



ZH-W

Welded Cylinders

Series ZH-W Welded Hydraulic Cylinders

Description:

Series ZH-W hydraulic cylinders are available in Industrial and Marine specifications, they are of a heavy duty welded construction and are available in a wide range of mounting styles together with accessories and options enabling them to be used for a wide range of applications.

All designs are created utilising 3D design software, which can then be exported, enabling customers to import the cylinder or actuator model directly into their own machine design.

Component parts are manufactured using latest CNC machinery ensuring part interchangeability, we carry stocks of components enabling us to offer quick turn round on new cylinders and service items, all cylinders are tested to 1.5 x the designed working pressure.

Series ZH-W hydraulic cylinders are designed with generous internal bearing lengths, using high quality materials in their construction together with proven seal types and a choice of sealing systems and materials.

All Series ZH-W hydraulic cylinders can be supplied with custom designed mountings, internal full displacement positional transducers, end of stroke sensors, seals for all types of hydraulic fluids and operational speeds together with control valve packages having valves built directly into the cylinder end cap or manifolded onto the cylinder.

The cylinders are supplied as standard in satin black enamel paint, but can be supplied with external surfaces plated or shotblasted and marine specification painted.

Standard Cylinders:

Working pressure: 250 bar

Fluids: Mineral oils, soluble oils, HWB fluids, and ester based fluids.

Operational speeds: 500 mm/sec subject to fluid type and pressure.

Temperature range: -10C to +80C.

Materials of Construction:

Tubes:

Up to & including 100 bore – ERW, DOM, grade E355 (ST52). Bore tolerance H9 – H11. Surface finish 0.8 microns Ra max.

100 bore up to and including 200 bore – Cold drawn & honed, grade E355 (ST52). Bore tolerance ISO H8 – H9. Surface finish 0.3 microns Ra max.

Over 200 bore – Hot rolled seamless, grade E355 (ST52). Bore tolerance H8 – H11. Surface finish 0.3 microns Ra max.

Rods:

CK45 (EN8D) carbon steel.

431S29T stainless steel, hardened and tempered, stress relieved.

Micro Cracked hard chrome plated

Standard chrome plate deposit 0.025 mm. Surface finish 0.10 – 0.3 microns Ra. Deposit hardness 1100 – 1200 Vickers.

Additional plating depths or plating systems available if required.

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Gland Bearings:

Subject to cylinder size, these are manufactured from aluminium grade HE30WP (25 bore cylinders), cast iron grade GR220 (DIN GG25) for cylinders 32 – 160 bore, or steel with composite bearing rings for cylinders 200 – 250 bore . Marine specification cylinders are provided with an additional rod and gland sealing system. In conjunction with internal stop tubes the cylinders provide long bearing spans to give maximum rod support.

For stroke lengths greater than 1 metre, an additional 25 mm stop tube length is recommended for each additional 250 mm of stroke length.

Note: An additional stop tube length will have a corresponding increase in the overall length of the cylinder.

Rod Buckling / Stroke Length Limitations

Piston rod selection:

In order to correctly size the hydraulic cylinder, it is necessary to also consider the compressiveload applied to the piston rod together with the stroke length and mounting style required, a further factor is whether the piston rod end is guided or unguided.

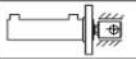
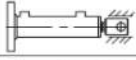



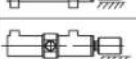
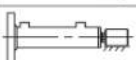

Identify from Chart 1, Page 4, the body mounting style and rod guidance type, read across to give the corrected stroke length. Apply the corrected stroke length to Chart 2, Page 4, in conjunction with the required thrust to give the minimum piston rod diameter.

Internal stop tubes

All Series ZH-W hydraulic cylinders are fitted with an internal stop tube.

For stroke lengths in excess of 1 metre, it is recommended that the stop tube length is increased to provide additional spread length to reduce bearing loads.

Chart 1

MOUNTING STYLE	MOUNTING TYPE	ROD END MOUNTING	CORRECTED STROKE LENGTH
C , G		GUIDED	0.7 X STROKE
D , H		GUIDED	1.0 X STROKE
F , (F)		GUIDED	1.0 X STROKE
F , (M)		GUIDED	1.5 X STROKE
A , B		GUIDED	2.0 X STROKE
E		UNGUIDED	2.0 X STROKE
F , (F)		UNGUIDED	3.0 X STROKE
D , H		UNGUIDED	4.0 X STROKE

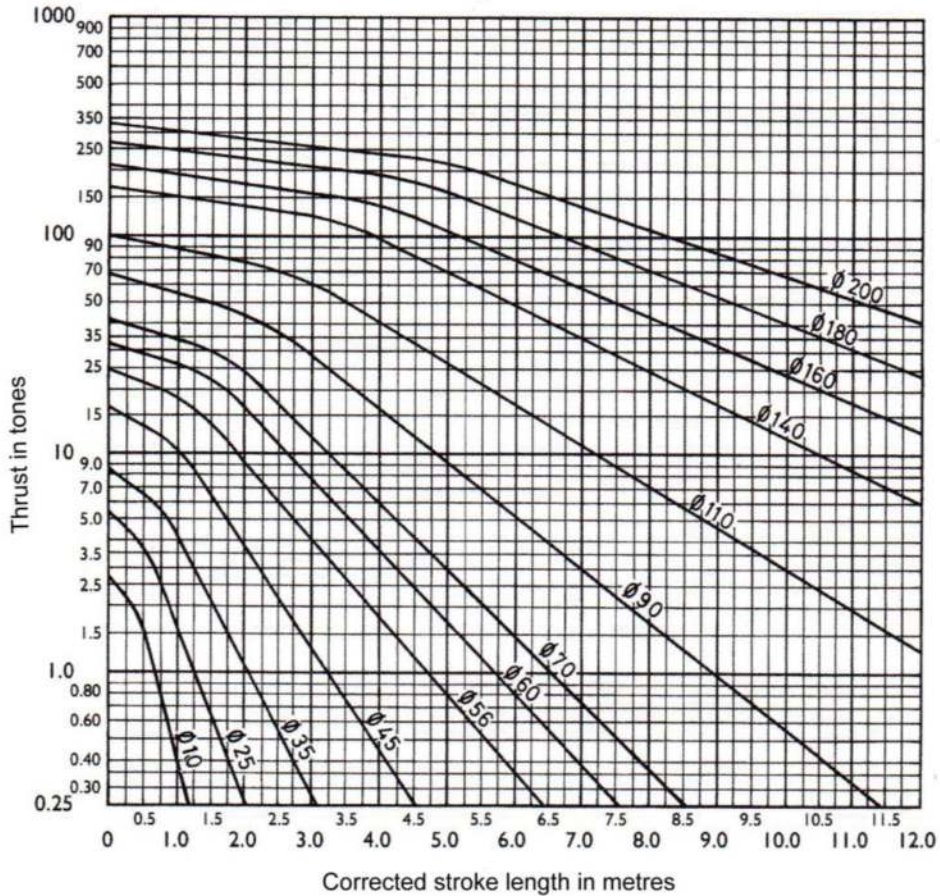
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Graph 2



Oversize ports

For applications requiring oversize fluid ports, the chart below shows the sizes available, these can if required be supplemented by fitting additional ports.

Bore Diameter	Standard Port (bsp)	Oversize Port (bsp)
25	1/4	3/8
32	1/4	3/8
40	3/8	1/2
50	3/8	3/4
63	1/2	3/4
80	1/2	3/4
100	3/4	1
125	3/4	1
160	1	1 ¼
200	1 ¼	1 ½
250	1 ½	2

Metric and JIC port threads or SAE flange connections can be supplied if required.

