

Air gripper(parallel style——Roller bearing/Dustproof) **AirTAC**

HFKP Series



Specification

Bore size (mm)		10	16	20	25	32	40
Acting type		Double acting					
Fluid		Air(to be filtered by 40μm filter element)					
Operating pressure	Φ10	0.2~0.7MPa(28~100psi)(2.0~7.0bar)					
	Others	0.15~0.7MPa(22~100psi)(1.5~7.0bar)					
Temperature ℃		-20~70					
Lubrication		Not required					
Repeatability mm		±0.01				±0.02	
Max. frequency		180(c.p.m)				60(c.p.m)	
Sensor switches		DMSH(S)\CMSH	DMSG(S)\CMSG, DMSH(S)\CMSH				
Port size		M3×0.5	M5×0.8				

Note) Refer to P519 for detail of sensor switch.

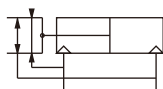
Gripping force and stroke

Bore size		10	16	20	25	32	40
Gripping force per finger Effective value(N)	External	9.8	30	42	65	158	254
	Internal	17	40	66	104	193	318
Opening/Closing stroke(Both sides)(mm)		4	6	10	14	22	30
Weight (g)							

[Note] The gripping force in the above table is in the working pressure of 0.5MPa, and with a gripping point of L=20mm.

Add) Please refer to page 451 for the definition of "L".

Symbol



Ordering code

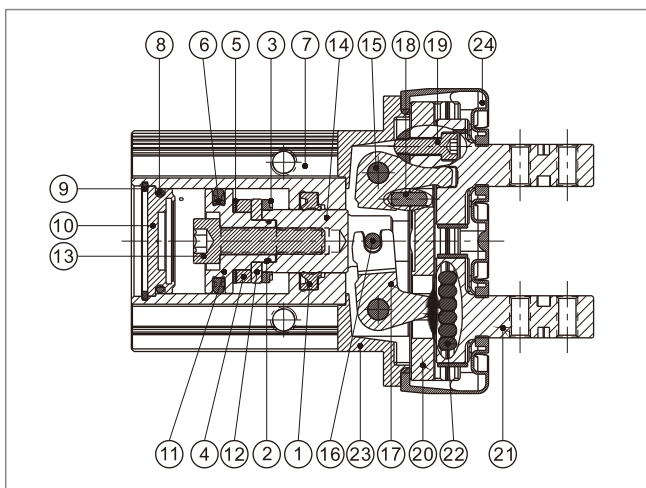
HFKP 32 □

① ② ③

① Model	② Bore size	③ Finger type		
HFKP: Air finger(Double acting/Dustproof)	10 16 20 25 32 40	Blank: Standard 	B: Side mounting type 	N: Thru.hole mounting type

HFKP series are all attached with magnet.

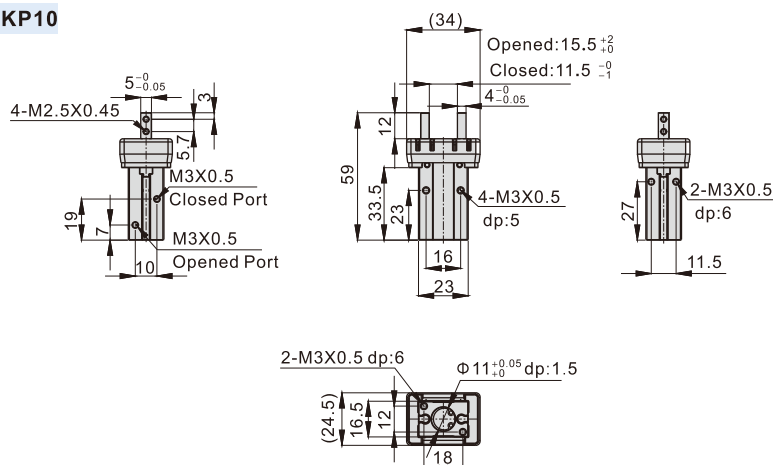
Inner structure and material of major parts



