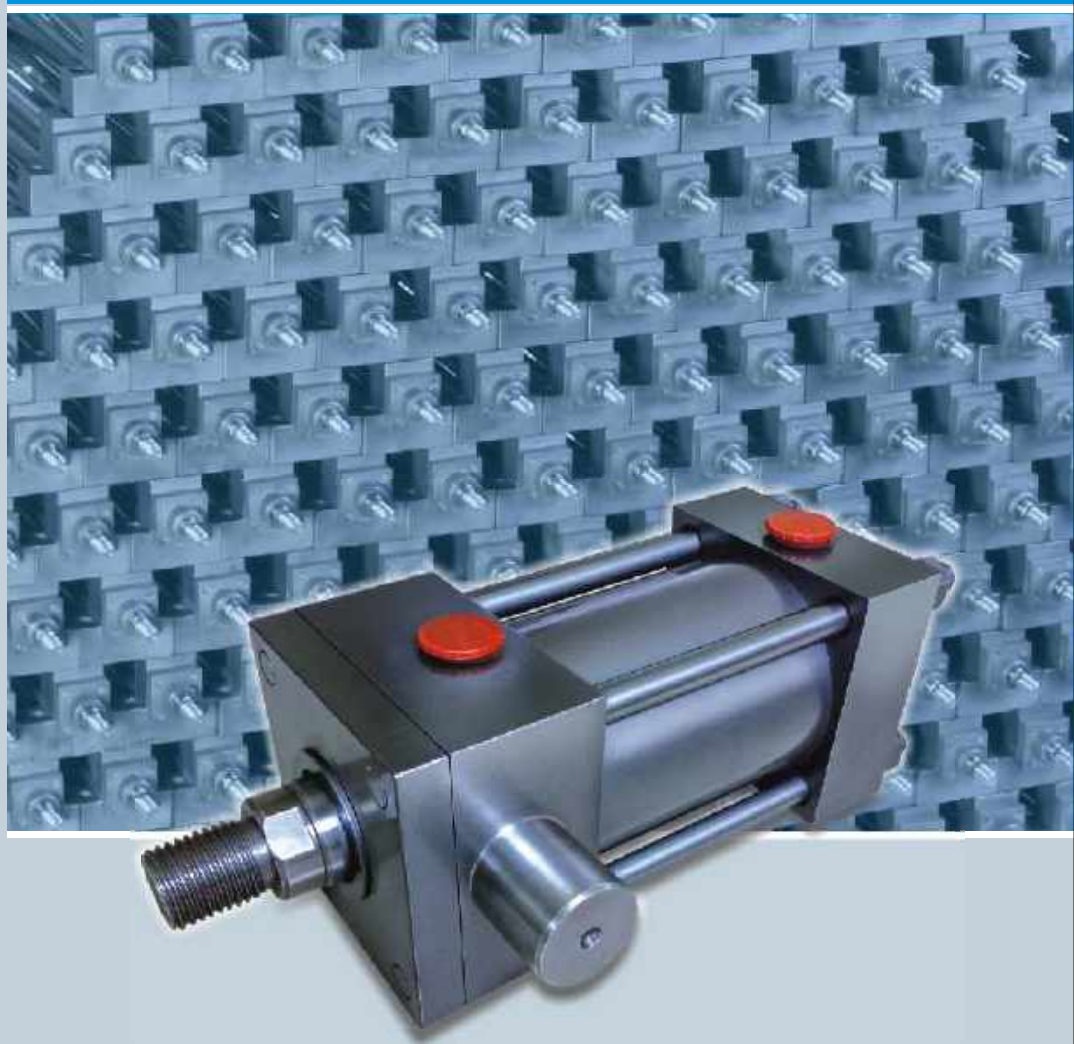


Hydraulic Cylinders



Simplifying technology, redefining value.

Proven expertise in Hydraulics

Dutta is an established and reputed brand of Hydraulic and Pneumatic products of various types for the past 15 years. Our wide range of product offerings include hydraulic cylinders, pneumatic cylinders, air filter- regulator-lubricator units, connectors, solenoid valves and hydro-pneumatic pumps.

Dutta hydraulic cylinders are designed to suit five pressure ranges from 50 bar to 320bar. They are available in bore size from 25mm to 300mm, and stroke length up to 3000mm.

Beside supplying standard hydraulic cylinders from our wide range, we specialize in designing and manufacturing cylinders as per customers, specific requirements.

A few facts about us

- Innovative technology
- Patented products
- Customized solutions
- Quality at par with international standards
- In-house Research and Development
- Integrated manufacturing set up
- Specially developed, cost-effective manufacturing technology
- Efficient service through nationwide network

A range of Hydraulic Cylinders

H50 Series



AJ Series



UN Series



XN Series



H200 Series



EN Series



H250 Series



JN Series



H320 Series



VN & WN Series



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Rear Flange Mounting
Tierod Extended Mounting
Rear Eye Mounting
Rear Clevis Mounting
Side Lugs Mounting
Front Trunnion Mounting
Rear Trunnion Mounting
Intermediate Trunnion Mounting

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Cap Rectangular Flange
Head Trunnion Mounting
Cap Trunnion Mounting
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Flange and Side Lugs Mounting
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H50 Series



Cylinder selection guide

Operating pressure at kg/sq. cm				Theoretical forces (at mechanical efficiency = 100%)							
				15		25		35		50	
Piston dia mm	Rod dia mm	Piston area sq. cm	Rod area sq. cm	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf
40	16	12.57	2.01	188.52	158.36	314.2	263.93	439.88	369.50	628.4	527.86
50	16	19.64	2.01	294.56	264.40	490.94	440.67	687.31	616.93	981.875	881.33
63	25	31.18	4.91	467.65	394.01	779.41	656.68	1091.18	919.35	1558.82	1313.36
80	25	50.27	4.91	754.08	680.44	1256.8	1134.07	1759.52	1587.69	2513.6	2268.13
100	35	78.55	9.62	1178.25	1033.91	1963.75	1723.19	2749.25	2412.47	3927.5	3446.38
125	45	122.73	15.91	1841.02	1602.42	3068.36	2670.7	4295.70	3738.98	6136.72	5341.4
150	45	176.74	15.91	2651.06	2412.47	4418.44	4020.78	6185.81	5629.09	8836.88	8041.56

Ordering details of H50 series hydraulic cylinders

H50			
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Series _____

Cylinder bore _____

Stroke length _____

Mounting style _____

Refer to dimension charts for code

Example

H50 series hydraulic cylinder with bore 50mm, stroke 100mm, mounting front flange will be specified as

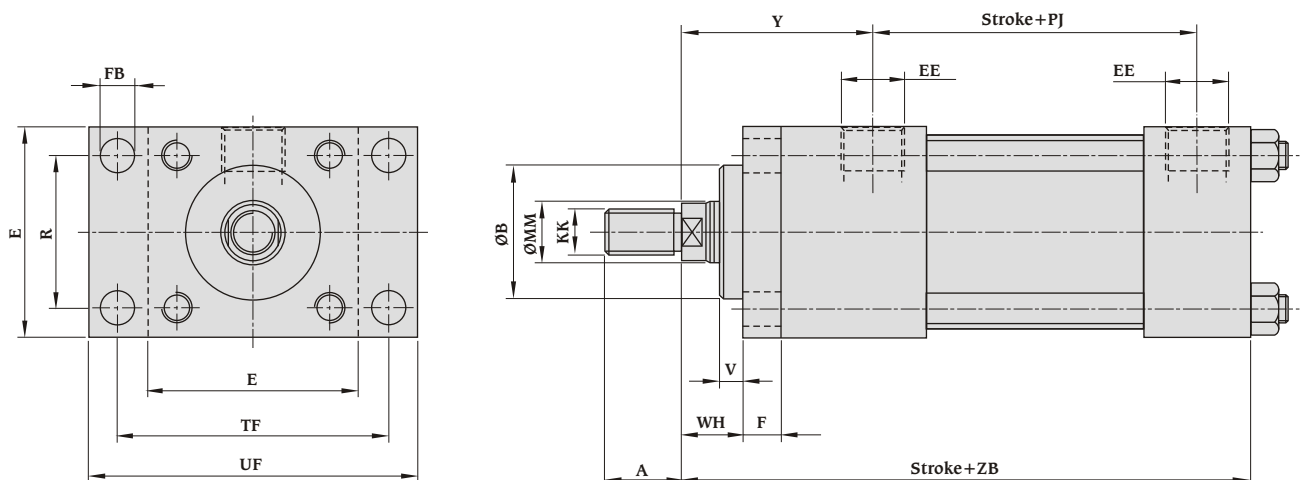
H50	50	100	FF	
-----	----	-----	----	--

All dimensions are in millimeters unless otherwise stated.

Features and specifications

- 9 Standard mounting styles
- Bore sizes : 40mm to 150mm
- Piston rods : 16mm to 45mm
- Strokes : available in any practical stroke length
- Maximum working pressure 50 bar
- Single rod designs
- Non-cushioned
- Temperature range : -20°C to +80°C (standard)
- Standard fluid : Mineral oil, DIN 51524 (HL, HLP)

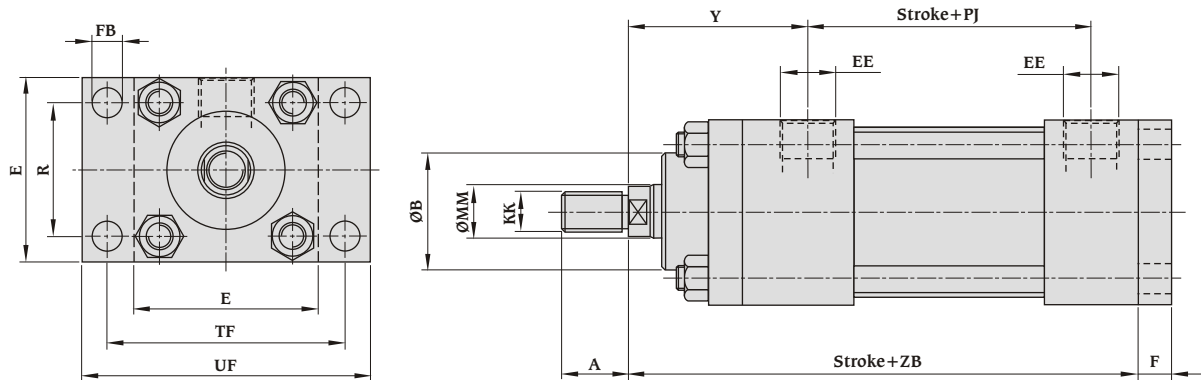
Mounting style Front flange (FF)



Bore	A	B	E	EE	F	FB	KK	MM	PJ	R	TF	UF	V	WH	Y	ZB
Ø40	20	28	54	3/8"BSP	10	7	M12x1.25P	16	67	36	70	86	6	16	54	134
Ø50	20	28	63	3/8"BSP	10	9	M12x1.25P	16	67	46	86	105	6	16	54	134
Ø63	28	38	76	3/8"BSP	12	9	M20x1.5P	25	70	56	98	117	8	21	63	146
Ø80	28	38	95	1/2"BSP	16	11	M20x1.5P	25	83	70	119	142	6	21	68	167
Ø100	40	50	114	1/2"BSP	16	13	M27x2P	35	85	85	138	164	6	25	73	174
Ø125	50	60	140	1/2"BSP	18	13	M33x2P	45	87	104	168	194	10	29	79	182
Ø150	50	60	165	3/4"BSP	20	17	M33x2P	45	99	125	198	230	10	29	82	200

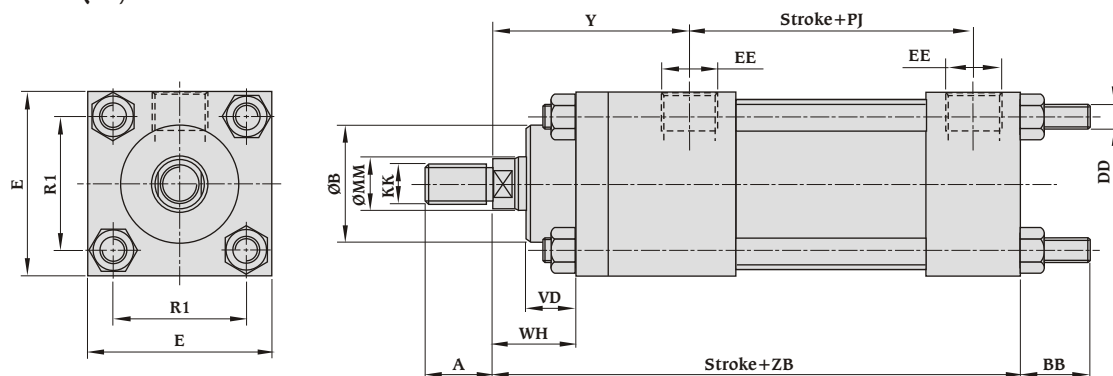
All dimensions are in millimeters unless otherwise stated.

Mounting style Rear flange (RF)



Bore	A	B	E	EE	F	FB	KK	MM	PJ	R	TF	UF	Y	ZB
Ø40	20	28	54	3/8"BSP	10	7	M12x1.25P	16	67	36	70	86	54	134
Ø50	20	28	63	3/8"BSP	10	9	M12x1.25P	16	67	46	86	105	54	134
Ø63	28	38	76	3/8"BSP	12	9	M20x1.5P	25	70	56	98	117	63	146
Ø80	28	38	95	1/2"BSP	16	11	M20x1.5P	25	83	70	119	142	68	167
Ø100	40	50	114	1/2"BSP	16	13	M27x2P	35	85	85	138	164	73	174
Ø125	50	60	140	1/2"BSP	18	13	M33x2P	45	87	104	168	194	79	182
Ø150	50	60	165	3/4"BSP	20	17	M33x2P	45	99	125	198	230	82	200

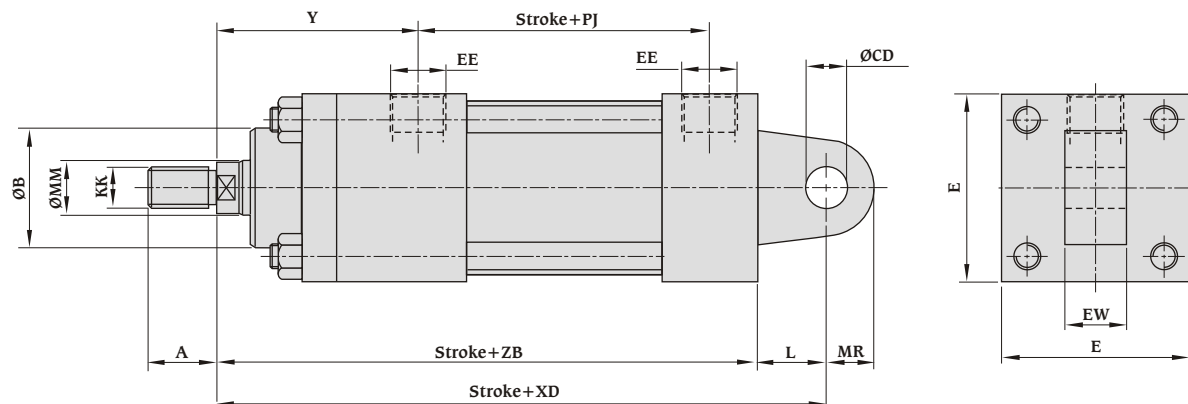
Mounting style Tie rod extended (TE)



Bore	A	B	BB	DD	E	EE	KK	MM	PJ	R1	VD	WH	Y	ZB
Ø40	20	28	25	M6x1P	54	3/8"BSP	M12x1.25P	16	67	40	6	16	54	134
Ø50	20	28	28	M8x1.25P	63	3/8"BSP	M12x1.25P	16	67	48	6	16	54	134
Ø63	28	38	28	M8x1.25P	76	3/8"BSP	M20x1.5P	25	70	58	8	21	63	146
Ø80	28	38	35	M10x1.5P	95	1/2"BSP	M20x1.5P	25	83	74	6	21	68	167
Ø100	40	50	45	M12x1.75P	114	1/2"BSP	M27x2P	35	85	81	6	25	73	174
Ø125	50	60	45	M12x1.75P	140	1/2"BSP	M33x2P	45	87	110	10	29	79	182
Ø150	50	60	55	M16x2P	165	3/4"BSP	M33x2P	45	99	130	10	29	82	200

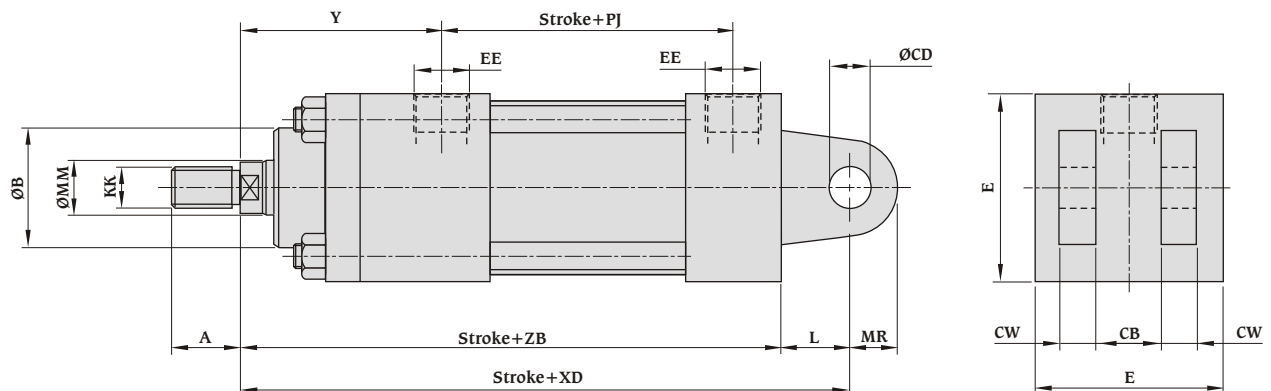
All dimensions are in millimeters unless otherwise stated.

Mounting style Rear eye (RP 3)



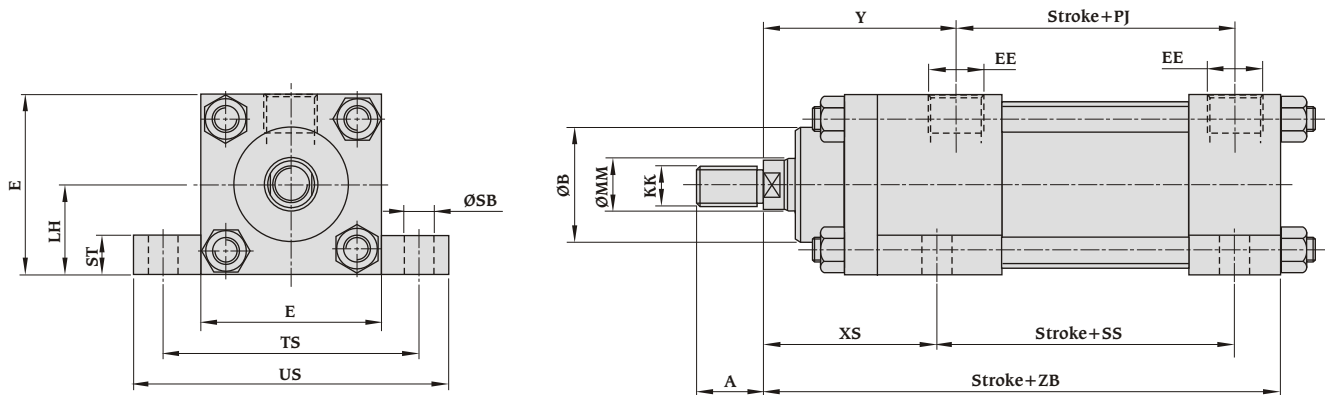
Bore	A	B	CD	E	EE	EW	KK	L	MM	MR	PJ	XD	Y	ZB
Ø40	20	28	12	54	3/8"BSP	19	M12x1.25P	19	16	16	67	153	54	134
Ø50	20	28	12	63	3/8"BSP	19	M12x1.25P	19	16	16	67	153	54	134
Ø63	28	38	12	76	3/8"BSP	19	M20x1.5P	19	25	16	70	165	63	146
Ø80	28	38	20	95	1/2"BSP	32	M20x1.5P	32	25	24	83	199	68	167
Ø100	40	50	20	114	1/2"BSP	32	M27x2P	32	35	24	85	206	73	174
Ø125	50	60	20	140	1/2"BSP	32	M33x2P	32	45	24	87	214	79	182
Ø150	50	60	25	165	3/4"BSP	38	M33x2P	38	45	30	99	238	82	200

Mounting style Rear clevis (RP 1)

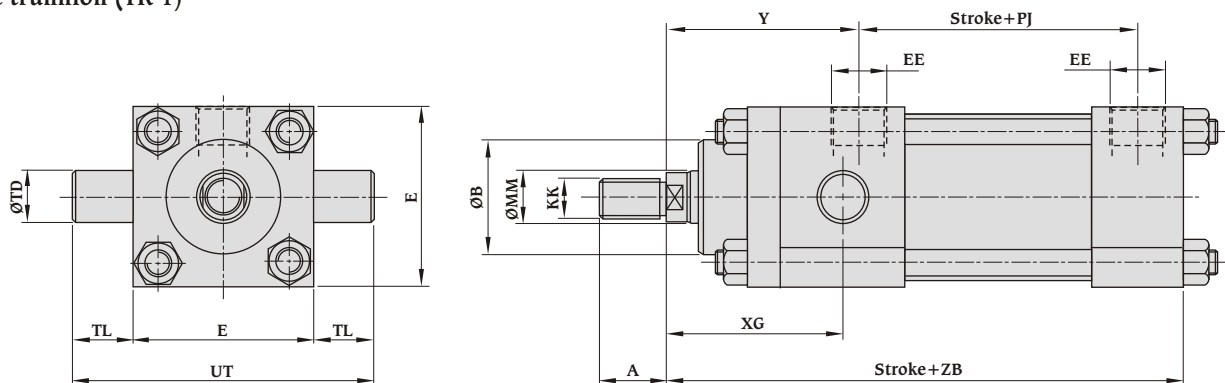


Bore	A	B	CB	CD	CW	E	EE	KK	L	MM	MR	PJ	XD	Y	ZB
Ø40	20	28	19	12	12	54	3/8"BSP	M12x1.25P	19	16	16	67	153	54	134
Ø50	20	28	19	12	12	63	3/8"BSP	M12x1.25P	19	16	16	67	153	54	134
Ø63	28	38	19	12	12	76	3/8"BSP	M20x1.5P	19	25	16	70	165	63	146
Ø80	28	38	32	20	16	95	1/2"BSP	M20x1.5P	32	25	24	83	199	68	167
Ø100	40	50	32	20	16	114	1/2"BSP	M27x2P	32	35	24	85	206	73	174
Ø125	50	60	32	20	16	140	1/2"BSP	M33x2P	32	45	24	87	214	79	182
Ø150	50	60	38	25	20	165	3/4"BSP	M33x2P	38	45	30	99	238	82	200

All dimensions are in millimeters unless otherwise stated.

