

# PNEUMATIC AIR GRIPPERS PARALLEL STYLE

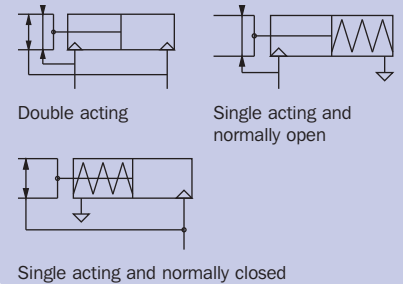
## Specification

<b>Bore size (mm)</b>		6	10	16	20	25	32	40
<b>Acting type</b>		Double Acting    Single Acting						
<b>Fluid</b>		Air (to be filtered by 40 $\mu$ m filter element)						
<b>Operating Pressure</b>	Double Acting	$\varnothing$ 6	0.2-0.7MPa (28-100psi) (2.0-7.0bar)					
		$\varnothing$ 10 - $\varnothing$ 32	0.1-0.7MPa (15-100psi) ( 1.0-7.0bar)					
	Single Acting	$\varnothing$ 6	0.35-0.7MPa (50-100psi) ( 3.5-7.0bar)					
		$\varnothing$ 10 - $\varnothing$ 32	0.25-0.7MPa (36-100psi) ( 2.5-7.0bar)					
<b>Temperature °C</b>		-20°C to +70°C						
<b>Lubrication</b>		Not required						
<b>Repeatability mm</b>		$\pm 0.01$					$\pm 0.02$	
<b>Maximum frequency</b>		180 (cpm)					60 (cpm)	
<b>Sensor switches*</b>		DS1-H	CS1-G DS1-G	CS1-G, DS1-G, DS1-H				
<b>Port size</b>		M3 X 0.5			M5 X 0.8			

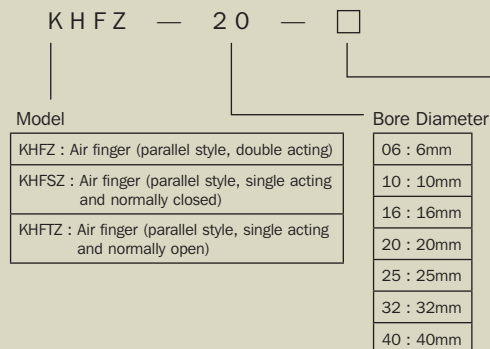
\*Sensor switch should be ordered separately.



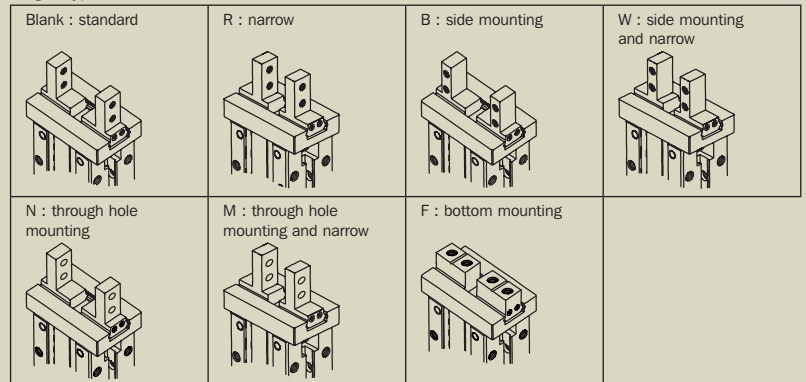
## Symbol



## Ordering Code

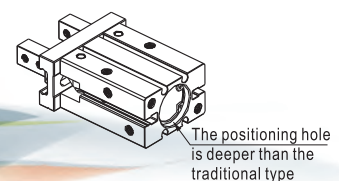
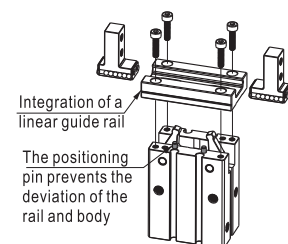


### Finger Type



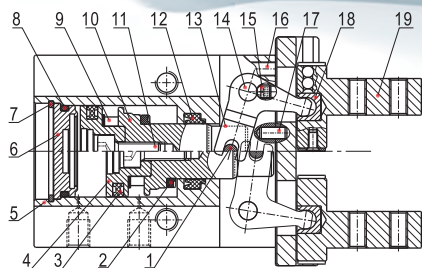
## Product Features

1. Integrated design of linear guide rail, high rigidity and high precision.
2. A positioning pin is attached to the bottom of the linear guide rail which can prevent the deviation of the positioning rail and body.
3. The hole of the body is deeper, which can improve the precision and the consistency of repeated dismounting and positioning.
4. Depending on customer requirements, the initial position of the clamping jaw can be customised to meet different needs under working conditions.