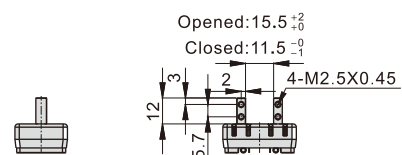
NO.	Item	Material
1	Rod packing	NBR
2	O-ring	NBR
3	Bumper	TPU
4	Magnet	Sintered metal(Neodymium-iron-boron)
5	Magnet washer	NBR
6	Piston seal	NBR
7	Body	Aluminum alloy
8	O-ring	NBR
9	C clip	Spring steel
10	Back cover	Aluminum alloy
11	Piston	Aluminum alloy/Stainless steel
12	Magnet fixed flake	Stainless steel
13	Countersink screw	Alloy steel
14	Piston rod	Aluminum alloy/Stainless steel
15	Pin	Bearing steel
16	Pin	Bearing steel
17	Curved bar	Stainless steel
18	Pin	Bearing steel
19	Countersink screw	Alloy steel
20	Guide roller	Alloy steel
21	Clamping jaw	Alloy steel
22	Bearing steel	Bearing steel
23	Dustproof cover ring	Plastic
24	Dustproof cover	NBR

Dimensions

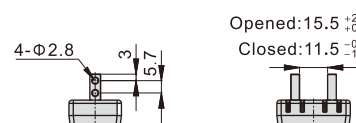
HFKP10



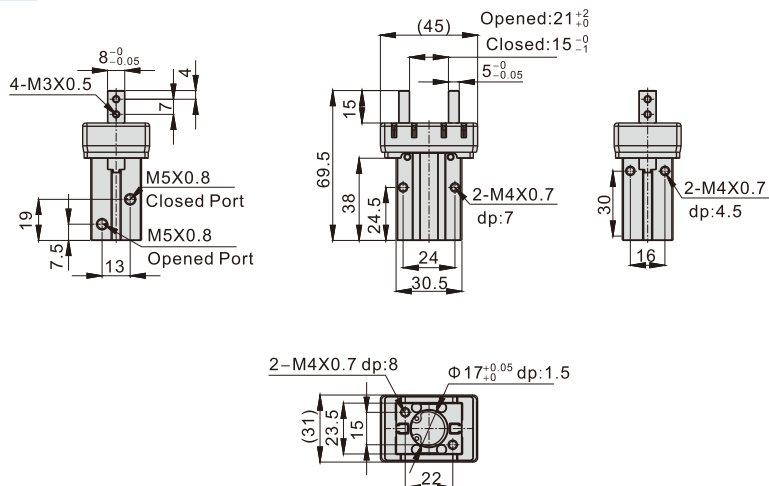
Side mounting type(B type)



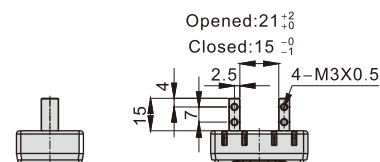
Thru.hole mounting type(N type)



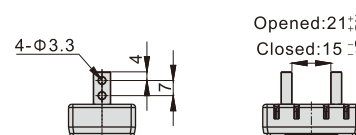
HFKP16



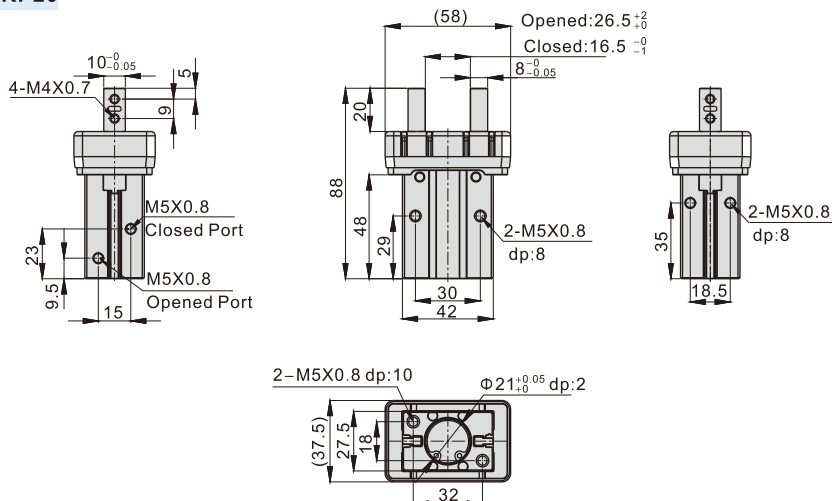
Side mounting type(B type)



