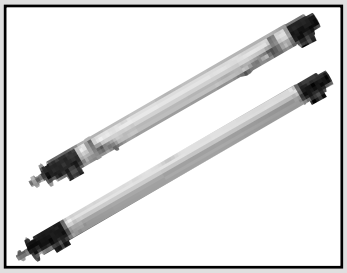
CKD

• HCA

High speed cylinder
Working speed: 50~3000 mm/sec.

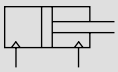


High speed cylinder, double acting/single rod type

HCA Series

• Bore size: 20, 25, 32, 40, 50, 63, 80, 100 mm

JIS symbol



Specifications

Descriptions		HCA (Standard type/With switch)							
Bore size mm		20 dia.	25 dia.	32 dia.	40 dia.	50 dia.	63 dia.	80 dia.	100 dia.
Actuation		Double acting							
Working fluid		Compressed air							
Max. working pressure MPa		1.0							
Min. working pressure MPa		0.1							
Withstanding pressure MPa		1.6							
Ambient temperature °C		-10 to 60 (to be unfrozen)							
Port size		Rc1/8		Rc1/4		Rc3/8		Rc1/2	
Stroke length tolerance mm		$+^{2.0}_{0}$		$+^{3.2}_{0}$			$+^{4.0}_{0}$		
Working piston speed mm/s		50 to 3000							
Cushion		Air cushion							
Lubrication		Not required (when lubrication, use turbine oil Class 1 ISO VG32.)							
Allowable energy absorption J	Cushioned	7.54	11.8	18.6	29.4	46.1	73.5	118	184
	No cushion	Can not absorb a large energy generated by an external load. We recommend to use an external shock absorber together.							
Effective cushion length mm		85	75	70	70	70	70	70	70

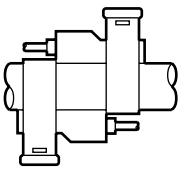
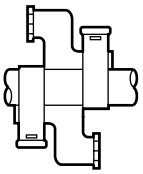
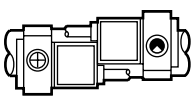
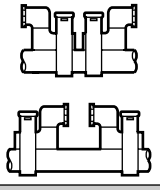
Note 1: Bore size (mm) 25, 63, 80, and 100 are custom orders.
Note 2: Please refer to "Selection guide" about absorbed energy.

Stroke length

Bore size (mm)	Max. stroke length (mm)
20, 25, 32 dia.	700
40, 50, 63, 80, 100 dia.	1000

Note 1: Stroke length exceeding maximum stroke length is manufactured depending on working conditions. Consult with CKD.
Note 2: For types with switch, minimum stroke length varies depending on installation method. Refer to the below table.

Min. stroke length of type with switch

	When different surface installation		When same surface installation	
Rough sketch				 (A) (B)
Descriptions	Grommet	Terminal box	Grommet	Terminal box
20 to 100 dia.	15(10)mm	15(10)mm	30mm	32mm (installation A) 80mm (installation B)

• Note 1: When one switch, refer to the value * marked in ( ).

Switch specifications

Descriptions	Proximity switch		
	R1	R2	R3
Applications	Programmable controller, relay, small solenoid valve	Programmable controller	Programmable controller, relay, IC circuit, solenoid valve
Power voltage	————	————	DC4.5V to 28V
Load voltage/ current	AC85V to 265V 5 to 100mA	DC10 to 30V 5 to 30mA	DC30V or less DC200mA or less
Light	LED ON lighting		

Descriptions	Reed switch			
	R0	R4	R5	R6
Applications	Relay, programmable controller	High capacity relay, solenoid valve	Programmable controller, relay, IC circuit (without indicator light), serial connection	Programmable controller (DC self hold function)
Load voltage/ current	DC12/24V, 5 to 50mA AC110V, 7 to 20mA AC220V, 7 to 10mA	AC110V, 20 to 200mA AC220V, 10 to 200mA	DC5/12/24V, 50mA or less AC110V, 20mA or less AC220V, 10mA or less	DC24V, 5 to 50mA
Light	LED ON lighting	Neon light OFF lighting	None	LED ON lighting

Note 1: Please refer to Ending 1 about other switch specifications.

Cylinder mass

(Unit: kg)

Bore size (mm)	Product mass when stroke length S =0mm			Mass per switch (Bracket included)		Additional mass per S = 100mm
	Basic type (00)	Foot type (LB)	Flange type (FA/FB)	Grommet lead	Terminal box	
20 dia.	0.73	0.91	0.80	0.04	0.03	0.11
25 dia.	0.80	0.98	0.87	0.04	0.03	0.14
32 dia.	0.85	1.03	0.92	0.04	0.03	0.16
40 dia.	1.37	1.63	1.69	0.04	0.03	0.27
50 dia.	2.13	2.56	2.50	0.04	0.03	0.34
63 dia.	3.17	3.88	3.81	0.04	0.03	0.42
80 dia.	5.75	7.27	7.12	0.04	0.03	0.67
100 dia.	7.92	9.94	9.75	0.04	0.03	0.91

Product mass of (e.g.) HCA-00-40B-500-R0-D

- When stroke length 0mm, product mass is 1.37kg + 2 X 0.04kg = 1.45kg
- Additional mass at stroke length 500mm is 0.27 X $\frac{500}{100}$ = 1.35kg
- Product mass is 1.45 + 1.35 = 2.80kg.

How to order

Without switch

HCA - 00 - 20 B - 400 ——— I

With switch

HCA - 00 - 20 B - 400 - R0 - R - I

Ⓐ Mounting style
Note 1

Ⓑ Bore size

Ⓒ Cushion

Ⓓ Stroke length

Ⓔ Switch model No.

Ⓕ Switch quantity

Ⓖ Accessory

Symbol	Descriptions
Ⓐ Mounting style	
00	Basic type
LB	Axial foot type
FA	Rod side flange type
FB	Head side flange type

Ⓑ Bore size (mm)	
20	20 dia.
25	25 dia. (custom order)
32	32 dia.
40	40 dia.
50	50 dia.
63	63 dia. (custom order)
80	80 dia. (custom order)
100	100 dia. (custom order)

Ⓒ Cushion	
B	Both sides cushion
R	Rod side cushion
H	Head side cushion
N	No cushion

Ⓓ Stroke length (mm)

Bore size (mm)	20	25	32	40	50	63	80	100
400	●	●	●	●	●	●	●	●
450	●	●	●	●	●	●	●	●
500	●	●	●	●	●	●	●	●
550	●	●	●	●	●	●	●	●
600	●	●	●	●	●	●	●	●
650	●	●	●	●	●	●	●	●
700	●	●	●	●	●	●	●	●
750				●	●	●	●	●
800				●	●	●	●	●
850				●	●	●	●	●
900				●	●	●	●	●
950				●	●	●	●	●
1000				●	●	●	●	●

Ⓔ Switch model No.

Grommet type	Terminal box type		Contact	Display	Lead wire
	Standard type	Splash-proof			
R1 *	R1B	R1A	Proximity	1 color indicator	2 wire
R2 *	R2B	R2A			
R3 *	R3B	R3A			3 wire
R0 *	R0B	R0A	Reed	2 color indicator	2 wire
R4 *	R4B	R4A			
R5 *	R5B	R5A			
R6 *	R6B	R6A			

* Lead wire length	
Blank	1m (standard)
3	3m (option)
5	5m (option)

Ⓕ Switch quantity	
R	One on rod side
H	One on head side
D	Two
T	Three

Ⓖ Accessory	
I	Rod eye
Y	Rod clevis

⚠ Cautions for model No. selection

Note 1: Mounting bracket, nut, and toothed washer are attached to product, when shipping.

