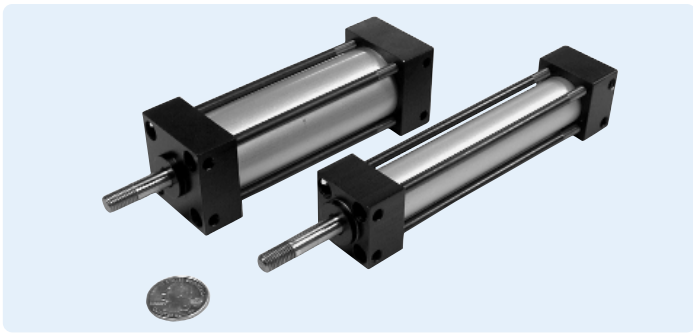


Reference



Control Valves

**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

Cylinders

**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.

Specialty Valves

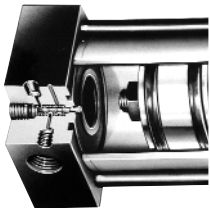
**Specify Cushions for Shock Absorption**

Model DM-112 is available with adjustable cushions that decelerate the piston rod over the last 1/16" 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.

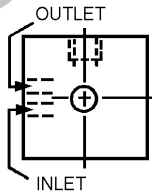
Production Devices

**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.



Accessories

**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	5/8-18	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

Bore	3/4	1 1/8
A	1/2	1/2
CB	-	5/8
CD	25/64	25/64
CR	2 1/4	2 1/4
CW	-	1/2
DD	13/64	13/64
E	1 1/4	1 5/8
EB	1 7/16	1 7/16
EE(NPTF)	1/8	1/8
EF	11/32	11/32
EJ	13/64	13/64
F	-	1/8
FB	7/32	7/32
G	3/4	3/4
J	3/4	3/4
KK	5/16-24	5/16-24
FL	1 1/8	5/8 Clevis 1 1/4 Pivot
M	-	3/8
MM	5/16	5/16
NT	13/64-Thru	13/64-Thru
R	13/16	1 1/8
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 1/8
UF	2 29/32	3 9/32
W	1/2	1/2
XT	1 1/16	1 1/16
H	7/8	7/8
HA	1 1/4	1 1/4
HB	1/4	1/4
HC	5/8	5/8
HD	5/16	5/16
HE	3/4	3/4
SN*	1 3/4	1 3/4
XD*	3 3/4	3 3/8 Pivot 3 3/4 Clevis
ZJ*	2 5/8	2 5/8
ZM**	3 1/8	3 1/8

\* Add Stroke Length to Dimension  
 \*\* Add 2 x Stroke Length to Dimension

**\*NOTE:**

- 1 1/8" bore cylinders use two angle brackets for flange mounting. (no flange plate)
- On 1 1/8" 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®, 5/8" must be added to J, ZJ, SN, and XD dimensions.
- 3/4" and 1 1/8" 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).
- 3/4" and 1 1/8" bore cylinders 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.

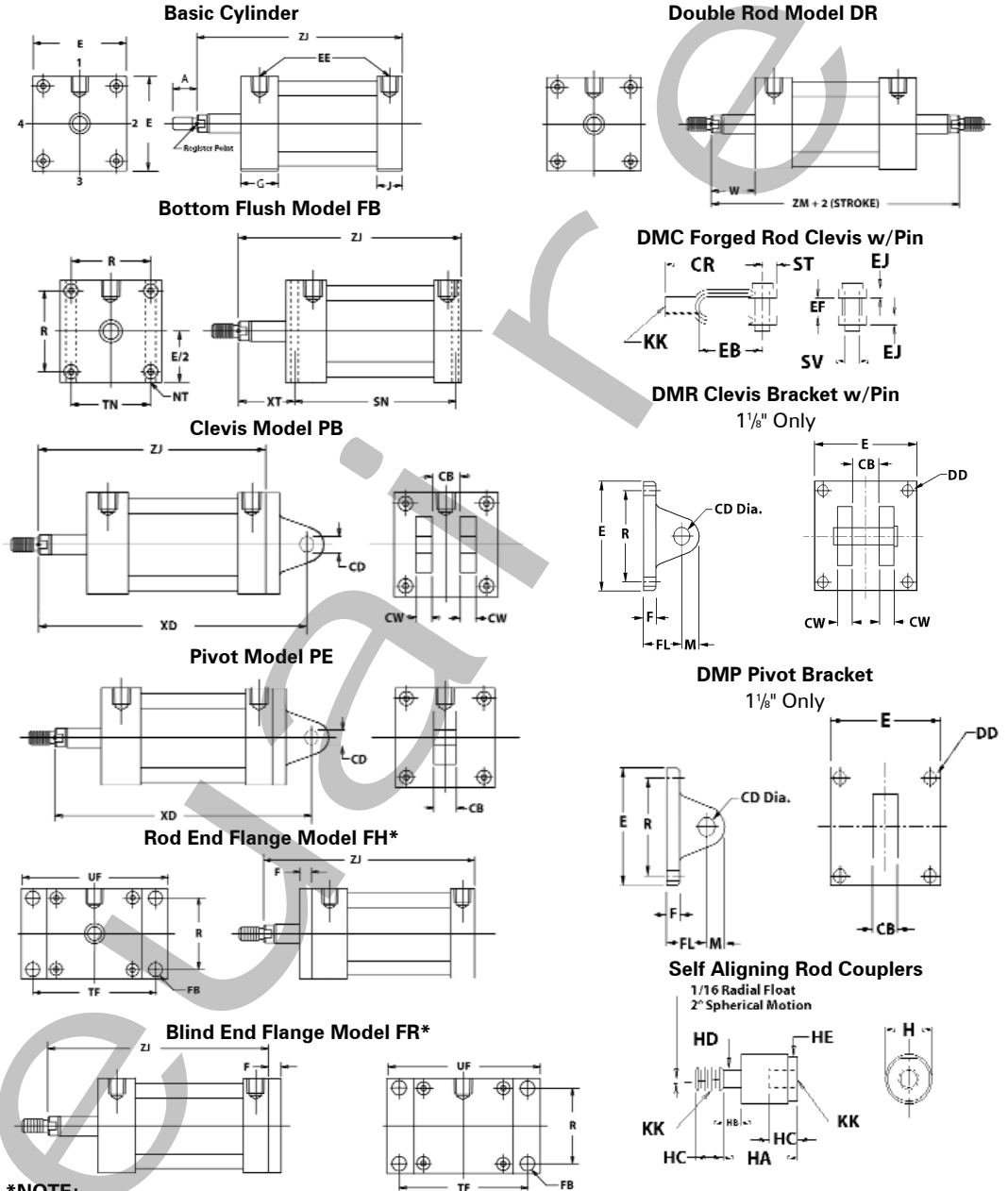


**Options**

- DR Double Rod
- VI Viton Seals
- HY Hydraulic Use

Options below are only available on DM-112

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



Reference  
Control Valves  
Cylinders  
Specialty Valves  
Production Devices  
Accessories  
Index

Reference

Control Valves

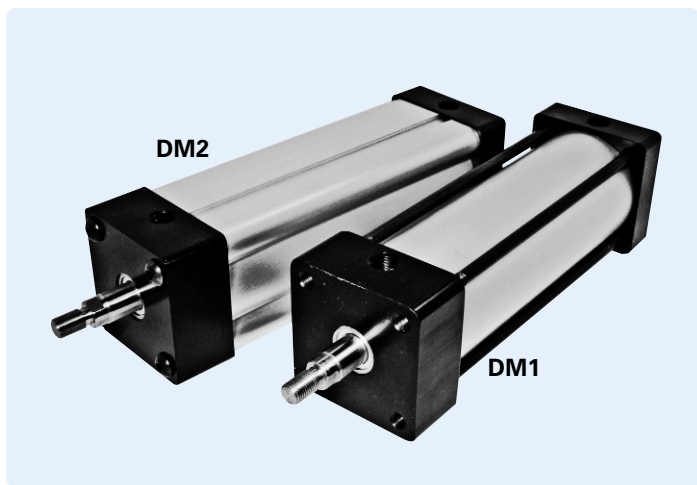
Cylinders

Specialty Valves

Production Devices

Accessories

Index



## 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 1<sup>1</sup>/<sub>16</sub>" 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.

## 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

## 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.

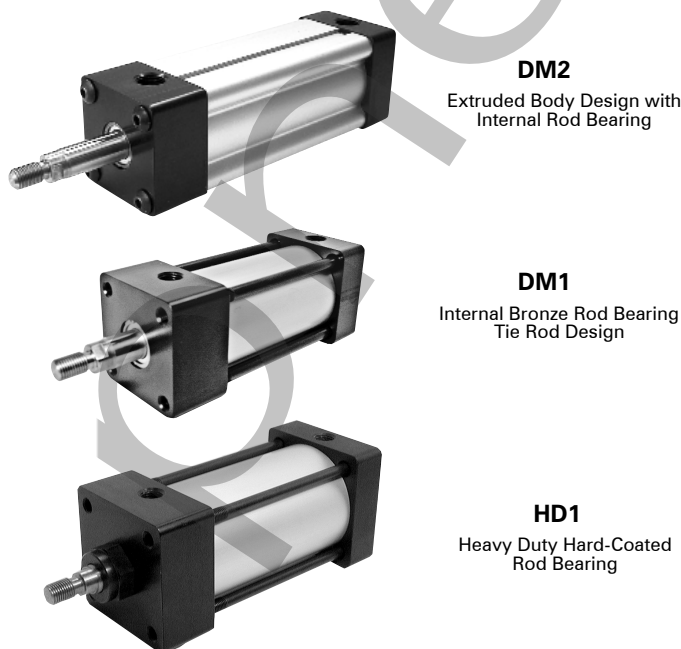
\*\* To determine thrust at other inlet pressures, multiply factor by the desired pressure.

† 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.

## 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:



Operating Specifications	
<b>Temp. Range:</b>	-40 to +250°F (to +400°F on request)
<b>Lubrication:</b>	Not necessary, but will extend cylinder life when operated with dry air.
<b>Filtration:</b>	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

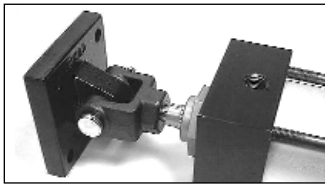


Front Flange

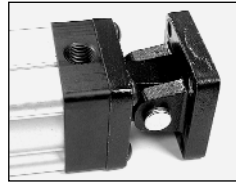
**Accessories**

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.

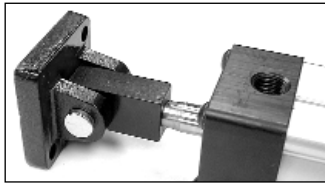
Rod Clevis and Pivot Bracket



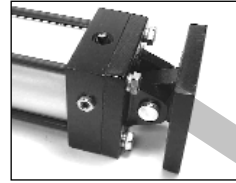
Clevis Bracket and PE Cylinder



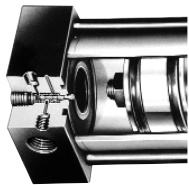
Rod Eye and Clevis Bracket



Pivot Bracket and PB Cylinder



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

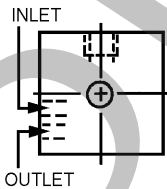


A miniature 3-way valve built into the cylinder head is actuated by the cylinder piston as it reaches the end of its stroke. Once contacted, the 3-way Inter-Pilot® valve emits an air signal. In this manner, sequencing is achieved without external limit switches and electric wiring.

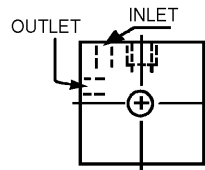
Inter-Pilots® may be built into either or both cylinder heads. They are not for hydraulic use. Cylinder operating pressure must not exceed pressure used to feed the Inter-Pilot®.

**Inter-Pilot® Port Locations**

For 1 1/2" Bore Cylinders

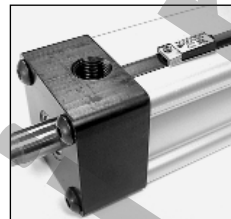


For 2"-4" Bore Cylinders



**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			
<b>Operating Voltage:</b>	5-28 DC	<b>Working Temp:</b>	23 to 194°F
<b>Operating Time:</b>	On 2 ms	<b>Repeatability:</b>	.001 ms
	Off .1 ms	<b>Max. Switching Current :</b>	.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			
<b>Operating Voltage:</b>	240 AC Max.	<b>Working Temp:</b>	67 to 200°F
<b>Switch Current:</b>	.5 Amps Max.	<b>Operating Time:</b>	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 1/8", 1/4", 1/2" pipe sizes. See pg. 57.