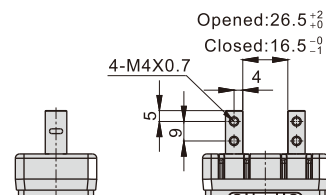
Thru.hole mounting type(N type)



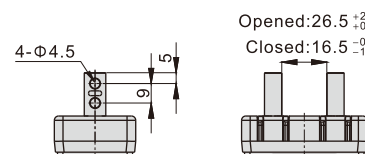
HFKP20



Side mounting type(B type)

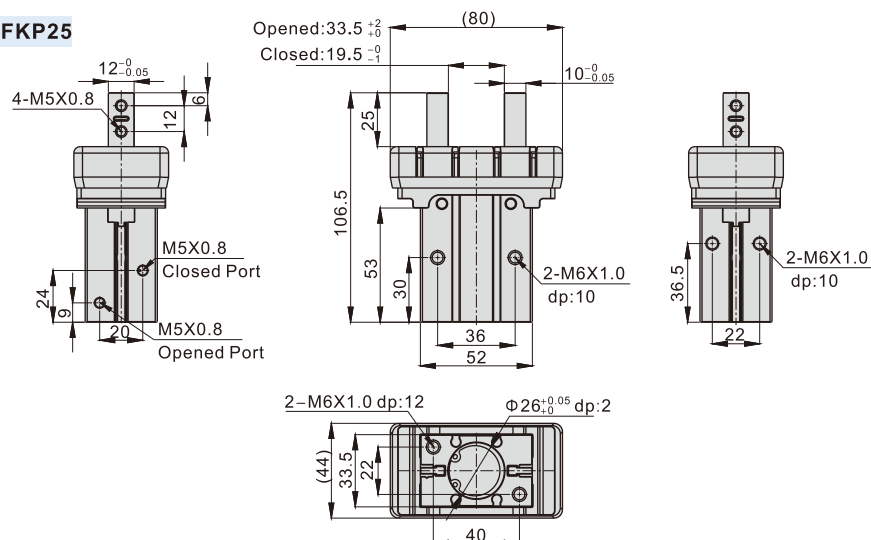


Thru.hole mounting type(N type)