<Example of model number>

HCA-00-20B-400-R0-R-I

Model: High speed cylinder, double acting/single rod type

- Ⓐ Mounting style : Basic type
- Ⓑ Bore size : 20 mm
- Ⓒ Cushion : Both sides cushion
- Ⓓ Stroke length : 400mm
- Ⓔ Switch model No. : Reed R0 switch, lead wire 1m
- Ⓕ Switch quantity : One on rod side
- Ⓖ Accessory : Rod eye

How to order switch

• Switch main body + mounting bracket

HCA - R0 (E) - 20 (B)

Bore size (Previous page B)

Switch model No. (Previous page E)

• Switch only

SW - R0 (E)

Switch model No. (Previous page E)

• Mounting bracket

HCA - R - 20 (B)

Bracket

Bore size (Previous page B)

• Terminal box only

• For R * B

SW - RB

• For R * A

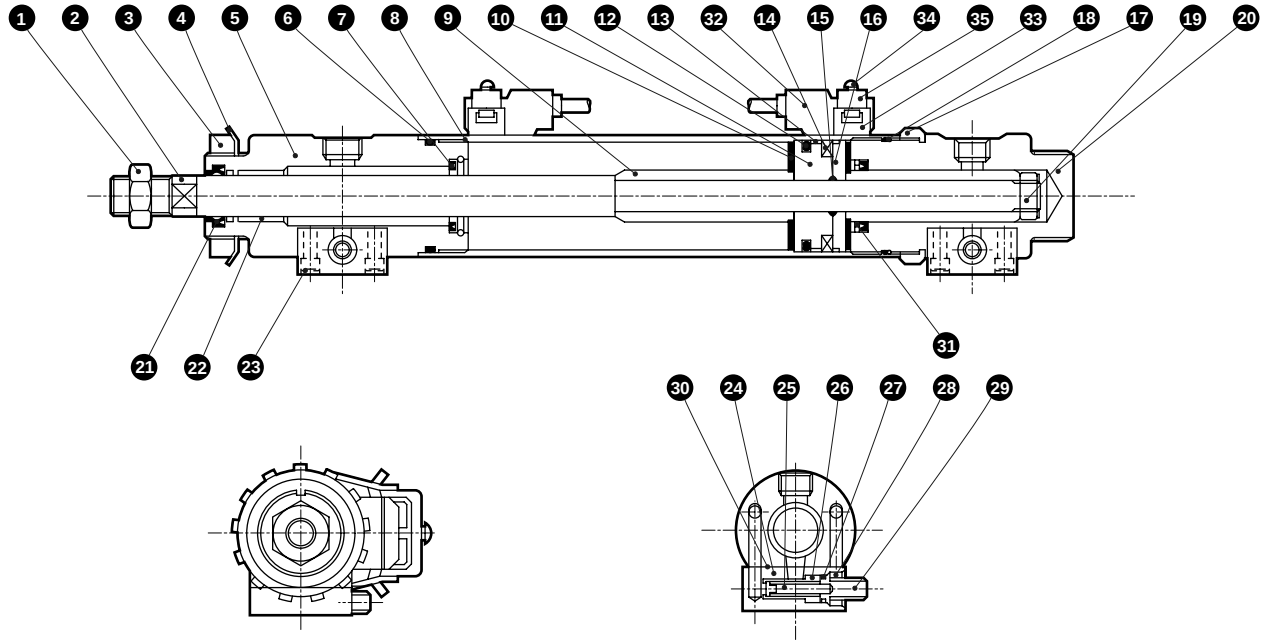
SW - RA

How to order mounting bracket

Bore size (mm) / Mounting bracket	20	25	32	40	50	63	80	100
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

Internal structure and parts list

• HCA



Note: Only for 20 mm bore, shape is a little bit different.

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Rod nut	Steel	Zinc chromate	19	Piston nut	Steel	Zinc chromate
2	Piston rod	Steel	Industrial chrome plated	20	Head cover	Aluminum alloy	Alumite
3	Nut	Steel	Black galvanizing	21	Rod packing seal	Nitrile rubber	
4	Toothed washer	Steel	Black galvanizing	22	Bush	Oil impregnated bearing alloy	
5	Rod cover	Aluminum alloy	Alumite	23	Hexagon socket head cap screw	Alloy steel	Blackening
6	Cylinder gasket	Nitrile rubber		24	Adjuster case	Aluminum alloy	Alumite
7	Cushion packing seal	Urethane rubber, steel		25	Check valve	Copper alloy	
8	Cylinder tube	Aluminum alloy	Hard alumite	26	Spring	Stainless steel	
9	Cushion ring	Steel	Industrial chrome plated	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	Nickeling
12	Piston packing seal	Nitrile rubber		30	Case gasket	Asbestos special fiber cloth	Special fiber + NBR
13	Wear ring	Acetar resin		31	Stopper ring	Steel	Zinc chromate
14	Magnet	Plastic		With switch			
15	Piston gasket	Nitrile rubber		32	Switch main body		
16	Piston holder	Aluminum alloy	Chromate	33	Band	Stainless steel	
17	Lock nut	Steel	Black chrome plated	34	Pan head machine screw	Steel	
18	Back up ring	Steel	Zinc chromate	35	Bracket	Stainless steel	

Repair parts list

Bore size (mm)	Kit number	Repair parts number
20 dia.	HCA-20K	
25 dia.	HCA-25K	
32 dia.	HCA-32K	
40 dia.	HCA-40K	6 7 10 12 13
50 dia.	HCA-50K	21 30
63 dia.	HCA-63K	
80 dia.	HCA-80K	
100 dia.	HCA-100K	

Note: When placing an order, indicate kit number.

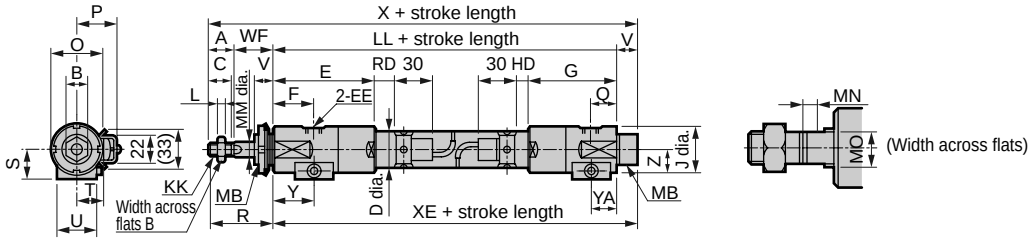
Mounting bracket material

Mounting style	Material	Remarks
LB	Steel	Black galvanizing
FA/FB	Steel	Black galvanizing