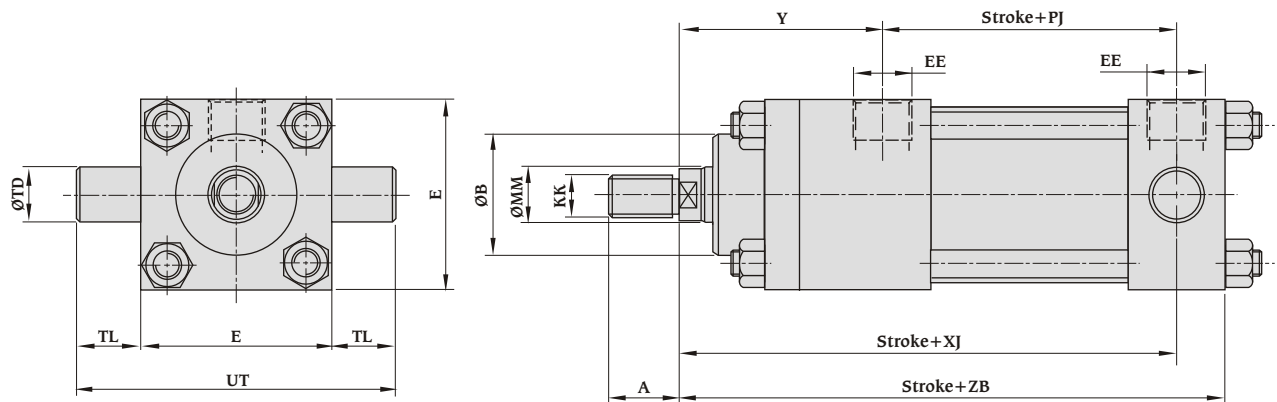
Mounting style
Side lug (SL)


Bore	A	B	E	EE	KK	LH	MM	PJ	SB	SS	ST	TS	US	XS	Y	ZB
Ø40	20	28	54	3/8"BSP	M12x1.25P	27	16	67	11	76	13	74	94	46	54	134
Ø50	20	28	63	3/8"BSP	M12x1.25P	31.5	16	67	11	76	13	83	103	46	54	134
Ø63	28	38	76	3/8"BSP	M20x1.5P	38	25	70	11	80	13	95	114	54	63	146
Ø80	28	38	95	1/2"BSP	M20x1.5P	47.5	25	83	13	91	20	121	147	60	68	167
Ø100	40	50	114	1/2"BSP	M27x2P	57	35	85	13	93	20	140	165	65	73	174
Ø125	50	60	140	1/2"BSP	M33x2P	70	45	87	17	95	25	175	210	71	79	182
Ø150	50	60	165	3/4"BSP	M33x2P	82.5	45	99	21	105	25	205	245	76	82	200

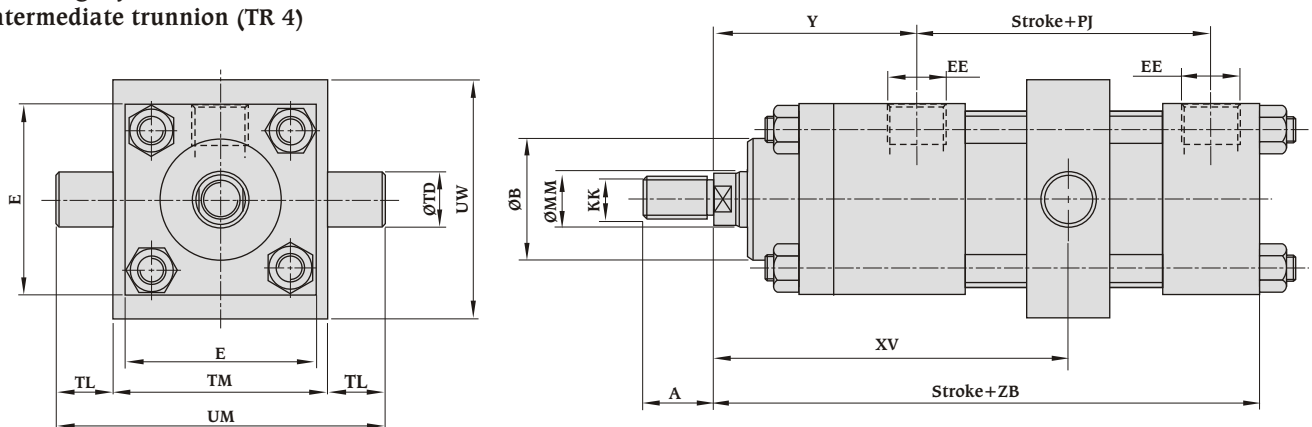
Mounting style
Front trunnion (TR 1)


Bore	A	B	E	EE	KK	MM	PJ	TD	TL	UT	XG	Y	ZB
Ø40	20	28	54	3/8"BSP	M12x1.25P	16	67	16	16	86	46	54	134
Ø50	20	28	63	3/8"BSP	M12x1.25P	16	67	20	20	103	46	54	134
Ø63	28	38	76	3/8"BSP	M20x1.5P	25	70	20	20	116	54	63	146
Ø80	28	38	95	1/2"BSP	M20x1.5P	25	83	25	25	145	60	68	167
Ø100	40	50	114	1/2"BSP	M27x2P	35	85	25	25	164	65	73	174
Ø125	50	60	140	1/2"BSP	M33x2P	45	87	28	28	196	71	79	182
Ø150	50	60	165	3/4"BSP	M33x2P	45	99	30	30	225	76	82	200

All dimensions are in millimeters unless otherwise stated.

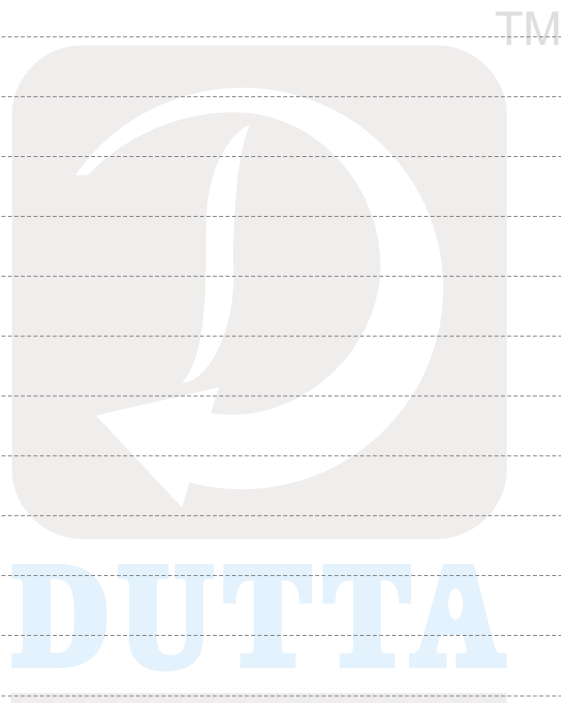
Mounting style**Rear trunnion (TR 2)**

Bore	A	B	E	EE	KK	MM	PJ	TD	TL	UT	XJ	Y	ZB
Ø40	20	28	54	3/8"BSP	M12x1.25P	16	67	16	16	86	122	54	134
Ø50	20	28	63	3/8"BSP	M12x1.25P	16	67	20	20	103	122	54	134
Ø63	28	38	76	3/8"BSP	M20x1.5P	25	70	20	20	116	134	63	146
Ø80	28	38	95	1/2"BSP	M20x1.5P	25	83	25	25	145	151	68	167
Ø100	40	50	114	1/2"BSP	M27x2P	35	85	25	25	164	158	73	174
Ø125	50	60	140	1/2"BSP	M33x2P	45	87	28	28	196	166	79	182
Ø150	50	60	165	3/4"BSP	M33x2P	45	99	30	30	225	181	82	200

Mounting style**Intermediate trunnion (TR 4)**

Bore	A	B	E	EE	KK	MM	PJ	TD	TL	TM	UM	UW	XV	Y	ZB
Ø40	20	28	54	3/8"BSP	M12x1.25P	16	67	16	16	63	95	63	Dimensions to be specified by customer	54	134
Ø50	20	28	63	3/8"BSP	M12x1.25P	16	67	20	20	76	116	76		54	134
Ø63	28	38	76	3/8"BSP	M20x1.5P	25	70	20	20	89	129	89		63	146
Ø80	28	38	95	1/2"BSP	M20x1.5P	25	83	25	25	114	164	114		68	167
Ø100	40	50	114	1/2"BSP	M27x2P	35	85	25	25	128	178	128		73	174
Ø125	50	60	140	1/2"BSP	M33x2P	45	87	28	28	158	214	158		79	182
Ø150	50	60	165	3/4"BSP	M33x2P	45	99	30	30	194	254	194		82	200

All dimensions are in millimeters unless otherwise stated.



EN Series



Cylinder selection guide

Operating pressure at kg/sq. cm				Theoretical forces (at mechanical efficiency = 100%)							
				50		80		100		160	
Piston dia mm	Rod dia mm	Piston area sq. cm	Rod area sq. cm	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf
25	16	4.91	2.01	245.47	144.92	392.75	231.88	490.94	289.85	785.5	463.76
32	20	8.04	3.14	402.18	245.08	643.48	392.12	804.35	490.15	1286.96	784.24
40	18	12.57	2.55	628.4	501.15	1005.44	801.84	1256.8	1002.30	2010.88	1603.68
	25		4.91		382.93		612.69		765.86		1225.38
50	25	19.64	4.91	981.88	736.41	1571	1178.25	1963.75	1472.81	3142	2356.5
	35		9.62		500.76		801.21		1001.51		1602.42
63	35	31.18	9.62	1558.82	1077.71	2494.12	1724.33	3117.65	2155.41	4988.24	3448.66
	45		15.91		763.51		1221.61		1527.01		2443.22
80	45	50.27	15.91	2513.6	1718.28	4021.76	2749.25	5027.2	3436.56	8043.52	5498.5
	56		24.63		1281.94		2051.10		2563.87		4102.20
100	45	78.55	15.91	3927.5	3132.18	6284	5011.49	7855	6264.36	12568	10022.98
	70		38.49		2003.03		3204.84		4006.05		6409.68
125	56	122.73	24.63	6136.72	490.51	9818.75	7848.09	12273.44	9810.11	19637.5	15696.18
	90		63.63		2955.44		4728.71		5910.89		9457.42
160	70	201.09	38.49	10054.4	8129.93	16087.04	13007.88	20108.8	16259.85	32174.08	26015.76
	110		95.05		5302.13		8483.4		10604.25		16966.8
200	90	314.2	63.63	15710	12528.73	25136	20045.96	31420	25057.45	50272	40091.92
	130		132.75		9072.53		14516.04		18145.05		29032.08

Ordering details of EN series hydraulic cylinders

EN							
----	--	--	--	--	--	--	--

Series

Cylinder bore

Piston rod dia

Stroke length

Mounting style
Refer to dimension charts for code

Cushioning

CB => Cushioned at both end NC => Non-cushioned
CC => Cap end cushioned CH => Head end cushioned

Double rod (K)
(optional)

High temperature seals (V)
(optional)

Example

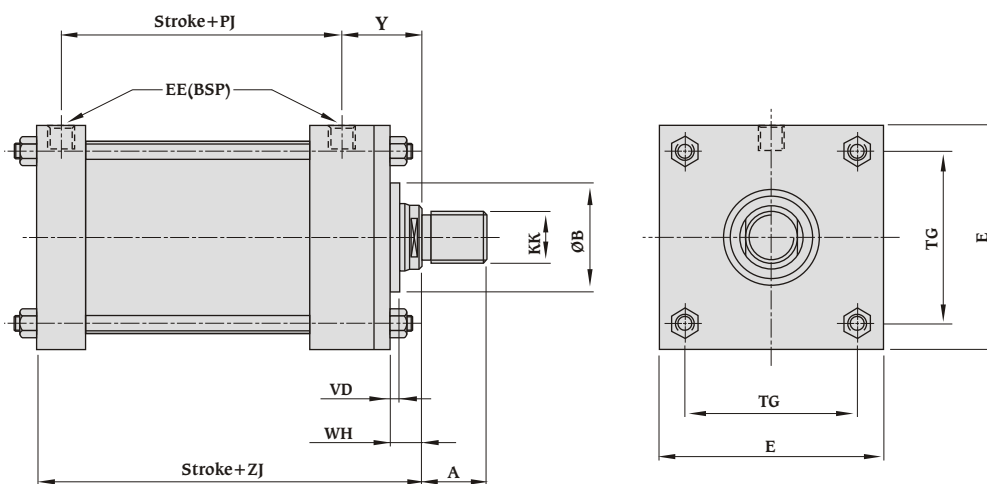
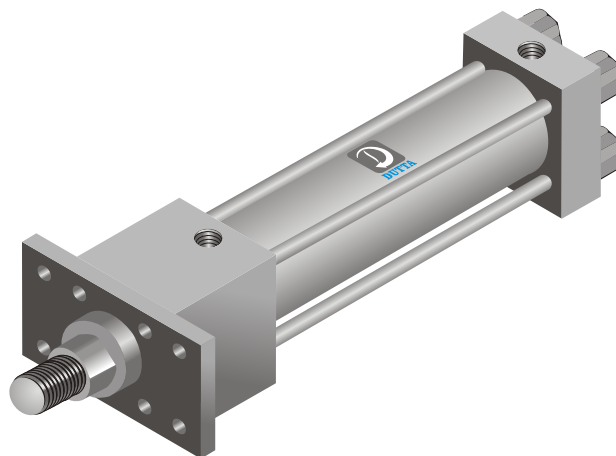
EN series hydraulic cylinder with bore 80mm, piston rod dia 45mm, stroke 300mm, mounting cap fixed clevis and non-cushioned at both ends will be specified as

EN	80	45	300	RP 1	NC	-	-
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All dimensions are in millimeters unless otherwise stated.

Features and specifications

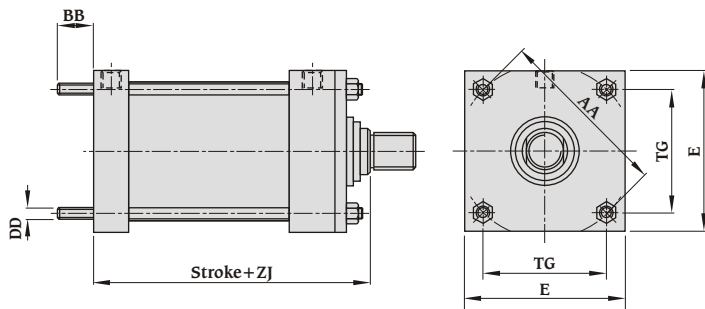
- Standard construction, square head, tie rod design
- 10 standard mounting styles available
- Provision for smaller as well as bigger rod diameter for each bore size
- Wide range of mounting accessories
- Bore sizes : 32mm to 200mm
- Strokes available in any practical stroke length
- Maximum working pressure : 160 bar
- Piston rods : 18mm to 130mm
- Single and double rod designs
- Cushioning available from 63mm bore onwards only
- Cushions available at either end
- Temperature range : - 20°C to +80°C (standard)
- 20°C to +150°C (optional)
- Standard fluid : Mineral oil DIN 51524 (HL, HLP)
- Seal types to suit a wide variety of operating environments



Piston dia	Rod dia		A		KK		ØB		WH	VD	EE	Y	PJ	TG	TG	ZJ
32		20		26		M16x1.5P		35	20.5	9.5	1/4"	61.5	74	54	38	147
40	18	25	18	28	M14x1.5P	M20x1.5P	40	40	23.6	11.6	1/4"	66	86	63	42	164
50	25	35	28	36	M20x1.5P	M27x2P	40	55	23.6	11.6	1/4"	66	91	75	52	169
63	35	45	36	45	M27x2P	M39x2P	55	65	21.6	9.6	3/8"	67.5	95	90	64	178
80	45	56	45	56	M39x2P	M42x2P	65	72	20.6	5.6	1/2"	75.6	101	115	83	194
100	45	70	45	63	M39x2P	M56x2P	65	90	32.2	3.2	3/4"	104	115	130	97	244
125	56	90	56	85	M42x2P	M76x2P	72	108	30.7	5.2	3/4"	103	130	165	126	258
160	70	110	63	95	M56x2P	M95x2P	-	-	25	-	1"	115	135	205	155	275
200	90	130	85	112	M76x2P	M120x2P	108	155	39	14.6	1-1/4"	133	165	245	190	328

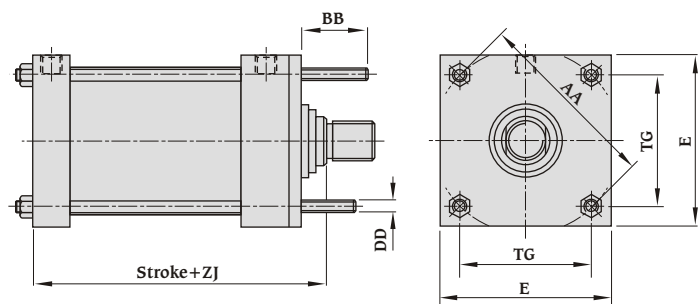
All dimensions are in millimeters unless otherwise stated.

Tie rod extended for cap end style (TC)



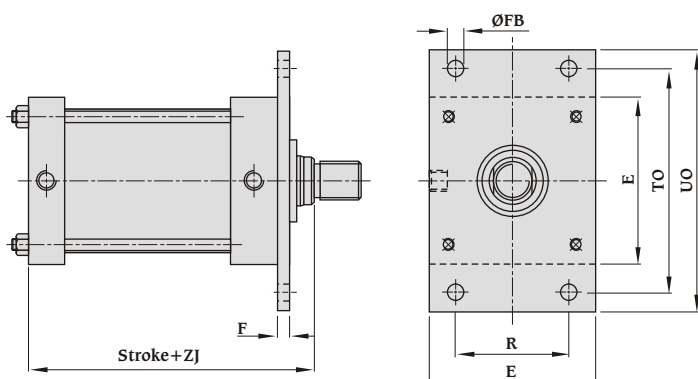
Bore size	AA	BB	DD	E	TG	ZJ
32	53.7	25	M8x1.25P	54	38	147
40	59.3	35	M8x1.25P	63	42	164
50	73.5	46	M12x1.75P	75	52	169
63	90.5	46	M12x1.75P	90	64	178
80	117.3	59	M16x2P	115	83	194
100	137.1	59	M16x2P	130	97	244
125	178.1	81	M22x2.5P	165	126	258
160	219.2	92	M27x3P	205	155	275
200	268.7	115	M30x3.5P	245	190	328

Tie rod extended for head end style (TH)



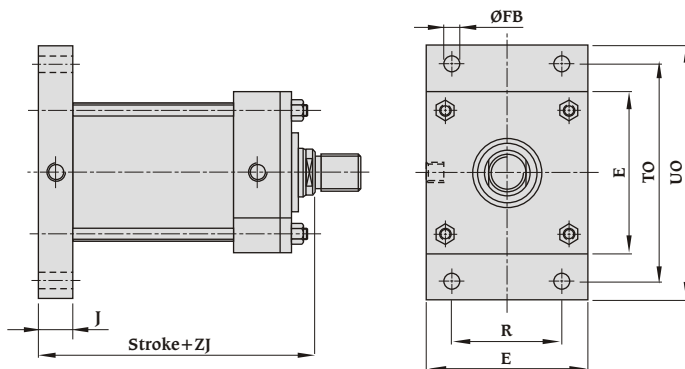
Bore size	AA	BB	DD	E	TG	ZJ
32	53.7	25	M8x1.25P	54	38	147
40	59.3	35	M8x1.25P	63	42	164
50	73.5	46	M12x1.75P	75	52	169
63	90.5	46	M12x1.75P	90	64	178
80	117.3	59	M16x2P	115	83	194
100	137.1	59	M16x2P	130	97	244
125	178.1	81	M22x2.5P	165	126	258
160	219.2	92	M27x3P	205	155	275
200	268.7	115	M30x3.5P	245	190	328

Head rectangular flange style (FF)

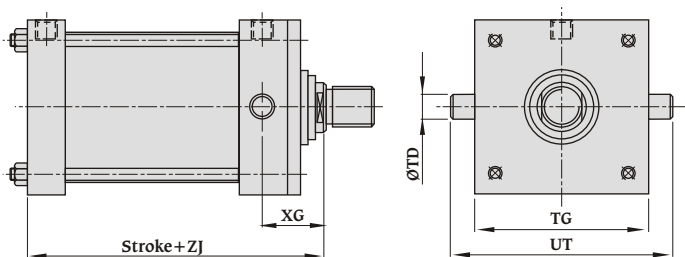


Bore size	E	F	ØFB	R	TO	UO	ZJ
32	54	10	9	36	74	95	147
40	63	10	11	41	87	115	164
50	75	10	14	52	105	142	169
63	90	12	14	65	117	160	178
80	115	15	18	83	149	190	194
100	130	20	18	97	162	220	244
125	165	20	22	126	208	260	258
160	205	26.7	26	155	253	320	275
200	245	30	33	190	300	380	328

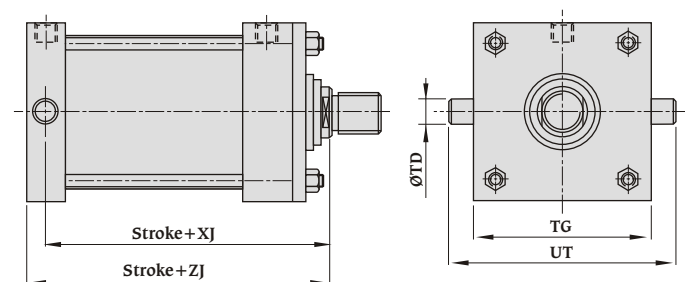
All dimensions are in millimeters unless otherwise stated.

**Cap rectangular
flange style (RF)**

Bore size	E	ØFB	J	R	TO	UO	ZJ
32	54	9	24	36	94	95	147
40	63	11	25	41	87	115	164
50	75	14	25	52	105	142	169
63	90	14	30	65	117	160	178
80	115	18	35	83	149	190	194
100	130	18	50	97	162	220	244
125	165	22	50	126	208	260	258
160	205	26	50	155	253	320	275
200	245	33	60	190	300	380	328

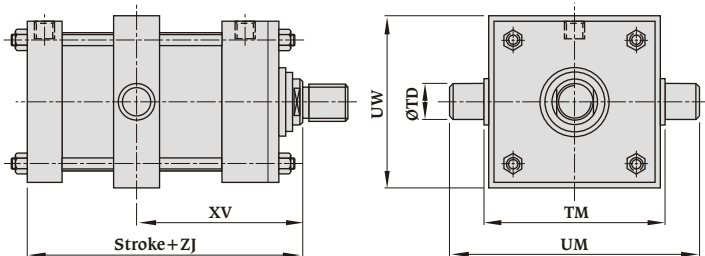
**Head trunnion
style (TR 1)**

Bore size	TC	ØTD	UT	XG	ZJ
32	54	16	78	52.5	147
40	63	25	113	56	164
50	75	25	125	56	169
63	90	30	150	58	178
80	115	35	185	64.6	194
100	130	40	210	91	244
125	165	42	249	89	258
160	205	48	301	96	275
200	245	54	353	116	328

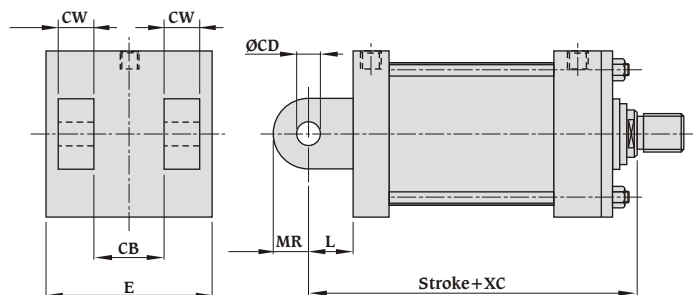
**Cap trunnion
style (TR 2)**

Bore size	TC	ØTD	UT	XJ	ZJ
32	54	16	78	135	147
40	63	25	113	151.5	164
50	75	25	125	156.5	169
63	90	30	150	163	178
80	115	35	185	176.5	194
100	130	40	210	219	244
125	165	42	249	233	258
160	205	48	301	250	275
200	245	54	353	298	328

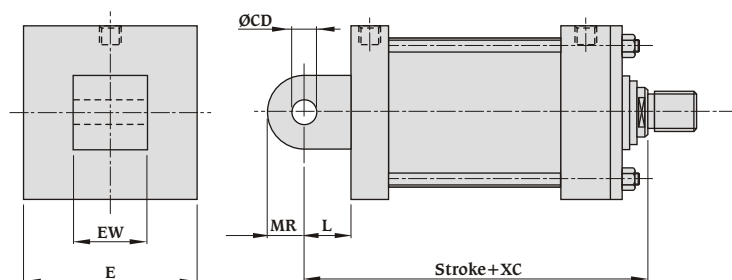
All dimensions are in millimeters unless otherwise stated.

Intermediate fixed
trunnion style (TR 4)

Bore size	Ø TD	TM	UM	UW	XV	ZJ
32	16	55	79	75	To be specified	147
40	25	76	126	92		164
50	25	89	139	112		169
63	30	100	160	126		178
80	35	127	197	160		194
100	40	140	220	180		244
125	42	178	262	215		258
160	48	215	311	260		275
200	54	279	387	355		328

Cap fixed
clevis style (RP 1)

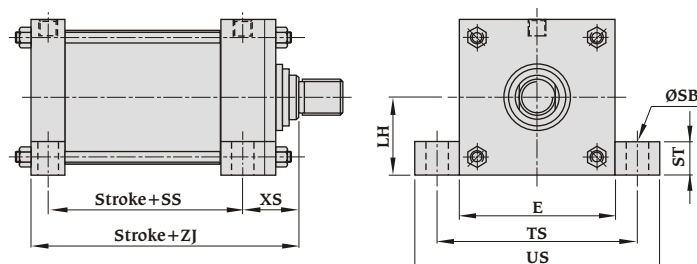
Bore size	CB	Ø CD	CW	E	L	MR	XC
32	16	12	8	54	19	17	166
40	20	14	10	63	19	17	183
50	30	20	15	75	32	29	201
63	30	20	15	90	32	29	210
80	40	28	20	115	39	34	233
100	50	36	25	130	54	50	298
125	60	45	30	165	57	53	315
160	70	56	35	205	63	59	338
200	80	70	40	245	82	78	413

Cap fixed
eye style (RP 3)

Bore size	Ø CD	E	EW	L	MR	XC
32	12	54	16	19	17	166
40	14	63	20	19	17	183
50	20	75	30	32	29	201
63	20	90	30	32	29	210
80	28	115	40	39	34	233
100	36	130	50	54	50	298
125	45	165	60	57	53	315
160	56	205	70	63	59	338
200	70	245	80	82	78	413

All dimensions are in millimeters unless otherwise stated.

