## **Small Bore Tie Rod**



#### **Cylinder Materials**

Heads:	Machined from solid aluminum; black anodized
Tubes:	Aluminum hard anodized to 60 Rc (16 RMS finish)
Piston:	Solid high alloy aluminum
Rod:	Hard chrome plated ground and polished steel
Bearing:	Long wearing oil impregnated porous bronze
Piston and Rod Seals:	Wear compensating Buna N vee rings
Rod Wiper:	PTFE
T' D I	

Tie Rods: High tensile steel torqued to allow for flexure

#### **Double-Rod Cylinders**

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

### **Specify Cushions for Shock Absorption**

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

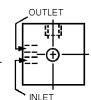
Note: Cushions are not recommended for hydraulic use.

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



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

Inter-Pilots<sup>®</sup> 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<sup>®</sup>. Inter-Pilots<sup>®</sup> are not available on DM-075.



### **Operating Parameters**

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

<sup>‡</sup> 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 place							
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 <sup>1</sup> /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 2Y 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	<sup>5</sup> / <sub>16</sub> -24	C-112, DM-075, DM-112
DMA-375	<sup>3</sup> / <sub>8</sub> -24	No Standard
DMA-437	<sup>7</sup> / <sub>16</sub> -20	DM-150, DM2-150, HD1-150, DM-200, DM2-200, HD1-200, DM-250, DM2-250, HD1-250
DMA-500	<sup>1</sup> / <sub>2</sub> -20	C-150
DMA-625	<sup>5</sup> / <sub>18</sub> -18	C-250
DMA-750	<sup>3</sup> / <sub>4</sub> -16	DM-325, DM2-325, HD1-325, DM-400, DM2-400, HD1-400
DMA-875	<sup>7</sup> / <sub>8</sub> -14	No Standard
DMA-1000	1-14	C-300, DM-600, HD1-600
DMA-1250	1 <sup>1</sup> / <sub>4</sub> -12	No Standard