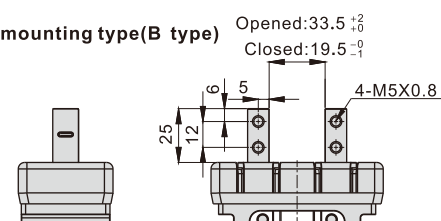


HFKP Series

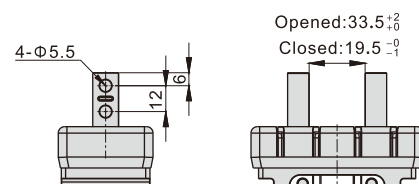
HFKP25



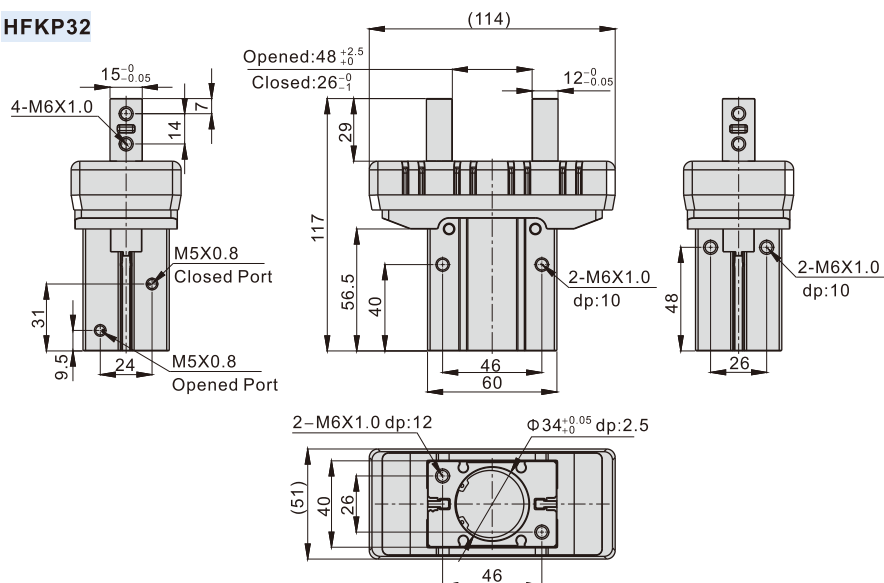
Side mounting type(B type)



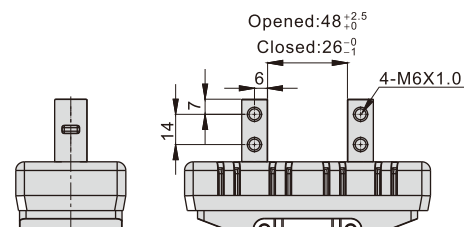
Thru.hole mounting type(N type)



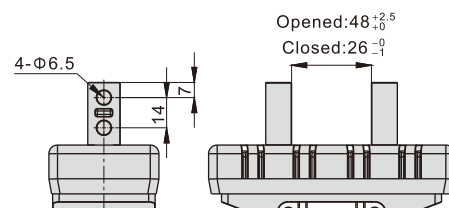
HFKP32



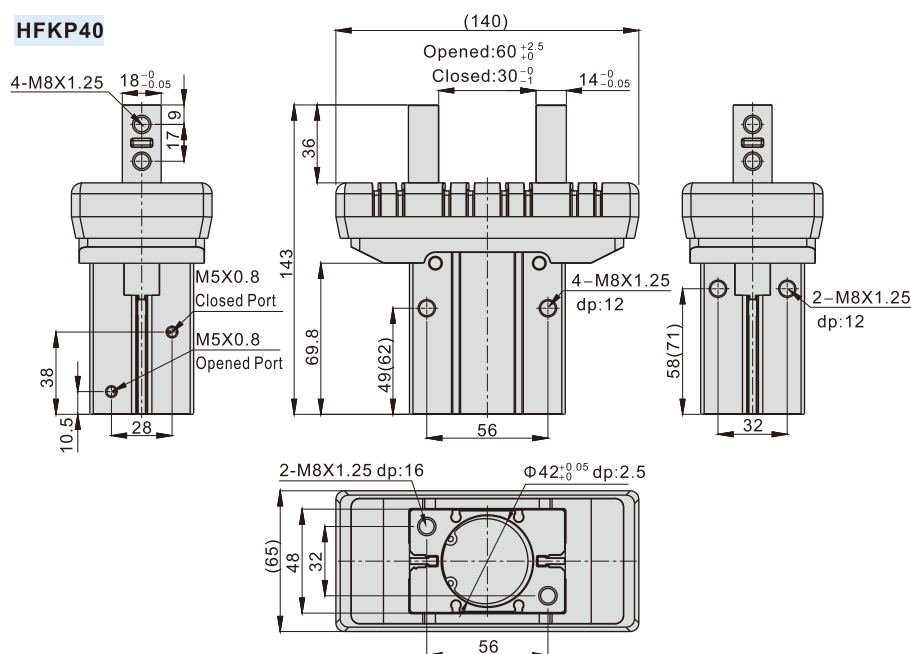
Side mounting type(B type)