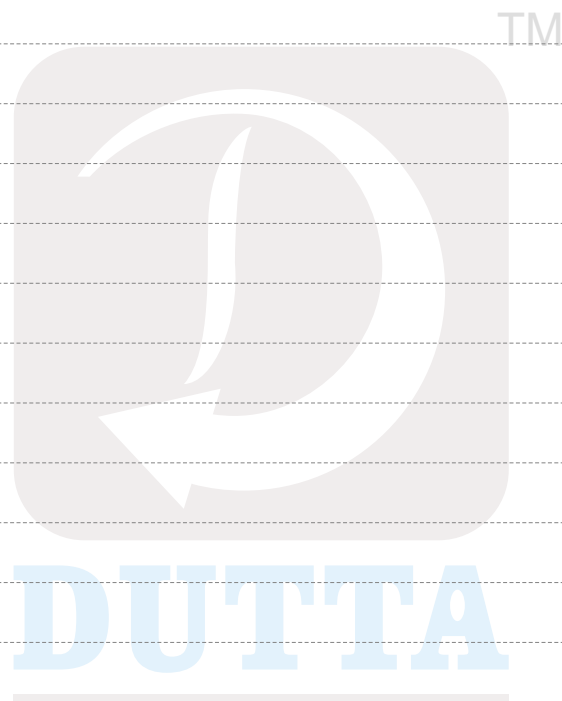
Side lugs (foot) style (SL)



Bore size	E	LH	Ø SB	SS	ST	TS	US	XS	ZJ
32	54	27	9	82.5	12	73	93	52.5	147
40	63	31.5	11	95	13	83	104	56	164
50	75	37.5	14	100	19	102	127	56	169
63	90	45	18	104.5	26	124	161	58	178
80	115	57.5	18	111.5	26	149	186	64.6	194
100	130	65	21	128.5	32	172	216	91	244
125	165	82.5	26	143.5	32	210	254	89	258
160	205	102.5	33	154.5	38	260	318	96	275
200	245	122.5	39	182	44	311	381	116	328

All dimensions are in millimeters unless otherwise stated.

All dimensions are in millimeters unless otherwise stated.

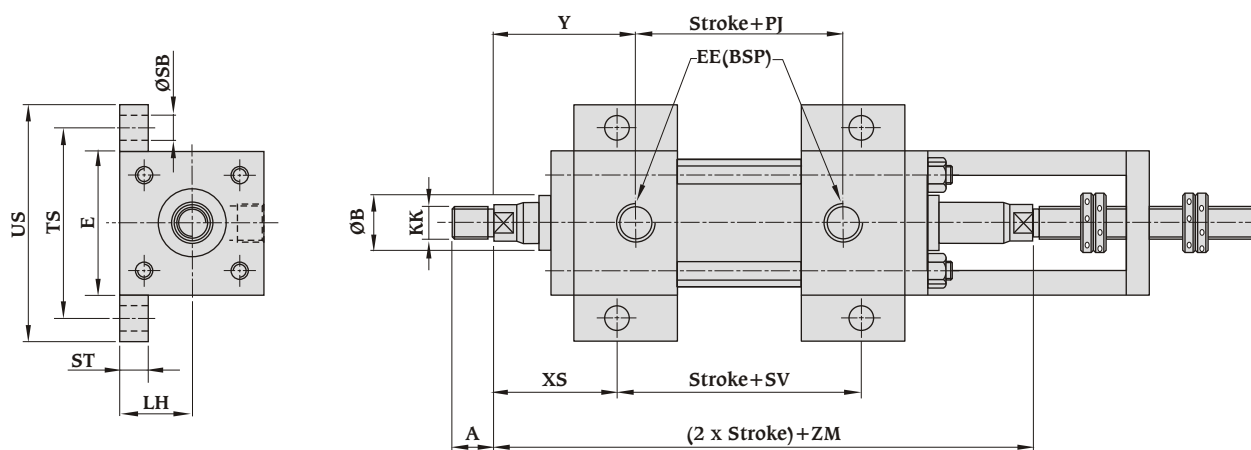


AJ Series

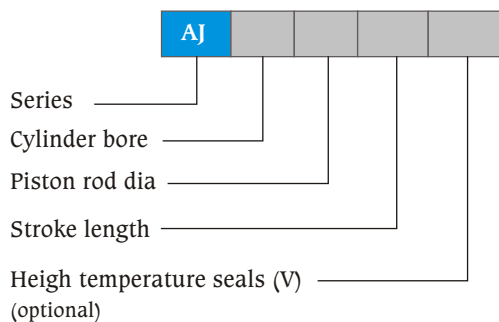


Features and specifications

- Mechanical stroke adjustment
- Standard construction, square head, tie rod design
- Provision for smaller as well as bigger rod diameter for each bore size
- Bore sizes : 40mm to 160mm
- Strokes available in any practical stroke length
- Maximum working pressure : 160 bar
- Piston rods : 18mm to 110mm
- Non-cushioned
- Temperature range - 20°C to 80°C (standard)
- 20°C to +150°C (optional)
- Standard fluid : Mineral oil, DIN 51524 (HL, HLP)
- Seals types to suit a wide variety of operating environments



Piston dia	Rod dia		A		KK		ØB		EE	Y	PJ	E	LH	ØSB	ST	SV	TS	US	XC	ZM
40	18	25	18	28	M14x1.5P	M20x1.5P	40	40	1/4"	66	66	63	31.5	11	13	105	83	104	56	218
50	25	35	28	36	M20x1.5P	M27x2P	40	55	1/4"	66	66	75	37.5	14	19	110	102	127	56	223
63	35	45	36	45	M27x2P	M39x2P	55	65	3/8"	67.5	67.5	90	45	18	26	114	124	161	58	230
80	45	56	45	56	M39x2P	M42x2P	65	72	1/2"	75.6	75.6	115	57.5	18	26	123	149	186	64.6	252
100	45	70	45	63	M39x2P	M56x2P	65	90	3/4"	104	104	130	65	21	32	142	172	216	91	323
125	56	90	56	85	M42x2P	M76x2P	72	108	3/4"	103	103	165	82.5	26	32	157	210	254	89	336
160	70	110	63	95	M56x2P	M95x2P	-	-	1"	115	115	205	102.5	33	38	165	260	318	96	365

Ordering details of AJ series hydraulic cylinders**Example**

AJ series hydraulic cylinder with bore 80mm, piston rod dia 45mm, stroke 50mm will be specified as

AJ	80	45	50	
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All dimensions are in millimeters unless otherwise stated.

JN Series



Cylinder selection guide

Operating pressure at kg/sq. cm				Theoretical forces (at mechanical efficiency = 100%)							
				50		80		100		160	
Piston dia mm	Rod dia mm	Piston area sq. cm	Rod area sq. cm	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf
25	12	.91	1.13	245.47	188.91	392.75	302.26	490.94	377.83	785.5	604.52
	18		2.55		118.22		189.15		236.44		378.30
32	14	8.04	1.54	402.18	325.20	643.48	520.32	804.35	650.39	1286.96	1040.63
	22		3.80		212.09		339.34		424.17		678.67
40	18	12.57	2.55	628.4	501.15	1005.44	801.84	1256.8	1002.30	2010.88	1603.68
	28		6.16		320.48		512.77		640.97		1025.55
50	22	19.64	3.80	981.88	791.78	1571	1266.85	1963.75	1583.57	3142	2533.71
	36		10.18		472.87		756.59		945.74		1513.19
63	28	31.18	6.16	1558.82	1250.91	2494.12	2001.45	3117.65	2501.82	4988.24	4002.91
	45		15.91		763.51		1221.61		1527.01		2443.22
80	36	50.27	10.18	2513.6	2004.60	4021.76	3207.35	5027.2	4009.19	8043.52	6414.71
	56		24.63		1281.94		2051.10		2563.87		4102.20
100	45	78.55	15.91	3927.5	3132.18	6284	5011.49	7855	6264.36	12568	10022.98
	70		38.49		2003.03		3204.84		4006.05		6409.68
125	56	122.73	24.63	6136.72	490.51	9818.75	7848.09	12273.44	9810.11	19637.5	15696.18
	90		63.63		2955.44		4728.71		5910.89		9457.42
160	70	201.09	38.49	10054.4	8129.93	16087.04	13007.88	20108.8	16259.85	32174.08	26015.76
	110		95.05		5302.13		8483.4		10604.25		16966.8
200	90	314.2	63.63	15710	12528.73	25136	20045.96	31420	25057.45	50272	40091.92
	140		153.96		8012.1		12819.36		16024.2		25638.72

Ordering details of JN Series hydraulic cylinders

JN							
----	--	--	--	--	--	--	--

Series _____

Cylinder bore _____

Piston rod dia _____

Stroke length _____

Mounting style _____

Refer to dimension charts for code _____

Cushioning _____

CB => Cushioned at both end NC => Non-cushioned

CC => Cap end cushioned CH => Head end cushioned

Double rod (K) _____

(optional)

High temperature seals (V) _____

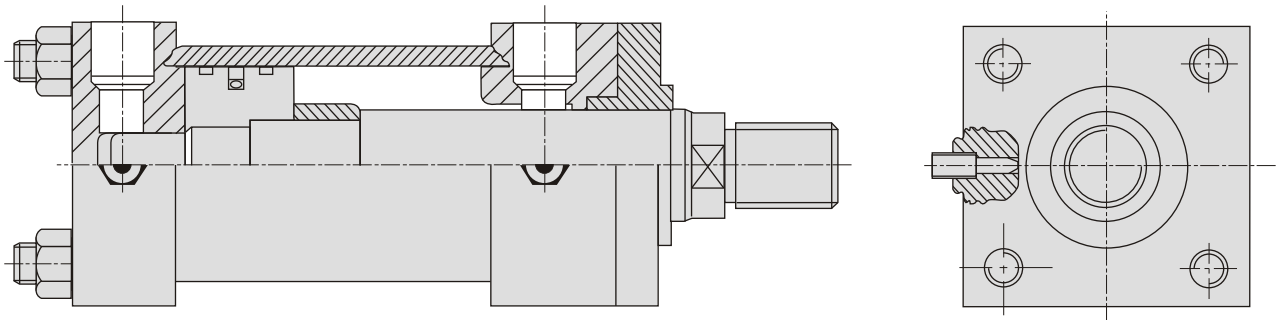
(optional)

Example

JN series hydraulic cylinder with bore 50mm, piston rod dia 22mm, stroke 100mm, mounting head rectangular and cushion at both ends will be specified as

JN	50	22	100	ME5	CB	-	-
----	----	----	-----	-----	----	---	---

All dimensions are in millimeters unless otherwise stated.



Design features and benefits

Piston rods

Made from medium carbon Steel. Precision ground, hard chrome-plated and polished to ensure smooth, dent & rust resistant surface for best sealing and long life.

Barrel

Made from cold drawn seamless Steel tubes. Honed to 0.4 micron and higher surface finish to minimize internal friction and longer seal life and performance.

Cover plates

Fine machined from Steel and constructed with a sturdy design to withstand high pressure loads.

Piston rod gland

Made from Turcite T47 material. Non-metallic wear rings are used in the cylinder head for precisely guiding the piston rod of the working cylinder and absorbing lateral forces which occur. At the same time, metallic contact between the sliding parts of the cylinder, e.g. piston rod and cylinder head must be prevented. Non-metallic wear rings offer major benefits compared to metallic guides.

Tie rods

Made from high tensile Steel rods tightened with hexagonal nuts for easy maintenance.

Cushioning

Self-aligning cushioning bush ensures alignment of the rod movement inside the cushioning chamber, providing accurate damping action at the end of stroke.

Cushioning adjustment

For fine adjustment of cushioning movement.

Piston seal

Provided with low friction single piston seal design for no stick-slip effect in rotated two wear strips. This design provides smooth operation, long bearing life and high load carrying capacity.

Rod seal

Polyurethane U-cup seal is used which has double lip design for good sealing effect & maximum flexibility.

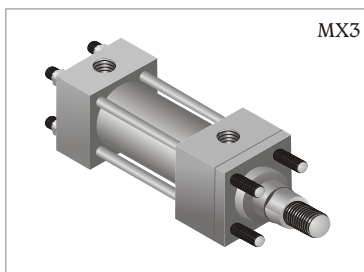
Wiper seal

The wiper is a double working nitrile wiper seal. The wiper lips are designed to wipe off dust and provide light sealing. It has advantage of radial tension to wipe off particles, dust and water.

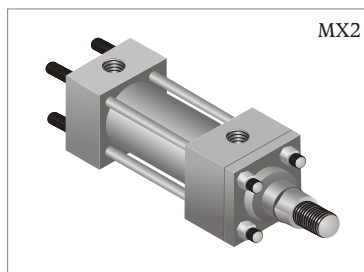
Features and Specifications

- Interchangeable mountings
- 12 Standard mounting styles
- Provision for smaller as well as bigger rod diameter for each bore size
- Wide range of mounting accessories
- Bore sizes - 25mm to 200mm
- Available in any practical stroke length
- Maximum working pressure 160 bar
- Piston rods - 12mm to 140mm
- Single and double rod design
- Cushioning available from 63mm bore onwards
- Cushions available at either ends
- Temperature range : - 20°C to +80°C (standard)
- 20°C to +150°C (optional)
- Seal types to suit a wide variety of applications
- Standard fluid : Mineral oil, DIN 51524 (HL, HLP)

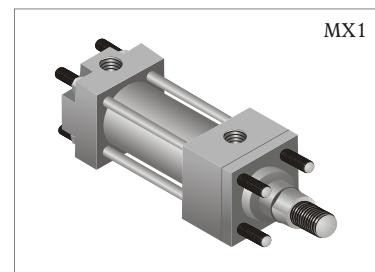
Available Mountings



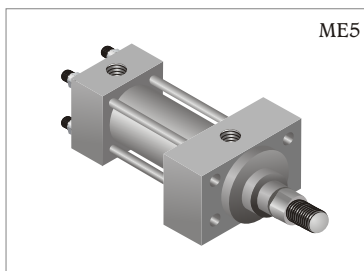
MX3



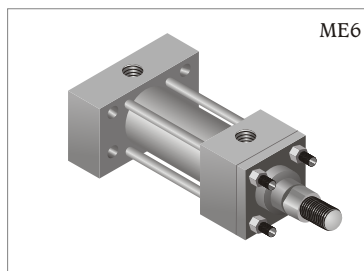
MX2



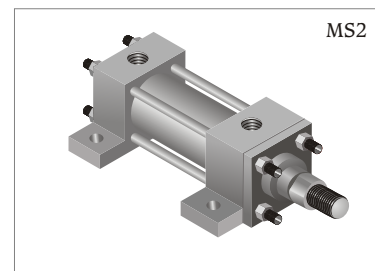
MX1



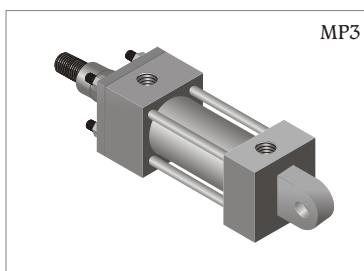
ME5



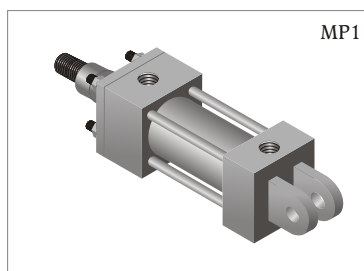
ME6



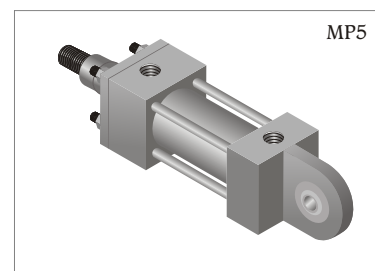
MS2



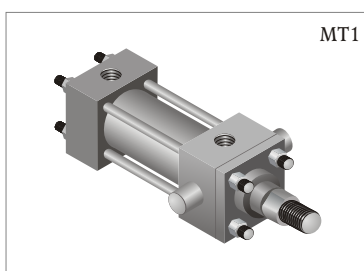
MP3



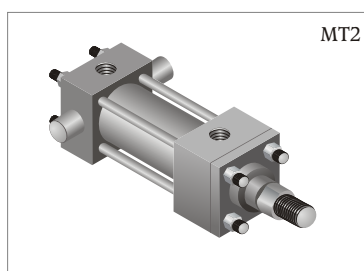
MP1



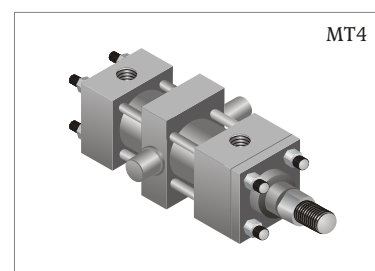
MP5



MT1

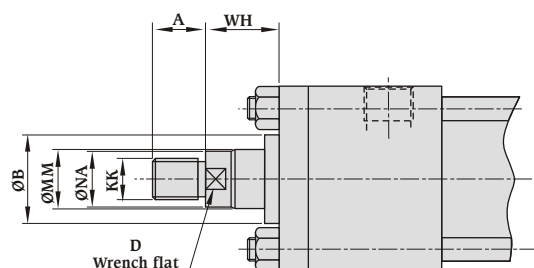
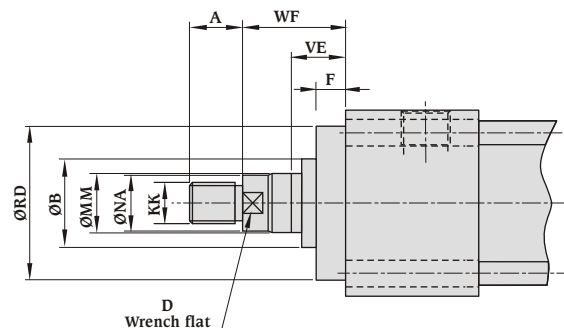


MT2

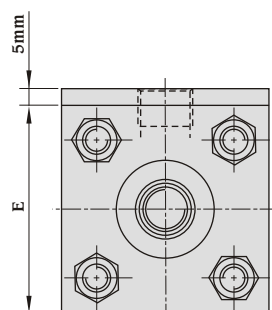


MT4

Piston rod end data and threads

Piston rod end
All except ME5 mountPiston rod end
ME5 mount only

25 & 32mm bore cylinders

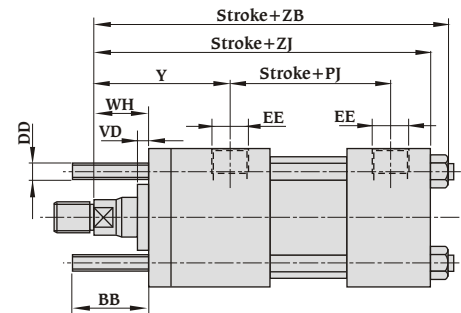
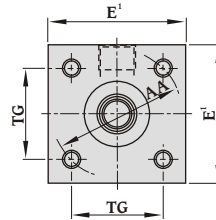
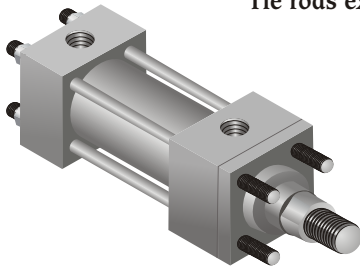
5mm extra height applies to
port face at head end only

Piston rod end dimensions

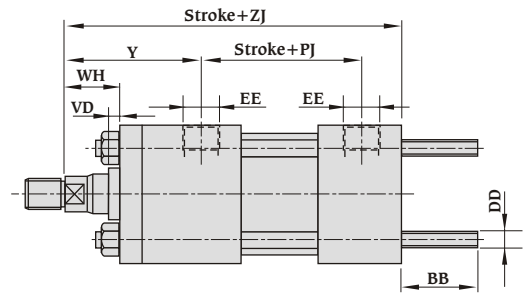
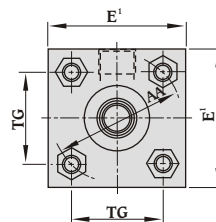
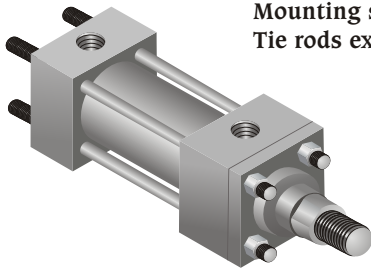
Bore dia	Rod dia mm	KK	A	B f9	D	NA	WH	RD f8	ME5 mount only		
									VE	WF	F
25	12	M10x1.25	14	24	10	11	15	38	16	25	10
	18	M14x1.5	18	30	15	17		38			
32	14	M12x1.25	16	26	12	13	25	42	22	35	10
	22	M16x1.5	22	34	18	21		42			
40	18	M14x1.5	18	30	15	17	25	62	22	35	10
	28	M20x1.5	28	42	22	26		62			
50	22	M16x1.5	22	34	18	21	25	74	25	41	16
	36	M27x2	36	50	30	34		74			
63	28	M20x1.5	28	42	22	26	32	75	29	48	16
	45	M33x2	45	60	39	43		88			
80	36	M27x2	36	50	30	34	31	82	29	51	20
	56	M42x2	56	72	48	54		105			
100	45	M33x2	45	60	39	43	35	92	32	57	22
	70	M48x2	63	88	62	68		125			
125	56	M42x2	56	72	48	54	35	105	32	57	22
	90	M64x3	85	108	80	88		150			
160	70	M48x2	63	88	62	68	32	125	32	57	25
	110	M80x3	95	133	100	108		170			
200	90	M64x3	85	108	80	88	32	150	32	57	25
	140	M100x3	112	163	128	138		210			

All dimensions are in millimeters unless otherwise stated.

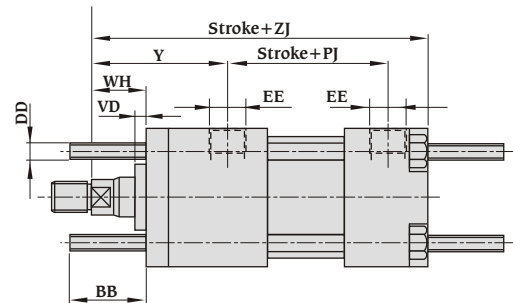
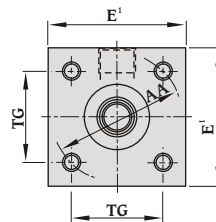
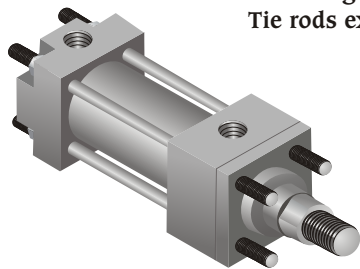
Mounting style
Tie rods extended head end (MX3)



Mounting style
Tie rods extended cap end (MX2)



Mounting style
Tie rods extended both ends (MX1)



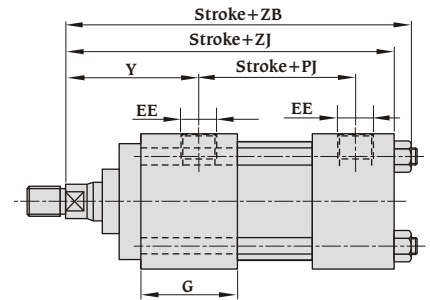
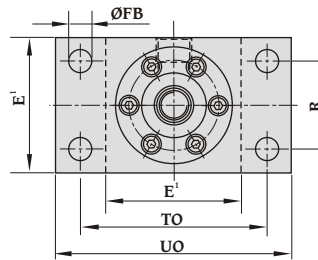
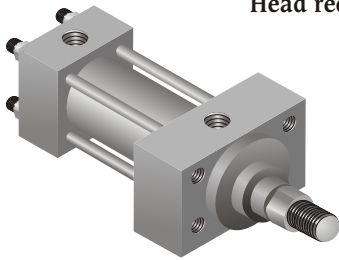
■ Head depth increased by 5mm to accommodate port on 25mm and 32mm bore cylinder-see page 22

Dimensions - MX3, MX2 & MX1. Also see rod end dimensions-page 22

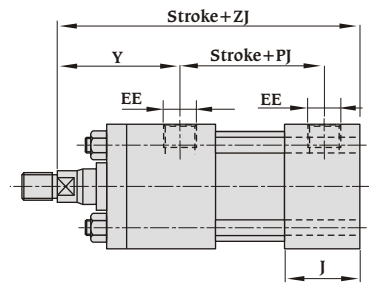
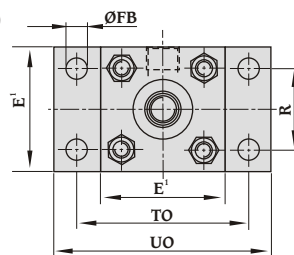
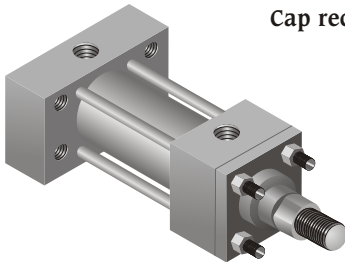
Bore Ø	AA	BB	DD	E	EE BSP	TG	WH	VD	Y	Stroke+		
										PJ	ZJ	ZB
25	40	19	M5x0.8	40 ¹	1/4"	28.3	15	5	50	53	114	121
32	47	24	M6x1	45 ¹	1/4"	33.2	25	5	60	56	128	137
40	59	35	M8x1	63	3/8"	41.7	25	5	62	73	153	166
50	74	46	M12x1.25	75	1/2"	52.3	25	5	67	74	159	176
63	91	46	M12x1.25	90	1/2"	64.3	32	5	71	80	168	185
80	117	59	M16x1.5	115	3/4"	82.7	31	5	77	93	190	212
100	137	59	M16x1.5	130	3/4"	96.9	35	5	82	101	203	225
125	178	81	M22x1.5	165	1"	125.9	35	5	86	117	232	260
160	219	92	M27x2	205	1"	154.9	32	5	86	130	245	279
200	269	115	M30x2	245	1-1/4"	190.2	32	5	98	165	299	336

All dimensions are in millimeters unless otherwise stated.

