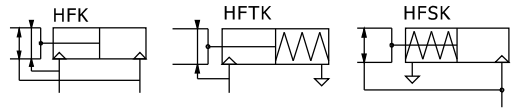




Air gripper—HFK Series

Parallel style with guide track—Roller bearing



Ordering code

HFK 20 □

1

2

3

① Model

HFK: Air finger(Double acting)

HFSK: Air finger
(Single acting and normally closed)

HFTK: Air finger
(Single acting and normally opened)

② Bore size

10 16 20 25 32 40

HFK series are all attached with magnet.
Sensor should be ordered individually.

③ Finger type

Bore size	Finger type	
10 16 20 25 32 40	Blank: Standard	B: Side mounting type
	R: Narrow type	F: Bottom mounting type
	N: Thru.hole mounting type	W: Side mounting and arrow type
10 16 20 25		
	M: Thru.hole mounting and narrow type	

Specification

Bore size (mm)			10	16	20	25	32	40
Acting type			Double acting		Single acting			
Fluid			Air(to be filtered by 40μm filter element)					
Operating pressure	Double acting	Φ10	28~100psi(0.2~0.7MPa)					
		Others	22~100psi(0.15~0.7MPa)					
	Single acting	Φ10	50~100psi(0.35~0.7MPa)					
		Others	36~100psi(0.25~0.7MPa)					
Temperature			-20~70℃					
Lubrication			Not required					
Repeatability mm			±0.01				±0.02	
Max. frequency			180(c.p.m)				60(c.p.m)	
Sensor switches			CMSh DMSh, EMSh		CMSh, DMSh, EMSh CMSh, DMSh, EMSh			
Port size			M3×0.5		M5×0.8			

Add) Refer to P530 for detail of sensor.



Air gripper(parallel style——roller bearing)

HFK Series

Bore size: Φ10, Φ16, Φ20, Φ25, Φ32, Φ40

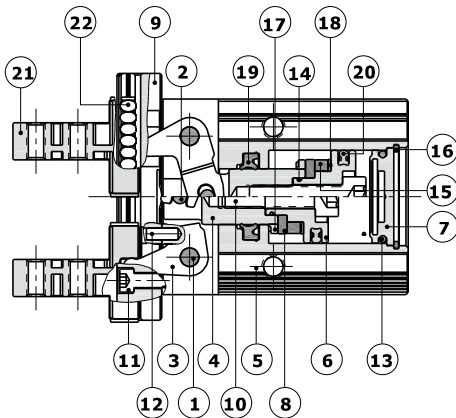
Gripping force and stroke

Acting type		Double acting(HFK)						Single acting_NO (HFTK)						Single acting_NC (HFSK)					
Bore size		10	16	20	25	32	40	10	16	20	25	32	40	10	16	20	25	32	40
Gripping force per finger Effective value(N)	External	11	34	45	69	160	255	7	27	35	55	133	220	-	-	-	-	-	-
	Internal	17	45	68	102	195	320	-	-	-	-	-	-	13	38	59	87	163	270
Opening/Closing stroke(Both sides)(mm)		4	6	10	14	22	30	4	6	10	14	22	30	4	6	10	14	22	30
Weight (g)	F Type	56	124	236	418	750	1340	57	125	238	420	799	1437	57	125	238	420	799	1437
	Others	56	124	236	428	729	1268	57	125	238	430	778	1365	57	125	238	430	778	1365

[Note] The gripping force in the above table is in the working pressure of 75psi, and with a gripping point of L=20mm.

Add) Please refer to page 488 for the definition of "L".

Inner structure



NO.	Item	NO.	Item
1	Pin	12	Pin
2	Pin	13	O-ring
3	Curved bar	14	O-ring
4	Piston rod	15	Magnet
5	Body	16	C clip
6	Piston	17	Bumper
7	Back cover	18	Magnet washer
8	Magnet fixed flake	19	Rod packing
9	Rail	20	Piston seal
10	Countersink screw	21	Clamping jaw
11	Countersink screw	22	Guide roller

Note: inner structure & material data sheet is based on certain bore size.

Please contact AirTAC if you need inner structure & material data sheet for specific bore size.

