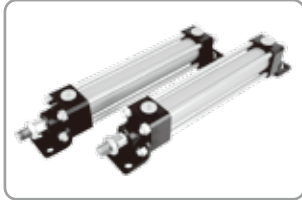
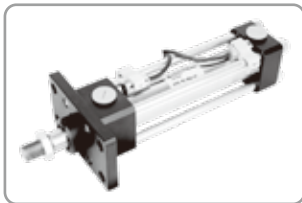


# TIE ROD CYLINDERS

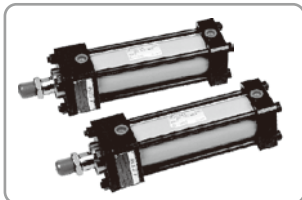
## SERIES Products Content



HC Tie rod cylinders  $\varnothing 32 \sim \varnothing 250$  ..... P.002



MGHC Tie rod cylinder for magnetic sensors  $\varnothing 32 \sim \varnothing 150$  ..... P.021



HC2 Tie rod cylinders  $\varnothing 32 \sim \varnothing 250$  ..... P.029

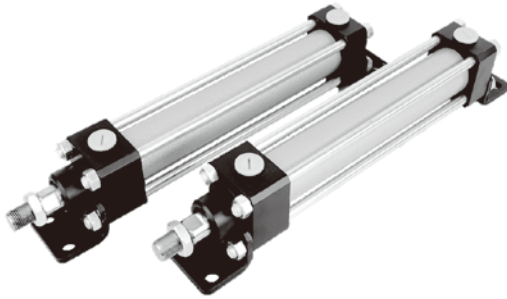


MGHC2 Tie rod cylinder for magnetic sensors  $\varnothing 32 \sim \varnothing 150$  ..... P.045



HC210 Heavy duty cylinders  $\varnothing 32 \sim \varnothing 250$  ..... P.060

HC TIE ROD CYLINDER



- Maximum working pressure 70kgf/cm<sup>2</sup>(7MPa) 、 140kgf/cm<sup>2</sup>(14MPa)
- Adopt four-position tie rod structure design, versatile and easy to maintain
- Designed and manufactured according to Japan standard specifications JIS-B8367
- Multiple installation options available

Tie-rod Hydraulic Cylinder

Mold Hydraulic Cylinders

Swivel & Clamp Hydraulic Cylinders

Booster Cylinders & Unclamping cylinders

ISO Specifications Cylinders

Round Hydraulic Cylinders

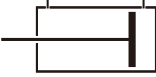

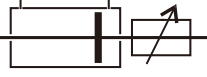
Specific Hydraulic Cylinders

Systems & Fittings

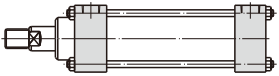
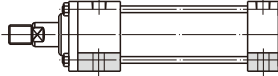
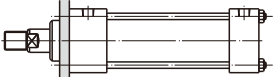
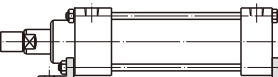
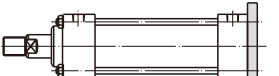
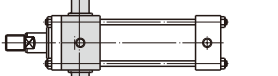

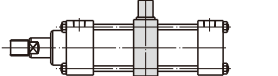
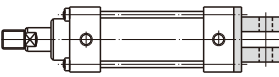
THEORETICAL OUTPUT TABLE

Inner diameter (mm)		32	40	50	63	80	100	125	150	180	200	224	250			
Piston pressure area (cm <sup>2</sup> )	Extend	8.0	12.6	19.6	31.2	50.3	78.5	122.7	176.7	254.5	314.2	394.1	490.9			
	Retract	Diameter	Class C	6.0	9.4	14.7	24.1	40.6	66.0	98.1	143.5	204.2	250.5	315.5	392.4	
			Class B	4.9	7.7	12.6	21.6	37.7	53.9	84.2	120.0	175.9	215.6	271.4	336.9	
Cylinder theoretical output (kgf)	70kgf/cm <sup>2</sup>	Pressure	Extend	563	880	1374	2182	3519	5498	8590	12370	17813	21991	27586	34361	
			Retract	Class C	422	660	1031	1687	2845	4618	6866	10047	14294	17538	22088	27465
				Class B	343	536	880	1509	2639	3774	5896	8398	12315	15095	18995	23586
	140kgf/cm <sup>2</sup>	Pressure	Extend	1126	1759	2749	4364	7037	10996	17181	24740	35626	43982	55171	68722	
			Retract	Class C	844	1319	2062	3375	5690	9236	13732	20094	28588	35076	44176	54929
				Class B	686	1072	1759	3017	5278	7547	11793	16796	24630	30189	37991	47171
	210kgf/cm <sup>2</sup>	Pressure	Extend	1689	2639	4123	6546	10556	16493	25771	37110	53438	65973	82757	103084	
			Retract	Class C	1267	1979	3093	5062	8535	13854	20599	30142	42883	52614	66264	82394
				Class B	1029	1608	2639	4526	7917	11321	17689	25194	36945	45284	56986	70757

## TYPE

Type	Mark	Graphics	Heat/acid & alkali resistance	Dust cover	Inner diameter (mm)
Double acting cylinder	HC1-A		HC1-AJ	HC1-AH	32,40,50 63,80,100 125,150 180,200 224,250
Biaxial cylinder	HC1-C		HC1-CJ	HC1-CH	
Double acting cylinder with adjustable stroke	HC1-D		HC1-DJ	HC1-DH	

## INSTALLATION FORM

Mark	Type	Graphics	Mark	Type	Graphics
SD	Basic		LA	Foot flange	
FA	Rod Flange		LB	End flange	
FB	Head Flange		TA	Rod Trunnion	
CA	Clevis		TC	Mid Trunnion	
CB	Dual Clevis				

## MAXIMUM STROKE CALCULATION

(Table 1)

Form	Status	terminal coefficient	Form	Status	terminal coefficient
LA LB		1/4	FB		1/4
		2			2
		4			4
FA		1/4	TC CA		1
		2			
		4			

$S = L - \ell$   
 S: Stroke (mm)    L: Extend length (mm)     $\ell$ : Lead in length (mm)

Inner diameter of cylinder is 80mm, shaft diameter 45mm, install form FA (Front Flange), shaft end joint Y and working pressure 10MPa. What is the working stroke of the cylinder?

Calculation:

- Installation type FA, shaft end joint Y. Table 1 shows that the terminal coefficient is  $n = 2$ .
- According to inner diameter (80mm), pressure (10MPa), terminal coefficient (2), and shaft diameter (45mm) in table 2, can find  $L = 1980\text{mm}$ .
- $\ell$  calculated from installation FA and shaft end joint Y (FA external dimension + (FA to shaft W) + (Nut thickness) + (shaft joint end Y CA))  
 $\ell = 24 + 35 + 18 + 75 = 152\text{mm}$  (Lead in length)
- Maximum stroke (S) = Extend length (L) - Lead in length ( $\ell$ )  
 $S = 1980\text{mm} - 152\text{mm} = 1828\text{mm}$

Tie-rod Hydraulic Cylinder

Mold Hydraulic Cylinders

Swivel & Clamp Hydraulic Cylinders

Booster Cylinders & Unclamping cylinders

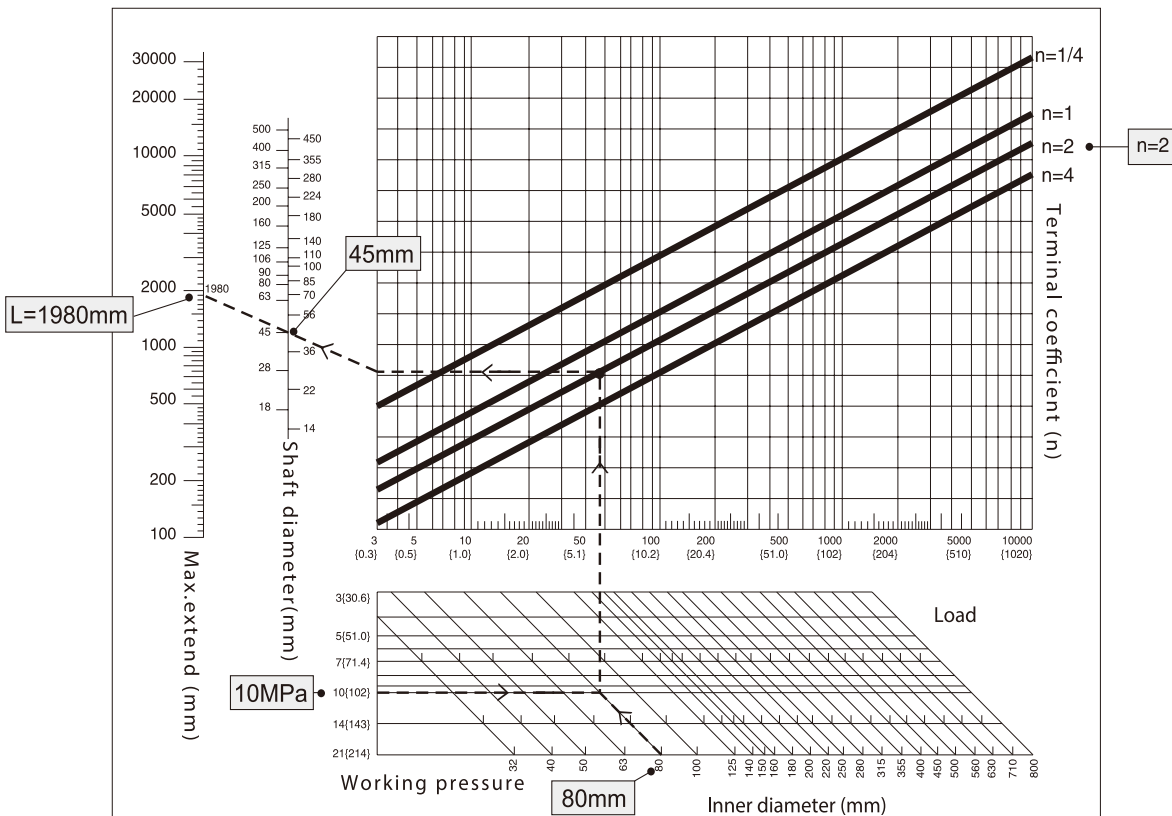
ISO Specifications Cylinders

Round Hydraulic Cylinders

Specific Hydraulic Cylinders

Systems & Fittings

(Table 2)



## SEAL MATERIAL

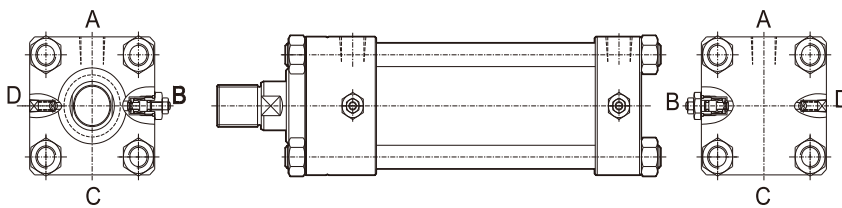
oil	material	(NBR)	(FPM)	(PU)
	symbol	standard	J	-
mineral		O	O	O
water solution		O	O	X
soluble		O	O	X
phosphate ester		X	O	X
temperature		-10°C~+80°C	-10°C~+150°C	-10°C~+80°C
viscosity		20~400mm <sup>2</sup> /s {cSt}		

Note:

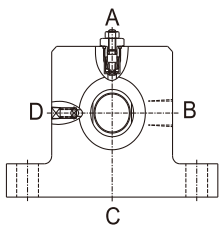
- 1.mineral oil : ISO-VG32
- 2.If mineral oil is used,NBR will be used without specify selections of material.
- 3.If phosphate ester oil is used or high temperature is applied, will shown as symbol J.
- 4.symbol O = ok, X = cannot be used.
- 5.Temperature of FPM must set below 150°C when operate long time.