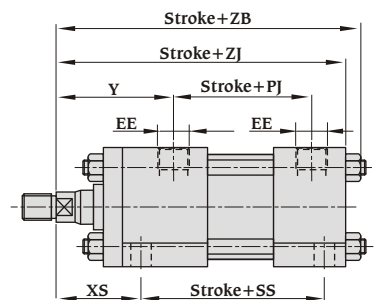
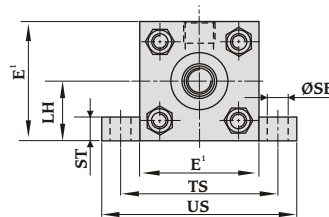
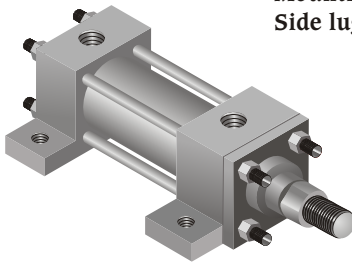
Mounting style
Head rectangular flange (ME5)



Mounting style
Cap rectangular flange (ME6)



Mounting style
Side lugs (MS2)



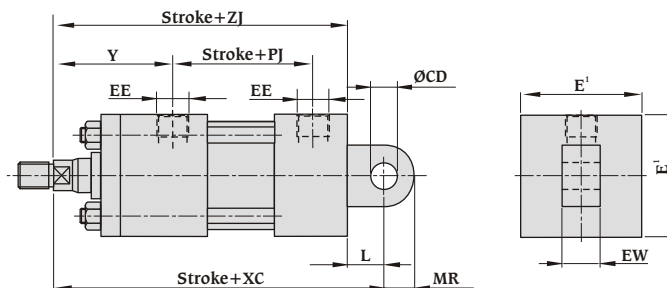
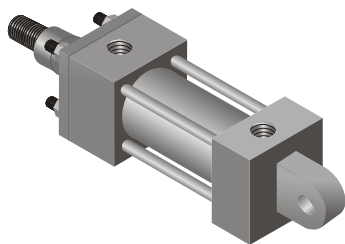
■ Head depth increased by 5mm to accommodate port on 25mm and 32mm bore cylinder-see page 22

Dimensions - ME5, ME6 & MS2. Also see rod end dimensions-page 22

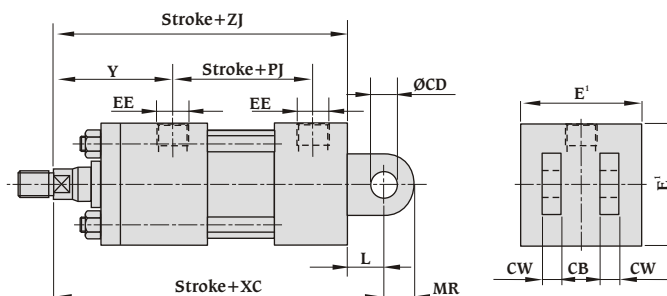
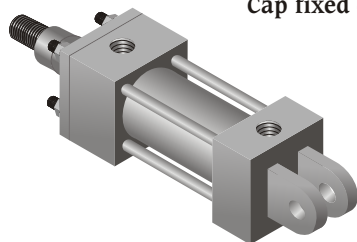
Bore Ø	E	EE BSP	FB	G	J	LH	R	SB	ST	TO	TS	UO	US	XS	Y	Stroke+			
																PJ	SS	ZJ	ZB
25	40 ¹	1/4"	5.5	36	22	19	27	6.5	8.5	51	54	65	72	33	50	53	72	114	121
32	45 ¹	1/4"	6.5	36	23	22	33	9	12.5	58	63	70	84	45	60	56	72	128	137
40	63	3/8"	11	41	32	31	41	11	12.5	87	83	110	103	45	62	73	97	153	166
50	75	1/2"	14	42	34	37	52	14	19	105	102	130	127	54	67	74	91	159	176
63	90	1/2"	14	40	34	44	65	18	26	117	124	145	161	65	71	80	85	168	185
80	115	3/4"	18	46	41	57	83	18	26	149	149	180	186	68	77	93	104	190	212
100	130	3/4"	18	47	42	63	97	26	32	162	172	200	216	79	82	101	101	203	225
125	165	1"	22	55	55	82	126	26	32	208	210	250	254	79	86	117	130	232	260
160	205	1"	26	57	57	101	155	33	38	253	260	300	318	86	86	130	129	245	279
200	245	1-1/4"	33	76	73	122	190	39	44	300	311	360	381	92	98	165	171	299	336

All dimensions are in millimeters unless otherwise stated.

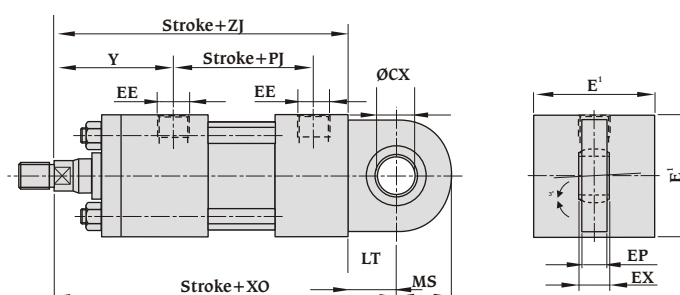
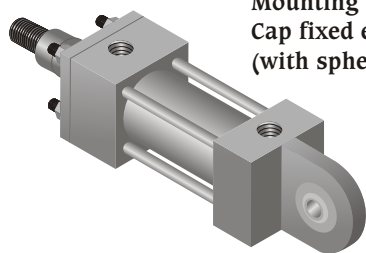
Mounting style
Cap fixed eye (MP3)



Mounting style
Cap fixed clevis (MP1)



Mounting style
Cap fixed eye
(with spherical bearing) (MP5)



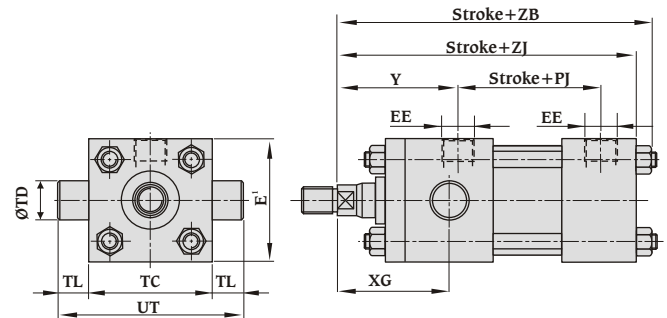
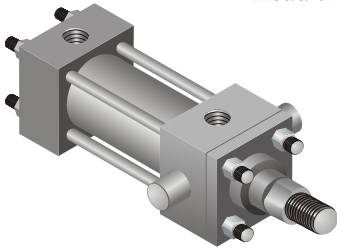
■ Head depth increased by 5mm to accommodate port on 25mm and 32mm bore cylinder-see page 22

Dimensions – MP3, MP1 & MP5. Also see rod end dimensions-page 22

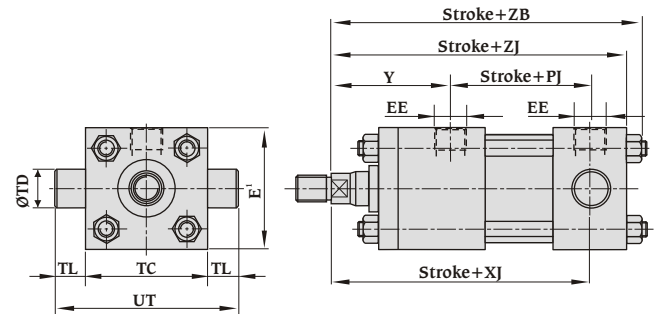
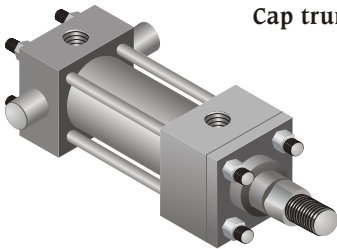
Bore Ø	CB	CD	CW	CX	E	EE BSP	EP	EW	EX	L	LT	MR	MS	Y	Stroke+			
															PJ	XC	XO	ZJ
25	12	10	6	12	40 ¹	1/4"	8	12	10	13	16	12	20	50	53	127	130	114
32	16	12	8	16	45 ¹	1/4"	11	16	14	19	20	17	22.5	60	56	147	148	128
40	20	14	10	20	63	3/8"	13	20	16	19	25	17	29	62	73	172	178	153
50	30	20	15	25	75	1/2"	17	30	20	32	31	29	33	67	74	191	190	159
63	30	20	15	30	90	1/2"	19	30	22	32	38	29	40	71	80	200	206	168
80	40	28	20	40	115	3/4"	23	40	28	39	48	34	50	77	93	229	238	190
100	50	36	25	50	130	3/4"	30	50	35	54	58	50	62	82	101	257	261	203
125	60	45	30	60	165	1"	38	60	44	57	72	53	80	86	117	289	304	232
160	70	56	35	80	205	1"	47	70	55	63	92	59	100	86	130	308	337	245299
200	80	70	40	100	245	1-1/4"	57	80	70	82	116	78	120	98	165	381	415	

All dimensions are in millimeters unless otherwise stated.

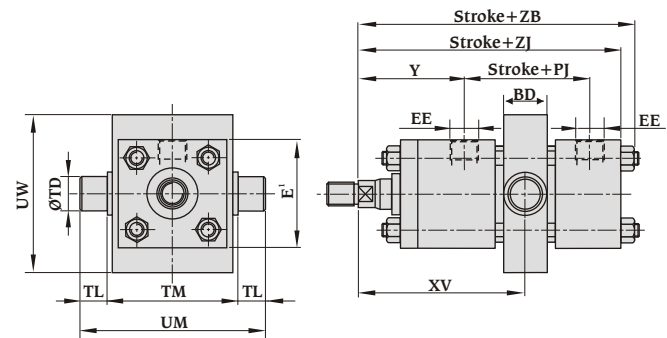
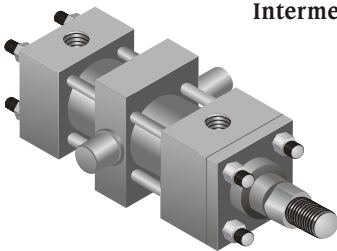
Mounting style
Head trunnion (MT1)



Mounting style
Cap trunnion (MT2)



Mounting style
Intermediate fixed trunnion (MT4)

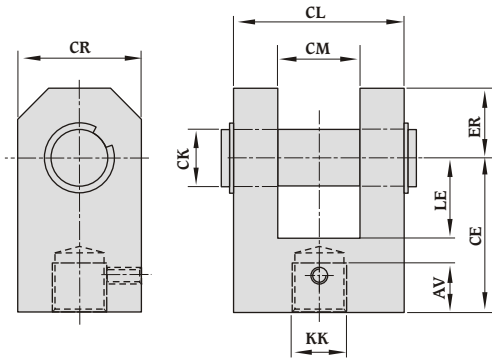


■ Head depth increased by 5mm to accommodate port on 25mm and 32mm bore cylinder-see page 22

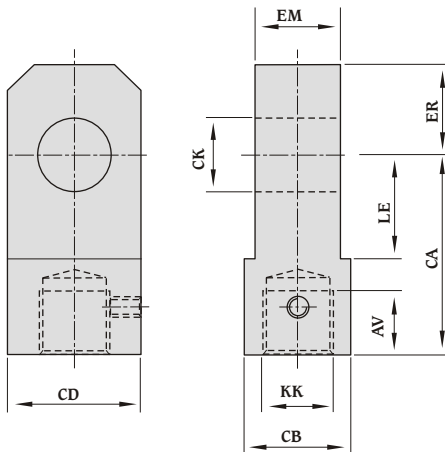
Dimensions – MT1, MT2 & MT4. Also see rod end dimensions-page 22

Bore Ø	BD	E	EE BSP	TC	TD f8	TL	TM	UM	UT	UW	XG ±2	Y	Stroke+				
													PJ	XJ ±1.5	XV ±2	ZJ	ZB
25	20	40 ¹	1/4"	38	12	10	48	68	58	63	44	50	53	101	Dimensions to be specified by customer	114	121
32	25	45 ¹	1/4"	44	16	12	55	79	68	75	54	60	56	115		128	137
40	30	63	3/8"	63	20	16	76	108	95	92	57	62	73	134		153	166
50	40	75	1/2"	76	25	20	89	129	116	112	64	67	74	140		159	176
63	40	90	1/2"	89	32	25	100	150	139	126	70	71	80	149		168	185
80	50	115	3/4"	114	40	32	127	191	178	160	76	77	93	168		190	212
100	60	130	3/4"	127	50	40	140	220	207	180	71	82	101	187		203	225
125	73	165	1"	165	63	50	178	278	265	215	75	86	117	209		232	260
160	90	205	1"	203	80	63	215	341	329	260	75	86	130	230		245	279
200	110	245	1-1/4"	241	100	80	279	439	401	355	85	98	165	276		299	336

All dimensions are in millimeters unless otherwise stated.

Accessories**Piston rod clevis**

Model No.	Thread KK	AV	CE	CK Ø	CL	CM	CR	ER	LE
RC-H160-M10x1.25	M10x1.25	14	32	10	26	12	20	12	14
RC-H160-M12x1.25	M12x1.25	16	36	12	34	16	32	17	19
RC-H160-M14x1.5	M14x1.5	18	38	14	42	20	32	17	19
RC-H160-M16x1.5	M16x1.5	22	54	20	62	30	50	29	32
RC-H160-M20x1.5	M20x1.5	28	60	20	62	30	50	29	32
RC-H160-M27x2	M27x2	36	75	28	83	40	60	34	39
RC-H160-M33x2	M33x2	45	99	36	103	50	80	50	54
RC-H160-M42x2	M42x2	56	113	45	123	60	102	53	57
RC-H160-M48x2	M48x2	63	126	56	143	70	112	59	63
RC-H160-M64x3	M64x3	85	168	70	163	80	146	78	83

Piston rod plain rod eye

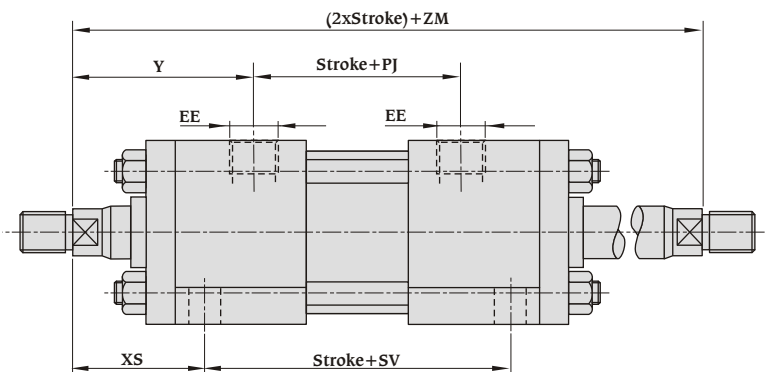
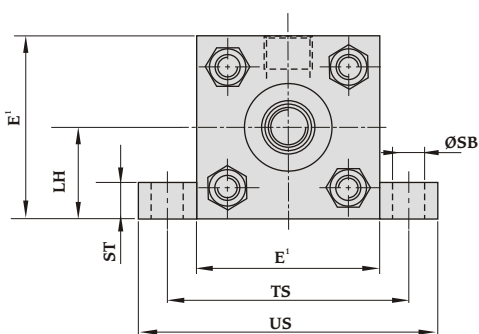
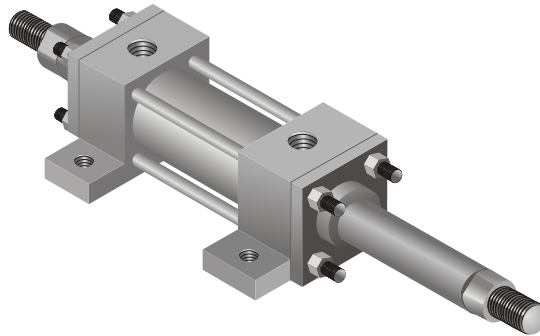
Model No.	Thread KK	AW	CA	CB	CD	CK Ø	EM	ER	LE
PRE-H160-M10x1.25	M10x1.25	14	32	18	18	10	12	12	13
PRE-H160-M12x1.25	M12x1.25	16	36	22	22	12	16	17	19
PRE-H160-M14x1.5	M14x1.5	18	38	25	25	14	20	17	19
PRE-H160-M16x1.5	M16x1.5	22	54	30	35	20	300	29	32
PRE-H160-M20x1.5	M20x1.5	28	60	30	40	20	30	29	32
PRE-H160-M27x2	M27x2	36	75	40	50	28	40	34	39
PRE-H160-M33x2	M33x2	45	99	50	70	36	50	50	54
PRE-H160-M42x2	M42x2	56	113	65	100	45	60	53	57
PRE-H160-M48x2	M48x2	63	126	90	112	56	70	59	63
PRE-H160-M64x3	M64x3	85	168	110	140	70	80	78	83

All dimensions are in millimeters unless otherwise stated.

Double rod cylinders

Available mounting styles

MX3, MS2 & Mt1

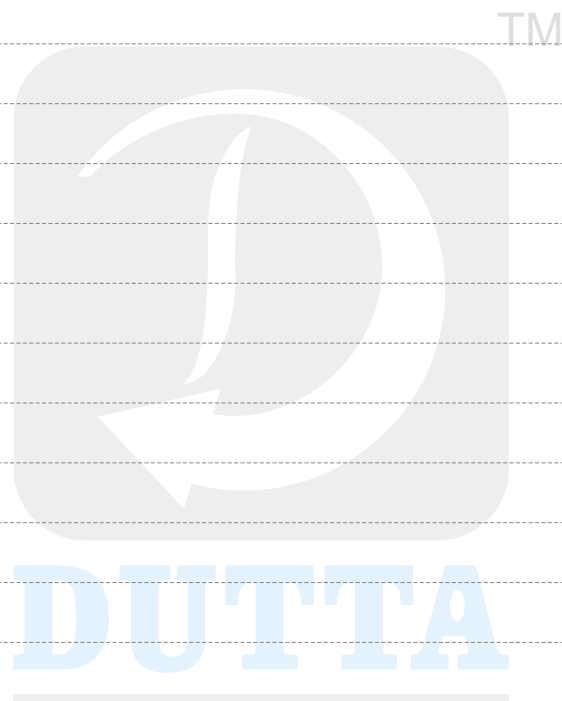


- Head depth increased by 5mm to accommodate port on 25mm and 32mm bore cylinder-See page 22

Dimensions – ME5, ME6 & MS2. Also see rod end dimensions-page 22

Bore Ø	E	EE BSP	LH	SB	ST	TS	US	XS	Y	Stroke+		
										PJ	SV	ZM
25	40 ¹	1/4"	19	6.5	8.5	54	72	33	50	53	88	154
32	45 ¹	1/4"	22	9	12.5	63	84	45	60	56	88	178
40	63	3/8"	31	11	12.5	83	103	45	62	73	105	195
50	75	1/2"	37	14	19	102	127	54	67	74	99	207
63	90	1/2"	44	18	26	124	161	65	71	80	93	223
80	115	3/4"	57	18	26	149	186	68	77	93	110	246
100	130	3/4"	63	26	32	172	216	79	82	101	107	265
125	165	1"	82	26	32	210	254	79	86	117	131	289
160	205	1"	101	33	38	260	318	86	86	130	130	302
200	245	1-1/4"	122	39	44	311	381	92	98	165	172	356

All dimensions are in millimeters unless otherwise stated.



UN Series



Cylinder selection guide

Operating pressure at kg/sq. cm				Theoretical forces (at mechanical efficiency = 100%)							
				50		80		100		160	
Piston dia mm	Rod dia mm	Piston area sq. cm	Rod area sq. cm	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf
40	22	12.57	3.80	628.4	438.31	1005.44	701.29	1256.8	876.62	2010.88	1402.59
	28		6.16		320.48		512.77		640.97		1025.55
50	28	19.64	6.16	981.88	673.96	1571	1078.33	1963.75	1347.92	3142	2156.67
	36		10.18		472.87		756.59		945.74		1513.19
63	36	31.18	10.18	1558.82	1049.82	2494.12	1679.71	3117.65	2099.64	4988.24	3359.43
	45		15.91		763.51		1221.61		1527.01		2443.22
80	45	50.27	15.91	2513.6	1718.28	4021.76	2749.25	5027.2	3436.56	8043.52	5498.5
	56		24.63		1281.94		2051.10		2563.87		4102.20
100	56	78.55	24.63	3927.5	2695.84	6284	4313.34	7855	5391.67	12568	8626.68
	70		38.49		2003.03		3204.84		4006.05		6409.68
125	70	122.73	38.49	6136.72	4212.24	9818.75	6739.59	12273.44	8424.49	19637.5	13479.18
	90		63.63		2955.44		4728.71		5910.89		9457.42
160	90	201.09	63.63	10054.4	6873.13	16087.04	10997	2018.8	13746.25	32174.08	21994
	110		95.05		5302.13		8483.4		10604.25		16966.8
200	110	314.20	95.05	15710	1095.77	25136	17532.36	31420	21915.45	50272	35064.72
	140		153.96		8012.1		12819.36		16024.2		25638.72

Ordering details of UN Series hydraulic cylinders

UN							
----	--	--	--	--	--	--	--

Series _____

Cylinder bore _____

Piston rod dia _____

Stroke length _____

Mounting style _____

Refer to dimension charts for code

Cushioning _____

CB => Cushioned at both end NC => Non-cushioned

CC => Cap end cushioned CH => Head end cushioned

Double rod (K) _____

(optional)

High temperature seals (V) _____

(optional)

Example

UN series hydraulic cylinder with bore 125mm, piston rod dia 90mm, stroke 150mm, mounting head circular flange and cushion at both ends will be specified as

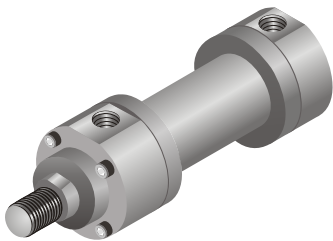
UN	125	90	150	MF 3	CB	-	-
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All dimensions are in millimeters unless otherwise stated.