# PNEUMATIC AIR GRIPPERS PARALLEL STYLE

## Inner Structure & Material of Major Parts



No	Item	Material
1	Pin	Stainless steel
2	Bumper	TPU
3	Piston seal	NBR
4	Piston	Aluminium alloy/stainless steel
5	Body	Aluminium alloy
6	Back cover	Aluminium alloy
7	C clip	Spring steel
8	O-ring	NBR
9	Magnet	Sintered metal
10	Piston rod	Aluminium alloy/stainless steel
11	Screw	Carbon steel
12	Rod packing	NBR
13	Curved bar	Stainless steel
14	Pin	Stainless steel
15	Countersink screw	Carbon steel
16	Hexagon screw	Carbon steel
17	Pin	Stainless steel
18	Guide sleeve	Stainless steel
19	Assembly of clamping jaw and guide rail	Stainless steel

## Gripping force and stroke

Acting	Model	Gripping force per finger effective valve (N)		Opening/ closing stroke (both sides) (mm)	Weight (g)		
		External	Internal		F Type	Others	
Double Acting	HFZ6	3.3	6.7	4	24	25	
	HFZ10	11	17	4	56	56	
	HFZ16	34	45	6	124	124	
	HFZ20	45	68	10	236	236	
	HFZ25	69	102	14	418	428	
	HFZ32	16	195	22	750	729	
	HFZ40	255	320	30	1340	1268	
Single Acting	Normally Open	HFTZ6	1.9	-	4	25	26
		HFTZ10	7	-	4	57	57
		HFTZ16	27	-	6	125	125
		HFTZ20	35	-	10	238	238
		HFTZ25	55	-	14	420	430
		HFTZ32	133	-	22	799	778
		HFTZ40	220	-	30	1437	1365
	Normally Closed	HFSZ6	-	3.7	4	25	26
		HFSZ11	-	13	4	57	57
		HFSZ16	-	38	6	125	125
		HFSZ20	-	59	10	238	238
		HFSZ25	-	87	14	420	430
HFSZ32		-	163	22	799	778	
	HFSZ40	-	270	30	1437	1365	

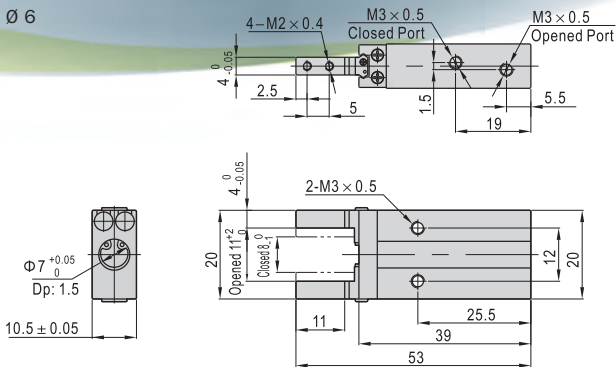
Note: the gripping force in the above table is in the working pressure of 0.5MPa, and with a gripping point of L = 20mm.

# PNEUMATIC AIR GRIPPERS PARALLEL STYLE

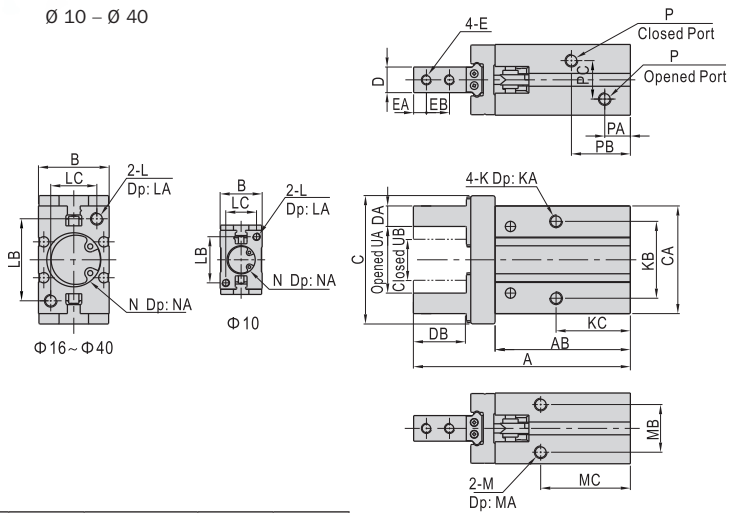
## Dimensions

### Standard type

Ø 6



Ø 10 - Ø 40



Model/Item	A	AB	B	C	CA	D	DA	DB	E	EA	EB
HFZ10	57	37.5	16.4	29	23	5	4	12	M2.5 X 0.45	3	5.7
HFZ16	67.5	42.5	23.6	38	30.5	8	5	15.5	M3 X 0.5	4	7
HFZ20	84.5	53	27.6	50	42	10	8	20	M4 X 0.7	5	9
HFZ25	102.5	63.5	33.6	63	52	12	10	25	M5 X 0.8	6	12
HFZ32	113	67	40	97	60	15	12	29	M6 X 1.0	7	14
HFZ40	139	83	48	119	72	18	14	36	M8 X 1.25	9	17