**Self Aligning Rod Couplers**

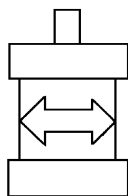


Rod couplers simplify cylinder alignment problems by compensating for 2° angular error and 1/16" lateral misalignment on both extension and retraction strokes. Greater reliability is achieved by reducing cylinder and component wear. All components are heat treated for wear and corrosion resistance.

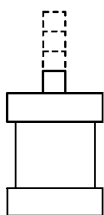
\* see page 30 for complete listing of Mead's self aligning rod couplers.



STEP 1:



STEP 2:



STEP 3:

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.)

CHOOSE STROKE LENGTH

PISTON ROD DIAMETERS:

Bore	1½"	2"	2½"	3¼"	4"	6"
Rod Diam.	5/8"	5/8"	5/8"	1"	1"	1¾"

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

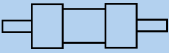
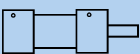
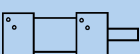


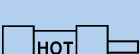

Note: Stroke costs vary with differing bore sizes. Extra charges may be incurred for fractional strokes and strokes over 12".

SELECT A MOUNTING STYLE

	Mead Code	Bore Diameter						NFPA Code	Description	
		1½"	2"	2½"	3¼"	4"	6"			
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.

**STEP 4:**

**SELECT CYLINDER OPTIONS**

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

**STEP 5:**

**BUILD A MODEL NUMBER**

When ordering Dyna-mation cylinders, list the:

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

Model Number	Stroke	Mounting Style	Options
<b>DM2-200</b>	<b>x 10</b>	<b>- PB</b>	<b>- CF</b>
2" Bore	10" Stroke	Clevis Mount (PB)	Cushioned Front (CF)

**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**

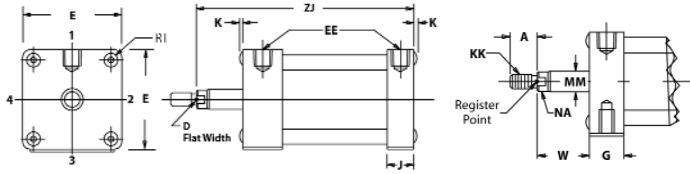
We invite inquiries regarding non-standard cylinders. Please call 773-685-6800 or your local Mead representative.

**Accessories**

	Bore Diameter	1½"	2"	2½"	3¼"	4"	6"
 Flex Rod Couplers	DMA-437	DMA-437	DMA-437	DMA-437	DMA-750	DMA-750	DMA-1000
 Forged Rod Clevis	DMC-1	DMC-1	DMC-1	DMC-1	NA	NA	NA
 Rod Clevis (NFPA Std.)	DMC-2	DMC-2	DMC-2	DMC-2	DMC-4	DMC-4	DMC-6
 Machined Rod Eye (NFPA Std.)	DME-1	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	

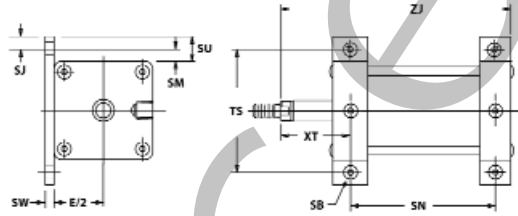
NOTE: DMP and DMR Pivot and Clevis brackets do not include any mounting hardware. See page 41 for mount kits.

Basic Cylinder

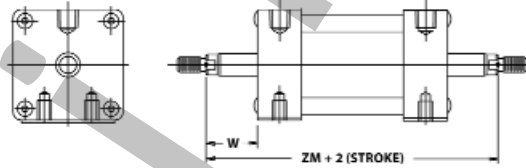


**NOTE:** DM1 Cylinders are constructed with sleeve nuts; use RT, K does not exist. DM2 use K; RT does not exist.

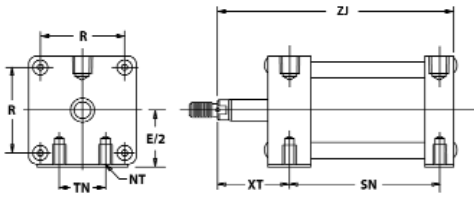
Foot Mount Plate Model FT



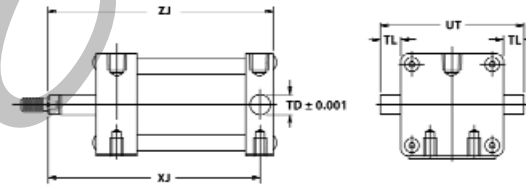
Double Rod Model DR



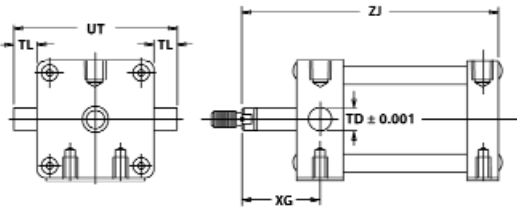
Bottom Flush Model FB



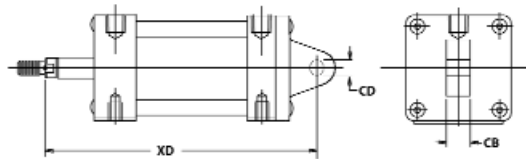
Blind End Trunnion Model TR



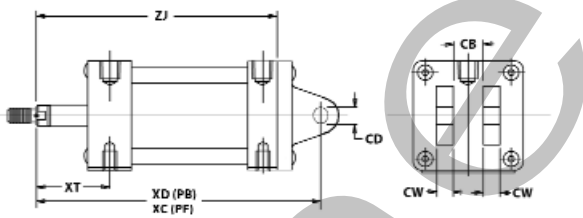
Rod End Trunnion Model TF



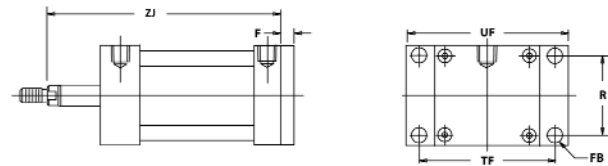
Pivot Model PE



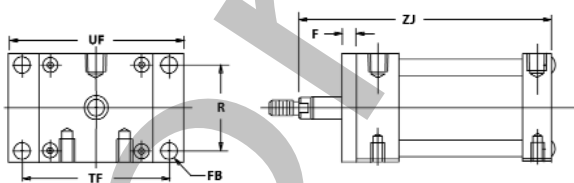
Clevis Model PB and PF



Blind End Flange Model FR\*



Rod End Flange Model FH\*



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

Reference

Control Valves

Cylinders

Specialty Valves

Production Devices

Accessories

Index

Bore	1 1/2	2	2 1/2	3 1/4	4	6
A	3/4	3/4	3/4	1 1/8	1 1/8	1 5/8
CA	1 1/2	1 1/2	1 1/2	2 1/16	2 1/16	1
CB	3/4	3/4	3/4	1 1/4	1 1/4	1 1/2
CD	1/2	1/2	1/2	3/4	3/4	1
CE	1 1/2	1 1/2	1 1/2	2 3/8	2 3/8	3 1/8
CW	1/2	1/2	1/2	5/8	5/8	3/4
D	1/2	1/2	1/2	7/8	7/8	1 1/8
DD	17/64	23/64	23/64	7/16	7/16	1 1/2-20
E	2	2 1/2	3	3 3/4	4 1/2	6 1/2
EE(NPTF)***	1/4	1/4	1/4	1/2	1/2	3/4
F	3/8	3/8	3/8	5/8	5/8	3/4
FB	5/16	3/8	3/8	7/16	7/16	9/16
FL	1 1/8	1 1/8	1 1/8	1 7/8	1 7/8	2 1/4 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 1/2
K	1/8	5/32	5/32	3/16	3/16	3/16
KK	7/16-20	7/16-20	7/16-20	3/4-16	3/4-16	1-14
M	1/2	1/2	1/2	3/4	3/4	2 1/4 Clevis
MM	5/8	5/8	5/8	1	1	1 3/8
NA	19/32	19/32	19/32	31/32	31/32	1 5/16
NT	1/4-20	5/16-18	3/8-16	1/2-13	1/2-13	3/4-10
R	1 7/16	1 27/32	2 3/16	2 3/4	3 21/64	4 7/8
RT	1/4-28	5/16-24	5/16-24	3/8-24	3/8-24	1/2-20
SB	17/64	21/64	25/64	33/64	33/64	33/64
SJ	3/8	3/8	3/8	1/2	1/2	11/16
SM	3/8	3/8	3/8	1/2	1/2	11/64
SU	3/4	3/4	3/4	1	1	11/64
SW	3/16	3/16	1/4	1/4	1/4	7/64
TD	1	1	1	1	1	1 3/8
TF	2 3/4	3 3/8	3 7/8	4 11/16	5 7/16	7 5/8
TK	3/8	1/2	9/16	3/4	3/4	1 1/8
TL	1	1	1	1	1	1 5/8
TN	5/8	7/8	1 1/4	1 1/2	2 1/16	3 1/4
TS	2 3/4	3 1/4	3 3/4	4 3/4	5 1/2	7 7/8
UF	3 3/8	4 1/8	4 5/8	5 1/2	6 1/4	8 5/8
UT	4	4 1/2	5	5 3/4	6 1/2	9 1/4
W	1	1	1	1 3/8	1 3/8	1 5/8
XT	1 15/16	1 15/16	1 15/16	2 7/16	2 7/16	2 13/16
XG	1 3/4	1 3/4	1 3/4	2 1/4	2 1/4	2 13/16
H	1 1/4	1 1/4	1 1/4	1 3/4	1 3/4	2 1/2
HA	2	2	2	2 5/16	2 5/16	2 15/16
HB	1/2	1/2	1/2	1/2	1/2	1/2
HC	3/4	3/4	3/4	1 1/8	1 1/8	1 5/8
HD	5/8	5/8	5/8	31/32	31/32	1 3/8
HE	1	1	1	1 1/2	1 1/2	2 1/4
HF	10,000	10,000	10,000	34,000	34,000	64,000

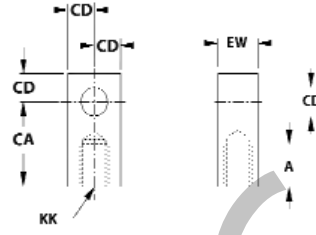
Note: \* Add Stroke Length to Dimensions Below \*\* Add Twice Stroke to ZM Dimension

SN*	2 1/4	2 1/4	2 3/8	2 5/8	2 5/8	3 1/8
XC*	5 3/8	5 3/8	5 1/2	6 7/8	6 7/8	7 7/8
XD*	5 3/4	5 3/4	5 7/8	7 1/2	7 1/2	7 1/2
XJ*	4 1/8	4 1/8	4 1/4	5	5	5 7/8
ZJ*	4 5/8	4 5/8	4 3/4	5 5/8	5 5/8	6 5/8
ZM**	6 1/8	6 1/8	6 1/4	7 1/2	7 1/2	8 3/4

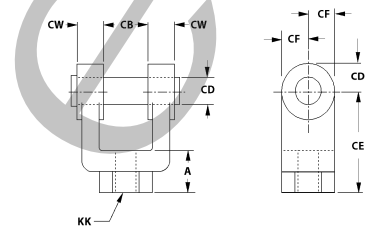
Note: For Inter-Pilot® port locations, see page 33.

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

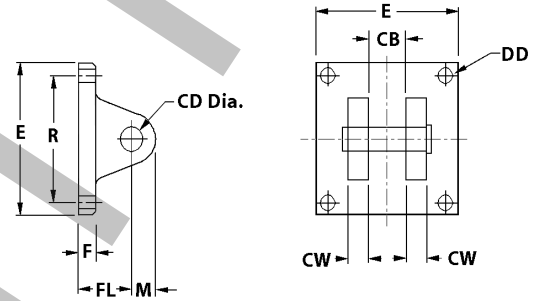
DME Interchangeable Rod Eye



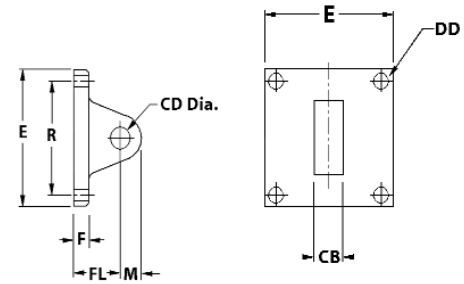
DMC Interchangeable Rod Clevis with Pin



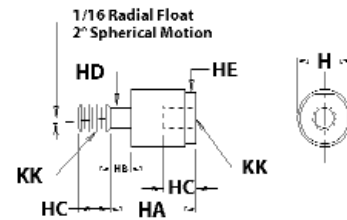
DMR Clevis Bracket w/Pin



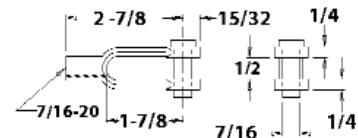
DMP Pivot Bracket



Self Aligning Rod Couplers



DMC-1 Forged Rod Clevis w/Pin  
1 1/2" through 2 1/2" bores





## 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 1/2"	177	1.77	5/8" or 1"	250	1000
2"	314	3.14	5/8" or 1"	250	1000
2 1/2"	491	4.91	5/8" or 1"	250	1000
3 1/4"	830	8.30	1" or 1 3/8"	250	700
4"	1257	12.57	1" or 1 3/8"	250	650
6"	2827	28.27	1 3/8" or 1 3/4"	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

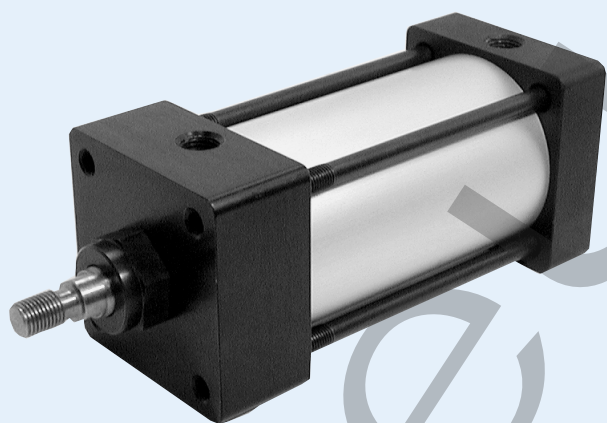
#### Rod Wiper

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 1/16" of stroke. Adjustable, they allow you to set the degree of cushioning needed for each specific application.