Air gripper(parallel style——roller bearing)

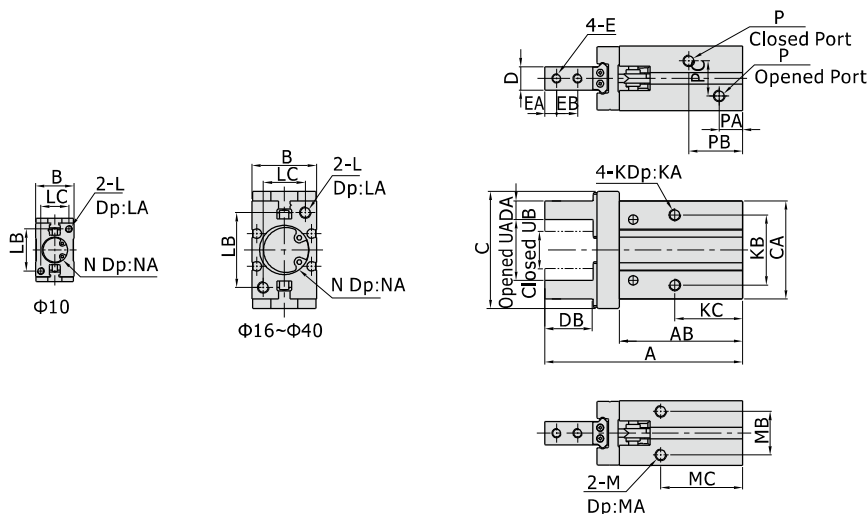
AIRTAC

HFK Series

Bore size: $\Phi 10$, $\Phi 16$, $\Phi 20$, $\Phi 25$, $\Phi 32$, $\Phi 40$

Dimensions

Standard



[Unit: mm]

Model\Item	A	AB	B	C	CA	D	DA	DB	E	EA	EB	K	KA	KB	KC
HFK10	57	37.5	16.5	30	23	5 ⁰ _{-0.05}	4 ⁰ _{-0.05}	12.2 ⁰ _{-0.1}	M2.5×0.45	3	5.7	M3×0.5	5	16	23
HFK16	67.5	42.5	23.5	39	30.5	8 ⁰ _{-0.05}	5 ⁰ _{-0.05}	15.3 ⁰ _{-0.1}	M3×0.5	4	7	M4×0.7	7	24	24.5
HFK20	85	53	27.5	53	42	10 ⁰ _{-0.05}	8 ⁰ _{-0.05}	20.5 ⁰ _{-0.1}	M4×0.7	5	9	M5×0.8	8	30	29
HFK25	103	64	33.5	71	52	12 ⁰ _{-0.05}	10 ⁰ _{-0.05}	25.3 ⁰ _{-0.1}	M5×0.8	6	12	M6×1.0	10	36	30
HFK32	113(122)	67(76)	40	106	60	15 ⁰ _{-0.05}	12 ⁰ _{-0.05}	29.75 ⁰ _{-0.1}	M6×1.0	7	14	M6×1.0	10	46	40(49)
HFK40	139(152)	83(96)	48	132	72	18 ⁰ _{-0.05}	14 ⁰ _{-0.05}	36.75 ⁰ _{-0.1}	M8×1.25	9	17	M8×1.25	12	56	49(62)

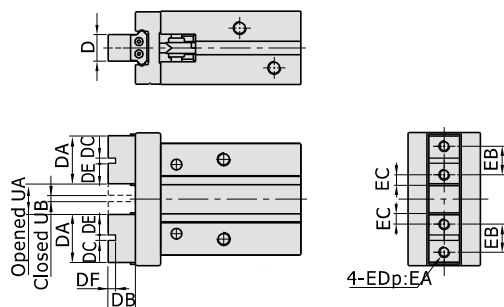
Model\Item	L	LA	LB	LC	M	MA	MB	MC	N	NA	P	PA	PB	PC	UA(Opened)	UB(Closed)
HFK10	M3×0.5	6	18	12	M3×0.5	6	11.5	27	$\Phi 11^{+0.05}_0$	1.5	M3×0.5	7	19	10	15.5 ⁺² ₀	11.5 ⁰ ₋₁
HFK16	M4×0.7	8	22	15	M4×0.7	4.5	16	30	$\Phi 17^{+0.05}_0$	1.5	M5×0.8	7.5	19	13	21 ⁺² ₀	15 ⁰ ₋₁
HFK20	M5×0.8	10	32	18	M5×0.8	8	18.5	35	$\Phi 21^{+0.05}_0$	2	M5×0.8	9.5	23	15	26.5 ⁺² ₀	16.5 ⁰ ₋₁
HFK25	M6×1.0	12	40	22	M6×1.0	10	22	36.5	$\Phi 26^{+0.05}_0$	2	M5×0.8	9	24	20	33.5 ⁺² ₀	19.5 ⁰ ₋₁
HFK32	M6×1.0	12	46	26	M6×1.0	10	26	48(57)	$\Phi 34^{+0.05}_0$	2.5	M5×0.8	9.5	31(40)	24	48 ^{+2.5} ₀	26 ⁰ ₋₁
HFK40	M8×1.25	16	56	32	M8×1.25	12	32	58(71)	$\Phi 42^{+0.05}_0$	2.5	M5×0.8	10.5	38(50)	28	60 ^{+2.5} ₀	30 ⁰ ₋₁

[Note] The values in "()" in the above table are single acting type sizes.

