

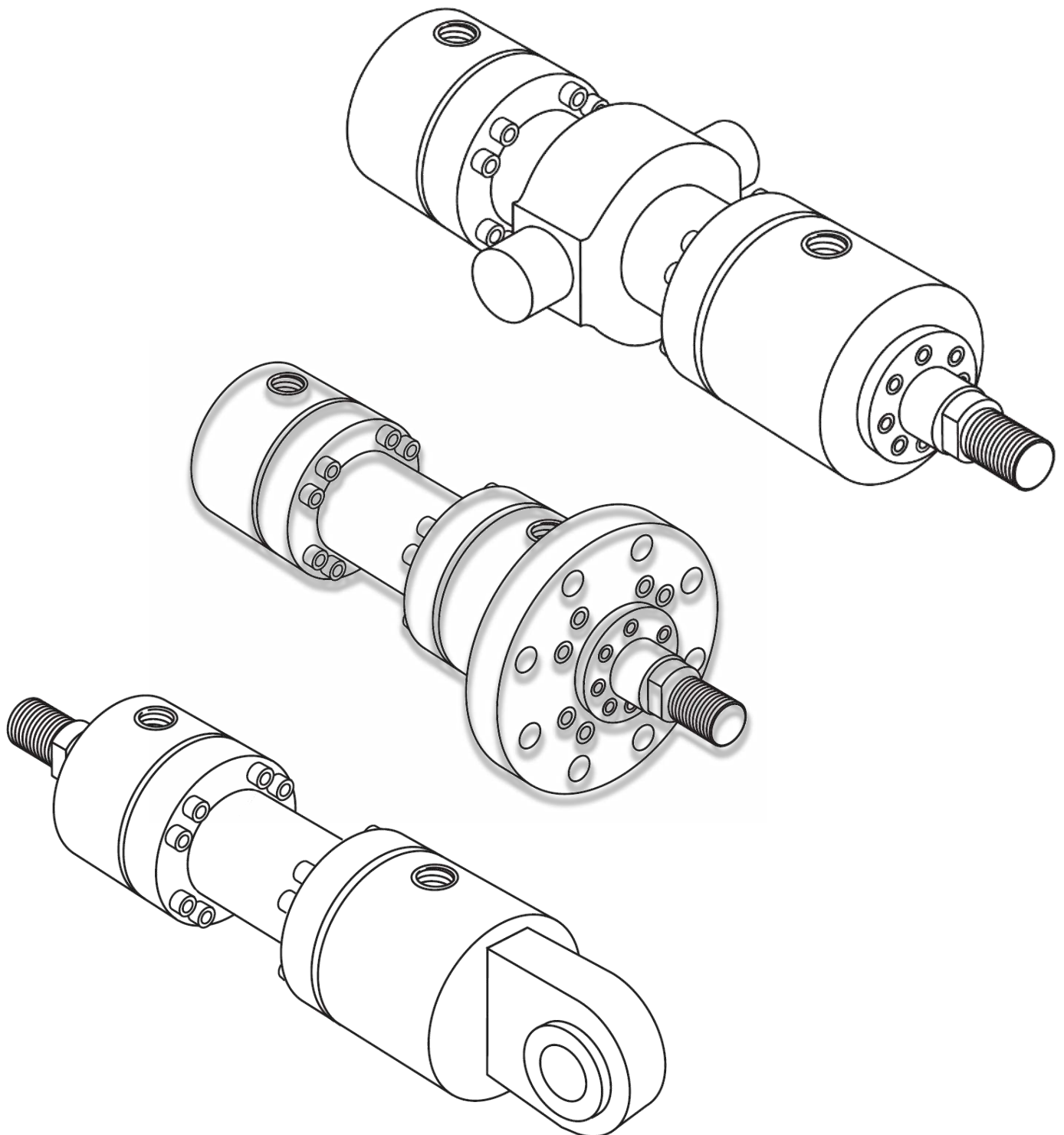
## Hydraulic Cylinder

Mill Duty Cylinders as per ISO-6022

Working Pressure up to 250 bar (On request higher Pressure also available)

