″	3″	4″
A*	49/64	25/32	59/64	1 1/16	1 5/64	1 25/64	1 17/32
B	½	½	½	9/16	9/16	¾	¾
D	1	1 3/8	1 ¾	2 ¼	2 ¾	3 ¼	4 ¼
E	5/16	½	½	⅝	⅝	¾	¾
H	10-32	10-32	10-32	⅛ NPT	⅛ NPT	⅛ NPT	⅛ NPT
J	1 ¾	2 ⅛	2 ½	3 ⅛	3 ¾	4 ¼	5 ¼
K	1 13/32	1 25/32	2 5/32	2 23/32	3 ¼	3 25/32	4 25/32
M	13/64 (2)	13/64 (2)	13/64 (2)	13/64 (2)	17/64 (4)	17/64 (4)	17/64 (4)
N	10-32 x¼	5/16-24 x⅜	5/16-24 x⅜	⅜-24 x⅜	⅜-24 x⅜	½-20 x½	½-20 x½
R	5/32	5/32	5/32	5/16	5/16	21/64	21/64
S*	25/64	25/64	½	11/16	11/16	59/64	1 3/64
T*	¾	49/64	57/64	1 3/64	1 1/16	1 23/64	1 ½

* Plus Stroke
Note: To obtain a ⅛″ or 3/16″ stroke on ¾″ or 1⅛″ bore models, a ¼″ stroke cylinder is used and spacers are added.

Specifications	
Pressure :	0-150 PSI Air Only
Temperature:	-40°F to 250°F (to 400°F with Viton™)
Lubrication:	Petroleum base oil

Options & Ordering Information

When ordering, specify model number, stroke length, and Viton seal option if required.

Example: SS-150 x ¼ - VI