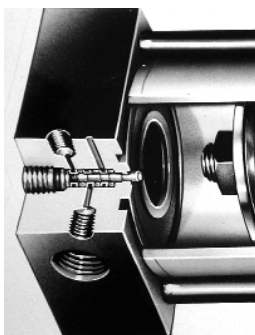
A built-in check valve assures a fast getaway in the opposite direction. A pre-lubricated nitrile cushion seal provides years of reliable service.

**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)



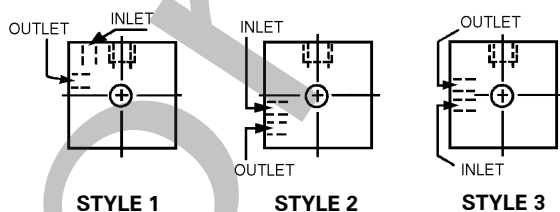
Mead's Inter-Pilot® is a miniature 3-way valve built in the cylinder head. Actuated by the cylinder's piston as it reaches the end of its stroke, the valve emits an air signal. Thus, sequencing is achieved without external limit switches and electric wiring.

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



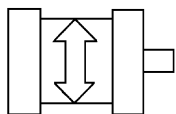
**Dyla-Trol®** - For unprecedented smoothness in cylinder speed control, use Mead's Dyla-Trol® valves with a perfectly tapering flow. Where needle type flow controls generate turbulence as they close, Dyla-Trol maintains an even 360 laminar flow regardless of the setting. Pg. 59.



**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:

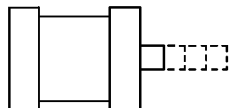


Select A Bore Size

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

\* 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.	5/8" or 1"	5/8" or 1"	5/8" or 1"	1" or 1 3/8"	1" or 1 3/8"	1 3/8" or 1 3/4"

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

Reference

Control Valves

Cylinders

Specialty Valves

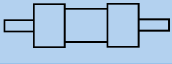
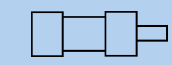

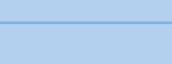
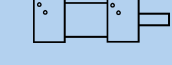

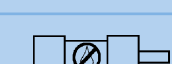

Production Devices

Accessories

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**STEP 4:**

**Select Cylinder Options**

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

**Build A Model Number**

When ordering Dyna-mation cylinders, list the:

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

Base Model	Stroke	Mounting Style	Options
<b>HD1-200</b>	<b>- 10</b>	<b>- PB</b>	<b>- CF</b>
	2" Bore	Clevis Mount (PB)	Cushioned Front (CF)

**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.

**Accessories**

	Bore Diameter:	Rod Size	1½"	2"	2½"	3¼"	4"	6"
				STD OR	DMA-437 DMA-750	DMA-437 DMA-750	DMA-437 DMA-750	DMA-750 DMA-1000
	STD OR	DMC-1 NA	DMC-1 NA	DMC-1 NA	NA	NA	NA	
	STD OR	DMC-2 DMC-4	DMC-2 DMC-4	DMC-2 DMC-4	DMC-4 DMC-6	DMC-4 DMC-6	DMC-6 DMC-?	
	STD OR	DME-1 DME-2	DME-1 DME-2	DME-1 DME-2	DME-2 DME-3	DME-2 DME-3	DME-3 DME-?	
	ALL	HD40-150	HD40-200	HD40-250	HD40-325	HD40-400	DMP-8 Bracket Only	
	ALL	HD35S-150	HD35S-200	HD35S-250	HD35S-325	HD35S-400	NA	
	ALL	HD35-150	HD35-200	HD35-250	HD35-325	HD35-400	DMR-8 Bracket Only	
	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.

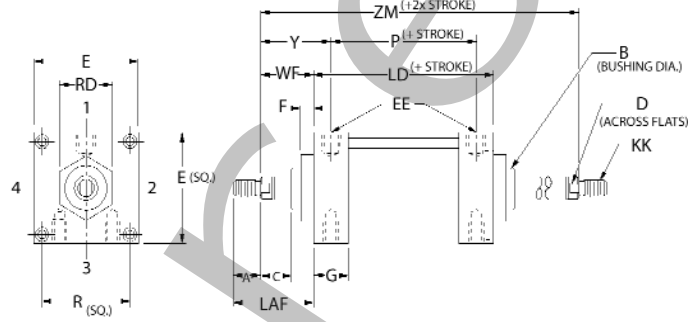
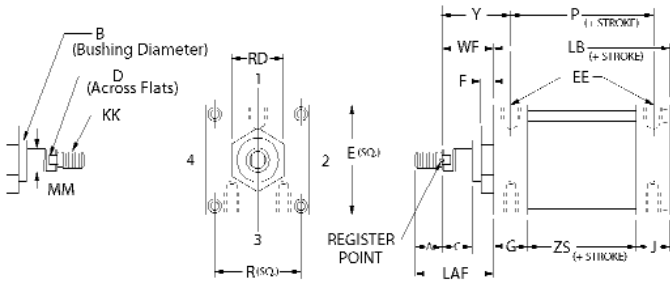
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Basic Cylinder

NFPA: MXO

Double Rod

NFPA: MDXO

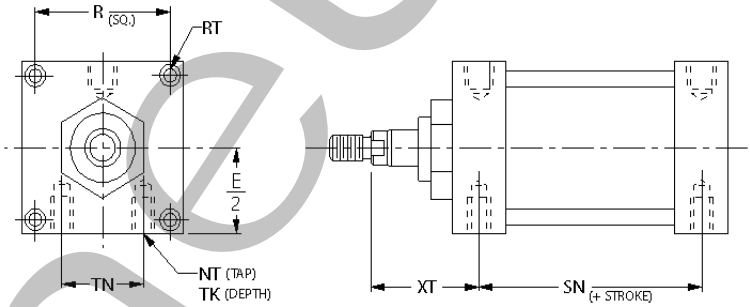


\* 6" bore HD cylinders have a rear tie rod nut, shown below as the "K" dimension.  $K = 7/16"$

	MM																					
BORE	ROD	A	B	C	D	E	EE	F	G	J	K	KK	LAF	LB	LD	P	R	WF	Y	ZS	ZM	RD
1 1/2	5/8	3/4	1 1/8	3/8	1/2	2	1/4	3/8	1 7/16	1 5/16	-	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	1 5/16	-	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	
2 1/2	5/8	3/4	1 1/8	3/8	1/2	3	1/4	3/8	1 7/16	1 5/16	-	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	
3 1/4	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	3/8	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

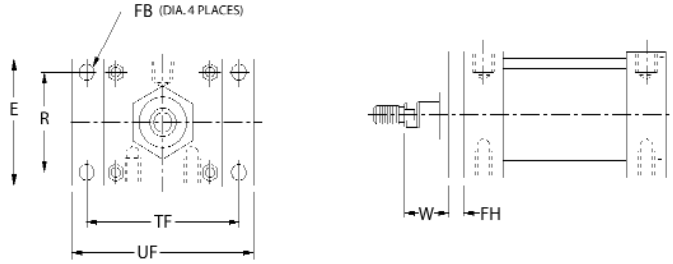


BORE	MM ROD DIA.	NT	RT	TK	TN	SN	XT
1 1/2	5/8	1/4-20	1/4-28	3/8	5/8	2 1/4	1 15/16
	1						2 5/16
2	5/8	5/16-18	5/16-24	1/2	7/8	2 1/4	1 15/16
	1						2 5/16
2 1/2	5/8	3/8-16	5/16-24	9/16	1 1/4	2 3/8	1 15/16
	1						2 5/16
3 1/4	1	1/2-13	3/8-24	3/4	1 1/2	2 5/8	2 7/16
	1 3/8						2 11/16
4	1	1/2-13	3/8-24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



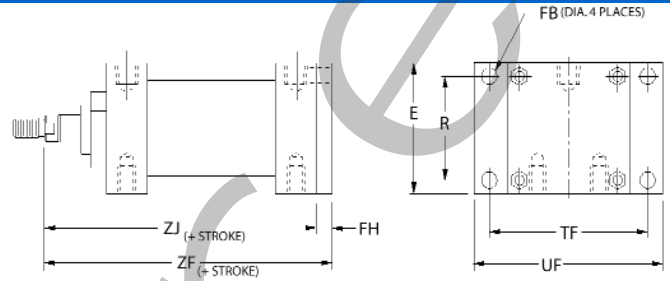
Front Flange (FH)

NFPA: MF1



Rear Flange (FR)

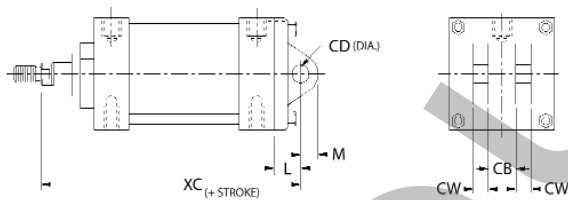
NFPA: MF2



BORE	MM ROD DIA.	E	FB (BOLT)	FH	R	TF	UF	W	ZJ	ZF
1½	5/8	2	5/16	3/8	17/16	2¾	3⅜	5/8	4⅝	5
	1							1		
2	5/8	2½	3/8	3/8	127/32	3⅜	4⅞	5/8	5	5⅝
	1							1		
2½	5/8	3	3/8	3/8	23/16	3⅞	4⅝	5/8	4¾	5⅞
	1							1		
3¼	1	3¾	7/16	5/8	2¾	411/16	5½	¾	5⅝	6¼
	1⅜							1		
4	1	4½	7/16	5/8	321/64	57/16	6¼	¾	5⅝	6¼
	1⅜							1		
6	1⅜	6½	9/16	¾	47/8	75/8	8⅝	7/8	6⅝	7⅝
	1¾							1⅛		

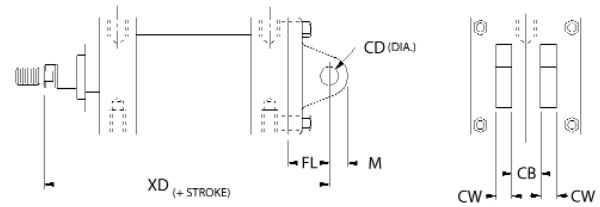
Short Clevis (PF)

NFPA: MP1



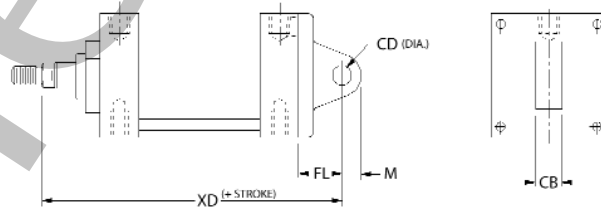
Long Clevis (PB)

NFPA: MP2



Pivot (PE)

NFPA: MP4



BORE	MM ROD DIA.	CB	CD	CW	FL	L	M	XC	XD
1½	5/8	¾	½	½	1⅞	¾	½	5⅝	5¾
	1							5¾	6⅞
2	5/8	¾	½	½	1⅞	¾	½	5⅝	5¾
	1							5¾	6⅞
2½	5/8	¾	½	½	1⅞	¾	½	5½	5⅞
	1							5⅞	6¼
3¼	1	1¼	¾	5/8	1⅞	1¼	¾	67/8	7½
	1⅜							7⅞	5¾
4	1	1¼	¾	5/8	1⅞	1¼	¾	67/8	7½
	1⅜							7⅞	7¾
6	1⅜	1½	1	¾	2¼ Clevis	-	1⅞ Clevis	NA	8⅞
	1¾								9⅞