Bottom mounting type(F type)

$\Phi 10 \sim \Phi 40$

[Unit: mm]



Model\Item	D	DA	DB	DC	DE	E
HFK10F	5 ⁰ _{-0.05}	11	5	2 ^{+0.04} _{+0.01}	4.5	M2.5×0.45
HFK16F	8 ⁰ _{-0.05}	14	8	2.5 ^{+0.04} _{+0.01}	5.8	M3×0.5
HFK20F	10 ⁰ _{-0.05}	18	10.5	3 ^{+0.04} _{+0.01}	7.5	M4×0.7
HFK25F	12 ⁰ _{-0.05}	22	13	4 ^{+0.04} _{+0.01}	9	M5×0.8
HFK32F	15 ⁰ _{-0.05}	34.5	18	5 ^{+0.04} _{+0.01}	14.8	M6×1.0
HFK40F	18 ⁰ _{-0.05}	41.5	22	6 ^{+0.04} _{+0.01}	17.7	M8×1.25

Model\Item	DF	EA	EB	EC	UA(Opened)	UB(Closed)
HFK10F	2	4	6	2.45	5.5 ⁺² ₀	1.8 ⁰ _{-0.5}
HFK16F	2.5	6	8	3.05	7.5 ⁺² ₀	1.8 ⁰ _{-0.5}
HFK20F	3	8	10	3.95	11.5 ⁺² ₀	1.8 ⁰ _{-0.5}
HFK25F	4	10	12	4.9	16 ^{+2.5} ₀	2.4 ⁰ _{-0.5}
HFK32F	5	12	20	7.3	25 ^{+2.5} ₀	3.4 ⁰ _{-0.5}
HFK40F	6	16	24	8.7	33 ⁺³ ₀	3.4 ⁰ _{-0.5}

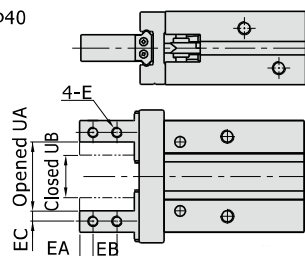
[Note] The other dimensions are the same as standard type.

HFK Series

Bore size: $\Phi 10$, $\Phi 16$, $\Phi 20$, $\Phi 25$, $\Phi 32$, $\Phi 40$

Side mounting type(B type)

$\Phi 10 \sim \Phi 40$

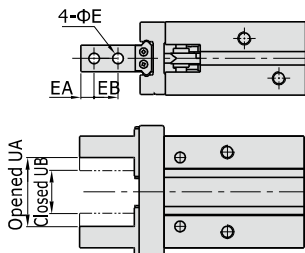


[Unit: mm]

Model\Item	E	EA	EB	EC	UA(Opened)	UB(Closed)
HFK10B	M2.5×0.45	3	5.7	2	15.5 ⁺² ₀	11.5 ⁻⁰ ₋₁
HFK16B	M3×0.5	4	7	2.5	21 ⁺² ₀	15 ⁻⁰ ₋₁
HFK20B	M4×0.7	5	9	4	26.5 ⁺² ₀	16.5 ⁻⁰ ₋₁
HFK25B	M5×0.8	6	12	5	33.5 ⁺² ₀	19.5 ⁻⁰ ₋₁
HFK32B	M6×1.0	7	14	6	48 ^{+2.5} ₀	26 ⁻⁰ ₋₁
HFK40B	M8×1.25	9	17	7	60 ^{+2.5} ₀	30 ⁻⁰ ₋₁

Thru.hole mounting type(N type)

$\Phi 10 \sim \Phi 40$

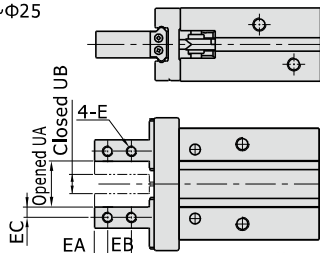


[Unit: mm]

Model\Item	E	EA	EB	UA(Opened)	UB(Closed)
HFK10N	2.8	3	5.7	15.5 ⁺² ₀	11.5 ⁻⁰ ₋₁
HFK16N	3.3	4	7	21 ⁺² ₀	15 ⁻⁰ ₋₁
HFK20N	4.5	5	9	26.5 ⁺² ₀	16.5 ⁻⁰ ₋₁
HFK25N	5.5	6	12	33.5 ⁺² ₀	19.5 ⁻⁰ ₋₁
HFK32N	6.5	7	14	48 ^{+2.5} ₀	26 ⁻⁰ ₋₁
HFK40N	9	9	17	60 ^{+2.5} ₀	30 ⁻⁰ ₋₁

Side mounting and narrow type(W type)