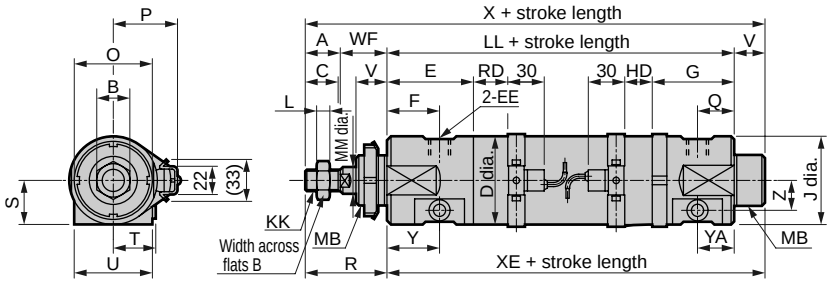
Dimensions

• HCA basic type (00) with R type switch

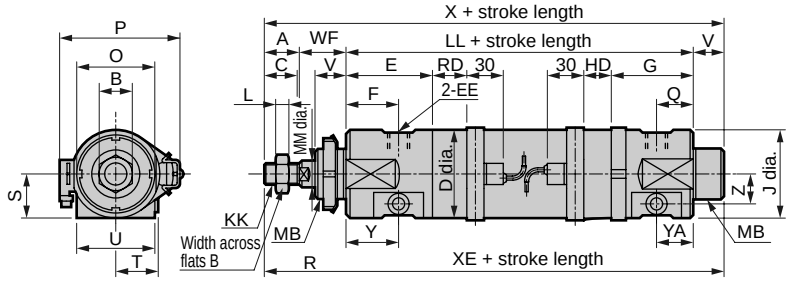
20, 25 mm bore



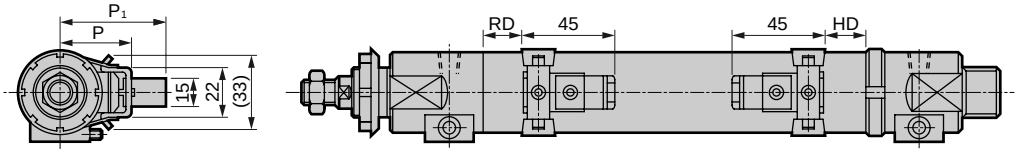
32 to 63 mm bore



80, 100 mm bore



• R type switch terminal box



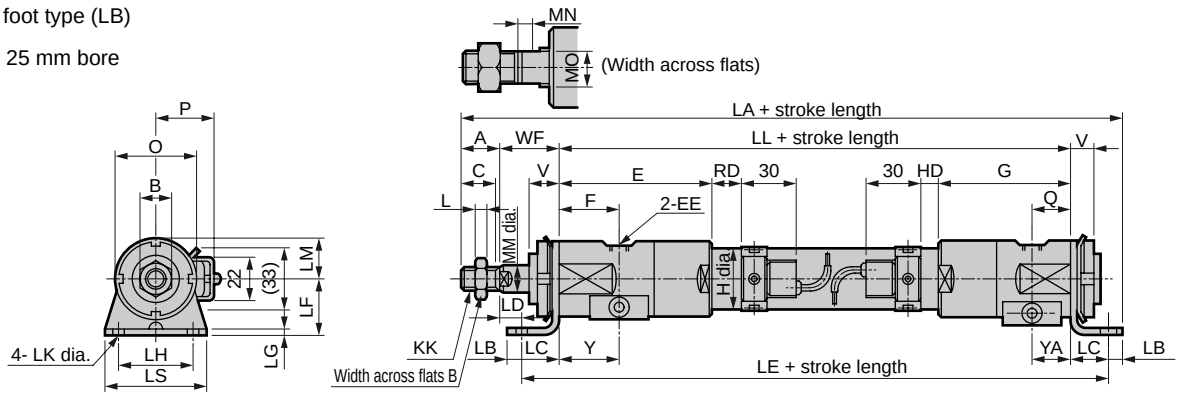
Symbol	Basic type (00) basic dimensions																	
Bore size (mm)	A	B	C	D	E	EE	F	G	J	KK	L	LL	MB	MM	MN	MO	O	Q
20 dia.	20	13	18	25	86	Rc1/8	34	74	33	M8 X 1	5	223	M25 X 1.5	10	4	8	42	22
25 dia.	20	17	18	30	82	Rc1/8	32.5	71	37	M10 X 1.25	6	213	M25 X 1.5	12	5	10	42	21.5
32 dia.	22	17	20	37	67	Rc1/4	42	57	37	M10 X 1.25	6	197	M25 X 1.5	12	5	10	42	25
40 dia.	22	22	20	46	73	Rc1/4	45.5	57	46	M14 X 1.5	8	203	M35 X 1.5	16	6	14	57	25
50 dia.	28	27	26	56.4	77	Rc3/8	47.5	60	56	M18 X 1.5	11	211	M40 X 1.5	20	7	17	62	24.5
63 dia.	28	27	26	69.4	69	Rc3/8	42	65	69.4	M18 X 1.5	11	214	M40 X 1.5	20	7	17	62	29
80 dia.	36	32	34	88	73	Rc1/2	45	70	88	M22 X 1.5	13	232	M60 X 2	25	10	22	86	31.5
100 dia.	45	41	43	108	72	Rc1/2	42	72	108	M26 X 1.5	16	235	M60 X 2	30	11	27	86	30

Symbol												With switch			
Bore size (mm)	R	S	T	U	V	WF	X	XE	Y	YA	Z	HD	P	P_1	RD
20 dia.	44	21.5	17 to 20	29	16	24	283	239	34	22	15	15.5	28	48	17.5
25 dia.	52	23.5	18.5 to 22	32	16	32	281	229	32.5	21.5	17	13	34	54	14.5
32 dia.	52	23.5	18.5 to 22	32	20	30	269	217	42	25	17	22	35	55	21
40 dia.	54	28.5	22 to 27	38	20	32	277	223	45.5	25	21	22	39	59	21
50 dia.	61	35.5	27 to 34.5	48	20	33	292	231	47.5	24.5	25.5	19	44	64	25
63 dia.	66	35.7	34 to 43	62	25	38	305	239	42	29	25.7	21	52	72	28
80 dia.	78	46.5	41 to 51	76	25	42	335	257	45	31.5	34.5	24.5	114	134	33.5
100 dia.	93	55.5	48 to 60	90	30	48	358	265	42	30	43.5	25	134	154	35

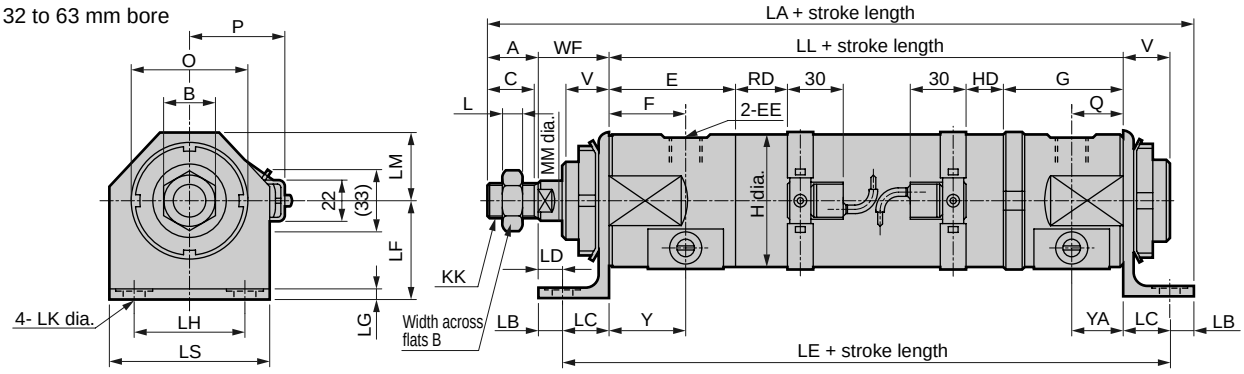
Dimensions

• Axial foot type (LB)