Reference

Control Valves

Cylinders

Specialty Valves

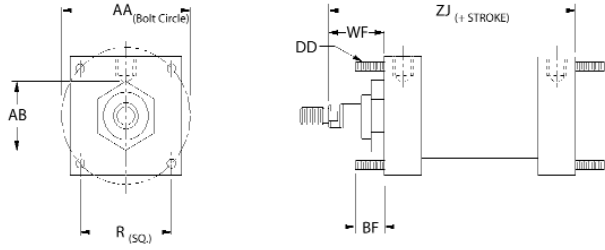
Production Devices

Accessories

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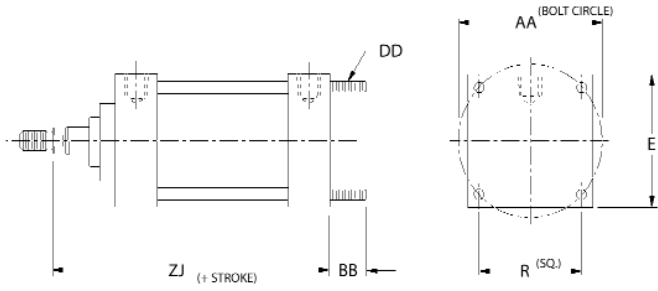
Extended Tie Rods, Both Ends (TIB)

NFPA Code: MX1



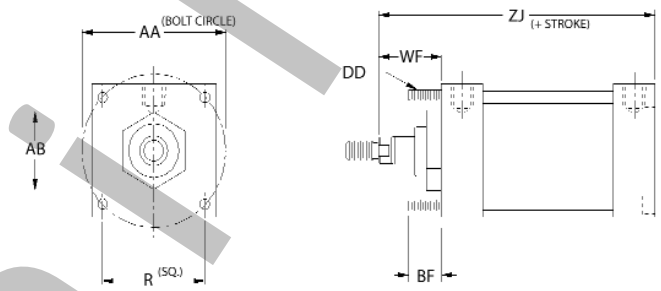
Back End (TIR)

NFPA: MX2



Rod End (TIF)

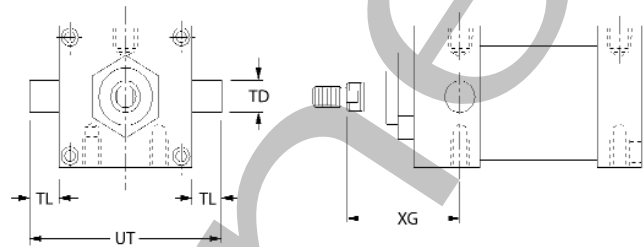
NFPA: MX3



BORE	MM ROD DIA.	AA	BB	AB	BF	DD	R	ZJ
1½	5/8	2.02	1	1 5/16	1 3/8	1/4-28	1 7/16	4 5/8
	1							5
2	5/8	2.6	1 1/8	1 5/16	1 1/2	5/16-24	1 27/32	4 5/8
	1							5
2½	5/8	3.1	1 1/8	1 3/4	1 1/2	5/16-24	2 3/16	4 3/4
	1							5 1/8
3¼	1	3.9	1 3/8	2 1/32	2	3/8-24	2 3/4	5 5/8
	1 1/8							5 7/8
4	1	4.7	1 3/8	2 1/32	2	3/8-24	3 21/64	5 5/8
	1 3/8							5 7/8
6	1 3/8	6.9	1 13/16	2 5/8	2 9/16	1/2-20	4 7/8	6 5/8
	1 3/4							6 7/8

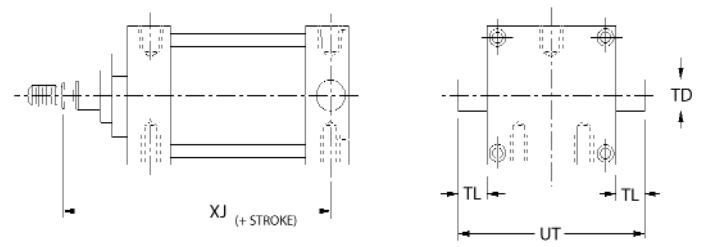
Front Trunnion (TF)

NFPA: MT1



Rear Trunnion

NFPA: MT2



BORE	MM ROD DIA.	TD ± .001	TL	UT	XG	XJ
1½	5/8	1	1	4	1 3/4	4 1/8
	1				2 1/8	4 1/2
2	5/8	1	1	4 1/2	1 3/4	4 1/8
	1				2 1/8	4 1/2
2½	5/8	1	1	5	1 3/4	4 1/4
	1				2 1/8	4 5/8
3¼	1	1	1	5 3/4	2 1/4	5
	1 1/8				2 1/2	5 1/4
4	1	1	1	6 1/2	2 1/4	5
	1 3/8				2 1/2	5 1/4
6	1 3/8	1 3/8	1 3/8	9 1/4	2 5/8	5 7/8
	1 3/4				2 7/8	6 7/8

Reference

Control Valves

Cylinders

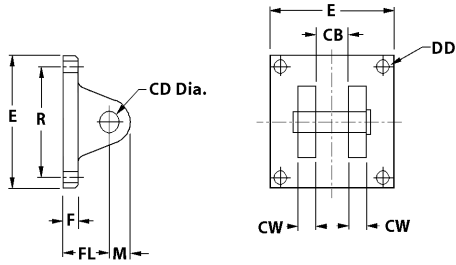
Specialty Valves

Production Devices

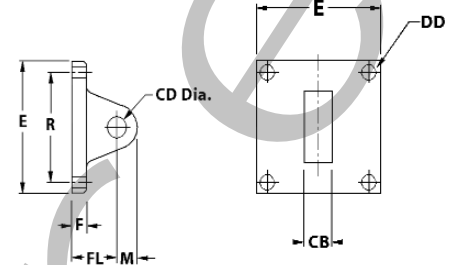
Accessories

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Clevis Bracket

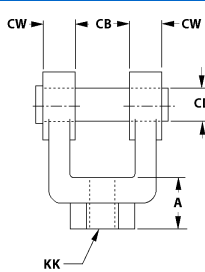


Pivot Bracket

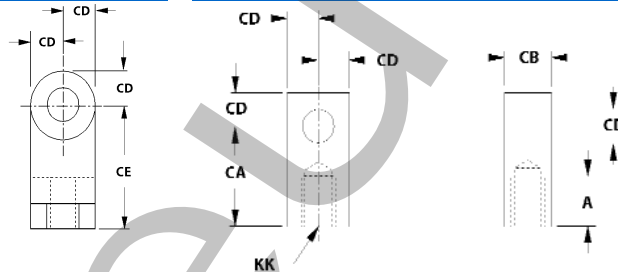


BORE	CB	CD	CW	DD	E	FL	M	R
1 1/2	3/4	1/2	1/2	17/64	2	1 1/8	1/2	1 7/16
2	3/4	1/2	1/2	23/64	2 1/2	1 1/8	1/2	1 27/32
2 1/2, 2 1/2*	3/4	1/2	1/2	23/64	3	1 1/8	1/2	2 3/16
3 1/4	1 1/4	3/4	5/8	7/16	3 3/4	1 7/8	3/4	2 3/4
4	1 1/4	3/4	5/8	7/16	4 1/2	1 7/8	3/4	3 21/64
6	1 1/2	1	3/4	17/32 Clevis 21/32 Pivot	6 1/2 Clevis 4 1/2 Pivot	2 1/4	1 1/8 Clevis 1 1/4 Pivot	4 7/8

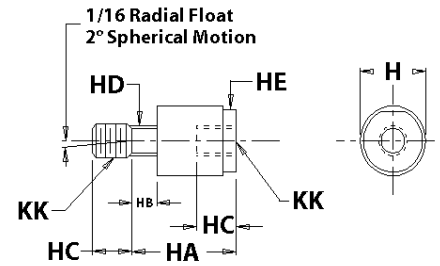
Rod Clevis



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	3/4	1 1/2	3/4	1/2	1 1/2	1/2	7/16-20	1 1/4	2	1/2	3/4	5/8	1 1/8
DMC-4 DME-2 DMA-750	HD1-150 OR HD1-200 OR HD1-250 OR HD1-325 HD1-400	1 1/8	2 1/16	1 1/4	3/4	2 5/8	5/8	3/4-16	1 3/4	2 5/16	5/16	1 1/8	3 1/32	1 1/2
DMC-6 DME-3 DMA-1000	HD1-325 OR HD1-400 OR HD-600	1 5/8	2 13/16	1	1	3 3/8	3/4	1-14	2 1/2	2 15/16	1/2	1 5/8	1 3/8	2 1/4
DMC-7 DME-4 DMA-1250	HD-600 OR	1 5/8	3 7/16	2	1 3/8	4 1/8	1	1 1/4-12	2 1/2	2 15/16	1/2	1 5/8	1 3/8	2 1/4

Reference

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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.

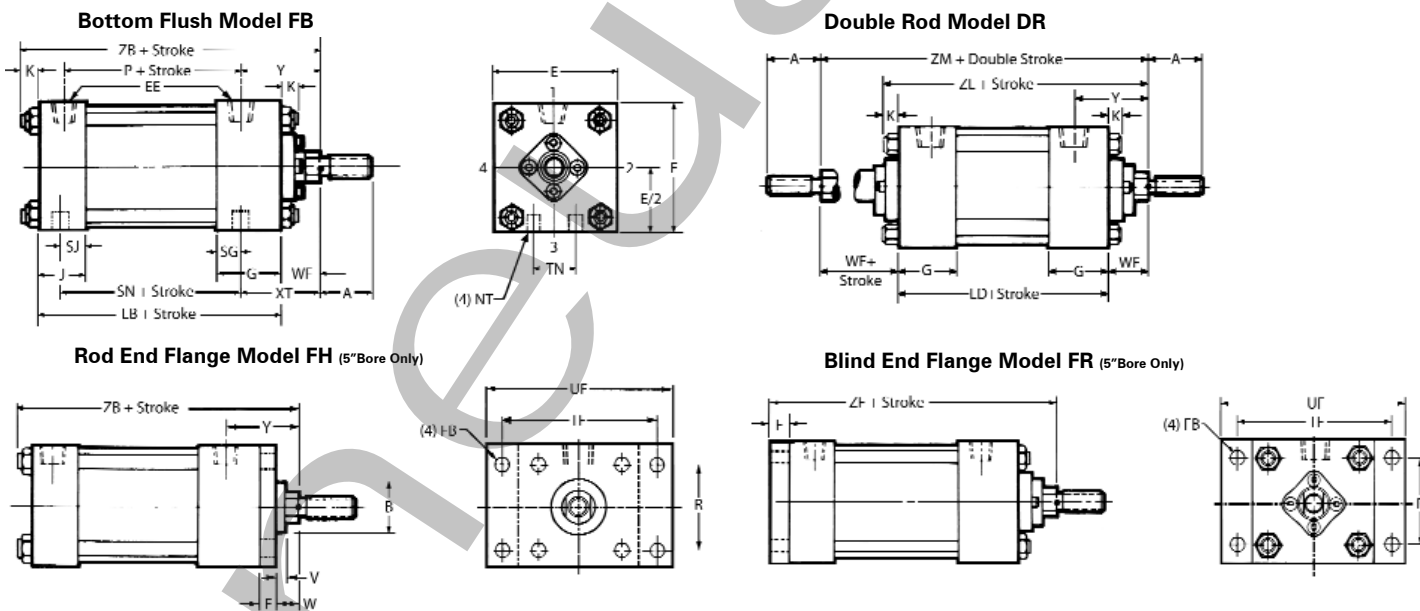
Bore Diam.	Thrust*	Thrust Mult.**	Rod Diam.	Max. Oper. Pressure	
				Air	Oil ‡
5"	1964	19.64	1" or 1 3/8"	250	900
8"	5027	50.27	1 3/8" or 1 3/4"	200	500
10"	7854	78.54	1 3/4" or 2"	200	400
12"	11310	113.1	2" or 2 1/2"	200	400

\*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.

