

HCA

High Speed Cylinder

High Speed Type

ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100



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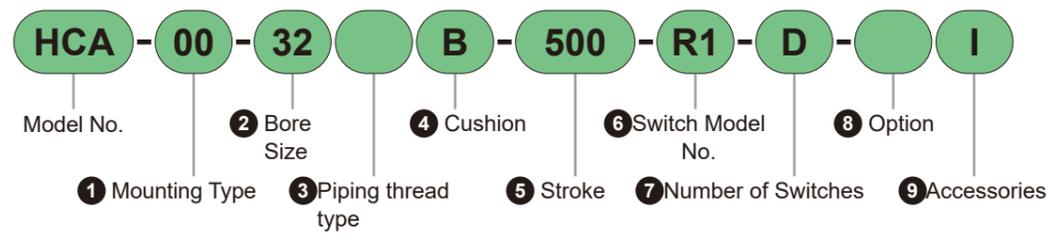
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Variation and Option Item Combination Availability Table

- ◎Mark : Option
- Mark : Custom-made
- △Mark : Manufacturable depending on conditions (please consult)
- × Mark : Not Available

Category	Variation	Code	Piping thread	
			NPT	G
Variations	Double Acting Basic Type	Blank	○	○
Piping thread	NPT	N		x
	G	G		
Accessories	Cylinder Switch	Separately Shown	◎	○
	Single Knuckle	I	◎	○
	Double Knuckle	Y	◎	○

[Model No. Example]



Model No.: High Speed Cylinder

- Variation : Double Acting, Basic, With switch
- ① mounting style : Basic type
- ② Bore Size : ø32 mm
- ③ Port thread : Rc Thread
- ④ Cushion : With Cushion on Both Sides
- ⑤ stroke : 500 mm
- ⑥ Switch model No. : Solid State R1 Switch, Lead Wire 1 m
- ⑦ Switch quantity : With 2 pcs
- ⑧ Option : None
- ⑨ Accessories: Single Knuckle

MEMO

High Speed Type

HCM

HCA

High Speed Type

HCM

HCA

Cylinder Switch

Ending

Cylinder Switch

Ending



High Speed Cylinder Double Acting, Single Rod Type

HCA Series

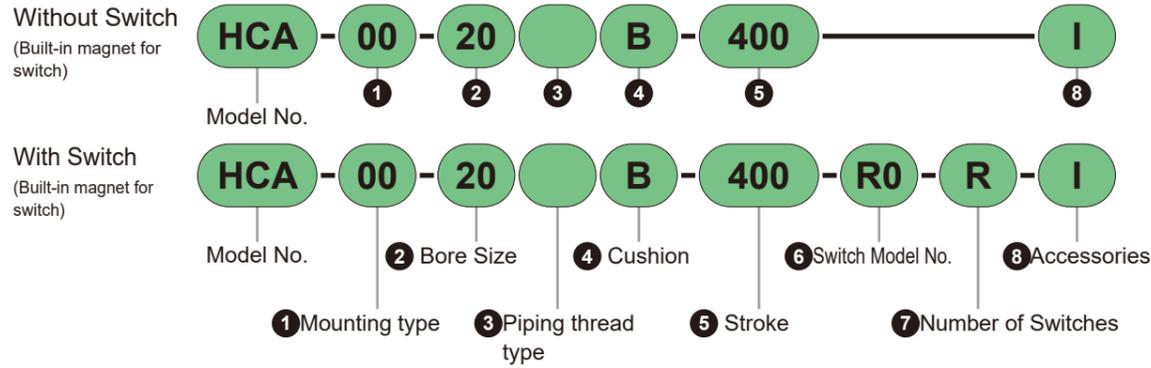
● Bore Size: $\phi 20$, $\phi 25$, $\phi 32$, $\phi 40$, $\phi 50$, $\phi 63$, $\phi 80$, $\phi 100$

Circuit Diagram
Code



HCA Series
Model No. Notation

Model No. Notation



1 Mounting type

Mounting brackets, nuts, and tooth washers are shipped included with the product.

Code	Content
00	Basic type
LB	Axial Foot Type (Double Side)
FA	Rod side Flange Type
FB	Head Side Flange Type

2 Bore Size (mm)

Code	Content
20	$\phi 20$
25	$\phi 25$
32	$\phi 32$
40	$\phi 40$
50	$\phi 50$
63	$\phi 63$
80	$\phi 80$
100	$\phi 100$

3 Piping thread type

Code	Content
Blank	Rc Thread
N	NPT Thread (Custom Order Product)
G	G thread (Custom product)

4 Cushion

Code	Content
B	With Cushion on Both Sides
R	With rod side cushion
H	With head side cushion
N	Without cushion

5 Stroke (mm)

Bore Size	Stroke	Intermediate Stroke	Recommended Stroke
$\phi 20$ to $\phi 32$	200 to 700	in 1 mm increments	400 mm or more
$\phi 40$ to $\phi 100$	200 to 1000		

Note: This product is designed with a longer cushion area than general cylinders to absorb high energy. Therefore, with short strokes, most of it becomes the cushion area, and the effect of high-speed use cannot be obtained.

6 Switch Model No.

For switch details, refer to P. 1457. Switches are shipped with the product.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V)		Load Current (mA)		Lead Wire Note 1	
			AC	DC	AC	DC	Grommet	Terminal box
Solid State	1-Color	2-wire	85 to 265	-	5 to 100	-	R1(K)□	R1B
			-	10 to 30	-	5 to 30	R2(K)□	R2B
	3-wire (NPN)	-	30 or less	-	200 or Less	R3(K)□	R3B	
		2-wire	-	10 to 30	-	5 to 30	R2Y(K)□	R2YB
Reed	2-Color	3-wire (NPN)	-	30 or less	-	100 or less	R3Y(K)□	R3YB
			1-Color	110/220	12/24	7 to 20/7 to 10	5 to 50	R0□
	1-Color Lights up when OFF	2-wire	110/220	-	20 to 200/10 to 200	-	R4□	R4B
			Without Indicator Lamp	110/220	5/12/24	20/10 or less	50 or less	R5□
1-Color With DC self-holding function	-	24 ± 10%	-	5 to 50	-	R6□	R6B	

* Lead wire length

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5 m (Option)

Example) Lead wire length
1 m R1
3 m R1³
5 m R1⁵

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch Model No..

7 Number of Switches

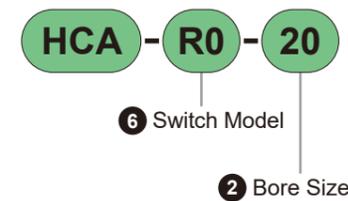
Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

8 Accessories

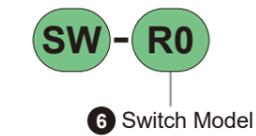
Code	Content
I	Single Knuckle
Y	Double Knuckle (pin and Retaining Ring included)

Switch Single Unit Model No. Notation

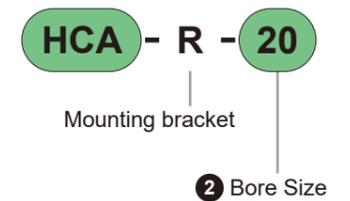
● Switch body+Mounting bracket set



● Switch Body Only



● Mounting bracket set



● Terminal box only

· For R□B



High Speed Type

High Speed Type

HCM

HCM

HCA

HCA

Cylinder Switch

Cylinder Switch

Ending

Ending

Specifications

Item	HCA (Standard Type, With Switch)									
	mm	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100	
Bore Size	mm	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100	
Actuation method		Double Acting Type								
Operating Fluid		Compressed Air								
Max Operating Pressure	MPa	1.0								
Min Operating Pressure	MPa	0.1								
Proof Pressure	MPa	1.6								
Ambient Temperature	°C	-10 to 60 (No freezing)								
Port Size		Rc1/8			Rc1/4			Rc3/8		Rc1/2
Stroke Tolerance	mm	$+2.4$ ₀	$+3.6$ ₀	$+4.3$ ₀			$+5.0$ ₀			
Operating Piston Speed	mm/s	50 to 3000								
Cushion		Air Cushion								
Lubrication		Not Required (When lubricating, etc., use turbine oil Class 1 ISO VG32)								
Allowable absorbed energy J	With Cushion	7.54	11.8	18.6	29.4	46.1	73.5	118	184	
	Without cushion	Large energy generated by external load cannot be absorbed. It is recommended to use an external shock absorber together.								
Effective air cushion length	mm	85	75	70	70	70	70	70	70	

Note: Refer to P. 1220 for absorbed energy.