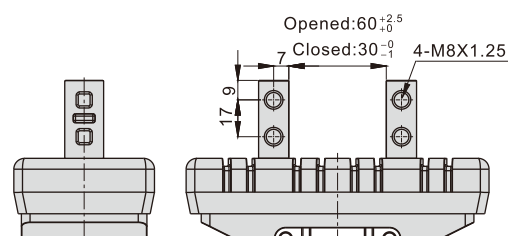
Thru.hole mounting type(N type)



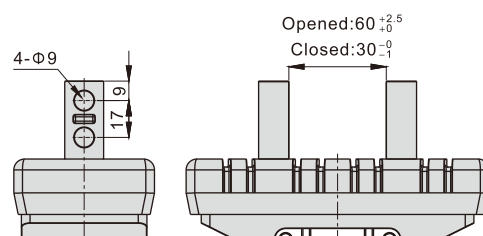
HFKP40



Side mounting type(B type)



Thru.hole mounting type(N type)



HFKP Series

How to select product

Please select pneumatic finger according to the following steps:

① The selection of the effective gripping force



② the confirmation of the gripping point



③ the confirmation of the external force put on the gripping jaw

1. The selection of the gripping force

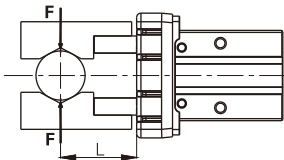
The gripping work-pieces shown below, on the impact condition of ordinary handling state, taking safety coefficient $a=4$, have a gripping force that is more than 10-20 times of the mass of the gripped objects.

	The work-pieces as shown in the left :		$\mu=0.2$	$\mu=0.1$
	F: Gripping force (N) μ : friction coefficient between fittings and work-pieces. m: mass of work-pieces g: acceleration of gravity ($=9.8\text{m/s}^2$)	The condition that the work-pieces won't drop is: $2 \times \mu F > mg$ so: $F > \frac{mg}{2 \times \mu}$ Safety coefficient is a, so F is: $F = \frac{mg}{2 \times \mu} \times a$	$F = \frac{mg}{2 \times 0.2} \times 4 = 10 \times mg$ 10 times of the mass of the gripped objects	$F = \frac{mg}{2 \times 0.1} \times 4 = 20 \times mg$ 20 times of the mass of the gripped objects

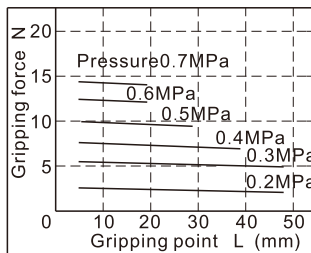
Note) If the friction coefficient $\mu > 0.2$, for safety, please also select clamping force according to the principle of 10~20 times of the mass of the clamped objects. As for large acceleration and shock, it requires for greater safety coefficient.

1.1) The actual gripping force must be within the effective gripping forces of different pneumatic fingers specifications shown in the below chart.

