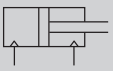


High energy absorption cylinder Double acting/single rod

HCM Series

● Bore size: ø20/ø25/ø32/ø40/ø50/ø63

JIS symbol



RoHS CAD

Specifications

Item		HCM					
Bore size	mm	ø20	ø25	ø32	ø40	ø50	ø63
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	1.0 (≈150 psi, 10 bar)					
Min. working pressure	MPa	0.15 (≈22 psi, 1.5 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	Rc1/8	Rc1/4	Rc1/4	Rc3/8	Rc3/8
Stroke tolerance	mm	$^{+2.0}_{0}$					
Working piston speed	mm/s	50 to 2000 (Operate within the allowable absorbed energy.)					
Cushion		With air cushion					
Lubrication		Not required (use turbine oil class 1 ISO VG32 if necessary for lubrication)					
Max absorbed energy J *1	With air cushion	3	5	9	14	23	30
Effective air cushion length	mm	56.5	56.5	56.5	55.5	58.5	58.5

*1 : If kinetic energy exceeds these values, consider using a separate shock absorber.
Refer to pages 970 to 973 for energy calculation and size selection.

Stroke

Bore size (mm)	Standard stroke (mm)	Max. stroke (mm)	Min. stroke (mm)
ø20	200 to 700	700	1
ø25			
ø32			
ø40	200 to 1000	1000	
ø50			
ø63			

*1 : The custom stroke is available in 1 mm increments.
*2 : Consult with CKD about strokes other than the above.
*3 : 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 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
HCM	150 mm stroke or less	300 mm stroke or more

Number of installed switches and min. stroke (mm)

Switch quantity	1		2		3		4		5	
Bore size (mm)	Proximity	Reed	Proximity	Reed	Proximity	Reed	Proximity	Reed	Proximity	Reed
ø20	10		25		40	50	55		75	85
ø25	10		25		40	50	55		75	85
ø32	10		25		40	50	55		75	85
ø40	10		25		40	50	55		75	85
ø50	10		25		40	50	55		75	85
ø63	10		25		40	50	55		75	85

Switch specifications

● 1-color/2-color LED/for AC magnetic field proof

Item	Proximity 2-wire	Proximity 2-wire			Proximity 3-wire				Reed 2-wire							Proximity 2-wire
	T1H/ T1V	T2H/T2V/ T2JH/ T2JV	T2YH/ T2YV	T2WH/ T2WV	T3H/ T3V	T3PH/ T3PV	T3YH/ T3YV	T3WH/ T3WV	T0H/T0V		T5H/T5V		T8H/T8V			T2YD(*4) T2YDT
Applications	For programmable controller, relay, compact solenoid valve	Dedicated for programmable controller			For programmable controller, relay				For programmable controller, relay		For programmable controller, relay, IC circuit (no indicator lamp), serial connection		For programmable controller, relay			For programmable controller
Output method	-				NPN output	PNP output	NPN output	NPN output	-							
Pwr. supp. V.	-				10 to 28 VDC				-							
Load voltage	85 to 265 VAC	10 to 30 VDC		24 VDC ±10%	30 VDC or less				12/24 VDC	100/110 VAC	5/12/24 VDC	100/110 VAC	12/24 VDC	110 VAC	220 VAC	24 VDC ±10%
Load current	5 to 100 mA	5 to 20 mA (*3)			100 mA or less		50 mA or less		5 to 50 mA	7 to 20 mA	≤50 mA	≤20 mA	5 to 50 mA	7 to 20 mA	7 to 10 mA	5 to 20 mA
Indicator lamp	LED (Lit when ON)	LED (Lit when ON)	Red/green LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)		Without LED		LED (Lit when ON)			Red/green LED (Lit when ON)
Leakage current	≤1 mA at 100 VAC, ≤2 mA at 200 VAC	1 mA or less			10 μA or less				0 mA							1 mA or less
Weight g	1 m:33	1 m:18	1 m:33	1 m:18	1 m:18		1 m:33	1 m:18	1 m:18				1 m:33			1 m:61
	3 m:87	3 m:49	3 m:87	3 m:49	3 m:49		3 m:87	3 m:49	3 m:49				3 m:87			3 m:166
	5 m:142	5 m:80	5 m:142	5 m:80	5 m:80		5 m:142	5 m:80	5 m:80				5 m:142			5 m:272

*1 : Refer to Ending Page 1 for detailed switch specifications and dimensions.
*2 : Switches other than the above models, such as switches with connectors, are also available. Refer to Ending Page 1.
*3 : The max. load current is 20 mA at 25°C. The current is lower than 20 mA if the operating ambient temperature around the switch is higher than 25°C. (5 to 10 mA at 60°C)
*4 : AC magnetic field proof switch (T2YD/T2YDT) cannot be used in DC magnetic fields.

