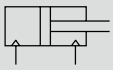


High speed cylinder/double acting/single rod

HCA Series

● Bore size: ø20/ø25/ø32/ø40/ø50/ø63/ø80/ø100

JIS symbol 

RoHS CAD

Specifications

Item			HCA (Standard/with switch)							
Bore size		mm	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100
Actuation			Double acting							
Working fluid			Compressed air							
Max. working pressure		MPa	1.0 (≈150 psi, 10 bar)							
Min. working pressure		MPa	0.1 (≈15 psi, 1 bar)							
Proof pressure		MPa	1.6 (≈230 psi, 16 bar)							
Ambient temperature		°C	-10 (14°F) to 60 (140°F) (no freezing)							
Port size			Rc1/8		Rc1/4		Rc3/8		Rc1/2	
Stroke tolerance		mm	$^{+2.4}_{0}$	$^{+3.6}_{0}$	$^{+4.3}_{0}$				$^{+5.0}_{0}$	
Working piston speed		mm/s	50 to 3000							
Cushion			Air cushion							
Lubrication			Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)							
Allowable absorbed energy J	Cushioned		7.54	11.8	18.6	29.4	46.1	73.5	118	184
	Without cushion		Cannot absorb high energy generated by external load. We recommend using an external shock absorber.							
Effective air cushion length		mm	85	75	70	70	70	70	70	70

*1 : Refer to page 990 for absorbed energy.

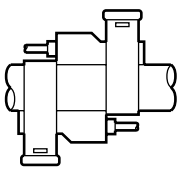
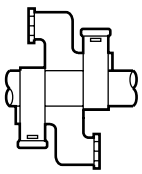
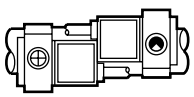
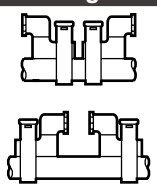
Stroke length

Bore size (mm)	Stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
ø20/ø25/ø32	400 to 700	700	1
ø40/ø50/ø63/ø80/ø100	400 to 1000	1000	

*1 : The custom stroke length is available in 1 mm increments.
*2 : Stroke length exceeding the max. stroke length is available depending on the working conditions. Contact CKD.
*3 : For types with switch, minimum stroke length varies depending on the mounting method. Refer to the table below for details.
*4 : The stroke is available from 1 mm. However, this product's cushion area is longer than a typical cylinder, allowing high absorbed energy. Therefore, at the stroke length below or less, the cushion is usually applied, and the effects of high-speed use cannot be obtained.

Model No.	Stroke at which high-speed effects cannot be obtained	Recommended stroke length
HCA	200 mm stroke length or less	400 mm stroke length or more

Min. stroke length with switch

	Different surface mounting		Same surface mounting	
Sketch				 (A) (B)
Item	Grommet	Terminal box	Grommet	Terminal box
ø20 to ø100	15(10) mm	15(10) mm	30 mm	32 mm (Mounting A) 80 mm (Mounting B)

● *1 : The value in ( ) is for types with one switch.

Switch specifications

Item		Proximity switch				
		R1	R2	R2Y (2-color display)	R3	R3Y (2-color display)
Applications		Programmable controller, relay, compact solenoid valve	Dedicated for programmable controller		For programmable controller, relay, IC circuit, solenoid valve	
Output method		———			NPN output	
Power supply voltage		———	———		4.5 VDC to 28 VDC	
Load voltage		85 VAC to 265 VAC	10 to 30 VDC		30 VDC or less	
Load current		5 to 100 mA	5 to 30 mA		200 mA or less	100 mA or less
Indicator lamp		LED (Lit when ON)		Red/green LED (Lit when ON)	LED (Lit when ON)	Red/green LED (Lit when ON)
Leakage current		1 mA or less with 100 VAC, 2 mA or less with 200 VAC	1 mA or less	1.2 mA or less	10 μA or less	
Weight g	Grommet lead	1 m:42 3 m:100 5 m:158			1 m:56 3 m:114 5 m:172	
	With terminal box	68		82	68	82

Item		Reed switch								
		R0			R4		R5			R6
Applications		For relay, programmable controller			For high capacity relay, solenoid valve		For programmable controller, relay, IC circuit (without indicator lamp), serial connection			Dedicated for programmable controller (with DC self-hold)
Load voltage		12/24 VDC	110 VAC	220 VAC	110 VAC	220 VAC	12/24 VDC	110 VAC	220 VAC	24 VDC
Load current		5 to 50 mA	7 to 20 mA	7 to 10 mA	20 to 200 mA	10 to 200 mA	50 mA or less	20 mA or less	10 mA or less	5 to 50 mA
Indicator lamp		LED lit when ON			Lit when the indicator lamp is OFF		None			LED lit when ON
Leakage current		0 mA			1 mA or less		0 mA			0.1 mA or less
Weight g	Grommet lead	1 m:42 3 m:100 5 m:158								
	With terminal box	68								

*1: Refer to Ending Page 1 for detailed switch specifications and dimensions.