# Small Bore Tie Rod Dimensions and Ordering Information

Sty 9/32 9/32 1/32 2/25/32 1/32 2/25/32 1/3 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4	Bore	3/4	1 <sup>1</sup> /8	Basic Cylinder	Double Rod Model DR
CR       7/4       7/4	Α	1/2			
CW       2//       2//       2//         CW       1//       1//         F       2///       1//         F       1//       1//	СВ	-		சைய்கா…ு ம்ும்	சும் க டி
CV       ·       ·       ·       ·         DO       · <td>CD</td> <td><sup>25</sup>/<sub>64</sub></td> <td><sup>25</sup>/<sub>64</sub></td> <td></td> <td></td>	CD	<sup>25</sup> / <sub>64</sub>	<sup>25</sup> / <sub>64</sub>		
D0       1/4       1/4       1/4         E       1/4       1/4       1/4         E       1/4       1/4       1/4         E       1/4       1/4       1/4         F       1/4       1/4       1/4         F       1/4       1/4       1/4         F       1/4       1/4       1/4         G       1/4       1/4       1/4         NT       1/4       1/4       1/4       1/4         NT       1/4       1/4       1/4       1/4         NT	CR	2 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	A A A A A A A A A A A A A A A A A A A	
<pre>Example in 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4</pre>	CW	-	<sup>1</sup> / <sub>2</sub>		
E 1/4 1/4 E 1/4 1/4 E 1/4 1/4 E 1/4 1/4 E 1/4 1/4 E 1/4 1/4 E 1/4 1/4 F - 1/6 F - 1/	DD	<sup>13</sup> / <sub>64</sub>	<sup>13</sup> / <sub>64</sub>	Bottom Flush Model FB	W ZM + 3 (178041)
EB       17/8       17/9         ENTERT       17/9       17/9         ES       17/9       17/9         F       17/9       17/9         G       7/2       17/3         G       17/4       17/4         F       17/4       17/4         G       17/4       17/4         G       17/4       17/4         KK       17/9       17/4         MM       1/4       17/4         NT       17/4       17/4         NT <td< td=""><td>Е</td><td>1 <sup>1</sup>/<sub>4</sub></td><td>1 <sup>5</sup>/<sub>8</sub></td><td>2</td><td>DMC Forged Bod Clevis w/Pin</td></td<>	Е	1 <sup>1</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>8</sub>	2	DMC Forged Bod Clevis w/Pin
EVENTED       V/1       V/1       V/1         EV       V/2       V/2       V/2         FE       V/2       V/2       V/2         G       V/2       V/2       V/2         G       V/2       V/2       V/2         G       V/2       V/2       V/2         MM       V/3       V/4       V/4         FE       V/2       V/2       V/2         MM       V/3       V/4       V/4         FE       V/3       V/4       V/4         MM       V/3       V/4       V/4         MM       V/3       V/4       V/4         MM       V/4       V/4       V/4         MM       V/4       V/4       V/4         MM       V/4       V/4       V/4         MM       V/4       V/4       V/4         MA       V/4       V/	EB	1 <sup>7</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>16</sub>	+R+	-
F       1/3       1/3         F	EE(NPTF)	1/8		-கம்க எப்ம்	
FB       1/s       1/s         FB       1/s       1/s         G       1/s       1/s         KK       5/s       1/s         MM       1/s       1/s					
F       ·       ·//s         G       ·//s       ·//s         G       ·//s       ·//s         K       ·//s       ·//s         N       ·//s       ·//s       ·//s         N       ·//s       ·/s       ·/s<	EJ			φ I — — — — — — — — — — — — — — — — — —	
FB       1/s       1					50
G y y y y y y y y y y y y y					
<pre>x y'_y y'_y y'_y y'_y y'_y y'_y y'_y y'_</pre>				Clevis Model PB	1%ª Only
KK       9/x 24       9/x 24         FL       1 1/x       NK Glovis         NM       -       3/z         NMM       9/z       9/z         NT       19/z       7/z         RT       10/z       0/z         RT       10/z       0/z         ST       9/z       9/z         ST       9/z       9/z         ST       1/z       1/z         TN       1/z       1/z         TN       1/z       1/z         W       1/z       1/z         NT       1/z       1/z	-				+ 08
FL       1 / 4       % Glewis         MM       7/4       % Pice         MM       Pice       Pice				nto	
MM       1/4       1/4         MM       1/4       1/4         NT       2/3/2       2/3/2         SV       3/4       3/4         NT       1/4       1/4         NT       1/4       1/4      <				$      \Psi   =   \Psi                         $	E CD Die.
M       -	r.	' /8		<b>■</b> ■ + + + + + + + + + + + + + + + + + +	
MM       Y/s       Y/s       Y/s         NT       Y/s       Y/s         R       Syst       Syst <td></td> <td></td> <td></td> <td></td> <td></td>					
NT 1 <sup>3</sup> / <sub>2</sub> <sup>4</sup> sr Thru 1 <sup>3</sup> / <sub>2</sub> <sup>4</sup> Thru R 1 <sup>3</sup> / <sub>2</sub> <sup>4</sup> sr Thru 1 <sup>3</sup> / <sub>2</sub> <sup>4</sup> Thru R 1 <sup>3</sup> / <sub>2</sub> <sup>4</sup> sr Thru R 2 <sup>3</sup> / <sub>2</sub> <sup>3</sup> sr Thru R 2 <sup>3</sup> / <sub>2</sub> <sup>3</sup> sr Thru R 2 <sup>3</sup> / <sub>2</sub> <sup>4</sup> sr Thru R 2 <sup>3</sup> / <sub>2</sub>		- 5/		00 = 0 = 00	* F =
R       11/s       11/s         RT       10-32       10-32         SV       9/s       9/s         SV       9/s       9/s         SV       9/s       9/s         TTN       19/s       11/s         UF       2.37/s       3.9/s       1/s         N       1/s       11/s         H       7/s       7/s         H       7/s       7/s       7/s         No       3/s       3/s       8/s       10/s'       10/s'       10/s'         State Langth to Dimensional divide Parade       10/s' bore cylinders use spacers for fractional stroke. For true fractional stroke. For true fractional stroke. For true fractional stroke. For true fractional stroke. For dimensioning, us				H	-FL-M-
RT       1/1/*         RT       1/2         ST       9/12         SV       9/16         TF       2/2/2         2/2/2       2/2/2         TN       11/6         UF       2/2/2         2/2/2       2/2/2         TN       11/6         UF       2/2/2         TN       11/6         UF       2/2/2         TN       11/6         UF       2/2/2         TN       11/6         UF       2/2/2         TN       11/6         HB       1/4         Y       1/4         HC       5/6         HD       7/6         Y/6       5/6         HD       7/6         Y/6       5/6         HD       7/6         Y/6       7/6         SN*       17/4         Y/6       3/7         3/7       3/7         3/7       3/7         3/7       3/7         3/7       3/7         3/7       3/7         3/7       3/7         Mdd 2				Pivot Model PE	DMP Pivot Bracket
ST 9/22 9/22 SV 9/16 5/16 TF 22*/22 32/22 TN 12/12 1/2 W 1/2 1/2 XT 11/16 11/16 H 1/2 1/2 H 1/4 11/4 H 1/4 11/4 H 1/4 11/4 H 1/4 11/4 H 1/4 11/4 H 1/4 11/4 H 2/4 1/4 H 2/4 1/4 H 2/4 1/4 H 2/4 1/4 NOT 3/4 Clovis ZJ* 2/6 2/6 ZJ* 3/7 3/7 3/7 Korot J/2 Clovis ZJ* 2/6 2/6 ZJ* 3/7 S/7 Korot J/2 Clovis ZJ* 2/6 2/6 ZJ* 2/6 Z ZJ* 2/6 2/6 ZJ* 2/6 Z ZJ* 2/6 Z ZZ*					
<pre>sv 5/s 5/s 5/s 5/s 5/s 5/s 5/s 5/s 5/s 5/s</pre>					E
TF       213/32       225/32         TN       13/6       11/6         UF       228/32       33/32         W       1/2       11/6         H       1/6       11/6         H       1/6       11/6         H       1/6       11/6         H       1/4       11/4         HB       1/4       1/4         HB       1/4       1/4         HB       1/4       1/4         HB       1/4       1/4         ND       5/6       7/6         HE       3/4       3/4         SN       13/4       13/4         SN       13/4       13/4         SN       13/4       31/6         Add zx Stroke Length to Dimensiona       Cont/16* bor models with ram end cuchions and/or inter-Pilots. 7/8* must be added to 6, 25, 5N, and XD dimensions. For bind end cushions and/or inter-Pilots. 7/8* must be added to 4, 2, 25N, and XD dimensions.         ONTO Order       11/2* bor models with ram end cuchions and/or inter-Pilots. 7/8* must be added to 6, 25, 5N, and XD dimensions.         SM 404       2/3* and 11/2* bor models with ram end cushions and/or inter-Pilots. 7/8* must be added to 6, 25, 5N, and XD dimensions. For thus fractional stroke. For true fractional stroke cylinders suse spacers for fractional stroke. For dimensi					
<b>i i i i i i j j k i j j k i j j k i j j k i j j k i j j k i j j k k k k k k k k k k</b>					
UF       2 <sup>28</sup> / <sub>32</sub> 3 <sup>4</sup> / <sub>32</sub> W       1/2       1/2         T       1/16       1/16         H       1/2       1/4         HB       1/4       1/4         NH       3/4       3/4         Store Length to Dimension 4       0         Ndd 2 × Stroke Length to Dimension 4       0         NM-075 (3/4" Bore)       0         MM-075 (3/4" Bore)       0         MM-075 (3/4" Bore)       0         MM-075 (3/4" Bore)       0         MM-12 (1-1/8" Bore)       0					E R A COM
w       1/2       1/2         XT       17/a       17/a         HA       17/a       17/a         HA       17/a       17/a         HB       1/2       17/a         HB       1/2       17/a         HB       1/2       17/a         HB       1/2       17/a         HC       3/a       5/a         MD       5/is       5/rs         MH       3/a       3/a         MA       13/a       13/a         MA       13/a       3/a         MA       13/a       13/a         MA       10/a*       bree wolded subt am and/or instree Pilot *, 1/a* imat and cushions and/or instre Pilot *, 1/a* imat and cushions and/a				Rod End Flange Model FF*	
XT       11/16       11/16         H       7/8       7/8         HA       11/4       11/4         HB       1/4       1/4         HC       5/8       5/8         HD       5/7.6       5/7.6         HZ       3/4       3/4         XD       3/3/4       3/4         XD       3/3/4       3/4         XD       3/4       3/4         3/4       3/4       3/4         XD       3/3/4       3/4         XD       3/3/4       3/4         XD       3/4       3/4         XD       11/8'' bore cylinders use two angle brackets for flange mounting. (no flange plate)         AD       10/8'' bore cylinders use two angle brackets for flange mounting. (so flange plate)         AD       11/8'' bore cylinders use two angle brackets for flange mounting. (so flange plate)         AD	UF			······································	
H 7/8 7/8 7/8 7/8 SHA HA 11/4 11/4 11/4 HB 7/4 7/8 7/8 5/8 HD 5/8 5/8 HE 3/4 3/4 SN* 12/4 13/4 XD* 33/4 3% (Pivot 3% Clevis ZJ* 25/8 2 5/8 ZM** 33/8 37/8 dd Stroke Length to Dimension kdd 2 x Stroke Length to Dimension kdf 2 x Stroke Length to Dimension ke Columber (kd) ke z threaded holes for tracfush mounting. <b>DM</b> - 112 (x 1/8" Bore) <b>DM</b> - 112 (x 1/8" Bore) ke feational Stroke se as decimals (i.e. 10.5) ke Columber (kde) ke Stroke Length the DM - 112 (z svailable in a Nose Mount (NS). Consult he factory for dimensional information. <b>DM</b> - 112 (x 1/8" Bore) ke feation for dimensional information. <b>DM</b> - 112 (x 1/8" Bore) ke feation for dimensional information. <b>DM</b> - 112 (x 1/8" Bore) ke feation for dimensional i	W			₩₩	
H       1/s       1/s       Self Aligning Rod Couplers         HB       1/s       1/s       1/s       Self Aligning Rod Couplers         Note:       Blind End Flange Model FR*       Image: Coupler State	ХТ				-FL-M
HA       1 1/4       1 1/4       1 1/4         HA       1 1/4       1 1/4       1 1/4         HB       1/4       1/4         HC       5/8       5/8       5/8         HD       5/6       5/7       5/7         HE       3/4       3/4       3/4         SN*       1 3/4       1 3/4       1 3/4       1 3/4       1 3/4         XD*       3 3/4       3% Clevis       *NOTE:       (1) 1/6" bore cylinders use two angle brackets for flange mounting. Ino flange plate)       (2) Clevis         ZJ*       2 5/8       3 3/4       3/4       3/4       3/6       (1) 1/6" bore cylinders use two angle brackets for flange mounting. Ino flange plate)       (2) On 1/6" bore cylinders use spacers for fractional strokes. For dimensions. For blind end cylinders use spacers for fractional strokes. For dimensioning. use the next even inch stroke. For true fractional stroke cylinders use spacers for fractional strokes. For dimensioning. use the next even inch stroke. For true fractional stroke (1) 0-2 threaded holes for rear flush mounting.         OW TO Order       DM-112 (1 -1/8" Bore)       Duble Rod       VI DV Hore Strokes as decimals (i.e. 10.5)         Obte:       The flucture fractional stroke cylinders use spacers for fractional stroke cylind	н				
HB       '/a       '/a       '/a       Blind End Flange Model FR*         HD       5/16       5/8       5/8       image: constraint of the state of t	HA				1/16 Radial Float
HC       7/8       7/8         HD       5/16       5/16         HE       3/4       3/4         SN*       17/4       17/4       17/4         XD*       3/4       3/4       17/4       17/4         XD*       3/4       3/4       17/6       bore cylinders use two angle brackets for flange mounting. (no flange plat)       (i)       iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	HB			Blind End Flange Model FB*	and the second sec
HE       3/4       3/4         SN*       13/4       13/4         SN*       13/4       13/4         XD*       33/4       3// Fivot         3// Clevis       *NOTE:         ZJ*       25/8       25/8         ZM**       31/8       31/8         3/4       31/8       31/8         Clove Length to Dimension       Add 2x Stroke Length to Dimension         Add 2 x Stroke Length to Dimension       Clove Tore       DM-112       x 10 - FB       DR         State Fractional Strokes as decimals (i.e. 10.5)       DM-112 x 10 - FB - DR       Options       DR       Duble Rod         NOTE:       DM-075 (3/4" Bore)       Duble Rod       Vi im Seals       Front Cushions         Note:       For the extrictional stroke. For dimensioning, use the next even only available on DM-112       Critical stroke. For the fractional stroke. For dimensioning, use the next even stroke. For the fractional stroke. For dimensioning, use the next even stroke. For the fractional stroke. For dimensioning, use the next even stroke. For the fractional stroke. For dimensioning, use the next even stroke. For the fractional stroke. For dimensioning, use the next even stroke. For the fractional stroke. For dimensioning, use the next even stroke. For the fractional stroke. For dimensioning. Use the next even stroke. For the fractional stroke. For dimensioning. Use the next even stroke. For the fractional stroke. For the fractional stroke. For the fractional stro	HC				
SN*       13/4       13/4       13/4         XD*       33/4       3/4       Pivot         ZM**       33/8       31/8       Stocke Length to Dimension         Add 2 x Stroke Length to Dimension       Add 2 x Stroke Length to Dimension       (2) On 11/8" bore cylinders use spacers for fractional strokes. For dimensioning, use the next even inch stroke. For true fractional strokes and/or lnter-Pilots, 5/8" must be added to 4, ZJ, SN, and XD dimensions.         OW TO Order       (3) 4/4" and 11/8" bore cylinders use spacers for fractional stroke. For dimensioning, use the next even inch stroke. For dimensioning, use the next even stroke. For true fractional stroke. For dimensioning, use the next even stroke. For true fractional stroke. For dimensioning, use the next even stroke. For true fractional stroke. For dimensioning, use the next even stroke. For true fractional stroke. For dimensioning, use the next even stroke. For true fractional stroke. For dimensioning, use the next even stroke. For true fractional stroke. For dimensioning, use the next even stroke. For true fractional stroke. For dimensioning, use the next even stroke. For true fractional stroke. For dimensioning, use the next even stroke. For true fractional stroke. For dimensioning. Use Options below are only available on DM-112         NOTE:       DM-075 only available with FB Mount.	HD			பாயா——யிட் ம்கைய்கா	
XD*       3 <sup>3</sup> / <sub>4</sub> 3 <sup>4</sup> / <sub>4</sub> Pivot       *NOTE:         ZJ*       2 <sup>5</sup> / <sub>8</sub> ZM**       3 <sup>1</sup> / <sub>8</sub> dd Stroke Length to Dimension       (1) 1 <sup>1</sup> / <sub>8</sub> " bore cylinders use two angle brackets for flange mounting. (no flange plate)       (2) On 1 <sup>1</sup> / <sub>8</sub> " bore models with ram end cushions and/or Inter-Pilots, <sup>5</sup> / <sub>8</sub> " must be added to 4, 2J, SN, and XD dimensions.         Add 2 x Stroke Length to Dimension       (3) <sup>3</sup> / <sub>4</sub> " and 1 <sup>1</sup> / <sub>8</sub> " bore cylinders use spacers for fractional strokes. For dimensioning, use the next even inch stroke. For true fractional strokes.         Ow TO Order <b>DM - 112 x 10 - FB - DR</b> See Model <b>DM - 112 x 10 - FB - DR</b> Obvir 112 (1 - 1/8" Bore) <b>DM - 112 x 10 - FB - DR</b> Obvir 12 (1 - 1/8" Bore) <b>DM - 112 x 10 - FB - DR</b> Obvir 12 (1 - 1/8" Bore) <b>DM - 112 x 10 - FB</b> Obvir 12 (1 - 1/8" Bore) <b>DM - 112 x 10 - FB</b> Otions       DR - Double Rod         VI III 1 - 1/8" bore specify CT (i.e. , 10.5 CT) <b>DR</b> NOTE:       DM-075 only available with FB Mount. <b>CF</b> For tCushions         n addition to Models shown above the DM-112 is available in a Nose Mount (NS). Consult <b>CF</b> For Cushions	HE				KK T
*NOTE: ZJ* 2 5/8 2 5/8 ZM** 3 1/8 3 1/8 (2) on 11/8" bore cylinders use two angle brackets for flange mounting. (no flange plate) (2) on 11/8" bore cylinders use two angle brackets for flange mounting. (no flange plate) (2) on 11/8" bore cylinders use two angle brackets for flange mounting. (no flange plate) (2) on 11/8" bore cylinders use two angle brackets for flange mounting. (no flange plate) (2) on 11/8" bore cylinders use two angle brackets for flange mounting. (no flange plate) (2) on 11/8" bore cylinders use two angle brackets for flange mounting. (no flange plate) (2) on 11/8" bore cylinders use spacers for fractional strokes. For dimensioning, use the next even inch stroke. For true fractional stroke. For dimensioning, use the next even inch stroke. For true fractional stroke. For true fractional stroke. For dimensioning, use the next even inch stroke. For true fractional stroke. For dimensioning, use the next even inch stroke. For true fractional stroke. For dimensioning, use the next even inch stroke. For true fractional stroke. For dimensioning, use the next even inch stroke. For dimensioning, use the next even inch stroke. For true fractional stroke. For dimensioning, use the next even inch stroke. For dimensioning, use the next even inch stroke. For true fractional stroke. For dimensioning, use the next even inch stroke. For dimensioning use the next even inch stroke. For dimensioning, use the next even inch stroke. For dimensioning, use the next even inch stroke. For dimensioning, use the next even inch stroke. For dimensioning use the next even inch stroke. For dimensioning, use the next even inch stroke. For dimensioning use the next even inch stroke cylinders specify CT (i.e., 10.5 CT) Options below are only available on DM-112 Options below are only available on DM-112 Of the fractional stroke cy	SN*				
ZJ*       2 5/8       2 5/8       2 5/8       3 1/8	XD*	3 <sup>3</sup> / <sub>4</sub>			
<ul> <li>2M** 3<sup>1</sup>/<sub>8</sub> 3<sup>1</sup>/<sub>8</sub> 3<sup>1</sup>/<sub>8</sub></li> <li>2 On 1<sup>1</sup>/<sub>8</sub>" bore models with ram end cushions and/or Inter-Pilots<sup>*</sup>, <sup>9</sup>/<sub>16</sub>" must be added to G, ZB, SN, and XD dimensions. For blind end cushions and/or Inter-Pilots<sup>*</sup>, <sup>9</sup>/<sub>16</sub>" must be added to G, ZB, SN, and XD dimensions. For blind end cushions and/or Inter-Pilots<sup>*</sup>, <sup>9</sup>/<sub>16</sub>" must be added to G, ZB, SN, and XD dimensions. For blind end cushions and/or Inter-Pilots<sup>*</sup>, <sup>9</sup>/<sub>16</sub>" must be added to G, ZB, SN, and XD dimensions. For blind end cushions and/or Inter-Pilots<sup>*</sup>, <sup>9</sup>/<sub>16</sub>" must be added to G, ZB, SN, and XD dimensions. For blind end cushions and/or Inter-Pilots<sup>*</sup>, <sup>9</sup>/<sub>16</sub>" must be added to G, ZB, SN, and XD dimensions. For blind end cushions and/or Inter-Pilots<sup>*</sup>, <sup>9</sup>/<sub>16</sub>" must be added to J. ZJ, SN, and XD dimensions.</li> <li>(3) <sup>3</sup>/<sub>4</sub>" and 1<sup>1</sup>/<sub>8</sub>" bore models with ram end cushions and/or Inter-Pilots<sup>*</sup>, <sup>9</sup>/<sub>16</sub>" must be added to J. ZJ, SN, and XD dimensions.</li> <li>(3) <sup>3</sup>/<sub>4</sub>" and 1<sup>1</sup>/<sub>8</sub>" bore models have (4) 10-32 threaded holes for rear flush mounting.</li> <li>(4) <sup>3</sup>/<sub>4</sub>" and 1<sup>1</sup>/<sub>8</sub>" bore models have (4) 10-32 threaded holes for rear flush mounting.</li> <li>(4) <sup>3</sup>/<sub>4</sub>" and 1<sup>1</sup>/<sub>8</sub>" bore models have (4) 10-32 threaded holes for rear flush mounting.</li> <li>(4) <sup>3</sup>/<sub>4</sub>" and 1<sup>1</sup>/<sub>8</sub>" bore models have (1) 10-32 threaded holes for rear flush mounting.</li> <li>(4) <sup>3</sup>/<sub>4</sub>" and 1<sup>1</sup>/<sub>8</sub>" bore models have (1) 10-32 threaded holes for rear flush mounting.</li> <li>(5) MI-075 (3/<sub>4</sub>" Bore)</li> <li>(6) MI-075 (3/<sub>4</sub>" Bore)</li> <li>(7) MI-075 (3/<sub>4</sub>" Bore)</li> <li>(8) MI-075 (3/<sub>4</sub>" Bore)</li> <li>(9) MI-075 (1) Available with FB Mount.</li> <li>(9) Available with FB Mount.</li> <li>(9</li></ul>					-10
2 M <sup>4*</sup> 3 /8 3 /8     dd Stroke Length to Dimension     Add 2 x Stroke Length to Dimension     Add 1/s" bore explicited to Length     A 1/s"     Bore     A 1/s"     B Add 1/s"     Bore     A 1/s"     Bore	ZJ*			(1) $1'/8"$ bore cylinders use two angle brackets for flange mounting. (no fla	ange plate)
dd Stroke Length to Dimension       (3) <sup>3</sup> / <sub>4</sub> " and 1 <sup>1</sup> / <sub>8</sub> " bore cylinders use spacers for fractional strokes. For dimensioning, use the next even inch stroke. For true fractional stroke         Add 2 x Stroke Length to Dimension       (4) <sup>3</sup> / <sub>4</sub> " and 1 <sup>1</sup> / <sub>8</sub> " bore models have (4) 10-32 threaded holes for rear flush mounting.         Ow To Order       DM-112 X 10 - FB - DR         See Model       DM-112 (1 -1/8" Bore)         OM-075 (3/4" Bore)       Double Rod         ON-112 (1 -1/8" Bore)       Viton Seals         Fractional Strokes as decimals (i.e. 10.5)       Double Rod external stroke. For dimensioning, use         State Fractional Strokes as decimals (i.e. 10.5)       Double Rod external stroke. For true fractional stroke. For dimensioning, use         NOTE: DM-075 only available with FB Mount.       Front Cushions         In addition to Models shown above the DM-112 is available in a Nose Mount (NS). Consult       CF       Front Cushions         CB       Cushions Both Ends       IPF       Interpilots - Front Head         IPF       Interpilots - Front Head       Interpilots - Rear Head	ZM**	3 <sup>1</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>8</sub>	cushions and/or Inter-Pilots <sup>*</sup> , $5/8''$ must be added to J, ZJ, SN. and XD	dimensions.
Add 2 X structe Lefight to Dimensionil       (4) 3/4" and 11/s" bore models have (4) 10-32 threaded holes for rear flush mounting.         DW To Order       DM-112 X 10 - FB - DR         See Model       Options         DM-075 (3/4" Bore)       DR         DM-112 (1-1/8" Bore)       Double Rod         VI       DR         Options       DR         State Fractional Strokes as decimals (i.e. 10.5)       Double Rod         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)       Double Rod         NOTE: DM-075 only available with FB Mount.       Front Cushions         n addition to Models shown above the DM-112 is available in a Nose Mount (NS). Consult       CF       Front Cushions         CB       CF       Front Cushions       CB       Cushions Both Ends         IPF       DF       Interpilots - Front Head       Interpilots - Rear Head	dd Stroke Le	ngth to Dime	ension	(3) $3/4''$ and $1^{1}/8''$ bore cylinders use spacers for fractional strokes. For di	
DM-112 x 10 - FB - DR   se Model   DM-075 (3/4" Bore)   DM-112 (1 -1/8" Bore)   roke   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)   DMTE: 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.	Add 2 x Strok	ke Length to	Dimension	cylinders, specify CL (cut to length). (4) $3/a''$ and $1^{1}/a''$ here models have (4) 10.22 threshold have (4)	h mounting
DM-075 (3/4" Bore) DM-112 (1 -1/8" Bore) Oke State Fractional Strokes as decimals (i.e. 10.5) Note: These cylinders use spacers for fractional stroke. For dimensioning, use he next even stroke. For true fractional stroke cylinders specify CT (i.e. , 10.5 CT) punting NOTE: DM-075 only available with FB Mount. n addition to Models shown above the DM-112 is available in a Nose Mount (NS). Consult he factory for dimensional information.					
DM-112 (1 - 1/8" Bore)       DR       Double Rod         oke       VI       Double Rod         State Fractional Strokes as decimals (i.e. 10.5)       VI       Double Rod         Note: These cylinders use spacers for fractional stroke. For dimensioning, use he next even stroke. For true fractional stroke cylinders specify CT (i.e. , 10.5 CT)       HY       Double Rod         NOTE: DM-075 only available with FB Mount.       Note: Shown above the DM-112 is available in a Nose Mount (NS). Consult       Options below are only available on DM-112         CF       CF       Front Cushions       Rear Cushions         CB       Cushions Both Ends       Interpilots - Front Head         IPF       Interpilots - Rear Head       Interpilots - Rear Head	ow To O	rder			
State Fractional Strokes as decimals (i.e. 10.5)       HY	se Model –				- Options
State Fractional Strokes as decimals (i.e. 10.5)       HY	<b>se Model –</b> DM-075 (3/4″	Bore)			
the next even stroke. For true fractional stroke cylinders specify CT (i.e. , 10.5 CT)  Dunting  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.  FE Ontion  FE Ontion  Options below are only available on DM-112  CF CR CB  Front Cushions CB  IPF IR  Interpilots - Front Head Interpilots - Rear Head	<b>se Model –</b> DM-075 (3/4″ DM-112 (1 -1/ <b>roke –</b>	Bore) /8″ Bore)			
Dunting       Options below are only available on DM-112         NOTE: DM-075 only available with FB Mount.       CF       Front Cushions         In addition to Models shown above the DM-112 is available in a Nose Mount (NS). Consult       CF       Front Cushions         the factory for dimensional information.       Image: Comparison of the properties of the propertie	<b>se Model –</b> DM-075 (3/4" DM-112 (1 -1/ <b>roke –</b> State Fraction	Bore) /8″ Bore) nal Strokes a			DR Double Rod
NOTE: DM-075 only available with FB Mount.       CF       Front Cushions         In addition to Models shown above the DM-112 is available in a Nose Mount (NS). Consult       CB       Front Cushions         the factory for dimensional information.       Imp       Interpilots - Front Head         IFE Ontion       Interpilots - Rear Head       Interpilots - Rear Head	se Model – DM-075 (3/4″ DM-112 (1 -1/ State Fraction Note: These 6	Bore) /8″ Bore) nal Strokes a cylinders use	e spacers for	fractional stroke. For dimensioning, use	DR Double Rod
In addition to Models shown above the DM-112 is available in a Nose Mount (NS). Consult  CR CR CR CR CR CR CR CR CB Rear Cushions Cushions Both Ends Cushions Both Ends IPF IPR IPF IPR IPF	se Model – DM-075 (3/4" DM-112 (1 -1/ roke – State Fraction Note: These of the next even	Bore) /8″ Bore) nal Strokes a cylinders use	e spacers for	fractional stroke. For dimensioning, use	DR Double Rod VI HOT Viton Seals HY Hydraulic Use
the factory for dimensional information.	se Model – DM-075 (3/4" DM-112 (1 -1/ roke – State Fraction Note: These of the next even punting –	Bore) /8″ Bore) nal Strokes a cylinders us a stroke. For	e spacers for true fraction	fractional stroke. For dimensioning, use al stroke cylinders specify CT (i.e. , 10.5 CT)	DR Double Rod VI HOT Viton Seals HY MIT Hydraulic Use Options below are only available on DM-112 CF Front Cushions
FE Ontion	se Model – DM-075 (3/4" DM-112 (1 -1/ roke — State Fraction Note: These of the next even punting — NOTE: DM-07	Bore) (8" Bore) nal Strokes a cylinders us a stroke. For 75 only avail	e spacers for true fraction able with FB	fractional stroke. For dimensioning, use al stroke cylinders specify CT (i.e. , 10.5 CT) Mount.	DR Double Rod VI HOT Viton Seals HY Mydraulic Use Options below are only available on DM-112 CF Front Cushions CR Rear Cushions
IPB Interpilots - Both Heads	se Model – DM-075 (3/4" DM-112 (1 -1/ roke — State Fraction Note: These ( the next even <b>bunting —</b> NOTE: DM-07 In addition to	Bore) (8" Bore) nal Strokes a cylinders us a stroke. For 75 only avail Models sho	e spacers for true fraction able with FB wn above th	fractional stroke. For dimensioning, use al stroke cylinders specify CT (i.e. , 10.5 CT) Mount. e DM-112 is available in a Nose Mount (NS). Consult	DR Double Rod VI Double Rod VI Hor Seals HY Mydraulic Use Options below are only available on DM-112 CF Front Cushions CR CB Cushions Both Ends IPF Interpilots - Front Head