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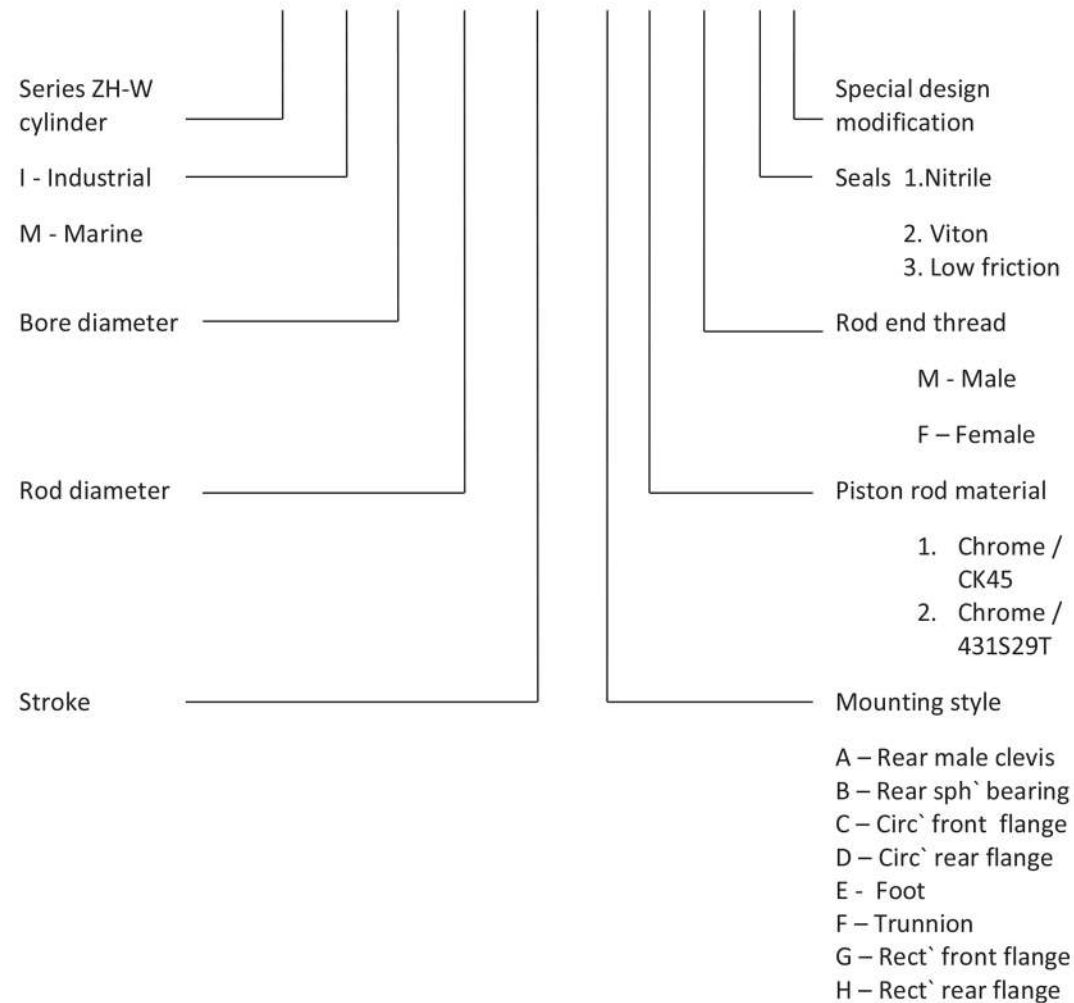
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Ordering Code:

Example: **ZH-W - I - 80 - 40 - 750 - B - 2 - M - 1 - *****

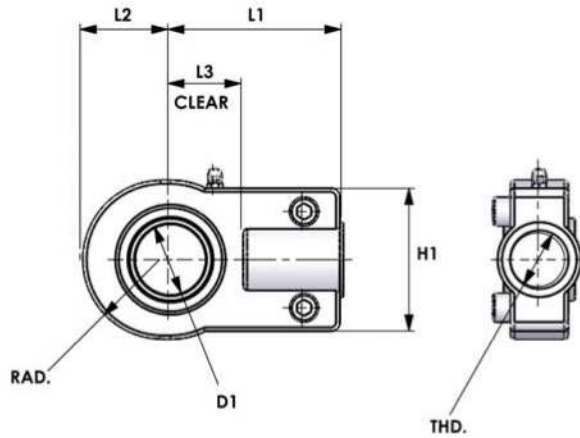
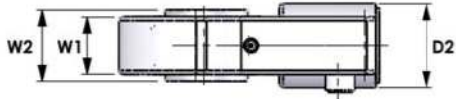


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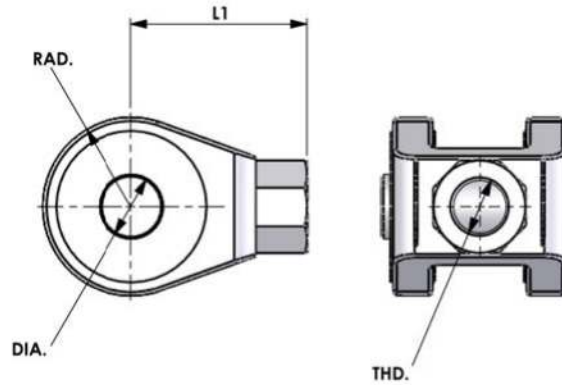
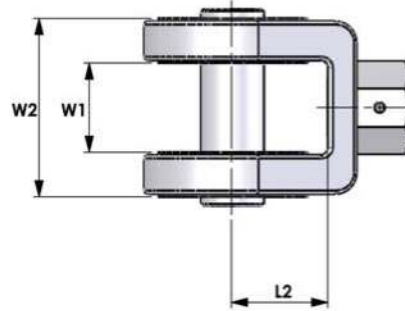
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SPHERICAL CLEVIS EYE ZH-WRSE
FIXED CLEVIS EYE ZH-WRFE



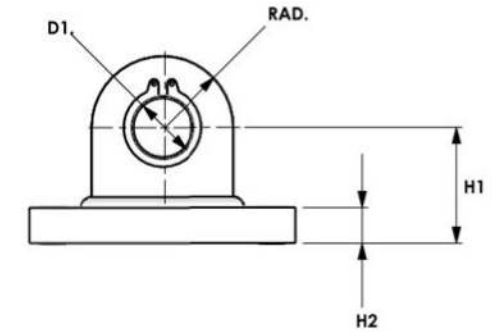
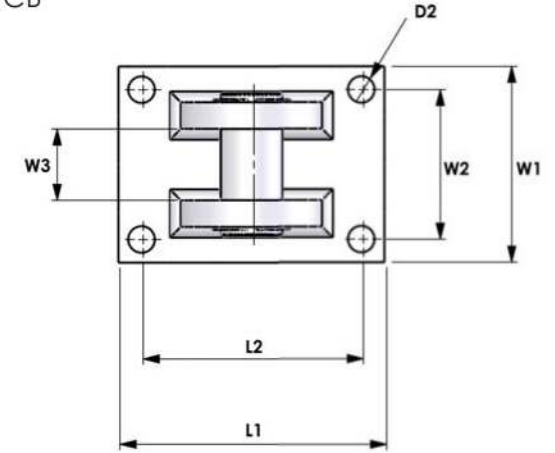
CYLBORE	D1	D2	H1	L1	L2	L3	R	W1	W2	THD.
25	12	16	32	38	16	14	16	10	12	M12 X 1.25P
32	16	21	40	44	20	18	20	12	16	M14 X 1.5P
40	20	25	47	52	25	22	24	14	20	M16 X 1.5P
50	25	30	54	65	31	27	29	19	25	M20 X 1.5P
63	32	38	66	80	39	32	35	22	32	M27 X 2P
80	40	47	80	97	49	41	45	26	40	M33 X 2P
100	50	58	96	120	60	50	59	32	50	M42 X 2P
125	63	70	114	140	72	62	66	38	63	M48 X 2P
160	80	90	148	180	91	78	84	48	80	M64 X 3P
200	100	110	178	210	113	96	105	62	100	M80 X 3P
250	125	135	200	260	146	120	132	72	125	M100 X 3P