Stroke

Bore Size (mm)	Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)	Recommended Stroke (mm)
ø20 to ø32	400 to 700	700	200	400 or more
ø40 to ø100	400 to 1000	1000		

*1: Intermediate strokes can be manufactured in 1 mm increments.

*2: This product is designed with a longer cushion area than general cylinders to absorb high energy. Therefore, with short strokes, most of it becomes the cushion area, and the effect of high-speed use cannot be obtained.

Cylinder Mass

(Unit: kg)

Bore Size (mm)	Product Weight when stroke S = 0 mm			Weight per Switch	Mounting Bracket Weight per Switch	Added mass per S=100 mm
	Basic type 00	Foot Type (LB)	Flange Type (FA, FB)			
ø20	0.73	0.91	0.80	Refer to the weight listed in the switch specifications on P. 1457.	0.02	0.11
ø25	0.80	0.98	0.87		0.02	0.14
ø32	0.85	1.03	0.92		0.02	0.16
ø40	1.37	1.63	1.69		0.02	0.27
ø50	2.13	2.56	2.50		0.02	0.34
ø63	3.17	3.88	3.81		0.03	0.42
ø80	5.75	7.27	7.12		0.03	0.67
ø100	7.92	9.94	9.75		0.03	0.91

- (Example) Product Weight of HCA-00-40B-500-R0-D
- Product Weight at 0 mm stroke 1.37 kg
 - Additional weight for 500 mm stroke..... $0.27 \times \frac{500}{100} = 1.35$ kg
 - Weight of 2 switches..... 2×0.042 kg + 2×0.02 kg = 0.124 kg
 - Product weight..... $1.37+1.35+0.124=2.844$ kg

Theoretical Thrust Table

(Unit: N)

Bore Size (mm)	Operating Direction	Operating Pressure MPa										
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	31.4	47.1	62.8	94.2	1.26×10^2	1.57×10^2	1.88×10^2	2.20×10^2	2.51×10^2	2.83×10^2	3.14×10^2
	Pull	23.6	35.3	47.1	70.7	94.2	1.18×10^2	1.41×10^2	1.65×10^2	1.88×10^2	2.12×10^2	2.36×10^2
ø25	Push	49.1k	73.6	98.2	1.47×10^2	1.96×10^2	2.45×10^2	2.95×10^2	3.44×10^2	3.93×10^2	4.42×10^2	4.91×10^2
	Pull	37.8	56.7	75.6	1.13×10^2	1.51×10^2	1.89×10^2	2.27×10^2	2.64×10^2	3.02×10^2	3.40×10^2	3.78×10^2
ø32	Push	80.4	1.21×10^2	1.61×10^2	2.41×10^2	3.22×10^2	4.02×10^2	4.83×10^2	5.63×10^2	6.43×10^2	7.24×10^2	8.04×10^2
	Pull	69.1	1.04×10^2	1.38×10^2	2.07×10^2	2.76×10^2	3.46×10^2	4.15×10^2	4.84×10^2	5.53×10^2	6.22×10^2	6.91×10^2
ø40	Push	1.26×10^2	1.88×10^2	2.51×10^2	3.77×10^2	5.03×10^2	6.28×10^2	7.54×10^2	8.80×10^2	1.01×10^3	1.13×10^3	1.26×10^3
	Pull	1.06×10^2	1.58×10^2	2.11×10^2	3.17×10^2	4.22×10^2	5.28×10^2	6.33×10^2	7.39×10^2	8.44×10^2	9.50×10^2	1.06×10^3
ø50	Push	1.96×10^2	2.95×10^2	3.93×10^2	5.89×10^2	7.85×10^2	9.82×10^2	1.18×10^3	1.37×10^3	1.57×10^3	1.77×10^3	1.96×10^3
	Pull	1.65×10^2	2.47×10^2	3.30×10^2	4.95×10^2	6.60×10^2	8.25×10^2	9.90×10^2	1.15×10^3	1.32×10^3	1.48×10^3	1.65×10^3
ø63	Push	3.12×10^2	4.68×10^2	6.23×10^2	9.35×10^2	1.25×10^3	1.56×10^3	1.87×10^3	2.18×10^3	2.49×10^3	2.81×10^3	3.12×10^3
	Pull	2.80×10^2	4.20×10^2	5.61×10^2	8.41×10^2	1.12×10^3	1.40×10^3	1.68×10^3	1.96×10^3	2.24×10^3	2.52×10^3	2.80×10^3
ø80	Push	5.03×10^2	7.54×10^2	1.01×10^3	1.51×10^3	2.01×10^3	2.51×10^3	3.02×10^3	3.52×10^3	4.02×10^3	4.52×10^3	5.03×10^3
	Pull	4.54×10^2	6.80×10^2	9.07×10^2	1.36×10^3	1.81×10^3	2.27×10^3	2.72×10^3	3.17×10^3	3.63×10^3	4.08×10^3	4.54×10^3
ø100	Push	7.85×10^2	1.18×10^3	1.57×10^3	2.36×10^3	3.14×10^3	3.93×10^3	4.71×10^3	5.50×10^3	6.28×10^3	7.07×10^3	7.85×10^3
	Pull	7.15×10^2	1.07×10^3	1.43×10^3	2.14×10^3	2.86×10^3	3.57×10^3	4.29×10^3	5.00×10^3	5.72×10^3	6.43×10^3	7.15×10^3

Mounting Bracket Model No. Notation

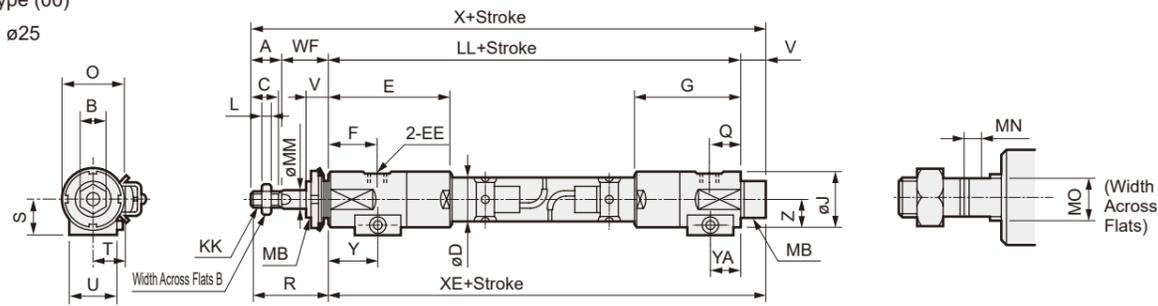
Bore Size (mm)	20	25	32	40	50	63	80	100
Mounting bracket								
Foot (LB)	HCA-LB-20	HCA-LB-25	HCA-LB-32	HCA-LB-40	HCA-LB-50	HCA-LB-63	HCA-LB-80	HCA-LB-100
Flange (FA/FB)	HCA-FA-20	HCA-FA-25	HCA-FA-32	HCA-FA-40	HCA-FA-50	HCA-FA-63	HCA-FA-80	HCA-FA-100

Note: Foot type mounting bracket is 2 pcs/set.