Dimensions



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

BORE	MM		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**
	ROD	ROD																													
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	1-14	1 1/4	4 1/2	5	5/8-11	2 3/4	4.10	1 1/16	1 1/16	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 5/8	1 5/8	2	8 1/2	3/4	7/8	-	2	1 1/2	5/8	1-14	1 1/4-12	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	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 1/4-12	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 1/8	8 1/8
	1 3/4	2	-	10 5/8	1	7/8	-	2 1/4	2	3/4	1 1/4-12	1 1/2-12	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 1/8	-	8 1/4	9 3/8
10	1 3/4	2	-	10 5/8	1	7/8	-	2 1/4	2	3/4	1 1/4-12	1 1/2-12	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 1/8	-	9 1/4	10 3/8
	2	2 1/4	-	12 3/8	1	-	-	2 1/4	2	3/4	1 1/4-12	1 1/2-12	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 3/8	10 5/8
12	2	2 1/4	-	12 3/8	1	-	-	2 1/4	2	3/4	1 1/4-12	1 1/2-12	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 3/8	11 1/8
	2 1/2	3	-	12 3/8	1	-	-	2 1/4	2	3/4	1 1/4-12	1 1/2-12	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 1/4	3 1/2	3 5/16	-	10 1/8	13 5/8

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

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)

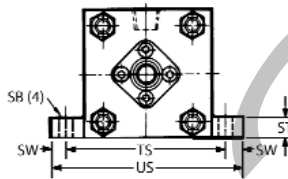
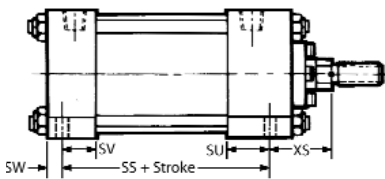
Mounting

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

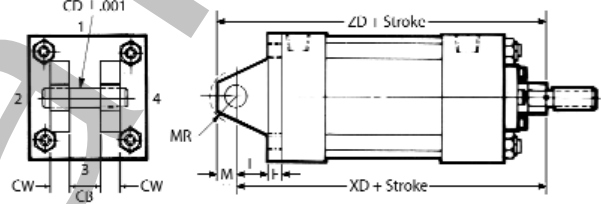
Options

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

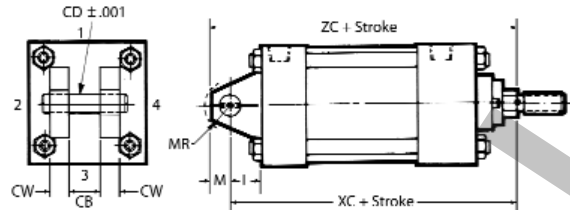
Foot Mount Model FT



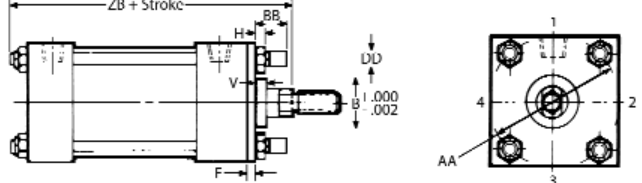
Clevis Mount Model PB



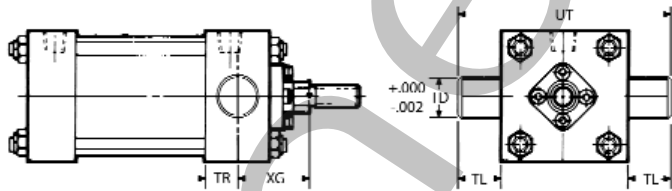
Clevis Mount Model PF



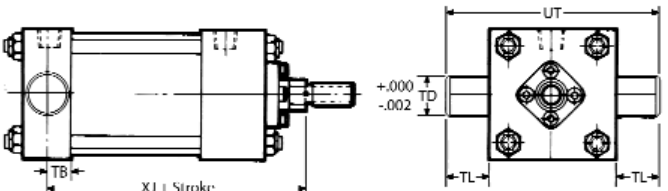
Tie Rods Extended Front Model TIF



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.

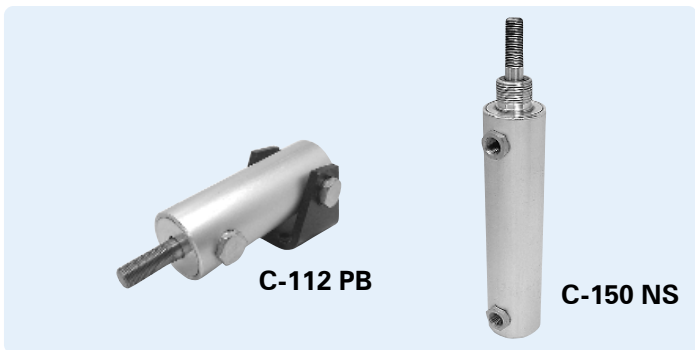
MM	BORE	ROD	AA	BB	CB	CD	CW	DD	M	MR	SB	SS	ST	SU	SV	SW	TB	TD	TL	TR	TS	US	UT	V	XC*	XD*	XG	XJ*	XS	ZB*	ZC*	ZD*
5	1	1 1/8	5.80	3/4	1 1/4	3/4	5/8	1/2-20	3/4	7/8	3/4	3 1/8	1	1 1/16	9/16	1 1/16	5/8	1	1	7/8	6 7/8	8 1/4	7 1/2	1/4	7 1/8	7 3/4	2 1/4	5 1/4	2 1/16	6 3/8	7 7/8	8 1/2
8	1 3/8	1 3/4	9.10	2 1/4	1 1/2	1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

NOTE: \* Indicates add stroke length to dimension.

Reference  
Control Valves  
Cylinders  
Specialty Valves  
Production Devices  
Accessories

Index



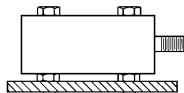


**Low Cost Mounting**

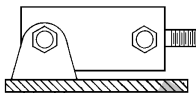
Flush bottom cylinder mounts directly onto a base plate with only two bolts...needs no mounting brackets or other hardware. The pivot bracket is built-in for easy pivoting at the inlet axis. The bracket pivots within the cylinder length to save space and to eliminate one entire bracket that would be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

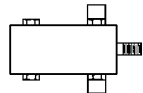
**Flush Bottom (FB)**



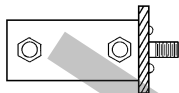
**Pivot Bracket (PB)**



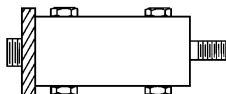
**Trunnion Rear (TR)  
Trunnion Front (TF)**



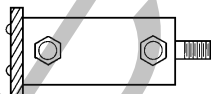
**Flush Front (FF)**  
1 1/2", 2", 2 1/2" & 3" bores only



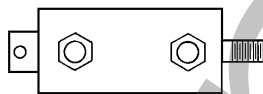
**Flush Rear (FR)**  
1 1/8" bore only



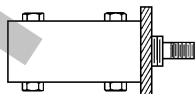
**Flush Rear (FR)**  
1 1/2", 2", 2 1/2" & 3" bores only



**Pivot Extended (PE)**  
1 1/8", 1 1/2" & 2" bores only



**Threaded Nose (NS)**  
Std. on all 1 1/8" bore mounts  
1 1/8", 1 1/2" & 2" bores only



**Technical Specifications**

**Pressure :** 150 PSI Air, 250 PSI Hydraulic

**Bore Sizes:** 1 1/8", 1 1/2", 2", 2 1/2" and 3"

**Body:** Hard Coated Aluminum

**Rod Bearing:** Oil Impregnated Porous Bronze

**Temperature Range:** -40°F to +250°F (to +400°F on request)

**Flow Controls**



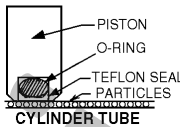
Control the speed of your cylinders with Mead Flow Control Valves. Right-angle flow controls can be found on page 66. For precise metering of air, see Mead Dyla-Trol valves on page 59.

**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**

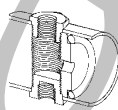
Centaur's unique Teflon® piston seal eliminates the forward lurch that occurs when rubber seals breakaway from the cylinder tube surface. Rod motion remains smooth throughout the stroke.



**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**

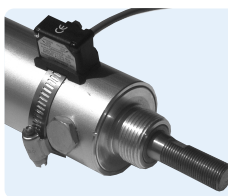


Rod couplers simplify cylinder alignment problems by compensating for 2° angular error and 1/16" lateral misalignment on both extension and retraction strokes.

\* 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.

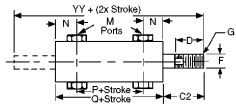
Model	C-112	C-150	C-200	C-250	C-300
Sinking	N/A	CS-6100N-150	CS-6100N-200	CS-6100N-250	CS-6100N-300
Sourcing	N/A	CS-6100P-150	CS-6100P-200	CS-6100P-250	CS-6100P-300
Reed	N/A	CS-6100R-150	CS-6100R-200	CS-6100R-250	CS-6100R-300

**Double Rod Cylinders**

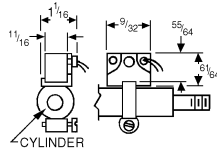


Centaur cylinders may be ordered with a one piece piston rod protruding from both ends of the cylinder for convenient stroke adjustment and for increased rigidity.

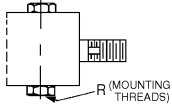
**Basic Dimensions**



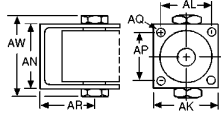
**Hall Effect**



**Flush Bottom (FB)**

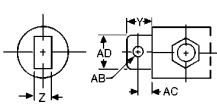


**Pivot Bracket (PB)**



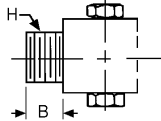
**Pivot Extended (PE)**

1 1/4", 1 1/2" & 2" bores only



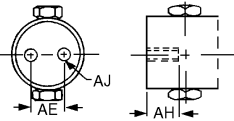
**Flush Rear (FR)**

1 1/8" bore only



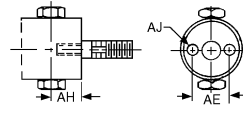
**Flush Rear (FR)**

1 1/2", 2", 2 1/2" & 3" bores only



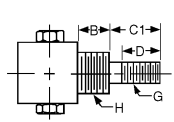
**Flush Front (FF)**

1 1/2", 2", 2 1/2" & 3" bores only

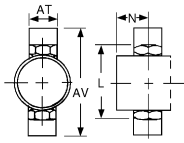


**Threaded Nose (NS)**

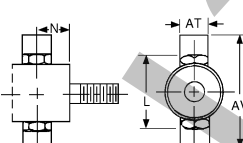
Std. on all 1 1/8" bore mounts  
1 1/8", 1 1/2" & 2" bores only



**Trunnion Rear (TR)**



**Trunnion Front (TF)**



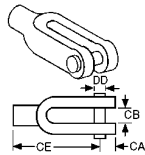
	Bore Sizes				
	1 1/8"	1 1/2"	2"	2 1/2"	3"
A	1 3/8	1 3/4	2 1/4	2 3/4	3 1/4
B	5/8	13/16	1 1/16	-	-
C1	5/8	1 3/8	1 7/8	-	-
C2	-	1 7/16	1 11/16	1 3/4	2 1/16
D	1/2	1 1/4	1 5/8	1 1/2	1 3/4
F	5/16	1/2	5/8	3/4	1
G	5/16-24	1/2-20	5/8-18	3/4-16	1-14
H	3/4-16	1-14	1 1/4-12	-	-
L	2 3/32	2 1/8	2 5/8	3 1/8	3 3/8
M	1/8 NPT*	1/4 NPSF	1/4 NPSF	1/4 NPSF	1/4 NPSF
N	7/16	51/64	51/64	51/64	51/64
P+Stroke	1 21/64	1 7/32	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 1/16
AT	.418	.731	.731	.731	.731
AV	2 5/32	3 3/8	4 1/8	4 5/8	5 1/8
AW	2 17/64	2 13/16	3 1/16	3 13/16	4 1/16
YY+ (2 X STK)	4 23/32	6 5/16	6 7/8	7 1/8	7 1/8

\* 1 1/8" bore model with trunnion mounts has 1/4-28 ports.

**Accessories**

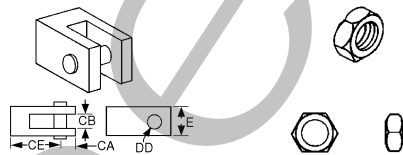
**Rod Clevis w/Pin (CEC)**

1 1/8" & 1 1/2" bores



**Nose Nuts (CN)**

1 1/8", 1 1/2" & 3" bores only



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

**Rod Clevis Accessory Dimensions**

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

**Model Numbers**

Bore Sizes Accessory	1 1/8"	1 1/2"	2"	2 1/2"	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**



Bore Model	1 1/8" C-112	1 1/2" C-150	2" C-200	2 1/2" 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 1 1/8" bore model with double rod.

Reference

Control Valves

Cylinders

Specialty Valves

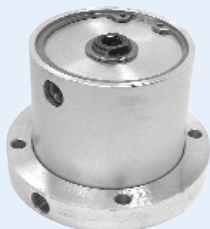
Production Devices

Accessories

Index



SS-300



SS-250

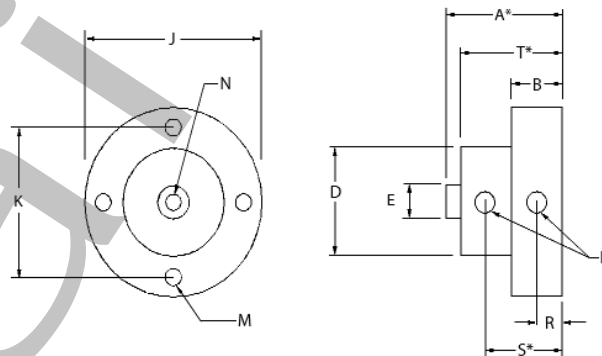
### Full Power In Half The Space

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.