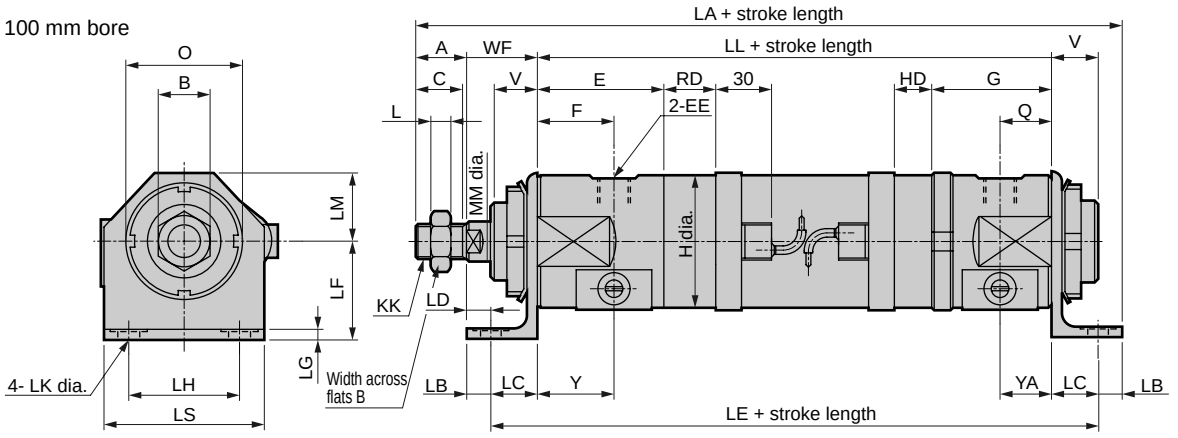
20, 25 mm bore



32 to 63 mm bore



80, 100 mm bore



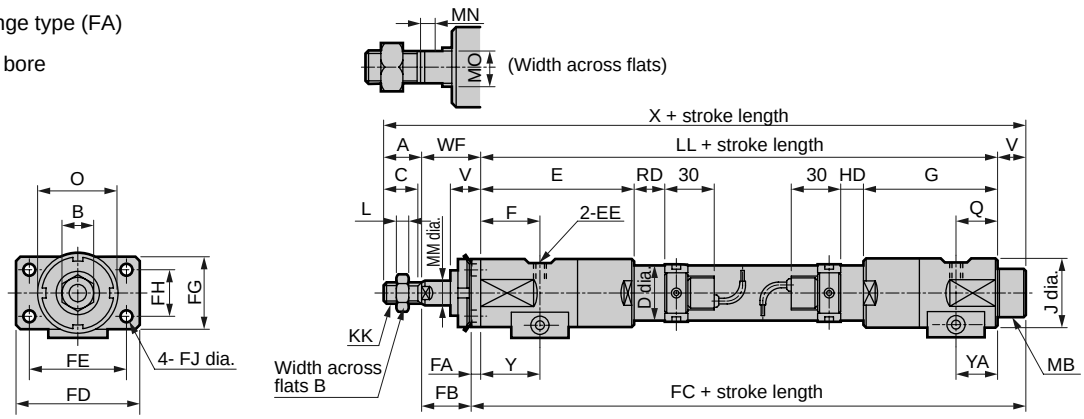
Symbol	Axial foot type (LB) basic dimensions																	
Bore size (mm)	A	B	C	D	E	EE	F	G	KK	L	LL	MM	MN	MO	O	Q	V	WF
20 dia.	20	13	18	25	86	Rc1/8	34	74	M8 X 1	5	223	10	4	8	42	22	16	24
25 dia.	20	17	18	30	82	Rc1/8	32.5	71	M10 X 1.25	6	213	12	5	10	42	21.5	16	32
32 dia.	22	17	20	37	67	Rc1/4	42	57	M10 X 1.25	6	197	12	5	10	42	25	20	30
40 dia.	22	22	20	46	73	Rc1/4	45.5	57	M14 X 1.5	8	203	16	6	14	57	25	20	32
50 dia.	28	27	26	56.4	77	Rc3/8	47.5	60	M18 X 1.5	11	211	20	7	17	62	24.5	20	33
63 dia.	28	27	26	69.4	69	Rc3/8	42	65	M18 X 1.5	11	214	20	7	17	62	29	25	38
80 dia.	36	32	34	88	73	Rc1/2	45	70	M22 X 1.5	13	232	25	10	22	86	31.5	25	42
100 dia.	45	41	43	108	72	Rc1/2	42	72	M26 X 1.5	16	235	30	11	27	86	30	30	48

Symbol			Installation method											With switch			
Bore size (mm)	Y	YA	LA	LB	LC	LD	LE	LF	LG	LH	LK	LM	LS	HD	P	RD	
20 dia.	34	22	295	8	20	4	263	30	3.2	40	6.6	19	54	15.5	28	17.5	
25 dia.	32.5	21.5	293	8	20	12	253	30	3.2	40	6.6	19	54	13	34	14.5	
32 dia.	42	25	277	8	20	10	237	30	3.2	40	6.6	19	54	22	35	21	
40 dia.	45.5	25	289	10	22	10	247	40	3.2	40	9	24	58	22	39	21	
50 dia.	47.5	24.5	307	10	25	8	261	45	4.5	45	9	29	63	19	44	25	
63 dia.	42	29	318	13	25	13	264	53	5.5	60	11	36.5	86	21	52	28	
80 dia.	45	31.5	355	15	30	12	292	63	8	71	14	45	102	24.5	114	33.5	
100 dia.	42	30	373	15	30	18	295	75	8	85	14	54	118	25	134	35	

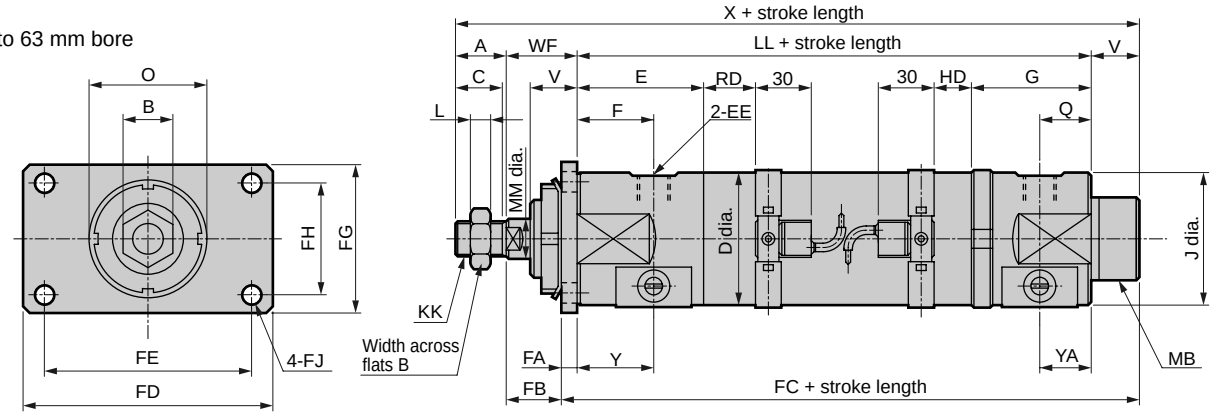
Dimensions

• Rod side flange type (FA)