Bore Sizes: - 40mm to 320mm

Cushioning- Optional at Both Ends



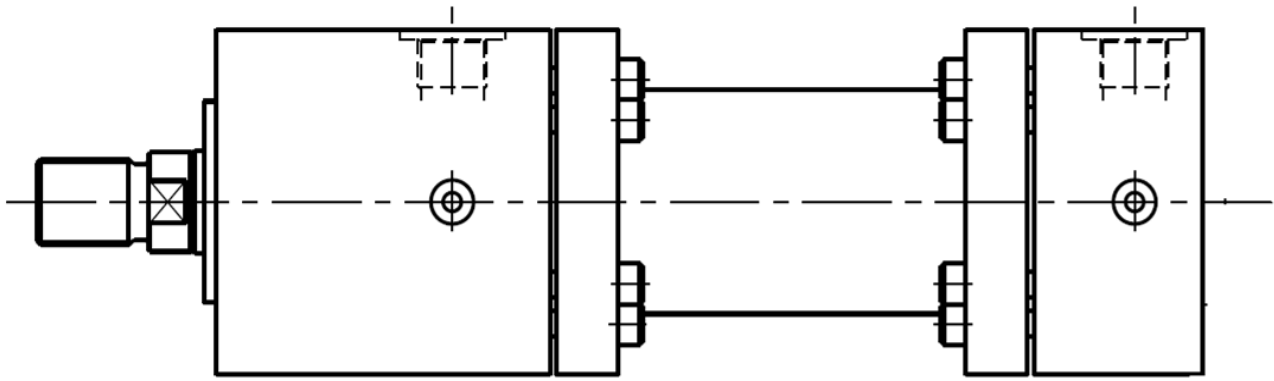
**BELL HYDROMATICS PVT LTD.**

A-238, MIDC MAHAPE, TTC INDUSTRIAL AREA.MAHAPE, NAVI MUMBAI-400710.

Email: - [sales@bellhyd.net](mailto:sales@bellhyd.net) Call: - +918767288819

1 | Page

## • Design Features & Benefits



### A. Piston Rod

The piston rod is manufactured from precision ground, high tensile carbon alloy steel, hard chrome plated and polished to 0.2µm max. This provides a 'dent resistant' surface, resulting in improved seal life. All rod and piston assemblies are designed to be fatigue free at full rated pressure.

### B. Head and Cap Retention

The head and cap are bolted to heavy steel flanges, which are retained by threads at each end of the cylinder body. The resulting assembly is fatigue-free at its maximum rated pressure.

### C. Tube

The heavy wall steel tubing is honed to a high surface finish, to minimise internal friction and prolong seal life.

### D. Head and Cap Ends

The head and cap are machined from steel and located into the cylinder body's internal diameter for added strength and precise alignment. To ensure leak-free performance, both the head and cap are sealed by 'O' rings.

### E. Cushioning

Optional cushions at the head and cap are progressive in action, providing controlled deceleration which reduces noise and shock loading, and prolongs machine life. Needle valves are provided at both ends of the cylinder for precise cushion adjustment, and are recessed and retained so that they cannot be inadvertently removed. Check valves at the head and cap ends of the cylinder minimize restriction to the start of a stroke, permitting full power and fast cycle times.

### F. Rod Seal

They are located in screw or bolted housing and comprise a polyurethane 'U' seal which provide efficient retention of pressurised fluid.

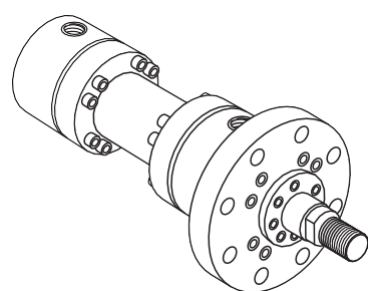
### G. Piston and Piston Seal

The piston is of one piece construction manufactured from fine grain iron or steel. The use of heavy duty wear rings prevents metal contact with ID of tube. The piston seal consists of a bronze filled PTFE outer ring which is preloaded by a rubber ring.