## PORT AND CUSHION POSITIONS

SD type

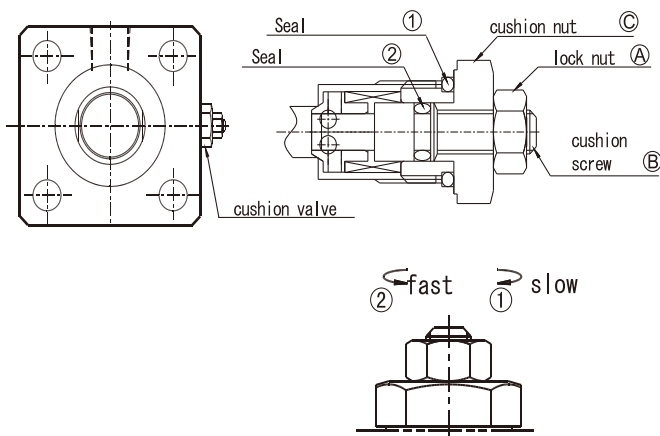


LA type



Standard location A = input port B = cushion position D = check valve position

## USE OF CUSHION VALVES

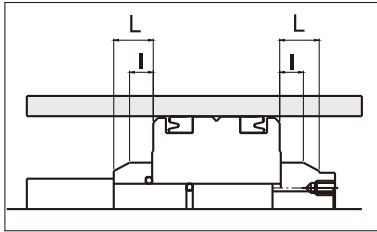


### Alignment steps

- 1.Turn lock nut(A)toward counter clockwise with 1/4 circle by wrench.
- 2.Use wrench to lock cushion nut(C) tightly to prevent ① ② oil spill.
- 3.Use screwdriver to adjust speed of (B)  
①clockwise:rod speed will slow down  
②counter clockwise:rod speed will increase
4. After alignment,fix (B) with hex wrench then tighten (A)

Note:Loose lock nut(A) before adjust (B).

## BUFFER LENGTH



inner diameter (mm)	Buffer length (front)		Buffer length (rear)	
	L	I	L	I
32	15	12	18	15
40~63	20	15	20	15
80~100	25	20	25	20
125	30	25	30	25
150~224	35	30	35	30
250	40	30	33	28

1. Buffering is required when the action speed of the cylinder reaches 100mm/s after the load is applied.

2. When the action speed is greater than 200mm/s, an external buffer should be considered.

Tie-rod Hydraulic Cylinder

Mold Hydraulic Cylinders

Swivel & Clamp Hydraulic Cylinders

Booster Cylinders & Unclamping cylinders

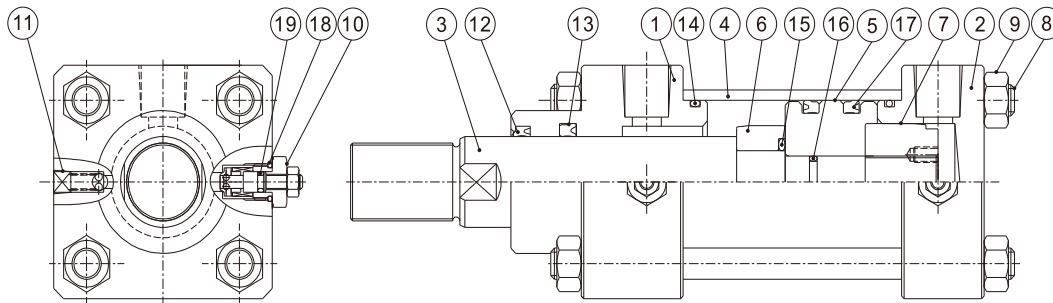
ISO Specifications Cylinders

Round Hydraulic Cylinders

Specific Hydraulic Cylinders

Systems & Fittings

## INTERNAL STRUCTURE AND PART NAMES



item	part name	qty	item	part name	qty
①	rod cover	1	⑪	check and vent valve	2
②	head cover	1	⑫	rod dust seal	1
③	piston rod	1	⑬	rod seal	1
④	tube	1	⑭	cover O ring	2
⑤	piston	1	⑮	cushion O ring	1
⑥	rod cushion	1	⑯	piston O ring	1
⑦	head cushion	1	⑰	piston packing	2
⑧	tie-rod	4	⑱	valve O ring	2
⑨	tie-rod nut	8			
⑩	cushion aligning valve	2			

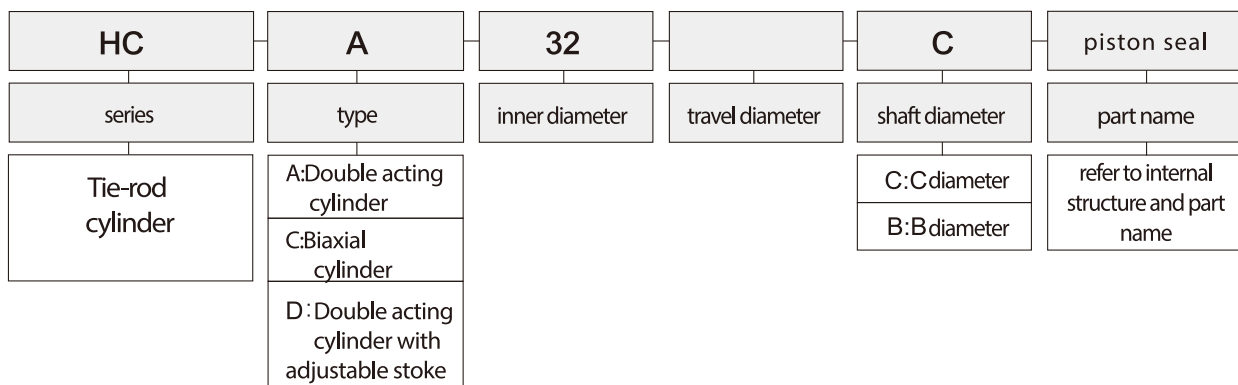
## ORDER INDICATION

HC	A	32		C	rod cover
series	type	inner diameter	travel diameter	shaft diameter	part name
Tie-rod cylinder	A: Double acting cylinder			C: C diameter	refer to internal structure and part name
	C: Biaxial cylinder			B: B diameter	
	D: Double acting cylinder with adjustable stroke				

## SEAL SPEC.

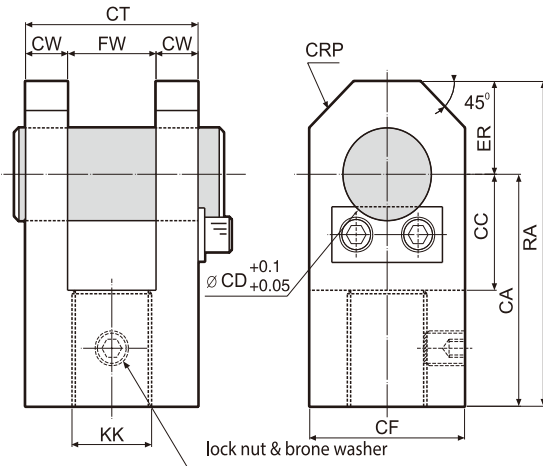
bore	item	⑫	⑬	⑭	⑮	⑯	⑰	⑱	⑲
		rod dust seal (NBR)	rod seal (NBR)	cover O ring (1B)	cushion O ring (1B)	piston O ring (1B)	piston packing (NBR)	valve O ring (1A)	valve O ring (1A)
		1	1	2	1	1	2	2	2
32	C	16×24×6	16×24×5	G25 cushioning SM32	SM12.5	AP10A	24×32×5	P11	P5
	B	20×28×6	20×28×5						
40	C	20×28×6	20×28×5	G35 cushioning SM40	P14	AP10A	30×40×6	P11	P5
	B	25×33×6	25×33×5						
50	C	25×33×6	25×33×5	G45	P18	P14	40×50×6	P11	P5
	B	30×38×6.5	30×40×6						
63	C	30×38×6.5	30×40×6	G58	P24	P20	53×63×6	P11	P5
	B	35×43×6.5	35×45×6						
80	C	35×43×6.5	35×45×6	G75	G30	G25	70×80×6	P11	P5
	B	40×48×6.5	40×50×6						
100	C	40×48×6.5	40×50×6	G95	G35	G30	85×100×9	P11	P5
	B	56×64×6.5	56×66×6		G45	G40			
125	C	56×64×6.5	56×66×6	G120	G50	G45	112×125×9	P14	P6
	B	70×80×8	70×80×6						
150	C	65×73×6.5	65×75×6	G145	G55	G50	136×150×8.5	P14	P6
	B	85×95×8	85×100×9						
180	C	80×90×8	80×90×6	G170	G70	G65	165×180×9	P14	P6
	B	100×110×8	100×115×9						
200	C	90×100×8	90×105×9	G190	G80	G75	180×200×12	P14	P6
	B	112×122×8	112×125×8.5						
224	C	100×110×8	100×115×9	G210	G90	G85	204×224×12	AS211	P10A
	B	125×138×9.5	125×140×9						
250	C	112×122×8	112×125×8.5	G240	G95	G90	230×250×12	AS211	P10A
	B	140×153×9.5	140×155×9						