### **Built to Last (Materials)**

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

### **Dyna-Mation -vs- HD Models**

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



DM2 Extruded Body Design with Internal Rod Bearing

**DM1** Internal Bronze Rod Bearing Tie Rod Design

HD1 Heavy Duty Hard-Coated Rod Bearing

### **Two Designs To Meet Application Demands**

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

### **Specify Cushions for Shock Absorption**

Adjustable cushions that decelerate the piston rod over the last  $1^{1}/16''$  of stroke may be ordered in either or both ends of Dyna-Mation cylinders. They allow the user to set the degree of cushioning needed for each specific application.

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

#### **Operating Parameters**

Bore Diam.	Thrust*	Thrust Mult.**	Rod Diam.(In.)	Max. Oper. Air	Pressure Oil <sup>‡</sup>
1 <sup>1</sup> /2″	177	1.77	<sup>5</sup> /8	250	1000
2″	314	3.14	<sup>5</sup> /8	250	1000
2 <sup>1</sup> /2"	491	4.91	<sup>5</sup> /8	250	1000
3 <sup>1</sup> /4″	830	8.30	1	250	700
4″	1257	12.57	1	250	650
6″	2827	28.27	1 <sup>3</sup> /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.

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

NOTE: 6" bore only available in DM1 Series.

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

## Dyna-Mation Series: DM1 & DM2

Cylinders



**Pivot Mount** 

**Clevis Mount** 

**Rear 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



Rod Eye and Clevis Bracket



**Clevis Bracket and PE Cylinder** 



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<sup>®</sup> valve emits an air signal. In this manner, sequencing is achieved without external limit switches and electric wiring.

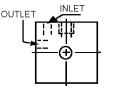
Inter-Pilots<sup>®</sup> may be built into either or both cylinder heads. They are not for hydraulic use. Cylinder operating pressure must not exceed pressure used to feed the Inter-Pilot<sup>®</sup>.

## Inter-Pilot<sup>®</sup> Port Locations



For 2"-4" Bore Cylinders





Note: Inter-Pilot® ports are 10-32.

### **Rod Position Sensors**



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

#### Hall Effect

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

Technical Information									
Operating Voltage: 5-28 DC Working Temp: 23 to 194°F									
Operating Time:	On 2 ms	Repeatability:	.001 ms						
	Off .1 ms	Max. Switching Current	: .5A						
Current Sinking: Load connected between output and positive supply.									
Current Sourcing: Lo	ad is conned	cted between output and co	ommon.						

#### 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, 3m length) included.

Note: Not for use with hydraulic cylinders.

Technical Information								
Operating Voltage: Switch Current:	240 AC Max. .5 Amps Max.	Working Temp: Operating Time:	67 to 200°F 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  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$  pipe sizes. See pg. 57.

## **Self Aligning Rod Couplers**



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

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

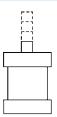
## Ordering Dyna-Mation DM1 & DM2



#### **SELECT A BORE SIZE** $1^{1/2}$ 2″ $2^{1/2''}$ 3<sup>1</sup>/4″ 4″ 6″ Bore 314 491 830 1257 2827 Force\* 177 Models DM1-150 DM1-200 DM1-250 DM1-325 DM1-400 DM-600 DM2-150 DM2-200 DM2-250 DM2-400 NA Available DM2-325

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

### **STEP 2:**



CHOOSE STROKE LENGTH								
PISTON ROD	PISTON ROD DIAMETERS:							
Bore	1 <sup>1</sup> /2″	2″	2 <sup>1</sup> /2″	3 <sup>1</sup> /4″	4″	6″		
Rod Diam.	<sup>5</sup> /8″	<sup>5</sup> /8″	<sup>5</sup> /8″	1″	1″	1 <sup>3</sup> /8″		

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".

STE	P 3:	SELECT	A MC	OUNT	ING S	TYLE				
		Mead Code	1 <sup>1</sup> /2″	E 2″	Bore Dia		4″	6″	NFPA Code	
		Code	1 1/2	2	2 <sup>1</sup> /2″	3 <sup>1</sup> /4″	4	6	Code	Description
Flush Bottom		FB	•	•	•	•	•	•	MS-4	Four tapped holes on bottom of cylinder.
Long Clevis		РВ	•	•	•	•	•	•	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 <sup>®</sup> or front cushions.
Trunnion Rear		TR	•	•	•	•	•	•	MT-2	Two pivot bars extend from two sides of rear head. Not available with rear Inter-Pilots <sup>®</sup> or rear cushions.
Foot		FT	•	•	•	•	•	•	Non Std.	A plate with two holes is mounted to the bottom of each head.

## Ordering Dyna-Mation DM1 & DM2

STEP 4:		SELECT CYLINDER OPTIONS							
		Mead	Bore Diameter						
		Code	1 <sup>1</sup> /2″	2″	<b>2</b> <sup>1</sup> /2″	3 <sup>1</sup> /4″	4″	6″	Description
Double Rod		DR	•	•	•	•	•	•	Rod extends through both heads: (adds to cylinder rigidity)
Cushions (Not available with Trunnion Mount)		Front CF Rear CR Both CB	•	•	•	•	•	•	Dampen the impact and sound that occur at stroke completion; cushions are adjustable.
Inter-Pilots (Not available with Trunnion Mount)	° • • •	Front IPF Rear IPR Both IPB	•	•	•	•	•	•	Inter-Pilots emit an air signal at the end of each stroke; Integral with cylinder head; Note: Not available on hydraulic cylinders.
Non-Rotating Rod (6 <sup>″</sup> Max.Stroke)		□ NR	NA	NA	NA	•	•	•	Internal bar prevents piston and rod rotation.
Non-Lube Seals		□ NL	•	•	•	•	•	•	Self-Lubricating seals are used in place of standard Buna N seals; Note: Not available on hydraulic cylinders.
High Temp. Seals (Viton)	нот	□ VI	•	•	•	•	•	•	Viton  seals are suitable for high temperature environments (400°F Max.)
Magnetic Pistons		□ MP	•	•	•	•	•	•	Enables Reed & Hall Effect switches to sense piston location. Note: Reed switch/Hall Effect not available on all hydraulic cylinders. (Contact Mead)

#### STEP 5:

When ordering Dyna-mation cylinders, list the:

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

BUILD A MODEL NUMBER								
Model Number	Stroke	Mounting Style	Options					
DM2-200 2″ Bore 10″ Stroke Clevis Mount (PI Cushioned From	3) ————	<u>PB</u> -	CF					

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

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

#### **Hall Effect Switches**

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

Lead length 3 meters. 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**

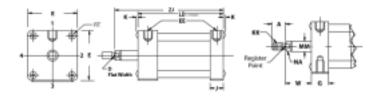
We invite inquiries regarding non-standard cylinders. Please call 773-685-6800 or your local Mead representative.

## Cylinders

## DM1 & DM2 Dimensions

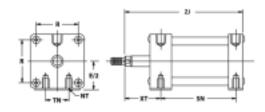
**Basic Cylinder** 

#### Foot Mount Plate Model FT

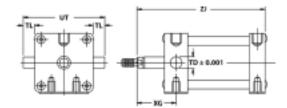


NOTE: DM1 Cylinders are constructed with sleeve nuts; use RT, K does not exist. DM2 use K; RT does not exist.