Cylinder weight

(Unit: kg)

Bore size (mm)			ø20	ø25	ø32	ø40	ø50	ø63
Product weight for 0 mm stroke	Basic	00	0.33	0.47	0.62	0.98	1.58	2.27
	Axial foot	LB	0.44	0.6	0.78	1.2	2.06	2.99
	Flange	FA/FB	0.36	0.51	0.68	1.06	1.92	2.77
Switch weight (per 1 pc.)			Refer to the weight indicated in the switch specifications.					
Additional weight per stroke without switch rail 100 mm			0.012	0.016	0.017	0.027	0.040	0.044
Additional weight per stroke with switch rail 100 mm			0.014	0.018	0.019	0.029	0.042	0.046

[Example of calculation]
Product weight of HCM-LB-40B-500-T2H-D

Product weight for stroke 0 mm 1.2 kg
Additional weight for stroke 500 mm $0.029 \times \frac{500}{100} = 0.145$ kg
Weight of 2 switches 0.018x2 = 0.036 kg
Product weight 1.2 + 0.145 + 0.036 = 1.381 kg

Theoretical thrust table

(Unit: N)

Bore size (mm)	Operating direction	Working pressure MPa									
		0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
ø20	Push	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	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	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	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	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	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	1.88×10^2	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	1.58×10^2	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	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	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	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	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

How to order

Without switch (built-in magnet for switch)

HCM - LB - 40 [ ] B - 500 ——— I

With switch (built-in magnet for switch)

HCM - LB - 40 [ ] B - 500 - T2H* - D - Q I

Ⓐ Mounting *1
Ⓑ Bore size
Ⓒ Port thread
Ⓓ Cushion
Ⓔ Stroke
Ⓕ Switch model No. *2
Ⓖ Switch quantity
Ⓗ Option
Ⓘ Accessory *3

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

Ⓒ 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 (mm)

Bore size	Stroke	Custom stroke
ø20 to ø32	**1 to 700**	**In 1 mm increments**
ø40 to ø63	**1 to 1000**	

Ⓕ Switch model No.

Axial lead wire	Radial lead wire	Contact	Voltage AC	Voltage DC	Indicator	Lead wire
T0H*	**T0V***	Reed	●	●	1-color LED	2-wire
T5H*	**T5V***	Reed	●	●	Without LED	2-wire
T8H*	**T8V***	Reed	●	●	1-color LED	2-wire
T1H*	**T1V***	Proximity	●		1-color LED	2-wire
T2H*	**T2V***	Proximity		●	1-color LED	2-wire
T3H*	**T3V***	Proximity		●	1-color LED	3-wire
T3PH*	**T3PV***	Proximity		●	1-color LED	3-wire
T2WH*	**T2WV***	Proximity		●	2-color LED	2-wire
T2YH*	**T2YV***	Proximity		●	2-color LED	2-wire
T3WH*	**T3WV***	Proximity		●	2-color LED	3-wire
T3YH*	**T3YV***	Proximity		●	2-color LED	3-wire
T2YD*	**-**	Proximity		●	Strong magn field proof (For AC magnetic field)	2-wire
T2YDT*	**-**	Proximity		●	Strong magn field proof (For AC magnetic field)	2-wire
T2JH*	**T2JV***	Proximity		●	Off-delay	2-wire

*** 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
4	4
5	5

Ⓗ Option	
Q	Switch rail attached at shipment
M	Piston rod material (stainless steel)

Ⓘ Accessory	
I	Rod eye
Y	Rod clevis (pin and snap ring attached)

Precautions for model No. selection

*1 : Mounting bracket will be shipped with the product.
*2 : Switches other than ⒻSwitch model No. are also available.
(Made to order) Refer to Ending Page 1 for details.
*3 : "I" and "Y" cannot be selected together.

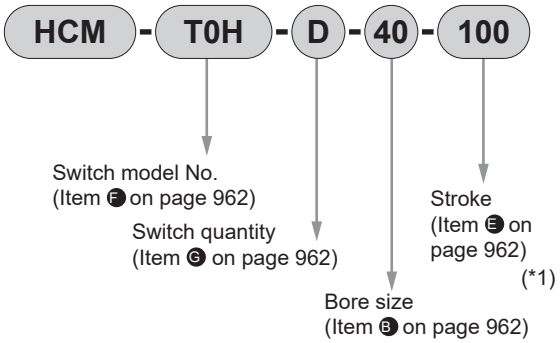
[Example of model No.]

HCM-LB-40B-500-T2H-D-QI

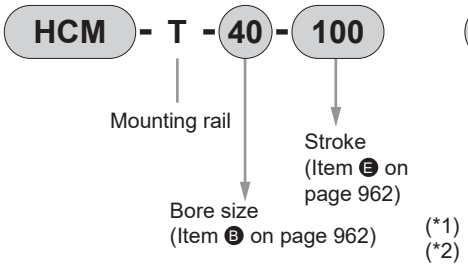
Model: High energy absorption cylinder double acting
Ⓐ Mounting : Axial foot
Ⓑ Bore size : ø40 mm
Ⓒ Port thread : Rc thread
Ⓓ Cushion : Both sides cushioned
Ⓔ Stroke : 500 mm
Ⓕ Switch model No. : Proximity T2H switch, lead wire 1 m
Ⓖ Switch quantity : 2
Ⓗ Option : Switch rail attached at shipment
Ⓘ Accessory : Rod eye

How to order switch

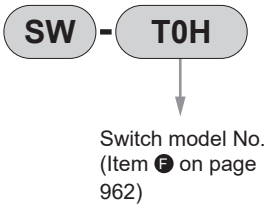
● Switch body + mounting rail set



● Mounting rail only



● Switch only



*1 : Indicate x if the stroke exceeds 300 mm. If exceeding 300 mm, a short rail (with 100 mm switch adjustment travel distance) will be included per switch.
*2 : If indicating X when ordering mounting rails only, order the same number of rails as that of applicable switches.

Mounting bracket model No.

Bore size / Mounting	Foot (LB)	Flange (FA/FB)
ø20	HCM-LB-20	HCM-FA-20
ø25	HCM-LB-25	HCM-FA-25
ø32	HCM-LB-32	HCM-FA-32
ø40	HCM-LB-40	HCM-FA-40
ø50	HCM-LB-50	HCM-FA-50
ø63	HCM-LB-63	HCM-FA-63

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