## ORDER INDICATION

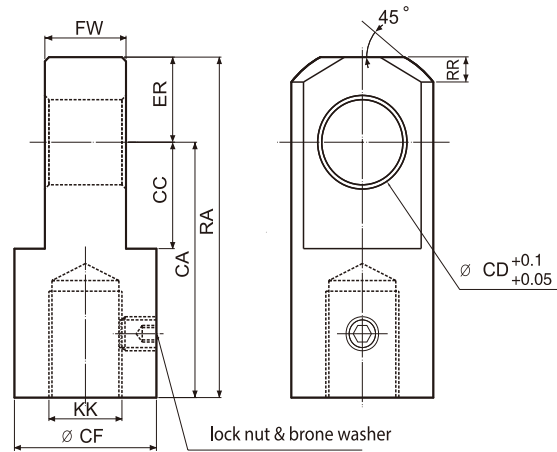


## CONNECTOR

### ● Y connector

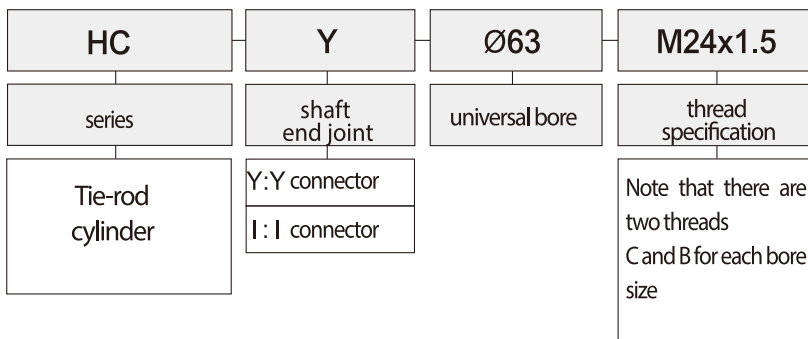


### ● I connector



bore	symbol		KK		FW		CA		RA		CF		CD	CT	CC		ER	CW	RP	RR
	rod C	rod B	Y	I	Y	I	Y	I	Y	I	Y	I								
32	M12xP1.5	M16xP1.5	20 <sup>+0.40</sup> / <sub>+0.10</sub>	20 <sup>-0.10</sup> / <sub>-0.40</sub>	49	69	65	85	32	38	16	45	24	24	16	12.5	8	8		
40	M16xP1.5	M20xP1.5	20 <sup>+0.40</sup> / <sub>+0.10</sub>	20 <sup>-0.10</sup> / <sub>-0.40</sub>	49	69	65	85	32	38	16	45	24	24	16	12.5	8	8		
50	M20xP1.5	M24xP1.5	25 <sup>+0.40</sup> / <sub>+0.10</sub>	25 <sup>-0.10</sup> / <sub>-0.40</sub>	60	80	80	100	40	45	20	55	35	30	20	15	10	10		
63	M24xP1.5	M30xP1.5	30 <sup>+0.40</sup> / <sub>+0.10</sub>	30 <sup>-0.10</sup> / <sub>-0.40</sub>	75	105	105	135	60	60	31.5	63	40	45	30	16.5	15	15		
80	M30xP1.5	M36xP1.5	30 <sup>+0.40</sup> / <sub>+0.10</sub>	30 <sup>-0.10</sup> / <sub>-0.40</sub>	75	105	105	135	60	60	31.5	63	40	45	30	16.5	15	15		
100	M36xP1.5	M48xP1.5	40 <sup>+0.40</sup> / <sub>+0.10</sub>	40 <sup>-0.10</sup> / <sub>-0.40</sub>	100	120	140	160	70	70	40	78	50	50	40	19	20	20		
125	M48xP1.5	M64xP2.0	63 <sup>+0.40</sup> / <sub>+0.10</sub>	63 <sup>-0.10</sup> / <sub>-0.40</sub>	180	180	230	230	100	100	50	126	70	65	50	31.5	25	25		
140	M56xP2.0	M72xP2.0	80 <sup>+0.60</sup> / <sub>+0.10</sub>	80 <sup>-0.10</sup> / <sub>-0.60</sub>	225	225	290	290	120	120	63	160	90	85	65	40	32	32		
150	M60xP2.0	M76xP2.0	80 <sup>+0.60</sup> / <sub>+0.10</sub>	80 <sup>-0.10</sup> / <sub>-0.60</sub>	225	225	290	290	120	120	63	160	90	85	65	40	32	32		
160	M64xP2.0	M80xP2.0	80 <sup>+0.60</sup> / <sub>+0.10</sub>	80 <sup>-0.10</sup> / <sub>-0.60</sub>	240	240	310	310	140	140	71	160	100	90	70	40	35	35		
180	M72xP2.0	M95xP2.0	100 <sup>+0.60</sup> / <sub>+0.10</sub>	100 <sup>-0.10</sup> / <sub>-0.60</sub>	270	270	350	350	160	160	80	200	110	100	80	50	40	40		
200	M80xP2.0	M100xP2.0	125 <sup>+0.60</sup> / <sub>+0.10</sub>	125 <sup>-0.10</sup> / <sub>-0.60</sub>	210	210	300	300	180	180	90	225	115	115	90	50	45	45		
224	M95xP2.0	M120xP2.0	125 <sup>+0.60</sup> / <sub>+0.10</sub>	125 <sup>-0.10</sup> / <sub>-0.60</sub>	235	235	335	335	200	200	100	251	125	125	100	63	50	50		
250	M100xP2.0	M130xP2.0	125 <sup>+0.60</sup> / <sub>+0.10</sub>	125 <sup>-0.10</sup> / <sub>-0.60</sub>	245	245	345	345	200	200	100	251	125	125	100	63	50	50		

## ORDER INDICATION



Tie-rod Hydraulic Cylinder

Mold Hydraulic Cylinders

Swivel & Clamp Hydraulic Cylinders

Booster Cylinders & Unclamping cylinders

ISO Specifications Cylinders

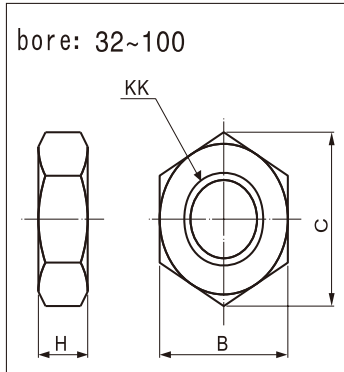
Round Hydraulic Cylinders

Specific Hydraulic Cylinders

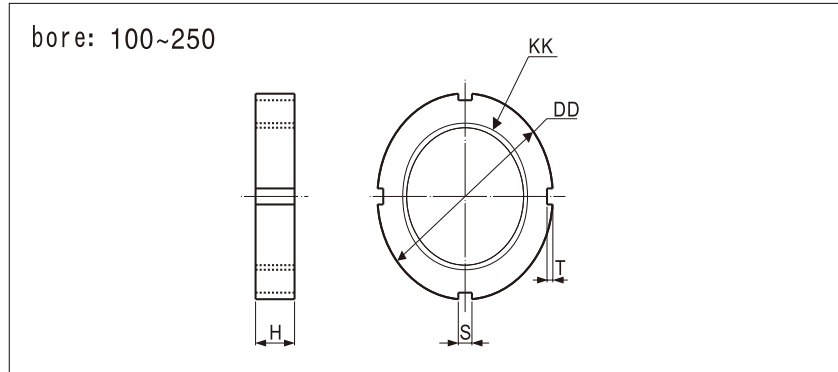
Systems & Fittings



## ROD NUT

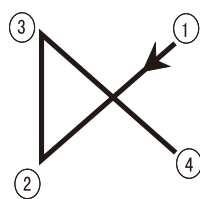
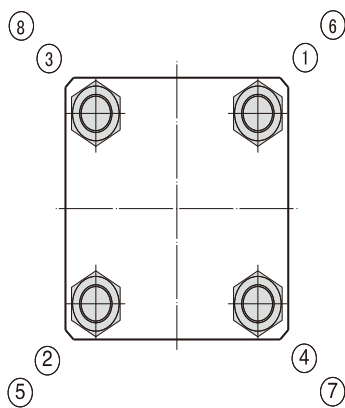


KK	B	C	H
M12xP1.5	19	22	8
M16xP1.5	24	27	10
M20xP1.5	30	34	11
M24xP1.5	36	41	13
M30xP1.5	41	47	17
M36xP1.5	50	57	18
M39xP1.5	50	57	18

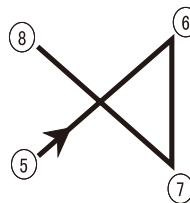


KK	DD	H	S	T	KK	DD	H	S	T
M48xP1.5	70	18	6	2.5	M80xP2.0	115	30	8	3.5
M60xP2.0	90	20	7	3	M95xP2.0	135	35	10	4
M64xP2.0	95	20	7	3	M100xP2.0	150	35	10	4
M72xP2.0	105	25	8	3.5	M120xP2.0	180	40	12	5
M76xP2.0	110	30	8	3.5	M130xP2.0	200	40	12	5

## NOTES OF TIE ROD ASSEMBLY



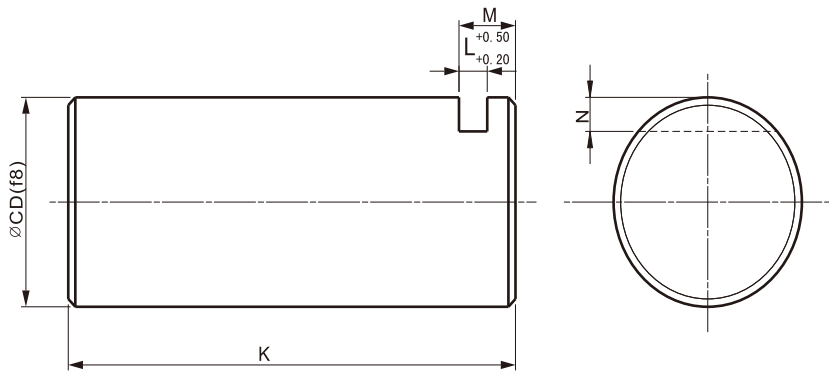
→ about 70% of needed torque



→ 100% needed torque

bore (mm)	32.40.50	63	80	100	125	150	180	200	224	250
thread	M10x1.5	M12x1.5	M16x1.5	M18x1.5	M22x1.5	M26x1.5	M30x1.5	M33x2.0	M39x2.0	M42x2.0
needed torque (kgf-cm)	S45C	200	250	870	1300	2400	4500	6300	8300	18000
	S45C (QT)	280	510	1300	1800	3400	6400	8900	12000	25000

## PIN AND KEEPER



symbol bore	CD	K	M	N	L
32	16	57	7	3.5	3
40	16	57	7	3.5	3
50	20	68	7	3.5	3
63	31.5	76	9	5.5	6
80	31.5	76	9	5.5	6
100	40	95	12	6.5	6
125	50	143	12	7.5	6
140	63	183	18	10	9
150	63	183	18	10	9
160	71	183	19	11	9
180	80	225	20	12	12
200	90	250	20	15	12
224	100	280	24	15.5	12
250	100	280	24	15.5	12