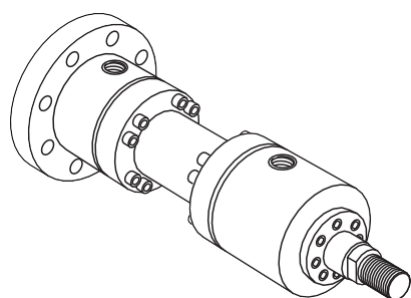
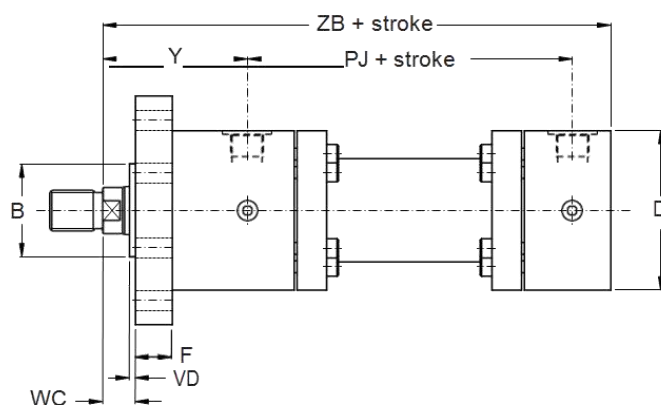
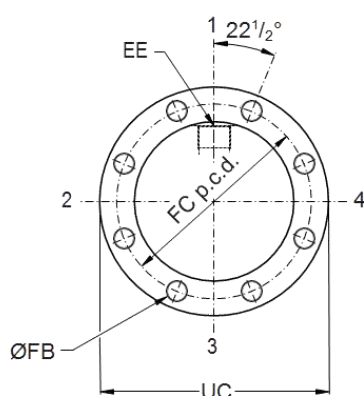
### H. Air Bleed

Air bleed screws are provided at both the ends to exhaust the trapped air to ensure jerk free movements of the piston rod

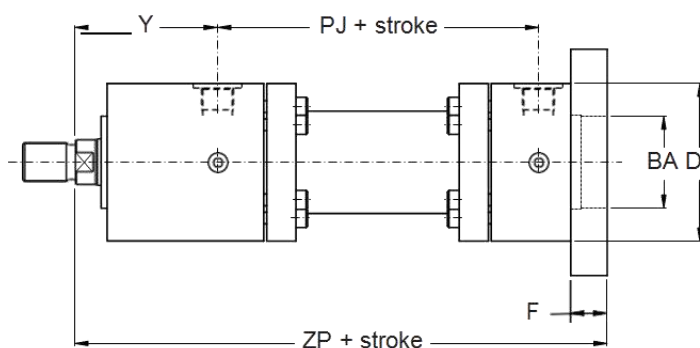
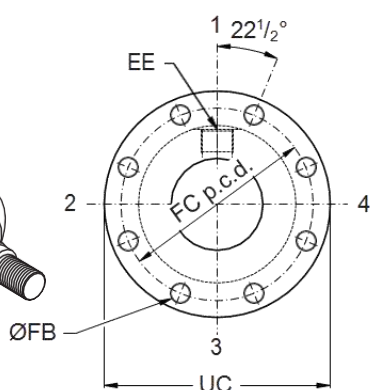
## Round Flange Mounting



Style MF3  
Head Circular Flange



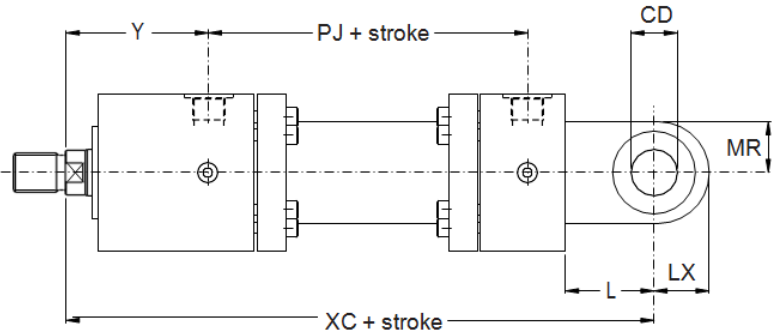
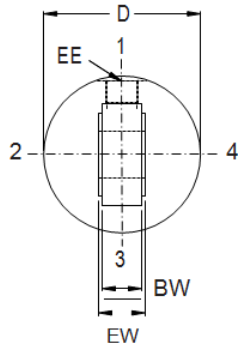
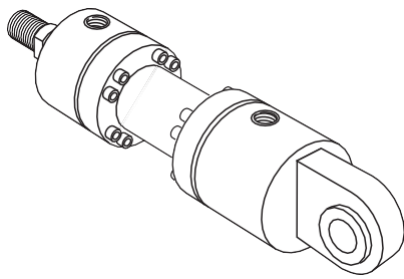
Style MF4  
Cap Circular Flange