Model/item	K	KA	KB	KC	L	LA	LB	LC	M	MA	MB	MC
HFZ10	M3 X 0.5	5.5	16	23	M3 X 0.5	6	18	12	M3 X 0.5	6	11.5	27
HFZ16	M4 X 0.7	8	24	24.5	M4 X 0.7	8	22	15	M4 X 0.7	4.5	16	30
HFZ20	M5 X 0.8	10	30	29	M5 X 0.8	10	32	18	M5 X 0.8	8	18.5	35
HFZ25	M6 X 1.0	12	36	30	M6 X 1.0	12	40	22	M6 X 1.0	10	22	36.5
HFZ32	M6 X 1.0	13	46	40	M6 X 1.0	13	46	26	M6 X 1.0	10	26	48
HFZ40	M8 X 1.25	16	56	49	M8 X 1.25	17	56	32	M8 X 1.25	13	32	58

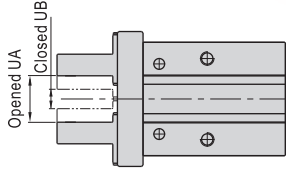
Model/item	N	NA	P	PA	PB	PC	UA (Open)	UB (Closed)
HFZ10	Ø 11	2	M3 X 0.5	7.5	19	10	15.5	11.5
HFZ16	Ø 17	2	M5 X 0.8	7.5	19	13	21	15
HFZ20	Ø 21	3	M5 X 0.8	9.5	23	15	26.5	16.5
HFZ25	Ø 26	3.5	M5 X 0.8	10	24	20	33.5	19.5
HFZ32	Ø 34	4	M5 X 0.8	11	31	24	48	26
HFZ40	Ø 42	4	M5 X 0.8	12	38	28	60	30

# PNEUMATIC AIR GRIPPERS PARALLEL STYLE

## Dimensions

### Narrow (R type)

Ø 10 – Ø 25

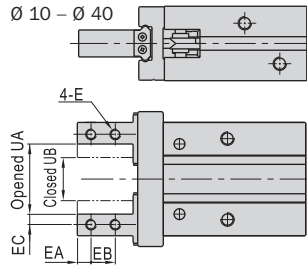
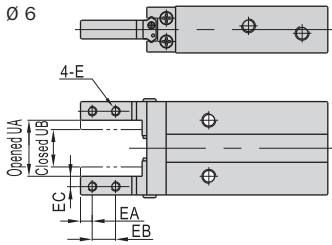


Model/Item	UA (Open)	UB (Closed)
HFZ10-R	10	6
HFZ16-R	12.5	6.5
HFZ20-R	17	7
HFZ25-R	23	9

Note: the other dimensions are the same as standard type.

### Side mounting (B type)

Ø 6

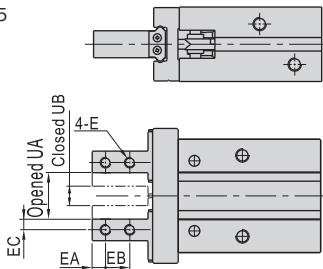


Model/Item	E	EA	EB	EC	UA (Open)	UB (Closed)
HFZ6-B	M2 X 0.4	2.5	5	2	11	8
HFZ10-B	M2.5 X 0.45	3	5.7	2	15.5	11.5
HFZ16-B	M3 X 0.5	4	7	2.5	21	15
HFZ20-B	M4 X 0.7	5	9	4	26.5	16.5
HFZ25-B	M5 X 0.8	6	12	5	33.5	19.5
HFZ32-B	M6 X 1.0	7	14	6	48	26
HFZ40-B	M8 X 1.25	9	17	7	60	30

Note: the other dimensions are the same as standard type.

### Side mounting and narrow (W type)

Ø 10 – Ø 25

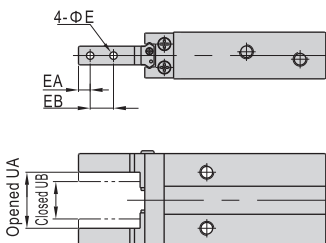


Model/Item	E	EA	EB	EC	UA (Open)	UB (Closed)
HFZ10-W	M2.5 X 0.45	3	3	2	10	6
HFZ16-W	M3 X 0.5	4	4	2.5	12.5	6.5
HFZ20-W	M4 X 0.7	5	5	4	17	7
HFZ25-W	M5 X 0.8	6	6	5	23	9

Note: the other dimensions are the same as standard type.

### Through hole mounting (N type)

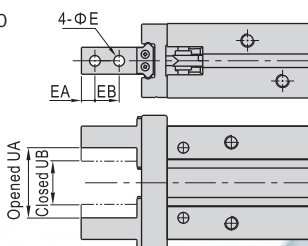
Ø 6



Model/Item	E	EA	EB	UA (Open)	UB (Closed)
HFZ6-N	2.3	2.5	5	11	8
HFZ10-N	2.8	3	5.7	15.5	11.5
HFZ16-N	3.3	4	7	21	15
HFZ20-N	4.5	5	9	26.5	16.5
HFZ25-N	5.5	6	12	33.5	19.5
HFZ32-N	6.5	7	14	48	26
HFZ40-N	9	9	17	60	30

Note: the other dimensions are the same as standard type.