Tie-rod Hydraulic Cylinder

Mold Hydraulic Cylinders

Swivel & Clamp Hydraulic Cylinders

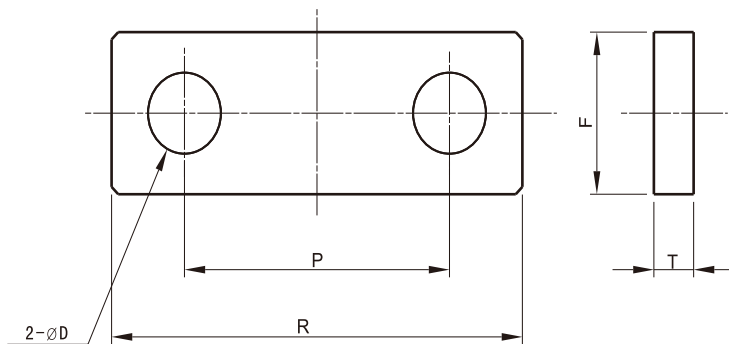
Booster Cylinders & Unclamping cylinders

ISO Specifications Cylinders

Round Hydraulic Cylinders

Specific Hydraulic Cylinders


Systems & Fittings



symbol bore	D	F	T	P	R	
32	6.5	16	3	18	28	steel bolt M6
40	6.5	16	3	18	28	
50	6.5	16	3	18	28	
63	11	25	6	33	55	M10
80	11	25	6	33	55	
100	11	25	6	40	62	
125	14	25	6	50	72	M12
140	14	32	9	63	93	
150	14	32	9	63	93	
160	14	38	9	71	101	M14
180	16	38	12	80	115	
200	16	38	12	90	125	
224	18	38	12	100	140	M16
250	18	38	12	100	140	

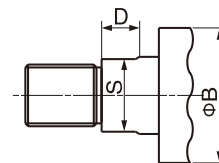
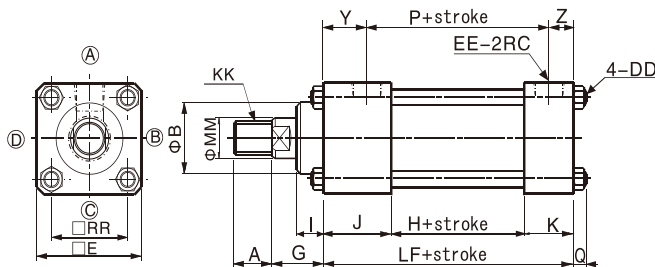
## ORDER INDICATION

HC	A	70		SD	C	100
series	type	working pressure	performance	installation form	shaft diameter	bore
Tie-rod cylinder	A: Double acting cylinder	70: working pressure 70kgf/cm <sup>2</sup>	blank = indicates standard  H: shaft with dust cover J: heat/ acid & alkali resistance (max. tem. 150°C)	SD: Basic	C: C diameter	32:32mm
	C: Biaxial cylinder	140: working pressure 140kgf/cm <sup>2</sup>		FA: Rod Flange	B: B diameter	40:40mm
	D: Double acting cylinder with adjustable stroke			FB: Head Flange	note :	50:50mm
				CA: Clevis	1. Standard cylinder HC-70 with C-shaft diameter	63:63mm
				CB: Dual Clevis	2. Standard cylinder HC-140 with C-shaft diameter	80:80mm
				LA: foot flange	3. Please specify when HC-70+B or HC-140+C	100:100mm
				LB: End flange		125:125mm
				TA: Rod Trunnion		150:150mm
				TC: Mid Trunnion		180:180mm
						200:200mm
						224:224mm
						250:250mm

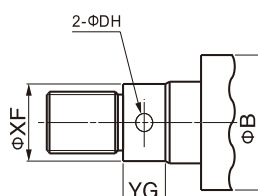
200ST					
stroke	cushion	shaft end joint	adjustable stroke	port position	cushion position
blank = indicates standard Refer maximum stroke in P.004	blank = indicates standard (no cushion) B: cushion on both ends R: cushion on rod cover H: cushion on head cover	Y: Y connector I: I connector Pin	 Double acting cylinder with adjustable stroke length choose 25mm or 50mm	blank = indicates standard pls refer to P.005	blank = indicates standard pls refer to P.005

**EXTERNAL DIMENSIONS**

- HC.A-SD double acting (basic)

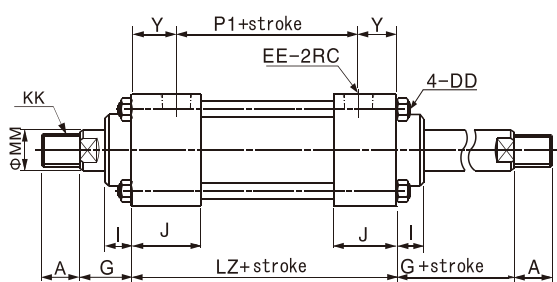


bore < 80mm

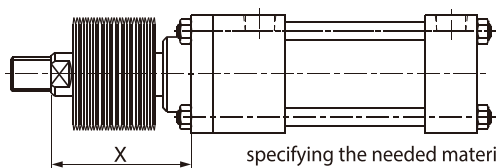


bore ≥ 80mm

- HC.C-SD double rod (basic)



with bellow (HC.A-H)



specifying the needed material while order.

- (1) N: NBR
- (2) V:F≤150°C

symbol	DH	XF	YG
80	10	79	20
85	10	84	20
90	10	89	20
100	12	99	24
112	12	111	24
125	12	124	24
140	12	139	24

symbol	X
32.40.50	1/3.5 × stroke + 45
63.80.100	1/4 × stroke + 55
125.150 180.200	1/5 × stroke + 65
224.250	1/6 × stroke + 80

symbol bore	bore class C			bore class B			D		E	G	H	I	J	K	P	P1	Q	S		Y	Z	DD	EE	LF	LZ	RR	
	MM	KK	A	MM	KK	A	C	B										C	B								
32	16	M12xP1.5	18	20	M16xP1.5	25	35	14	14	55	41	50	25	36	26	80	84	10	14	17	19	13	M10xP1.5	3/8	112	122	40
40	20	M16xP1.5	25	25	M20xP1.5	30	40	14	14	65	41	50	25	36	26	78	80	10	17	21	21	13	M10xP1.5	3/8	112	122	45
50	25	M20xP1.5	30	30	M24xP1.5	35	46	14	14	75	44	58	28	42	34	88	88	10	21	27	27	19	M10xP1.5	3/8	134	142	52
63	30	M24xP1.5	35	35	M30xP1.5	45	55	17	17	90	50	58	29	42	34	88	88	12	27	32	27	19	M12xP1.5	1/2	134	142	63
80	35	M30xP1.5	45	40	M36xP1.5	55	65	17	17	110	53	62	32	46	40	98	98	15	32	37	28	22	M16xP1.5	1/2	148	154	80
100	40	M36xP1.5	60	56	M48xP1.5	70	80	20	22	135	60	74	34	50	40	114	114	17	37	50	30	20	M18xP1.5	3/4	164	174	102
125	56	M48xP1.5	75	70	M64xP2.0	90	95	22	22	165	69	83	41	58	48	123	123	20	50	65	38	28	M22xP1.5	3/4	189	199	122
150	65	M60xP2.0	85	85	M76xP2.0	110	110	22	—	196	78	89	47	58	48	129	129	24	62	—	38	28	M26xP1.5	3/4	195	205	148
180	80	M72xP2.0	110	100	M95xP2.0	130	125	—	—	220	88	95	56	68	58	151	151	26	—	—	40	30	M30xP1.5	1	221	231	168
200	90	M80xP2.0	120	112	M100xP2.0	150	140	—	—	245	92	100	61	68	58	158	160	28	—	—	38	30	M33xP1.5	1	226	236	190
224	100	M95xP2.0	130	125	M120xP2.0	170	150	—	—	292	101	105	68	68	68	161	161	35	—	—	40	40	M39xP2.0	1 1/4	241	241	225
250	112	M100xP2.0	140	140	M130xP2.0	190	170	—	—	325	111	105	75	68	68	161	161	39	—	—	40	40	M42xP2.0	1 1/4	241	241	250

Tie-rod Hydraulic Cylinder

Mold Hydraulic Cylinders

Swivel & Clamp Hydraulic Cylinders

Booster Cylinders & Unclamping cylinders

ISO Specifications Cylinders

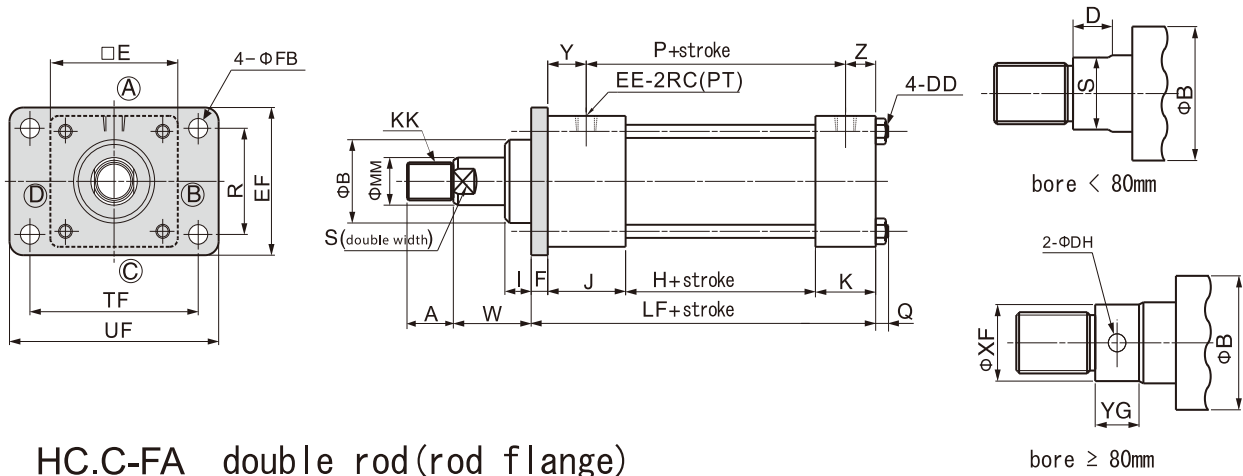
Round Hydraulic Cylinders

Specific Hydraulic Cylinders

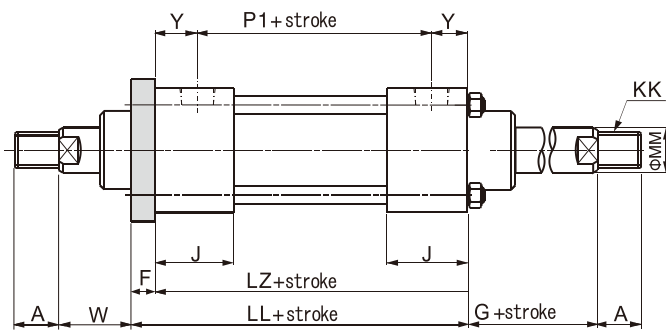
Systems & Fittings

## EXTERNAL DIMENSIONS

- HC.A-FA double acting (rod flange)