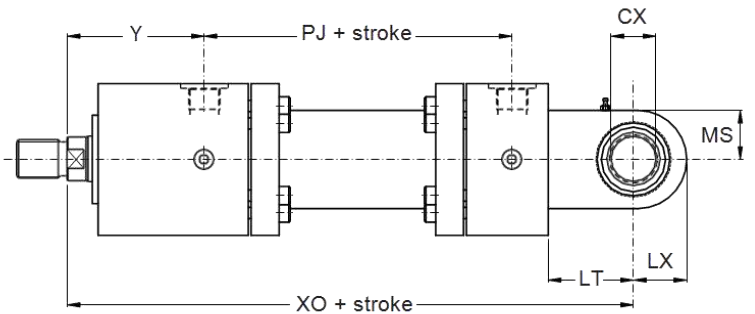
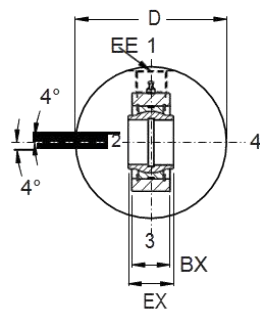
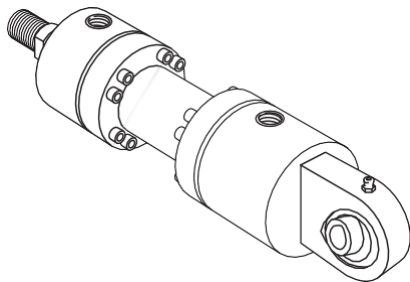
## Dimensions – MF3 and MF4 See also Rod End Dimensions, page 8

Bore Ø	Rod No.	Rod Ø	B <sup>18</sup> & BA <sup>H8</sup>	D <sub>max</sub>	EE (BSPP)	F	FB	FC	UC	VD <sub>min</sub>	WC	Y	Min. Stroke	+ Stroke		
														PJ	ZB <sub>max</sub>	ZP
50	1 2	32 36	63	108	G <sup>1</sup> / <sub>2</sub>	25	13.5	132	155	4	22	98	20	120	244	265
63	1 2	40 45	75	124	G <sup>3</sup> / <sub>4</sub>	28	13.5	150	175	4	25	112	30	133	274	298
80	1 2	50 56	90	148	G <sup>3</sup> / <sub>4</sub>	32	17.5	180	210	4	28	120	20	155	305	332
100	1 2	63 70	110	175	G1	36	22	212	250	5	32	134	25	171	340	371
125	1 2	80 90	132	208	G1	40	22	250	290	5	36	153	50	205	396	430
140	1 2	90 100	145	255	G <sup>1</sup> / <sub>4</sub>	40	26	300	340	5	36	181	50	208	430	465
160	1 2	100 110	160	270	G <sup>1</sup> / <sub>4</sub>	45	26	315	360	5	40	185	50	235	467	505
180	1 2	110 125	185	315	G <sup>1</sup> / <sub>4</sub>	50	33	365	420	5	45	205	20	250	505	550
200	1 2	125 140	200	330	G <sup>1</sup> / <sub>4</sub>	56	33	385	440	5	45	220	20	278	550	596
250	1 2	160 180	250	412	G <sup>1</sup> / <sub>2</sub>	63	39	475	540	8	50	260	20	325	652	703
320	1 2	200 220	320	510	G2	80	45	600	675	8	56	310	20	350	764	830