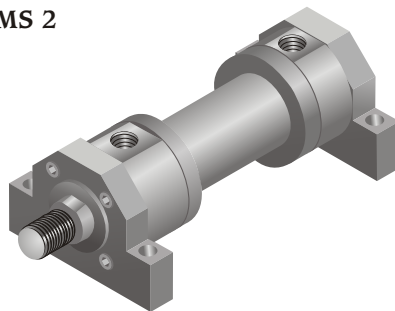
Features and specifications

- Interchangeable mountings
- 8 Standard mounting styles
- Provision for smaller as well as bigger rod diameter for each bore size
- Wide range of mounting accessories
- Bore sizes - 40mm to 200mm
- Strokes available in any practical stroke length
- Maximum working pressure - 160 bar
- Piston rods - 22mm to 140mm
- Single rod designs
- Cushioning available from 63mm bore onwards only
- Cushions available at either end
- Temperature range : - 20°C to +80°C (standard)
- 20°C to +150°C (optional)
- Seal types to suit a wide variety of operating environments
- Standard fluid - Mineral oil DIN 51524 (HL, HLP)

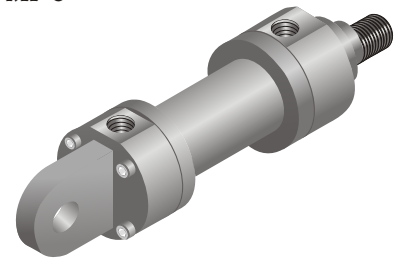
M00



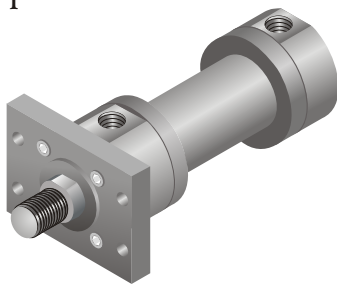
MS 2



MP 3

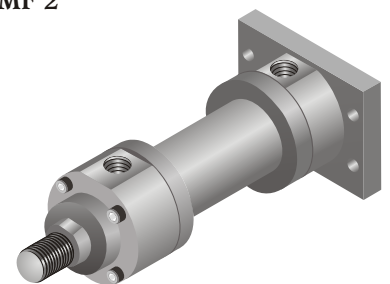


MF 1

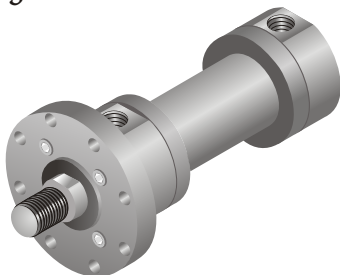


Available
mountings

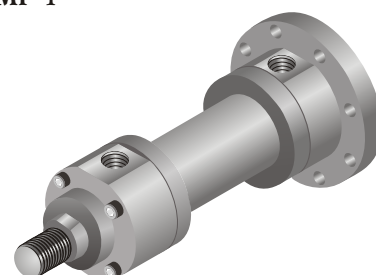
MF 2



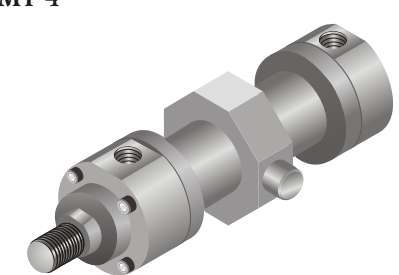
MF 3



MF 4

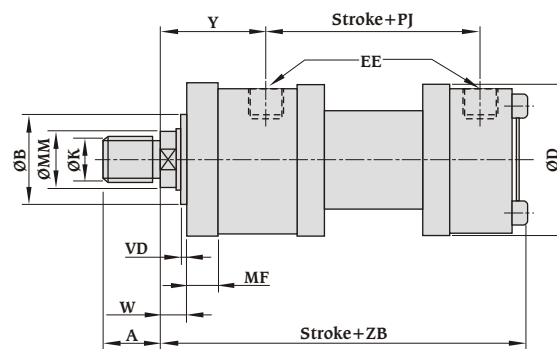
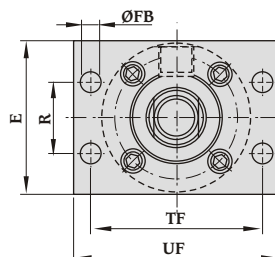
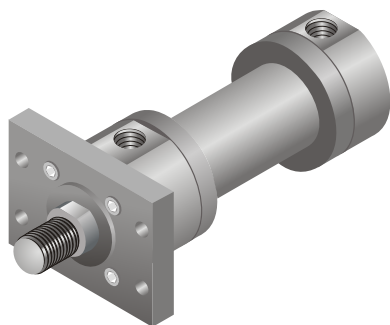
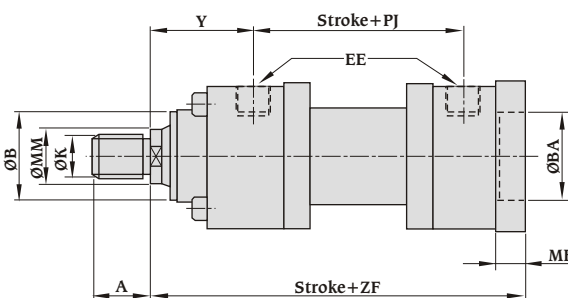
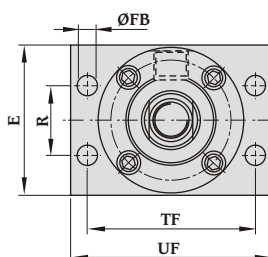
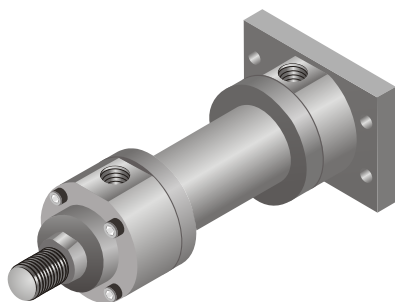


MT 4



Specifications in this catalogue are subject to change without notice.

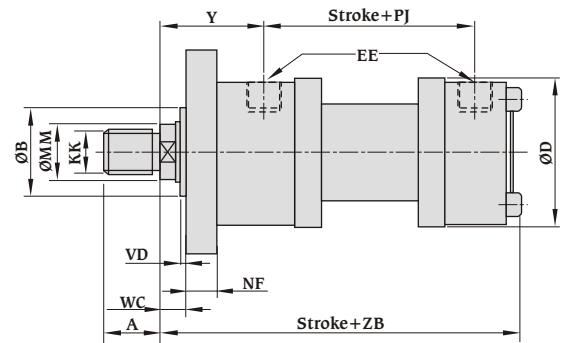
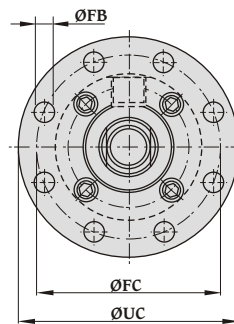
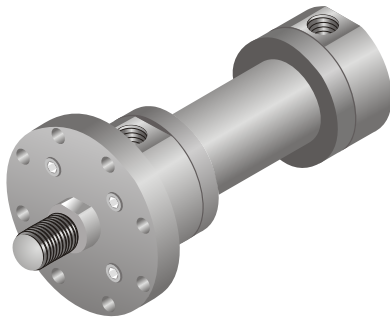
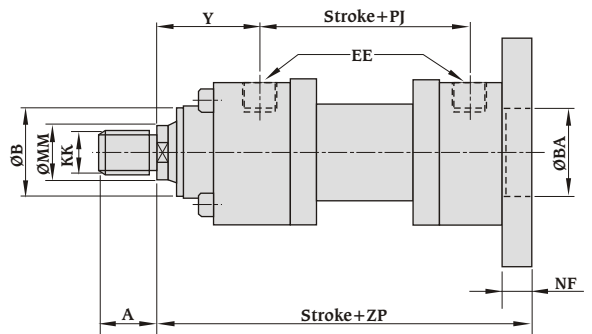
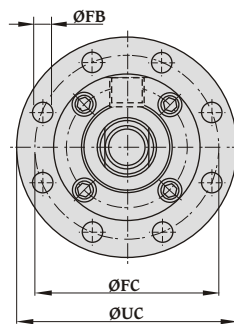
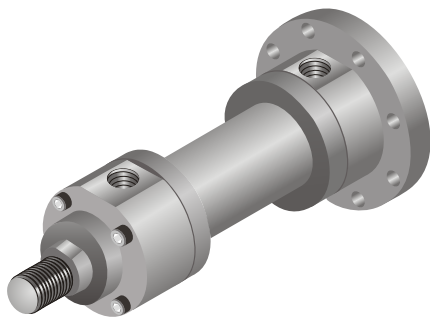
Rectangular flange mountings

Mounting style (MF 1)
Head rectangular flangeMounting style (MF 2)
Cap rectangular flange

Bore	mm	KK	A	D	B/BA H/f8	W	VD	MF	EE BSP	Y	TF	UF	R	E	FB	Stroke+		
																PJ	ZB	ZF
40	22	M16x1.5	22	78	16	50	3	16	1/2"	71	98	115	40.6	80	9	97	198	206
	28	M 20x1.5	28															
50	28	M 20x1.5	28	95	18	60	4	20	1/2"	72	116.4	140	48.2	11	11	111	213	225
	36	M 27x2	36															
63	36	M 27x2	36	116	20	70	4	25	3/4"	82	134	160	55.5	120	13.5	117	234	249
	45	M 33x2	45															
80	45	M 33x2	45	130	22	85	4	32	3/4"	91	152.5	185	63.1	135	17.5	134	260	282
	56	M 42x2	56															
100	56	M 42x2	56	158	25	106	5	32	1"	108	184.8	225	76.5	160	22	162	310	332
	70	M 48x2	63															
125	70	M 48x2	63	192	28	132	5	32	1"	121	217.1	255	90.2	195	22	174	335	357
	90	M 64x3	85															

All dimensions are in millimeters unless otherwise stated.

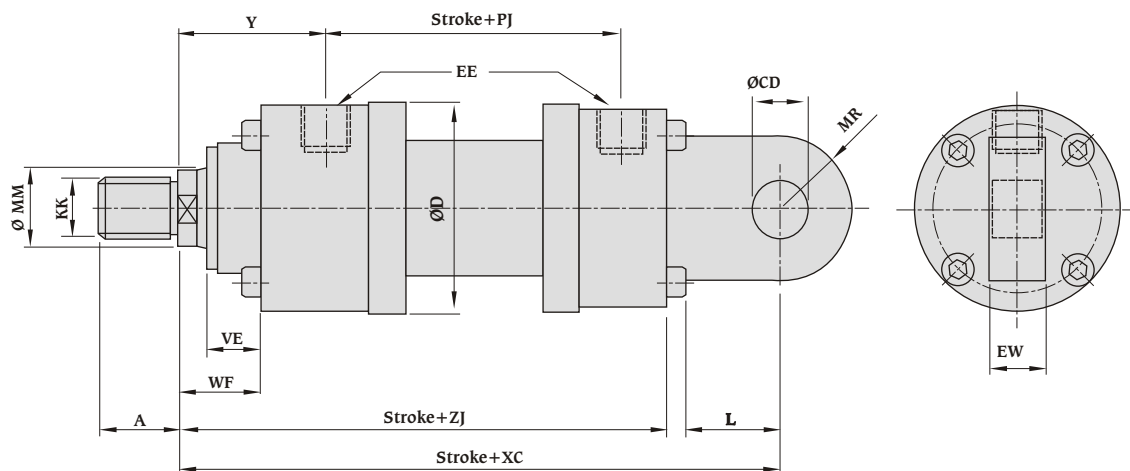
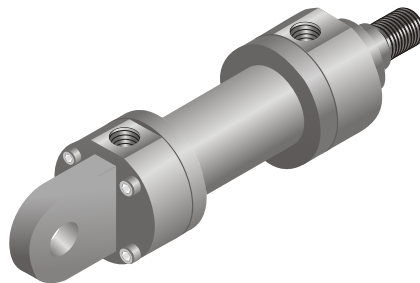
Rectangular flange mountings

 Mounting style (MF 3)
 Head circular flange

 Mounting style (MF 4)
 Cap circular flange


Bore	mm	KK	A	D	B/BA H/f8	WC	VD	NF	EE BSP	Y	FC	UC	FB	Stroke +		
														PJ	ZB	ZP
40	22	M16x1.5	22	78	50	16	3	16	1/2"	71	106	125	8xØ9	97	198	206
	28	M20x1.5	28													
50	28	M20x1.5	28	95	60	18	4	20	1/2"	72	126	150	8xØ11	111	213	225
	36	M27x2	36													
63	36	M27x2	36	116	70	20	4	25	3/4"	82	145	170	8xØ13.5	117	234	249
	45	M33x2	45													
80	45	M33x2	45	130	85	22	4	32	3/4"	91	165	195	8xØ17.5	134	260	282
	56	M42x2	56													
100	56	M42x2	56	158	106	25	5	32	1"	108	200	240	8xØ22	162	310	332
	70	M48x2	63													
125	70	M48x2	63	192	132	28	5	32	1"	121	235	275	8xØ22	174	335	357
	90	M64x3	85													
160	90	M64x3	85	238	160	30	5	36	1-1/4"	143	280	320	8xØ22	191	380	406
	110	M80x3	95													
200	110	M80x3	95	285	200	35	5	40	1-1/4"	190	340	385	8xØ26	224	480	490
	140	M100x3	112													

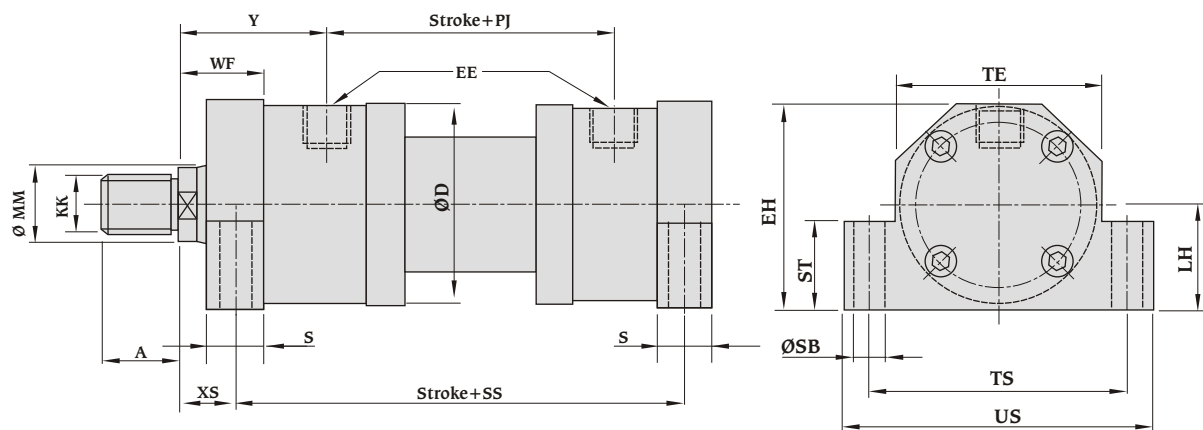
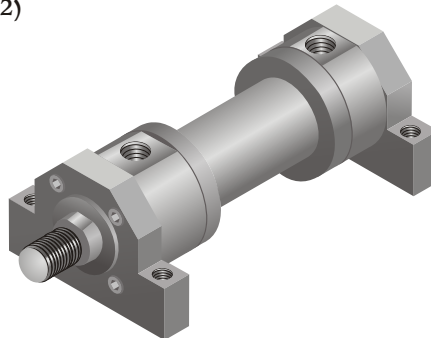
All dimensions are in millimeters unless otherwise stated.

Mounting style
Cap fixed plain eye (MP3)



Bore	mm	KK	A	D	CD H9	EW	L	MR	EE BSP	WF	VE	Y	Stroke +		
													PJ	ZB	ZF
40	22	M16x1.5	22	78	20	20	25	25	1/2"	32	19	71	97	190	231
	28	M20x1.5	28												
50	28	M20x1.5	28	95	25	25	32	32	1/2"	38	24	72	111	205	257
	36	M27x2	36												
63	36	M27x2	36	116	32	32	40	40	3/4"	45	29	82	117	224	289
	45	M33x2	45												
80	45	M33x2	45	130	40	40	50	50	3/4"	54	36	91	134	250	332
	56	M42x2	56												
100	56	M42x2	56	158	50	50	63	63	1"	57	37	108	162	300	395
	70	M48x2	63												
125	70	M48x2	63	192	63	63	71	71	1"	60	37	121	174	325	428
	90	M64x3	85												
160	90	M64x3	85	238	80	80	90	90	1-1/4"	66	41	143	191	370	505
	110	M80x3	95												
200	110	M80x3	95	285	100	100	112	112	1-1/4"	75	45	190	224	450	615
	140	M100x3	112												

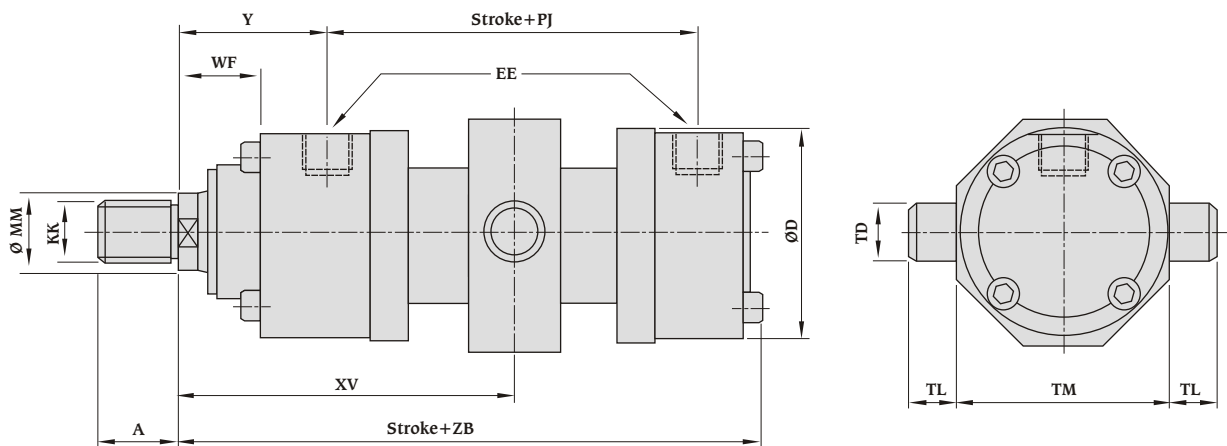
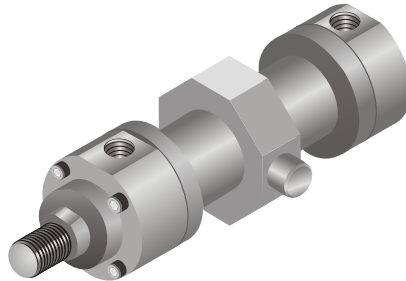
All dimensions are in millimeters unless otherwise stated.

Mounting style
 Side lugs (MS 2)


Bore	mm	KK	A	D	EE BSP	EH	LH	S	SB	ST	TE	TS	US	WF	XS	Y	Stroke+	
																	PJ	SS
40	22	M16x1.5	22	78	1/2"	82	43	25	11	43	78	100	120	32	19.5	71	97	183
	28	M20x1.5	28															
50	28	M20x1.5	28	95	1/2"	100	52	32	14	52	95	120	145	38	22	72	111	199
	36	M27x2	36															
63	36	M27x2	36	116	3/4"	120	62	32	18	62	116	150	180	45	29	82	117	211
	45	M33x2	45															
80	45	M33x2	45	130	3/4"	135	70	40	22	70	130	170	210	54	34	92	134	236
	56	M42x2	56															
100	56	M42x2	56	158	1"	161	82	50	26	82	158	205	250	57	32	108	162	293
	70	M48x2	63															
125	70	M48x2	63	192	1"	196	100	56	33	100	192	245	300	60	32	121	174	321
	90	M64x3	85															
160	90	M64x3	85	238	1-1/4"	238	119	60	33	119	238	295	350	66	36	143	191	364
	110	M80x3	95															
200	110	M80x3	95	285	1-1/4"	288	145	72	39	145	285	350	415	75	39	190	224	447
	140	M100x3	112															

All dimensions are in millimeters unless otherwise stated.

Mounting style
Intermediate fixed trunnion
(male) (MT 4)



Bore	mm	KK	A	D	EE BSP	TD f8	TL	TM h 12	WF	XV	Y	Stroke+	
												PJ	ZB
40	22	M16x1.5	22	78	1/2"	20	16	90	32	Dimensions to be specified by customer	71	97	198
	28	M20x1.5	28										
50	28	M20x1.5	28	95	1/2"	25	20	105	38		72	111	213
	36	M27x2	36										
63	36	M27x2	36	116	3/4"	32	25	120	45		82	117	234
	45	M33x2	45										
80	45	M33x2	45	130	3/4"	40	32	135	54		91	134	260
	56	M42x2	56										
100	56	M42x2	56	158	1"	50	40	160	57		108	162	310
	70	M48x2	63										
125	70	M48x2	63	192	1"	63	50	195	60		121	174	335
	90	M64x3	85										
160	90	M64x3	85	238	1-1/4"	80	63	240	66		143	191	380
	110	M80x3	95										
200	110	M80x3	95	285	1-1/4"	100	80	295	75		190	224	480
	140	M100x3	112										

All dimensions are in millimeters unless otherwise stated.

VN & WN Series



Cylinder selection guide

Operating pressure at kg/sq. cm				Theoretical forces (at mechanical efficiency = 100%)							
				50		80		100		160	
Piston dia mm	Rod dia mm	Piston area sq. cm	Rod area sq. cm	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf
40	25	12.57	4.91	628.4	382.93	1005.44	612.69	1256.8	765.86	2010.88	1225.38
50	32	19.64	8.04	981.88	579.70	1571.00	927.52	1963.75	1159.40	3142	1855.04
63	40	31.18	12.57	1558.82	930.42	2494.12	1488.68	3117.65	1860.85	4988.24	2977.36
80	45	50.27	15.91	2513.6	1718.28	4021.76	2749.25	5027.2	3436.56	8043.52	5498.50
100	50	78.55	19.64	3927.5	2945.63	6284	4713.00	7855	5891.25	12568	9426.00

Ordering details for VN series hydraulic cylinder

	VN				
Series					
Cylinder bore					
Stroke length					
Type of acting					
DA - Double acting					
SA - Single acting (return by weight)					
High temperature seals (V)					
optional					

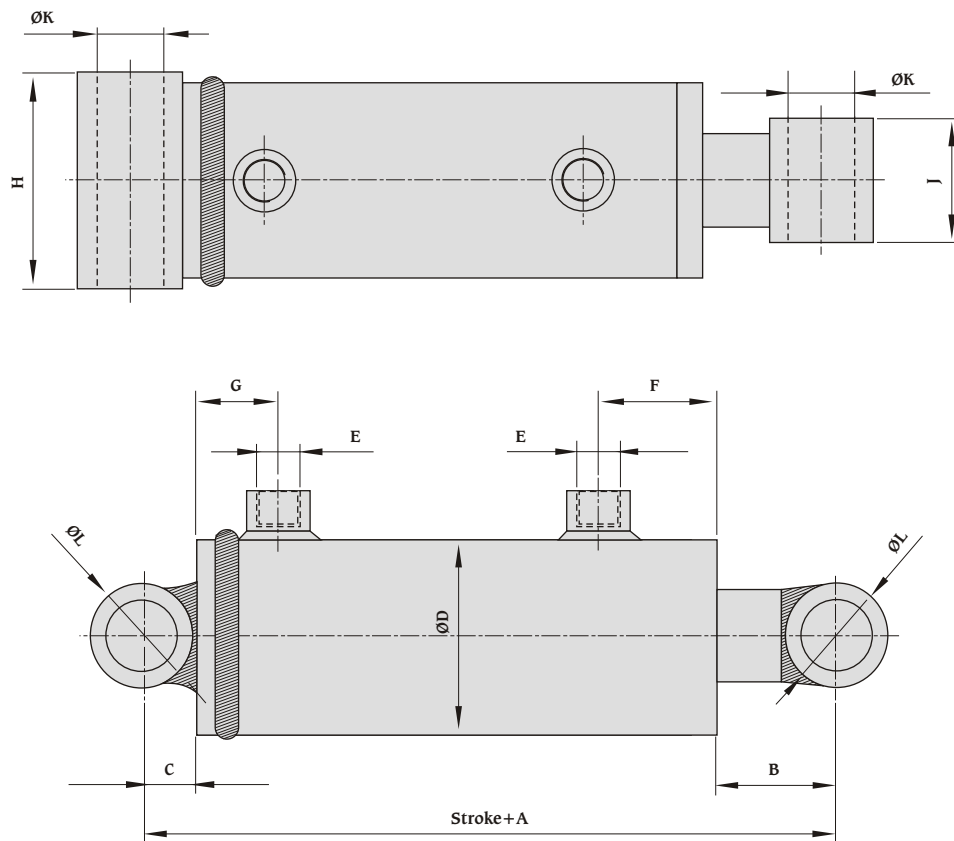
Ordering details for WN series hydraulic cylinder

	WN				
Series					
Cylinder bore					
Stroke length					
Type of acting					
DA - Double acting					
SA - Single acting (return by weight)					
High temperature seals (V)					
optional					

All dimensions are in millimeters unless otherwise stated.