- HC.C-FA double rod (rod flange)



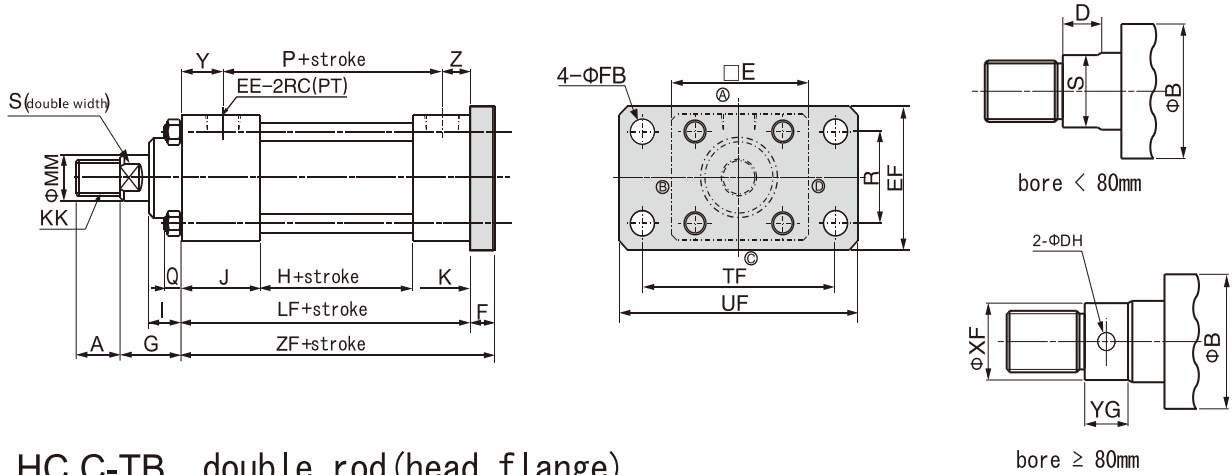
symbol	DH	XF	YG
80	10	79	20
85	10	84	20
90	10	89	20
100	12	99	24
112	12	111	24
125	12	124	24
140	12	139	24

symbol	bore class C			bore class B			B	D		E	F		G	H	I		J	K	P	P1	Q
	MM	KK	A	MM	KK	A		C	B		C	B			C	B					
32	16	M12xP1.5	18	20	M16xP1.5	25	35	14	14	55	11	11	41	50	14	14	36	26	80	84	10
40	20	M16xP1.5	25	25	M20xP1.5	30	40	14	14	65	11	11	41	50	14	14	36	26	78	80	10
50	25	M20xP1.5	30	30	M24xP1.5	35	46	14	14	75	14	18	44	58	14	10	42	34	88	88	10
63	30	M24xP1.5	35	35	M30xP1.5	45	55	17	17	90	15	20	50	58	14	9	42	34	88	88	12
80	35	M30xP1.5	45	40	M36xP1.5	55	65	17	17	110	18	24	53	62	14	8	46	40	98	98	15
100	40	M36xP1.5	60	56	M48xP1.5	70	80	20	22	135	20	28	60	74	14	6	50	40	114	114	17
125	56	M48xP1.5	75	70	M64xP2.0	90	95	22	22	165	24	33	69	83	17	8	58	48	123	123	20
150	65	M60xP2.0	85	85	M76xP2.0	110	110	22	—	196	28	39	78	89	19	8	58	48	129	129	24
180	80	M72xP2.0	110	100	M95xP2.0	130	125	—	—	220	33	46	88	95	23	10	68	58	151	151	26
200	90	M80xP2.0	120	112	M100xP2.0	150	140	—	—	245	37	51	92	100	24	10	68	58	158	160	28
224	100	M95xP2.0	130	125	M120xP2.0	170	150	—	—	292	41	58	101	105	27	10	68	68	161	161	35
250	112	M100xP2.0	140	140	M130xP2.0	190	170	—	—	325	46	65	111	105	29	10	68	68	161	161	39

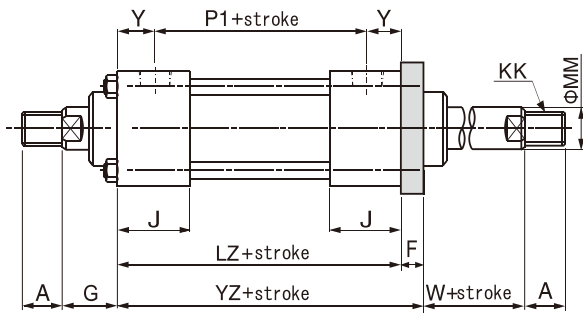
symbol	R	S		W	Y	Z	DD	EE	EF	FB	LL		LF		LZ	TF	UF
		C	B								C	B					
32	40	14	17	30	19	13	M10xP1.5	3/8	63	11	133	133	123	123	122	88	109
40	46	17	21	30	21	13	M10xP1.5	3/8	69	11	133	133	123	123	122	95	118
50	58	21	27	30	27	19	M10xP1.5	3/8	85	14	156	166	148	152	142	115	145
63	65	27	32	35	27	19	M12xP1.5	1/2	98	18	157	162	149	154	142	132	165
80	87	32	37	35	28	22	M16xP1.5	1/2	118	18	172	178	166	172	154	155	190
100	109	37	50	40	30	20	M18xP1.5	3/4	150	22	194	202	184	192	174	190	230
125	130	50	65	45	38	28	M22xP1.5	3/4	175	26	223	232	213	222	199	224	272
150	155	62	—	50	38	28	M26xP1.5	3/4	210	30	233	244	223	234	205	270	320
180	185	—	—	55	40	30	M30xP1.5	1	243	33	264	277	254	267	231	315	375
200	206	—	—	55	38	30	M33xP2.0	1	272	36	273	287	263	277	236	355	425
224	230	—	—	60	40	40	M39xP2.0	1 1/4	300	42	282	299	282	299	241	395	475
250	250	—	—	65	40	40	M42xP2.0	1 1/4	335	45	287	306	287	306	241	425	515

## EXTERNAL DIMENSIONS

- HC.A-FB double acting(head flange)



- HC.C-TB double rod(head flange)



symbol	DH	XF	YG
80	10	79	20
85	10	84	20
90	10	89	20
100	12	99	24
112	12	111	24
125	12	124	24
140	12	139	24

symbol	bore class C			bore class B			B	D		E	F		G	H	I	J	K	P	P1	Q
	MM	KK	A	MM	KK	A		C	B		C	B								
32	16	M12xP1.5	18	20	M16xP1.5	25	35	14	14	55	11	11	41	50	25	36	26	80	84	10
40	20	M16xP1.5	25	25	M20xP1.5	30	40	14	14	65	11	11	41	50	25	36	26	78	80	10
50	25	M20xP1.5	30	30	M24xP1.5	35	46	14	14	75	14	18	44	58	28	42	34	88	88	10
63	30	M24xP1.5	35	35	M30xP1.5	45	55	17	17	90	15	20	50	58	29	42	34	88	88	12
80	35	M30xP1.5	45	40	M36xP1.5	55	65	17	17	110	18	24	53	62	32	46	40	98	98	15
100	40	M36xP1.5	60	56	M48xP1.5	70	80	20	22	135	20	28	60	74	34	50	40	114	114	17
125	56	M48xP1.5	75	70	M64xP2.0	90	95	22	22	165	24	33	69	83	41	58	48	123	123	20
150	65	M60xP2.0	85	85	M76xP2.0	110	110	22	—	196	28	39	78	89	47	58	48	129	129	24
180	80	M72xP2.0	110	100	M95xP2.0	130	125	—	—	220	33	46	88	95	56	68	58	151	151	26
200	90	M80xP2.0	120	112	M100xP2.0	150	140	—	—	245	37	51	92	100	61	68	58	158	160	28
224	100	M95xP2.0	130	125	M120xP2.0	170	150	—	—	292	41	58	101	105	68	68	68	161	161	35
250	112	M100xP2.0	140	140	M130xP2.0	190	170	—	—	325	46	65	111	105	75	68	68	161	161	39

symbol	R	S		W	Y	Z	EE	EF	FB	LF	LZ	TF	UF	ZF		YZ	
		C	B											C	B		
																32	40
40	46	17	21	30	21	13	3/8	69	11	112	122	95	118	123	122	133	133
50	58	21	27	30	27	19	3/8	85	14	134	142	115	145	148	152	156	160
63	65	27	32	35	27	19	1/2	98	18	134	142	132	165	149	154	157	162
80	87	32	37	35	28	22	1/2	118	18	148	154	155	190	166	172	172	178
100	109	37	50	40	30	20	3/4	150	22	164	174	190	230	184	192	194	202
125	130	50	65	45	38	28	3/4	175	26	189	199	224	272	213	222	223	232
150	155	62	—	50	38	28	3/4	210	30	195	205	270	320	223	234	233	244
180	185	—	—	55	40	30	1	243	33	221	231	315	375	254	267	264	277
200	206	—	—	55	38	30	1	272	36	226	236	355	425	263	277	273	287
224	230	—	—	60	40	40	1 1/4	300	42	241	241	395	475	282	299	282	299
250	250	—	—	65	40	40	1 1/4	335	45	241	241	425	515	287	306	287	306