$\Phi 10 \sim \Phi 25$

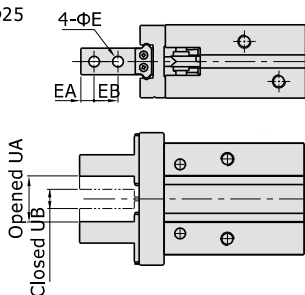


[Unit: mm]

Model\Item	E	EA	EB	EC	UA(Opened)	UB(Closed)
HFK10W	M2.5×0.45	3	5.7	2	10 ⁺² ₀	6 ⁻⁰ ₋₁
HFK16W	M3×0.5	4	7	2.5	12.5 ⁺² ₀	6.5 ⁻⁰ ₋₁
HFK20W	M4×0.7	5	9	4	17 ⁺² ₀	7 ⁻⁰ ₋₁
HFK25W	M5×0.8	6	12	5	23 ^{+2.5} ₀	9 ⁻⁰ ₋₁

Thru.hole mounting and narrow type(M type)

$\Phi 10 \sim \Phi 25$

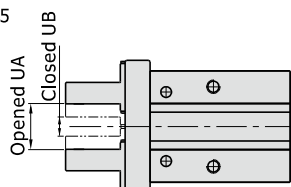


[Unit: mm]

Model\Item	E	EA	EB	UA(Opened)	UB(Closed)
HFK10M	2.8	3	5.7	10 ⁺² ₀	6 ⁻⁰ ₋₁
HFK16M	3.3	4	7	12.5 ⁺² ₀	6.5 ⁻⁰ ₋₁
HFK20M	4.5	5	9	17 ⁺² ₀	7 ⁻⁰ ₋₁
HFK25M	5.5	6	12	23 ^{+2.5} ₀	9 ⁻⁰ ₋₁

Narrow type(R type)

$\Phi 10 \sim \Phi 25$



[Unit: mm]

Model\Item	UA(Opened)	UB(Closed)
HFK10R	10 ⁺² ₀	6 ⁻⁰ ₋₁
HFK16R	12.5 ⁺² ₀	6.5 ⁻⁰ ₋₁
HFK20R	17 ⁺² ₀	7 ⁻⁰ ₋₁
HFK25R	23 ^{+2.5} ₀	9 ⁻⁰ ₋₁

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

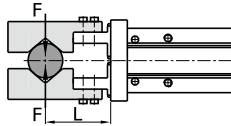
The gripping work-pieces shown below, on the impact condition of ordinary handling state, taking safety coefficient $a=4$, have a gripping force that is more than 10-20 times of the mass of the gripped objects.

	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 ($=9.8m/s^2$)	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

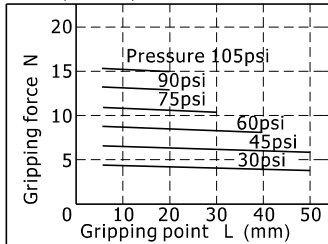
Note) If the friction coefficient $\mu > 0.2$, for safety, please also select clamping force according to the principle of 10~20 times of the mass of the clamped objects. As for large acceleration and shock, it requires for greater safety coefficient.

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

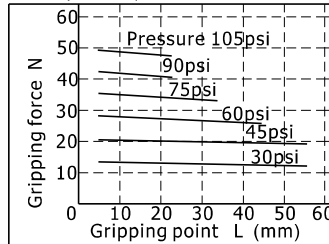
Double acting type closed gripping force