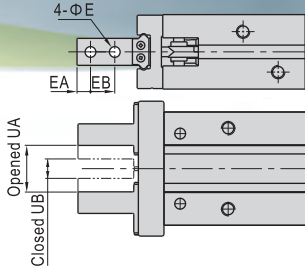
Ø 10 – Ø 40



# PNEUMATIC AIR GRIPPERS PARALLEL STYLE

## Dimensions

Through hole mounting and narrow (M type)

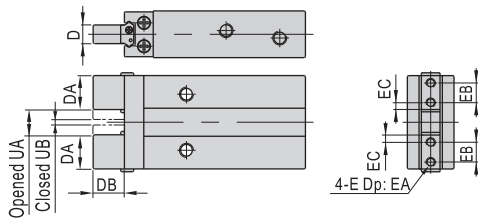


Model/Item	E	EA	EB	UA (Opened)	UB (Closed)
HFZ10-M	2.8	3	5.7	10	6
HFZ16-M	3.3	4	7	12.5	6.5
HFZ20-M	4.5	5	9	17	7
HFZ25-M	5.5	6	12	23	9

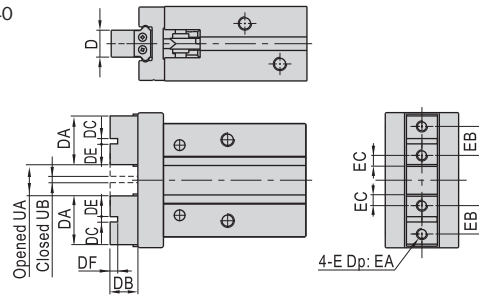
Note: the other dimensions are the same as standard type.

## Bottom mounting (F type)

Ø 6



Ø 10 - Ø 40

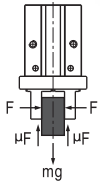


Model/item	D	DA	DB	DC	DE	DF	E	EA	EB	EC	UA (Open)	UB (Closed)
HFZ6-F	4	7.5	7	-	-	-	M2 X 0.4	3	3.5	2	4	1.5
HFZ10-F	5	11	5	2	4.5	2	M2.5 X 0.45	4	6	2.45	5.5	1.5
HFZ16-F	8	14	8	2.5	5.8	2.5	M3 X 0.5	6	8	3.05	7.5	1.5
HFZ20-F	10	18	10.5	3	7.5	3	M4 X 0.7	8	10	3.95	11.5	1.5
HFZ25-F	12	22	13	4	9	4	M5 X 0.8	10	12	4.9	16	2
HFZ32-F	15	34.5	18	5	14.8	5	M6 X 1.0	12	20	7.9	25	3
HFZ40-F	18	41.5	22	6	17.7	6	M8 X 1.25	16	24	8.7	33	3

Note: the other dimensions are the same as standard type.

# PNEUMATIC AIR GRIPPERS PARALLEL STYLE

## How to Select Product



Please select pneumatic finger according to the following steps: the selection of the effective gripping force, then the confirmation of the gripping point, then the confirmation of the external force put on the gripping jaw.

### 1. Selection of gripping force

The gripping work pieces shown to the left, 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.

$\mu = 0.2$ $F = \frac{mg}{2 \times 0.2} \times 4$ $= 10 \times mg$ <p>10 times the mass of the gripped object</p>	$\mu = 0.1$ $F = \frac{mg}{2 \times 0.1} \times 4$ $= 20 \times mg$ <p>20 times the mass of the gripped object</p>
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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 a greater safety coefficient.

The work pieces as shown to the left:

F: gripping force (N)

$\mu$ : friction coefficient between fittings and work pieces.

m: mass of work pieces

g: acceleration of gravity ( $=9.8m/s^2$ )

The condition that the work pieces won't drop is:  $2 \times \mu F > mg$

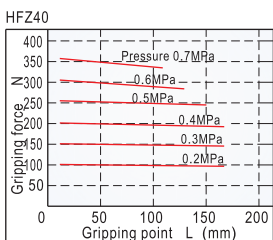
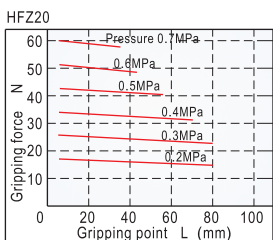
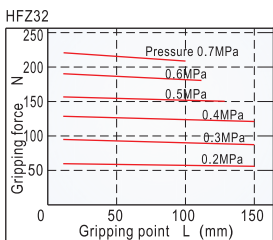
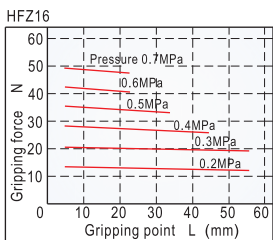
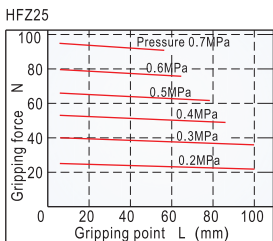
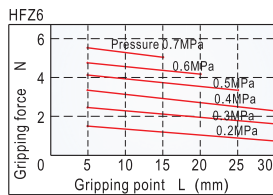
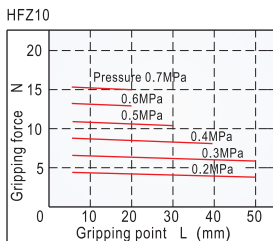
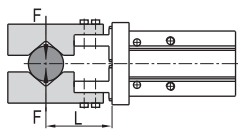
$$F > \frac{mg}{2 \times \mu}$$