Tie-rod Hydraulic Cylinder

Mold Hydraulic Cylinders

Swivel & Clamp Hydraulic Cylinders

Booster Cylinders & Unclamping cylinders

ISO Specifications Cylinders

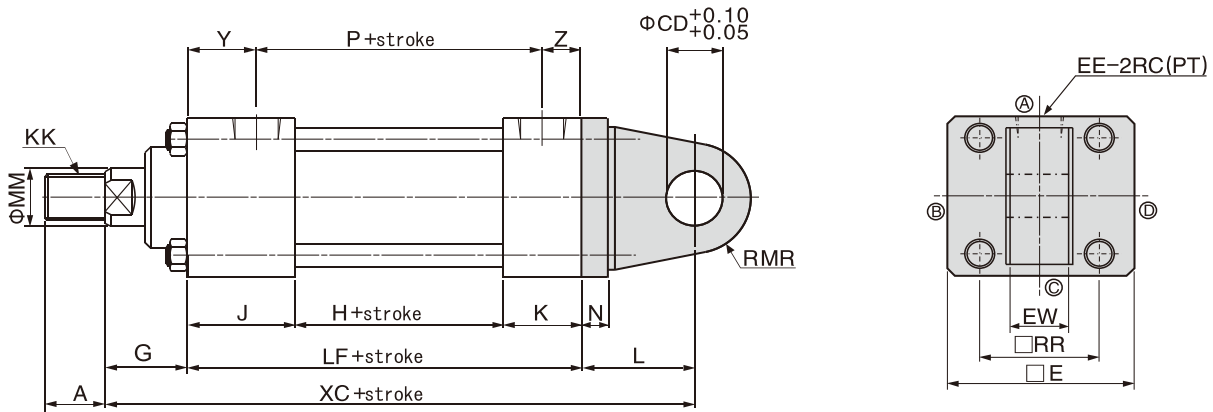
Round Hydraulic Cylinders

Specific Hydraulic Cylinders

Systems & Fittings

## EXTERNAL DIMENSIONS

- HC.A-CA double acting(clevis)



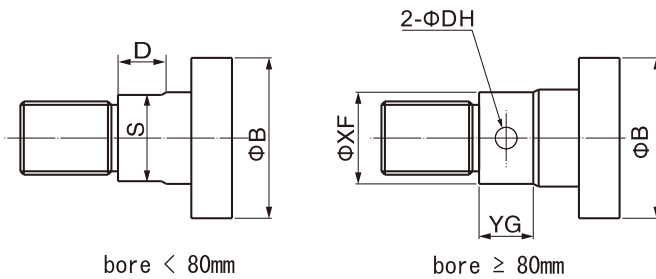
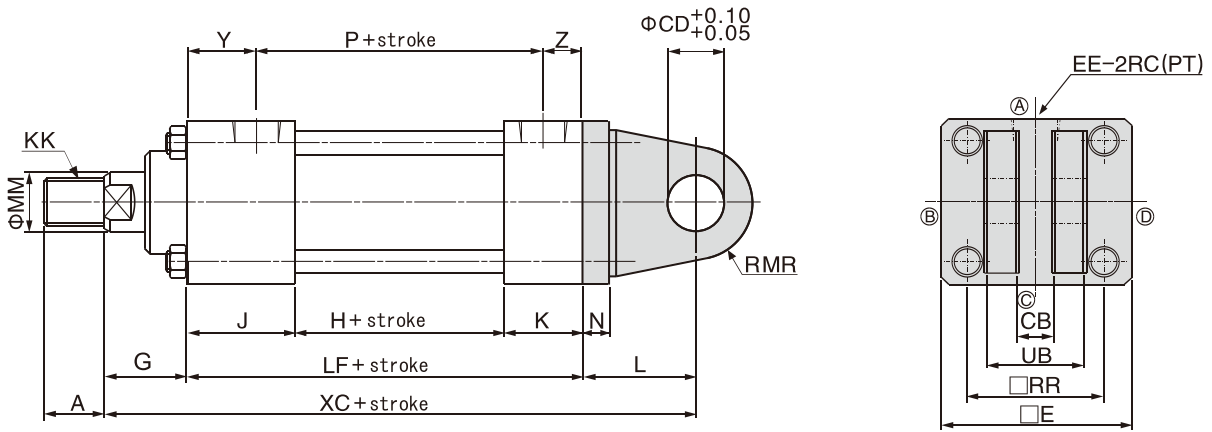
symbol	DH	XF	YG
shaft 80	10	79	20
85	10	84	20
90	10	89	20
100	12	99	24
112	12	111	24
125	12	124	24
140	12	139	24

symbol	bore class C			bore class B			D		E	G	H	J	K	L	N	
	MM	KK	A	MM	KK	A	B	C								
32	16	M12xP1.5	18	20	M16xP1.5	25	35	14	14	55	41	50	36	26	38	11
40	20	M16xP1.5	25	25	M20xP1.5	30	40	14	14	65	41	50	36	26	38	11
50	25	M20xP1.5	30	30	M24xP1.5	35	46	14	14	75	44	58	42	34	45	14
63	30	M24xP1.5	35	35	M30xP1.5	45	55	17	17	90	50	58	42	34	63	15
80	35	M30xP1.5	45	40	M36xP1.5	55	65	17	17	110	53	62	46	40	72	18
100	40	M36xP1.5	60	56	M48xP1.5	70	80	20	22	135	60	74	50	40	84	18
125	56	M48xP1.5	75	70	M64xP2.0	90	95	22	22	165	69	83	58	48	100	24
150	65	M60xP2.0	85	85	M76xP2.0	110	110	22	—	196	78	89	58	48	122	28
180	80	M72xP2.0	110	102	M95xP2.0	130	125	—	—	220	88	95	68	58	150	33
200	90	M80xP2.0	120	112	M100xP2.0	150	140	—	—	245	92	100	68	58	170	37
224	100	M95xP2.0	130	125	M120xP2.0	170	150	—	—	292	101	105	68	68	185	40
250	112	M100xP2.0	140	140	M130xP2.0	190	170	—	—	325	111	105	68	68	185	47

symbol	P	S		Y	Z	CD	EE	EW	LF	MR	RR	XC
		C	B									
32	80	14	17	19	13	16	3/8	25	112	16	40	191
40	78	17	21	21	13	16	3/8	25	112	16	45	191
50	88	21	27	27	19	20	3/8	31.5	134	20	52	223
63	88	27	32	27	19	31.5	1/2	40	134	31.5	63	247
80	98	32	37	28	22	31.5	1/2	40	148	31.5	80	273
100	114	37	50	30	20	40	3/4	50	164	40	102	308
125	123	50	65	38	28	50	3/4	63	189	50	122	358
150	129	62	—	38	28	63	3/4	80	195	63	148	395
180	151	—	—	40	30	80	1	100	221	80	168	459
200	158	—	—	38	30	90	1	125	226	90	190	488
224	161	—	—	40	40	100	1 1/4	125	241	100	225	527
250	161	—	—	40	40	100	1 1/4	125	241	100	250	537

**EXTERNAL DIMENSIONS**

- HC.A-CB double acting(dual clevis)



symbol shaft	DH	XF	YG
80	10	79	20
85	10	84	20
90	10	89	20
100	12	99	24
112	12	111	24
125	12	124	24
140	12	139	24

symbol bore	bore class C			bore class B			B	D		E	G	H	J	K	L	N
	MM	KK	A	MM	KK	A		C	B							
32	16	M12xP1.5	18	20	M16xP1.5	25	35	14	14	55	41	50	36	26	38	11
40	20	M16xP1.5	25	25	M20xP1.5	30	40	14	14	65	41	50	36	26	38	11
50	25	M20xP1.5	30	30	M24xP1.5	35	46	14	14	75	44	58	42	34	45	14
63	30	M24xP1.5	35	35	M30xP1.5	45	55	17	17	90	50	58	42	34	63	15
80	35	M30xP1.5	45	40	M36xP1.5	55	65	17	17	110	53	62	46	40	72	18
100	40	M36xP1.5	60	56	M48xP1.5	70	80	20	22	135	60	74	50	40	84	18
125	56	M48xP1.5	75	70	M64xP2.0	90	95	22	22	165	69	83	58	48	100	24
150	65	M60xP2.0	85	85	M76xP2.0	110	110	22	—	196	78	89	58	48	122	28
180	80	M72xP2.0	110	100	M95xP2.0	130	125	—	—	220	88	95	68	58	150	33
200	90	M80xP2.0	120	112	M100xP2.0	150	140	—	—	245	92	100	68	58	170	37
224	100	M95xP2.0	130	125	M120xP2.0	170	150	—	—	292	101	105	68	68	185	40
250	112	M100xP2.0	140	140	M130xP2.0	190	170	—	—	325	111	105	68	68	185	47

symbol bore	P	S		Y	Z	CB	CD	EE	LF	MR	RR	UB	XC
		C	B										
32	80	14	17	19	13	25	16	3/8	112	16	40	50	191
40	78	17	21	21	13	25	16	3/8	112	16	45	50	191
50	88	21	27	27	19	31.5	20	3/8	134	20	52	63.5	223
63	88	27	32	27	19	40	31.5	1/2	134	31.5	63	80	247
80	98	32	37	28	22	40	31.5	1/2	148	31.5	80	80	273
100	114	37	50	30	20	50	40	3/4	164	40	102	100	308
125	123	50	65	38	28	63	50	3/4	189	50	122	126	358
150	129	62	—	38	28	80	63	3/4	195	63	148	160	395
180	151	—	—	40	30	100	80	1	221	80	168	200	459
200	158	—	—	38	30	125	90	1	226	90	190	225	488
224	161	—	—	40	40	125	100	1 1/4	241	100	225	251	527
250	161	—	—	40	40	125	100	1 1/4	241	100	250	251	537

Tie-rod Hydraulic Cylinder

Mold Hydraulic Cylinders

Swivel & Clamp Hydraulic Cylinders

Booster Cylinders & Unclamping cylinders

ISO Specifications Cylinders

Round Hydraulic Cylinders

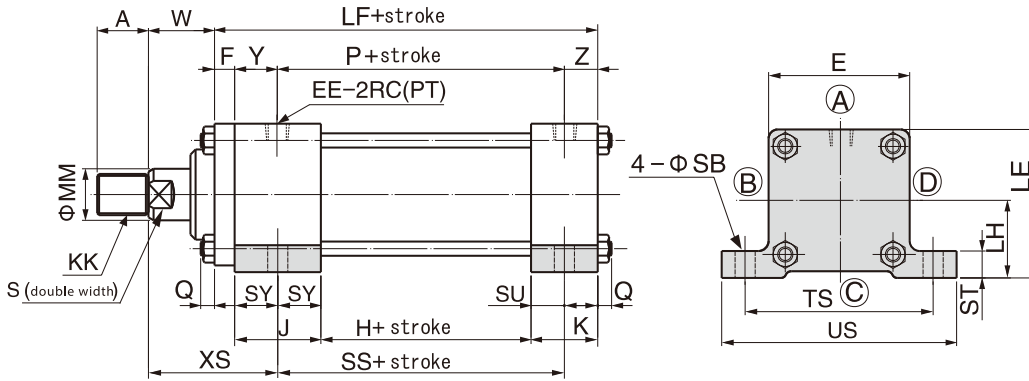
Specific Hydraulic Cylinders

Systems & Fittings

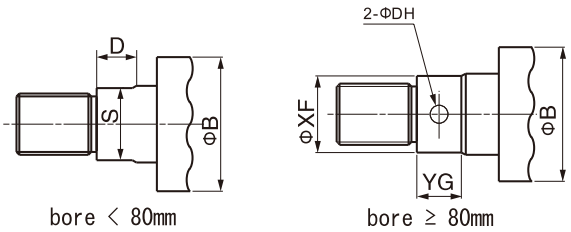
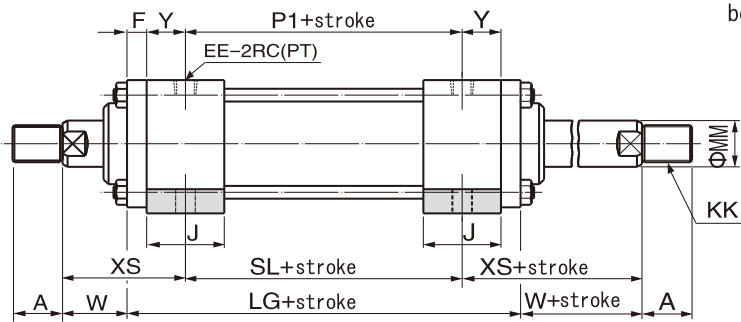