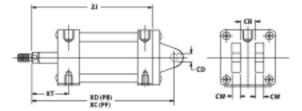
#### **Bottom Flush Model FB**



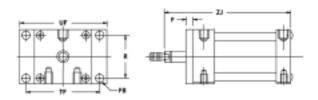
#### **Rod End Trunnion Model TF**

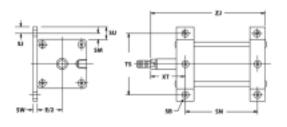


#### **Clevis Model PB and PF**

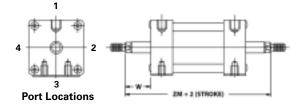


#### Rod End Flange Model FH\*

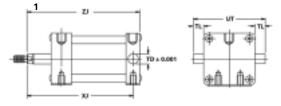




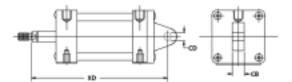
#### Double Rod Model DR



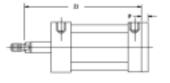
#### Blind End Trunnion Model TR

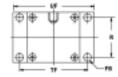


#### **Pivot Model PE**



#### Blind End Flange Model FR\*





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

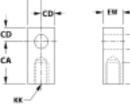
## DM1 & DM2 Dimensions

# Cylinders

A $\frac{9}{4}$ $\frac{9}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ CA $1\frac{1}{2}$ $1\frac{1}{2}$ $1\frac{1}{2}$ $2\frac{1}{4}$ $1\frac{1}{4}$ $1\frac{1}{4}$ $1\frac{1}{2}$ CD $\frac{1}{2}$ $\frac{1}{2}$ $\frac{3}{4}$ $1\frac{1}{4}$ $1\frac{1}{4}$ $1\frac{1}{2}$ CD $\frac{1}{2}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{1}{4}$ $1\frac{1}{4}$ $\frac{1}{4}$ D $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{3}{4}$ D $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{3}{4}$ D $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{7}{6}$ $\frac{5}{6}$ $\frac{3}{4}$ D $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{7}{6}$ $\frac{7}{6}$ $\frac{3}{4}$ D $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{7}{6}$ $\frac{7}{6}$ $\frac{3}{4}$ D $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{7}{6}$ $\frac{7}{6}$ $\frac{3}{4}$ FB $\frac{3}{6}$ $\frac{3}{6}$ $\frac{3}{6}$ $\frac{7}{6}$ $\frac{7}{6}$ $\frac{3}{6}$ FL $1\frac{1}{8}$ $1\frac{1}{8}$ $1\frac{1}{16}$ $1\frac{1}{16}$ $1\frac{1}{2}$ J $1\frac{5}{16}$ $1\frac{7}{16}$ $1\frac{7}{16}$ $1\frac{3}{6}$ $\frac{3}{6}$ G $1\frac{7}{16}$ $1\frac{7}{16}$ $\frac{1}{2}\frac{3}{2}$ $\frac{3}{3}\frac{3}{2}$ $\frac{3}{3}\frac{3}{2}$ $\frac{3}{16}$ J $1\frac{1}{9}$ $1\frac{3}{9}$ $\frac{1}{9}$ $\frac{3}{2}^{2}$ $\frac{3}{16}^{2}$ $\frac{3}{16}^{2}$ M $\frac{1}{2}^{2}$ $\frac{1}{2}^{2}\sqrt{2}^{2}$ $\frac{3}{2}\sqrt{6}^{2}^{2}^{2}^{2}^{2}^{2}^{2}^{2}$	Bore	1 <sup>1</sup> /2	2	2 <sup>1</sup> /2	3 <sup>1</sup> /4	4	6	DME Interd
CA1 $1/2_2$ 1 $1/2_2$ 1 $1/2_4$ 2 $1/1_6$ 1 $1/2_6$ CB $3/4$ $3/4$ $1/4$ $1/4$ $1/4$ $1/1_2$ CD $1/2_2$ $1/2_2$ $1/2_2$ $3/4_4$ $3/4$ 1CE $1/2_2$ $1/2_2$ $1/2_2$ $2/3_6$ $2/3_6$ $3/4_6$ D $1/2_2$ $1/2_2$ $1/2_2$ $2/3_6$ $2/3_6$ $3/4$ D $1/2_2$ $1/2_2$ $1/2_2$ $2/3_6$ $2/4_6$ F $2/3_6$ $2/3_64$ $2/1_66$ $1/4_6$ $1/2_7$ EE(INPTF)*** $1/4$ $1/4$ $1/4$ $1/4$ $1/2_7$ $1/2_2$ $3/4$ $7/6$ $3/6$ $3/6$ $7/16$ $7/16$ $7/16$ F $3/8$ $3/8$ $3/6$ $5/8$ $3/4$ FE $5/16$ $3/6$ $3/6$ $7/16$ $1/76$ $2/4$ G $17/16$ $17/16$ $17/16$ $17/16$ $17/16$ $17/2$ J $19/16$ $17/16$ $17/16$ $17/16$ $17/16$ $17/16$ G $17/16$ $17/16$ $17/16$ $17/16$ $17/16$ J $19/22$ $2/1/220$ $3/16$ $3/16$ $3/16$ K $1/9$ $5/32$ $5/32$ $3^2/10$ $3/16$ $3/16$ MM $5/52$ $5/32$ $3^2/16$ $3/16$ $3/16$ $3/26$ MM $5/22$ $2/1/220$ $3^2/32$ $3/24$ $3/24$ $3/24$ MM $5/22$ $5/122$ $3^2/34$ $3^2/40$ $3^2/44$								al China
CB $3/_4$ $3/_4$ $1/_4$ $1/_4$ $1/_2$ $1/_2$ CD $1/_2$ $1/_2$ $1/_2$ $1/_2$ $3/_4$ $3/_4$ $1$ CE $1/_2$ $1/_2$ $1/_2$ $1/_2$ $5/_8$ $3/_8$ $3/_8$ D $1/_2$ $1/_2$ $1/_2$ $7/_8$ $7/_8$ $1/_8$ D $1/_2$ $1/_2$ $3/_3$ $4/_2$ $6/_2$ E       2 $2/_2$ 3 $3/_4$ $4/_2$ $6/_2$ F $3/_8$ $3/_8$ $7/_8$ $7/_8$ $7/_8$ $9/_8$ F $3/_8$ $3/_8$ $7/_8$ $7/_8$ $9/_8$ $3/_4$ F $3/_8$ $3/_8$ $7/_8$ $1/_8$ $3/_4$ $3/_4$ $4/_2$ $4/_2$ $4/_4$ $3/$	СА							
CD $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ $2^2/8$ $2^2/8$ $3^2/8$ CE $1^1/2$ $1^1/2$ $1^1/2$ $2^2/8$ $2^2/8$ $3^2/8$ D $1^1/2$ $1^1/2$ $1^1/2$ $1^2/8$ $2^3/8$ $3^1/8$ DD $1^1/2$ $1^1/2$ $1^1/2$ $1^2/8$ $1^3/8$ DD $1^1/64$ $2^2/4$ $2^2/64$ $7^1/16$ $7^1/86$ $1^1/86$ DD $1^1/64$ $2^2/2$ $3$ $3^3/4$ $4^1/2$ $6^1/2$ EE(NPTF)*** $1^1/4$ $1^1/4$ $1^1/4$ $1^1/2$ $7^1/86$ $7^1/86$ FB $5^1/86$ $3^1/8$ $3^1/8$ $5^1/86$ $5^1/86$ $3^1/46$ FL $1^1/86$ $1^1/86$ $1^1/86$ $1^1/166$ $1^1/166$ $1^1/166$ G $1^1/166$ $1^1/166$ $1^1/166$ $1^1/166$ $1^1/166$ $1^1/166$ K $7^1/86^220$ $7^1/86^220$ $3^1/86^23/86^2$ $3^1/86^23/166^2$ MM $7^1/86^220$ $7^1/86^230$ $3^1/86^23/166^23/$	СВ						$1 \frac{1}{2}$	- CD
CE $1 \frac{1}{2}$ $1 \frac{1}{2}$ $1 \frac{1}{2}$ $2 \frac{3}{8}$ $2 \frac{3}{8}$ $3 \frac{1}{8}$ CW $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{5}{8}$ $\frac{5}{8}$ $\frac{7}{4}$ DD $1 \frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{8}$ $\frac{1}{8}$ DD $1 \frac{1}{2}$ $\frac{2}{2}\frac{1}{44}$ $2 \frac{3}{44}$ $\frac{7}{16}$ $\frac{7}{16}$ $\frac{1}{2}^{2}20$ EE(NPTF)*** $1 \frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{3}{4}$ F $\frac{3}{8}$ $\frac{3}{8}$ $\frac{7}{16}$ $\frac{7}{16}$ $\frac{3}{4}$ $\frac{4}{2}$ $\frac{2}{4}$ G $1 \frac{1}{16}$ $1 \frac{1}{3}$ $1 \frac{1}{3}$ $1 \frac{7}{6}$ $\frac{2}{14}$ $\frac{2}{4}$ G $1 \frac{1}{16}$ $1 \frac{7}{16}$ $1 \frac{7}{16}$ $1 \frac{7}{16}$ $\frac{1}{1}\frac{1}{2}$ $\frac{2}{14}$ K $\frac{7}{8}$ $\frac{5}{8}$ $\frac{5}{8}$ $\frac{1}{8}$ $\frac{3}{16}$ $\frac{3}{16}$ $\frac{3}{16}$ $\frac{3}{16}$ MM $\frac{1}{2}$ $\frac{7}{16}$ $\frac{7}{16}$ $\frac{3}{123}$ $\frac{3}{123}$ $\frac{1}{14}$ $\frac{1}{14}$ ID $4 \frac{1}{12}$ $\frac{3}{16}$ $\frac{3}{8}$ $\frac{3}{8}$ $\frac{3}{8}$ $\frac{3}{8}$ $\frac{3}{8}$ $\frac{3}{8}$ MM $\frac{1}{2}$ $\frac{7}{16}$ $\frac{5}{8}$ $1$ $1$ $1$ $1 \frac{3}{8}$ MM $\frac{1}{2}$ $\frac{2}{122}$ $\frac{3}{123}$ $\frac{3}{123}$ $\frac{3}{124}$ $\frac{3}{123}$ MA $1\frac{1}{2}$ <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>								
CW $1/2_2$ $1/2_2$ $1/2_2$ $1/2_2$ $3/4$ $3/4$ D $1/2_{c4}$ $1/2_2$ $1/2_2$ $1/2_c$ $1/2_c$ D $1/2_{c4}$ $2/2_1/2_2$ $3$ $3/4$ $4/2_2$ $6/2_2$ E $2$ $2/1/2_2$ $3$ $3/4$ $4/2_2$ $6/2_2$ E $2$ $2/1/2_2$ $3$ $3/4$ $4/2_2$ $6/2_2$ E $1/4_6$ $1/4_4$ $1/4_4$ $1/2_2$ $1/2_2$ $7/6$ $7/6$ $7/6$ $7/6$ $7/6$ $7/6$ FB $8/7_6$ $3/8$ $3/8$ $5/8$ $5/8$ $3/4$ FB $8/7_6$ $3/7_6$ $17/6$ $17/7_6$ $17/7_6$ $17/7_6$ $17/7_6$ G $17/6$ $17/7_6$ $17/7_6$ $17/7_6$ $17/7_6$ $17/7_6$ $17/7_6$ J $15/7_5$ $17/7_6$ $17/7_6$ $17/7_6$ $17/7_6$ $17/7_6$ K $7/8$ $8/7_8$ $9/7_8$ $3/7_8$ $3/7_8$ $3/7_8$ MM $1/2_2$ $17/2_2$ $7/7_6$ $17/7_6$ $17/7_6$ MM $1/2_2$ $17/2_2$ $17/2_2$ $3/7_2$ $37/2_2$ $17/2_2$ MM $1/2_2$ $17/2_2$ $17/2_2$ $37/2_2$ $37/2_2$ $17/2_2$ MM $1/2_2$ $17/2_2$ $17/2_2$ $37/2_2$ $37/2_2$ $17/2_2$ MM $1/2_2$ $17/2_2$ $37/2_2$ $37/2_2$ $37/2_2$ $17/2_2$ MM $1/2_2$ $17/2_2$ $17/2_2$ $37/2_2$ $17/2_2$	CE						3 <sup>1</sup> / <sub>8</sub>	
D $1/2_{c}$ $1/2_{c}$ $1/2_{c}$ $7/6$ $7/6$ $1/8$ DD $1^{1}/6_{c4}$ $2^{2}/6_{c4}$ $2^{2}/6_{c4}$ $2^{2}/6_{c4}$ $7/6$ $7/6$ $1/2_{c20}$ E2 $2^{2}/2_{c}$ 3 $3^{3}/4$ $4^{1}/2$ $6^{1}/2$ EE(NPTF)*** $1/4$ $1/4$ $1/4$ $1/4$ $1/2_{c}$ $3/4$ F $3/8$ $3/8$ $5/8$ $5/8$ $3/4$ FE $1^{1}/6$ $1^{1}/6$ $1^{1}/6$ $1^{7}/6$ $1^{7}/6$ $7/16$ G $1^{1}/6$ $1^{7}/6$ $1^{7}/6$ $1^{7}/6$ $1^{7}/6$ $1^{7}/6$ J $1^{1}/6$ $1^{7}/6$ $1^{3}/6$ $3/4$ $3/4$ G $1^{7}/6$ $1^{7}/6$ $1^{7}/6$ $1^{7}/6$ $1^{7}/6$ K $1/8$ $5/2$ $9/32$ $3/46$ $3/46$ $3/46$ LD $4^{1}/6$ $4^{1}/8$ $4^{1}/4$ $4^{3}/4$ $4^{3}/4$ $5^{1}/2$ M $1/2$ $1^{7}/6$ $1^{7}/62$ $7/16^{20}$ $3/4^{-16}$ $1^{-14}$ LD $4^{1}/6$ $4^{1}/8$ $4^{1}/4$ $4^{3}/4$ $4^{3}/4$ $4^{3}/4$ $5^{1}/6$ MM $5/8$ $5/8$ $1^{7}/2$ $3^{1}/2^{2}$ $3^{1}/2^{2}$ $3^{1}/2^{2}$ $1^{1}/2^{20}$ MM $1^{1}/4^{2}$ $1^{2}/2$ $3^{1}/2^{2}$ $3^{1}/2^{2}$ $3^{1}/2^{2}$ $1^{2}/2^{2}$ MM $5/8$ $5/8^{2}/8$ $3^{1}/2^{2}$ $3^{1}/2^{2}$ $1^{2}/2^{2}$ MM $1^{7}/4^{2}$ $2^{1}$	CW							
DD $1^{7}/_{64}$ $2^{2}/_{64}$ $2^{2}/_{64}$ $7/_{16}$ $7/_{16}$ $1/_{2} \cdot 20$ E2 $2 \cdot 1/_{2}$ 3 $3^{3}/_{4}$ $4^{1}/_{2}$ $6^{1}/_{2}$ EE(NPTE)*** $1/_{4}$ $1/_{4}$ $1/_{4}$ $1/_{2}$ $7/_{2}$ $3/_{4}$ FB $3^{6}/_{8}$ $3^{6}/_{8}$ $5^{7}/_{8}$ $5^{7}/_{8}$ $9^{7}/_{16}$ $9^{7}/_{16}$ FL $1^{1}/_{8}$ $1^{7}/_{16}$ $1^{7}/_{16}$ $1^{7}/_{16}$ $1^{7}/_{16}$ $1^{7}/_{16}$ G $1^{7}/_{16}$ $1^{7}/_{16}$ $1^{7}/_{16}$ $1^{7}/_{16}$ $1^{7}/_{16}$ $1^{7}/_{16}$ KK $7/_{16} \cdot 20^{7}/_{16} \cdot 21^{7}/_{2} \cdot 21^{7}$	D							<u> </u>
E2 $2^{1/2}$ 3 $3^{3/4}$ $4^{1/2}$ $6^{1/2}$ EE(NPTF)*** $1^{1/4}$ $1^{1/4}$ $1^{1/4}$ $1^{1/2}$ $1^{1/2}$ $3^{1/4}$ F $3^{1/6}$ $3^{1/6}$ $3^{1/6}$ $3^{1/6}$ $5^{1/6}$ $3^{1/6}$ $3^{1/6}$ FL $1^{1/6}$ $1^{1/6}$ $1^{1/6}$ $1^{1/6}$ $1^{1/6}$ $1^{1/6}$ $1^{1/6}$ $1^{1/16}$ G $1^{1/6}$ $1^{1/6}$ $1^{1/6}$ $1^{1/6}$ $1^{1/16}$ $1^{1/16}$ $1^{1/16}$ $1^{1/16}$ K $1^{1/6}$ $1^{5/16}$ $1^{5/16}$ $1^{5/16}$ $1^{3/16}$ $1^{3/16}$ $3^{1/16}$ KK $7^{1/6}$ $7^{1/6}$ $7^{1/6}$ $2^{1/2}$ $3^{1/6}$ $3^{1/16}$ MM $5^{1/6}$ $5^{1/2}$ $7^{1/6}$ $3^{1/16}$ $3^{1/16}$ MM $5^{1/8}$ $5^{1/8}$ $5^{1/8}$ $1$ $1$ $1^{3/18}$ NA $1^{1/22}$ $1^{1/22}$ $3^{1/22}$ $3^{1/22}$ $3^{1/22}$ MM $5^{1/8}$ $5^{1/8}$ $5^{1/8}$ $1$ $1$ $1^{3/18}$ NA $1^{1/22}$ $1^{1/22}$ $3^{1/62}$ $3^{1/62}$ $3^{1/62}$ MM $5^{1/8}$ $5^{1/8}$ $5^{1/8}$ $1$ $1$ $1^{1/2}$ MA $1^{1/22}$ $1^{1/22}$ $3^{1/22}$ $3^{1/22}$ $3^{1/22}$ MM $5^{1/8}$ $5^{1/8}$ $5^{1/8}$ $3^{1/8}$ $3^{1/22}$ MM $3^{1/6}$ $3^{1/6}$ $3^{1/6}$ $3^{1/6}$ $3^{1/6}$ <tr<< th=""><th>DD</th><th></th><th></th><th></th><th></th><th></th><th></th><th>KK</th></tr<<>	DD							KK