Safety coefficient is a, so F is:

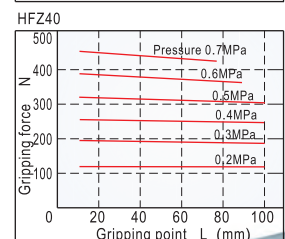
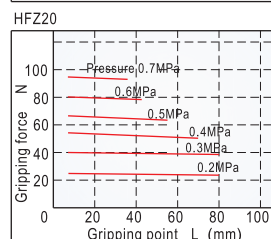
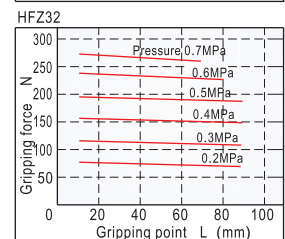
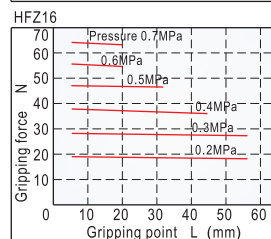
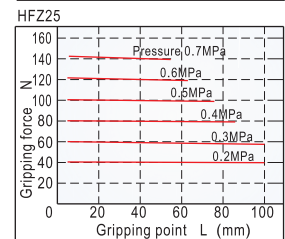
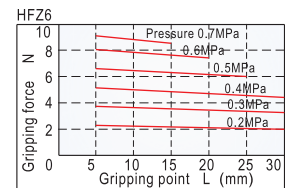
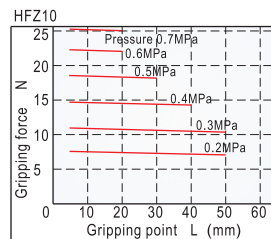
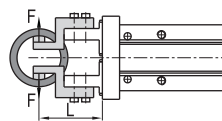
$$F > \frac{mg}{2 \times \mu} \times a$$

1.1 The actual gripping force must be within the effective gripping forces of the different pneumatic finger specifications shown in the below charts.

## Double acting, closed gripping force



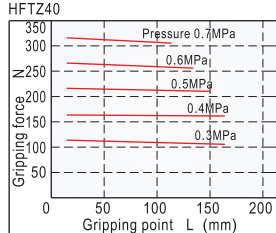
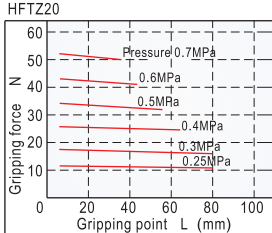
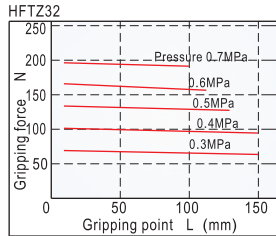
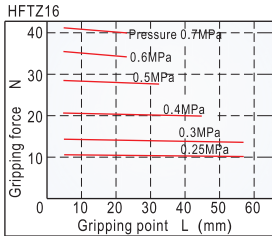
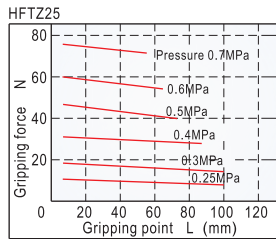
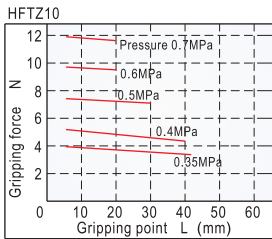
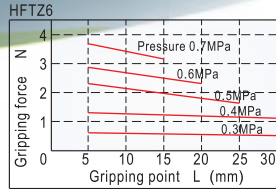
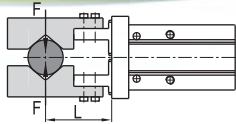
## Double acting, open gripping force