CLEVIS FORK (SUPPLIED WITH PIN & CIRCLIPS)
 ZH-WFRC

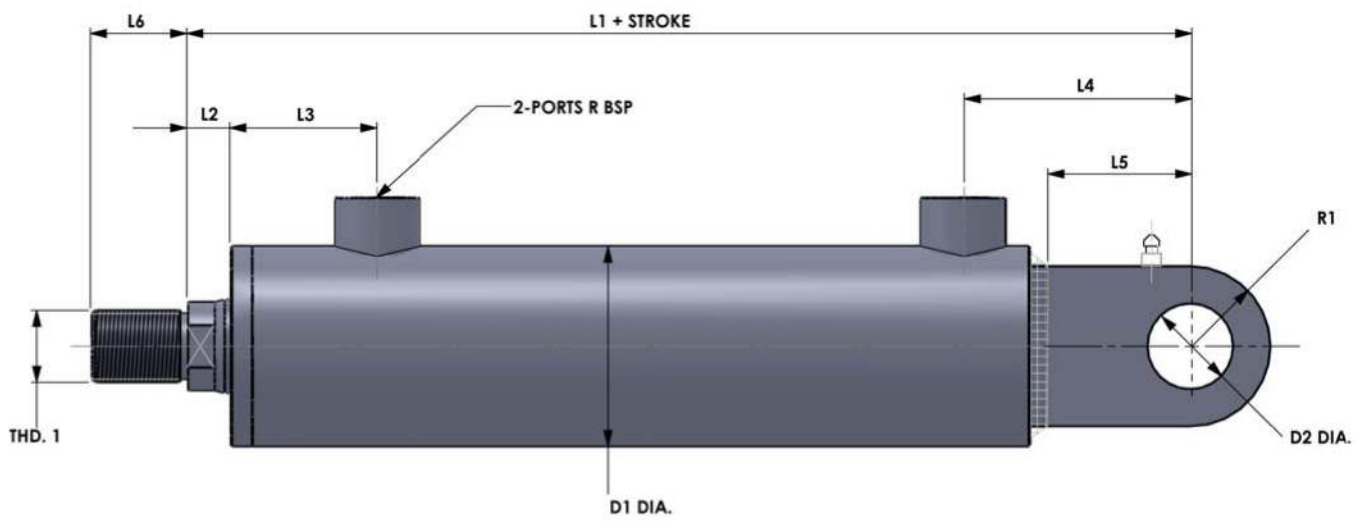
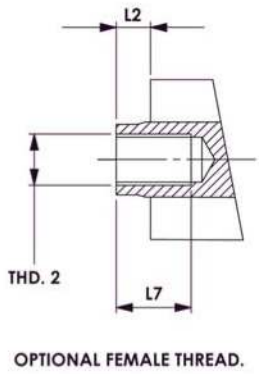
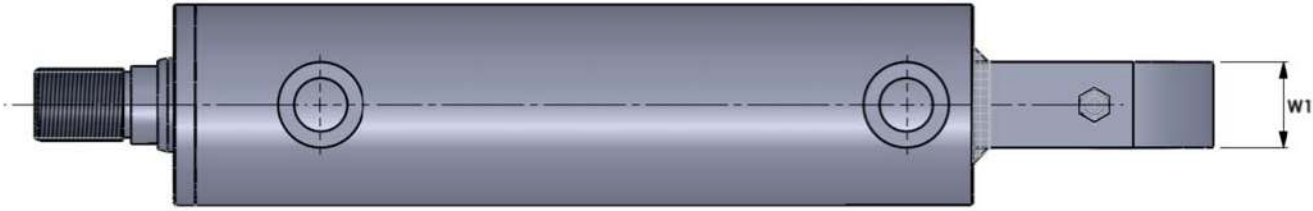
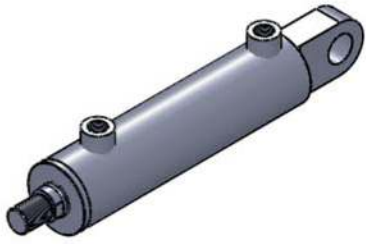


CYLBORE	L1	L2	W1	W2	DIA.	RAD.	THD.
25	36	19	16	32	12	17	M12 X 1.25P
32	38	19	20	40	14	17	M14 X 1.5P
40	54	32	30	60	20	29	M16 X 1.5P
50	60	32	30	60	20	29	M20 X 1.5P
63	75	39	40	80	28	34	M27 X 2P
80	99	54	50	100	36	50	M33 X 2P
100	113	57	60	120	45	53	M42 X 2P
125	126	63	70	126	56	59	M48 X 2P
160	168	83	80	160	70	78	M64 X 3P
200	168	83	80	160	70	78	M80 X 3P

CLEVIS BRACKET (SUPPLIED WITH PIN & CIRCLIPS)
 ZH-WCB



CYLBORE	D1	D2	H1	H2	L1	L2	W1	W2	W3	W4	RAD.
25	12	7	35	10	90	70	50	30	12	8	13
32	16	9	45	12	105	80	60	40	16	10	17
40	20	9	50	12	120	95	70	45	20	12	20
50	25	11	55	16	130	105	75	50	25	16	25
63	32	13	60	20	150	120	90	60	32	16	30
80	40	18	80	25	190	150	110	75	40	20	40
100	50	22	105	30	205	170	125	85	50	25	48
125	63	26	125	35	280	220	150	100	63	30	60
160	80	32	160	40	310	250	240	175	80	35	75
200	100	38	200	50	410	330	270	200	100	45	95
250	125	44	230	50	510	410	320	230	125	50	115

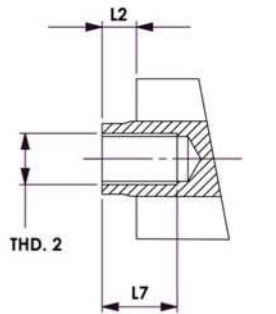


BORE DIA.	ROD DIA.	L1	L2	L3	L4	L5	L6	D1	D2	R1	W1	R	THD. 1	FEMALE THREAD DETAILS		
														ROD DIA.	THD. 2	L7
25	16	150	13	50	50	20	16	35	12	15	12	1/4"	M12 X 1.25P	16	M12 X 1.25P	20
32	20	175	13	55	55	30	18	42	16	20	16	1/4"	M14 X 1.5P	20	M16 X 1.5P	25
40	20 25	183	13	50	65	32	22	50	20	25	20	3/8"	M16 X 1.5P	25	M20 X 1.5P	30
50	25 35	235	14	63	80	38	28	60	25	28	25	3/8"	M20 X 1.5P	35	M27 X 2P	40
63	35 40	260	16	65	97	55	36	75	32	35	32	1/2"	M27 X 2P	40	M33 X 2P	50
80	40 60	270	18	70	100	60	45	92	40	50	40	1/2"	M33 X 2P	50	M42 X 2P	60
100	50 70	320	20	95	120	78	56	115	50	62	50	3/4"	M42 X 2P	60	M48 X 2P	70
125	70 90	395	23	105	165	95	63	145	63	66	63	3/4"	M48 X 2P	70	M52 X 2P	75
160	90 110	458	25	115	205	130	85	190	80	90	80	1"	M64 X 3P	90	M64 X 3P	90
200	110 140	535	30	160	235	150	95	230	100	125	100	1 1/4"	M80 X 3P	110	M80 X 3P	100
250	140 180	750	35	190	300	190	100	280	125	150	125	1 1/2"	M100 X 3P	140	M100 X 3P	120
														180	M125 X 4P	130

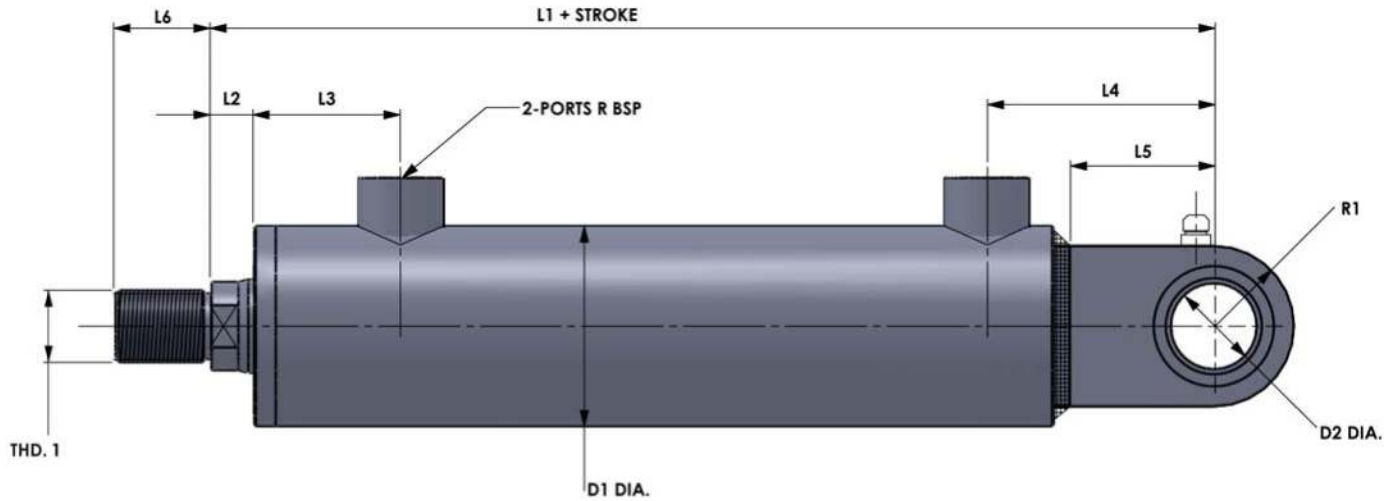
ZH-W CYLINDER MTG. STYLE A



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OPTIONAL FEMALE THREAD.