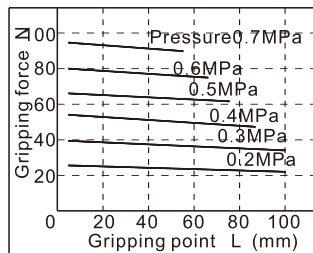
Closed gripping force



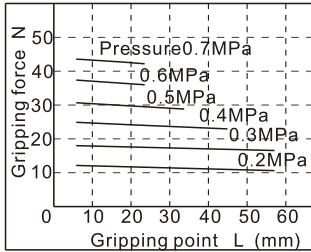
HFKP10



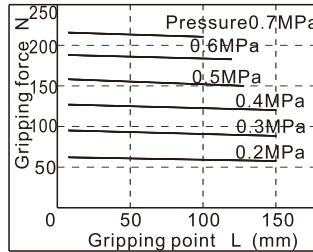
HFKP25



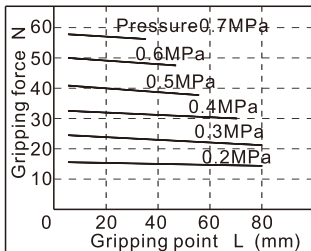
HFKP16



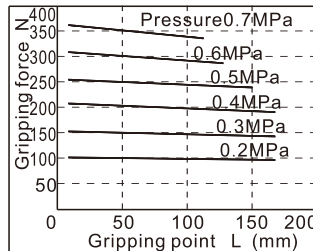
HFKP32



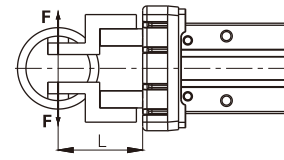
HFKP20



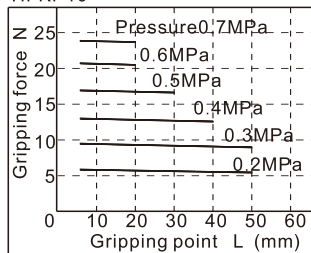
HFKP40



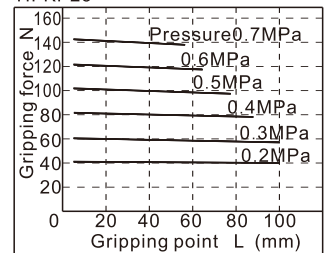
Opened gripping force



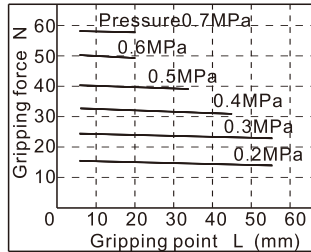
HFKP10



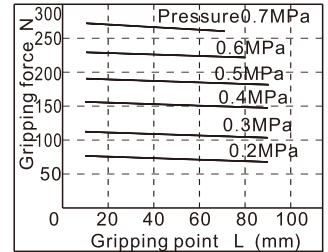
HFKP25



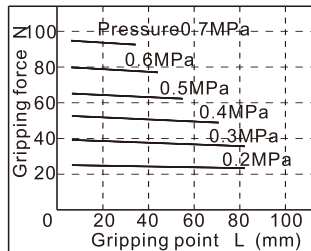
HFKP16



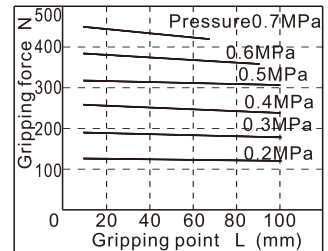
HFKP32



HFKP20



HFKP40

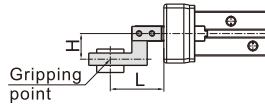


HFKP Series

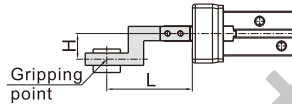
2. The selection of the gripping point

2.1) Please select the gripping point within the limited field shown below.

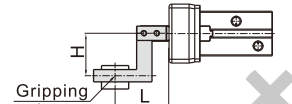
Over the limits, grippers would be subjected to excessive torque loads, and lead to short life of the air gripper.



L and H have proper sizes



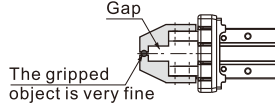
L is too long



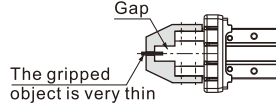
H is too long

2.2) In the allowable range of gripping point, it is better to design for short and light fittings. If the fittings are long and heavy, the inertia force when the finger is open and close will become larger, and the performance of gripping jaw will be degraded, at the same time it will affect the life.

2.3) When the gripped object is very fine and thin, you have to equip with gap between fittings. If not, there will be unstable clamp, resulting in a position offset and adverse clamping and so on.