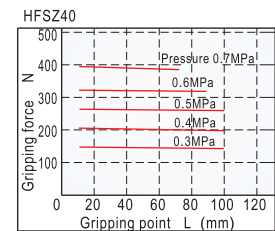
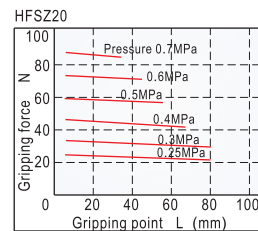
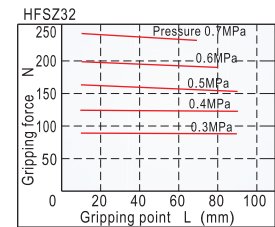
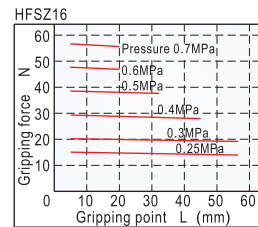
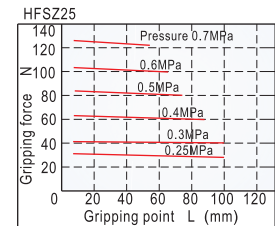
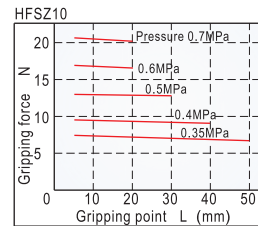
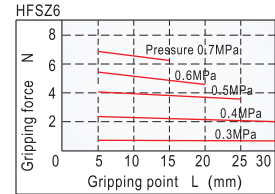
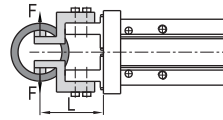
# PNEUMATIC AIR GRIPPERS PARALLEL STYLE

## How to Select Product

Single acting, normally open  
gripping force

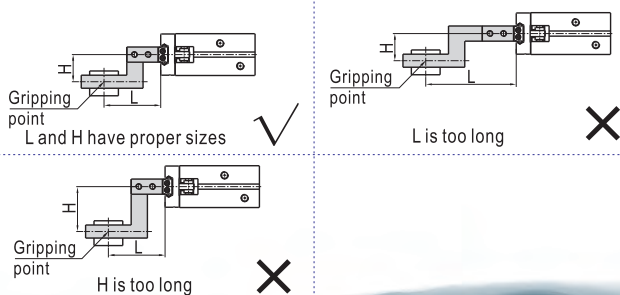


Single acting, normally open  
clamping force



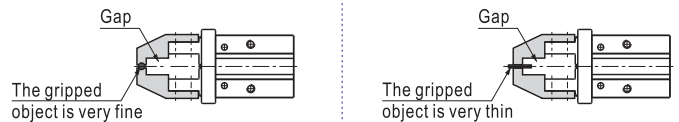
## 2. Selection of gripping point

2.1 Please select the gripping point within the limited field shown below. Above these limits, gripping jaws would be subjected to excessive torque loads and lead to short life of the air gripper.



2.2 Within the recommended range of the gripping point, it is better to use short, light fittings. If the fittings are long and heavy, the inertia force when the finger is opened and closed will become larger, and the performance of the gripping jaw will degrade, at the same time it will affect its life.

2.3 When the gripped object is very fine and thin, ensure a sufficient gap is positioned between fittings. If not, the clamp will be unstable, resulting in an offset position and adverse clamping.

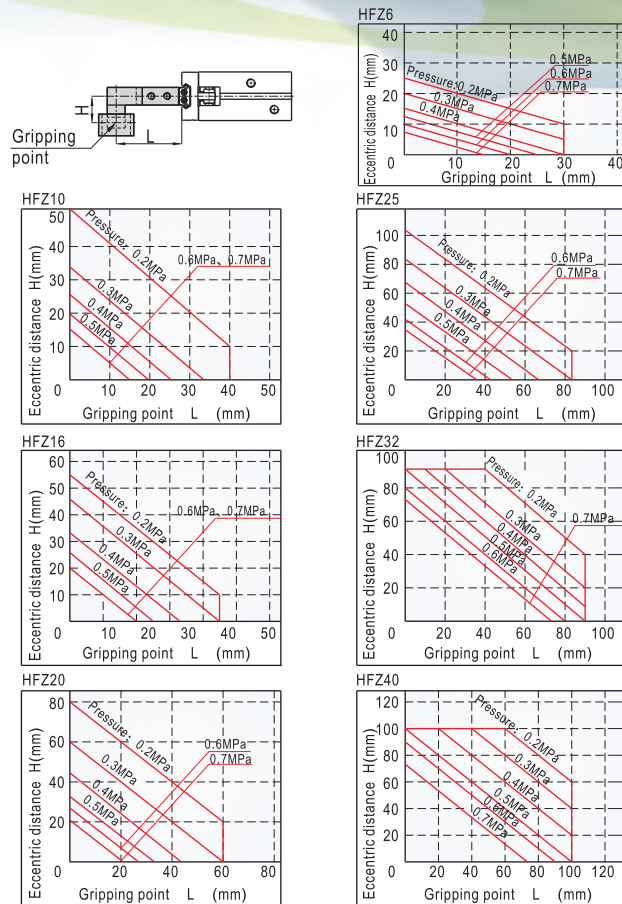
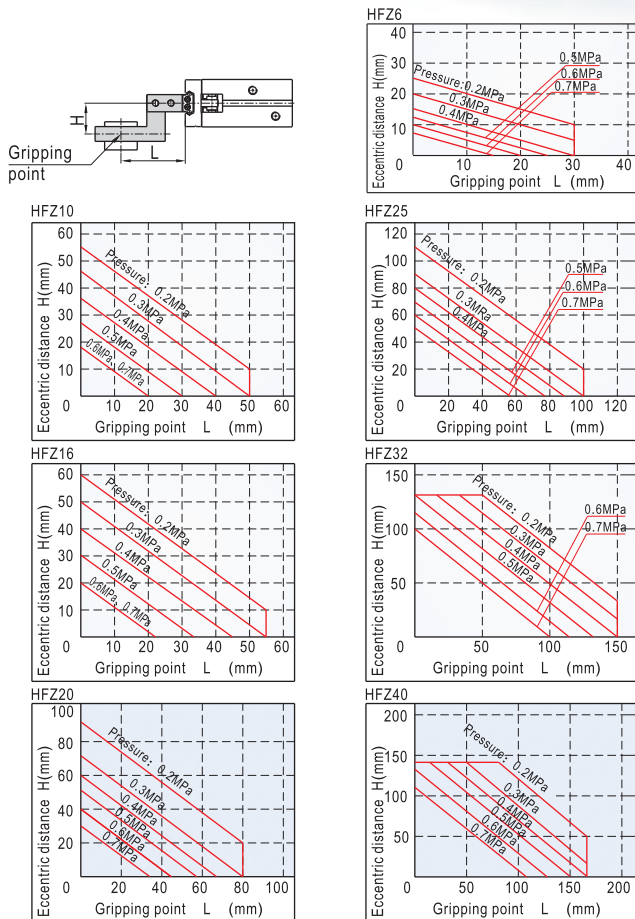