EE(NPTF)****       1/4       1/4       1/4       1/2       1/2       3/4         F       3/8       3/8       3/8       5/6       5/8       3/4         FB       5/16       3/8       1/8       17/8       17/8       17/8       17/8       17/8         FL       11/18       11/8       11/8       17/16       17/16       17/16       17/16       17/17         G       17/16       17/16       17/16       17/16       13/16       11/2       2         J       15/16       15/16       15/16       13/16       11/1       1       2         K       1/4       5/32       5/32       3/16       3/16       3/16       1/2         K       7/16-20       7/16-20       3/16-3       3/1       1       1       1         MM       5/2       5/3       5       1       1       1       1       1         MM       1/2       1/2       1/2       3/1/2       31/32       1       1         MM       5/8       1/8       1/2       1/2       3/4       1       1       1       1       1         MM       1/4       1/2 </th <th>Е</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	Е							
F $3/_{4}$ $3/_{8}$ $3/_{8}$ $5/_{8}$ $5/_{8}$ $3/_{4}$ FB $5/_{16}$ $3/_{8}$ $3/_{8}$ $7/_{16}$ $7/_{16}$ $9/_{16}$ FL $11/_{8}$ $11/_{8}$ $11/_{8}$ $11/_{8}$ $11/_{8}$ $21/_{2}$ ClevisG $17/_{16}$ $17/_{16}$ $17/_{16}$ $11/_{16}$ $11/_{16}$ $11/_{16}$ J $15/_{16}$ $15/_{16}$ $13/_{16}$ $13/_{16}$ $11/_{2}$ K $1/_{8}$ $5/_{32}$ $5/_{32}$ $3/_{16}$ $3/_{16}$ AKK $7/_{16}$ $21/_{12}$ $21/_{2}$ $21/_{2}$ M $1/_{2}$ $1/_{2}$ $1/_{2}$ $3/_{4}$ $43/_{4}$ $43/_{4}$ $47/_{8}$ MM $5/_{8}$ $5/_{8}$ $1$ $1$ $1$ $13/_{8}$ NA $19/_{32}$ $19/_{32}$ $19/_{32}$ $31/_{32}$ $15/_{16}$ NA $19/_{32}$ $19/_{32}$ $31/_{23}$ $3/_{4}$ $3/_{4}$ RT $17/_{16}$ $127/_{32}$ $2^3/_{16}$ $3/_{2^{-1}13}$ $3/_{2^{-1}13}$ NA $19/_{32}$ $19/_{32}$ $31/_{32}$ $31/_{64}$ $33/_{64}$ SB $17/_{16}$ $127/_{52}$ $2^3/_{16}$ $3/_{2^{-1}3}$ $3/_{2^{-2}4}$ NA $19/_{22}$ $9/_{16}^{-2}4$ $3/_{2}^{-2}4$ $3/_{2}^{-2}4$ $1/_{2}^{-2}0$ SB $17/_{64}$ $21/_{64}$ $25/_{64}$ $33/_{64}$ $33/_{64}$ SJ $3/_{8}$ $3/_{8}$ $3/_{8}$ $1/_{2}$ $1/_{2}$ SM <th>EE(NPTF)***</th> <th>1/4</th> <th>1/4</th> <th>1/4</th> <th>1/2</th> <th>1/2</th> <th></th> <th></th>	EE(NPTF)***	1/4	1/4	1/4	1/2	1/2		
FL1 $1/_8$ 1 $1/_8$ 1 $1/_8$ 1 $1/_8$ 1 $1/_8$ 1 $1/_8$ 2 $1/_4$ ClevisG1 $1/_{16}$ 1 $1/_{16}$ 1 $1/_{16}$ 1 $1/_{16}$ 1 $1/_{16}$ 1 $1/_{16}$ 2J15/_{16}15/_{16}15/_{16}13/_{16}1 $1/_{16}$ 1 $1/_{16}$ 1 $1/_{16}$ 1 $1/_2$ K1/_85/_{32}5/_{32}3/_{16}3/_{16}1 $1/_2$ KK7/_{16}207/_{16}203/_{4}-163/_{4}-161-14LD4 $1/_8$ 4 $1/_8$ 4 $1/_4$ 4 $3/_4$ 4 $3/_4$ 2 $1/_2$ MM1/_21/_21/_23/_43/_42 $1/_2$ MM5/_85/_85/_8111 $3/_8$ NA19/_3219/_3231/_3231/_321 $5/_{16}$ NT1/_4-205/_{16-18}9/_6-161/_2-133/_2-14RT1/_4-285/_{16-24}3/_6-243/_6-243/_6-24SJ3/_83/_81/_21/_211/_64SU3/_83/_83/_81/_21/_211/_64SW3/_63/_6433/_6433/_6433/_64SW3/_163/_43/_81/_21/_211/_164SW3/_83/_83/_81/_21/_211/_64SW3/_63/_6433/_6433/_6433/_64SW3/_161/_41/_41/_41/_41/_4Th11111 </th <th>F</th> <th><sup>3</sup>/8</th> <th><sup>3</sup>/8</th> <th><sup>3</sup>/8</th> <th><sup>5</sup>/8</th> <th></th> <th>3/4</th> <th></th>	F	<sup>3</sup> /8	<sup>3</sup> /8	<sup>3</sup> /8	<sup>5</sup> /8		3/4	
G $1^{7}/_{16}$ $1^{7}/_{16}$ $1^{7}/_{16}$ $1^{7}/_{16}$ $1^{11}/_{16}$ $1^{11}/_{16}$ $1^{11}/_{16}$ $1^{1}/_{2}$ K $1^{7}/_{8}$ $5^{7}/_{32}$ $5^{7}/_{32}$ $3^{7}/_{16}$ $3^{7}/_{16}$ $3^{7}/_{16}$ $3^{7}/_{16}$ KK $7^{7}/_{16}$ -20 $7^{7}/_{16}$ -20 $7^{7}/_{16}$ -20 $7^{7}/_{16}$ -20 $7^{7}/_{16}$ -20 $3^{7}/_{4}$ -16 $3^{7}/_{4}$ LD $4^{7}/_{8}$ $4^{7}/_{8}$ $4^{7}/_{4}$ $4^{3}/_{4}$ $4^{3}/_{4}$ $4^{3}/_{4}$ $5^{7}/_{2}$ MM $1^{7}/_{2}$ $1^{7}/_{2}$ $1^{7}/_{2}$ $3^{7}/_{4}$ $3^{7}/_{4}$ $2^{7}/_{4}$ ClevisMM $5^{7}/_{8}$ $5^{7}/_{8}$ $5^{7}/_{8}$ $1$ $1$ $1^{3}/_{8}$ NA $1^{9}/_{22}$ $1^{9}/_{32}$ $3^{7}/_{32}$ $3^{7}/_{32}$ $3^{7}/_{4}$ $2^{7}/_{4}$ ClevisMM $5^{7}/_{8}$ $5^{7}/_{16}$ $3^{7}/_{8}$ $1^{7}/_{2}$ $1^{7}/_{2}$ $3^{7}/_{4}$ $1^{7}/_{2}$ NA $1^{9}/_{32}$ $1^{9}/_{32}$ $3^{7}/_{32}$ $3^{7}/_{32}$ $3^{7}/_{2}$ $1^{7}/_{2}$ $1^{7}/_{2}$ NT $1^{7}/_{4}$ $1^{27}/_{32}$ $2^{3}/_{16}$ $3^{7}/_{8}$ $3^{7}/_{8}$ $3^{7}/_{8}$ $3^{7}/_{6}$ $3^{7}/_{6}$ SM $3^{7}/_{8}$ $3^{7}/_{8}$ $3^{7}/_{8}$ $1^{7}/_{2}$ $1^{7}/_{2}$ $1^{7}/_{2}$ SM $3^{7}/_{8}$ $3^{7}/_{8}$ $3^{7}/_{8}$ $4^{11}/_{11}$ $1^{7}/_{2}$ $1^{7}/_{6}$ SW $3^{7}/_{16}$ $3^{7}/_{8$	FB	<sup>5</sup> / <sub>16</sub>	<sup>3</sup> /8	<sup>3</sup> /8	<sup>7</sup> / <sub>16</sub>	<sup>7</sup> / <sub>16</sub>	<sup>9</sup> / <sub>16</sub>	
J $15/_{16}$ $15/_{16}$ $15/_{16}$ $13/_{16}$ $11/_2$ K $1/_8$ $5/_{32}$ $5/_{32}$ $3/_{16}$ $3/_{16}$ $3/_{16}$ KK $7/_{16}$ :20 $7/_{16}$ :20 $3/_{4}$ :16 $3/_{4}$ :16 $1-14$ LD $41/_8$ $41/_8$ $41/_4$ $43/_4$ $43/_4$ $51/_2$ M $1/_2$ $1/_2$ $1/_2$ $3/_4$ $3/_4$ $21/_4$ ClevisMM $5/_8$ $5/_8$ $5/_8$ $1$ $1$ $13/_8$ NA $19/_{22}$ $19/_{32}$ $3/_{32}$ $31/_{32}$ $31/_{32}$ NT $1/_4$ :20 $5/_{16}$ :18 $3/_6$ :16 $1/_2$ :13 $1/_2$ :13 $3/_4$ :10R $17/_{64}$ $127/_{32}$ $23/_{16}$ $32/_{64}$ $47/_8$ RT $1/_4$ :28 $5/_{16}$ :24 $23/_4$ $32/_{64}$ $43/_64$ SJ $3/_8$ $3/_8$ $3/_8$ $1/_2$ $1/_2$ $11/_{164}$ SU $3/_8$ $3/_8$ $3/_8$ $1/_2$ $1/_2$ $11/_{164}$ SW $3/_{16}$ $3/_{16}$ $1/_4$ $1/_4$ $1/_4$ $1/_4$ $1/_4$ TD1111 $1$ $13/_8$ TK $3/_8$ $3/_8$ $37/_8$ $411/_{16}$ $57/_5$ $57/_8$ TK $3/_8$ $1/_2$ $9/_{16}$ $3/_4$ $3/_4$ $51/_2$ $7/_8$ UF $23/_4$ $3^1/_4$ $3^3/_4$ $4^3/_4$ $51/_2$ $27/_8$ SW $3/_8$ $1/_4$ $1/_4$	FL		1 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	1 <sup>7</sup> /8	1 <sup>7</sup> /8	$2 \frac{1}{4}$ Clevis	
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 $1-14$ LD $41/_8$ $41/_8$ $41/_4$ $4^3/_4$ $4^3/_4$ $51/_2$ M $1/_2$ $1/_2$ $1/_2$ $3/_4$ $3/_4$ $21/_4$ ClevisMM $5/_8$ $5/_8$ $5/_8$ $1$ $1$ $13/_8$ NA $19/_{32}$ $19/_{32}$ $31/_{32}$ $31/_{32}$ $31/_{31}$ NT $1/_4$ -20 $5/_{16}$ -18 $3/_{61}$ $1/_{2}$ -13 $3/_{2}$ -13RT $17/_{74}$ $2^2/_{16}$ $2^3/_4$ $3^2/_{64}$ $47/_8$ RT $11/_{4}$ -20 $5/_{16}$ -24 $5/_{16}$ -24 $3/_{2}$ -24SB $17/_{64}$ $2^2/_{64}$ $2^3/_4$ $3^2/_{64}$ $3^2/_{64}$ SJ $3/_8$ $3/_8$ $3/_8$ $1/_2$ $1/_2$ $11/_{16}$ SM $3/_8$ $3/_8$ $3/_8$ $1/_2$ $1/_2$ $11/_{64}$ SW $3/_{16}$ $3/_4$ $3/_4$ $1$ $1$ $11/_{16}$ TD11111 $1$ $1/_8$ TK $3/_8$ $3/_8$ $3/_8$ $4^1/_4$ $3/_4$ $3/_4$ $3^3/_4$ $3^3/_4$ $3^3/_4$ $3/_4$ TD11111TI1111TK $3/_8$ $7/_8$ $5^1/_2$ $6^1/_4$ $3/_8$ $41/_8$	G	1 <sup>7</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>16</sub>	1 <sup>11</sup> / <sub>16</sub>	1 <sup>11</sup> / <sub>16</sub>	2	
KK $7/_{16}$ :20 $7/_{16}$ :20 $7/_{16}$ :20 $3/_{4}$ :16 $3/_{4}$ :16 $1$ :14LD $4 \frac{1}{8}$ $4 \frac{1}{8}$ $4 \frac{1}{4}$ $4 \frac{3}{4}$ $4 \frac{3}{4}$ $5 \frac{1}{2}$ M $1/_2$ $1/_2$ $1/_2$ $3/_4$ $3/_4$ $2 \frac{1}{4}$ ClevisMM $5/_8$ $5/_8$ $5/_8$ 11 $1 \frac{3}{8}$ NA $19/_{32}$ $19/_{32}$ $19/_{32}$ $31/_{32}$ $31/_{32}$ $15/_{16}$ NT $1/_4$ :20 $5/_{16}$ :18 $3/_{8}$ -16 $1/_2$ :13 $1/_2$ :13 $2/_4$ R $17/_{16}$ $12^2/_{32}$ $2 \frac{3}{16}$ $3/_{24}$ $3/_{2-4}$ RT $1/_4$ :20 $5/_{16}$ :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 $3/_8$ $3/_8$ $3/_8$ $1/_2$ $1/_2$ $11/_6$ SM $3/_8$ $3/_8$ $3/_8$ $1/_2$ $1/_2$ $11/_6$ SW $3/_{16}$ $3/_{16}$ $1/_4$ $1/_4$ $1/_4$ $1/_6$ SW $3/_16$ $3/_1$ $3/_4$ $3/_4$ $3/_4$ $11/_8$ TF $2 \frac{3}{4}$ $3/_8$ $37/_8$ $4 \frac{11}{16}$ $57/_{16}$ $75/_8$ TK $3/_8$ $1/_2$ $9/_16$ $3/_4$ $3/_4$ $11/_8$ $11/_8$ TH1111 $1$ $1/_2$ $21/_2$ TK $3/_8$ $7/_8$ $1/_4$ $1/_4$	J	<sup>15</sup> / <sub>16</sub>	<sup>15</sup> / <sub>16</sub>	<sup>15</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	
LD4 1/84 1/84 1/44 3/44 3/45 1/2M1/21/21/23/43/42 1/4 ClevisMM $5/8$ $5/8$ $5/8$ 111 $13/8$ NA $19/32$ $19/32$ $19/32$ $31/32$ $31/32$ $15/16$ NT $1/4^2$ O $5/16^2$ 18 $3/8^2$ 16 $1/2^2$ 13 $1/2^2$ 13 $3/4^2$ 10R $17/16$ $127/32$ $2^3/16$ $2^3/4$ $3^2/64$ $47/8$ RT $1/4^2$ C8 $5/16^2$ C4 $5/16^2$ C4 $3/6^2$ C4 $3/6^2$ C4 $1/2^2$ C0SB $17/64$ $21/64$ $25/64$ $33/64$ $33/64$ $33/64$ SJ $3/8$ $3/8$ $3/8$ $1/2$ $1/2$ $11/16$ SM $3/8$ $3/8$ $3/2$ $1/2$ $11/64$ SW $3/16$ $3/14$ $3/4$ 11TF $2^3/4$ $3/8$ $37/8$ $4^{11/16}$ $57/16$ TF $2^3/4$ $3/8$ $37/8$ $4^{11/16}$ $57/16$ TK $3/8$ $1/2$ $9/16$ $3/4$ $3/4$ $11/8$ TL1111 $15/8$ $11/4$ TL111 $11/8$ $51/2$ $77/8$ UF $3^3/8$ $4^1/8$ $4^5/8$ $51/2$ $6^1/4$ $85/8$ UF $3^3/8$ $4^1/8$ $4^5/8$ $51/2$ $6^1/4$ $85/8$ UF $3^3/8$ $4^1/8$ $4^5/8$ $5^1/2$ $6^1/4$ $8^5/8$	к	<sup>1</sup> /8	<sup>5</sup> / <sub>32</sub>	<sup>5</sup> / <sub>32</sub>	<sup>3</sup> / <sub>16</sub>	<sup>3</sup> / <sub>16</sub>	<sup>3</sup> / <sub>16</sub>	
M $1/2$ $1/2$ $1/2$ $3/4$ $3/4$ $21/4$ ClevisMM $5/8$ $5/8$ $5/8$ $1$ $1$ $1$ $13/8$ NA $19/32$ $19/32$ $19/32$ $31/32$ $31/32$ $15/16$ NT $1/4-20$ $5/16-18$ $3/8-16$ $1/2-13$ $1/2-13$ $3/4-10$ R $17/16$ $127/32$ $23/16$ $23/4$ $32^{1}/64$ $47/8$ RT $1/4-28$ $5/16-24$ $5/16-24$ $3/8-24$ $1/2-20$ 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 $1$ $1$ $1$ $1$ $1$ $1$ T $2^{3}/4$ $3^{3}/8$ $3^{7}/8$ $4^{17}/8$ TK $3/8$ $1/2$ $9/16$ $3/4$ $3^{7}/8$ TK $3/8$ $1/2$ $9/16$ $3/4$ $3^{7}/8$ TL $1$ $1$ $1$ $1$ $1$ TK $3/8$ $1/2$ $9/16$ $3/4$ $5^{1}/2$ TK $3/8$ $1/2$ $9/16$ $3/4$ $5^{1}/2$ $7/78$ UF $3^{3}/8$ $4^{1}/8$ $5^{1}/2$ $5^{1}/8$ $5^{1}/8$ TL $1$ $1$	КК	<sup>7</sup> / <sub>16</sub> -20	<sup>7</sup> / <sub>16</sub> -20	<sup>7</sup> / <sub>16</sub> -20	<sup>3</sup> / <sub>4</sub> -16	<sup>3</sup> / <sub>4</sub> -16	1-14	
MM $5/_8$ $5/_8$ $5/_8$ 111 $1^3/_8$ NA $1^9/_{32}$ $1^9/_{32}$ $1^9/_{32}$ $3^1/_{32}$ $3^1/_{32}$ $1^5/_{16}$ NT $1/_4$ -20 $5/_{16}$ -18 $3/_8$ -16 $1/_2$ -13 $1/_2$ -13 $3/_4$ -10R $1^7/_{16}$ $1^{27}/_{32}$ $2^3/_{16}$ $2^3/_4$ $3^{21}/_{64}$ $4^7/_8$ RT $1/_4$ -28 $5/_{16}$ -24 $5/_{16}$ -24 $3/_8$ -24 $1/_2$ -20SB $1^7/_{64}$ $2^1/_{64}$ $2^5/_{64}$ $3^3/_{64}$ $3^3/_{64}$ SJ $3/_8$ $3/_8$ $3/_8$ $1/_2$ $1/_2$ Image: SM $3/_8$ $3/_8$ $3/_8$ $1/_2$ $1/_2$ SW $3/_4$ $3/_4$ $3/_4$ $1$ $1$ TD11111111TF $2^3/_4$ $3^3/_8$ $3^7/_8$ $4^1/_2$ $9'_{16}$ $3/_4$ $3'_4$ TK $3/_8$ $1/_2$ $9'_{16}$ $3/_8$ $1/_2$ $9'_{16}$ $3/_4$ $1/_4$ $1/_4$ $1/_4$ $1/_8$ TK $3/_8$ $1/_2$ $9'_{16}$ $3/_8$ $1/_2$ $9'_{16}$ $3/_4$ $3/_8$ $1/_2$ $9'_{16}$ $3/_4$ $3'_4$ $1/_4$ $1/_8$ $1/_4$ $1/_4$ $1/_4$ $1/_8$ $1/_4$ $1/_2$ $9'_{16}$ $3/_8$ $1/_2$ $9'_{16}$ $3/_4$ $3/_4$ $5'_2$ $7/_8$ $5'_$	LD	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>4</sub>	4 <sup>3</sup> /4	4 <sup>3</sup> /4	5 <sup>1</sup> / <sub>2</sub>	