### Dimensions



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

Bore	3/4"	1 1/8"	1 1/2"	2"	2 1/2"	3"	4"
A*	49/64	25/32	59/64	1 1/16	1 5/64	1 25/64	1 17/32
B	1/2	1/2	1/2	9/16	9/16	3/4	3/4
D	1	1 3/8	1 3/4	2 1/4	2 3/4	3 1/4	4 1/4
E	5/16	1/2	1/2	5/8	5/8	3/4	3/4
H	10-32	10-32	10-32	1/8 NPT	1/8 NPT	1/8 NPT	1/8 NPT
J	1 3/4	2 1/8	2 1/2	3 1/8	3 3/4	4 1/4	5 1/4
K	1 13/32	1 25/32	2 5/32	2 23/32	3 1/4	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	5/16-24	5/16-24	3/8-24	3/8-24	1/2-20	1/2-20
R	x1/4	x3/8	x3/8	x3/8	x3/8	x1/2	x1/2
S*	5/32	5/32	5/32	5/16	5/16	21/64	21/64
T*	25/64	25/64	1/2	11/16	11/16	59/64	1 3/64
	3/4	49/64	57/64	1 3/64	1 1/16	1 23/64	1 1/2

\* Plus Stroke

Note: To obtain a 1/8" or 3/16" stroke on 3/4" or 1 1/8" bore models, a 1/4" 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 1/4 - VI

### Offers A Wide Range Of Power

Bore	3/4"	1 1/8"	1 1/2"	2"	2 1/2"	3"	4"
Force @ 100 PSI (lbs.)	44	100	177	314	491	707	1257

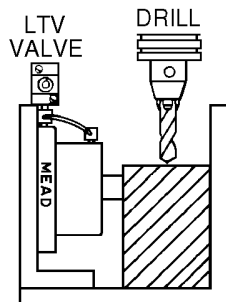
NOTE: Pull force is approximately 10% less.

### 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°.

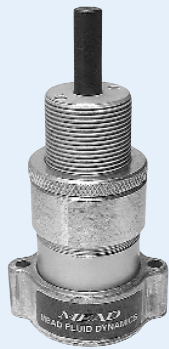
### Stroke Availability

Model	Bore	Stroke Lengths											
		1/8	3/16	1/4	3/8	1/2	5/8	3/4	1	1 1/2	2	2 1/2	3
SS-075	3/4"	X*	-	X*	X	X	X	X	X	X	X	-	-
SS-112	1 1/8"	X*	X*	X*	-	X	-	X	X	X	X	X	X
SS-150	1 1/2"	X*	-	X	-	X	-	X	X	X	X	X	X
SS-200	2"	X	-	X	-	X	-	X	X	X	X	X	X
SS-250	2 1/2"	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

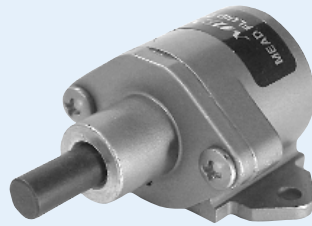
\* Includes special fitting

Note: To obtain a 1/8" or 3/16" stroke on 3/4" or 1 1/8" bore models, a 1/4" stroke cylinder is used and spacers are added.

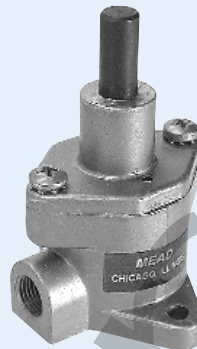
Non-standard strokes subject to special machining charge.



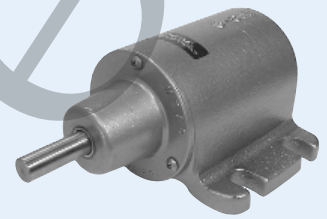
VOX01



H-1



V-1



H-43

Economical single-acting air clamps provide gripping power on the out stroke and spring retraction. They are ideal for use in drill fixtures and for bending, swaging, forming, crimping, & pressing operations. Because 3-way valves may be used, hook-ups are quick and easy.

### Adjustable Stroke Models

H0X01, HIX12, VOX01, and VIX12 models are supplied with an adjustable front head so that the user may adjust the length of the stroke by as much as one inch.

Specifications	
<b>Pressure :</b>	Air to 150 PSI
<b>Temperature:</b>	-40°F to +250°F
<b>Rod Material:</b>	Nitrotec plated steel on 1 bore models, ground and polished on all others.
<b>Seals:</b>	Custom molded one-piece neoprene cups
<b>Body &amp; Cover:</b>	Aluminum on adjustable models, cast aluminum on all other models. Cast iron on H-12 and H-283.

Models	Return †	Bore (")	Stroke (")	Output *
H-1 & V-1	4	1	1 1/16	68
H0X01 & VOX01	5	1	0 to 1	62
HIX12 & VIX12	5	1	1 to 2	61
H-41 & V-41	9	2 1/4	1	361
H-42	10	2 1/4	2	353
H-43	11	2 1/4	3	351
H-71	18	3	1	682
H-72	13	3	2	675
H-73	14	3	3	679
H-12	39	4	2	1206
H-122	27	4	2 5/8	1204
H-283	40	6	3	2763

†Maximum weight in pounds that spring will return.

\*Force in pounds at 100 PSI input pressure with maximum spring resistance.

	H-1	H0X-01	HIX-12	H-41	H-71	Single Side Lug
A	2 25/32	4	5	4 7/8	5 5/16	
B	1 11/32	Var.		2 1/4	2 3/4	
C	5/8	Var.		1 1/2	1 7/16	
D	5/16	5/16	1/2	3/4	3/4	
G	1 1/4	1 9/16	3 1/16	3 1/16	3 23/32	
H	-	-	-	-	-	
J	1/8 NPT	1/8 NPT	1/8 NPT	1/4 NPT	1/4 NPT	
K	3/16	.200	1/2 Slot	21/64	21/64	
L	1 5/8	1 5/8	3 1/2	4 5/8	4 5/8	
M	2	2 1/8	4 7/16	5 3/8	5 3/8	
Q	5/8	13/16	1 9/16	1 15/16	1 15/16	

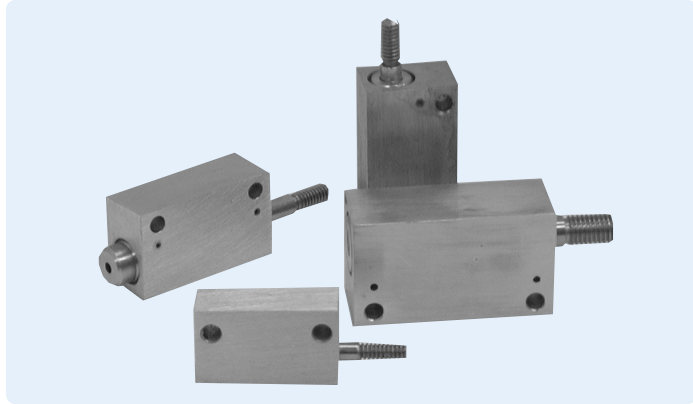
	V-1	VOX-01	VIX-12	V-41	Base Mount
A	2 5/8	3 13/16	4 13/16	4 5/8	
B	1 15/16	Var.		3 3/16	
C	1 1/16	Var.		1 7/16	
D	5/16	5/16	1/2	1/2	
G	1 9/16	1 3/4	3	3	
H	-	-	-	-	
J	1/8 NPT	1/8 NPT	1/8 NPT	1/8 NPT	
K	3/16	.200	.257	.257	
L	1 11/16	1 5/8	3 3/4	3 3/4	
M	2 1/8	2	4 1/4	4 1/4	
Q	-	-	-	-	

	H-43	H-72	H-73	H-12	H-283	Double Side Lug
A	7 1/4	6 5/16	7 5/16	7	9	
B	2 3/4	2 3/16	2 3/16	2 9/16	3 1/2	
C	5/8	1 7/16	1 7/16	1 7/16	1 7/16	
D	1/2	3/4	3/4	3/4	1 1/4	
G	3 1/16	3 11/16	3 11/16	5 1/16	7 1/16	
H	2	2 1/16	3 1/16	2 5/16	7 1/16	
J	1/8 NPT	1/4 NPT	1/4 NPT	3/8 NPT	1/2 NPT	
K	1/2 Slot	21/64	21/64	1/2 Slot	1/2-13	
L	4	4 5/8	4 5/8	5 1/2	5 5/8	
M	5 1/8	5 1/4	5 1/4	7	6 3/4	
Q	1 9/16	1 7/8	1 7/8	2 9/16	3 9/16	

	H-42	H-122	Bottom Flush
A	5 13/16	7 9/16	
B	2 5/8	2 5/8	
C	1 7/16	1 7/16	
D	1/2	3/4	
G	3 1/16	4 31/32	
H	2 Holes	2 1/2	
J	1/8 NPT	3/8 NPT	
K	1/4-20	5/16-18	
L	2 1/4	2 1/4	
M	3	4 13/16	
Q	1 9/16	2 9/16	

Mini Cylinders Mount Anywhere!

Mead's line of miniature air cylinders offers users a wide range of low-profile linear actuators. These versatile cylinders are available in both single-acting and double-acting models. They are ideal actuators in any application where space is limited.



General Specifications	
<b>Seals:</b>	Buna N (Viton Optional)
<b>Temperature:</b>	Buna N seals = 0°F to 220°F Viton seals = 0°F to 400°F
<b>Operating Pressure:</b>	to 125 psi
<b>Piston Rods:</b>	Stainless Steel
<b>Rod Bearings:</b>	660 Bronze
<b>Lubrication:</b>	Recommended - non detergent petroleum based

MF Series - Mini Flat Mount Cylinders

Mead's MF Series are miniature, rectangular flat mount cylinders. MF cylinders are available in both single and double-acting models with strokes up to 2".

All ports are tapped 10-32 except the front ports of 1/4" bore models, which have a 6-32 barb fitting. The standard location for the rear extend port is denoted by location "N" on the dimensional drawing. As an option, a rear side port can be ordered special. Contact Mead for details.

Stroke Length Availability - MF Series

This series is available in 1/4" and 1/2" standard stroke lengths.\* By adding a spacer, all models are also available in fractional stroke lengths for no additional charge. (Dimensionally the cylinder will be the same as the next closest size up.) If other strokes are required, contact Mead to quote a custom stroke length.

\*NOTE: The MF-250 (1/4" bore), Single Acting (SR or SE) is only available in 1/4" standard stroke length.

MF Cylinder Dimensions

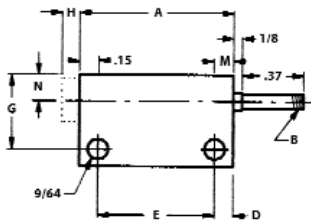
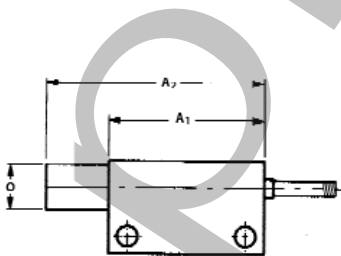


Figure 1: For strokes up to 1/2"  
# 1 Indicates port locations  
The H dimension is for spring extend cylinders only.