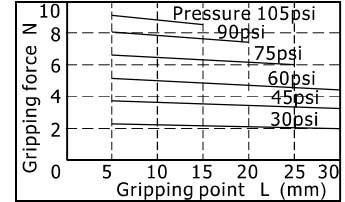
HFZ10/HFK10/HFKL10



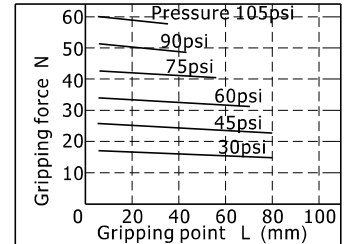
HFZ16/HFK16/HFKL16



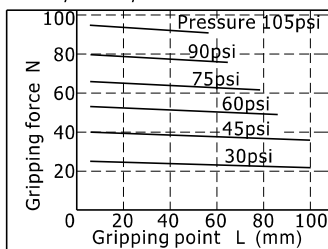
HFZ6



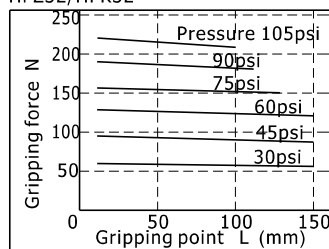
HFZ20/HFK20/HFKL20



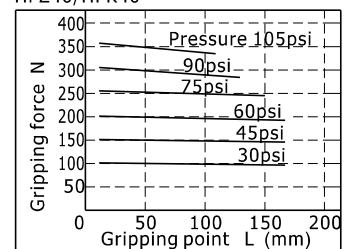
HFZ25/HFK25/HFKL25



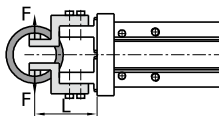
HFZ32/HFK32



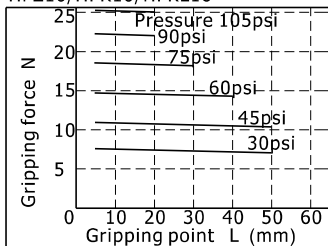
HFZ40/HFK40



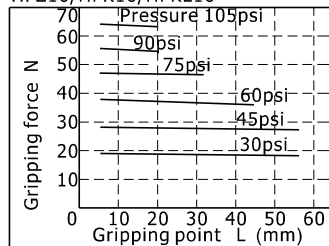
Double acting type opened gripping force



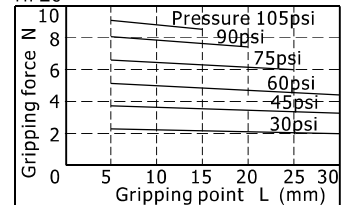
HFZ10/HFK10/HFKL10



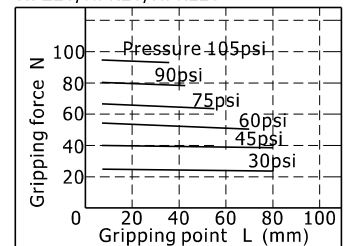
HFZ16/HFK16/HFKL16



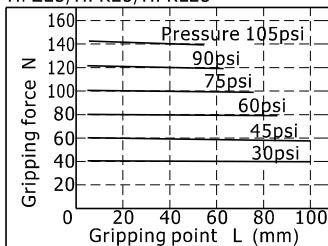
HFZ6



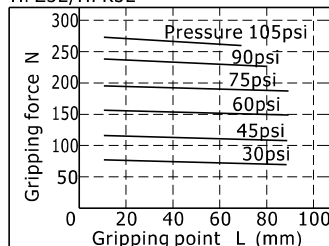
HFZ20/HFK20/HFKL20



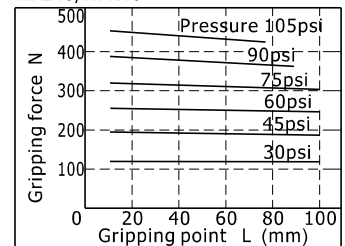
HFZ25/HFK25/HFKL25



HFZ32/HFK32



HFZ40/HFK40



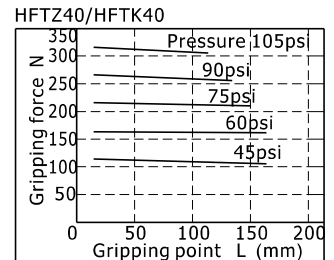
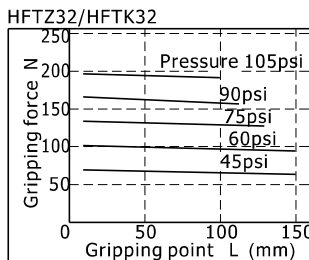
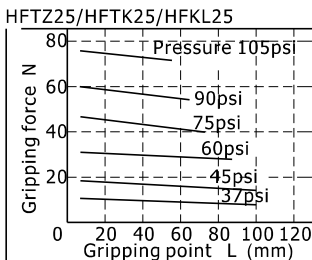
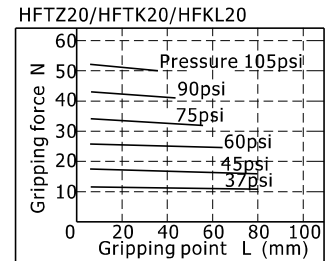
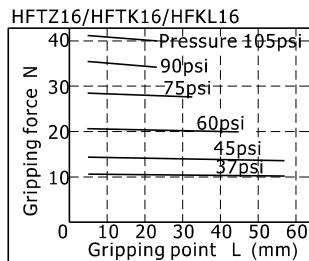
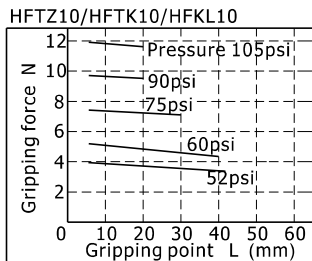
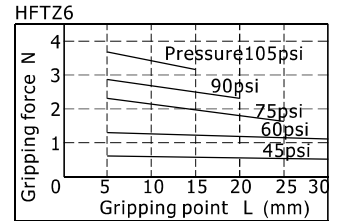
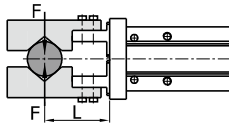
Air gripper(parallel style)