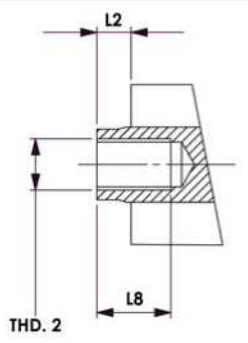
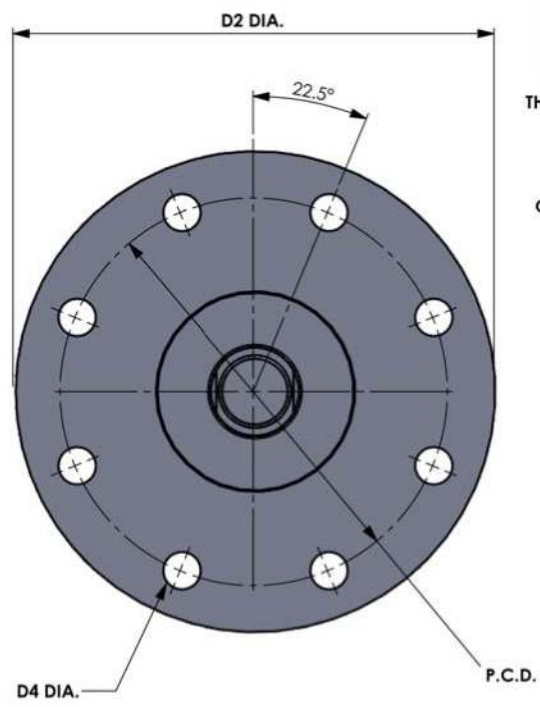
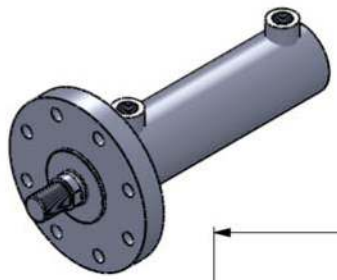


BORE DIA.	ROD DIA.	L1	L2	L3	L4	L5	L6	D1	D2	R1	W1	R	W2	THD. 1	FEMALE THREAD DETAILS		
															ROD DIA.	THD. 2	L6
25	16	150	13	50	50	20	16	35	12	15	10	1/4"	8	M12 X 1.25P	16	M12 X 1.25P	20
32	20	175	13	55	55	30	18	42	16	20	16	1/4"	14	M14 X 1.5P	20	M16 X 1.5P	25
40	20 25	183	13	50	65	32	22	50	20	25	20	3/8"	19	M16 X 1.5P	25	M20 X 1.5P	30
50	25 35	235	14	63	80	38	28	60	25	28	25	3/8"	23	M20 X 1.5P	35	M27 X 2P	40
63	30 40	260	16	65	97	55	36	75	32	35	32	1/2"	27	M27 X 2P	40	M33 X 2P	50
80	40 60	270	18	70	100	60	45	92	40	50	40	1/2"	35	M33 X 2P	50	M42 X 2P	60
100	50 70	320	20	95	120	78	56	115	50	62	50	3/4"	40	M42 X 2P	60	M48 X 2P	70
125	70 90	395	23	105	165	95	63	145	63	66	63	3/4"	52	M48 X 2P	70	M52 X 2P	75
160	90 110	458	25	115	205	130	85	190	80	90	80	1"	60	M64 X 3P	90	M64 X 3P	90
200	110 140	535	30	160	235	150	95	230	100	125	100	1 1/4"	70	M80 X 3P	110	M80 X 3P	100
250	140 180	750	35	190	300	190	100	280	125	150	125	1 1/2"	115	M100 X 3P	140	M100 X 3P	120
															180	M125 X 4P	130

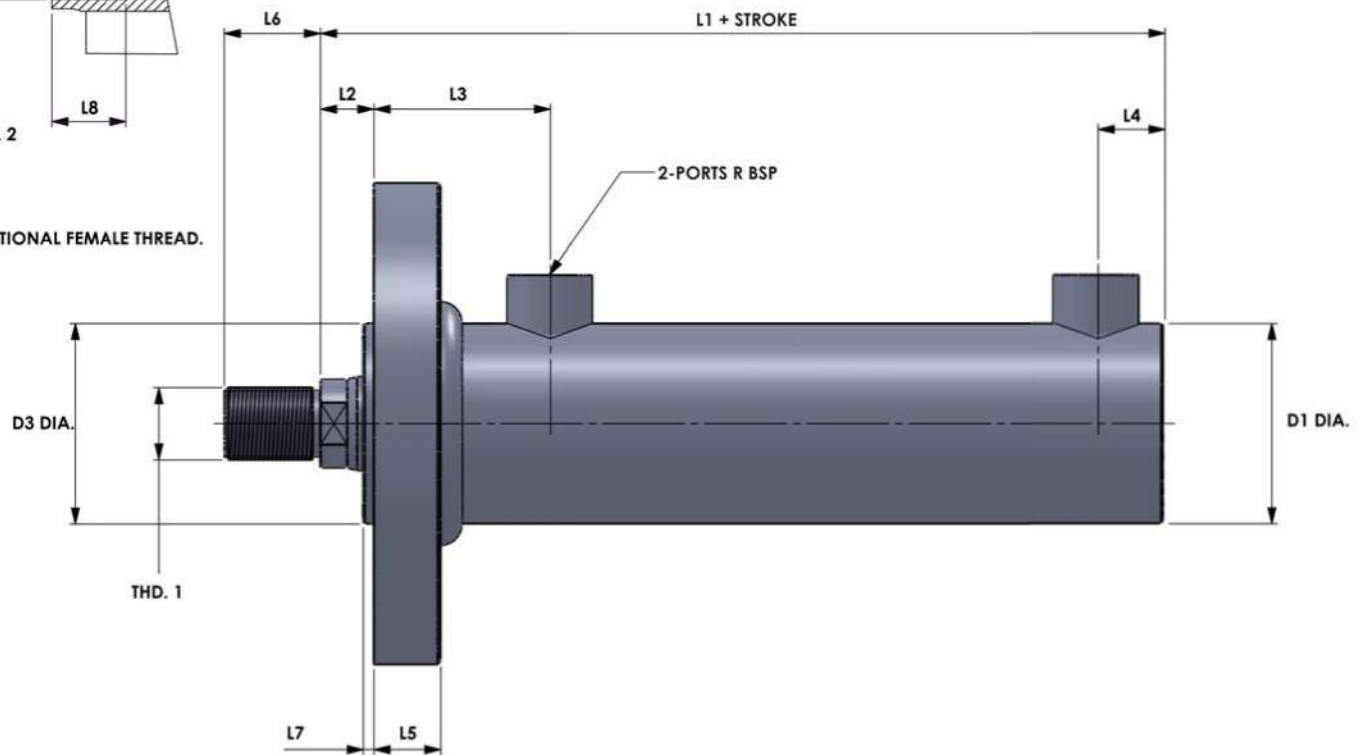
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OPTIONAL FEMALE THREAD.