Features and specifications

- Low cost cylinder
- Thoroughly tested to our standard quality and performance
- Double acting & single acting versions
- Bore sizes : 40mm to 100mm
- Strokes available in up to 1000mm stroke length
- Single rod designs
- Ideal for construction, agriculture and other industries
- Maximum working pressure : 160 bar
- Piston rods : Precision ground & hard chrome plated
- Non-cushioned
- Temperature range : - 20°C to +80°C (standard)
- 20°C to 150°C (optional)
- Standard fluid : Mineral oil DIN 51524 (HL, HLP)
- Seal types to suit a wide variety of operating environments

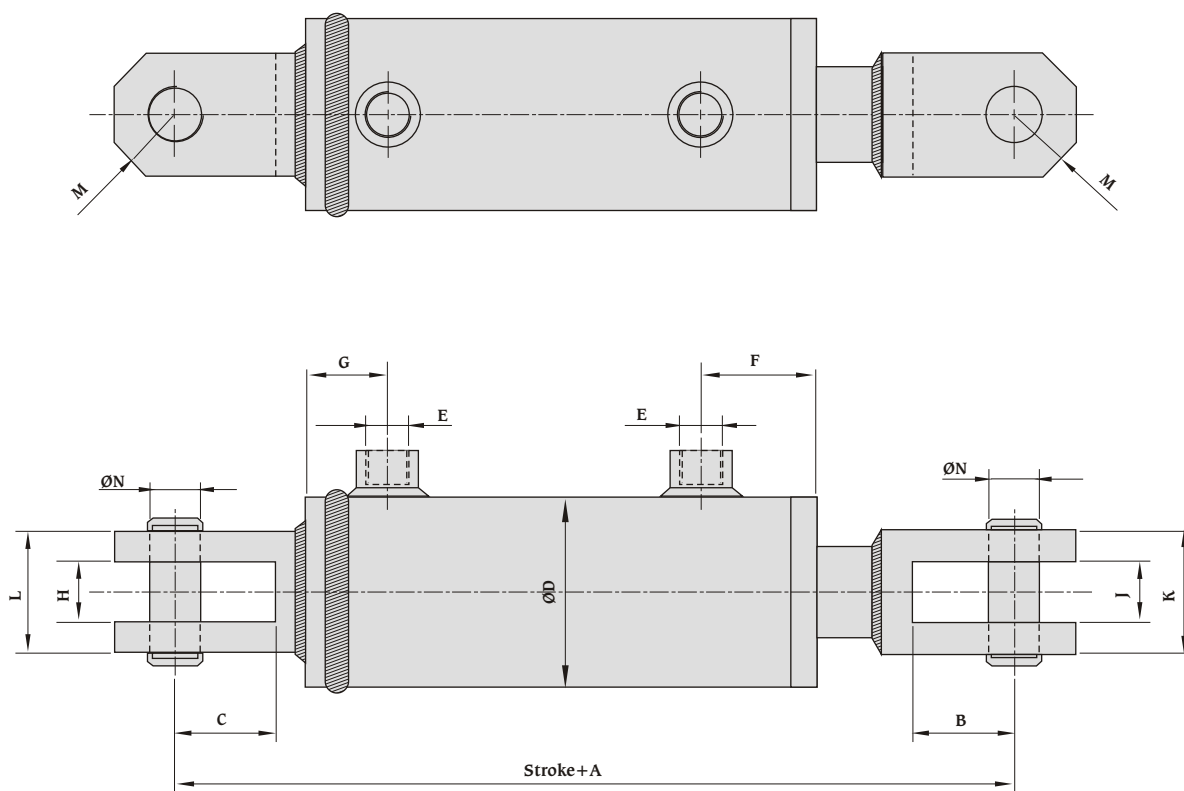


Piston $\varnothing$	Rod $\varnothing$	A	B	C	D $\varnothing$	E BSP	F	G	H	J	K $\varnothing$	L $\varnothing$
40	25	175	40	16	50	3/8"	49	24	55	50	20	32
50	32	185	45	19	60	3/8"	49	24	70	55	25	38
63	40	201	45	19	73	3/8"	54	24	80	55	25	38
80	45	232	60	25	94	1/2"	60	30	100	65	32	50
100	50	252	70	28	114	1/2"	65	32	120	70	38	56

All dimensions are in mm unless otherwise stated.

Features and specifications

- Low cost cylinder
- Thoroughly tested to our standard quality and performance
- Double acting & single acting versions
- Bore sizes - 40mm to 100mm
- Strokes available in up to 1000mm stroke length
- Maximum pressure - 160 bar
- Ideal for construction, agriculture and other industries
- Single rod designs
- Piston rods - Precision grounded & hard chrome plated
- Non-cushioned
- Temperature range : - 20°C to +80°C (standard)
- 20°C to 150°C (optional)
- Standard fluid : Mineral oil DIN 51524 (HL, HLP)
- Seal types to suit a wide variety of operating environments



Piston Ø	Rod Ø	A	B	C	D Ø	E BSP	F	G	H	J	K	L	M	N Ø
40	25	213	30	30	50	3/8"	49	24	20	20	40	40	23	16
50	32	239	40	40	60	3/8"	49	24	25	25	49	49	28	20
63	40	267	40	40	73	3/8"	54	24	25	25	49	49	28	20
80	45	312	50	50	94	1/2"	60	30	30	30	60	60	32	25
100	50	326	50	50	114	1/2"	65	32	30	30	60	60	32	25

All dimensions are in mm unless otherwise stated.

XN Series



Cylinder selection guide

Operating pressure at kg/sq. cm				Theoretical forces (at mechanical efficiency =100%)							
				50		100		160		200	
Piston dia mm	Rod dia mm	Piston area sq. cm	Rod area sq. cm	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf
25	16	4.91	2.01	245.46875	144.92	490.9375	289.85	785.5	463.76	981.875	579.70
32	20	8.04	3.14	402.18	245.08	804.35	490.15	1286.96	784.24	1608.704	980.30
40	25	12.57	4.91	628.40	382.93	1256.80	765.86	2010.88	1225.38	2513.60	1531.73
50	32	19.64	8.04	981.875	579.70	1963.75	1159.40	3142	1855.04	3927.5	2318.80
63	35	31.18	9.62	1558.8248	1077.71	3117.6495	2155.41	4988.2392	3448.66	6235.299	4310.82
80	45	50.27	15.91	2513.60	1718.28	5027.20	3436.5625	8043.52	5498.50	10054.40	6873.125
100	56	78.55	24.63	3927.50	2695.84	7855.00	5391.67	12568.00	8626.68	15710.00	10783.34

Ordering details for XN series compact hydraulic cylinders

XN				
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Series _____

Cylinder bore _____

Stroke length _____

Mounting style _____

V = vertically counter holes mounting
Vt = vertically threaded mounting
H = Horizontal mounting (optional)

Piston rod thread _____

MT = Male thread
FT = Female thread

Example

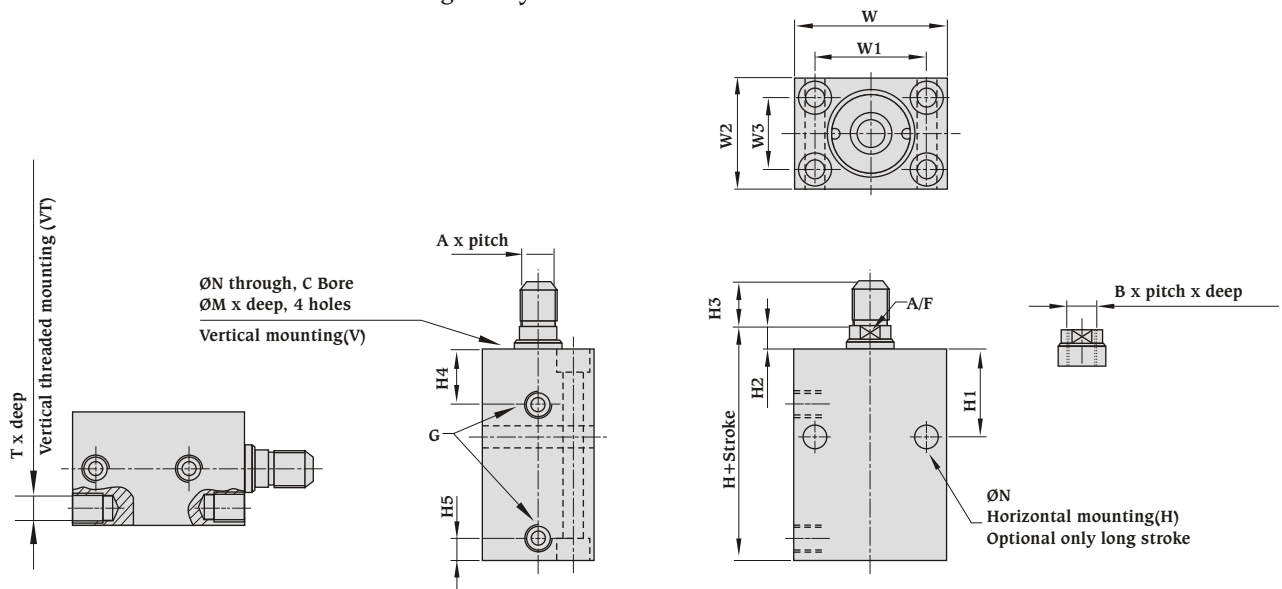
XN series hydraulic cylinder with bore 50mm, stroke 15mm, mounting VT, piston rod threads male will be specified as

XN	50	15	VT	MT
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All dimensions are in millimeters unless otherwise stated.

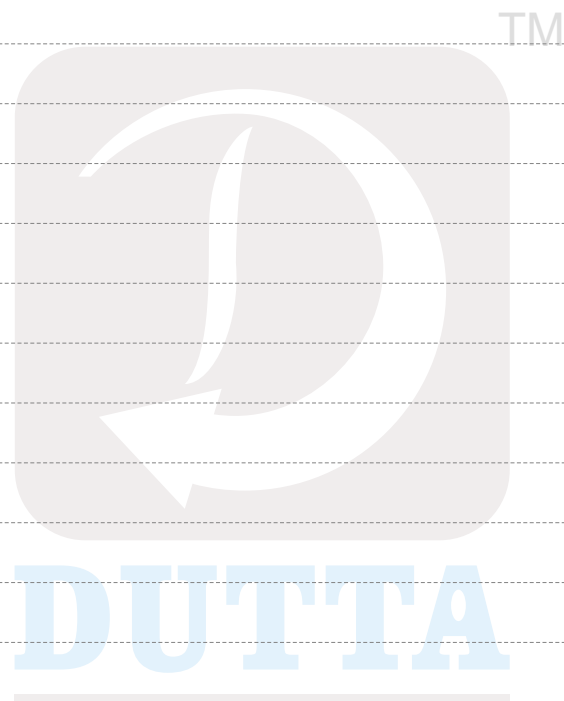
Features and specifications

- Male/Female threaded piston rod also available
- Can be mounted vertically or horizontally
- Bore sizes - 25mm to 100mm
- Strokes available in 5 to 50mm stroke length only
- Maximum working pressure - 200 bar
- Temperature range : - 20°C to +80°C
- Non-cushioned



Piston dia	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100
Rod dia	Ø16	Ø20	Ø25	Ø32	Ø35	Ø45	Ø56
A x pitch	M 12x1.25P	M 16x1.5P	M 20x1.5P	M24x2P	M27x2P	M33x2P	M42x2P
B x pitch x deep	M10x1.5Px15	M12x1.7Px15	M16x2Px25	M20x2.5Px30	M24x3Px35	M30x3.5Px40	M42x2Px40
T x pitch x deep	M 10x1.5Px15	M 12x1.75Px15	M 12x1.75Px15	M16x2Px20	M20x2.5Px22	M24x3Px25	M30x3.5Px32
H	60	65	71	76	86	100	110
H1	47	43	44	50	56	63	NA
H2	8	11	11	11	13	15	15
H3	16	20	28	32	36	45	56
H4	26	27	29	32	35	35	40
H5	11	13	13	12	15	20	20
G BSP	1/4"	1/4"	1/4"	1/4"	1/4"	1/2"	1/2"
W	65	75	85	100	125	160	170
W1	50	55	62	76	95	120	120
W2	45	55	63	75	95	120	150
W3	30	35	40	45	65	80	110
A/F	13	17	21	26	30	41	50
ØN	9	11	11	11	18	22	26
ØM x Deep	14x10	17x11	17x11	20x13	26x18	33x22	30x26

All dimensions are in mm unless otherwise stated.



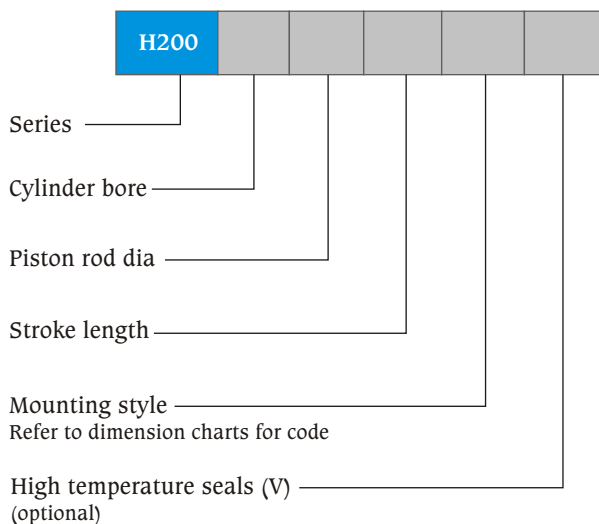
H200 Series



Cylinder selection guide

Operating pressure at kg/sq. cm				Theoretical forces (at mechanical efficiency = 100%)							
				140		160		180		200	
Piston dia mm	ROD dia mm	Piston area Sq. cm	ROD area Sq. cm	PUSH kgf	PULL kgf	PUSH kgf	PULL kgf	PUSH kgf	PULL kgf	PUSH kgf	PULL kgf
80	45	50.27	15.91	7038.08	4811.19	8043.52	5498.50	9048.96	6185.81	10054.4	6873.13
	56		24.63		3589.42		4102.20		4614.97		5127.74
100	56	78.55	24.63	10997.00	7548.34	12568	8626.68	14139	9705.01	15710	10783.34
	70		38.49		5608.47		6409.68		7210.89		8012.10
125	70	122.73	38.49	17182.81	11794.28	19637.50	13479.18	22092.19	15164.08	24546.88	16848.98
	90		63.63		8275.24		9457.42		10639.60		11821.78
160	90	201.09	63.63	28152.32	19244.75	32174.08	21994	36195.84	24743.25	40217.6	27492.5
	110		95.05		14845.95		16966.80		19087.65		21208.50
200	110	314.20	95.05	43988	30681.63	50272	35064.72	56556	39447.81	62840	43830.90
	140		153.96		22433.88		25638.72		28843.56		32048.4
250	140	490.94	153.96	68731.25	47177.13	78550	53916.72	88368.75	60656.31	98187.5	67395.9
	180		254.50		33100.97		37829.68		42558.39		47287.1
300	180	706.95	254.50	98973	63342.72	113112	72391.68	127251	81440.64	141390	90489.6
	220		380.18		45747.52		52282.88		58818.24		65353.6

Ordering details for H200 series hydraulic cylinder



Example

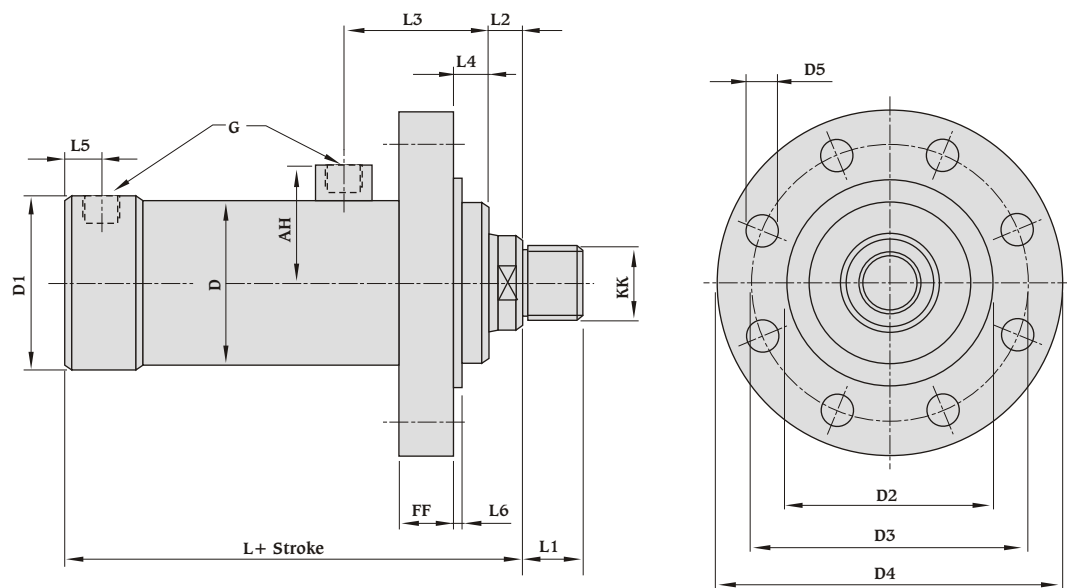
H200 series hydraulic cylinder with bore 100mm, piston rod dia 70mm, stroke 500mm. mounting rear flange will be specified as

H200	100	70	500	RF	-
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All dimensions are in millimeters unless otherwise stated.

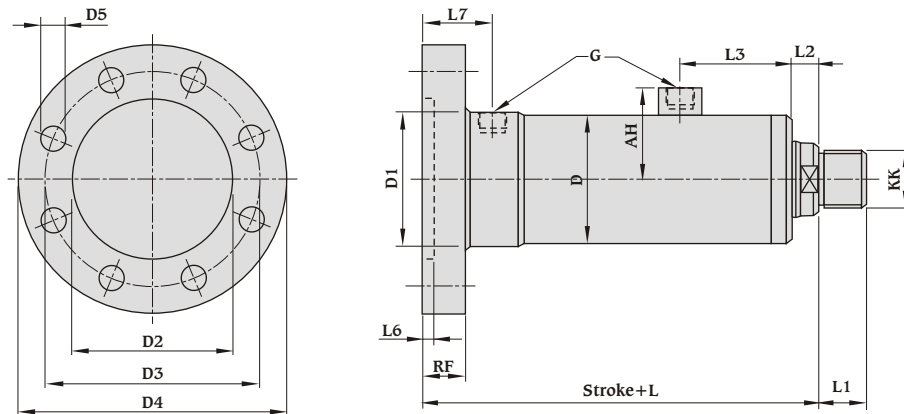
Features and specifications

- 5 Standard mounting styles
- Provision for smaller as well as bigger rod diameter for each bore size
- Bore size - 80mm to 300 mm
- Strokes available in any practical stroke length
- Maximum working pressure - 200 bar
- Piston rods - 45 mm to 220 mm
- Single rod design
- Non-cushioned
- Temperature range : - 20°C to + 80°C (standard)
- 20° C to + 150°C (optional)
- Seal types to suit a wide variety of operating environments
- Standard fluid - Mineral oil DIN 51524 (HL, HLP)

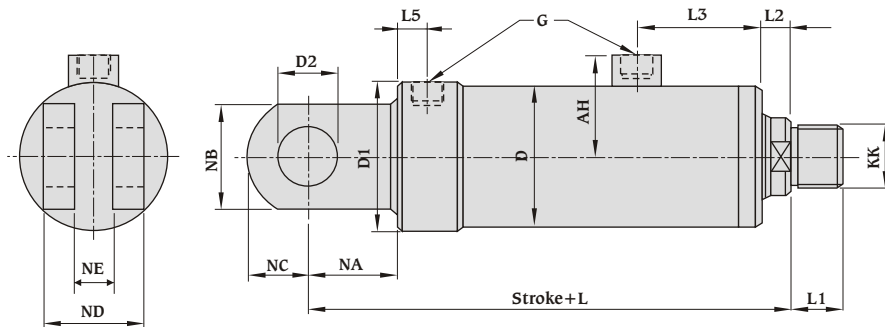
**Mounting style
Front flange (FF)**

Piston Ø	Rod		AH	G BSP	D Ø	D1 Ø	D2 Ø	D3 Ø	D4 Ø	D5 Ø	FF	KK		L	L1		L2	L3	L4	L5	L6
	Ø1	Ø2										Ø1	Ø2		Ø1	Ø2					
80	45	56	73	1/2"	95	95	120	160	200	18(x8)	31	M33x2P	M42x2P	213	35	45	20	83	19	15	4
100	56	70	90	3/4"	120	120	140	191	231	22(x8)	32	M42x2P	M48x2P	247	45	58	30	93	20	19	5
125	70	90	103	3/4"	150	150	165	205	245	22(x8)	40	M48x2P	M64x3P	277	58	65	30	98	20	19	5
160	90	110	123	1"	190	190	205	265	320	26(x8)	40	M64x3P	M80x3P	323	65	80	35	118	25	23	5
200	110	140	145	1"	238	238	260	320	380	33(x8)	50	M80x3P	M100x3P	370	80	100	35	130	30	23	5
250	140	180	184	1-1/4"	300	300	310	390	460	39(x8)	60	M100x3P	M125x3P	422	100	125	35	145	33	28	8
300	180	220	214	1-1/2"	357	357	380	450	520	33(x12)	65	M125x3P	M135x3P	510	125	135	40	180	38	40	8

All dimensions are in millimeters unless otherwise stated.

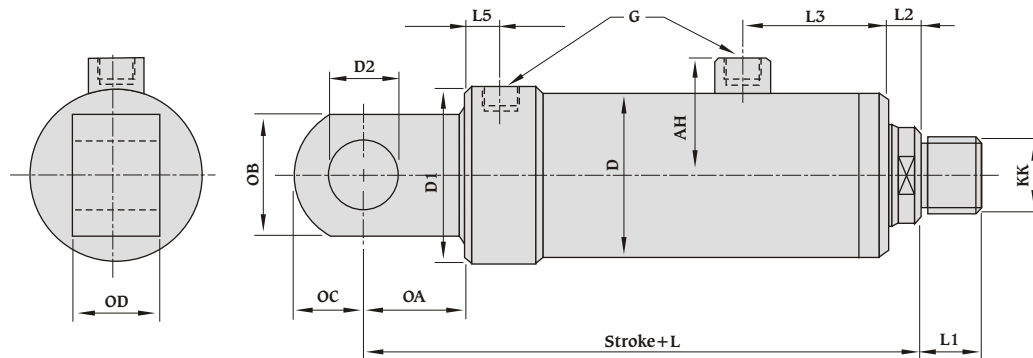
Mounting style
Rear flange (RF)


Piston Ø	Rod		AH	G BSP	D Ø	D1 Ø	D2 Ø	D3 Ø	D4 Ø	D5 Ø	RF	KK		L	L1		L2	L3	L6	L7
	Ø1	Ø2										Ø1	Ø2		Ø1	Ø2				
80	45	56	73	1/2"	95	95	120	160	200	18(x8)	28	M33x2P	M42x2P	251	35	45	20	83	4	53
100	56	70	90	3/4"	120	120	140	191	231	22(x8)	32	M42x2P	M48x2P	289	45	58	30	93	5	61
125	70	90	103	3/4"	150	150	165	205	245	22(x8)	38	M48x2P	M64x3P	325	58	65	30	98	5	67
160	90	110	123	1"	190	190	205	265	320	26(x8)	38	M64x3P	M80x3P	371	65	80	35	118	5	71
200	110	140	145	1"	238	238	260	320	380	33(x8)	48	M80x3P	M100 x3P	428	80	100	35	130	5	81
250	140	180	184	1-1/4"	300	300	310	390	460	39(x8)	58	M100x3P	M125 x 3P	490	100	125	35	145	8	96
300	180	220	214	1-1/2"	357	357	380	450	520	33(x12)	65	M125x3P	M 135 X 3P	585	125	135	40	180	8	115

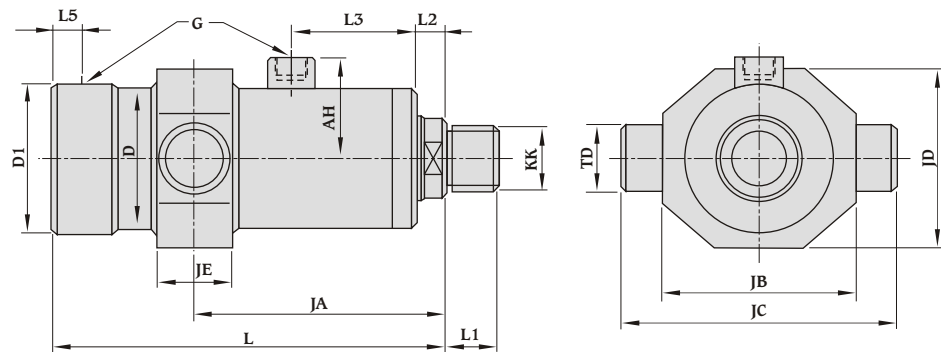
Mounting style
Rear clevis (RP1)


Piston Ø	Rod		AH	G BSP	D Ø	D1 Ø	D2 Ø	KK		L	L1		L2	L3	L5	NA	NB	NC	ND	NE
	Ø1	Ø2						Ø1	Ø2		Ø1	Ø2								
80	45	56	73	1/2"	95	95	40	M33x2P	M42x2P	273	35	45	20	83	15	60	80	40	90	45
100	56	70	90	3/4"	120	120	50	M42x2P	M48x2P	322	45	58	30	93	19	75	100	45	100	50
125	70	90	103	3/4"	150	150	50	M48x2P	M64x3P	362	58	65	30	98	19	85	100	60	100	50
160	90	110	123	1"	190	190	60	M64x3P	M80x3P	428	65	80	35	118	23	105	120	80	120	60
200	110	140	145	1"	238	238	80	M80x3P	M100 x3P	515	80	100	35	130	23	145	160	95	140	70
250	140	180	184	1-1/4"	300	300	100	M100x3P	M125 x 3P	612	100	125	35	145	28	190	200	130	165	85
300	180	220	214	1-1/2"	357	357	120	M125x3P	M 135 X 3P	750	125	135	40	180	40	240	240	145	215	110

All dimensions are in millimeters unless otherwise stated.