## Pivot Mounting



Style MP3  
Cap End Clevis



Style MP5  
Cap End Clevis with Spherical Bearing

### Dimensions – MP3 and MP5 See also Rod End Dimensions, page 8

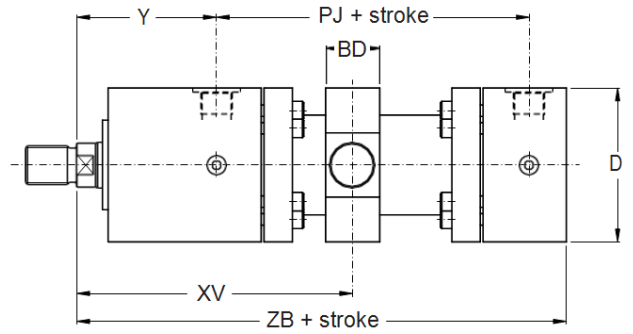
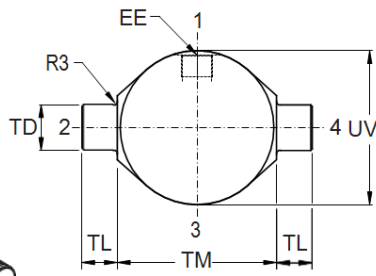
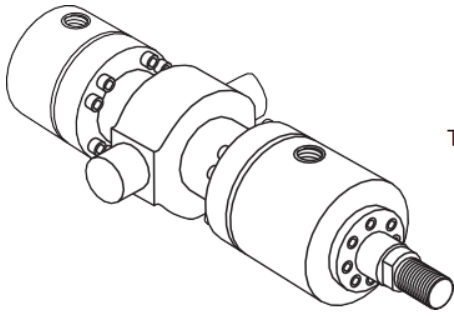
Bore Ø	Rod No.	Rod Ø	BW & BX	CD H9 & CX H7	D max	EE (BSP P)	EW h12 & EX h12	L & LT	LX	MR & MS	Y	Min. Stroke	+ Stroke	
													PJ	XC & XO
50	1 2	32 36	27	32	108	G1/2	32	61	38	35	98	20	120	305
63	1 2	40 45	35	40	124	G3/4	40	74	50	50	112	30	133	348
80	1 2	50 56	40	50	148	G3/4	50	90	61.5	61.5	120	20	155	395
100	1 2	63 70	52	63	175	G1	63	102	71	66	134	25	171	442
125	1 2	80 90	60	80	208	G1	80	124	90	90	153	50	205	520
140	1 2	90 100	65	90	255	G1 1/4	90	150	113	113	181	50	208	580
160	1 2	100 110	84	100	270	G1 1/4	100	150	112	112	185	50	235	617
180	1 2	110 125	88	110	315	G1 1/4	110	185	129	118	205	20	250	690
200	1 2	125 140	102	125	330	G1 1/4	125	206	145	131	220	20	278	756
250	1 2	160 180	130	160	412	G1 1/2	160	251	178	163	260	20	325	903
320	1 2	200 220	162	200	510	G2	200	316	230	209	310	20	350	1080

## BELL HYDROMATICS PVT LTD.

A-238, MIDC MAHAPE, TTC INDUSTRIAL AREA. MAHAPE, NAVI MUMBAI-400710.

Email: - [sales@bellhyd.net](mailto:sales@bellhyd.net) Call: - +918767288819

## Trunnion Mounting



Style MT4

Intermediate Trunnion

**Note:** XV Dimension to be specified by customer. Where minimum dimension is unacceptable, please consult factory.

Dimensions – MT4 See also Rod End Dimensions, page 8

Bore Ø	Rod No.	Rod Ø	BD	D max	EE (BSP P)	TD f8	TL	TM h13	UV max	XV min	Y	Min. Stroke	PJ	+ Stroke XV max	ZB max
50	1 2	32 36	38	108	G1/2	32	25	112	108	187	98	55	120	132	244
63	1 2	40 45	48	124	G3/4	40	32	125	124	212	112	75	133	137	274
80	1 2	50 56	58	148	G3/4	50	40	150	148	245	120	90	155	155	305
100	1 2	63 70	73	175	G1	63	50	180	175	280	134	120	171	160	340
125	1 2	80 90	88	208	G1	80	63	224	218	340	153	160	205	180	396
140	1 2	90 100	98	255	G1 1/4	90	70	265	260	380	181	180	208	200	430
160	1 2	100 110	108	270	G1 1/4	100	80	280	280	400	185	180	235	220	467
180	1 2	110 125	118	315	G1 1/4	110	90	320	315	410	205	170	250	240	505
200	1 2	125 140	133	330	G1 1/4	125	100	335	330	450	220	190	278	260	550
250	1 2	160 180	180	412	G1 1/2	160	125	425	412	540	260	240	325	300	652
320	1 2	200 220	220	510	G2	200	160	530	510	625	310	300	350	325	764