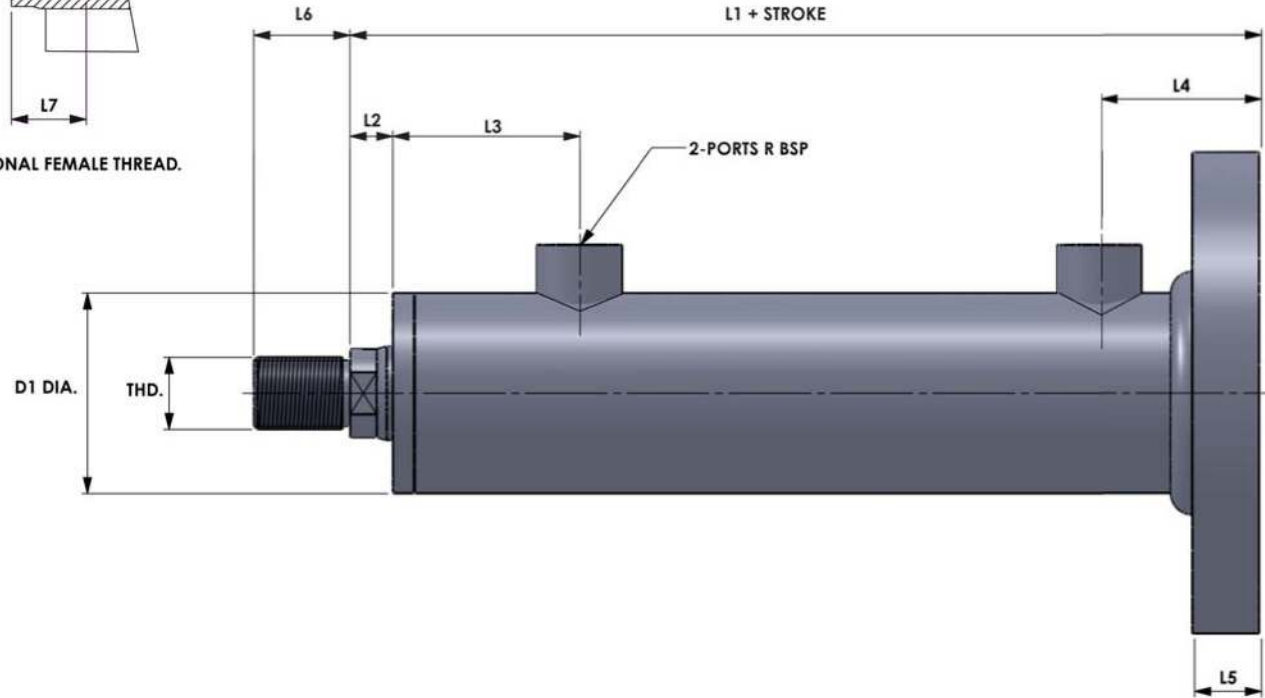
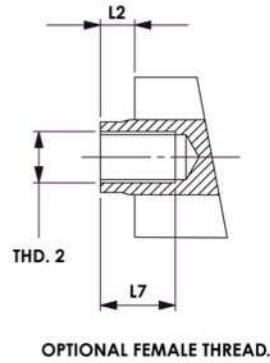
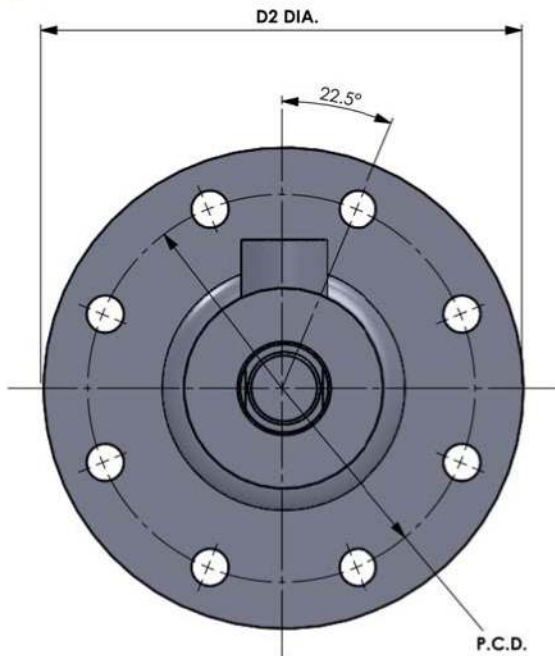
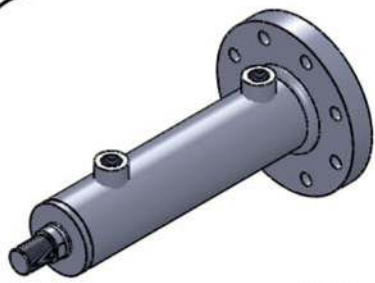


BORE DIA.	ROD DIA.	L1	L2	L3	L4	L5	L6	L7	D1	D2	D3	D4	PCD	R	THD. 1	FEMALE THREAD DETAILS		
																ROD DIA.	THD. 2	L8
25	16	123	16	47	23	15	16	3	35	95	32	7	75	1/4"	M12 X 1.25P	16	M12 X 1.25P	20
32	20	140	16	52	20	15	18	3	42	125	40	9	92	1/4"	M14 X 1.5P	20	M16 X 1.5P	25
40	20 25	142	16	47	27	20	22	3	50	130	48	9	106	3/8"	M16 X 1.5P	25	M20 X 1.5P	30
50	25 35	190	18	59	35	20	28	4	60	150	58	11	126	3/8"	M20 X 1.5P	35	M27 X 2P	40
63	30 40	185	20	61	32	25	36	4	75	180	70	14	145	1/2"	M27 X 2P	40	M33 X 2P	50
80	40 60	201	22	66	31	32	45	4	92	200	90	18	165	1/2"	M33 X 2P	50	M42 X 2P	60
100	50 70	232	25	90	32	32	56	5	115	250	110	22	200	3/4"	M42 X 2P	60	M48 X 2P	70
125	70 90	288	28	100	58	32	63	5	145	280	140	22	235	3/4"	M48 X 2P	70	M52 X 2P	75
160	90 110	317	30	110	64	40	85	5	190	330	175	22	280	1"	M64 X 3P	90	M64 X 3P	90
200	110 140	365	35	155	65	85	95	5	230	440	200	35	340	1 1/4"	M80 X 3P	110	M80 X 3P	100
250	140 180	550	40	190	100	100	100	5	280	500	250	40	420	1 1/2"	M100 X 3P	140	M100 X 3P	120
																180	M125 X 4P	130