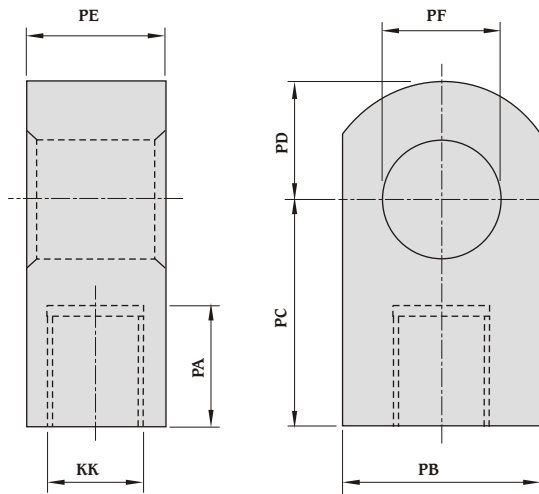
Mounting style
Rear eye (RP3)


Piston Ø	Rod		AH	G BSP	D Ø	D1 Ø	D2 Ø	KK		L	L1		L2	L3	L5	OA	OB	OC	OD
	Ø1	Ø2						Ø1	Ø2		Ø1	Ø2							
80	45	56	73	1/2"	95	95	40	M33x2P	M42x2P	273	35	45	20	83	15	60	70	40	50
100	56	70	90	3/4"	120	120	50	M42x2P	M48x2P	317	45	58	30	93	19	70	90	45	60
125	70	90	103	3/4"	150	150	60	M48x2P	M64x3P	367	58	65	30	98	19	90	100	60	70
160	90	110	123	1"	190	190	70	M64x3P	M80x3P	433	65	80	35	118	23	110	140	80	90
200	110	140	145	1"	238	238	90	M80x3P	M100 x3P	510	80	100	35	130	23	140	160	95	118
250	140	180	184	1-1/4"	300	300	120	M100x3P	M125 x 3P	592	100	125	35	145	28	170	200	130	138
300	180	220	214	1-1/2"	357	357	150	M125x3P	M 135 X 3P	710	125	135	40	180	40	200	230	145	176

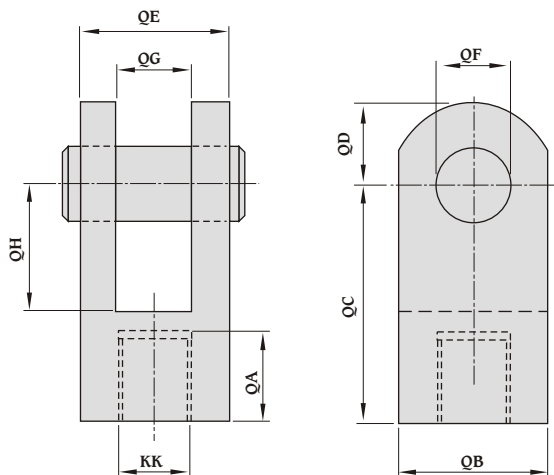
Mounting style
Intermediate trunnion (TR 4)


Piston Ø	Rod		AH	G BSP	D Ø	D1 Ø	KK		L	L1		L2	L3	L5	JA	JB	JC	JD	JE	TD Ø
	Ø1	Ø2					Ø1	Ø2		Ø1	Ø2									
80	45	56	73	1/2"	95	95	M33x2P	M42x2P	213	35	45	20	83	15	To be specified by customer	130	184	120	50	45
100	56	70	90	3/4"	120	120	M42x2P	M48x2P	247	45	58	30	93	19		165	230	140	60	55
125	70	90	103	3/4"	150	150	M48x2P	M64x3P	277	58	65	30	98	19		185	280	180	80	65
160	90	110	123	1"	190	190	M64x3P	M80x3P	323	65	80	35	118	23		235	360	220	100	85
200	110	140	145	1"	238	238	M80x3P	M100 x3P	370	80	100	35	130	23		300	440	290	130	110
250	140	180	184	1-1/4"	300	300	M100x3P	M125 x 3P	422	100	125	35	145	28		360	550	350	150	130
300	180	220	214	1-1/2"	357	357	M125x3P	M 135 X 3P	510	125	135	40	180	40		450	680	420	180	160

All dimensions are in millimeters unless otherwise stated.

Accessories**Plain rod eye**

Model No.	KK THD	PA	PB	PC	PD	PE	PF Ø
PRE-H200-M33x2P	M33x2P	37	70	70	40	50	40
PRE-H200-M42x2P	M42x2P	48	90	90	45	60	50
PRE-H200-M48x2P	M48x2P	55	100	115	60	70	60
PRE-H200-M64x3P	M64x3P	68	140	140	80	90	70
PRE-H200-M80x3P	M80x3P	64	160	160	90	98	80
PRE-H200-M100x3P	M100x3P	104	180	190	110	118	100
PRE-H200-M125x3P	M125x3P	130	230	255	145	176	150
PRE-H200-M135x3P	M135x3P	140	270	275	165	196	170

Rod clevis

Model No.	KK THD	QA	QB	QC	QD	QE	QF Ø	QG	QH
RC-H200-M33x2P	M33x2P	37	80	110	40	90	40	45	60
RC-H200-M42x2P	M42x2P	48	100	140	55	100	50	50	75
RC-H200-M48x2P	M48x2P	55	100	160	55	100	50	50	85
RC-H200-M64x3P	M64x3P	68	120	190	70	120	60	60	105
RC-H200-M80x3P	M80x3P	64	140	235	80	130	70	65	130
RC-H200-M100x3P	M100x3P	104	180	295	110	155	90	80	165
RC-H200-M125x3P	M125x3P	130	240	405	145	215	120	110	240
RC-H200-M135x3P	M135x3P	140	280	450	165	250	140	130	270

All dimensions are in millimeters unless otherwise stated.

H250 Series



Cylinder selection guide

Operating pressure at kg/sq. cm				Theoretical forces (at mechanical efficiency = 100%)							
				160		180		200		250	
Piston dia mm	Rod dia mm	Piston area sq. cm	Rod area sq. cm	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf
80	45	50.27	15.91	8043.52	5498.50	9048.96	6185.81	10054.4	6873.10	12568	8591.41
	56		24.63		4102.20		4614.97		5127.74		6409.68
100	56	78.55	24.63	12568.00	8626.68	14139	9705.01	15710	10783.34	19637.5	13479.18
	70		38.49		6409.68		7210.89		8012.10		10015.13
125	70	122.73	38.49	19637.50	13479.18	22092.19	15164.08	24546.88	16848.98	30683.59	21061.22
	90		63.63		9457.42		10639.60		11821.78		14777.22
160	90	201.09	63.63	32174.08	21994.00	36195.84	24743.25	40217.6	27492.50	50272	34365.625
	110		95.05		16966.80		19087.65		21208.50		26510.63
200	110	314.20	95.05	50272	35064.72	56556	39447.81	62840	43830.90	78550	54788.63
	140		153.96		25638.72		28843.56		32048.4		40060.5
250	140	490.94	153.96	78550.00	53916.72	88368.75	60656.31	98187.50	67395.90	122734.375	84244.875
	180		254.50		37829.68		42558.39		47287.10		113112
300	180	706.95	254.50	113112	52282.88	127251	81440.64	141390	90489.6	176737.5	81692
	220		380.18				58818.24		65353.6		

Ordering details for H250 series hydraulic cylinder

H250					
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Series _____

Cylinder bore _____

Piston rod dia _____

Stroke length _____

Mounting style _____
Refer to dimension charts for code

High temperature seals (V) _____
(optional)

Example

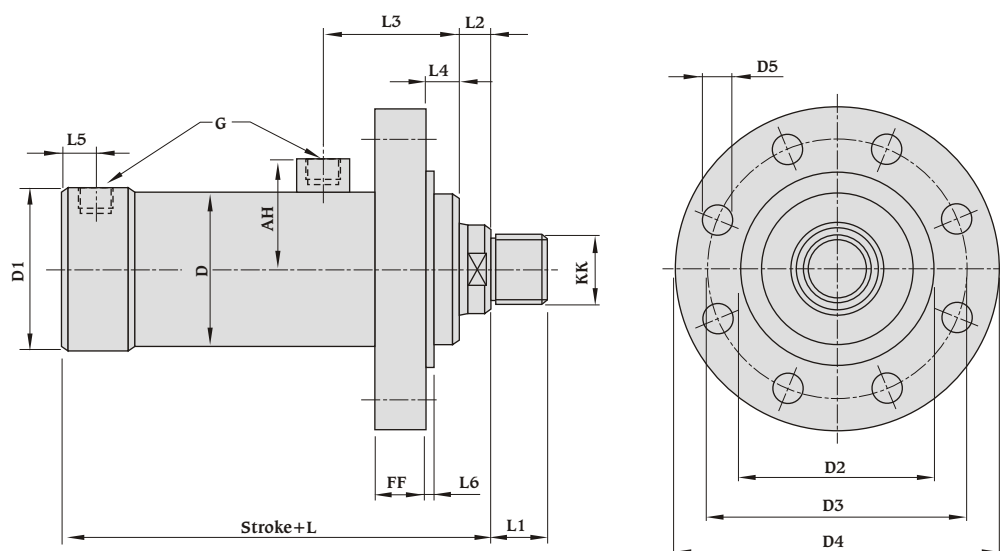
H250 series hydraulic cylinder with bore 100mm, piston rod dia 70mm, stroke 500mm, mounting rear flange will be specified as

H250	100	70	500	RF	-
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All dimensions are in millimeters unless otherwise stated.

Features and specifications

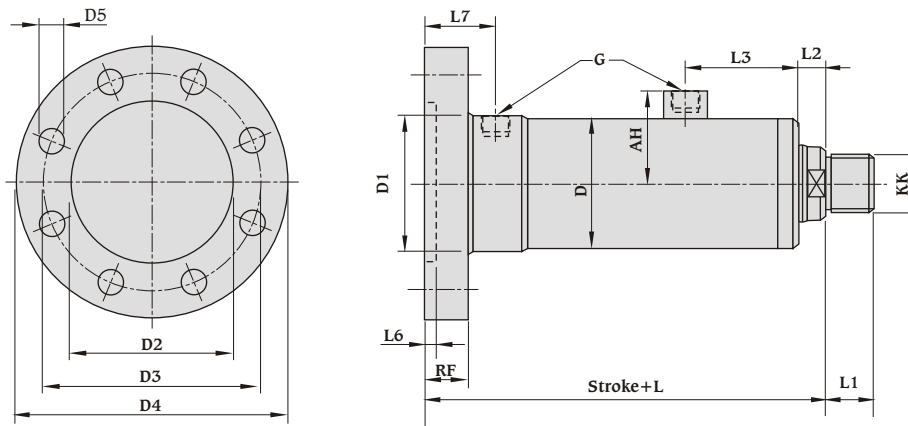
- 5 Standard mounting styles
- Provision for smaller as well as bigger rod diameter for each bore size
- Bore sizes - 80 to 300 mm
- Strokes available in any practical stroke length
- Maximum working pressure - 250 bar
- Piston rods - 45mm to 220mm
- Single rod designs
- Non-cushioned
- Temperature range : - 20°C to +80°C (standard)
- 20°C to +150°C (optional)
- Seal types to suit a wide variety of operating environments
- Standard fluid - Mineral oil DIN 51524 (HL, HLP)

**Mounting style
Front flange (FF)**

Piston Ø	Rod		AH	G	D Ø	D1 Ø	D2 Ø	D3 Ø	D4 Ø	D5 Ø	FF	KK		L	L1		L2	L3	L4	L5	L6
	Ø1	Ø2										Ø1	Ø2		Ø1	Ø2					
80	45	56	73	1/2"	100	100	120	160	200	18(x8)	31	M33x2P	M42x2P	213	35	45	20	83	19	15	4
100	56	70	90	3/4"	124	124	140	191	231	22(x8)	32	M42x2P	M48x2P	247	45	58	30	93	20	19	5
125	70	90	103	3/4"	155	155	170	205	245	22(x8)	40	M48x2P	M64x3P	277	58	65	30	98	20	19	5
160	90	110	123	1"	197	197	215	265	320	26(x8)	40	M64x3P	M80x3P	323	65	80	35	118	25	23	5
200	110	140	152	1"	248	248	270	340	410	33(x8)	50	M80x3P	M100x3P	370	80	100	35	130	30	23	5
250	140	180	184	1-1/4"	310	310	322	390	460	39(x8)	60	M100x3P	M125x3P	422	100	125	35	145	33	28	8
300	180	220	220	1-1/2"	371	371	400	485	560	39(x12)	75	M125x3P	M135x3P	520	125	135	40	190	38	40	8

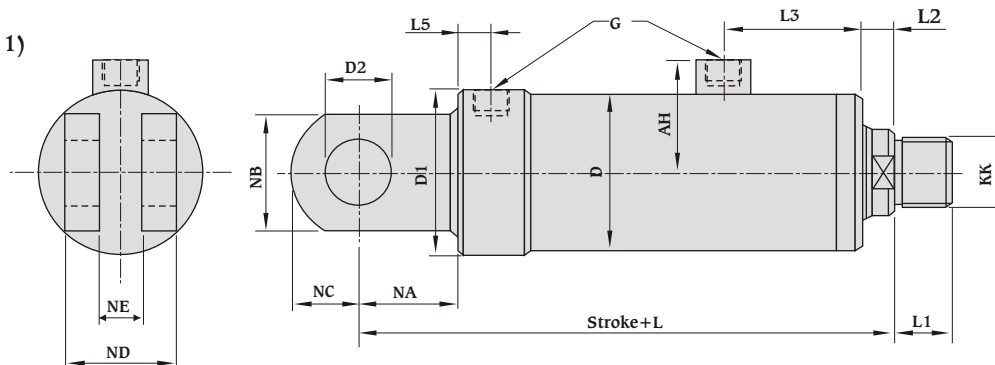
All dimensions are in mm unless otherwise stated.

Mounting style
Rear flange (RF)



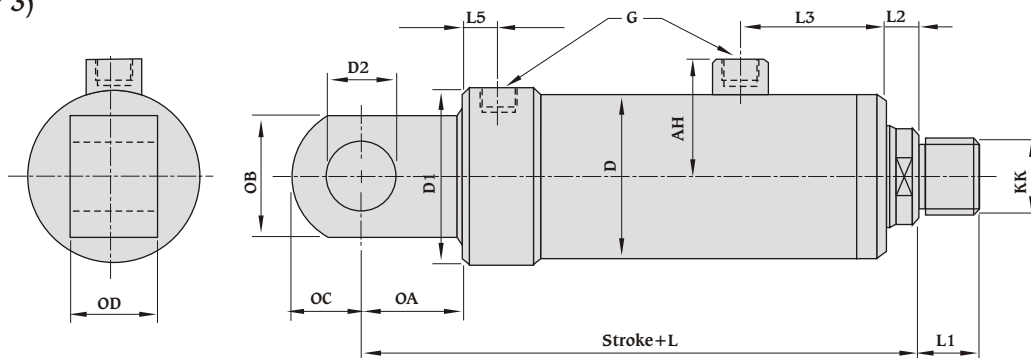
Piston Ø	Rod		AH	G BSP	D Ø	D1 Ø	D2 Ø	D3 Ø	D4 Ø	D5 Ø	RF	KK		L	L1		L2	L3	L6	L7
	Ø1	Ø2										Ø1	Ø2		Ø1	Ø2				
80	45	56	73	1/2"	100	100	120	160	200	18(x8)	28	M33x2P	M42x2P	251	35	45	20	83	4	53
100	56	70	90	3/4"	124	124	140	191	231	22(x8)	32	M42x2P	M48x2P	289	45	58	30	93	5	61
125	70	90	103	3/4"	155	155	170	205	245	22(x8)	38	M48x2P	M64x3P	325	58	65	30	98	5	67
160	90	110	123	1"	197	197	215	265	320	26(x8)	38	M64x3P	M80x3P	371	65	80	35	118	5	71
200	110	140	152	1"	248	248	270	340	410	33(x8)	48	M80x3P	M100x3P	428	80	100	35	130	5	81
250	140	180	184	1-1/4"	310	310	322	390	460	39(x8)	58	M100x3P	M125x3P	490	100	125	35	145	8	96
300	180	220	220	1-1/2"	371	371	400	485	560	39(x12)	75	M125x3P	M135x3P	605	125	135	40	190	8	125

Mounting style
Rear clevis (RP 1)

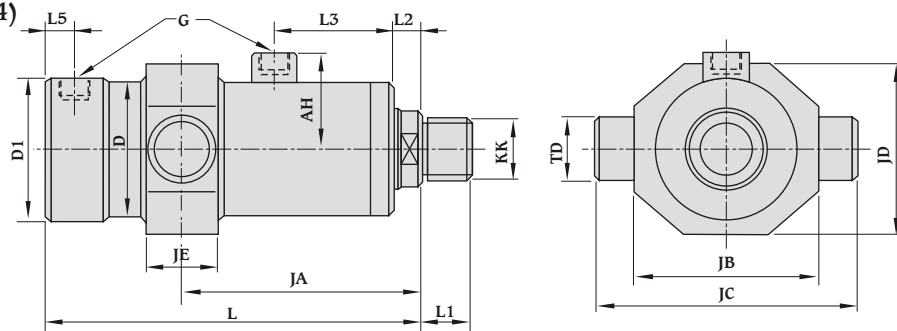


Piston Ø	Rod		AH	G BSP	D Ø	D1 Ø	D2 Ø	KK		L	L1		L2	L3	L5	NA	NB	NC	ND	NE
	Ø1	Ø2						Ø1	Ø2		Ø1	Ø2								
80	45	56	73	1/2"	100	100	40	M33x2P	M42x2P	273	35	45	20	83	15	60	80	40	90	45
100	56	70	90	3/4"	124	124	50	M42x2P	M48x2P	332	45	58	30	93	19	85	100	45	100	50
125	70	90	103	3/4"	155	155	60	M48x2P	M64x3P	382	58	65	30	98	19	105	120	70	120	60
160	90	110	123	1"	197	197	70	M64x3P	M80x3P	453	65	80	35	118	23	130	140	90	130	65
200	110	140	152	1"	248	248	90	M80x3P	M100x3P	535	80	100	35	130	23	165	180	105	155	75
250	140	180	184	1-1/4"	310	310	110	M100x3P	M125x3P	632	100	125	35	145	28	210	220	135	180	95
300	180	220	220	1-1/2"	371	371	140	M125x3P	M135x3P	790	125	135	40	190	40	270	280	165	250	130

All dimensions are in millimeters unless otherwise stated.

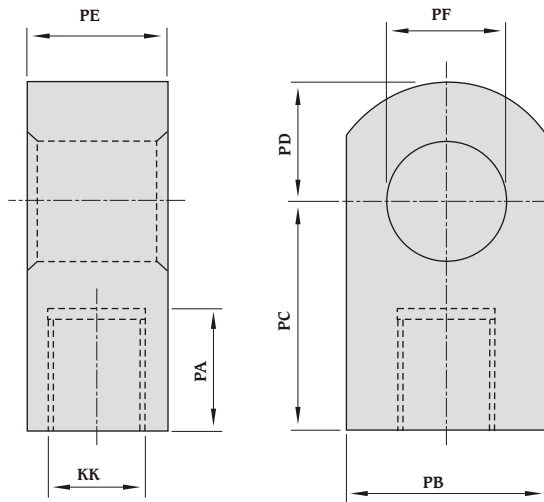
Mounting style
Rear eye (RP 3)


Piston Ø	Rod		AH	G BSP	D Ø	D1 Ø	D2 Ø	KK		L	L1		L2	L3	L5	OA	OB	OC	OD
	Ø1	Ø2						Ø1	Ø2		Ø1	Ø2							
80	45	56	73	1/2"	100	100	40	M33x2P	M42x2P	273	35	45	20	83	15	60	70	40	50
100	56	70	90	3/4"	124	124	50	M42x2P	M48x2P	332	45	58	30	93	19	70	90	45	60
125	70	90	103	3/4"	155	155	60	M48x2P	M64x3P	382	58	65	30	98	19	100	120	70	80
160	90	110	123	1"	197	197	70	M64x3P	M80x3P	453	65	80	35	118	23	120	160	90	98
200	110	140	152	1"	248	248	90	M80x3P	M100x3P	535	80	100	35	130	23	150	180	100	118
250	140	180	184	1-1/4"	310	310	110	M100x3P	M125x3P	632	100	125	35	145	28	190	220	130	158
300	180	220	220	1-1/2"	371	371	140	M125x3P	M135x3P	790	125	135	40	190	40	230	270	160	196

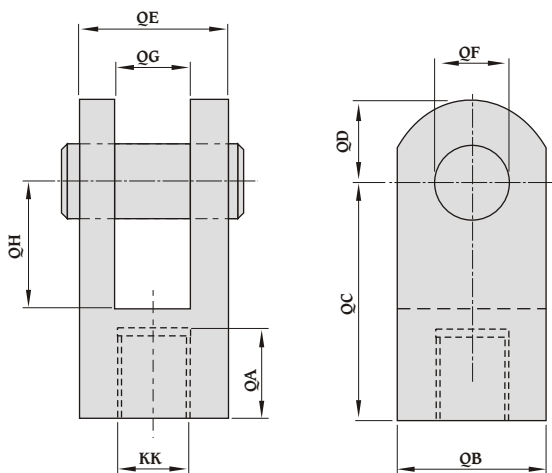
Mounting style
Intermediate trunnion (TR 4)


Piston Ø	Rod		AH	G BSP	D Ø	D1 Ø	KK		L	L1		L2	L3	L5	JA	JB	JC	JD	JE	TD
	Ø1	Ø2					Ø1	Ø2		Ø1	Ø2									
80	45	56	73	1/2"	100	100	M33x2P	M42x2P	213	35	45	20	83	15	To be specified by customer	130	184	120	50	45
100	56	70	90	3/4"	124	124	M42x2P	M48x2P	247	45	58	30	93	19		165	230	140	60	55
125	70	90	103	3/4"	155	155	M48x2P	M64x3P	277	58	65	30	98	19		185	280	180	80	65
160	90	110	123	1"	197	197	M64x3P	M80x3P	323	65	80	35	118	23		235	360	220	100	85
200	110	152	145	1"	248	248	M80x3P	M100 x3P	370	80	100	35	130	23		300	440	290	130	110
250	140	180	184	1-1/4"	310	310	M100x3P	M125 x 3P	422	100	125	35	145	28		360	550	350	150	130
300	180	220	220	1-1/2"	371	371	M125x3P	M 135 X 3P	520	125	135	40	190	40		470	700	420	180	160

All dimensions are in mm unless otherwise stated.