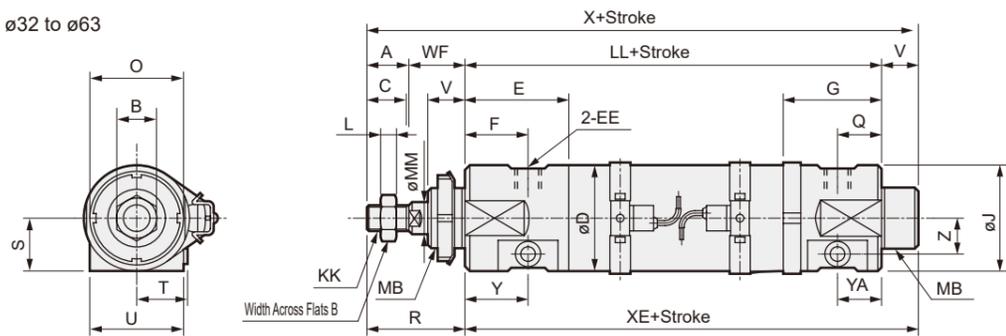
Dimensional Drawings

● Basic type (00)

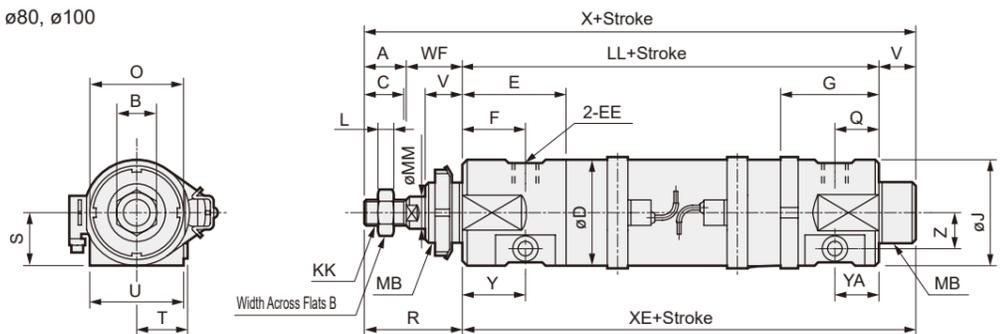
ø20, ø25



ø32 to ø63



ø80, ø100



Code	Basic Type (00) Basic Dimensions															
Bore Size (mm)	A	B	C	D	E	EE	F	G	J	KK	L	LL *1	MB	MM	MN	MO
ø20	20	13	18	25	86	Rc1/8	34	74	33	M8×1	5	223	M25×1.5	10	4	8
ø25	20	17	18	30	82	Rc1/8	32.5	71	37	M10×1.25	6	213	M25×1.5	12	5	10
ø32	22	17	20	37	67	Rc1/4	42	57	37	M10×1.25	6	197	M25×1.5	12	5	10
ø40	22	22	20	46	73	Rc1/4	45.5	57	46	M14×1.5	8	203	M35×1.5	16	6	14
ø50	28	27	26	56.4	77	Rc3/8	47.5	60	56	M18×1.5	11	211	M40×1.5	20	7	17
ø63	28	27	26	69.4	69	Rc3/8	42	65	69.4	M18×1.5	11	214	M40×1.5	20	7	17
ø80	36	32	34	88	73	Rc 1/2	45	70	88	M22×1.5	13	232	M60×2	25	10	22
ø100	45	41	43	108	72	Rc 1/2	42	72	108	M26×1.5	16	235	M60×2	30	11	27

Code	Basic Dimensions												
Bore Size (mm)	O	Q	R	S	T	U	V	WF	X *1	XE *1	Y	YA	Z
ø20	42	22	44	21.5	17 to 20	29	16	24	283	239	34	22	15
ø25	42	21.5	52	23.5	18.5 to 22	32	16	32	281	229	32.5	21.5	17
ø32	42	25	52	23.5	18.5 to 22	32	20	30	269	217	42	25	17
ø40	57	25	54	28.5	22 to 27	38	20	32	277	223	45.5	25	21
ø50	62	24.5	61	35.5	27 to 34.5	48	20	33	292	231	47.5	24.5	25.5
ø63	62	29	66	35.7	34 to 43	62	25	38	305	239	42	29	25.7
ø80	86	31.5	78	46.5	41 to 51	76	25	42	335	257	45	31.5	34.5
ø100	86	30	93	55.5	48 to 60	90	30	48	358	265	42	30	43.5

*1: Due to the product structure, LL, X, and XE dimensions may be longer by Approx. 1 mm for ø20/ø25, 3 mm for ø32 to ø63, and 4 mm for ø80/ø100.

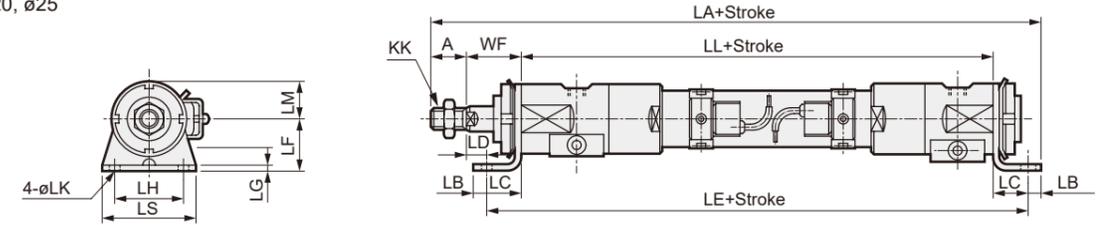
*2: For the external dimensions diagram of accessories, please refer to P. 1214.

*3: For dimensions with each switch, refer to P. 1216.

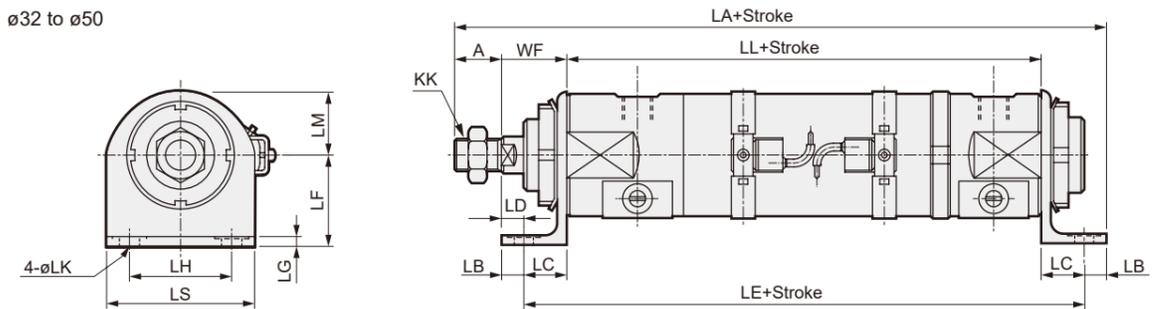
Dimensional Drawings

● Axial foot type (LB)

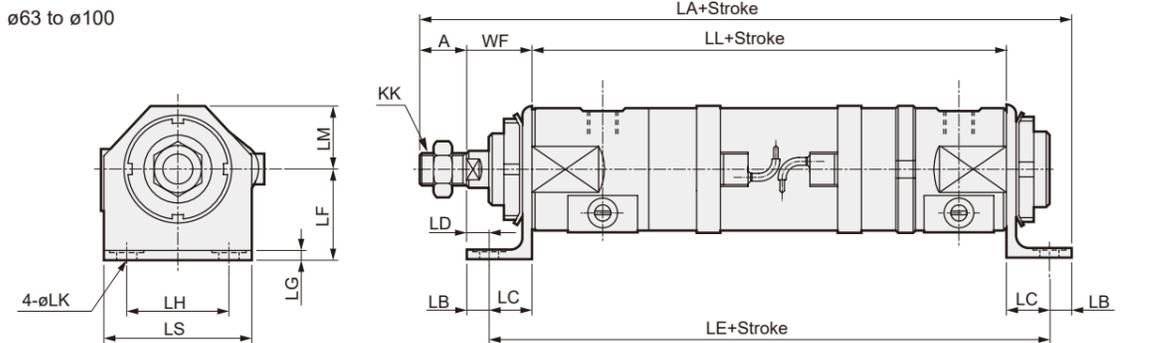
ø20, ø25



ø32 to ø50



ø63 to ø100



Code	Axial Foot Type (LB)														
Bore Size (mm)	A	KK	LA *1	LB	LC	LD	LE *1	LF	LG	LH	LK	LL *1	LM	LS	WF
ø20	20	M8×1	295	8	20	4	263	30	3.2	40	6.6	223	19	54	24
ø25	20	M10×1.25	293	8	20	12	253	30	3.2	40	6.6	213	19	54	32
ø32	22	M10×1.25	277	8	20	10	237	30	3.2	40	6.6	197	19	54	30
ø40	22	M14×1.5	289	10	22	10	247	40	3.2	40	9	203	24	58	32
ø50	28	M18×1.5	307	10	25	8	261	45	4.5	45	9	211	29	63	33
ø63	28	M18×1.5	318	13	25	13	264	53	5.5	60	11	214	36.5	86	38
ø80	36	M22×1.5	355	15	30	12	292	63	8	71	14	232	45	102	42
ø100	45	M26×1.5	373	15	30	18	295	75	8	85	14	235	54	118	48

*1: Due to the product structure, LL, LA, and LE dimensions may be longer by Approx. 1 mm for ø20/ø25, 3 mm for ø32 to ø63, and 4 mm for ø80/ø100.