ZH-W CYLINDER MTG. STYLE C




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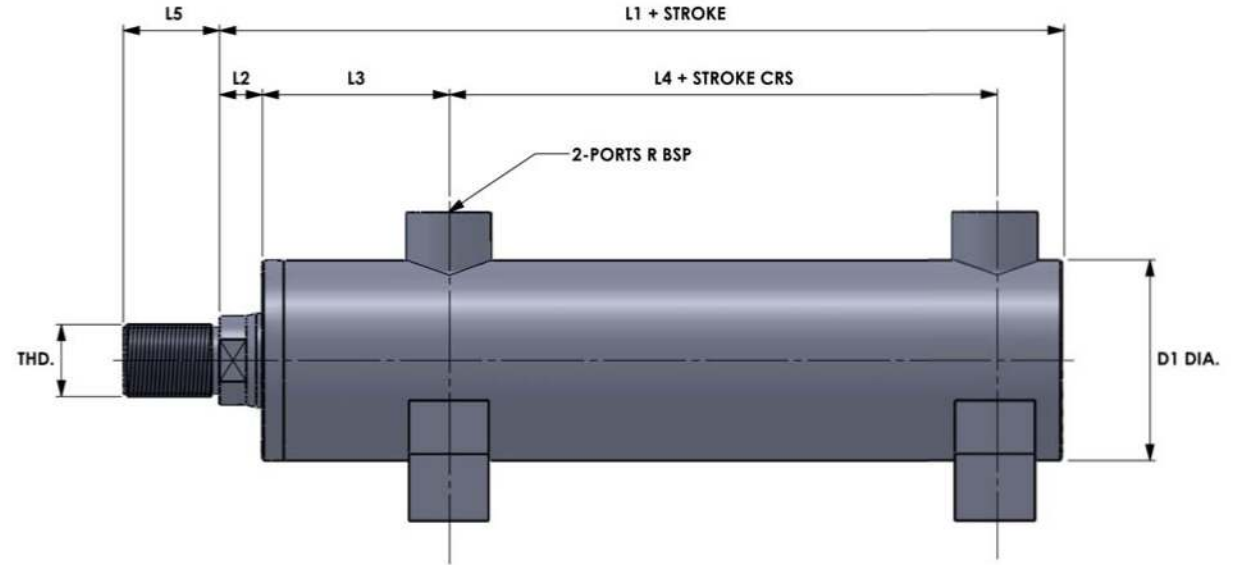
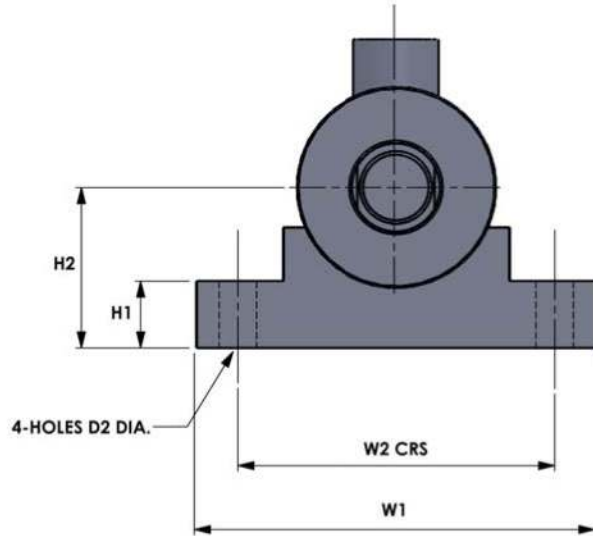
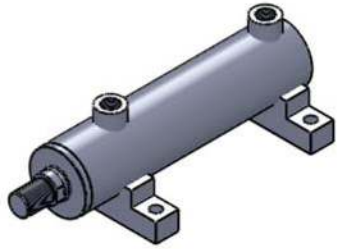


BORE DIA.	ROD DIA.	L1	L2	L3	L4	L5	L6	D1	D2	D3	PCD	R	THD. 1	FEMALE THREAD DETAILS		
														ROD DIA.	THD. 2	L7
25	16	138	13	50	38	15	16	35	95	7	75	1/4"	M12 X 1.25P	16	M12 X 1.25P	20
32	20	155	13	55	35	15	18	42	125	9	92	1/4"	M14 X 1.5P	20	M16 X 1.5P	25
40	20 25	162	13	50	47	20	22	50	130	11	106	3/8"	M16 X 1.5P	25	M20 X 1.5P	30
50	25 35	210	14	63	55	20	28	60	150	11	126	3/8"	M20 X 1.5P	35	M27 X 2P	40
63	30 40	210	16	65	57	25	36	75	180	14	145	1/2"	M27 X 2P	40	M33 X 2P	50
80	40 60	233	18	70	63	32	45	92	200	18	165	1/2"	M33 X 2P	50	M42 X 2P	60
100	50 70	264	20	95	64	32	56	115	250	22	200	3/4"	M42 X 2P	60	M48 X 2P	70
125	70 90	320	23	105	90	32	63	145	280	22	235	3/4"	M48 X 2P	70	M52 X 2P	75
160	90 110	357	25	115	104	40	85	190	330	26	280	1"	M64 X 3P	90	M64 X 3P	90
200	110 140	450	30	160	150	85	95	230	440	35	340	1 1/4"	M80 X 3P	110	M80 X 3P	100
250	140 180	650	35	195	200	100	100	280	500	40	420	1 1/2"	M100 X 3P	140	M100 X 3P	120
														180	M125 X 4P	130

ZH-W CYLINDER MTG. STYLE D



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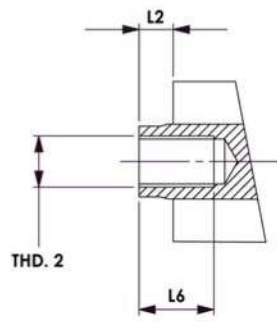
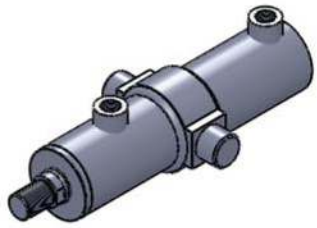
**CYLINDER MAXIMUM WORKING PRESSURE : 250 BAR.
STANDARD FINISH : SATIN BLACK ENAMEL.
SEE ORDER SHEET FOR OPTIONS.**

BORE DIA.	ROD DIA.	L1	L2	L3	L4	L5	H1	H2	D1	D2	W1	W2	W3	R	THD.
25	16	123	13	50	37	16	10	25	35	7	65	50	20	1/4"	M12 X 1.25P
32	20	140	13	55	49	18	14	30	42	9	75	60	20	1/4"	M14 X 1.5P
40	20 25	142	13	50	55	22	16	35	50	11	95	70	25	3/8"	M16 X 1.5P
50	25 35	190	14	63	78	28	18	45	60	11	120	90	25	3/8"	M20 X 1.5P
63	30 40	185	16	65	82	36	23	55	75	14	145	110	30	1/2"	M27 X 2P
80	40 60	201	18	70	82	45	28	70	92	18	175	135	35	1/2"	M33 X 2P
100	50 70	232	20	95	35	56	35	80	115	22	205	155	40	3/4"	M42 X 2P
125	70 90	288	23	105	102	63	40	90	145	22	240	190	40	3/4"	M48 X 2P
160	90 110	317	25	115	113	85	55	115	190	26	320	260	45	1"	M64 X 3P
200	110 140	365	30	160	110	95	65	150	230	35	370	300	60	1 1/4"	M80 X 3P
250	140 180	550	35	190	225	100	75	180	280	38	435	355	70	1 1/2"	M100 X 3P