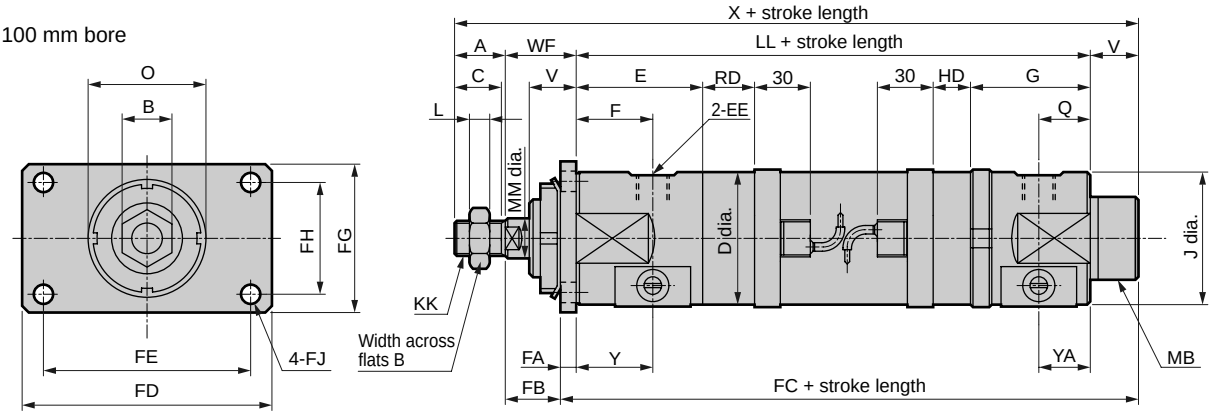
20, 25 mm bore



32 to 63 mm bore



80, 100 mm bore



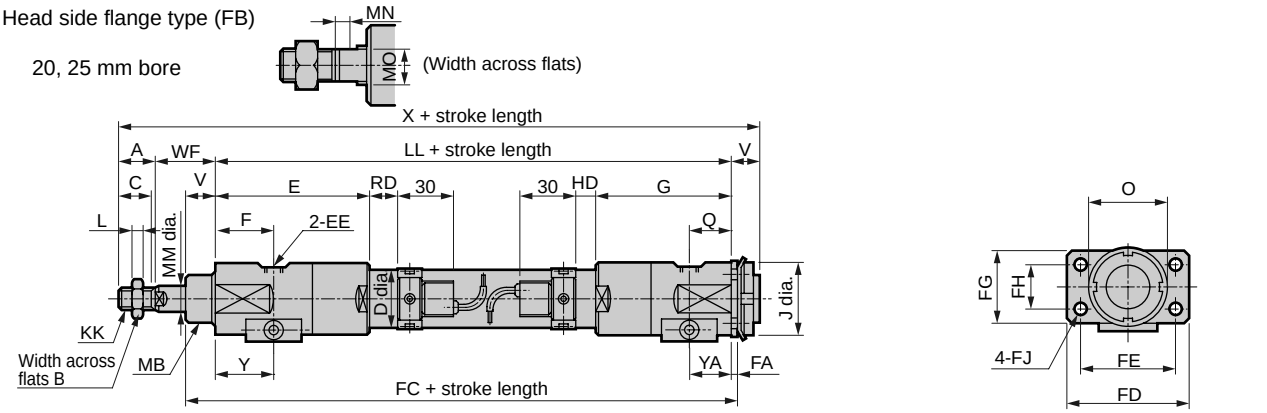
Symbol	Rod side flange type (FA) basic dimensions																	
Bore size (mm)	A	B	C	D	E	EE	F	G	J	KK	L	LL	MB	MM	MN	MO	O	Q
20 dia.	20	13	18	25	86	Rc1/8	34	74	33	M8 X 1	5	223	M25 X 1.5	10	4	8	42	22
25 dia.	20	17	18	30	82	Rc1/8	32.5	71	37	M10 X 1.25	6	213	M25 X 1.5	12	5	10	42	21.5
32 dia.	22	17	20	37	67	Rc1/4	42	57	37	M10 X 1.25	6	197	M25 X 1.5	12	5	10	42	25
40 dia.	22	22	20	46	73	Rc1/4	45.5	57	46	M14 X 1.5	8	203	M35 X 1.5	16	6	14	57	25
50 dia.	28	27	26	56.4	77	Rc3/8	47.5	60	56	M18 X 1.5	11	211	M40 X 1.5	20	7	17	62	24.9
63 dia.	28	27	26	69.4	69	Rc3/8	42	65	69.4	M18 X 1.5	11	214	M40 X 1.5	20	7	17	62	29
80 dia.	36	32	34	88	73	Rc1/2	45	70	88	M22 X 1.5	13	232	M60 X 2	25	10	22	86	31.5
100 dia.	45	41	43	108	72	Rc1/2	42	72	108	M26 X 1.5	16	235	M60 X 2	30	11	27	86	30

Symbol						Installation dimensions								With switch	
Bore size (mm)	V	WF	X	Y	YA	FA	FB	FC	FD	FE	FG	FH	FJ	HD	RD
20 dia.	16	24	283	34	22	4.5	19.5	243.5	66	52	38	24	6.6	15.5	17.5
25 dia.	16	32	281	32.5	21.5	4.5	27.5	233.5	66	52	38	24	6.6	13	14.5
32 dia.	20	30	269	42	25	4.5	25.5	221.5	66	52	38	24	6.6	22	21
40 dia.	20	32	277	45.5	25	9	23	232	100	80	58	40	9	22	21
50 dia.	20	33	292	47.5	24.5	9	24	240	108	90	65	45	9	19	25
63 dia.	25	38	305	42	29	9	29	248	134	112	80	60	11	21	28
80 dia.	25	42	335	45	31.5	14	28	271	160	132	100	71	14	24.5	33.5
100 dia.	30	48	358	42	30	14	34	279	178	150	114	85	14	25	35

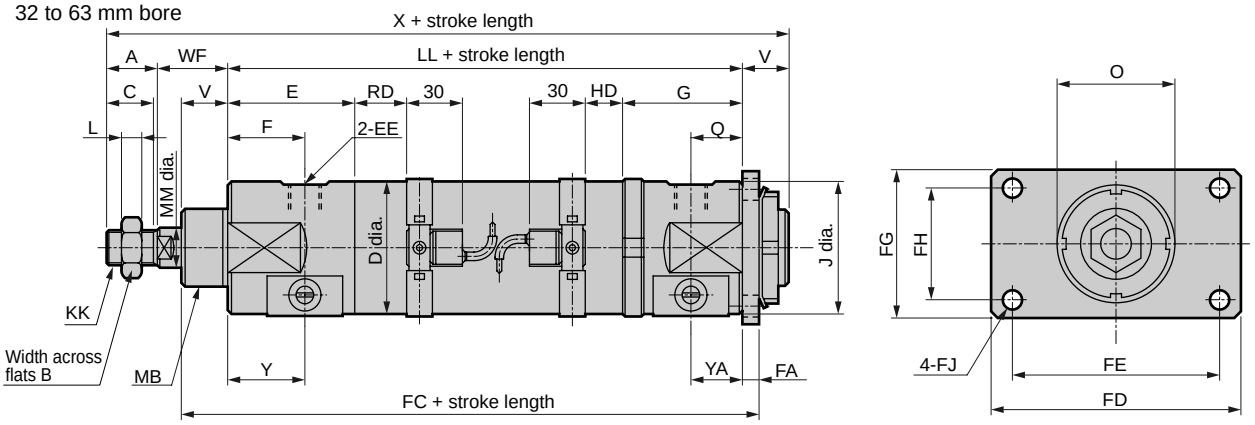
Dimensions

• Head side flange type (FB)