NA $19/_{32}$ $19/_{32}$ $19/_{32}$ $31/_{32}$ $11/_{32}$ $15/_{16}$ NT $1/_4$ -20 $5/_{16}$ -18 $3/_8$ -16 $1/_2$ -13 $1/_2$ -13 $3/_4$ -10R $17/_{16}$ $12^{7}_{32}$ $2^{3}/_{16}$ $2^{3}/_{4}$ $3^{21}/_{64}$ $47/_8$ RT $1/_4$ -28 $5/_{16}$ -24 $5/_{16}$ -24 $3/_8$ -24 $3/_8$ -24 $1/_2$ -20SB $17/_{64}$ $21/_{64}$ $25/_{64}$ $33/_{64}$ $33/_{64}$ $33/_{64}$ 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 $3/_4$ $3/_4$ $1$ $1$ $1$ $11/_{64}$ SW $3/_{16}$ $3/_{16}$ $1/_4$ $1/_4$ $1/_4$ $7/_{64}$ TD1111 $1$ $1$ $13/_8$ TF $2^{3}/_4$ $3^{3}/_8$ $37/_8$ $4^{11}/_{16}$ $5^{7}/_{16}$ TK $3/_8$ $1/_2$ $9/_{16}$ $3/_4$ $3/_4$ $11/_8$ TL1111 $1$ $15/_8$ TM $5/_8$ $7/_8$ $11/_4$ $11/_2$ $2^{7}/_{16}$ S3/_8 $4^{1}/_8$ $5^{1}/_2$ $6^{1}/_4$ $8^{5}/_8$ UF $3^{3}/_4$ $3^{3}/_4$ $4^{3}/_4$ $5^{1}/_2$ $77/_8$ UF $3^{3}/_4$ $1^{3}/_4$ $1^{3}/_4$ $2^{1}/_2$ $2^{1}/_4$ XG $1^{3}/_4$ $1^{3}/_4$ $1$	М	$^{1}/_{2}$	1/2	1/2	3/4	3/4	$2 \frac{1}{4}$ Clevis	
NT $1/4-20$ $5/_{16}-18$ $3/_8-16$ $1/_2-13$ $1/_2-13$ $3/_4-10$ R $17/_{16}$ $127/_{32}$ $2^3/_{16}$ $2^3/_4$ $3^{21}/_{64}$ $47/_8$ 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 $3/_8$ $3/_8$ $3/_8$ $1/_2$ $1/_2$ $11/_64$ SW $3/_8$ $3/_8$ $3/_8$ $1/_2$ $1/_2$ $11/_64$ SW $3/_{16}$ $3/_{16}$ $1/_4$ $1/_4$ $1/_4$ $7/_{64}$ TD11111 $13/_8$ TF $2^3/_4$ $3^3/_8$ $37/_8$ $4^{11}/_{16}$ $5^7/_{16}$ TK $3/_8$ $1/_2$ $9/_{16}$ $3/_4$ $3/_4$ $11/_8$ TL1111 $1$ $15/_8$ TK $3/_8$ $1/_2$ $9/_{16}$ $3/_4$ $3/_4$ $11/_8$ TL1111 $1$ $15/_8$ TM $5/_8$ $7/_8$ $11/_4$ $11/_2$ $2^7/_{16}$ $3^7/_8$ UF $3^3/_8$ $4^1/_8$ $4^5/_8$ $5^1/_2$ $6^1/_4$ $8^5/_8$ UT $4$ $4^1/_2$ $5$ $5^3/_4$ $6^1/_2$ $9^1/_4$ W111 $1^3/_8$ $1^3/_8$ $1^5/_8$ TM $5^1/_5/_{16}$ $1^3/_4$ $1^3/_4$ $2^1/_4$ $2^1/_4$	ММ	<sup>5</sup> /8	<sup>5</sup> /8	<sup>5</sup> /8	1	1	1 <sup>3</sup> /8	
R $17/_{16}$ $12^2/_{32}$ $2^3/_{16}$ $2^3/_4$ $32^2/_{64}$ $47/_8$ RT $1/_4$ -28 $5/_{16}$ -24 $5/_{16}$ -24 $3/_8$ -24 $3/_8$ -24 $1/_2$ -20SB $17/_{64}$ $2^1/_{64}$ $2^5/_{64}$ $33/_{64}$ $33/_{64}$ $33/_{64}$ SJ $3/_8$ $3/_8$ $3/_8$ $1/_2$ $1/_2$ $11/_{16}$ SM $3/_8$ $3/_8$ $3/_8$ $1/_2$ $1/_2$ $11/_{64}$ SW $3/_16$ $3/_16$ $1/_4$ $1/_4$ $1/_4$ $1/_4$ SW $3/_{16}$ $3/_{16}$ $1/_4$ $1/_4$ $1/_4$ $7/_{64}$ TD11111 $1^3/_8$ TF $2^3/_4$ $3^3/_8$ $37/_8$ $4^{11}_{16}$ $5^7/_{16}$ $7^5/_8$ TK $3/_8$ $1/_2$ $9/_{16}$ $3/_4$ $3/_4$ $11/_8$ TL11111 $1^5/_8$ TN $5/_8$ $7/_8$ $11/_4$ $11/_2$ $2^1/_{16}$ $3^3/_8$ $4^1/_2$ 5 $5^3/_4$ $6^1/_2$ $9^1/_4$ W111 $1^3/_8$ $15/_8$ UF $3^3/_8$ $4^1/_2$ 5 $5^3/_4$ $6^1/_2$ $2^1/_{16}$ XT $1^{15}/_{16}$ $1^{15}/_{16}$ $2^7/_{16}$ $2^1/_{16}$ $2^1/_{16}$ KG $1^3/_4$ $1^3/_4$ $1^3/_4$ $2^1/_2$ $2^1/_2$ $2^1/_2$ HA222 $2^5/_{16}$ $2^{15}/_{16}$ $2^{15}/_{16$	NA	<sup>19</sup> / <sub>32</sub>	<sup>19</sup> / <sub>32</sub>	<sup>19</sup> / <sub>32</sub>	<sup>31</sup> / <sub>32</sub>	<sup>31</sup> / <sub>32</sub>	1 <sup>5</sup> / <sub>16</sub>	
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 $3/_{16}$ $3/_{16}$ $1/_4$ $1/_4$ $1/_4$ $1/_4$ TD $1$ $1$ $1$ $1$ $1$ $1/_8$ TF $23/_4$ $33/_8$ $37/_8$ $411/_{16}$ $57/_{16}$ $75/_8$ TK $3/_8$ $1/_2$ $9/_{16}$ $3/_4$ $3/_4$ $11/_8$ TL11 $1$ $1$ $1$ $15/_8$ TN $5/_8$ $7/_8$ $11/_4$ $11/_2$ $21/_{16}$ $31/_4$ TS $23/_4$ $31/_4$ $33/_4$ $4^3/_4$ $51/_2$ $77/_8$ UF $33/_8$ $41/_8$ $45/_8$ $51/_2$ $61/_4$ $85/_8$ UT $4$ $41/_2$ $5$ $53/_4$ $61/_2$ $91/_4$ W11 $1$ $13/_8$ $15/_8$ XT $115/_16$ $115/_16$ $27/_16$ $213/_16$ XG $13/_4$ $13/_4$ $13/_4$ $21/_4$ $21/_2$ HA $2$ $2$ $2$ $25/_{16}$ $215/_{16}$ HB $1/_2$ $1/_2$ $1/_2$ $1/$	NT	<sup>1</sup> / <sub>4</sub> -20	<sup>5</sup> / <sub>16</sub> -18	<sup>3</sup> / <sub>8</sub> -16	<sup>1</sup> / <sub>2</sub> -13	<sup>1</sup> / <sub>2</sub> -13	<sup>3</sup> / <sub>4</sub> -10	
SB $17/_{64}$ $21/_{64}$ $25/_{64}$ $33/_{64}$ $33/_{64}$ $33/_{64}$ SJ $3/_8$ $3/_8$ $3/_8$ $3/_8$ $1/_2$ $1/_2$ $11/_{16}$ SM $3/_8$ $3/_8$ $3/_8$ $1/_2$ $1/_2$ $11/_{64}$ SU $3/_4$ $3/_4$ $3/_4$ $1$ 1 $11$ SW $3/_{16}$ $3/_{16}$ $1/_4$ $1/_4$ $1/_4$ $1/_4$ TD1111 $13/_8$ TF $23/_4$ $33/_8$ $37/_8$ $4^{11}/_{16}$ $57/_{16}$ $75/_8$ TK $3/_8$ $1/_2$ $9/_{16}$ $3/_4$ $3/_4$ $11/_8$ TL1111 $15/_8$ $1/_4$ $33/_4$ $4^3/_4$ TK $3/_8$ $1/_2$ $9/_{16}$ $3/_4$ $51/_2$ $77/_8$ TK $3/_8$ $1/_2$ $9/_16$ $3/_4$ $51/_2$ $77/_8$ UF $33/_8$ $41/_8$ $4^5/_8$ $51/_2$ $61/_4$ $8^5/_8$ UT4 $41/_2$ $5$ $5^3/_4$ $61/_2$ $91/_4$ W111 $1^3/_8$ $1^5/_8$ XT $1^{16}_{16}$ $1^{15}_{16}$ $2^{1}/_16$ $2^{13}_{16}$ XG $1^3/_4$ $1^3/_4$ $1^3/_4$ $2^1/_2$ $1/_2$ HA222 $2^5/_{16}$ $2^{15}_{16}$ $2^{15}_{16}$ HB $1/_2$ $1/_2$ $1/_2$ $1/_2$ $1/_2$ HB $1/_2$ $1/_2$	R	1 <sup>7</sup> / <sub>16</sub>	1 <sup>27</sup> / <sub>32</sub>	2 <sup>3</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>4</sub>	3 <sup>21</sup> / <sub>64</sub>	4 <sup>7</sup> /8	
SJ $3/8$ $3/8$ $3/8$ $3/8$ $1/2$ $1/2$ $11/16$ SM $3/8$ $3/8$ $3/8$ $1/2$ $1/2$ $11/64$ SU $3/4$ $3/4$ $3/4$ $1$ $1$ $1$ $11/64$ SW $3/16$ $3/16$ $1/4$ $1/4$ $1/4$ $1/4$ $1/64$ TD $1$ $1$ $1$ $1$ $1$ $1$ $1$ TF $23/4$ $33/8$ $37/8$ $4^{11}/16$ $57/16$ $75/8$ TK $3/8$ $1/2$ $9/16$ $3/4$ $3/4$ $11/8$ TL $1$ $1$ $1$ $1$ $1$ $15/8$ TN $5/8$ $7/8$ $11/4$ $11/2$ $2^{1}/16$ $31/4$ TS $23/4$ $3^{1}/4$ $3^{3}/4$ $4^{3}/4$ $5^{1}/2$ $77/8$ UF $33/8$ $4^{1}/8$ $4^{5}/8$ $5^{1}/2$ $6^{1}/4$ $8^{5}/8$ UT $4$ $4^{1}/2$ $5$ $5^{3}/4$ $6^{1}/2$ $9^{1}/4$ W $1$ $1$ $1$ $1^{3}/8$ $1^{5}/8$ XT $1^{15}/6$ $1^{15}/6$ $2^{7}/16$ $2^{7}/16$ $2^{13}/16$ KG $1^{3}/4$ $1^{3}/4$ $1^{3}/4$ $2^{1}/2$ $1^{1}/2$ HA $2$ $2$ $2$ $2^{5}/16$ $2^{5}/16$ $2^{15}/16$ HB $1^{1}/2$ $1^{1}/2$ $1^{1}/2$ $1^{1}/2$ $1^{1}/2$ HC $3^{1}/4$ $3^{1}/4$ $3^{1}/4$ $3^{1}/2$ $3^{1}/2$ $3^{1}/2$ HD<	RT	<sup>1</sup> / <sub>4</sub> -28	<sup>5</sup> / <sub>16</sub> -24	<sup>5</sup> / <sub>16</sub> -24	<sup>3</sup> / <sub>8</sub> -24	<sup>3</sup> / <sub>8</sub> -24	<sup>1</sup> / <sub>2</sub> -20	
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 $3/_{16}$ $3/_{16}$ $1/_4$ $1/_4$ $1/_4$ $1/_4$ TD $1$ $1$ $1$ $1$ $1$ $1/_64$ TD $1$ $1$ $1$ $1$ $1/_4$ $1/_4$ TK $2^3/_4$ $3^3/_8$ $3^7/_8$ $4^{11}/_{16}$ $5^7/_{16}$ TK $3/_8$ $1/_2$ $9/_{16}$ $3/_4$ $3/_4$ $11/_8$ TL $1$ $1$ $1$ $1$ $1$ $1/_8$ TK $3/_8$ $1/_2$ $9/_{16}$ $3/_4$ $3/_4$ $1/_8$ TL $1$ $1$ $1$ $1$ $1$ $1/_8$ TN $5/_8$ $7/_8$ $1^1/_4$ $1^1/_2$ $2^1/_{16}$ $3^1/_4$ 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 $1$ $1$ $1$ $1^3/_8$ $1^5/_8$ XG $1^3/_4$ $1^3/_4$ $1^3/_4$ $2^1/_4$ $2^1/_4$ $2^1/_2$ 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 $3/_4$ $3/_4$ $3/_4$ $1^1/_8$ $1^1/_8$ $1^5/_8$ HE11 $1$ $1^1/_2$ <th>SB</th> <th>17/64</th> <th><sup>21</sup>/<sub>64</sub></th> <th><sup>25</sup>/<sub>64</sub></th> <th><sup>33</sup>/<sub>64</sub></th> <th><sup>33</sup>/<sub>64</sub></th> <th><sup>33</sup>/<sub>64</sub></th> <th></th>	SB	17/64	<sup>21</sup> / <sub>64</sub>	<sup>25</sup> / <sub>64</sub>	<sup>33</sup> / <sub>64</sub>	<sup>33</sup> / <sub>64</sub>	<sup>33</sup> / <sub>64</sub>	
SU $3/4$ $3/4$ $3/4$ $1$ $1$ $1$ $11/64$ SW $3/16$ $3/16$ $1/4$ $1/4$ $1/4$ $1/4$ $1/4$ $7/64$ TD11111 $1^3/8$ TF $2^3/4$ $3^3/8$ $3^7/8$ $4^{11}/16$ $5^7/16$ $7^5/8$ TK $3/8$ $1/2$ $9/16$ $3/4$ $3/4$ $11/8$ TL11111 $1^6/8$ 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 $3^3/8$ $4^1/8$ $4^5/8$ $5^1/2$ $6^1/4$ $8^5/8$ UT4 $4^1/2$ 5 $5^3/4$ $6^1/2$ $9^1/4$ W111 $1^3/8$ $1^3/8$ $1^5/8$ XG $1^3/4$ $1^3/4$ $1^3/4$ $2^1/4$ $2^1/4$ $2^{13}/16$ HB $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ HA222 $2^5/16$ $2^5/16$ $2^{15}/16$ HB $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ HC $3/4$ $3/4$ $3^1/32$ $3^1/32$ $3^1/32$ $1^3/8$ HE111 $1^1/2$ $1^1/2$ $2^1/4$ HF $10,000$ $10,000$ $10,000$ $34,000$ $34,000$ $64,000$	SJ	<sup>3</sup> /8	<sup>3</sup> /8	<sup>3</sup> /8	1/2	1/2	<sup>11</sup> / <sub>16</sub>	
SW $3/_{16}$ $3/_{16}$ $1/_4$ $1/_4$ $1/_4$ $1/_4$ $1/_64$ TD111111 $1^3/_8$ TF $2^3/_4$ $3^3/_8$ $3^7/_8$ $4^{11}/_{16}$ $5^7/_{16}$ $7^5/_8$ TK $3/_8$ $1/_2$ $9/_{16}$ $3/_4$ $3/_4$ $1^1/_8$ TL11111 $1^5/_8$ TK $3/_8$ $1/_2$ $9/_{16}$ $3/_4$ $3/_4$ $11/_8$ TL11111 $1^5/_8$ TK $3/_8$ $7/_8$ $11/_4$ $11/_2$ $2^1/_{16}$ $3^1/_4$ TS $2^3/_4$ $3^1/_4$ $3^3/_4$ $4^3/_4$ $5^1/_2$ $7^7/_8$ UF $3^3/_8$ $4^1/_8$ $4^5/_8$ $5^1/_2$ $6^1/_4$ $8^5/_8$ UT4 $4^1/_2$ 5 $5^3/_4$ $6^1/_2$ $9^1/_4$ W111 $1^3/_8$ $1^3/_8$ $1^5/_8$ XG $1^3/_4$ $1^3/_4$ $1^3/_4$ $2^1/_4$ $2^1/_4$ $2^{13}/_{16}$ XG $1^3/_4$ $1^3/_4$ $1^3/_4$ $2^1/_2$ $1^1/_2$ $1^1/_2$ HA22 $2^5/_{16}$ $2^5/_{16}$ $2^{15}/_{16}$ HB $1^1/_2$ $1^1/_2$ $1^1/_2$ $1^1/_2$ $1^1/_2$ HC $3^1/_4$ $3^1/_4$ $3^1/_4$ $3^1/_3$ $3^1/_32$ $1^3/_8$ HE111 $1^1/_2$ $1^1/_2$ $2^1/_4$ HF $1$	SM	<sup>3</sup> /8	<sup>3</sup> /8	<sup>3</sup> /8	1/2	1/2	<sup>11</sup> / <sub>64</sub>	
TD11111 $1^3/8$ TF $2^3/_4$ $3^3/_8$ $3^7/_8$ $4^{11}/_{16}$ $5^7/_{16}$ $7^5/_8$ TK $3^3/_8$ $1^1/_2$ $9^1/_6$ $3^1/_4$ $3^1/_4$ $1^1/_8$ TL111111 $1^5/_8$ TN $5^1/_8$ $7^1/_8$ $1^1/_4$ $1^1/_2$ $2^1/_{16}$ $3^1/_4$ TS $2^3/_4$ $3^1/_4$ $3^3/_4$ $4^3/_4$ $5^1/_2$ $7^7/_8$ UF $3^3/_8$ $4^1/_8$ $4^5/_8$ $5^1/_2$ $6^1/_4$ $8^5/_8$ UF $3^3/_8$ $4^1/_8$ $4^5/_8$ $5^1/_2$ $6^1/_4$ $8^5/_8$ UF $3^3/_4$ $4^1/_2$ $5$ $5^3/_4$ $6^1/_2$ $9^1/_4$ W111 $1^3/_8$ $1^3/_8$ $1^5/_8$ XG $1^3/_4$ $1^3/_4$ $1^3/_4$ $2^1/_4$ $2^1/_4$ HA22 $2$ $2^5/_{16}$ $2^5/_{16}$ $2^{15}/_{16}$ HB $1^1/_2$ $1^1/_2$ $1^1/_2$ $1^1/_2$ $1^1/_2$ HC $3^3/_4$ $3^1/_4$ $3^1/_4$ $1^1/_8$ $1^1/_8$ $1^5/_8$ HE111 $1^1/_2$ $1^1/_2$ $2^1/_4$ HF $10,000$ $10,000$ $34,000$ $34,000$ $64,000$	SU	3/4	3/4	3/4	1	1	<sup>11</sup> / <sub>64</sub>	