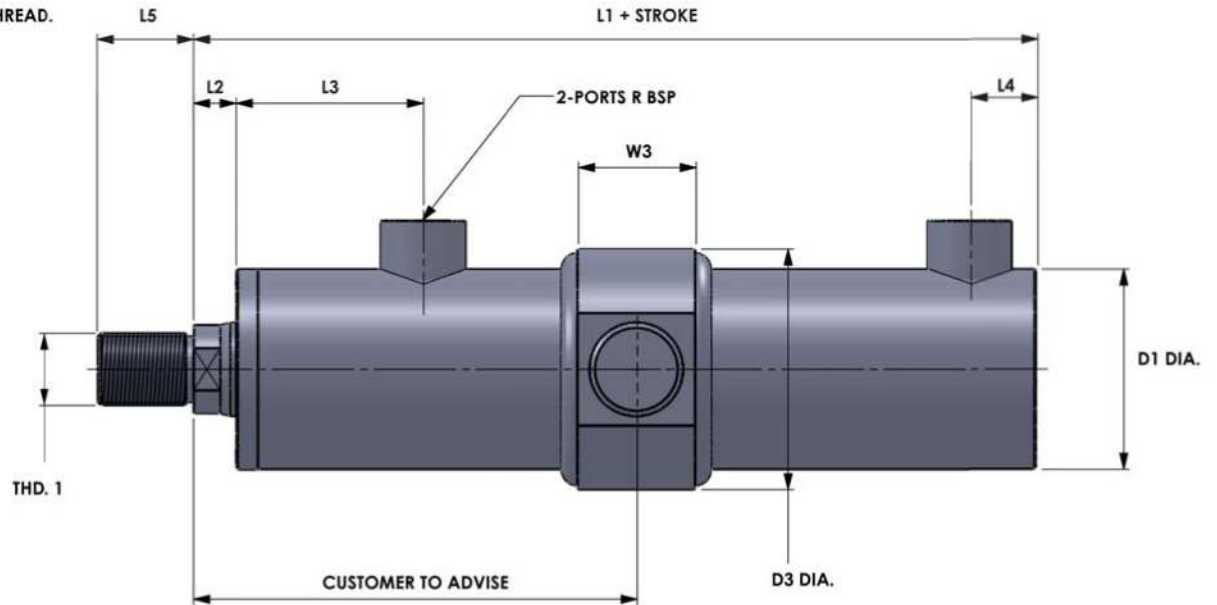
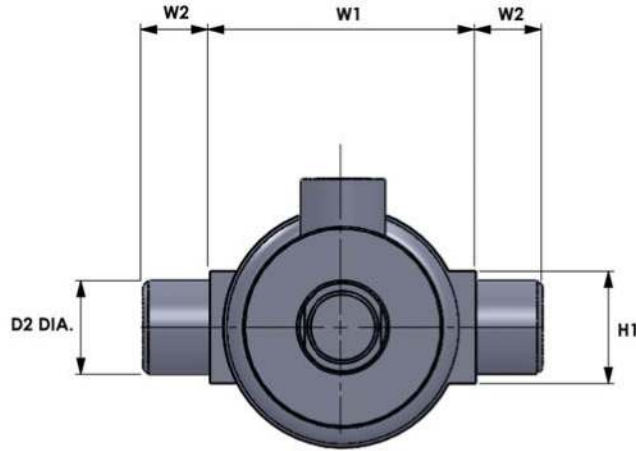
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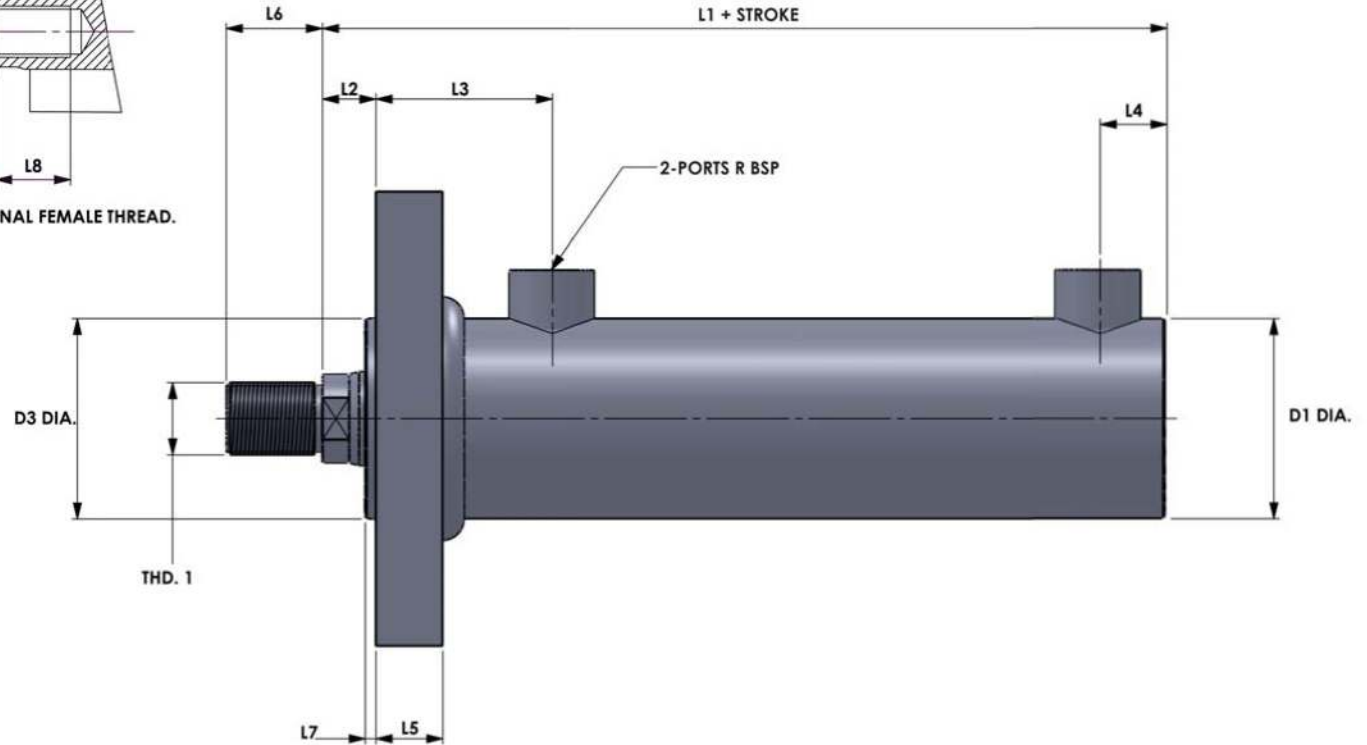
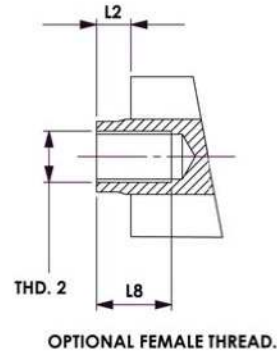
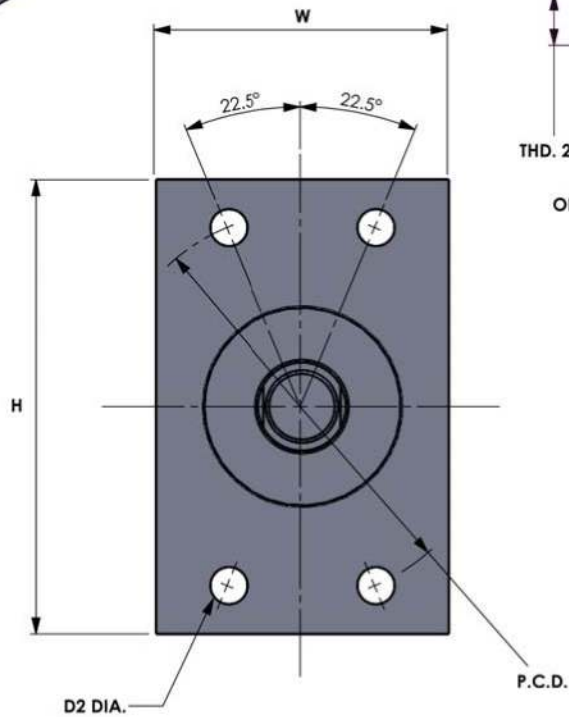
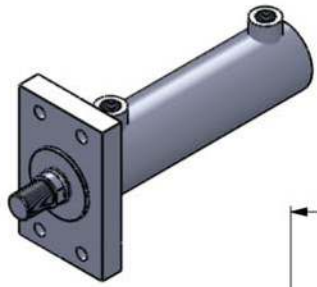


BORE DIA.	ROD DIA.	L1	L2	L3	L4	L5	H1	D1	D2	D3	W1	W2	W3	R	THD. 1	FEMALE THREAD DETAILS		
																ROD DIA.	THD. 2	L6
25	16	123	13	50	23	16	20	35	12	45	45	10	20	1/4"	M12 X 1.25P	16	M12 X 1.25P	20
32	20	140	13	55	20	18	24	42	16	55	55	12	25	1/4"	M14 X 1.5P	20	M16 X 1.5P	25
40	20 25	145	13	50	27	22	27	50	25	65	65	15	29	3/8"	M16 X 1.5P	25	M20 X 1.5P	30
50	25 35	190	14	63	35	28	32	60	30	75	75	20	34	3/8"	M20 X 1.5P	35	M27 X 2P	40
63	30 40	195	16	65	32	36	42	75	35	100	100	25	44	1/2"	M27 X 2P	40	M33 X 2P	50
80	40 60	201	18	70	31	45	56	92	45	120	120	35	58	1/2"	M33 X 2P	50	M42 X 2P	60
100	50 70	232	20	95	32	56	66	115	50	145	145	40	68	3/4"	M42 X 2P	60	M48 X 2P	70
125	70 90	288	23	105	58	75	75	145	63	180	180	50	75	3/4"	M48 X 2P	70	M52 X 2P	75
160	90 110	317	25	115	64	95	95	190	80	240	240	65	100	1"	M64 X 3P	90	M64 X 3P	90
200	110 140	365	30	160	65	95	120	230	100	290	290	80	120	1 1/4"	M80 X 3P	110	M80 X 3P	100
250	140 180	550	35	195	100	100	140	280	125	330	350	100	140	1 1/2"	M100 X 3P	140	M100 X 3P	120
																180	M125 X 4P	130