The gripped object is very fine



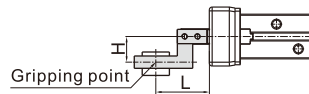
The gripped object is very thin

3. The confirmation of the external force put on the gripping jaw.

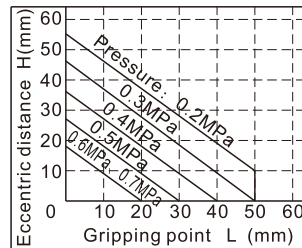
	Bore size	The allowed vertical loads Fv(N)	Max. permissible torque(Nm)			The calculation of allowable forces when moment loads work	Examples of calculation
			Mp	My	Mr		
	10	87	0.26	0.26	0.53	$\text{Allowable load(N)} = \frac{M(\text{Maximum permissible moment})(\text{N.m})}{L \times 10^{-3}}$ $\text{Unit conversion constant}$	In the guide rail of HFKP16, the external force of the pitching moment static loads put on the point of L=30mm is f=10 N, Allowable load F= 0.68/(30×10 ⁻³) = 22.7(N) Actual load f=10(N)<22.7(N) To meet the using requirements
	16	147	0.68	0.68	1.36		
	20	221	1.32	1.32	2.65		
	25	382	1.94	1.94	3.88		
	32	514	3	3	6		
	40	735	4.5	4.5	9		

[Note] The loads and torque values of said are all static values.

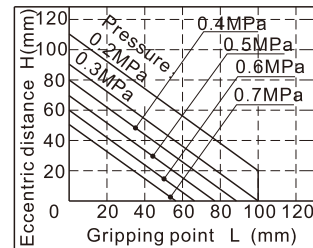
Closed gripping points



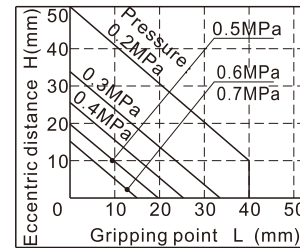
HFKP10



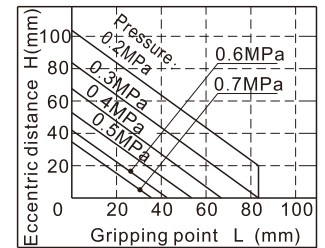
HFKP25



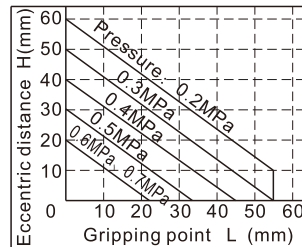
HFKP10



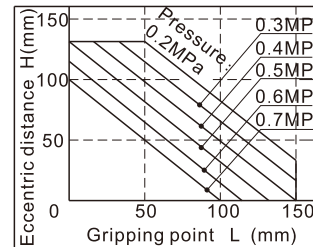
HFKP25



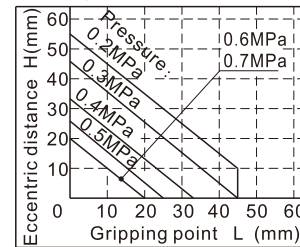
HFKP16



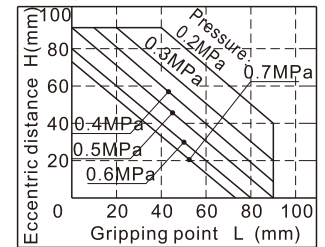
HFKP32



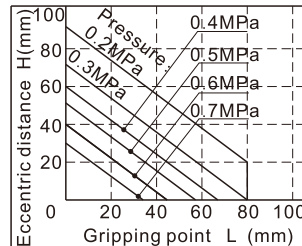
HFKP16



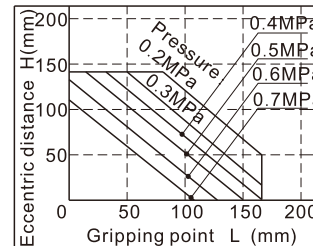
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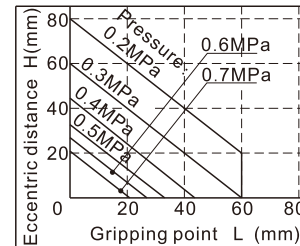
HFKP20



HFKP40



HFKP20



HFKP40