TF $2 \frac{3}{4}$ $3 \frac{3}{8}$ $3 \frac{7}{8}$ $4 \frac{11}{16}$ $5 \frac{7}{16}$ $7 \frac{5}{8}$ TK $3\frac{3}{8}$ $1\frac{1}{2}$ $9\frac{1}{16}$ $3\frac{4}{4}$ $3\frac{1}{4}$ $1\frac{1}{8}$ TL11111 $1\frac{5}{8}$ TN $5\frac{7}{8}$ $7\frac{7}{8}$ $1\frac{1}{4}$ $1\frac{1}{2}$ $2\frac{1}{16}$ $3\frac{1}{4}$ TS $2\frac{3}{4}$ $3\frac{1}{4}$ $3\frac{3}{4}$ $4\frac{3}{4}$ $5\frac{1}{2}$ $7\frac{7}{8}$ UF $3\frac{3}{8}$ $4\frac{1}{8}$ $4\frac{5}{8}$ $5\frac{1}{2}$ $6\frac{1}{4}$ $8\frac{5}{8}$ UT4 $4\frac{1}{2}$ 5 $5\frac{3}{4}$ $6\frac{1}{2}$ $9\frac{1}{4}$ W111 $1\frac{3}{8}$ $1\frac{3}{8}$ $1\frac{5}{8}$ XT $1\frac{15}{16}$ $1\frac{15}{16}$ $1\frac{15}{16}$ $2\frac{7}{16}$ $2\frac{7}{16}$ $2\frac{13}{16}$ XG $1\frac{3}{4}$ $1\frac{3}{4}$ $2\frac{1}{4}$ $2\frac{1}{2}$ $2\frac{1}{2}$ $2\frac{1}{2}$ HA222 $2\frac{5}{16}$ $2\frac{5}{16}$ $2\frac{15}{16}$ HB $1\frac{1}{2}$ $1\frac{1}{2}$ $1\frac{1}{2}$ $1\frac{1}{2}$ $1\frac{1}{2}$ HC $3\frac{4}{4}$ $3\frac{4}{4}$ $3\frac{1}{32}$ $3\frac{1}{32}$ $1\frac{3}{8}$ HE111 $1\frac{1}{2}$ $1\frac{1}{2}$ $2\frac{1}{4}$ HF $10,000$ $10,000$ $34,000$ $34,000$ $64,000$	SW	<sup>3</sup> / <sub>16</sub>	<sup>3</sup> / <sub>16</sub>	1/4	1/4	1/4	<sup>7</sup> / <sub>64</sub>	
TK $3/8$ $1/2$ $9/16$ $3/4$ $3/4$ $11/8$ TL11111 $15/8$ TN $5/8$ $7/8$ $11/4$ $11/2$ $21/16$ $31/4$ TS $23/4$ $31/4$ $33/4$ $43/4$ $51/2$ $77/8$ UF $33/8$ $41/8$ $45/8$ $51/2$ $61/4$ $85/8$ UT4 $41/2$ 5 $53/4$ $61/2$ $91/4$ W111 $13/8$ $13/8$ $15/8$ XT $1^{15}/16$ $1^{15}/16$ $1^{15}/16$ $2^{7}/16$ $2^{7}/16$ $2^{13}/16$ XG $13/4$ $13/4$ $13/4$ $21/4$ $21/2$ HA22 $2$ $25/16$ $25/16$ $2^{16}/16$ HB $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ HC $3/4$ $3/4$ $31/4$ $11/8$ $15/8$ HD $5/8$ $5/8$ $5/8$ $31/32$ $31/32$ $13/8$ HE111 $11/2$ $11/2$ $11/2$ $21/2$ HF10,00010,000 $10,000$ $34,000$ $34,000$ $64,000$	TD	1	1	1		1	1 <sup>3</sup> / <sub>8</sub>	
TL11111 $1^{5}/_{8}$ 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 $3^{3}/_{8}$ $4^{1}/_{8}$ $4^{5}/_{8}$ $5^{1}/_{2}$ $6^{1}/_{4}$ $8^{5}/_{8}$ UT4 $4^{1}/_{2}$ 5 $5^{3}/_{4}$ $6^{1}/_{2}$ $9^{1}/_{4}$ W111 $1^{3}/_{8}$ $1^{5}/_{8}$ XT $1^{15}/_{16}$ $1^{15}/_{16}$ $2^{7}/_{16}$ $2^{7}/_{16}$ $2^{13}/_{16}$ XG $1^{3}/_{4}$ $1^{3}/_{4}$ $2^{1}/_{4}$ $2^{1}/_{4}$ $2^{1}/_{2}$ HA22 $2^{5}/_{16}$ $2^{5}/_{16}$ $2^{15}/_{16}$ HB $1'_{2}$ $1'_{2}$ $1'_{2}$ $1'_{2}$ $1'_{2}$ HC $3'_{4}$ $3'_{4}$ $3'_{4}$ $1^{1}/_{8}$ $1^{1}/_{8}$ $1^{5}/_{8}$ HE111 $1^{1}/_{2}$ $1'_{2}$ $2^{1}/_{4}$ HF $10,000$ $10,000$ $34,000$ $34,000$ $64,000$	TF	2 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> /8	3 <sup>7</sup> /8	4 <sup>11</sup> / <sub>16</sub>	5 <sup>7</sup> / <sub>16</sub>	7 <sup>5</sup> / <sub>8</sub>	
TN $5/8$ $7/8$ $1 \frac{1}{4}$ $1 \frac{1}{2}$ $2 \frac{1}{16}$ $3 \frac{1}{4}$ TS $2 \frac{3}{4}$ $3 \frac{1}{4}$ $3 \frac{3}{4}$ $4 \frac{3}{4}$ $5 \frac{1}{2}$ $7 \frac{7}{8}$ UF $3 \frac{3}{8}$ $4 \frac{1}{8}$ $4 \frac{5}{8}$ $5 \frac{1}{2}$ $6 \frac{1}{4}$ $8 \frac{5}{8}$ UT4 $4 \frac{1}{2}$ 5 $5 \frac{3}{4}$ $6 \frac{1}{2}$ $9 \frac{1}{4}$ W111 $1 \frac{3}{8}$ $1\frac{3}{8}$ $1\frac{5}{8}$ XT $1 \frac{15}{16}$ $1 \frac{15}{16}$ $2 \frac{7}{16}$ $2 \frac{7}{16}$ $2 \frac{13}{16}$ XG $1\frac{3}{4}$ $1\frac{3}{4}$ $2\frac{1}{4}$ $2\frac{1}{2}$ $2\frac{1}{2}$ HA222 $2\frac{5}{16}$ $2\frac{5}{16}$ $2\frac{15}{16}$ HB $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ HC $3/4$ $3/4$ $3/4$ $31/32$ $31/32$ $1\frac{3}{8}$ HE111 $1\frac{1}{2}$ $1\frac{1}{2}$ $2\frac{1}{2}$ HF10,00010,00034,00034,00064,000	тк	<sup>3</sup> /8	<sup>1</sup> / <sub>2</sub>	<sup>9</sup> / <sub>16</sub>	3/4	3/4	1 <sup>1</sup> / <sub>8</sub>	
TS $2^{3}/_{4}$ $3^{1}/_{4}$ $3^{3}/_{4}$ $4^{3}/_{4}$ $5^{1}/_{2}$ $7^{7}/_{8}$ UF $3^{3}/_{8}$ $4^{1}/_{8}$ $4^{5}/_{8}$ $5^{1}/_{2}$ $6^{1}/_{4}$ $8^{5}/_{8}$ UT4 $4^{1}/_{2}$ 5 $5^{3}/_{4}$ $6^{1}/_{2}$ $9^{1}/_{4}$ W111 $1^{3}/_{8}$ $1^{3}/_{8}$ $1^{5}/_{8}$ XT $1^{15}/_{16}$ $1^{15}/_{16}$ $2^{7}/_{16}$ $2^{7}/_{16}$ $2^{13}/_{16}$ XG $1^{3}/_{4}$ $1^{3}/_{4}$ $1^{3}/_{4}$ $2^{1}/_{4}$ $2^{11}/_{2}$ HA222 $2^{5}/_{16}$ $2^{5}/_{16}$ $2^{15}/_{16}$ HB $1/_{2}$ $1/_{2}$ $1/_{2}$ $1/_{2}$ $1/_{2}$ $1/_{2}$ HC $3/_{4}$ $3/_{4}$ $3/_{4}$ $1^{1}/_{8}$ $1^{1}/_{8}$ $1^{5}/_{8}$ HE111 $1^{1}/_{2}$ $1^{1}/_{2}$ $1^{1}/_{2}$ $2^{1}/_{4}$	TL						1 <sup>5</sup> / <sub>8</sub>	
UF $3 \frac{3}{8}$ $4 \frac{1}{8}$ $4 \frac{5}{8}$ $5 \frac{1}{2}$ $6 \frac{1}{4}$ $8 \frac{5}{8}$ UT4 $4 \frac{1}{2}$ 5 $5 \frac{3}{4}$ $6 \frac{1}{2}$ $9 \frac{1}{4}$ W111 $1 \frac{3}{8}$ $1 \frac{3}{8}$ $1 \frac{5}{8}$ XT $1 \frac{15}{16}$ $1 \frac{15}{16}$ $2 \frac{7}{16}$ $2 \frac{7}{16}$ $2 \frac{13}{16}$ XG $1 \frac{3}{4}$ $1 \frac{3}{4}$ $1 \frac{3}{4}$ $2 \frac{1}{4}$ $2 \frac{1}{2}$ HA222 $2 \frac{5}{16}$ $2 \frac{5}{16}$ $2 \frac{15}{16}$ HB $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ HC $3/4$ $3/4$ $3/4$ $1 \frac{1}{8}$ $1 \frac{1}{8}$ $1 \frac{5}{8}$ HE111 $1 \frac{1}{12}$ $1 \frac{1}{2}$ $1 \frac{1}{2}$ $2 \frac{1}{4}$	TN					2 <sup>1</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>4</sub>	
UT4 $4 \frac{1}{2}$ 5 $5 \frac{3}{4}$ $6 \frac{1}{2}$ $9 \frac{1}{4}$ W111 $1\frac{3}{8}$ $1\frac{3}{8}$ $1\frac{5}{8}$ XT $1\frac{15}{16}$ $1\frac{15}{16}$ $1\frac{15}{16}$ $2\frac{7}{16}$ $2\frac{7}{16}$ $2\frac{13}{16}$ XG $1\frac{3}{4}$ $1\frac{3}{4}$ $1\frac{3}{4}$ $2\frac{1}{4}$ $2\frac{1}{4}$ $2\frac{13}{16}$ H $1\frac{1}{4}$ $1\frac{1}{4}$ $1\frac{1}{4}$ $1\frac{3}{4}$ $2\frac{1}{4}$ $2\frac{1}{2}$ HA22 $2\frac{5}{16}$ $2\frac{5}{16}$ $2\frac{5}{16}$ $2\frac{15}{16}$ HB $1/2$ $1/2$ $1/2$ $1/2$ $1\frac{1}{2}$ $1\frac{1}{2}$ HC $3\frac{3}{4}$ $3\frac{4}{4}$ $3\frac{1}{4}$ $1\frac{1}{8}$ $1\frac{5}{8}$ HD $5\frac{5}{8}$ $5\frac{5}{8}$ $3\frac{1}{322}$ $3\frac{3}{32}$ $1\frac{3}{8}$ HE111 $1\frac{1}{2}$ $1\frac{1}{2}$ $2\frac{1}{4}$ HF10,00010,00034,00034,00064,000	TS						7 <sup>7</sup> /8	
W111 $1^{3}/_{8}$ $1^{3}/_{8}$ $1^{5}/_{8}$ 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 $1^{1}/_{4}$ $1^{1}/_{4}$ $1^{1}/_{4}$ $1^{3}/_{4}$ $2^{1}/_{4}$ $2^{1}/_{2}$ HA222 $2^{5}/_{16}$ $2^{5}/_{16}$ $2^{15}/_{16}$ HB $1/_{2}$ $1/_{2}$ $1/_{2}$ $1/_{2}$ $1/_{2}$ HC $3/_{4}$ $3/_{4}$ $3/_{4}$ $1^{1}/_{8}$ $1^{1}/_{8}$ $1^{5}/_{8}$ HD $5/_{8}$ $5/_{8}$ $5/_{8}$ $3^{1}/_{32}$ $3^{1}/_{32}$ $1^{3}/_{8}$ HE111 $1^{1}/_{2}$ $1^{1}/_{2}$ $2^{1}/_{4}$ HF10,00010,00034,00034,00064,000	UF	3 <sup>3</sup> /8	4 <sup>1</sup> / <sub>8</sub>	4 <sup>5</sup> /8	5 <sup>1</sup> / <sub>2</sub>		8 <sup>5</sup> / <sub>8</sub>	
XT $1 \frac{15}{16}$ $1 \frac{15}{16}$ $1 \frac{15}{16}$ $2 \frac{7}{16}$ $2 \frac{7}{16}$ $2 \frac{13}{16}$ XG $1 \frac{3}{4}$ $1 \frac{3}{4}$ $1 \frac{3}{4}$ $2 \frac{1}{4}$ $2 \frac{1}{4}$ $2 \frac{13}{16}$ H $1 \frac{1}{4}$ $1 \frac{1}{4}$ $1 \frac{1}{4}$ $1 \frac{3}{4}$ $1 \frac{3}{4}$ $2 \frac{1}{2}$ HA22 $2 \frac{5}{16}$ $2 \frac{5}{16}$ $2 \frac{15}{16}$ HB $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ HC $\frac{3}{4}$ $\frac{3}{4}$ $\frac{3}{4}$ $1 \frac{1}{8}$ $1 \frac{1}{8}$ $1 \frac{5}{8}$ HD $\frac{5}{8}$ $\frac{5}{8}$ $\frac{5}{8}$ $\frac{31}{32}$ $\frac{31}{32}$ $1 \frac{3}{8}$ HE111 $1 \frac{1}{2}$ $1 \frac{1}{2}$ $\frac{2}{4}$ HF10,00010,000 $34,000$ $34,000$ $64,000$	UT	4	4 <sup>1</sup> / <sub>2</sub>	5	-		9 <sup>1</sup> / <sub>4</sub>	
XG $1 \frac{3}{4}$ $1 \frac{3}{4}$ $1 \frac{3}{4}$ $2 \frac{1}{4}$ $2 \frac{1}{4}$ $2 \frac{1}{3}_{16}$ H $1 \frac{1}{4}$ $1 \frac{1}{4}$ $1 \frac{1}{4}$ $1 \frac{3}{4}$ $1 \frac{3}{4}$ $2 \frac{1}{2}$ HA222 $2 \frac{5}{16}$ $2 \frac{5}{16}$ $2 \frac{15}{16}$ HB $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ HC $3/4$ $3/4$ $3/4$ $1 \frac{1}{8}$ $1 \frac{1}{8}$ $1 \frac{5}{8}$ HD $5/8$ $5/8$ $5/8$ $31/32$ $31/32$ $1 \frac{3}{8}$ HE111 $1 \frac{1}{2}$ $1 \frac{1}{2}$ $2 \frac{1}{4}$ HF10,00010,00034,00034,00064,000	w							
H $1 \frac{1}{4}$ $1 \frac{1}{4}$ $1 \frac{3}{4}$ $1 \frac{3}{4}$ $2 \frac{1}{2}$ HA222 $2 \frac{5}{16}$ $2 \frac{5}{16}$ $2 \frac{15}{16}$ HB $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ HC $3/4$ $3/4$ $3/4$ $1 \frac{1}{8}$ $1 \frac{1}{8}$ $1 \frac{5}{8}$ HD $5/8$ $5/8$ $5/8$ $31/32$ $31/32$ $1 \frac{3}{8}$ HE111 $1 \frac{1}{2}$ $1 \frac{1}{2}$ $2 \frac{1}{4}$ HF10,00010,00010,00034,00034,00064,000	ХТ		1 <sup>15</sup> / <sub>16</sub>				2 <sup>13</sup> / <sub>16</sub>	
HA222 $2 \frac{5}{16}$ $2 \frac{5}{16}$ $2 \frac{15}{16}$ HB $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ HC $3/4$ $3/4$ $3/4$ $1 \frac{1}{8}$ $1 \frac{1}{8}$ $1 \frac{5}{8}$ HD $5/8$ $5/8$ $5/8$ $31/32$ $31/32$ $1 \frac{3}{8}$ HE111 $1 \frac{1}{2}$ $1 \frac{1}{2}$ $2 \frac{1}{4}$ HF10,00010,00034,00034,00064,000	XG	1 <sup>3</sup> /4	1 <sup>3</sup> /4	1 <sup>3</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>			
HB $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ $1/2$ HC $3/4$ $3/4$ $3/4$ $11/8$ $11/8$ $15/8$ HD $5/8$ $5/8$ $5/8$ $31/32$ $31/32$ $13/8$ HE111 $11/2$ $11/2$ $21/4$ HF10,00010,00034,00034,00064,000	Н	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub>		1 <sup>3</sup> /4	2 <sup>1</sup> / <sub>2</sub>	
HC $3/_4$ $3/_4$ $11/_8$ $11/_8$ $15/_8$ HD $5/_8$ $5/_8$ $5/_8$ $31/_{32}$ $31/_{32}$ $13/_8$ HE111 $11/_2$ $11/_2$ $21/_4$ HF10,00010,00010,00034,00064,000	HA							
HD $5/_8$ $5/_8$ $5/_8$ $31/_{32}$ $31/_{32}$ $13/_8$ HE111 $11/_2$ $11/_2$ $21/_4$ HF10,00010,00034,00034,00064,000	HB							
HE         1         1         1 1/2         1 1/2         2 1/4           HF         10,000         10,000         34,000         34,000         64,000	HC						1 <sup>5</sup> / <sub>8</sub>	
<b>HF</b> 10,000 10,000 10,000 34,000 64,000	HD	5/8	<sup>5</sup> /8	<sup>5</sup> /8		<sup>31</sup> / <sub>32</sub>		
[1] A. M.	HE			1	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>4</sub>	
Note: * Add Stoke Length to Dimensions Below ** Add Twice Stroke to ZM Dimension	HF	10,000	10,000	10,000	34,000	34,000	64,000	
	Note: * Add Stok	te Length to D	imensions E	Below ** A	dd Twice St	roke to ZN	1 Dimension	