Accessories**Plain rod eye**

Model No.	KK	PA	PB	PC	PD	PE	PF Ø
PRE-H250-M33x2P	M33x2P	37	70	70	40	50	40
PRE-H250-M42x2P	M42x2P	48	90	90	45	60	50
PRE-H250-M48x2P	M48x2P	55	120	125	70	80	65
PRE-H250-M64x3P	M64x3P	68	160	140	90	98	80
PRE-H250-M80x3P	M80x3P	84	160	160	95	118	90
PRE-H250-M100x3P	M100x3P	104	200	200	130	138	120
PRE-H250-M125x3P	M125x3P	130	270	260	165	196	170
PRE-H250-M135x3P	M135x3P	140	300	290	190	216	190

Rod clevis

Model No.	KK	QA	QB	QC	QD	QE	QF Ø	QG	QH
RC-H250-M33x2P	M33x2P	37	80	110	40	90	40	45	60
RC-H250-M42x2P	M42x2P	48	100	150	55	100	50	50	80
RC-H250-M48x2P	M48x2P	55	120	180	70	120	60	60	105
RC-H250-M64x3P	M64x3P	68	140	220	80	130	70	65	130
RC-H250-M80x3P	M80x3P	84	160	250	98	140	80	70	145
RC-H250-M100x3P	M100x3P	104	200	320	130	165	100	85	190
RC-H250-M125x3P	M125x3P	130	280	440	165	250	140	130	270
RC-H250-M135x3P	M135x3P	140	320	490	190	280	160	150	305

All dimensions are in millimeters unless otherwise stated.

H320 Series



Cylinder selection guide

Operating pressure at kg/sq. cm				Theoretical forces (at mechanical efficiency = 100%)							
				200		250		300		320	
Piston dia mm	Rod dia mm	Piston area sq. cm	Rod area sq. cm	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf	Push kgf	Pull kgf
80	45	50.27	15.91	10054.4	6873.13	12568	8591.41	15081.6	10309.69	16087.04	10997.00
	56		24.63		5127.74		6409.68		7691.62		8204.39
100	56	78.55	24.63	15710.00	10783.34	19637.5	13479.18	23565	16175.02	25136	17253.35
	70		38.49		8012.10		10015.13		12018.15		12819.36
125	70	122.73	38.49	245446.88	16848.98	30683.59	21061.22	36820.31	25273.46	39275.00	26958.36
	90		63.63		11821.78		14777.22		17732.66		18914.84
160	90	201.09	63.63	40217.6	27492.50	50272	34365.625	60326.4	41238.75	64348.16	43988
	110		95.05		21208.50		26510.63		31812.75		33933.60
200	110	314.20	95.05	62840	43830.90	78550	54788.63	94260	65746.35	100544	70129.44
	140		153.96		32048.40		40060.5		48072.6		51277.44
250	140	490.94	153.96	98187.50	67395.90	122734.375	84244.875	147281.25	101093.85	157100	107833.44
	180		254.50		47287.10		59108.875		70930.65		75659.36
300	180	706.95	254.50	141390	90489.60	176737.5	113112	212085	135734.4	226224	144783.36
	220		380.18		65353.60		81692		98030.4		104565.76

Ordering details for H320 series hydraulic cylinder

H320					
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Series _____

Cylinder bore _____

Piston rod dia _____

Stroke length _____

Mounting style _____
Refer to dimension charts for code

High temperature seals (V) _____
(optional)

Example

H320 series hydraulic cylinder with bore 100mm, piston rod dia 70mm, stroke 500mm, mounting rear flange will be specified as

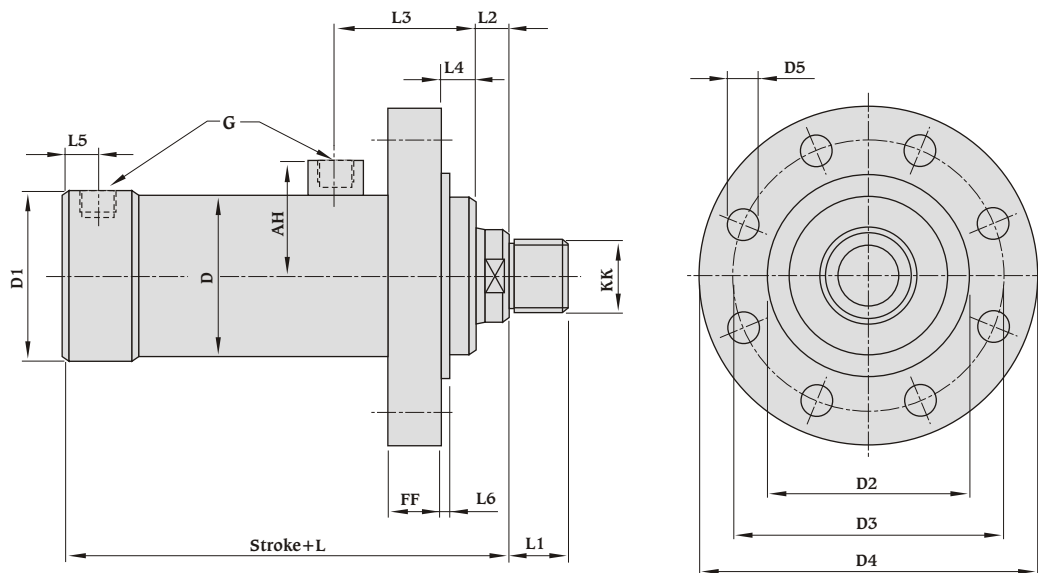
H320	100	70	500	RF	-
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All dimensions are in millimeters unless otherwise stated.

Features and specifications

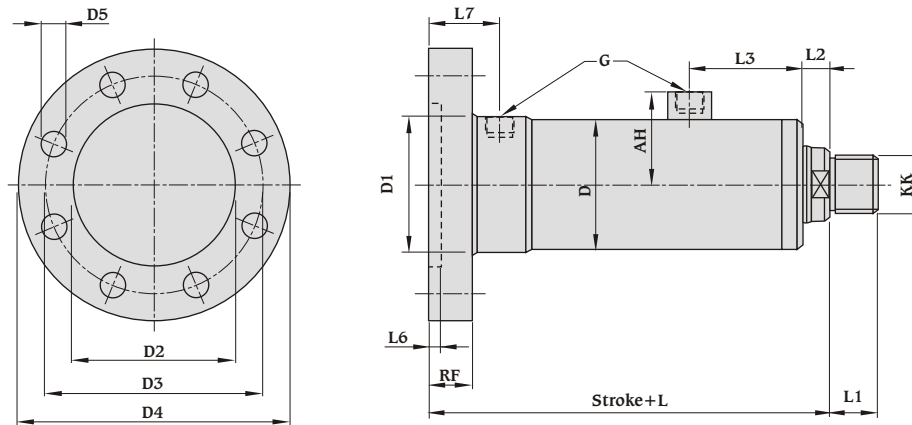
- 5 Standard mounting styles
- Provision for smaller as well as bigger rod diameter for each bore size
- Bore size - 80mm to 300 mm
- Strokes available in any practical stroke length
- Maximum working pressure - 320 bar
- Piston rods - 45 mm to 220 mm
- Single rod design
- Non-cushioned
- Temperature range : - 20°C to + 80°C (standard)
- 20° C to + 150°C (optional)
- Seal types to suit a wide variety of operating environments
- Standard fluid - Mineral oil DIN 51524 (HL, HLP)

Mounting style Front flange (FF)

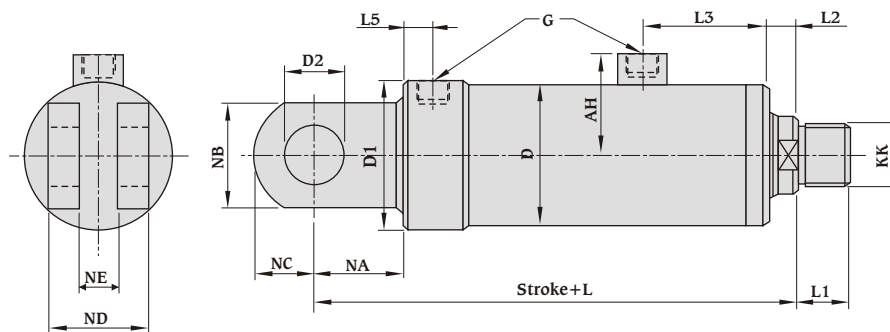


Piston Ø	Rod		AH	G	D Ø	D1 Ø	D2 Ø	D3 Ø	D4 Ø	D5 Ø	FF	KK		L	L1		L2	L3	L4	L5	L6
	Ø1	Ø2										Ø1	Ø2		Ø1	Ø2					
80	45	56	75	1/2"	105	105	120	160	200	18(x8)	31	M33x2P	M42x2P	213	35	45	20	83	19	15	4
100	56	70	90	3/4"	130	130	145	191	231	22(x8)	32	M42x2P	M48x2P	247	45	58	30	93	20	19	5
125	70	90	107	3/4"	163	163	180	215	255	22(x8)	40	M48x2P	M64x3P	277	58	65	30	98	20	19	5
160	90	110	130	1"	204	204	220	280	340	26(x8)	40	M64x3P	M80x3P	323	65	80	35	118	25	23	5
200	110	140	163	1"	262	262	290	350	410	33(x8)	50	M80x3P	M100x3P	370	80	100	35	130	30	23	5
250	140	180	197	1-1/4"	325	325	345	410	480	39(x8)	60	M100x3P	M125x3P	422	100	125	35	145	33	28	8
300	180	220	233	1-1/2"	390	390	420	500	580	39(x16)	85	M125x3P	M135x3P	535	125	135	40	205	38	40	8

All dimensions are in mm unless otherwise stated.

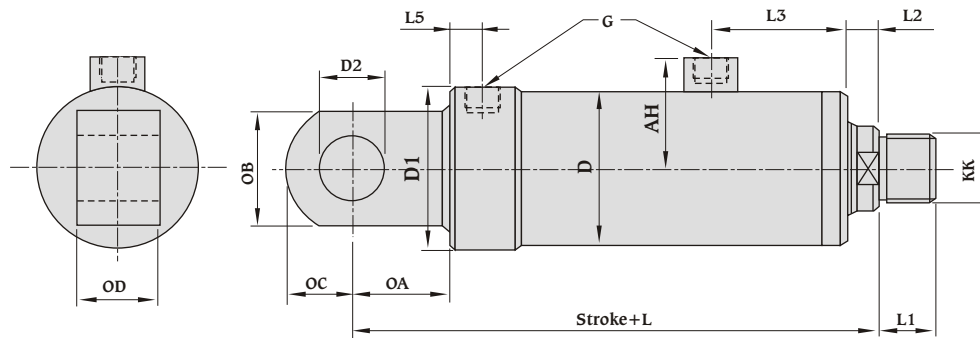
Mounting style
Rear flange (RF)


Piston Ø	Rod		AH	G BSP	D Ø	D1 Ø	D2 Ø	D3 Ø	D4 Ø	D5 Ø	RF	KK		L	L1		L2	L3	L6	L7
	Ø1	Ø2										Ø1	Ø2		Ø1	Ø2				
80	45	56	75	1/2"	105	105	120	160	200	18(x8)	28	M33x2P	M42x2P	251	35	45	20	83	4	53
100	56	70	90	3/4"	130	130	145	191	231	22(x8)	32	M42x2P	M48x2P	289	45	58	30	93	5	61
125	70	90	107	3/4"	163	163	180	215	255	22(x8)	38	M48x2P	M64x3P	325	58	65	30	98	5	67
160	90	110	130	1"	204	204	220	280	340	26(x8)	38	M64x3P	M80x3P	371	65	80	35	118	5	71
200	110	140	163	1"	262	262	290	350	410	33(x8)	48	M80x3P	M100x3P	428	80	100	35	130	5	81
250	140	180	197	1-1/4"	325	325	345	410	480	39(x8)	58	M100x3P	M125x3P	490	100	125	35	145	8	96
300	180	220	233	1-1/2"	390	390	420	500	580	39(x12)	85	M125x3P	M135x3P	630	125	135	40	205	8	135

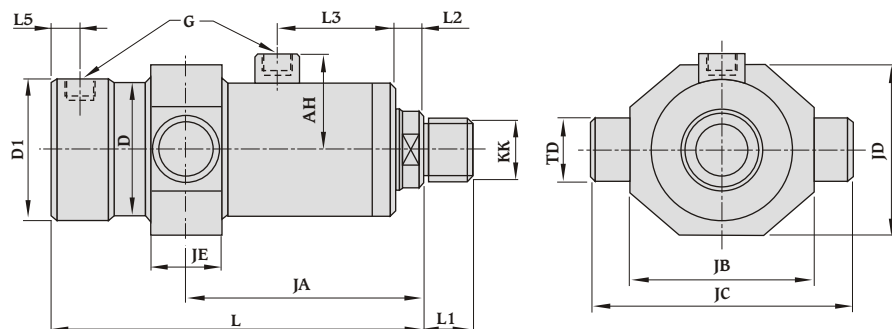
Mounting style
Rear clevis (RP 1)


Piston Ø	Rod		AH	G BSP	D Ø	D1 Ø	D2 Ø	KK		L	L1		L2	L3	L5	NA	NB	NC	ND	NE
	Ø1	Ø2						Ø1	Ø2		Ø1	Ø2								
80	45	56	75	1/2"	105	105	50	M33x2P	M42x2P	298	35	45	20	83	15	85	100	55	100	50
100	56	70	90	3/4"	130	130	60	M42x2P	M48x2P	352	45	58	30	93	19	105	120	70	120	60
125	70	90	107	3/4"	163	163	60	M48x2P	M64x3P	382	58	65	30	98	19	105	120	70	120	60
160	90	110	130	1"	204	204	80	M64x3P	M80x3P	468	65	80	35	118	23	145	160	95	140	70
200	110	140	163	1"	262	262	100	M80x3P	M100x3P	560	80	100	35	130	23	190	200	130	165	85
250	140	180	197	1-1/4"	325	325	120	M100x3P	M125x3P	637	100	125	35	145	28	240	240	145	215	110
300	180	220	233	1-1/2"	390	390	160	M125x3P	M135x3P	840	125	135	40	190	40	305	320	190	280	150

All dimensions are in millimeters unless otherwise stated.

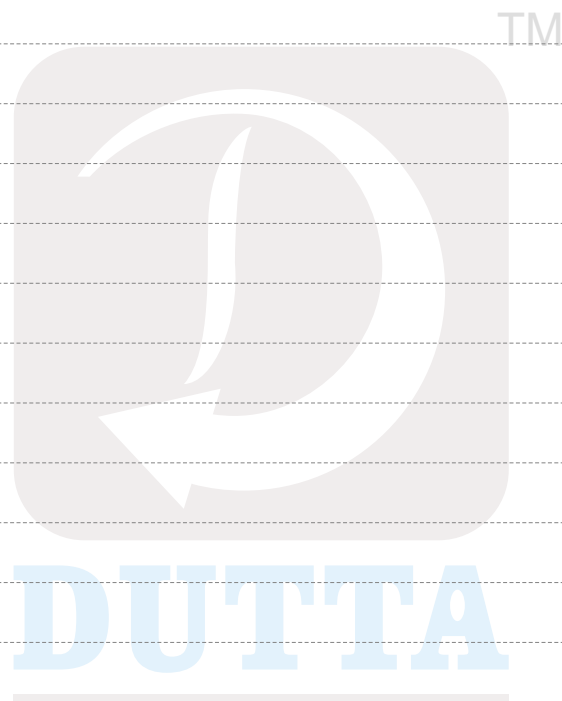
Mounting style
Rear eye (RP 3)


Piston Ø	Rod		AH	G BSP	D Ø	D1 Ø	D2 Ø	KK		L	L1		L2	L3	L5	OA	OB	OC	OD
	Ø1	Ø2						Ø1	Ø2		Ø1	Ø2							
80	45	56	75	1/2"	105	105	50	M33x2P	M42x2P	283	35	45	20	83	15	70	80	45	50
100	56	70	90	3/4"	130	130	60	M42x2P	M48x2P	327	45	58	30	93	19	80	100	55	70
125	70	90	107	3/4"	163	163	70	M48x2P	M64x3P	382	58	65	30	98	19	105	120	65	80
160	90	110	130	1"	204	204	90	M64x3P	M80x3P	458	65	80	35	118	23	135	160	85	108
200	110	140	163	1"	262	262	120	M80x3P	M100x3P	530	80	100	35	130	23	160	200	110	138
250	140	180	197	1-1/4"	325	325	150	M100x3P	M125x3P	612	100	125	35	145	28	190	230	135	176
300	180	220	233	1-1/2"	390	390	190	M125x3P	M135x3P	795	125	135	40	205	40	260	300	190	216

Mounting style
Intermediate trunnion (TR 4)


Piston Ø	Rod		AH	G BSP	D Ø	D1 Ø	KK		L	L1		L2	L3	L5	JA	JB	JC	JD	JE	TD
	Ø1	Ø2					Ø1	Ø2		Ø1	Ø2									
80	45	56	75	1/2"	105	105	M33x2P	M42x2P	213	35	45	20	83	15	To be specified by Customer	130	184	120	50	45
100	56	70	90	3/4"	130	130	M42x2P	M48x2P	247	45	58	30	93	19		165	230	140	60	55
125	70	90	107	3/4"	163	163	M48x2P	M64x3P	277	58	65	30	98	19		185	280	180	80	65
160	90	110	130	1"	204	204	M64x3P	M80x3P	323	65	80	35	118	23		235	360	220	100	85
200	110	140	163	1"	262	262	M80x3P	M100 x3P	370	80	100	35	130	23		320	460	300	130	110
250	140	180	197	1-1/4"	325	325	M100x3P	M125 x 3P	422	100	125	35	145	28		390	590	370	150	130
300	180	220	233	1-1/2"	390	390	M125x3P	M 135 X 3P	535	125	135	40	205	40		500	730	450	200	180

All dimensions are in millimeters unless otherwise stated.



The force chart shows the allowable axial pushing force F as the function of the free buckling length L_k for the existing standard rod diameters. These forces can be calculated using the following formulae and variables.

■ Calculation according to Euler

$$F = \frac{\pi^2 \cdot E \cdot I}{v \cdot L \cdot k^2} \text{ When } \lambda > \lambda_g$$

■ Calculation according to Tetmajer

$$F = \frac{d^2 \cdot \pi \cdot (335 - 0.62 \cdot \lambda)}{4 \cdot v} \text{ When } \lambda > \lambda_g$$

■ Explanation :

E = Modules of elasticity in N/mm^2
 $= 2.1 \times 10^5$ for Steel

I = Moment of inertia in mm^4 for circular cross-sectional area

$$I = \frac{\pi \cdot d^4}{64} = 0.0491 \times d^4$$

■ $V = 3$ (safety factor)

■ L_k = Free buckling length in mm
 (depending on mounting style, see sketches A, B & C)

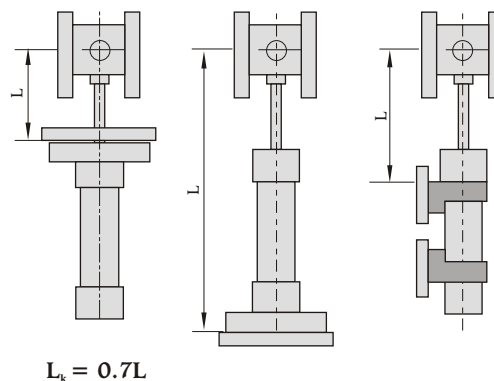
■ d = Piston rod dia in mm

■ λ = Slenderness ratio

$$= \frac{4 \cdot L_k}{d} \quad \lambda_g = \pi \sqrt{\frac{E}{0.8 \cdot R_e}}$$

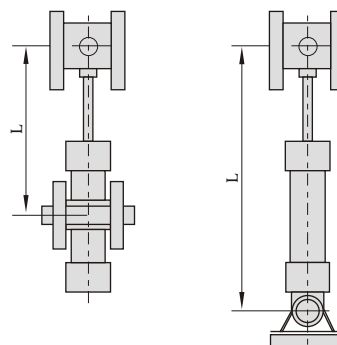
■ R_e = Yield strength of piston rod material

A Cylinder flange mounted to front or rear end cover with the piston rod end guided



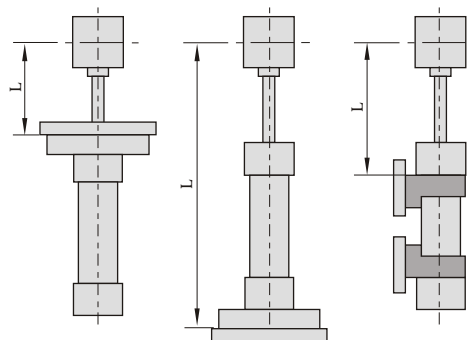
$$L_k = 0.7L$$

B Cylinder trunnion mounted with the piston rod end guided



$$L_k = L$$

C Cylinder flange mounted to front or rear end cover with the piston rod end unguided



$$L_k = 2L$$

Piston rod selection

The piston rod in a cylinder is normally under compressive loads and in certain applications, under tensile loads. When it is under compressive loads, the piston rod is subjected to buckling stresses. Hence, it is sometimes necessary to use an oversize piston rod to withstand buckling stresses.

The following chart shows various combinations of thrust load, rod diameter and equivalent column length. The values shown are recommended for normal applications, but deviations could always be made depending on specific applications and engineering judgement.

How to use the chart

1. Determine the maximum thrust required in the application.
2. Compare your installation type to the three cases i.e. A, B and C shown in the figures.
3. With piston rod in fully extended position, determine the L_k value for your installation by referring to the figure.
4. Refer to the chart and select the thrust figures that equal or exceed the value determined in figure B.
5. By moving to the right, locate the value of L_k in the chart that is equal to or greater than the L dimension of your installation. (figure A)
6. In the chart, the rod diameter is shown at the top. If the recommended rod diameter exceeds the piston rod available for the cylinder, the cylinder may have to be redesigned with an oversize piston rod.

Examples

1. Clevis mounting with the rod with plain rod eye. Thrust force 5027 kgf, stroke 500. Refer to the dimensional table in the catalogue and select L value.

L value is 132.8cm. The given mounting condition is similar to both ends pivoted (see figure B).

$$\text{So, } L = L_k \quad 132.08 = 132.8\text{cm}$$

From the chart, piston rod dia 45 mm is sufficient.

2. Rear flange mounting with piston rod end free, but guided. Thrust force 5027 kgf, stroke 500. Refer to the dimensional table in the catalogue and select L value. L value is 128.9cm. The given mounting condition is similar to figure A.

$$\text{So, } L = 0.7L_k \quad 128.9 = 128.9 \times 0.7 = 90.23\text{cm}$$

$$\text{For Force} = 5027\text{kgf} \quad L_k = 90.23$$

Form the chart, piston rod dia 36mm is sufficient.

Values of L_k cm

Thrust load in kg	Piston rod diameter in mm							
	16	25	28	36	45	56	70	90
50	184	449						
75	150	366	460					
100	130	317	399					
125	116	284	356	590				
150	106	259	325	540				
175	98	240	301	498				
200	92	224	282	466	727			
225	86	211	266	438	685			
250	82	200	252	417	650			
300	75	183	230	380	595			
350	69	169	213	353	550	853		
400	65	158	199	329	515	798		
450	61	149	188	311	484	753		
500	58	142	178	295	460	705		
600	53	129	163	269	420	650		
700	49	120	150	249	388	600	942	
800	46	112	141	233	363	565	881	
900	43	105	133	220	343	532	831	
1000	41	100	126	208	325	505	788	
1100	39	95	120	198	310	481	751	
1300	36	88	110	183	285	443	691	

Note : Specifications in this catalogue subject to change without prior notice

Values of L_k cm

Thrust load in kg	Piston rod diameter in mm							
	16	25	28	36	45	56	70	90
1500	33	82	103	170	265	412	643	
1750	31	76	95	157	246	381	596	985
2000	29	71	89	147	230	357	557	922
2500	26	63	80	132	205	319	498	825
3000	23	58	73	120	187	291	455	753
3500	22	53	67	111	174	269	421	696
4000	20	50	63	104	162	252	394	651
4500	19	47	59	98	153	238	371	614
5000	18	45	56	93	145	225	352	583
6000	16	41	51	85	132	206	322	531
7500			46	76	118	184	288	476
9000			42	69	108	168	263	434
11000				63	98	152	237	393
13000				58	90	140	218	361
15000				54	84	130	203	336
17500				50	77	120	188	311
20000					72	112	176	291
24000					66	103	161	266
28000					61	95	149	246
34000					55	86	135	223
40000					51	80	124	206

All dimensions are in millimeters unless otherwise stated.

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