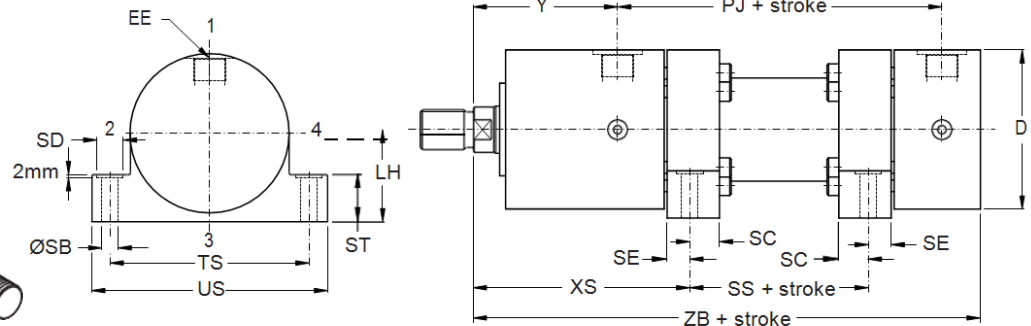
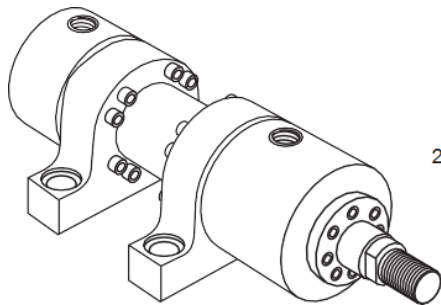
**BELL HYDROMATICS PVT LTD.**

A-238, MIDC MAHAPE, TTC INDUSTRIAL AREA. MAHAPE, NAVI MUMBAI-400710.

Email: - [sales@bellhyd.net](mailto:sales@bellhyd.net) Call: - +918767288819

5 | Page

## Foot Mounting



Style MS2  
Foot Mounting  
(Not to ISO 6022)

Note: The MS2 mounting should only be used where the stroke is at least half of the bore diameter or where the cylinder operates below 160 bar.

## Dimensions – MS2 See also Rod End Dimensions, page 8

Bore Ø	Rod No.	Rod Ø	BD	D max	EE (BSP P)	TD f8	TL	TM h13	UV max	XV min	Y	Min. Stroke	PJ	+ Stroke XV max	ZB max
50	1 2	32 36	38	108	G1/2	32	25	112	108	187	98	55	120	132	244
63	1 2	40 45	48	124	G3/4	40	32	125	124	212	112	75	133	137	274
80	1 2	50 56	58	148	G3/4	50	40	150	148	245	120	90	155	155	305
100	1 2	63 70	73	175	G1	63	50	180	175	280	134	120	171	160	340
125	1 2	80 90	88	208	G1	80	63	224	218	340	153	160	205	180	396
140	1 2	90 100	98	255	G1 1/4	90	70	265	260	380	181	180	208	200	430
160	1 2	100 110	108	270	G1 1/4	100	80	280	280	400	185	180	235	220	467
180	1 2	110 125	118	315	G1 1/4	110	90	320	315	410	205	170	250	240	505
200	1 2	125 140	133	330	G1 1/4	125	100	335	330	450	220	190	278	260	550
250	1 2	160 180	180	412	G1 1/2	160	125	425	412	540	260	240	325	300	652
320	1 2	200 220	220	510	G2	200	160	530	510	625	310	300	350	325	764

## ● Piston Rod End Data

### Piston Rod End Styles

MD cylinders are available with standard metric male and female rod ends to ISO 4395. They can also be supplied with other rod end threads, eg: ISO metric coarse, Unified, British Standard etc., or to the customer's special requirements.

### Rod End Code 3

Non-standard rod ends are designated code 3. Orders for these should include dimensioned sketches and descriptions, showing dimensions KK or KF, A or AF, rod stand-out W and the thread form required.

BELL HYDROMATICS PVT LTD.

A-238, MIDC MAHAPE, TTC INDUSTRIAL AREA. MAHAPE, NAVI MUMBAI-400710.

Email: - [sales@bellhyd.net](mailto:sales@bellhyd.net) Call: - +918767288819

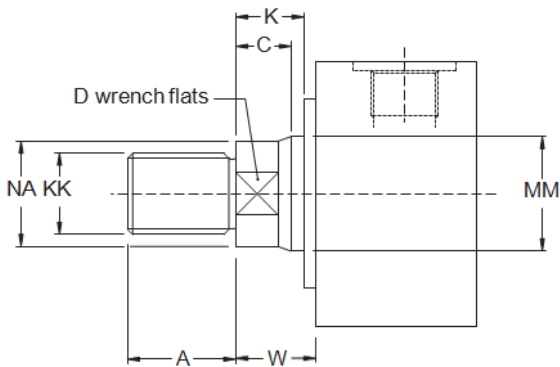
## Rod End Codes 4 and 9

Each cylinder bore size is offered with two diameters of piston rod – the smaller is designated no. 1 and the larger, no. 2. The standard male rod end threads, to ISO 6022, are designated code 4 and female threads are designated code 9. Female threads are only available with the no. 2 rod size.