**EXTERNAL DIMENSIONS**

- HC.A-LA double acting (foot flange)



- HC.C-LA double rods (foot flange)



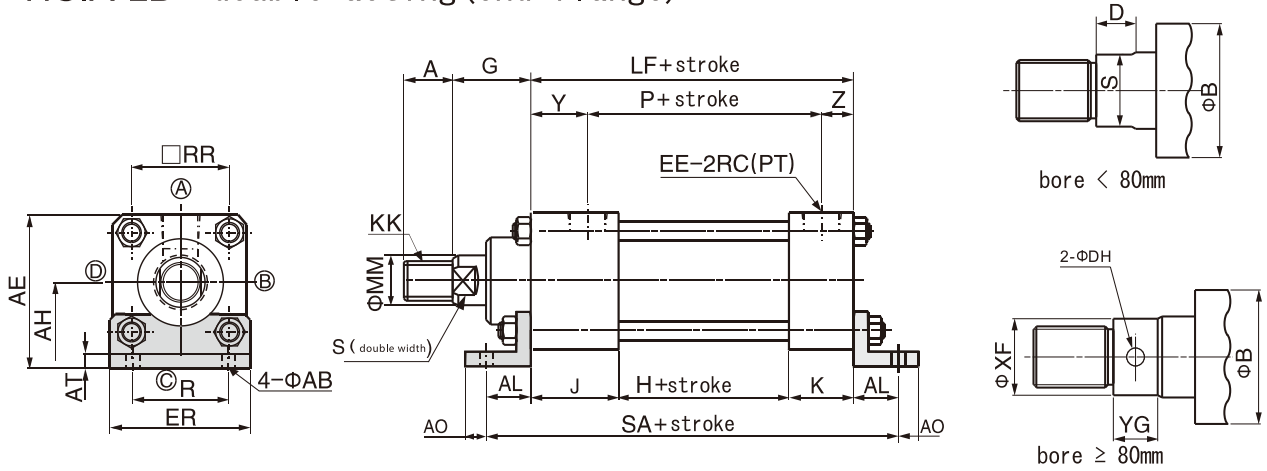
symbol	DH	XF	YG
shaft 80	10	79	20
85	10	84	20
90	10	89	20
100	12	99	24
112	12	111	24
125	12	124	24
140	12	139	24

symbol bore	bore class C			bore class B			B	D		E	F	H	J	K	P	P1	Q	S	
	MM	KK	A	MM	KK	A		C	B									C	B
32	16	M12xP1.5	18	20	M16xP1.5	25	35	14	14	55	11	50	36	26	80	84	10	14	17
40	20	M16xP1.5	25	25	M20xP1.5	30	40	14	14	65	11	50	36	26	78	80	10	17	21
50	25	M20xP1.5	30	30	M24xP1.5	35	46	14	14	75	14	58	42	34	88	88	10	21	27
63	30	M24xP1.5	35	35	M30xP1.5	45	55	17	17	90	15	58	42	34	88	88	12	27	32
80	35	M30xP1.5	45	40	M36xP1.5	55	65	17	17	110	18	62	46	40	98	98	15	32	37
100	40	M36xP1.5	60	56	M48xP1.5	70	80	20	22	135	20	74	50	40	114	114	17	37	50
125	56	M48xP1.5	75	70	M64xP2.0	90	95	22	22	165	24	83	58	48	123	123	20	50	65
150	65	M60xP2.0	85	85	M76xP2.0	110	110	22	—	196	28	89	58	48	129	129	24	62	—
180	80	M72xP2.0	110	100	M95xP2.0	130	125	—	—	220	33	95	68	58	151	151	26	—	—
200	90	M80xP2.0	120	112	M100xP2.0	150	140	—	—	245	37	100	68	58	158	160	28	—	—
224	100	M95xP2.0	130	125	M120xP2.0	170	150	—	—	292	41	105	68	68	161	161	35	—	—
250	112	M100xP2.0	140	140	M130xP2.0	190	170	—	—	325	46	105	68	68	161	161	39	—	—

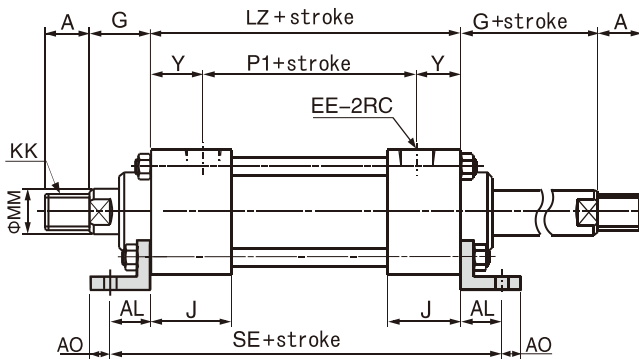
symbol bore	Y	Z	EE	LE	LF	LG	LH	SB	SL	SS	ST	SU	SY	TS	US	W	XS
32	19	13	3/8	62.5	123	144	35	11	86	81	14	13	18	88	109	30	59
40	21	13	3/8	70	123	144	37.5	11	86	81	14	13	18	95	118	30	59
50	27	19	3/8	82.5	148	170	45	14	100	96	17	17	21	115	145	30	65
63	27	19	1/2	95	149	172	50	18	100	96	19	17	21	132	165	35	71
80	28	22	1/2	115	166	190	60	18	108	105	25	20	23	155	190	35	76
100	30	20	3/4	138.5	184	214	71	22	124	119	27	20	25	190	230	40	85
125	38	28	3/4	167.5	213	247	85	26	141	136	32	24	29	224	272	45	98
150	38	28	3/4	204	223	261	106	30	147	142	37	24	29	270	320	50	107
180	40	30	1	235	254	297	125	33	163	158	47	29	34	315	375	55	122
200	38	30	1	262.5	263	310	140	36	168	163	52	29	34	355	425	55	126
224	40	40	1 1/4	296	282	323	150	42	173	168	52	29	34	395	475	60	135
250	40	40	1 1/4	332.5	287	333	170	45	173	168	57	29	34	425	515	65	145

**EXTERNAL DIMENSIONS**

- HC.A-LB double acting(end flange)



- HC.C-LB double rods(end flange)



symbol	DH	XF	YG
80	10	79	20
85	10	84	20
90	10	89	20
100	12	99	24
112	12	111	24
125	12	124	24
140	12	139	24

symbol	bore class C			bore class B			B	D		ER	G	H	J	K	P	P1	R	S	
	MM	KK	A	MM	KK	A		C	B									C	B
32	16	M12xP1.5	18	20	M16xP1.5	25	35	14	14	55	41	50	36	26	80	84	35	14	17
40	20	M16xP1.5	25	25	M20xP1.5	30	40	14	14	65	41	50	36	26	78	80	45	17	21
50	25	M20xP1.5	30	30	M24xP1.5	35	46	14	14	75	44	58	42	34	88	88	50	21	27
63	30	M24xP1.5	35	35	M30xP1.5	45	55	17	17	90	50	58	42	34	88	88	58	27	32
80	35	M30xP1.5	45	40	M36xP1.5	55	65	17	17	110	53	62	46	40	98	98	78	32	37
100	40	M36xP1.5	60	56	M48xP1.5	70	80	20	22	135	60	74	50	40	114	114	96	37	50
125	56	M48xP1.5	75	70	M64xP2.0	90	95	22	22	165	69	83	58	48	123	123	120	50	65
150	65	M60xP2.0	85	85	M76xP2.0	110	110	22	—	196	78	89	58	48	129	129	146	62	—
180	80	M72xP2.0	110	100	M95xP2.0	130	125	—	—	235	88	95	68	58	151	151	180	—	—
200	90	M80xP2.0	120	112	M100xP2.0	150	140	—	—	262	92	100	68	58	158	160	200	—	—
224	100	M95xP2.0	130	125	M120xP2.0	170	150	—	—	310	101	105	68	68	161	161	222	—	—
250	112	M100xP2.0	140	140	M130xP2.0	190	170	—	—	335	111	105	68	68	161	161	250	—	—

symbol	Y	Z	AB	AE	AH	AL	AO	AT	RR	EE	LF	LZ	SA	SE
32	19	13	11	67.5	40	32	13	6	40	3/8	112	122	176	186
40	21	13	11	75.5	43	32	13	6	45	3/8	112	122	176	186
50	27	19	14	87.5	50	35	15	6	52	3/8	134	142	204	212
63	27	19	18	105	60	42	18	8	63	1/2	134	142	218	226
80	28	22	18	127	72	50	20	9	80	1/2	148	154	248	254
100	30	20	22	152.5	85	55	20	12	102	3/4	164	174	274	284
125	38	28	26	187.5	105	66	29	13	122	3/4	189	199	321	331
150	38	28	30	221	123	75	30	18	148	3/4	195	205	345	355
180	40	30	33	258	148	85	40	18	168	1	221	231	391	401
200	38	30	36	287.5	165	98	40	25	190	1	226	236	422	432
224	40	40	42	331	185	115	45	30	225	1 1/4	241	241	471	471
250	40	40	45	370.5	208	130	50	35	250	1 1/4	241	241	501	501