Bore	Stroke	A	B	D	E	G	H	I	J	K	M	N	O	Front Port	Rear Port
1/4"	1/4"	1.06	6-32	.12	0.81	7/16"	.10	.31	3/8"	5/8"	.20	.18	5/16"	6-32	10-32
	1/2"	1.31	6-32	.12	1.06	7/16"	-	.31	3/8"	5/8"	.20	.18	5/16"	Barb	Tap
3/8"	1/4"	1.25	8-32	.15	0.93	5/8"	.18	.37	1/2"	3/4"	.37	.25	7/16"	10-32	10-32
	1/2"	1.50	8-32	.15	1.18	5/8"	.18	.37	1/2"	3/4"	.37	.25	7/16"	Tap	Tap
1/2"	1/4"	1.31	1/4-28	.15	1.00	3/4"	-	.37	5/8"	7/8"	.37	.31	9/16"	10-32	10.32
	1/2"	1.56	1/4-28	.15	1.25	3/4"	-	.37	5/8"	7/8"	.37	.31	9/16"	Tap	Tap



Dimensions For Cylinders With Strokes Over 1/2"

Bore	A <sub>1</sub>	A <sub>2</sub>
1/4"	1.06	0.81 + Stroke
3/8"	1.25	1.00 + Stroke
1/2"	1.31	1.06 + Stroke

Figure 2: For Strokes Over 1/2"

Reference

Control Valves

Cylinders

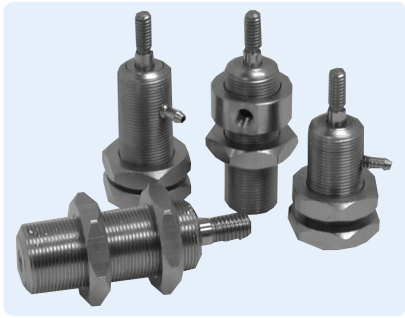
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**MA Series - Mini Adjustable Location Cylinders**

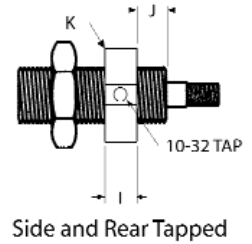
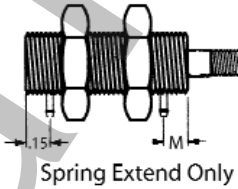
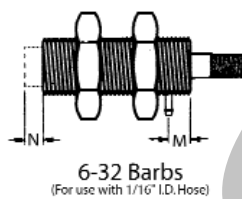
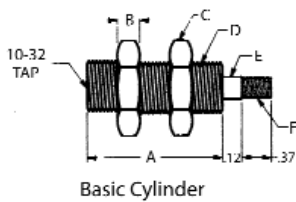
These threaded body cylinders install quickly and easily without special mounting devices. Either drill a hole, insert your cylinder, and position with the pair of jam nuts or tap a hole and lock into position with a single jam nut. The MA-Series cylinders are electroless nickel plated for excellent corrosion resistance and a gleaming appearance.

**Non-rotating:** This option is available on 3/8" and 1/2" bore, single-acting, spring return cylinders.

**Stroke Length Availability - MA Series**

The MA-250 (1/4" Bore) single acting is only available in a 1/4" stroke lengths. The MA-250 double acting is available in 1/4", 1/2" and 1" stroke lengths. The MA-375 (3/8" Bore) and MA-500 (1/2" Bore) single acting is available in 1/4" and 1/2"; the double acting version is available in 1/4", 1/2", 1", 1-1/2" and 2" stroke lengths. By adding a spacer, all models are also available in fractional stroke lengths for no additional charge. (Dimensionally the cylinder will be the same as the next closest size up.) If other strokes are required, contact Mead to quote a custom stroke length.

**MA Cylinder Dimensions**



Bore	A=Stroke+	B	C	D	E	F	I	J	K	M	N
1/4"	0.81	.15	.62	3/8-32	.14	6-32	.31	.06	.62	.20	.10
3/8"	1.00	.18	.75	1/2-32	.17	8-32	.31	.21	.75	.37	.18
1/2"	1.06	.18	.87	5/8-32	.25	1/4-28	.31	.21	.87	.37	-

**Ordering Miniature Cylinders:**

**MA - 500 x 1.00 DA - RB ( \* \* \* )**

**Family**

MA = Mini Adjustable  
MF = Mini Flat

**Bore**

250 = 1/4" Bore  
375 = 3/8" Bore  
500 = 1/2" Bore

**Stroke (in inches)**

See "Stroke Length Availability..." for particular series.

**Type**

DA = Double Acting  
SR = Spring Return  
SE = Spring Extended

**Accessories**

- Fitting: 10-32 to 1/16" ID Hose . . . . .PMHF
- Fitting: 6-32 Barb to 1/16" ID Hose . . . . .PMBF
- Hex Nut for 1/4" Bore Cylinder . . . . .PMH-250
- Hex Nut for 3/8" Bore Cylinder . . . . .PMH-375
- Hex Nut for 1/2" Bore Cylinder . . . . .PMH-500
- 1/16" ID Tube Clear Polyurethane (50 ft.)..11NAT

**Options**

V = Viton Seals  
NR = Non-Rotating (Hex Rod) (MA Series Only)

**Front Port**

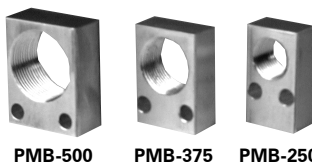
O = None (Spring Return)  
S = Side Tapped (10-32)  
B = 6-32 Barb (For 1/16" ID Hose)

**Rear Port**

O = None (Spring Extend)  
R = Rear Tapped (10-32)  
S = Side Tapped (10-32)\*  
B = 6-32 Barb (For 1/16" ID Hose)

\* Special Order (Non-Stock, contact factory)

**Mounting Blocks**



	PMB 250	PMB 375	PMB 500
<b>Bore</b>	1/4"	3/8"	1/2"
<b>Width</b>	0.503	0.626	0.75
<b>Height</b>	0.879	0.876	0.94
<b>Depth</b>	0.314	0.314	0.38
<b>Hole (2)</b>	0.14	0.139	0.136

## Lockout and Easy-Glide Ball Handle Valves

## Slide/Lockout Valve

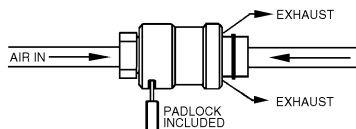
Mead's Slide/Lockout Valves (SLV) are designed to comply with OSHA Standard Rule 29 CFR1910.147. SLVs exhaust downstream air to atmosphere when the valve is in the closed position. This prohibits the unexpected cycling of equipment due to stored energy in the air line. These valves can only be locked in the closed position, rendering any downstream machinery or equipment completely inoperable. The aluminum sleeve is anodized bright gold for easy identification.

## Put A Lock On Plant Accidents

In the open position, air flows freely through the valve to downstream equipment or tool.



In the closed position, air from compressor side is restricted while exhaust air bleeds to atmosphere, rendering downstream equipment inoperable. Lockout is only possible in the closed position.



## "Gang Lock" Option

SLVs may be ordered with a gang lock adapter rather than the standard Mead padlock. The adapter permits the use of one or multiple standard padlocks. To order, add a "G" to the model (i.e. SLVG-50).

## OSHA Rule 29 CFR1910.147\* (Effective January 1990)

To protect employees from the unexpected energization or release of stored energy during repair, maintenance and associated activities, this new standard requires potentially hazardous energy sources for certain equipment to be disabled and either be locked or labeled with a warning tag to prevent unauthorized start-up of these machines or equipment.

\*Copies of the actual OSHA standard may be obtained from the U.S. Department of Labor, Occupational Safety and Health Administration, Office of Publications, Room N3101, Washington, D.C. 20210.

## Easy Glide Ball Handles Valves (MHL SERIES)



MHL-3/MHL-4

## General Specifications

Flow:	0.14 Cv
Ports:	1/8" NPT
Temperature Range:	-40°F to 250°F
Lubrication:	SAE 10
Pressure Range:	0 to 150 PSI (Air Only)
Seals:	Buna



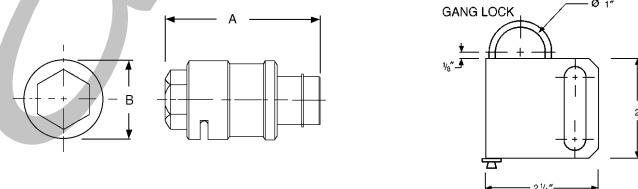
SLV-37

## Specifications

Temperature Range:	-50°F to 180°F
Pressure Range:	0 to 150 PSI
Construction:	
Body:	Black Anodized Aluminum
Sleeve:	Gold Anodized Aluminum
Retaining Ring:	Steel
O Rings:	Buna N
Lock:	Solid Brass (Steel Shackle)

Warning: SLV's are not to be used for lockout of hydraulic fluid.

## Dimensions



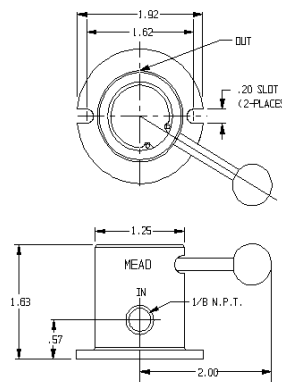
## Ordering Information

Model	Model (With Gang Lock)	Port Size	Cv	A (In.)	B (In.)
SLV-25	SLVG-25	1/4" NPT	0.94	2 9/16"	1 1/4"
SLV-37	SLVG-37	3/8" NPT	2.00	2 15/16"	1 7/16"
SLV-50	SLVG-50	1/2" NPT	3.18	3 11/32"	1 5/8"

Note: Use part #LCK100 to order replacement lock and key set.  
Use part #2028002 to order replacement gang lock.

## Low Friction Motion

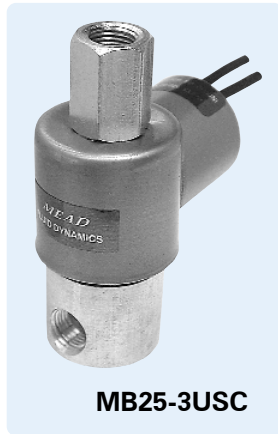
MHL valves provide either 3-way pilot control (MHL-3) or 4-way directional control (MHL-4). To operate MHL valves, simply move the ball handle across the slot on the valve body. The handle rotates a precision-lapped disc to control the directional flow of air. The hardcoat anodized aluminum disc allows virtually effortless handle motion. The handle will hold in any position. Air exhausts through the disc and out to atmosphere.



## Easy To Mount and Repair

Base mount holes make mounting and removal quick and easy. Further, MHL valves are easy to disassemble. By simply removing the ball handle and snap ring, any part worn by use can be found and replaced.

General Purpose 2 & 3-Way Mini Solenoid Valves



MB25-3USC

Dyna-Coil valves are used when you need to convert an electrical signal into a flow of air. 2-way models allow air to flow through the valve when energized. 3-way models allow air to flow through the valve when energized and exhaust when de-energized.

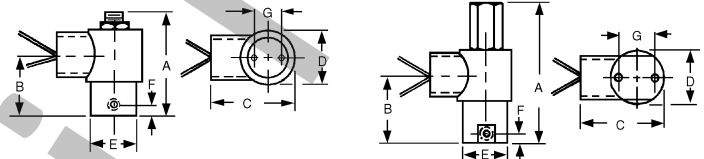
Normally closed means inlet air is blocked until the valve is energized. Normally open means inlet air flows through the valve and is blocked when energized.

General Specifications	
Media:	Air
Pressure:	Vacuum to 120 PSI
Orifice:	0.038"
Conduit:	1/2" NPS
Response:	20-30 ms
Base:	Aluminum
Mounting Holes(2):	8-32 UNC-2B threads
Lubrication:	None Required

Basic Dimensions

1/8" and 1/4" CSC Models

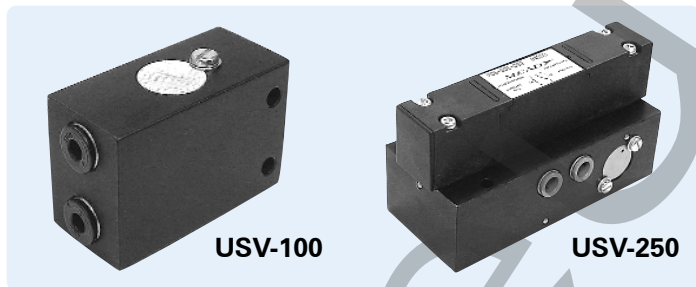
1/8" and 1/4" USC Models



Model	Ports	Style	Exhaust	Voltage	Cv (In)	Cv (Exh)	A	B	C	D	E	F	G
MB12-2CSC	1/8" NPT	2-Way NC	None	24 VAC, 120 VAC, 240 VAC, 12 VDC, 24 VDC	.035	-	2 5/16	1 3/8	1 27/32	1 3/16	1	9/32	.738
MB25-2CSC	1/4" NPT	2-Way NC	None	24 VAC, 120 VAC, 240 VAC, 12 VDC, 24 VDC	.035	-	2 3/8	1 1/2	1 27/32	1 3/16	1 3/16	5/16	29/32
MB12-3CSC	1/8" NPT	3-Way NC	Free to Atmos.	24 VAC, 120 VAC, 240 VAC, 12 VDC, 24 VDC	.035	.050	2 5/16	1 3/8	1 27/32	1 3/16	1	9/32	.738
MB12-3USC*	1/8" NPT	3-Way NC, NO	Piped	24 VAC, 120 VAC, 240 VAC, 12 VDC, 24 VDC	.035	.050	2 29/32	1 3/8	1 27/32	1 3/16	1	9/32	.738
MB25-3CSC	1/4" NPT	3-Way NC	Free to Atmos.	24 VAC, 120 VAC, 240 VAC, 12 VDC, 24 VDC	.035	.050	2 3/8	1 1/2	1 27/32	1 3/16	1 3/16	5/16	29/32
MB25-3USC*	1/4" NPT	3-Way NC, NO	Piped	24 VAC, 120 VAC, 240 VAC, 12 VDC, 24 VDC	.035	.050	2 27/32	1 1/2	1 27/32	1 3/16	1 3/16	5/16	29/32