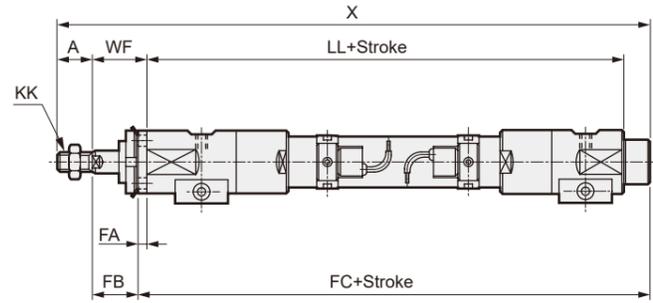
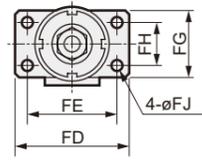
*2: For the external dimensions diagram of accessories, please refer to P. 1214.

*3: For dimensions of models with switches, see P. 1216.

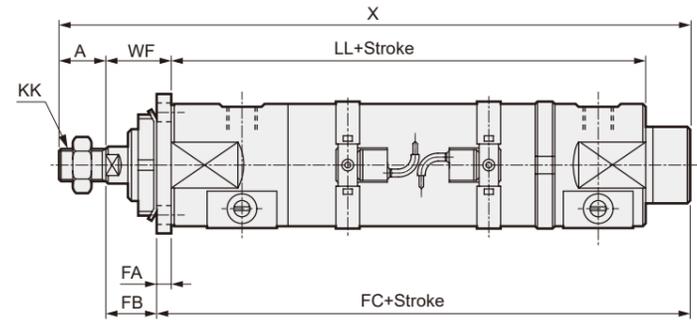
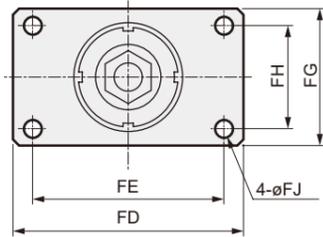
Dimensional Drawings

●Rod Side Flange Type (FA)

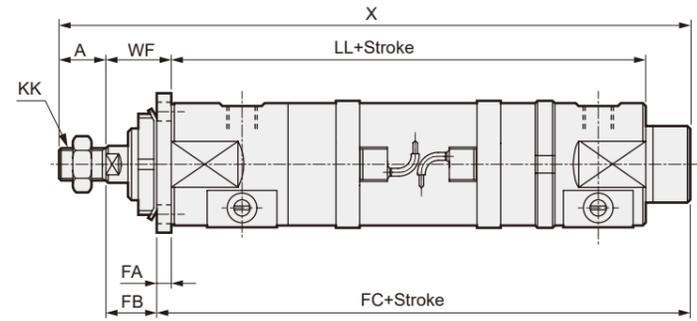
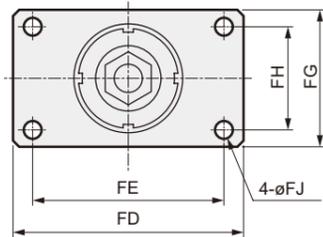
ø20, ø25



ø32 to ø63



ø80, ø100



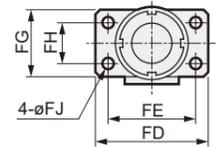
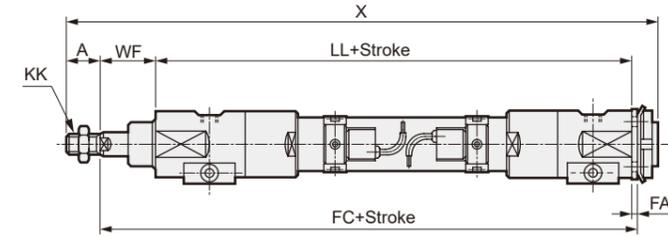
Code	Rod Side Flange Type (FA)												
Bore Size (mm)	A	FA	FB	FC *1	FD	FE	FG	FH	FJ	KK	LL *1	WF	X *1
ø20	20	4.5	19.5	243.5	66	52	38	24	6.6	M8×1	223	24	283
ø25	20	4.5	27.5	233.5	66	52	38	24	6.6	M10×1.25	213	32	281
ø32	22	4.5	25.5	221.5	66	52	38	24	6.6	M10×1.25	197	30	269
ø40	22	9	23	232	100	80	58	40	9	M14×1.5	203	32	277
ø50	28	9	24	240	108	90	65	45	9	M18×1.5	211	33	292
ø63	28	9	29	248	134	112	80	60	11	M18×1.5	214	38	305
ø80	36	14	28	271	160	132	100	71	14	M22×1.5	232	42	335
ø100	45	14	34	279	178	150	114	85	14	M26×1.5	235	48	358

*1: Due to the product structure, LL, X, and FC dimensions may be longer by Approx. 1 mm for ø20/ø25, 3 mm for ø32 to ø63, and 4 mm for ø80/ø100.
 *2: For the external dimensions diagram of accessories, please refer to P. 1214.
 *3: For dimensions of models with switches, see P. 1216.

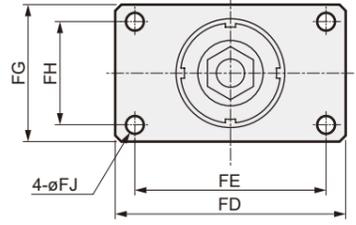
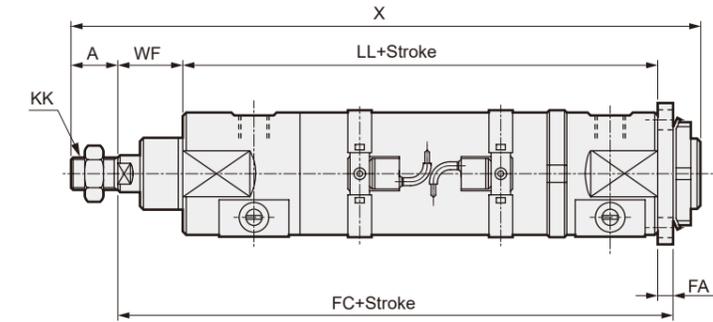
Dimensional Drawings

●Head Side Flange Type (FB)

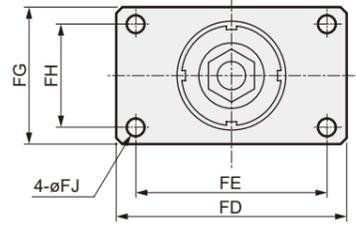
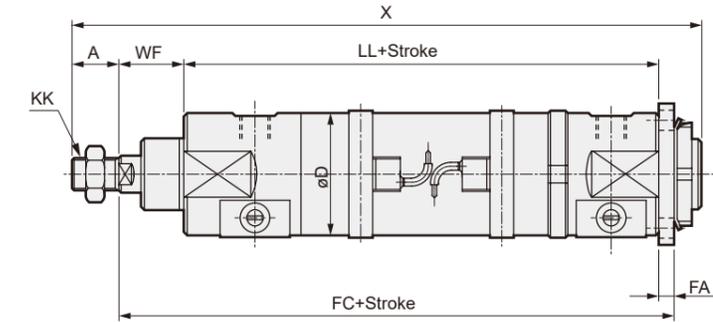
ø20, ø25



ø32 to ø63



ø80, ø100



Code	Head Side Flange Type (FB)												
Bore Size (mm)	A	FA	FC *1	FD	FE	FG	FH	FJ	KK	LL *1	WF	X *1	
ø20	20	4.5	251.5	66	52	38	24	6.6	M8×1	223	24	283	
ø25	20	4.5	249.5	66	52	38	24	6.6	M10×1.25	213	32	281	
ø32	22	4.5	231.5	66	52	38	24	6.6	M10×1.25	197	30	269	
ø40	22	9	244	100	80	58	40	9	M14×1.5	203	32	277	
ø50	28	9	253	108	90	65	45	9	M18×1.5	211	33	292	
ø63	28	9	261	134	112	80	60	11	M18×1.5	214	38	305	
ø80	36	14	288	160	132	100	71	14	M22×1.5	232	42	335	
ø100	45	14	297	178	150	114	85	14	M26×1.5	235	48	358	

*1: Due to the product structure, LL, X, and FC dimensions may be longer by Approx. 1 mm for ø20/ø25, 3 mm for ø32 to ø63, and 4 mm for ø80/ø100.
 *2: For the external dimensions diagram of accessories, please refer to P. 1214.
 *3: For dimensions of models with switches, see P. 1216.