AIRTAC

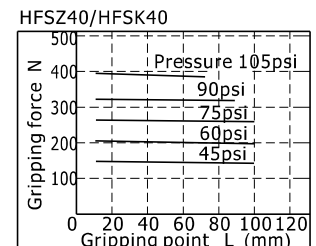
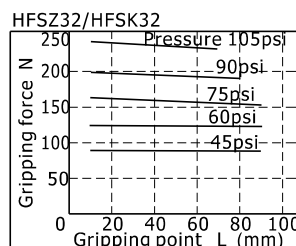
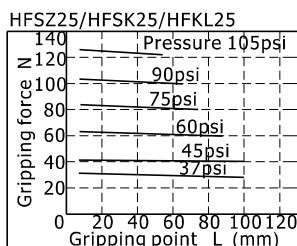
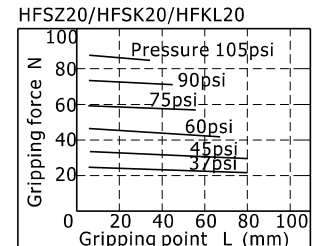
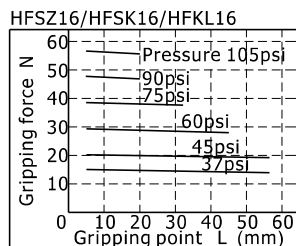
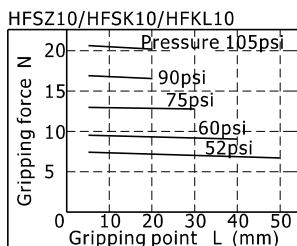
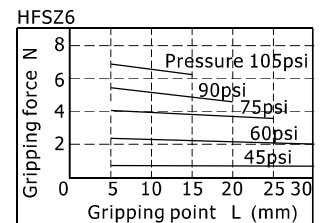
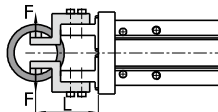
HFZ,HFK,HFKL Series

Bore size: Φ10, Φ16, Φ20, Φ25, Φ32, Φ40

Single acting normally opened gripping force



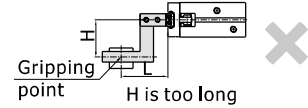
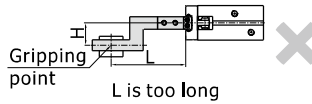
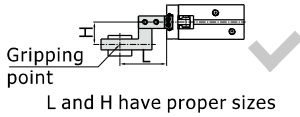
Single acting normally closed clamping force



2. The selection of the gripping point

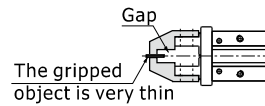
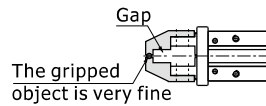
2.1) Please select the gripping point within the limited field shown below.

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



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.



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
		HFK	HFZ	HFKL	Mp	My	Mr		
[Note] The loads and torque values of said are all static values.	6	-	10	-	0.04	0.04	0.08	$\text{Allowable load(N)} = \frac{M(\text{Maximum permissible moment})(\text{N.m})}{L \times 10^{-3}}$ Unit conversion constant	In the guide rail of HFK16, the external force of the pitching moment static loads put on the point of L=30mm is f=10 N, 0.68 $\text{Allowable load } F = \frac{0.68}{30 \times 10^{-3}} = 22.7(\text{N})$ Actual load f=10(N) < 22.7(N) To meet the using requirements
	10	87	58	87	0.26	0.26	0.53		
	16	147	98	147	0.68	0.68	1.36		
	20	221	147	221	1.32	1.32	2.65		
	25	382	255	382	1.94	1.94	3.88		
	32	514	343	-	3	3	6		
	40	735	490	-	4.5	4.5	9		

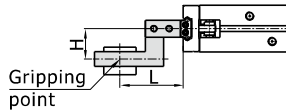
Air gripper(parallel style)