\* Valve can be piped either normally closed (NC) or normally open (NO)

Note: All models consume 7 watts of power

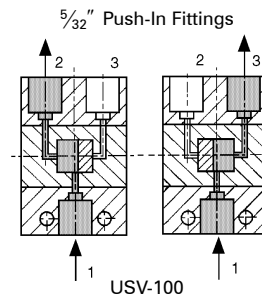


USV-100

USV-250

Binary Valves

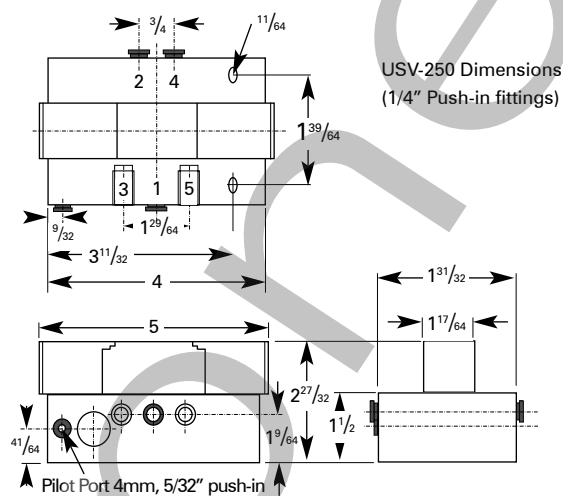
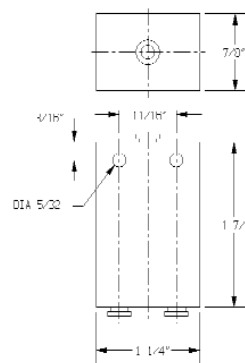
The USV-100 provides alternating outputs from a single input port. The valve has two outputs which are selected alternately by applying a pulsing, on-off air signal to the input port. USV-100 will not function properly with a sustained signal.



USV-100

When pressure is applied to port 1, it flows through the valve to provide an output at port 2. When the pressure is released from port 1, the valve changes over so that when pressure is next applied at port 1, air flows out through port 3. Release of the pressure again changes the valve back to its original position. Therefore, each time pressure is applied and released to port 1, outputs 2 and 3 change over. **Note:** The air signal must be fully exhausted to enable the valve to change over properly.

USV-100 Dimensions

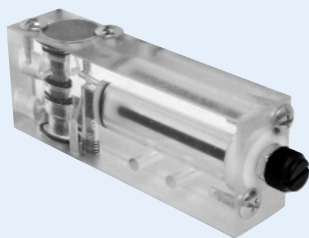


USV-250 Dimensions (1/4" Push-in fittings)

Technical Specification	100 Model	250 Model
Operating Pressure	35-100PSI	35-100PSI
Flow to atmosphere	4 SCFM @ 100 PSI	36.9 SCFM @ 100 PSI
Permissible Mediums	Air and Inert Gas	Air and Inert Gas
Ambient Temp. Range	10°F to 120°F	10°F to 120°F
Lubrication	Recommended	Not necessary

Reference  
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Cylinders  
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# Air Timers and Impulse Relay Valves



KLC-110

## Air Timers Delay Signal

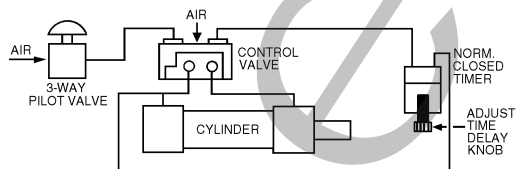
Air timers are used to delay the air signal coming in or out of an air component. Depending on the model, the delay may be adjusted from 0.75 to 30 seconds. Input port is indicated by a yellow dot. Timers are available in either normally closed (NC) or normally open (NO) models. Normally closed models are used to time in and normally open models are used to time out. Once set, timers are accurate for repeatability to 10% with regulated air pressure.

General Specifications						
<b>Filtration:</b>	40 micron filtration recommended					
<b>Lubrication:</b>	30 wt. non-detergent oil					
<b>Pressure Range:</b>	50-150 PSI (NC); 40-150 PSI (NO)					
<b>Mounting:</b>	(2) 11/64 clearance holes					
<b>Life Expectancy:</b>	1,000,000 cycles					

Model Number		Range	Ports	Length	Width	Height
NC	NO					
KLC-105	KLH-105	0.75-6 sec.	1/8"	4"	1"	1 1/2"
KLC-110	KLH-110	1-11 sec.	1/8"	4"	1"	1 1/2"
KLC-230	KLH-230	2-30 sec.	1/8"	4 7/8"	1 1/2"	1 7/8"

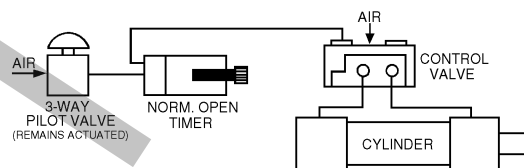
Note: NC timers have a green spool; NO timers have a red spool.

## Timing In (Normally Closed) Circuit



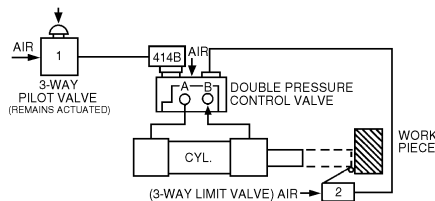
In this circuit, the 3-way valve is actuated and air is sent to the control valve. The control valve shifts, sending air through port A to the cylinder, which extends. Air also flows to the timer where it begins to time to the pre-setting. Once reached, the timer opens, allowing the air to flow through to the control valve's other pilot port, shifting the valve back. Air flows through port B, retracting the cylinder.

## Timing Out (Normally Open) Circuit



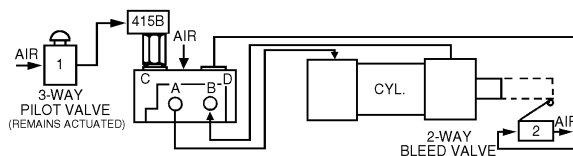
When the 3-way valve is actuated, air flows through the NO timer to the control valve. The 3-way valve remains actuated. The control valve shifts, sending air through port A to the cylinder, which extends. At the same time, the timer begins to time to the pre-setting. Once reached, the timer closes, blocking off the air flow to the control valve, which springs back. Air flows through port B, retracting the cylinder.

## Sample Circuit Using 414B (Pressure Type)



When actuated, the 3-way valve sends a signal to 414B, which emits a signal to the control valve. The 3-way valve remains actuated. The valve shifts, allowing air to flow through port A, extending the cylinder. 414B senses the back pressure caused by the shifted valve, closes, and exhausts. Since the signal from valve #1 is blocked by the closed 414B, valve #2 (when actuated) shifts the control valve back. Air flows through port B, retracting the cylinder.

## Sample Circuit Using 415B (Bleed Type)



Air enters a double bleed piloted valve, flows through ports C and D, and is blocked by the 415B relay and valve #2. When actuated, the 3-way valve #1 sends an air signal to the 415B. The 3-way valve remains actuated, 415B exhausts, shifting the control valve and extending the cylinder. The 415B senses the back pressure from the shifted valve and closes, blocking off the air flow from valve #1. This allows valve #2 (when actuated) to bleed air, allowing the control valve to shift. Air flows through port B, retracting the cylinder.

414B Pressure Type



415B Bleed Type



## Pneumatic Impulse Relay Valves

Impulse relay valves allow you to shift a double-pressure piloted or double bleed piloted valve, even though there are overlapping pilot signals. Relay valves convert a sustained air flow from a three-way pilot valve into a momentary pulse or bleed, which shifts a control valve and then closes.

General Specifications	
<b>Mounting:</b>	Mounts directly to control valve with nipple fitting
<b>Body Construction:</b>	Aluminum
<b>Pressure Range:</b>	35 to 125 PSI
<b>Lubrication:</b>	10 wt. non-detergent oil

Note: Required inlet pressure must be delivered all at once.

Model Number	Ports	Type	Length	Width	Height
414B	1/8" NPTF	Pressure	1 59/64"	3/4"	1 1/4"
415B	1/8" NPTF	Bleed	1 59/64"	3/4"	3 11/16"

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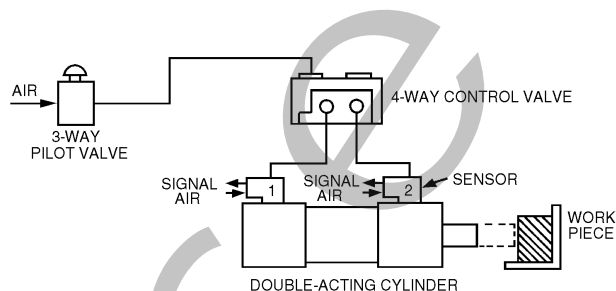


SCS-112

### Pneumatic Stroke Completion Sensors

Stroke Completion Sensors (SCS) mount directly on cylinder ports to provide an air signal when rod motion stops...even when the full stroke length is not used. Stroke completion sensors automatically adjust to variable strokes, replacing limit and reed switches in clamping, holding and sequencing tasks.

Sensors work by comparing supply pressure to exhaust pressure. Once the pressure drops on the exhaust side of the cylinder, the sensor will emit an air signal. Stroke completion sensors are not recommended for cylinder "inching" operations with pressure held valves.

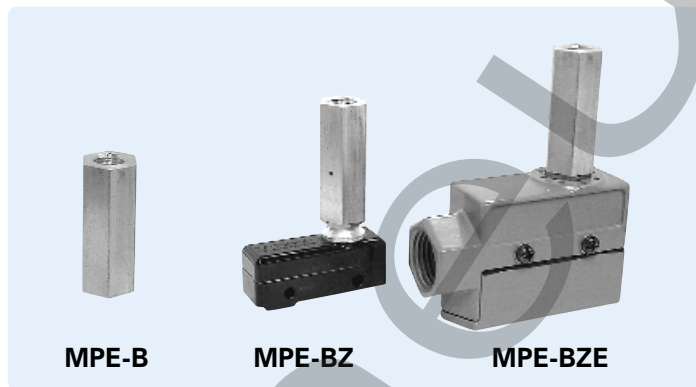


In this sample circuit, sensor #1 provides an air signal when the cylinder rod is retracted. When the four-way control valve shifts, air flows to the cylinder, which extends. This causes sensor #1 to shut off. The cylinder rod stops when it reaches the work piece or end of stroke, causing sensor #2 to emit an air signal. This air signal may be used to actuate another valve or for sequencing operations.

When using a flow control valve in conjunction with a stroke completion sensor, place the flow control valve between the control valve and the sensor.

### Specifications & Dimensions

Model Number	Mtg. Thread	Pilot Tubing	Pressure Range	Length	Width	Height
SCS-112	1/8" NPT	5/32" OD	60 to 120 PSI	2 3/16"	29/32"	1"
SCS-250	1/4" NPT	5/32" OD	60 to 120 PSI	2 3/16"	29/32"	1"
SCS-375	3/8" NPT	5/32" OD	60 to 120 PSI	2 3/4"	1 17/64"	1 1/16"
SCS-500	1/2" NPT	5/32" OD	60 to 120 PSI	2 3/4"	1 17/64"	1 1/16"



MPE-B

MPE-BZ

MPE-BZE

### Air to Electric Switches

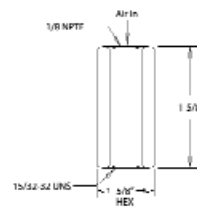
Air to electric switches convert air signals into electrical signals...ideal for actuating solenoid power valves or other electric components. Switches may be wired normally closed or normally open.

Actuator head model MPE-B may be easily mounted on any plunger-type switch; operating range is 8 PSI (minimum) to 100 PSI (maximum) and is not adjustable to a specific pressure.

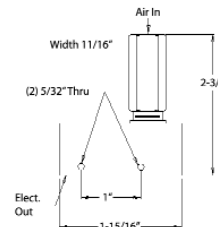
Switch models MPE-BZ and MPE-BZE are single pull double throw (SPDT), have a 15 amp capacity for normal, low resistance electrical circuits and are UL and CSA listed. Solder terminals accept up to #14 wire.

### Dimensions

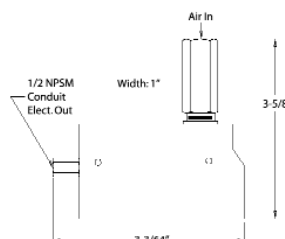
MPE-B (Actuator Head)



MPE-BZ



MPE-BZE



### Specifications

Model Number	Description
MPE-B	Actuator Head Only
MPE-BZ	Actuator Head and Switch, 15 Amp
MPE-BZE	Actuator Head, Switch and Enclosure, 15 Amp