Tie-rod Hydraulic Cylinder

Mold Hydraulic Cylinders

Swivel & Clamp Hydraulic Cylinders

Booster Cylinders & Unclamping cylinders

ISO Specifications Cylinders

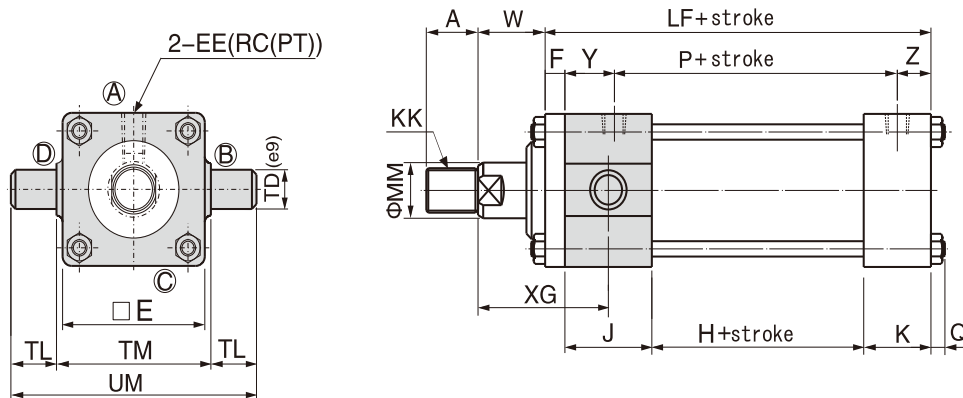
Round Hydraulic Cylinders

Specific Hydraulic Cylinders

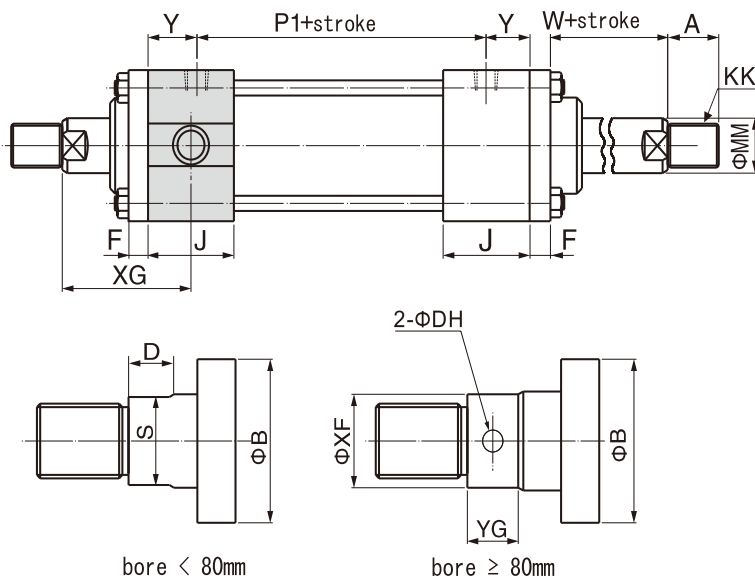
Systems & Fittings

## EXTERNAL DIMENSIONS

- HC.A-TA double acting (rod trunnion)



- HC.C-TA double rods (rod trunnion)

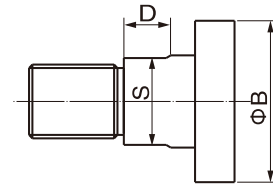
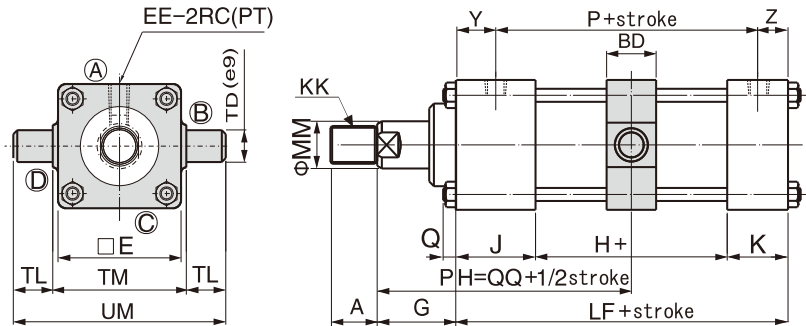


symbol	DH	XF	YG
shaft	85	10	84
			20

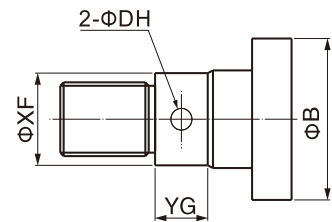
symbol	bore class C			bore class B			D		E	F	H	J	K	P	P1	Q	S		W	Y	Z	EE	LF	TD	TL	TM	UM	XG	
	MM	KK	A	MM	KK	A	B	C									C	B											
32	16	M12xP1.5	18	20	M16xP1.5	25	35	14	14	55	11	50	36	26	80	84	10	14	17	30	23	13	3/8	123	20	20	58 <sup>0</sup> <sub>-0.3</sub>	98	59
40	20	M16xP1.5	25	25	M20xP1.5	30	40	14	14	65	11	50	36	26	78	80	10	17	21	30	23	13	3/8	123	20	20	69 <sup>0</sup> <sub>-0.3</sub>	109	59
50	25	M20xP1.5	30	30	M24xP1.5	35	46	14	14	75	14	58	42	34	88	88	10	21	27	30	27	19	3/8	148	25	25	85 <sup>0</sup> <sub>-0.35</sub>	135	65
63	30	M24xP1.5	35	35	M30xP1.5	45	55	17	17	90	15	58	42	34	88	88	12	27	32	35	27	19	1/2	149	31.5	31.5	98 <sup>0</sup> <sub>-0.35</sub>	161	71
80	35	M30xP1.5	45	40	M36xP1.5	55	65	17	17	110	18	62	46	40	98	98	15	32	37	35	28	22	1/2	166	31.5	31.5	118 <sup>0</sup> <sub>-0.35</sub>	181	76
100	40	M36xP1.5	60	56	M48xP1.5	70	80	20	22	135	20	74	50	40	114	114	17	37	50	40	30	20	3/4	184	40	40	145 <sup>0</sup> <sub>-0.40</sub>	225	85
125	56	M48xP1.5	75	70	M64xP2.0	90	95	22	22	165	24	83	58	48	123	123	20	50	65	45	38	28	3/4	213	50	50	175 <sup>0</sup> <sub>-0.40</sub>	275	98
150	65	M60xP2.0	85	85	M76xP2.0	110	110	22	—	196	28	89	58	48	129	129	24	62	—	50	38	28	3/4	223	63	63	206 <sup>0</sup> <sub>-0.46</sub>	306	107

## EXTERNAL DIMENSIONS

- HC.A-TC double acting (mid trunnion)



bore < 80mm

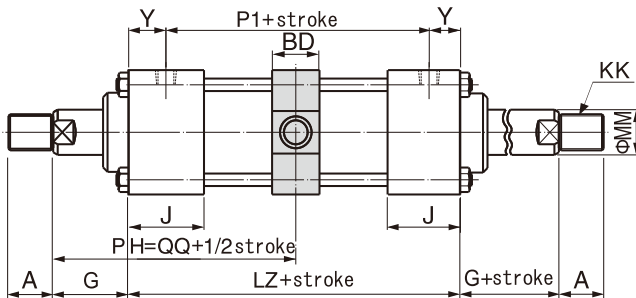


bore ≥ 80mm

Tie-rod Hydraulic Cylinder

Mold Hydraulic Cylinders

- HC.C-TC double rods (mid trunnion)



symbol	DH	XF	YG
80	10	79	20
85	10	84	20
90	10	89	20
100	12	99	24
112	12	111	24
125	12	124	24
140	12	139	24

Swivel & Clamp Hydraulic Cylinders

Booster Cylinders & Unclamping cylinders

ISO Specifications Cylinders

Round Hydraulic Cylinders

Specific Hydraulic Cylinders

Systems & Fittings

symbol	bore class C			bore class B			B	D		E	G	H	J	K	P	P1
	MM	KK	A	MM	KK	A		C	B							
32	16	M12xP1.5	18	20	M16xP1.5	25	35	14	14	55	41	50	36	26	80	84
40	20	M16xP1.5	25	25	M20xP1.5	30	40	14	14	65	41	50	36	26	78	80
50	25	M20xP1.5	30	30	M24xP1.5	35	46	14	14	75	44	58	42	34	88	88
63	30	M24xP1.5	35	35	M30xP1.5	45	55	17	17	90	50	58	42	34	88	88
80	35	M30xP1.5	45	40	M36xP1.5	55	65	17	17	110	53	62	46	40	98	98
100	40	M36xP1.5	60	56	M48xP1.5	70	80	20	22	135	60	74	50	40	114	114
125	56	M48xP1.5	75	70	M64xP2.0	90	95	22	22	165	69	83	58	48	123	123
150	65	M60xP2.0	85	85	M76xP2.0	110	110	22	—	196	78	89	58	48	129	129
180	80	M72xP2.0	110	100	M95xP2.0	130	125	—	—	220	88	95	68	58	151	151
200	90	M80xP2.0	120	112	M100xP2.0	150	140	—	—	245	92	100	68	58	158	160
224	100	M95xP2.0	130	125	M120xP2.0	170	150	—	—	292	101	105	68	68	161	161
250	112	M100xP2.0	140	140	M130xP2.0	190	170	—	—	325	111	105	68	68	161	161

symbol	Q	S		Y	Z	BD	EE	LF	LZ	QQ	TD	TL	TM	UM
		C	B											
32	10	14	17	19	13	28	3/8	112	122	102	20	20	58 <sup>0</sup> <sub>-0.3</sub>	98
40	10	17	21	21	13	28	3/8	112	122	102	20	20	69 <sup>0</sup> <sub>-0.3</sub>	109
50	10	21	27	27	19	33	3/8	134	142	115	25	25	85 <sup>0</sup> <sub>-0.35</sub>	135
63	12	27	32	27	19	43	1/2	134	142	121	31.5	31.5	98 <sup>0</sup> <sub>-0.35</sub>	161
80	15	32	37	28	22	43	1/2	148	154	130	31.5	31.5	118 <sup>0</sup> <sub>-0.35</sub>	181
100	17	37	50	30	20	53	3/4	164	174	147	40	40	145 <sup>0</sup> <sub>-0.40</sub>	225
125	20	50	65	38	28	58	3/4	189	199	168.5	50	50	175 <sup>0</sup> <sub>-0.40</sub>	275
150	24	62	—	38	28	78	3/4	195	205	180.5	63	63	206 <sup>0</sup> <sub>-0.46</sub>	332
180	26	—	—	40	30	98	1	221	231	203.5	80	80	243 <sup>0</sup> <sub>-0.46</sub>	403
200	28	—	—	38	30	108	1	226	236	210	90	90	272 <sup>0</sup> <sub>-0.52</sub>	452
224	35	—	—	40	40	117	1 1/4	241	241	221.5	100	100	308 <sup>0</sup> <sub>-0.52</sub>	508
250	39	—	—	40	40	117	1 1/4	241	241	231.5	100	100	335 <sup>0</sup> <sub>-0.57</sub>	535