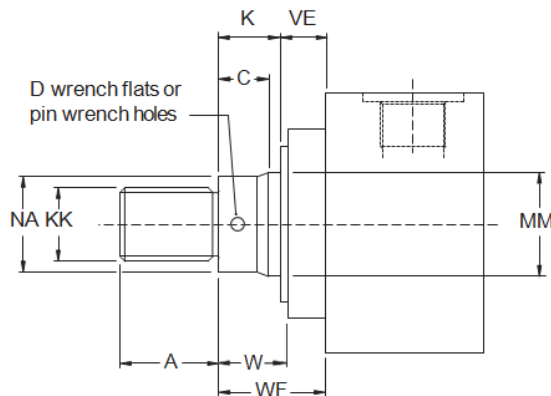
## Wrench Flats

Piston rods up to and including 90mm in diameter are supplied with flats for a spanner wrench while rods above 90mm in diameter feature four drilled holes to accept a pin wrench. See dimension D in the table on page 9.

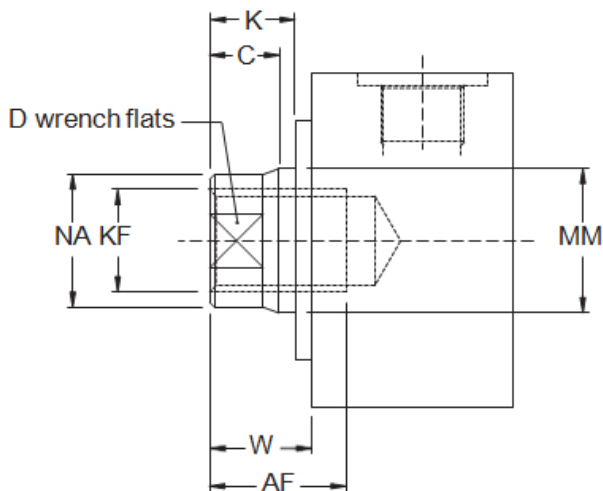
Rod End Code 4  
Bore Ø 50mm - 100mm



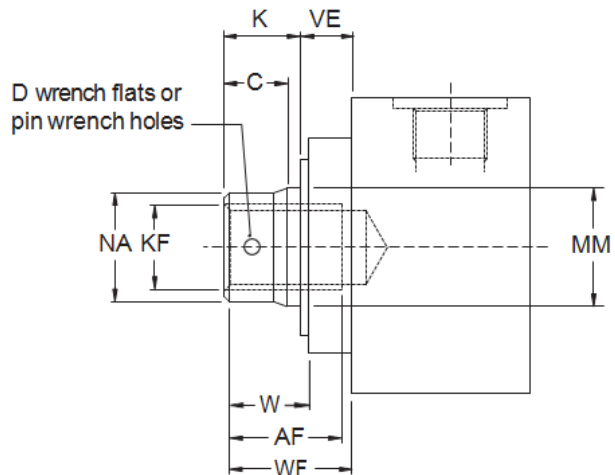
Rod End Code 4  
Bore Ø 125mm - 320mm



Rod End Code 9  
Bore Ø 50mm - 100mm



Rod End Code 9  
Bore Ø 125mm - 320mm

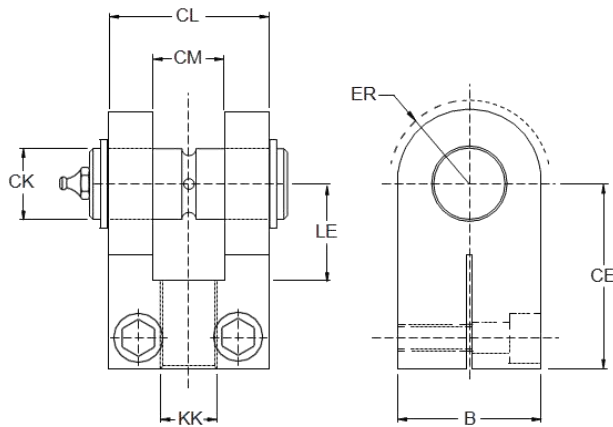


## Rod End Dimensions

Bore Ø	Rod No.	MM Rod Ø	A & AF	C	D	K	KK Code 4	KF Code 9	NA	VE max	W	WF
50	1 2	32 36	36	15	28 32	18	M27x2	– M27x2	31 35	–	22	–
63	1 2	40 45	45	18	34 36	21	M33x2	– M33x2	38 43	–	25	–
80	1 2	50 56	56	20	43 46	24	M42x2	– M42x2	48 54	–	28	–
100	1 2	63 70	63	23	53 60	27	M48x2	– M48x2	60 67	–	32	–
125	1 2	80 90	85	27	65 75	31	M64x3	– M64x3	77 87	39	36.5	70
140	1 2	90 100	90	27	75 Ø10 x 4 Ø10 x 4	31	M72x3	– M72x3	87 96	39	36.5	70
160	1 2	100 110	95	31	Ø10 x 4 Ø10 x 4	35	M80x3	– M80x3	96 106	43	40.5	78
180	1 2	110 125	105	36	Ø10 x 4 Ø10 x 4	40	M90x3	– M90x3	106 121	47	45.5	87
200	1 2	125 140	112	36	Ø12 x 4 Ø12 x 4	40	M100x3	– M100x3	121 136	51	45.5	91
250	1 2	160 180	125	38	Ø15 x 4 Ø15 x 4	42	M125x4	– M125x4	155 175	59	50.5	101
320	1 2	200 220	160	44	Ø15 x 4 Ø15 x 4	48	M160x4	– M160x4	194 214	74	56.5	122

## ● Accessories

### Rod Clevis and Pivot Pin AP2 ISO 8132



Part No.	B	CE js13	CK H9/f8	CL h16	CM A13	ER max	KK	LE min	Mass kg	Nominal Force kN
BH-M27P2-50	65	80	32	70	32	40	M27x2	41	2.2	50
BH-M33P2-80	80	97	40	90	40	50	M33x2	51	4.4	80
BH-M42P2-125	100	120	50	110	50	63	M42x2	63	7.6	125
BH-M48P2-200	120	140	63	140	63	71	M48x2	75	17.7	200
BH-M64P3-320	140	180	80	170	80	90	M64x3	94	30.6	320

**BELL HYDROMATICS PVT LTD.**

A-238, MIDC MAHAPE, TTC INDUSTRIAL AREA. MAHAPE, NAVI MUMBAI-400710.

Email: - [sales@bellhyd.net](mailto:sales@bellhyd.net) Call: - +918767288819

8 | Page