High Speed Type

HCM

HCA

High Speed Type

HCM

HCA

Cylinder Switch

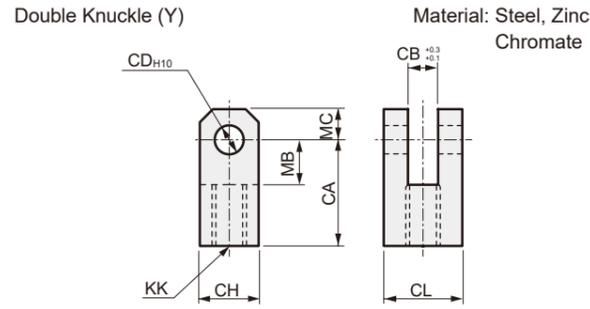
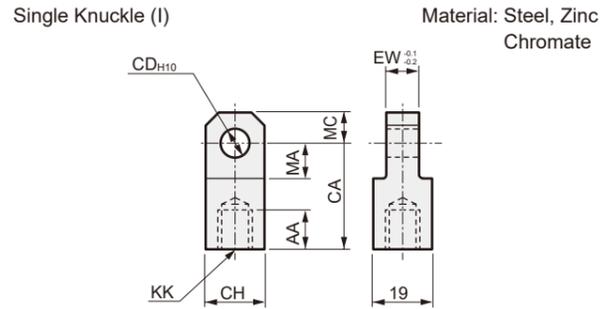
Ending

Cylinder Switch

Ending

Accessory External Dimensions

● Rod eye/clevis dimensions (ø20, 25, 32)

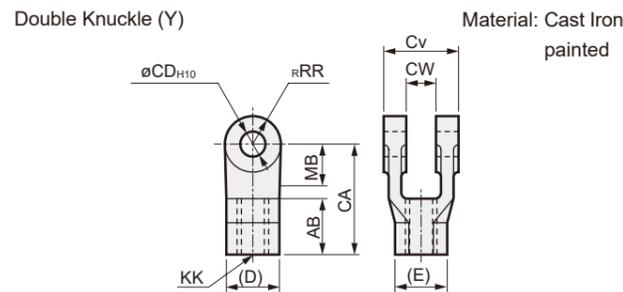
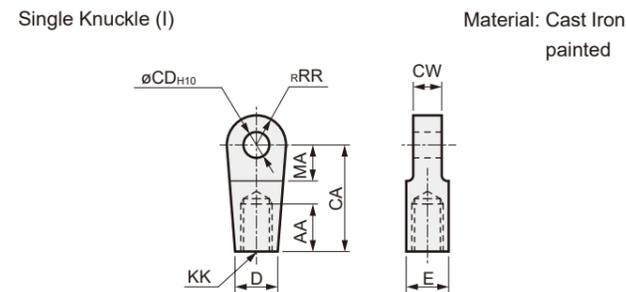


Model No.	Applicable Bore Size (mm)	AA	CA	CD	CH	EW	KK	MA	MC	Weight (g)
M1-I-20	20	14	30	10	19	8	M8×1	13	10	60
M1-I-30	25, 32	14	36	12	25	10	M10×1.25	16	12	110

Model No.	Applicable Bore Size (mm)	CA	CB	CD	CH	CL	KK	MB	MC	Weight (g)
M1-Y-20	20	30	8	10	19	19	M8×1	13	10	100
M1-Y-30	25, 32	36	10	12	25	25	M10×1.25	16	12	210

*1: Pins, washers, and split pins are included.

● Rod eye/clevis dimensions (ø40, 50, 63, 80, 100)



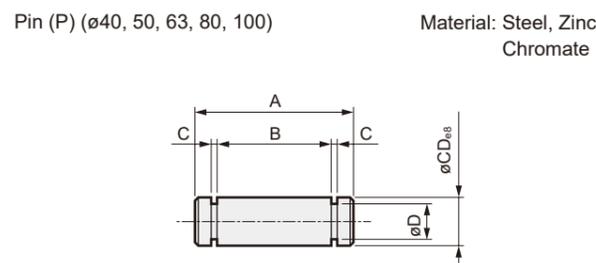
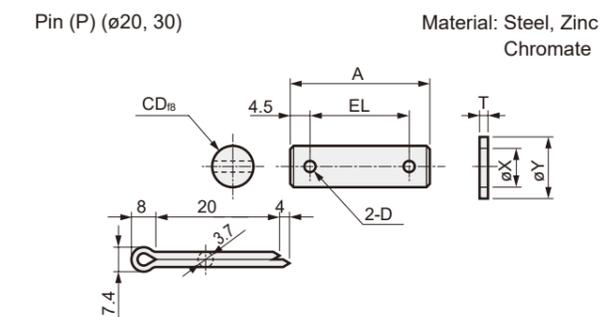
Model No.	Applicable Bore Size (mm)	AA	CA	CD	CW	D	E	KK	MA	RR	Weight (kg)
S1-I-40	40	20	50	12	18 ^{+0.1} _{-0.4}	27	27	M14×1.5	21	16	0.26
S1-I-50	50	21	50	12	18 ^{+0.1} _{-0.4}	27	27	M18×1.5	21	16	0.24
S1-I-63	63	21	50	14	20 ^{+0.1} _{-0.4}	27	27	M18×1.5	21	16	0.25 (36 psi)
S1-I-80	80	30	70	20	28 ^{+0.1} _{-0.4}	46	41	M22×1.5	30	25	0.88
S1-I-100	100	30	70	20	22 ^{+0.1} _{-0.4}	46	41	M26×1.5	30	25	0.84

Model No.	Applicable Bore Size (mm)	AB	CA	CD	Cv	CW	D	E	KK	MB	RR	Weight (kg)
S1-Y-40	40	24	50	12	36	18 ^{+0.4} _{-0.1}	27	31.2	M14×1.5	19	16	0.25
S1-Y-50	50	24	50	12	36	18 ^{+0.4} _{-0.1}	27	31.2	M18×1.5	19	16	0.24
S1-Y-63	63	24	50	14	40	20 ^{+0.4} _{-0.1}	27	31.2	M18×1.5	19	16	0.26
S1-Y-80	80	35	70	20	56	28 ^{+0.4} _{-0.1}	41	47.3	M22×1.5	30	25	0.90
S1-Y-100	100	35	70	20	56	28 ^{+0.4} _{-0.1}	41	47.3	M26×1.5	30	25	0.85

*1: Pin and Retaining Ring are included.

*2: MB dimension represents the effective length of CW dimension.