# PNEUMATIC AIR GRIPPERS PARALLEL STYLE

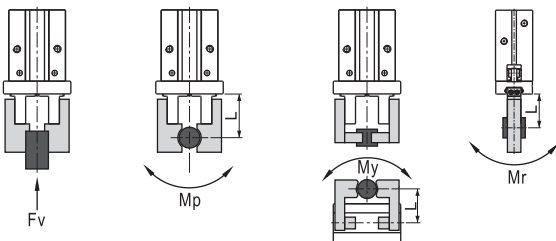
## How to Select Product

### Range of closed gripping points

### Range of open clamping point



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



Bore size	The allowed vertical loads Fv (N)	Maximum permissible torque (Nm)		
		Mp	My	Mr
6	10	0.04	0.04	0.08
10	58	0.26	0.26	0.53
16	98	0.68	0.68	1.36
20	147	1.32	1.32	2.65
25	255	1.94	1.94	3.88
32	343	3	3	6
40	490	4.5	4.5	9

Note: the loads and torque values above are all static values.

The calculation of allowable forces when moment loads work

Allowable load (N) =  $\frac{M \text{ (maximum permissible moment) (M.m)}}{L \times 10^{-3}}$

( $10^{-3}$  = unit conversion constant)

Examples of calculation

In the guide rail of HFZ16, the external force of the pitching moment static loads put on the point of L = 30mm is f = 10 N

Allowable load f =  $\frac{0.68}{30 \times 10^{-3}} = 22.7 \text{ (N)}$

Actual load f = 10 (N) < 22.7 (N) to meet the using requirements

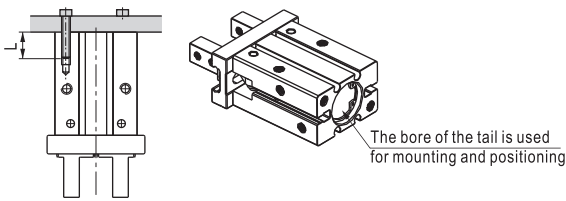


# PNEUMATIC AIR GRIPPERS PARALLEL STYLE

## Installation & Application

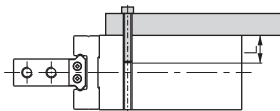
1. The gripping force may change with the fluctuation of pressure. This will affect the grip hold of any work-piece and may cause the work-piece to slip out of the jaws.
2. Do not use the air gripper under strong external force or impact force.
3. Single acting spring return on request.
4. Avoid installing the gripper in a vulnerable position that may obstruct or damage the workpiece.
5. When fixing the gripping jaw parts, do not twist the gripping jaw.
6. There are several kinds of installation methods for this type of gripper. The locking torque for the fastening screw must be within the prescribed torque range shown in the chart below.