## ● Cylinder Mounting Information

### Mounting Bolts

It is recommended that mounting bolts with strength to ISO 898/1 grade 12.9 should be used for fixing cylinders to the machine or base. Mounting bolts should be torque loaded to their manufacturer's recommended figures.

### Head and Cap Retention Bolts

The head and cap retention bolts on MD Series cylinders are torque loaded on assembly in the factory. If damage or corrosion is found on removal, the old bolts must be discarded and replacement bolts with a minimum strength to ISO 898/1 grade 12.9 must be fitted. Head and cap bolts should always be tightened progressively in a diagonal Sequence and torque loaded to the figures shown in the table.

Bore Ø	Flange Bolts	
	Torque	Bolt Load (Nm) Size
50	26-28	M8
63	51-54	M10
80	112-118	M12
100	157-165	M14
125	247-260	M16
140		
160	456-480	M20
180		
200	668-692	M22
250	1112-1170	M27
320	1425-1500	M33

### Spherical Bearings

All spherical bearings should be re-packed with grease periodically. In unusual or severe working conditions, consult the factory regarding the suitability of the bearing chosen.

## ● Selecting the Cylinder Diameter

### Push Force

If the piston rod is in compression, use the Push Force table below.

1. Identify the operating pressure closest to that required.
2. In the same column, identify the force required to move the load (always rounding up).
3. In the same row, look along to the cylinder bore required.

If the cylinder envelope dimensions are too large, increase the operating pressure, if possible, and repeat the exercise.

Bore Ø	Cylinder Bore Area mm <sup>2</sup>	Cylinder Push Force in kN				
		50 bar	100 bar	150 bar	200 bar	250 bar
50	1964	10	20	30	40	50
63	3117	15	31	46	63	79
80	5026	25	51	76	102	128
100	7854	40	80	120	160	200
125	12272	62	125	187	250	312
140	15386	77	154	231	308	385
160	20106	102	205	307	410	512
180	25434	127	254	381	508	635
200	31416	160	320	480	640	801
250	49087	250	500	750	1000	1250
320	80425	410	820	1230	1640	2050