● Pin dimensions



Model No.	Applicable Bore Size (mm)	A	D	CD	EL	T	X	Y	Weight (g)
M1-P-20	20	37	4	10	28	1.6	10.5	18	30
M1-P-30	25/32	46	4	12	37	2.3	12.5	22	50

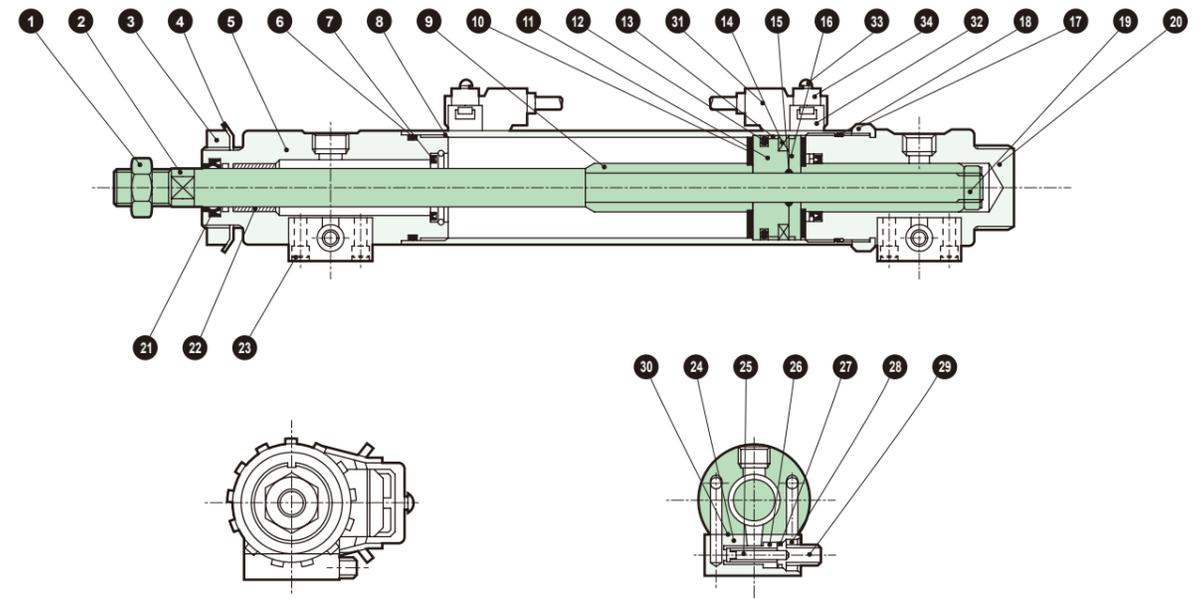
Model No.	Applicable Bore Size (mm)	A	B	C	D	CD	Weight (g)	Retaining Ring Used
S1-P-40	40, 50	43.5	36.2	1.15	11.5	12	40	C-type Retaining Ring for shaft 12
S1-P-63	63	47.5	40.2	1.15	13.4	14	60	C-type 14 for Shaft
S1-P-80	80, 100	64	56.2	1.35	19	20	100	C-type Retaining Ring for shaft 20

*1: Pins and Retaining Rings for use with double projection knuckle are included with the product.

* Please specify by Model No. when ordering.

Internal Structure Diagram/Material

● HCA



Note: Shape is different for ø20 only.

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Rod Nut	Steel	Zinc Chromate	19	Piston Nut	Steel	Zinc Chromate
2	Piston Rod	Steel	Industrial Chrome Plating	20	Head Cover	Aluminum Alloy	Alumite
3	Nut	Steel	Zinc Plating	21	Rod Packing	Nitrile Rubber	
4	Tooth Washer	Steel	Zinc Plating	22	Bushing	Oil-Impregnated Bearing Alloy	
5	Rod Cover	Aluminum Alloy	Alumite	23	Hexagon Socket Head Cap Screw	Alloy Steel	Black Oxide
6	Cylinder Gasket	Nitrile Rubber		24	Adjuster Case	Aluminum Alloy	Alumite
7	Cushion Packing	Urethane, Steel		25	Check Valve	Copper Alloy	
8	Cylinder Tube	Aluminum Alloy	Hard Anodized	26	Spring	Stainless Steel	
9	Cushion ring	Steel	Industrial Hard Chrome Plating	27	Adjust Gasket	Nitrile Rubber	
10	Cushion Rubber	Urethane Rubber		28	U-nut	Steel	Zinc Chromate
11	Piston	Aluminum Alloy	Chromate	29	Adjust bolt	Steel	Nickel Plating
12	Piston Packing	Nitrile Rubber		30	Case Gasket	Special Fiber Cloth	Special Fiber, Nitrile Rubber
13	Wear Ring	Polyacetal		With Switch			
14	Magnet	Plastic		31	Switch		
15	Piston gasket	Nitrile Rubber		32	Band	Stainless Steel	
16	Piston Retainer	Aluminum Alloy	Chromate	33	Pan Head Screw	Steel	
17	Lock Nut	Steel	Black Chrome Plating	34	Mounting bracket	Stainless Steel	
18	Backup Ring	Steel	Zinc Chromate				

Mounting Bracket Material

Mounting Style	Material	Remarks
Foot (LB)	Steel	Zinc Plating
Flange (FA, FB)	Steel	Zinc Plating

For maintenance parts, please visit the CKD Equipment Product Site (<https://www.ckd.co.jp/kiki/en/>) → "model No." → Maintenance Parts.

High Speed Type

High Speed Type

HCM

HCM

HCA

HCA

Cylinder Switch

Cylinder Switch

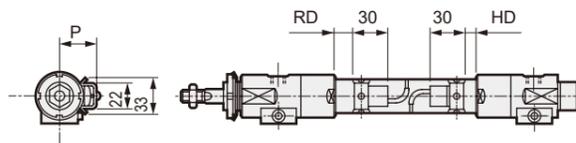
Ending

Ending

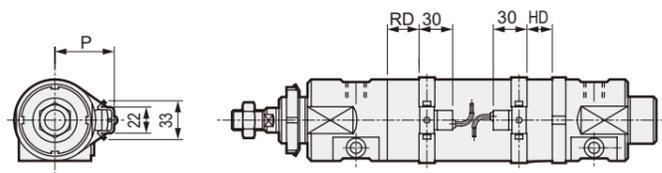
HCA Series Outline Dimension Drawing with Switch

● R1 (K), R2 (K), R2Y (K), R3Y (K), R4, R5, R6

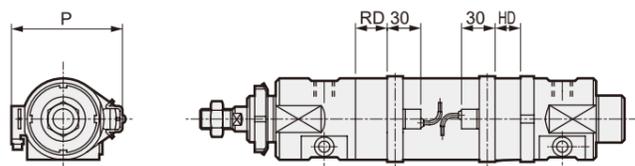
ø20, ø25



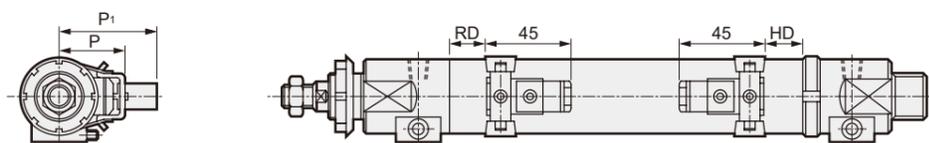
ø32 to ø63



ø80, ø100



● R1B, R2B, R2YB, R3B, R3YB, R0B, R4B, R5B, R6B



Code	RD	HD	P	P ₁
ø20	17.5	15.5	28	48
ø25	14.5	13	34	54
ø32	21	22	35	55
ø40	21	22	39	59
ø50	25	19	44	64
ø63	28	21	52	72
ø80	33.5	24.5	58.5	134
ø100	35	25	68.5	154

MEMO

High Speed Type

HCM

HCA

Cylinder Switch

Ending

High Speed Type

HCM

HCA

Cylinder Switch

Ending

Model Selection

When using a high-speed cylinder, particular attention should be paid to the cylinder speed and kinetic energy.

Step 1 High-Speed Cylinder Model Selection

Since pneumatic cylinders use compressible fluid, the average speed and the Max speed at cushion engagement are different. Obtain the required composite effective sectional area S and maximum speed V when you want to operate the load W at the average speed V1 from the following table. However, this table is a guideline and varies slightly depending on the Load Direction, piping length, etc.