Cylinder weight

(Unit: kg)

Bore size (mm)	Product weight when stroke length S = 0 mm			Weight per switch	Mounting bracket weight per switch	Additional weight per S = 100 mm
	Basic (00)	Foot (LB)	Flange (FA/FB)			
ø20	0.73	0.91	0.80	Refer to the weight in the switch specifications.	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 for 0 mm stroke length.....1.37 kg
- Additional weight for 500 mm stroke length.....0.27 x $\frac{500}{100}$ = 1.35 kg
- Weight of 2 switches..... 2 x 0.042 kg + 2 x 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	Working 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	49.1	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

How to order

Without switch (built-in magnet for switch)

HCA - 00 - 20 ( ) B - 400 ——— I

With switch (built-in magnet for switch)

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

Ⓐ Mounting *1

Ⓑ Bore size

Ⓒ Port thread

Ⓓ Cushion

Ⓔ Stroke length

Ⓕ Switch model No.

Ⓖ Switch quantity

Ⓗ Accessory

Code	Description
Ⓐ Mounting	
00	Basic
LB	Axial foot
FA	Rod side flange
FB	Head side flange
Ⓑ Bore size (mm)	
20	ø20
25	ø25
32	ø32
40	ø40
50	ø50
63	ø63
80	ø80
100	ø100
Ⓒ Port thread	
Blank	Rc thread
N	NPT thread (made-to-order product)
G	G thread (made-to-order product)
Ⓓ Cushion	
B	Both sides cushioned
R	Rod side cushioned
H	Head side cushioned
N	Without cushion

Ⓔ Stroke length (mm)

Bore size	Stroke length	Custom stroke length
ø20 to ø32	**1 to 700**	**In 1 mm increments**
ø40 to ø100	**1 to 1000**	

Ⓕ Switch model No.

Grommet	Terminal box	Contact	Voltage AC	Voltage DC	Display	Lead wire
R1*	**R1B**	**Proximity**	●		1-color display	2-wire
R2*	**R2B**			●		
R2Y*	**R2YB**			●	2-color display	2-wire
R3Y*	**R3YB**			●		3-wire
R3*	**R3B**			●	1-color display	
R0*	**R0B**	**Reed**	●	●	1-color display	2-wire
R4*	**R4B**		●		1-color display	
R5*	**R5B**		●	●	Without indicator lamp	
R6*	**R6B**			●	1-color display	

*** Lead wire length**	
Blank	1 m (standard)
3	3 m (option)
5	5 m (option)
Ⓖ Switch quantity	
R	1 on rod side
H	1 on head side
D	2
T	3
Ⓗ Accessory	
I	Rod eye
Y	Rod clevis (pin and snap ring attached)

⚠ Precautions for model No. selection

*1: Mounting bracket, nut, and toothed washer are attached with product at shipment.

[Example of model No.]

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

Model: High speed cylinder Double acting/single rod

Ⓐ Mounting : Basic
Ⓑ Bore size : ø20 mm
Ⓒ Port thread : Rc thread
Ⓓ Cushion : Both sides cushioned
Ⓔ Stroke length : 400 mm
Ⓕ Switch model No. : Reed R0 switch, lead wire 1 m
Ⓖ Switch quantity : 1 on rod side
Ⓗ Accessory : Rod eye

How to order switch

● Switch body + mounting bracket set

HCA - R0 - 20

- R0: Switch model No. (Item Ⓕ on page 980)
- 20: Bore size (Item Ⓑ on page 980)

● Switch body only

SW - R0

- R0: Switch model No. (Item Ⓕ on page 980)

● Mounting bracket set

HCA - R - 20

- R: Mounting bracket
- 20: Bore size (Item Ⓑ on page 980)

● Terminal box only

·For R□B

SW - RB

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

*1 : The foot mounting bracket is provided as 2 pcs./set.