AIRTAC

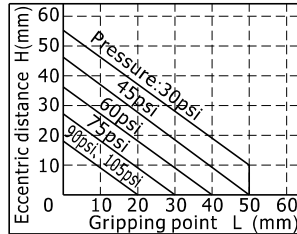
HFZ,HFK,HFKL Series

Bore size: $\Phi 10$, $\Phi 16$, $\Phi 20$, $\Phi 25$, $\Phi 32$, $\Phi 40$

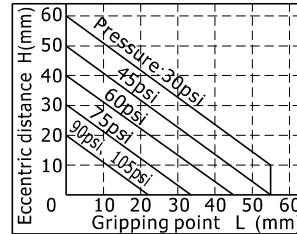
The range of the closed gripping points



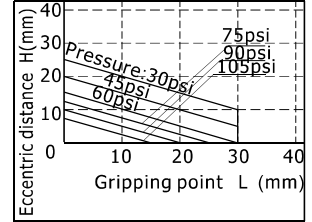
HFZ10/HFK10/HFKL10



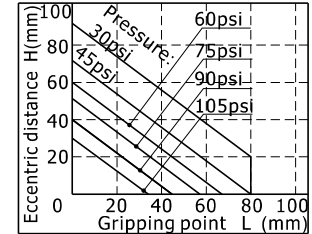
HFZ16/HFK16/HFKL16



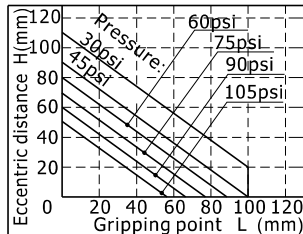
HFZ6



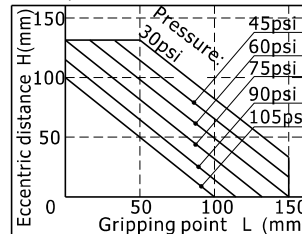
HFZ20/HFK20/HFKL20



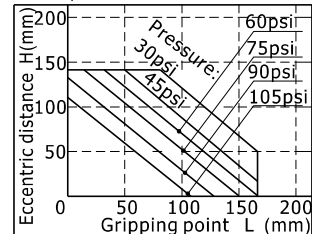
HFZ25/HFK25/HFKL25



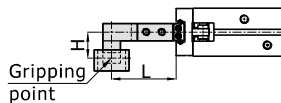
HFZ32/HFK32



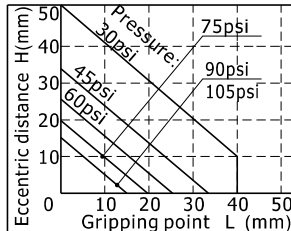
HFZ40/HFK40



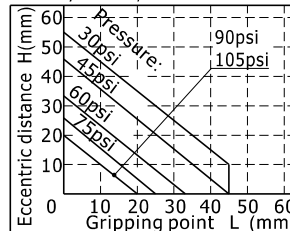
The range of the opened clamping point



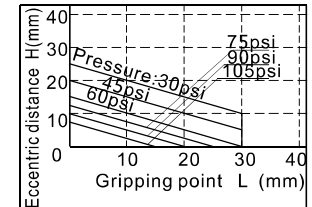
HFZ10/HFK10/HFKL10



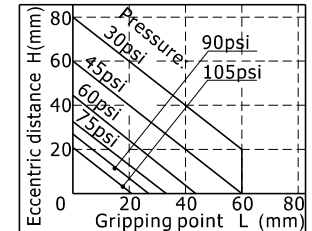
HFZ16/HFK16/HFKL16



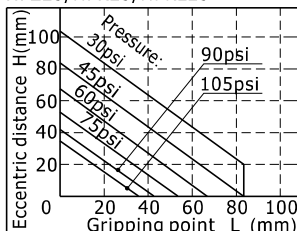
HFZ6



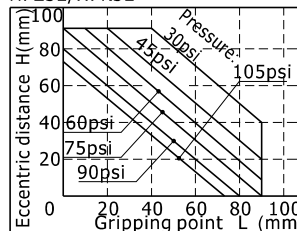
HFZ20/HFK20/HFKL20



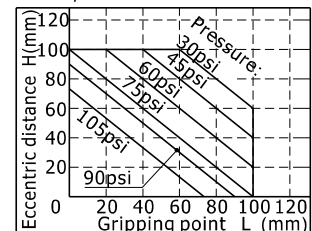
HFZ25/HFK25/HFKL25



HFZ32/HFK32



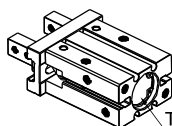
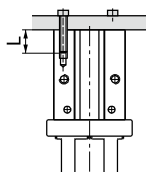
HFZ40/HFK40



Installation and application

1. Due to the abrupt changes, the circuit pressure is low, which will lead to the decrease of the gripping force and falling of the work-pieces. In order to avoid the harm to the human body and damage to the equipment, anti-dropping device must be equipped.
2. Don't use the air gripper under strong external force and impact force.
3. Please contact with us when the single acting type clamps only with the spring force.
4. When install and fix the air gripper, avoid falling down, collision and damage.
5. When fixing the gripping jaw parts, don't twist the gripping jaw.
6. There are several kinds of installation method, and the locking torque of fastening screw must be within the prescribed torque range shown in the below chart. If the locking torque is too large, it will cause the dysfunctional. If the locking torque is too small, it will cause the position deviation and fall.