Average Speed and Max Speed at Load Factor of High-Speed Cylinder (When Air Pressure = 0.5 MPa)

Bore Size (mm)	Average speed Load factor	V1=500 mm/s			V1=1,000 mm/s			V1=2,000 mm/s		
		10%	20%	30%	10%	20%	30%	10%	20%	30%
		W	S	V	W	S	V	W	S	V
ø20 (A2=2.356)	W	1.57	3.14	4.71	1.57	3.14	4.71	1.57	3.14	4.71
	S	0.80	0.89	0.98	1.60	1.78	1.96	3.19	3.56	3.93
	V	630	689	714	1,260	1,378	1,482	2,512	2,756	2,971
ø25 (A2=3.778)	W	2.45	4.91	7.36	2.45	4.91	7.36	2.45	4.91	7.36
	S	1.28	1.43	1.57	2.56	2.85	3.15	5.12	5.71	6.30
	V	628	690	740	1,257	1,376	1,485	2,514	2,757	2,970
ø32 (A2=6.912)	W	4.02	8.04	12.1	4.02	8.04	12.1	4.02	8.04	12.1
	S	2.34	2.61	2.88	4.68	5.22	5.76	9.36	12.4	11.5
	V	630	692	747	1,261	1,383	1,494	2,521	2,758	2,983
ø40 (A2=10.56)	W	6.28	12.6	18.8	6.28	12.6	18.8	6.28	12.6	18.8
	S	3.57	3.99	4.40	7.15	7.97	8.80	14.3	15.9	17.6
	V	630	693	747	1,261	1,383	1,494	2,521	2,765	2,988
ø50 (A2=16.49)	W	9.82	19.6	29.5	9.82	19.6	29.5	9.82	19.6	29.5
	S	5.58	6.23	6.87	11.2	12.5	13.7	22.3	24.9	27.5
	V	630	693	747	1,265	1,389	1,490	2,518	2,768	2,990
ø63 (A2=28.03)	W	15.6	31.2	46.8	15.6	31.2	46.8	15.6	31.2	46.8
	S	9.49	10.6	11.7	19.0	21.2	23.4	38.0	42.3	46.7
	V	632	694	749	1,266	1,389	1,498	2,531	2,771	2,989
ø80 (A2=45.36)	W	25.1	50.3	75.4	25.1	50.3	75.4	25.1	50.3	75.4
	S	15.4	17.1	18.9	30.7	34.3	37.8	61.4	68.5	75.6
	V	634	692	744	1,264	1,388	1,495	2,527	2,773	2,990
ø100 (A2=71.47)	W	39.3	78.5	118	39.3	78.5	118	39.3	78.5	118
	S	24.2	27.0	29.8	48.4	54.0	59.6	96.8	108	119
	V	632	694	748	1,264	1,387	1,496	2,529	2,774	2,987

W: Load weight (kg) S: Composite effective sectional area (mm²) V: Max speed (mm/s) V1: Average speed (mm/s) A2: Piston Rod side cross-section areas (cm²)

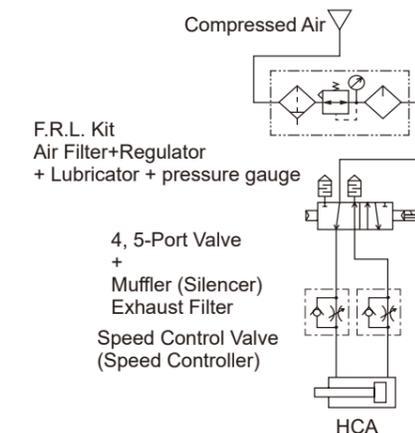
For example, when HCA-40 is used and the average speed V1 is 2,000 mm/s at a load of 6.28 kgf (load factor 10%, 0.5 MPa), the maximum speed will be 1.26 times, which is 2,521 mm/s. In this case, required composite effective sectional area is 14.3 mm². Select system equipment that matches the combined effective cross-sectional area from the table on the next page.

System Selection Guide Table

For each Bore Size, optimal system selection matching the specified cylinder speed can be performed.

Bore Size	Port Size	Required effective sectional area (mm ²)	4, 5-Port Valve for Pneumatic Control		Pneumatic Auxiliary Components		Piping
			Single solenoid	Double Solenoid	Speed Controller	Silencer	Piping (mm) (Between Valve and Cylinder)
ø20	Rc1/8	1.3	4KA110-M5 / 4KB110-06 4GA110R-M5 / 4GB110R-06	4KA120-M5 / 4KB120-06 4GA120R-M5 / 4GB120R-06	SC3W-6 / SC3R-6	SLW-6A	ø4×2.5NT
		2.0	4KA110-M5 / 4KB110-06 4GA110R-M5 / 4GB110R-06	4KA120-M5 / 4KB120-06 4GA120R-M5 / 4GB120R-06	SC3R-6	SLW-6A	ø6×ø4NT
		2.8	4KA210-06 / 4KB210-06 4GA210R-06 / 4GB210R-08	4KA220-06 / 4KB220-06 4GA220R-06 / 4GB220R-08	SC3R-6	SLW-6A	ø8×ø5.7NT
		3.6	4KA210-06 / 4KB210-06 4GA210R-06 / 4GB210R-08	4KA220-06 / 4KB220-06 4GA220R-06 / 4GB220R-08	SC1-6	SLW-6A	ø6×ø4NT
		4.3	4KA210-06 / 4KB210-06 4GA210R-06 / 4GB210R-08	4KA220-06 / 4KB220-06 4GA220R-06 / 4GB220R-08	SC1-6	SLW-6A	ø8×ø5.7NT
ø25	Rc1/8	1.4	4KA110-M5 / 4KB110-06 4GA110R-M5 / 4GB110R-06	4KA120-M5 / 4KB120-06 4GA120R-M5 / 4GB120R-06	SC3W-6	SLW-6A	ø4×ø2.5NT
		2.4	4KA110-M5 / 4KB110-06 4GA110R-M5 / 4GB110R-06	4KA120-M5 / 4KB120-06 4GA120R-M5 / 4GB120R-06	SC3W-6	SLW-6A	ø6×ø4NT
		4.4	4KA210-06 / 4KB210-06 4GA210R-06 / 4GB210R-08	4KA220-06 / 4KB220-06 4GA220R-06 / 4GB220R-08	SC1-6	SLW-6A	ø6×ø4NT
		5.8	4KA210-06 / 4KB210-06 4GA210R-06 / 4GB210R-08	4KA220-06 / 4KB220-06 4GA220R-06 / 4GB220R-08	SC1-6	SLW-6A	ø8×ø5.7NT
		6.6	4KA210-06 / 4KB210-06 4GA210R-06 / 4GB210R-08	4KA220-06 / 4KB220-06 4GA220R-06 / 4GB220R-08	SC1-8	SLW-6A	ø10×ø7.2NT
ø32	Rc1/4	3.6	4KB210-08 / 4GB210R-08 4GB310R-08	4KB220-08 / 4GB220R-08 4GB320R-08	SC3W-8 / SC3R-8	SLW-8A	ø6×ø4NT
		5.9	4KB210-08 / 4GB210R-08 4GB310R-08	4KB220-08 / 4GB220R-08 4GB320R-08	SC1-8	SLW-8A	ø8×ø5.7NT
		8.4	4F210-08 / 4KB310-08 4GB310R-08	4F220-08 / 4KB320-08 4GB320R-08	SC1-8	SLW-8A	ø10×ø7.2NT
		9.5	4KB310-08 / 4F310-08 4GB310R-08	4KB320-08 / 4F320-08 4GB320R-08	SC1-8	SLW-8A	ø10×ø7.2NT
		11.6	4F310-08 / 4F410-08 4GB310R-08	4F320-08 / 4F420-08 4GB320R-08	SC3W-10 / SC3R-10	SLW-8A	ø12×ø8.9NT
ø40	Rc1/4	3.6	4KB210-08 / 4GB310R-08 4GB310R-08	4KB220-08 / 4GB320R-08 4GB320R-08	SC3W-8 / SC3R-8	SLW-8A	ø6×ø4NT
		8.5	4F210-08 / 4KB310-08 4GB310R-08	4F220-08 / 4KB320-08 4GB320R-08	SC1-8	SLW-8A	ø10×ø7.2NT
		12.0	4F310-08 / 4F410-08 4GB310R-08	4F320-08 / 4F420-08 4GB320R-08	SC3W-10 / SC3R-10	SLW-8A	ø12×ø8.9NT
		15.2	4F410-08	4F420-08	SC-1-10	SLW-8A	ø12×ø8.9NT
		18.4	4F510-10	4F520-10	SC-1-10	SLW-10A	ø15×ø11.5NT
ø50	Rc3/8	5.5	4KB320-10 / 4F310-10 4K310-10 / 4F310-10	4KB320-10 / 4F320-10 4K320-10 / 4F320-10	SC3W-10 / SC3R-10	SLW-10A	ø6×ø4NT
		12.0	4KB320-10 / 4F310-10 4K310-10 / 4F310-10	4KB320-10 / 4F320-10 4K320-10 / 4F320-10	SC3W-10 / SC3R-10	SLW-10A	ø12×ø8.9NT
		18.1	4F510-10	4F520-10	SC1-10	SLW-10A	ø12×ø8.9NT
		23.5	4F510-10	4F520-10	SC1-15	SLW-10A	ø15×ø11.5NT
		26.9	4F610-15	4F620-15	SC1-15	SLW-15A	ø15×ø11.5NT
ø63	Rc3/8	11.0	4K310-10 / 4F310-10 4K410-10 / 4F510-10	4K320-10 / 4F320-10 4K420-10 / 4F520-10	SC3W-10 / SC3R-10	SLW-10A	ø10×ø7.2NT
		18.0	4K310-10 / 4F310-10 4K410-10 / 4F510-10	4K320-10 / 4F320-10 4K420-10 / 4F520-10	SC1-10	SL-10A	ø10×ø7.2NT
		26.9	4F610-15	4F620-15	SC1-15	SLW-15A	ø10×ø8.9NT
		43.1	4F610-15	4F620-15	SC-20A	SLW-15A	ø15×ø11.5NT
		62.8	4F610-20	4F620-20	SC-20A	SL-20A	Rc1/2 Steel Pipe
ø80	Rc 1/2	19.5	4F610-15	4F620-15	SC3W-15 / SC3R-15	SLW-15A	ø12×ø8.9NT
		31.3	4F610-15	4F620-15	SC1-15	SLW-15A	ø15×ø11.5NT
		67.4	4F610-20	4F620-20	SC-20A	SL-20A	Rc3/4 Steel Pipe
		85.9	4F710-20	4F720-20	SC-20A	SL-20A	Rc3/4 Steel Pipe
		95.9	4F710-20	4F720-20	SC-25A	SL-20A	Rc3/4 Steel Pipe
ø100	Rc 1/2	31.8	4F610-15	4F620-15	SC1-15	SLW-15A	ø15×ø11.5NT
		67.4	4F610-20	4F620-20	SC-20A	SL-20A	Rc3/4 Steel Pipe
		85.9	4F710-20	4F720-20	SC-20A	SL-20A	Rc3/4 Steel Pipe
		95.9	4F710-20	4F720-20	SC-25A	SL-20A	Rc3/4 Steel Pipe
		109.9	4F710-25	4F720-25	SC-25A	SL-25A	Rc3/4 Steel Pipe