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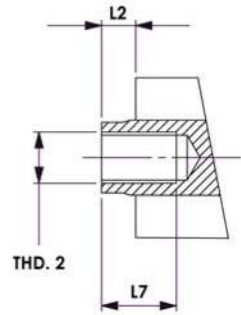
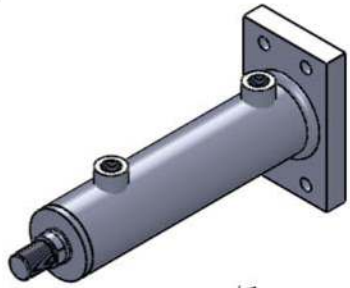


BORE DIA.	ROD DIA.	L1	L2	L3	L4	L5	L6	L7	D1	D2	D3	H	PCD	R	W	THD. 1	FEMALE THREAD DETAILS			
																	ROD DIA.	THD. 2	L8	
25	16	123	16	47	23	15	16	3	35	7	32	90	75	1/4"	50	M12 X 1.25P	16	M12 X 1.25P	20	
32	20	140	16	52	20	15	18	3	42	9	40	110	92	1/4"	60	M14 X 1.5P	20	M16 X 1.5P	25	
40	20 25	142	16	47	27	20	22	3	50	11	48	120	106	3/8"	70	M16 X 1.5P	25	M20 X 1.5P	30	
50	25 35	190	18	59	35	20	28	4	60	11	58	140	126	3/8"	90	M20 X 1.5P	35	M27 X 2P	40	
63	30 40	185	20	61	32	25	36	4	75	14	70	170	145	1/2"	110	M27 X 2P	40	M33 X 2P	50	
80	40 60	201	22	66	31	32	45	4	92	18	90	200	165	1/2"	120	M33 X 2P	50	M42 X 2P	60	
100	50 70	232	25	90	32	32	56	5	115	22	110	240	200	3/4"	150	M42 X 2P	60	M48 X 2P	70	
125	70 90	288	28	100	58	32	63	5	145	22	140	280	235	3/4"	180	M48 X 2P	70	M52 X 2P	75	
160	90 110	317	30	110	64	40	85	5	190	26	175	370	280	1"	220	M64 X 3P	90	M64 X 3P	90	
200	110 140	365	35	155	65	85	95	5	230	35	200	400	340	1 1/4"	260	M80 X 3P	110	M80 X 3P	100	
250	140 180	550	40	190	100	100	100	5	280	40	250	500	420	1 1/2"	310	M100 X 3P	140	M100 X 3P	120	
																		180	M125 X 4P	130

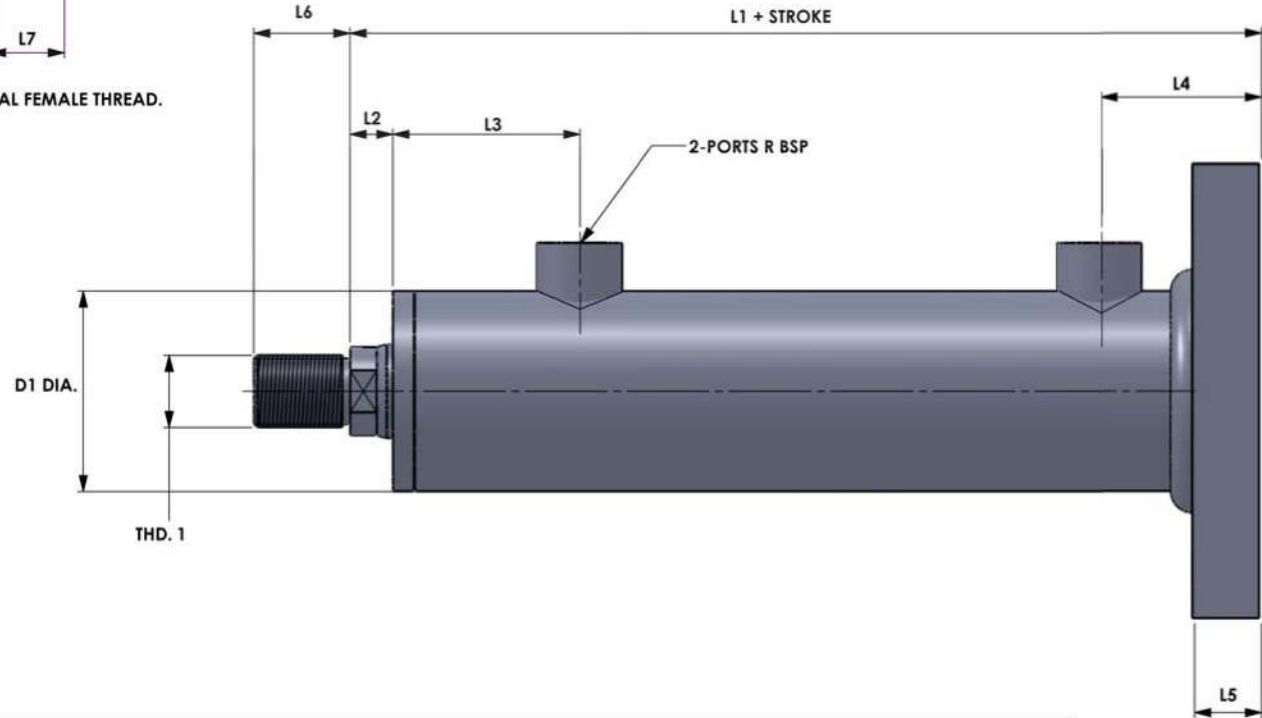
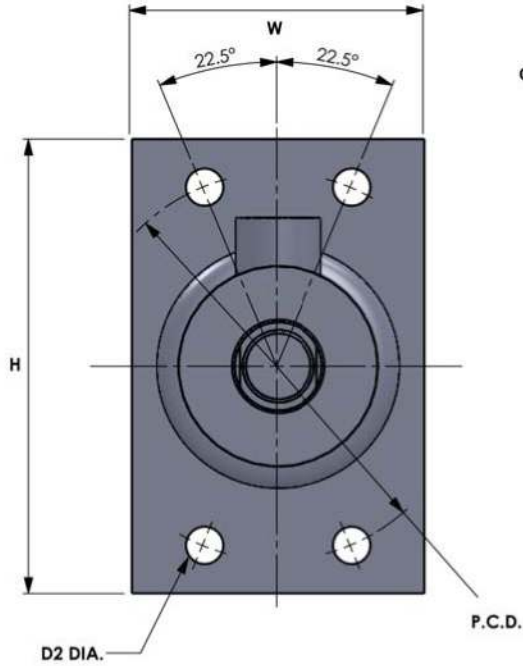
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BORE DIA.	ROD DIA.	L1	L2	L3	L4	L5	L6	D1	D2	H	PCD	R	W	THD. 1	FEMALE THREAD DETAILS		
															ROD DIA.	THD. 2	L7
25	16	138	13	50	38	15	16	35	7	90	75	1/4"	50	M12 X 1.25P	16	M12 X 1.25P	20
32	20	155	13	55	35	15	18	42	9	110	92	1/4"	60	M14 X 1.5P	20	M16 X 1.5P	25
40	20 25	162	13	50	47	20	22	50	11	120	106	3/8"	70	M16 X 1.5P	25	M20 X 1.5P	30
50	25 35	210	14	63	55	20	28	60	11	140	126	3/8"	90	M20 X 1.5P	35	M27 X 2P	40
63	30 40	210	16	65	57	25	36	75	14	170	145	1/2"	110	M27 X 2P	40	M33 X 2P	50
80	40 60	233	18	70	63	32	45	92	18	200	165	1/2"	120	M33 X 2P	50	M42 X 2P	60
100	50 70	264	20	95	64	32	56	115	22	240	200	3/4"	150	M42 X 2P	60	M48 X 2P	70
125	70 90	320	23	105	90	32	63	145	22	280	235	3/4"	180	M48 X 2P	70	M52 X 2P	75
160	90 110	357	25	115	104	40	85	190	26	370	280	1"	220	M64 X 3P	90	M64 X 3P	90
200	110 140	450	30	160	150	85	95	230	35	400	340	1 1/4"	260	M80 X 3P	110	M80 X 3P	100
250	140 180	650	35	195	200	100	100	280	40	500	420	1 1/2"	310	M100 X 3P	140	M100 X 3P	120
															180	M125 X 4P	130

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