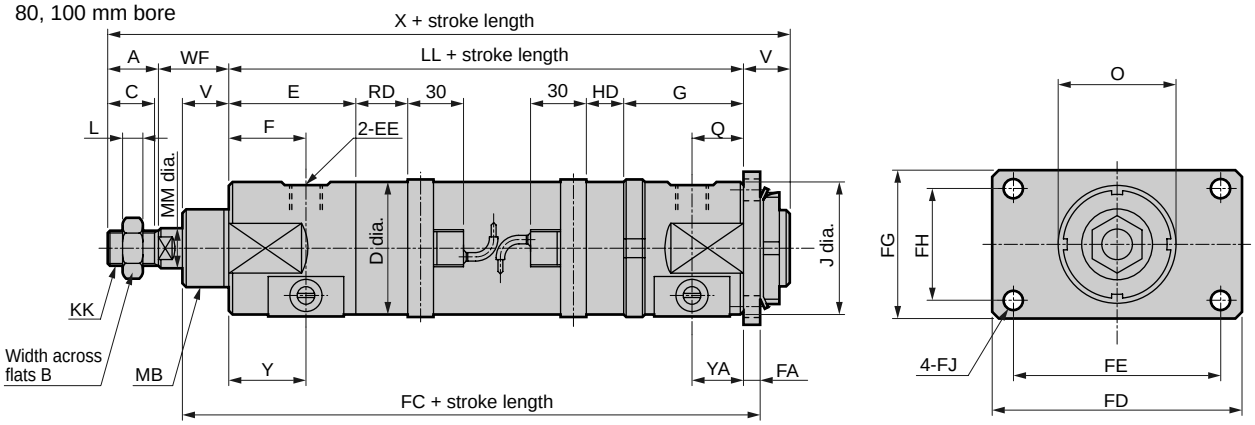
20, 25 mm bore



32 to 63 mm bore



80, 100 mm bore



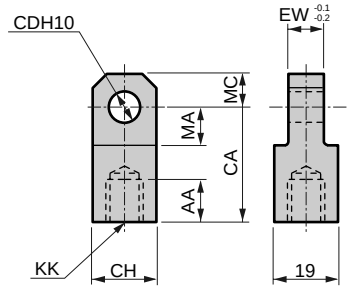
Symbol	Head side flange type (FB) basic dimensions																
Bore size (mm)	A	B	C	D	E	EE	F	G	J	KK	L	LL	MB	MM	MN	MO	O	Q
20 dia.	20	13	18	25	86	Rc1/8	34	74	33	M8 X 1	5	223	M25 X 1.5	10	4	8	42	22
25 dia.	20	17	18	30	82	Rc1/8	32.5	71	37	M10 X 1.25	6	213	M25 X 1.5	12	5	10	42	21.5
32 dia.	22	17	20	37	67	Rc1/4	42	57	37	M10 X 1.25	6	197	M25 X 1.5	12	5	10	42	25
40 dia.	22	22	20	46	73	Rc1/4	45.5	57	46	M14 X 1.5	8	203	M35 X 1.5	16	6	14	57	25
50 dia.	28	27	26	56.4	77	Rc3/8	47.5	60	56	M18 X 1.5	11	211	M40 X 1.5	20	7	17	62	24.5
63 dia.	28	27	26	69.4	69	Rc3/8	42	65	69.4	M18 X 1.5	11	214	M40 X 1.5	20	7	17	62	29
80 dia.	36	32	34	88	73	Rc1/2	45	70	88	M22 X 1.5	13	232	M60 X 2	25	10	22	86	31.5
100 dia.	45	41	43	108	72	Rc1/2	42	72	108	M26 X 1.5	16	235	M60 X 2	30	11	27	86	30

Symbol						Installation dimensions							With switch	
Bore size (mm)	V	WF	X	Y	YA	FA	FD	FE	FG	FH	FJ	FI	HD	RD
20 dia.	16	24	283	34	22	4.5	66	52	38	24	6.6	251.5	15.5	17.5
25 dia.	16	32	281	32.5	21.5	4.5	66	52	38	24	6.6	233.5	13	14.5
32 dia.	20	30	269	42	25	4.5	66	52	38	24	6.6	231.5	22	21
40 dia.	20	32	277	45.5	25	9	100	80	58	40	9	244	22	21
50 dia.	20	33	292	47.5	24.5	9	108	90	65	45	9	253	19	25
63 dia.	25	38	305	42	29	9	134	112	80	60	11	248	21	28
80 dia.	25	42	335	45	31.5	14	160	132	100	71	14	271	24.5	33.5
100 dia.	30	48	358	42	30	14	178	150	114	85	14	279	25	35

Accessory dimensions

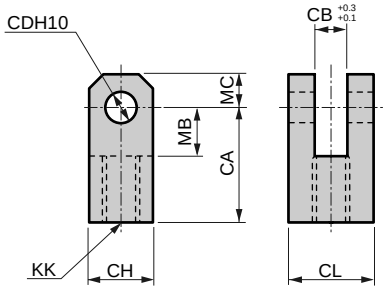
• Knuckle dimensions (20, 25, 32 mm bore)

Rod eye (I) Material: Steel



Model No.	Applicable bore size (mm)	AA	CA	CD	CH	EW	KK	MA	MC
M1-I-20	20	14	30	$10^{+0.058}_{0}$	19	8	M8 X 1	13	10
M1-I-30	25, 32	16	36	$12^{+0.070}_{0}$	25	10	M10 X 1.25	16	12

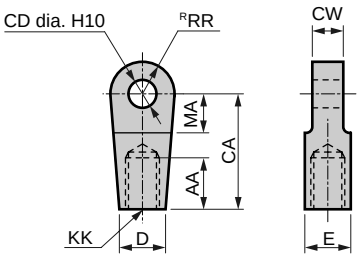
Rod clevis (Y) Material: Steel



Model No.	Applicable bore size (mm)	CA	CB	CD	CH	CL	KK	MB	MC
M1-Y-20	20	30	8	$10^{+0.058}_{0}$	19	19	M8 X 1	13	10
M1-Y-30	25, 32	36	10	$12^{+0.070}_{0}$	25	25	M10 X 1.25	16	12

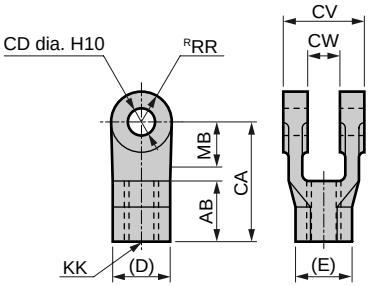
• Knuckle dimensions (40, 50, 63, 80, 100 mm bore)

Rod eye (I) Material: Cast iron



Model No.	Applicable bore size (mm)	AA	CA	CD	CW	D	E	KK	MA	RR
S1-I-40	40	20	50	$12^{+0.070}_{0}$	$18^{-0.1}_{-0.4}$	27	27	M14 X 1.5	21	16
S1-I-50	50	21	50	$12^{+0.070}_{0}$	$18^{-0.1}_{-0.4}$	27	27	M18 X 1.5	21	16
S1-I-63	63	21	50	$14^{+0.070}_{0}$	$20^{-0.1}_{-0.4}$	27	27	M18 X 1.5	21	16
S1-I-80	80	30	70	$20^{+0.084}_{0}$	$28^{-0.1}_{-0.4}$	46	41	M22 X 1.5	30	25
S1-I-100	100	30	70	$20^{+0.084}_{0}$	$22^{-0.1}_{-0.4}$	46	41	M26 X 1.5	30	25

Rod clevis (Y) Material: Cast iron

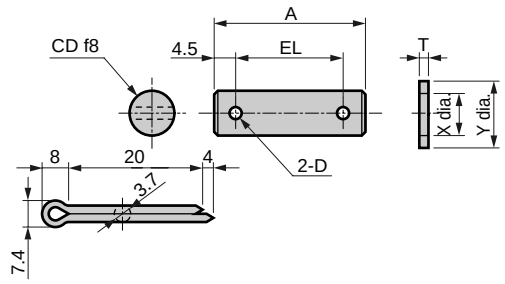


Model No.	Applicable bore size (mm)	AB	CA	CD	CV	CW	D	E	KK	MB	RR
S1-Y-40	40	24	50	$12^{+0.070}_{0}$	36	$18^{+0.4}_{+0.1}$	27	31.2	M14 X 1.5	19	16
S1-Y-50	50	24	50	$12^{+0.070}_{0}$	36	$18^{+0.4}_{+0.1}$	27	31.2	M18 X 1.5	19	16
S1-Y-63	63	24	50	$14^{+0.070}_{0}$	40	$20^{+0.4}_{+0.1}$	27	31.2	M18 X 1.5	19	16
S1-Y-80	80	35	70	$20^{+0.084}_{0}$	56	$28^{+0.4}_{+0.1}$	41	47.3	M22 X 1.5	25	25
S1-Y-100	100	35	70	$20^{+0.084}_{0}$	56	$28^{+0.4}_{+0.1}$	41	47.3	M26 X 1.5	25	25

Note: MB dimension indicates effective length of CW dimension.