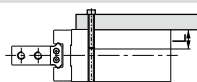
Tail installation type



The bore of the tail is used for mounting and positioning

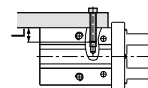
Bore size	The bolts type	Max. locking moment	Max. screwed depth	The aperture of the positioning bore	The depth of the positioning bore
10	M3×0.5	0.88N.m	6mm	Φ11mm $+0.05/0$	1.5mm
16	M4×0.7	2.1N.m	8mm	Φ17mm $+0.05/0$	1.5mm
20	M5×0.8	4.3N.m	10mm	Φ21mm $+0.05/0$	2mm
25	M6×1.0	7.3N.m	12mm	Φ26mm $+0.05/0$	2mm
32	M6×1.0	7.9N.m	12mm	Φ34mm $+0.05/0$	2.5mm
40	M8×1.25	17.7N.m	16mm	Φ42mm $+0.05/0$	2.5mm

The installation of the front threaded hole



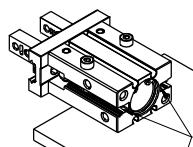
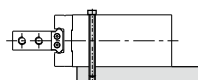
Bore size	The bolts type	Max. locking moment(Nm)	Max. screwed depth(mm)
6	M3×0.5	0.88	10
10	M3×0.5	0.69	5
16	M4×0.7	2.1	7
20	M5×0.8	4.3	8
25	M6×1.0	7.3	10
32	M6×1.0	7.9	12
40	M8×1.25	17.7	12

Surface installation type



Bore size	The bolts type	Max. locking moment(Nm)	Max. screwed depth(mm)
10	M3×0.5	0.9	6
16	M4×0.7	1.6	4.5
20	M5×0.8	3.3	8
25	M6×1.0	5.9	10
32	M6×1.0	5.9	10
40	M8×1.25	13.7	12

The installation of the front through hole

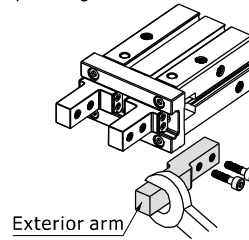


When installed from front through holes, sensors can not be installed in the sensor grooves that are interfered by screws.

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

7. The installation method of the gripping jaw fittings When install the gripping jaw fittings, you have to pay particular attention that you can only hold the gripping jaw by using spanner, and then lock the screws with allen wrench. Never clamp the body directly and then lock the screws, otherwise the parts will be easily damaged.

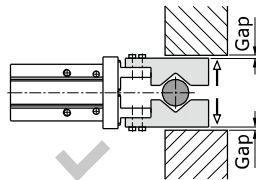
Bore size	The bolts type	Max. locking moment(Nm)
6	M2×0.4	0.15
10	M2.5×0.45	0.31
16	M3×0.5	0.59
20	M4×0.7	1.4
25	M5×0.8	2.8
32	M6×1.0	4.9
40	M8×1.25	11.8



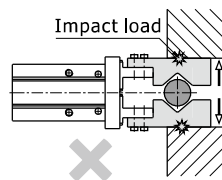
8. Confirm that there is no external forces exerted on the gripping jaw.

Transverse load acts on the gripping jaw, which will cause impact load and leads to the shaking and damage of gripping jaw. Equip with gaps so that the air gripper will not crash into work-pieces and accessories at the end of its trip.

- 8.1) The end of stroke under the open state of air gripper

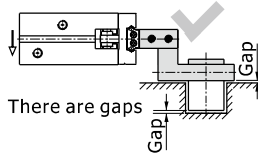


There are gaps

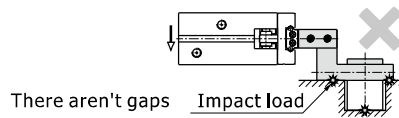


There aren't gaps

- 8.2) The end of stroke under the move state of air gripper



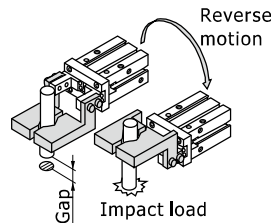
There are gaps



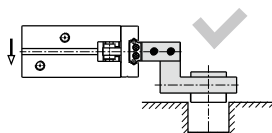
There aren't gaps

- 8.3) Reverse motion state

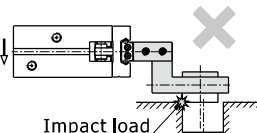
When reverse motion state, the gripping point must be precision, otherwise in the reverse motion state the air gripper maybe impact with ambience and will cause impact load .



9. When the work-pieces are inserted, the center line should be coaxial, no offset, in case there are external force generated on gripping jaw. When testing, it is specially required that the manual operation should be reduced, the pressure should be used to run it at a low speed, and guarantee the safety and no impact.



Center coaxial



Center offset

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

11. People can not enter the movement path of air gripper and articles can not be placed on the path too.

12. Before removing the air gripper, please confirm that it is out of working state, and then discharge of compressed air.