### VIE Interchangeable Rod Eye

#### DMC Interchangeable Rod Clevis with Pin





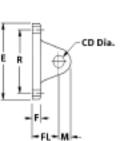


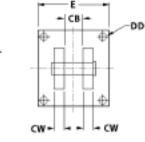
#### DMR Clevis Bracket w/Pin

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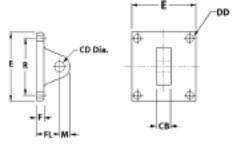
CD

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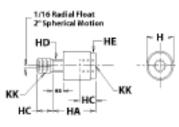




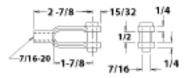
**DMP Pivot Bracket** 



#### **Self Aligning Rod Couplers**



DMC-1 Forged Rod Clevis w/Pin  $1^{1/2}$ " through  $2^{1/2}$ " bores



Note: For Inter-Pilot<sup>®</sup> port locations, see page 33.

 $2^{1}/_{4}$ 

 $5^{3}/_{8}$ 

 $5^{3}/_{4}$ 

 $4^{1}/_{8}$ 

4<sup>5</sup>/<sub>8</sub>

6 <sup>1</sup>/<sub>8</sub>

 $2^{1}/_{4}$ 

5 <sup>3</sup>/8

 $5^{3}/_{4}$ 

 $4^{1}/_{8}$ 

4 5/8

6 <sup>1</sup>/<sub>8</sub>

SN\*

XC\* XD\*

XJ\* ZJ\*

ZM\*\*

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

 $2^{3}/_{8}$ 

5 <sup>1</sup>/<sub>2</sub>

5<sup>7</sup>/8

 $4^{1}/_{4}$ 

 $4^{3}/_{4}$ 

 $6^{1}/_{4}$ 

2 5/8

6 7/8

 $7^{1}/_{2}$ 

5

5<sup>5</sup>/8

 $7^{1/2}$ 

2 5/8

6 7/8

 $7^{1}/_{2}$ 

5

5<sup>5</sup>/8

7 <sup>1</sup>/<sub>2</sub>

 $3^{1}/_{8}$ 

7 <sup>7</sup>/8

 $7^{1/2}$ 

5 <sup>7</sup>/8

6 <sup>5</sup>/<sub>8</sub>

8 <sup>3</sup>/<sub>4</sub>