### Tail installation type



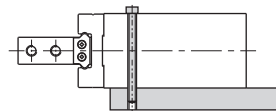
Bore size	Bolt type	Maximum locking moment (Nm)	Maximum screwed depth (mm)	The aperture of the positioning bore (mm)	The depth of the positioning bore (mm)
10	M3 X 0.5	0.88	6	Ø 11	2
16	M4 X 0.7	2.1	8	Ø 17	2
20	M5 X 0.8	4.3	10	Ø 21	3
25	M6 X 1.0	7.3	12	Ø 26	3.5
32	M6 X 1.0	7.9	13	Ø 34	4
40	M8 X 1.25	17.7	17	Ø 42	4

### Installation of the front threaded hole



Bore size	Bolt type	Max. locking moment (Nm)	Max. screwed depth (mm)
6	M3 X 0.5	0.88	10
10	M3 X 0.5	0.69	5
16	M4 X 0.7	2.1	8
20	M5 X 0.8	4.3	10
25	M6 X 1.0	7.3	12
32	M6 X 1.0	7.9	13
40	M8 X 1.25	17.7	17

### Installation of the front through hole



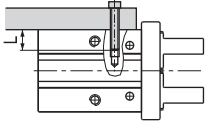
Bore size	Bolt type	Max. locking moment (Nm)	Max. screwed depth (mm)
6	M2.5 X 0.45	0.49	-
10	M2.5 X 0.45	0.49	5
16	M3 X 0.5	0.88	8
20	M4 X 0.7	2.1	10
25	M5 X 0.8	4.3	12
32	M5 X 0.8	4.3	13
40	M6 X 1.0	7.3	16

# PNEUMATIC AIR GRIPPERS

## PARALLEL STYLE

### Installation & Application

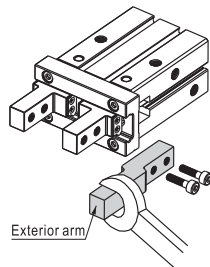
#### Surface installation type



Bore size	Bolt type	Max. locking moment (Nm)	Max. screwed depth (mm)
10	M3 X 0.5	0.9	6
16	M4 X 0.7	1.6	4.5
20	M5 X 0.8	3.3	8
25	M6 X 1.0	5.9	10
32	M6 X 1.0	5.9	10
40	M8 X 1.25	13.7	13
40	M8 X 1.25	17.7	17

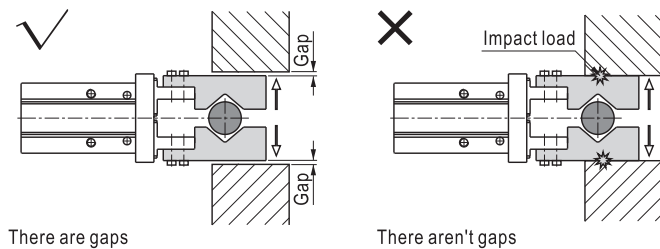
7. When installing the gripping jaw fittings, pay particular attention; you can only hold the gripping jaw by using a spanner, and then lock the screws with an allen wrench. Never clamp the body directly and then lock the screws, otherwise the parts will be easily damaged.

Bore size	Bolt type	Max. locking moment (Nm)
6	M2 X 0.4	0.15
10	M2.5 X 0.45	0.31
16	M3 X 0.5	0.59
20	M4 X 0.7	1.4
25	M5 X 0.8	2.8
32	M6 X 1.0	4.9
40	M8 X 1.25	11.8

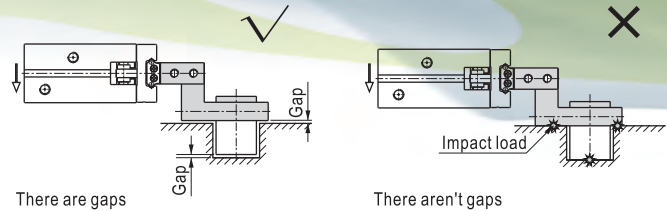


8. Confirm there are no external forces exerted on the gripping jaw. Transverse loads on the gripping jaw will cause impact loads and lead to shaking and damage of the gripping jaw. Gaps are required to ensure the air gripper does not collide with the work-piece at the end of its stroke.

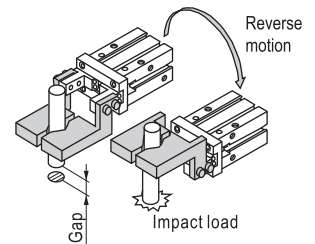
8.1 The end of stroke under the open state of air gripper.



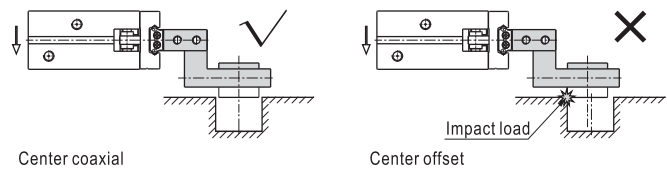
8.2 The end of stroke under the move stat of air gripper.



8.3 When in a reverse motion state, the gripping point must be precise, otherwise the air gripper may contact and cause impact load.



9. When the workpiece is inserted the centre line should be coaxial and not offset to the workpiece in case there is external force generated on the gripping jaw.



10. Please use the flow control valve to adjust the opening and closing speed of the gripping jaw if too fast.

11. Do not place articles or get in the way of the air gripper.

12. Before removing the air gripper, ensure it is not in operation and ensure any compressed air is discharged.