• Pin dimensions

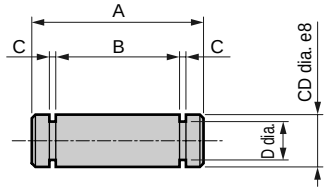
Pin (P) (20, 30 mm bore) Material: Steel



Model No.	Applicable bore size (mm)	A	D	CD	EL	T	X	Y
M1-P-20	20	37	4	$10^{-0.013}_{-0.035}$	28	2	10.5	18
M1-P-30	25, 32	46	4	$12^{-0.016}_{-0.043}$	37	2.5	13	21

Note: For rod clevis type, a pin and a washer and a split pin are attached to the product.

Pin (P) (40, 50, 63, 80, 100 mm bore) Material: Steel

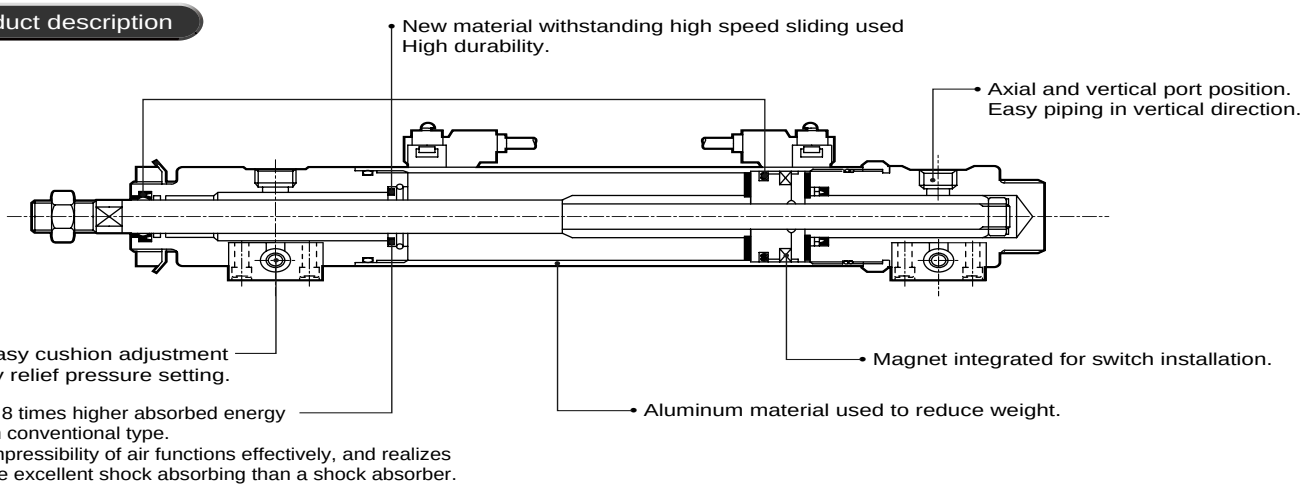


Model No.	Applicable bore size (mm)	A	B	C	D	CD	Applicable snap rings
S1-P-40	40	43.5	36.3	1.15	11.5	$12^{-0.032}_{-0.059}$	Shaft C 12
S1-P-50	50	43.5	36.3	1.15	11.5	$12^{-0.032}_{-0.059}$	Shaft C 12
S1-P-63	63	47.5	40.2	1.15	13.4	$14^{-0.032}_{-0.059}$	Shaft C 14
S1-P-80	80, 100	64	56.2	1.35	19	$20^{-0.040}_{-0.073}$	Shaft C 20

Note: For rod clevis type, a pin and a snap ring are attached to product.

• When placing an order, designate model No.

Product description



Selection guide

When using a high speed cylinder, the cylinder speed and the kinetic energy should be considered.

Step 1 High speed cylinder selection guide

For pneumatics cylinder, average speed is different from max. speed rush into cushion because of compressibility fluid.
When operating load W with average speed V1, find the required composite effective sectional area S and the max. speed V according to the following table.
This table is just reference. Some values may vary depending on load direction and pipe length etc.

Average speed and max. speed for load factor of high speed cylinder (when air pressure = 0.5MPa)

Tube bore size (mm) / Load factor		V1=500mm/s			V1=1,000mm/s			V1=2,000mm/s		
		10%	20%	30%	10%	20%	30%	10%	20%	30%
20 dia. (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
25 dia. (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
32 dia. (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
40 dia. (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
50 dia. (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
63 dia. (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
80 dia. (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
100 dia. (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 mass (kg) S: Composite effective sectional area (mm^2) V: Max. speed (mm/s) V1: Average speed (mm/s) A2: Piston rod side cross-section areas (cm^2)

For example, when using HCA- 40 with load 6.28kgf (load factor 10%, 0.5MPa) and average speed V1 =2,000mm/s, the max. speed is 2,521mm/s (1.26 time larger). In this case, required composite effective sectional area is 14.3mm^2.

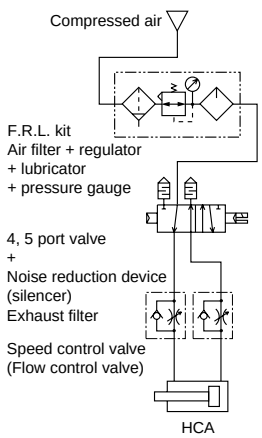
Select system components matched to composite effective sectional area from the table on the following page.

System selection guide table

Appropriate system matched to the required cylinder speed according to bore size can be selected.