● Pneumatics basic circuit diagram





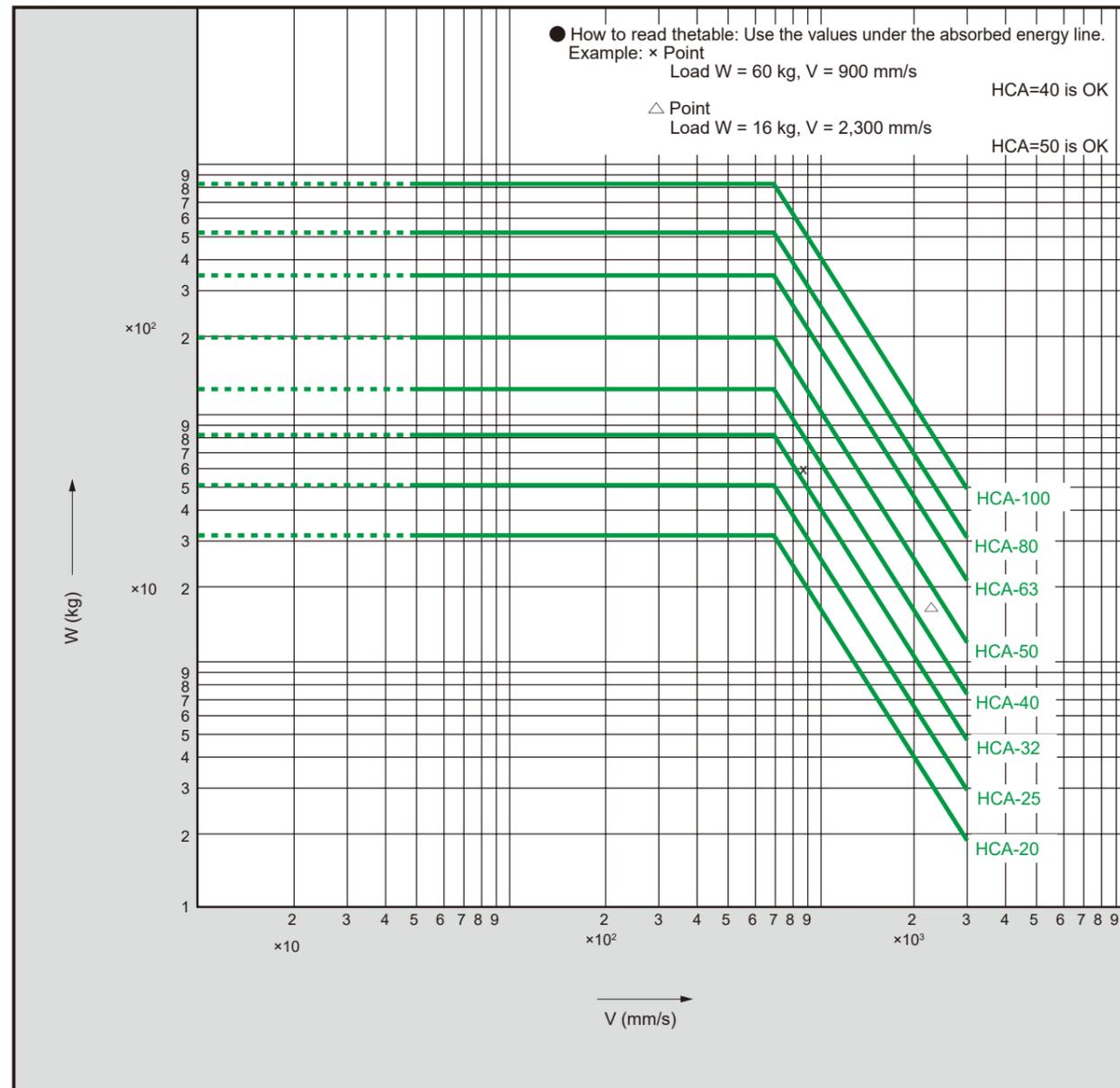
To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for Cylinder Switches, see P. 1512.

Step 2 High-Speed Cylinder Model Selection

Determine the model from the following table based on the relationship between load W and Max speed V.

High-Speed Cylinder Absorption Energy List



Note: Please be careful when reading the graph as it is a log-log scale.

For example, when the load W=16 kg and the maximum speed is 2300 mm/s, the △ mark indicates that HCA-40 cannot be used, and HCA-50 should be selected.

Individual Precautions: High Speed Cylinder HCA Series

Design / Selection

CAUTION

■ Avoid using the product so as to apply lateral load to the Piston Rod of the cylinder. If a lateral load is applied, the desired speed cannot be obtained, and the bearing part will wear unevenly, significantly reducing performance.

■ Cushion
 The air cushion absorbs kinetic energy that the piston generates by using air compressibility and prevents the piston and cover from colliding at the stroke end. Therefore, note that it is not a function for reducing the piston speed near the stroke end.

■ Consider the system selection guide of the cylinder only as a guideline, as it may vary depending on the operating conditions (Operating Pressure, travel method and direction of the load and piping length).

■ Operating the cylinder at high speed increases the instantaneous flow rate of the air, allowing drainage to accumulate more easily. Install an air tank to prevent drain from entering the cylinder and prevent pressure loss when passing through the oil mist filter.

■ The Max speed for the working piston is 3000 mm/s, which is not the average speed.

■ The Cylinder Body restriction is designed for a speed of 3000 mm/s and over, and should not be constricted by piping, valves, or speed controllers.

■ If started with the exhaust side at atmospheric pressure, the rod may extend suddenly, which is dangerous. Apply pressure to the exhaust side at startup.

■ If the cushion specifications (allowable absorption energy) are exceeded, install a separate shock absorbing device.

For precautions regarding mounting, installation, adjustment, operation, and maintenance, please refer to the CKD Equipment Product Site(<https://www.ckd.co.jp/kiki/en/>) → 'model No.' → [Instruction Manual](#).

High Speed Type

HCM

HCA

High Speed Type

HCM

HCA

Cylinder Switch

Ending

Cylinder Switch

Ending