Bore size	Port size	Required effective sectional area (mm^2)	4.5 port valve for pneumatics control		Pneumatic auxiliary components		Pipe
			Single solenoid	Double solenoid	Flow control valve	Silencer	Pipe (/m) (Between valve and cylinder)
20 dia.	Rc1/8	1.3	4KA110-M5/4KB110-06 4GA110-M5/4GB110-06	4KA120-M5/4KB120-06 4GA120-M5/4GB120-06	SC3W-6/SC3R-6	SLW-6A	4 dia. X 2.5NT dia.
		2.0	4KA110-M5/4KB110-06 4GA110-M5/4GB110-06	4KA120-M5/4KB120-06 4GA120-M5/4GB120-06	SC3R-6	SLW-6A	6 dia. X 4NT dia.
		2.8	4KA210-06/4KB210-06 4GA210-06/4GB210-08	4KA220-06/4KB220-06 4GA220-06/4GB220-08	SC3R-6	SLW-6A	8 dia. X 5.7NT dia.
		3.6	4KA210-06/4KB210-06 4GA210-06/4GB210-08	4KA220-06/4KB220-06 4GA220-06/4GB220-08	SC1-6	SLW-6A	6 dia. X 4NT dia.
		4.3	4KA210-06/4KB210-06 4GA210-06/4GB210-08	4KA220-06/4KB220-06 4GA220-06/4GB220-08	SC1-6	SLW-6A	8 dia. X 5.7NT dia.
25 dia.	Rc1/8	1.4	4KA110-M5/4KB110-06 4GA110-M5/4GB110-06	4KA120-M5/4KB120-06 4GA120-M5/4GB120-06	SC3W-6	SLW-6A	4 dia. X 2.5NT dia.
		2.4	4KA110-M5/4KB110-06 4GA110-M5/4GB110-06	4KA120-M5/4KB120-06 4GA120-M5/4GB120-06	SC3W-6	SLW-6A	6 dia. X 4NT dia.
		4.4	4KA210-06/4KB210-06 4GA210-06/4GB210-08	4KA220-06/4KB220-06 4GA220-06/4GB220-08	SC1-6	SLW-6A	6 dia. X 4NT dia.
		5.8	4KA210-06/4KB210-06 4GA210-06/4GB210-08	4KA220-06/4KB220-06 4GA220-06/4GB220-08	SC1-6	SLW-6A	8 dia. X 5.7NT dia.
		6.6	4KA210-06/4KB210-06 4GA210-06/4GB210-08	4KA220-06/4KB220-06 4GA220-06/4GB220-08	SC1-8	SLW-6A	10 dia. X 7.2NT dia.
32 dia.	Rc1/4	3.6	4KB210-08/4GB210-08	4KB220-08/4GB220-08	SC3W-8/SC3R-8	SLW-8A	6 dia. X 4NT dia.
		5.9	4KB210-08/4GB210-08	4KB220-08/4GB220-08	SC1-8	SLW-8A	8 dia. X 5.7NT dia.
		8.4	4F210-08/4KB310-08 4GB310-08	4F220-08/4KB320-08 4GB320-08	SC1-8	SLW-8A	10 dia. X 7.2NT dia.
		9.5	4KB310-08/4F310-08 4GB310-08	4KB320-08/4F320-08 4GB320-08	SC1-8	SLW-8A	10 dia. X 7.2NT dia.
		11.6	4F310-08/4F410-08 4GB310-08	4F320-08/4F420-08 4GB320-08	SC3W-10/SC3R-10	SLW-8A	12 dia. X 8.9NT dia.
40 dia.	Rc1/4	3.6	4KB210-08/4GB310-08	4KB220-08/4GB320-08	SC3W-8/SC3R-8	SLW-8A	6 dia. X 4NT dia.
		8.5	4F210-08/4KB310-08 4GB310-08	4F220-08/4KB320-08 4GB320-08	SC1-8	SLW-8A	10 dia. X 7.2NT dia.
		12.0	4F310-08/4F410-08 4GB310-08	4F320-08/4F420-08 4GB320-08	SC3W-10/SC3R-10	SLW-8A	12 dia. X 8.9NT dia.
		15.2	4F410-08	4F420-08	SC-1-10	SLW-8A	12 dia. X 8.9NT dia.
		18.4	4F510-10	4F520-10	SC-1-10	SLW-10A	15 dia. X 11.5NT dia.
50 dia.	Rc3/8	5.5	4KB310-10/4F310-10	4KB320-10/4F320-10	SC3W-10/SC3R-10	SLW-10A	6 dia. X 4NT dia.
		12.0	4K310-10/4F310-10	4K320-10/4F320-10	SC3W-10/SC3R-10	SLW-10A	12 dia. X 8.9NT dia.
		18.1	4F510-10	4F520-10	SC1-10	SLW-10A	12 dia. X 8.9NT dia.
		23.5	4F510-10	4F520-10	SC1-15	SLW-10A	15 dia. X 11.5NT dia.
		26.9	4F610-15	4F620-15	SC1-15	SLW-15A	15 dia. X 11.5NT dia.
63 dia.	Rc3/8	11.0	4K310-10/4F310-10	4K320-10/4F320-10	SC3W-10/SC3R-10	SLW-10A	10 dia. X 7.2NT dia.
		18.0	4K410-10/4F510-10	4K420-10/4F520-10	SC1-10	SL-10A	10 dia. X 7.2NT dia.
		26.9	4F610-15	4F620-15	SC1-15	SLW-15A	10 dia. X 8.9NT dia.
		43.1	4F610-15	4F620-15	SC-20A	SLW-15A	15 dia. X 11.5NT dia.
		62.8	4F610-20	4F620-20	SC-20A	SL-20A	Rc1/2 steel pipe
80 dia.	Rc1/2	19.5	4F610-15	4F620-15	SC3W-15/SC3R-15	SLW-15A	12 dia. X 8.9NT dia.
		31.3	4F610-15	4F620-15	SC1-15	SLW-15A	15 dia. X 11.5NT dia.
		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
100 dia.	Rc1/2	31.8	4F610-15	4F620-15	SC1-15	SLW-15A	15 dia. X 11.5NT dia.
		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

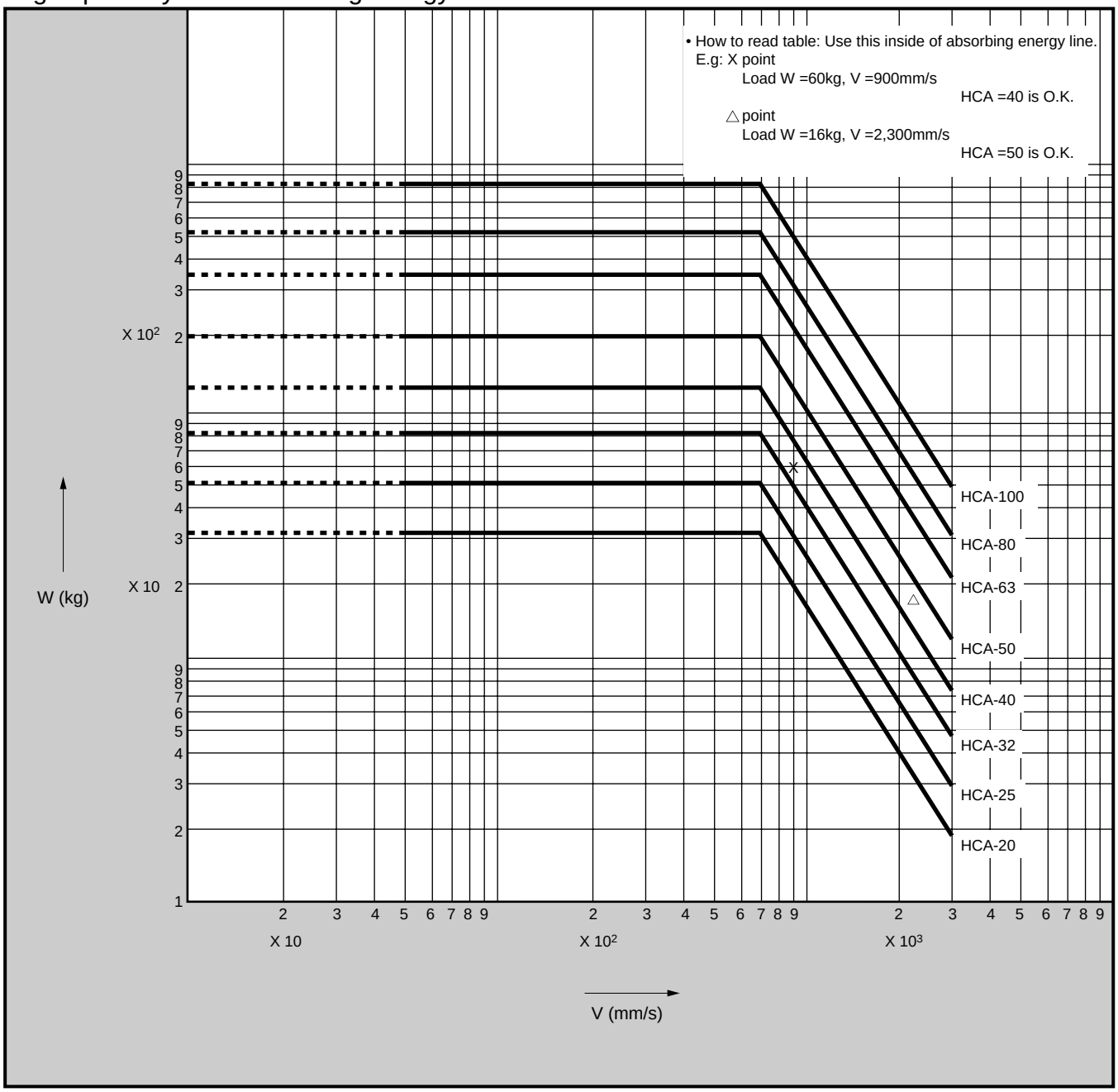
• Pneumatics basic circuit diagram



Step 2 High speed cylinder selection guide

Determine the model according to relations between load W and highest speed V on the following table.

High speed cylinder absorbing energy list



Note: This is a log-log graph.

For example, when load W = 16kg, and max. speed 2,300mm/s, △shows that HCA-40 does not meet the conditions, but HCA-50 meets the conditions.

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