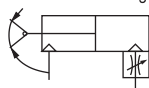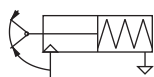**AirTAC**

■ Symbol

HFY: Double acting

HFTY: Single acting and normally opened

■ Product feature

1. Using a single piston structure, large gripping torque.
2. Integrated with variable flow valve, it is easy and convenient to adjust the speed of opening and closing of gripping jaw.
3. Reasonable gripping angle, wide range of actual use.
4. Precise positioning accuracy, it is more accurate and reliable when gripping work-piece.
5. Various types of installation, it is convenient for the use in different occasions.
6. All series are attached with magnet, so that it is easy to control.

■ Specification

Bore size (mm)		6	10	16	20	25	32
Acting type				Double acting	Single acting		
Fluid			Air(to be filtered by 40 μm filter element)				
Operating pressure	Double acting Φ6			0.15~0.7MPa(22~100psi)(1.5~7.0bar)			
	Φ10~Φ32			0.1~0.7MPa(15~100psi)(1.0~7.0bar)			
	Single acting Φ6			0.3~0.7MPa(45~100psi)(3.0~7.0bar)			
	Φ10~Φ32			0.25~0.7MPa(36~100psi)(2.5~7.0bar)			
Temperature ℃				-20~70			
Lubrication			Cylinder：Not required；　Gripper jaws：Lubricate grease				
Cushion type				Bumper			
Max. frequency				180(c.p.m)			
Sensor switches ①		DS1-H		CS1-G、DS1-G			

① Sensor switch should be ordered additionally，please refer to P397~420 for detail of sensor switch.

■ Ordering code

HFY 20

Model ● ● Bore size

HFY: Air finger(Angle style, Double acting)
HFTY: Air finger(Angle style, Single acting and normally opened)

Bore size
6: Φ6mm
10: Φ10mm
16: Φ16mm
20: Φ20mm
25: Φ25mm
32: Φ32mm

Add) HFY series are all attached with magnet.

■ Gripping force and stroke

| Acting	Model	Theoretical gripping torque (N·cm) Closed	Opened	Max. length of griping point (L)(mm)	Opening angle	Closing angle
Double acting	HFY6	$7.4 \times P$	$10.6 \times P$	30	30^{+3}_{0}	-10^{0}_{-3}
	HFY10	$17.6 \times P$	$29.4 \times P$	30		
	HFY16	$90 \times P$	$129 \times P$	40		
	HFY20	$152 \times P$	$252 \times P$	60		
	HFY25	$304 \times P$	$473 \times P$	70		
	HFY32	$637 \times P$	$904 \times P$	85		
Single acting Normally opened	HFTY6	$5.7 \times P$	-	30		
	HFTY10	$11.8 \times P$	-	30		
	HFTY16	$71.2 \times P$	-	40		
	HFTY20	$122.4 \times P$	-	60		
	HFTY25	$252 \times P$	-	70		
	HFTY32	$589 \times P$	-	85		

Note) The P in the gripping torque shown in the above chart represents the actual use of air pressure.

■ Inner structure and material of major parts

NO.	Item	Material
1	Gripping jaws	Carbon steel
2	Pin	Stainless steel
3	Front cover	Aluminum alloy
4	Rod packing	NBR
5	Piston rod	Aluminum alloy/Stainless steel
6	Bumper	TPU
7	Countersink screw	Carbon steel
8	Magnet washer	NBR
9	Piston	Aluminum alloy/Stainless steel
10	Bumper	TPU
11	C clip	Spring steel
12	Back cover	Aluminum alloy
13	Steel ball	Stainless steel
14	O-ring	NBR
15	O-ring	NBR
16	Screw cap	Carbon steel
17	Adjustable nut	Brass
18	Fixed nut	Brass
19	O-ring	NBR
20	Piston seal	NBR
21	Magnet	Sintered metal (Neodymium-iron-boron)
22	Body	Aluminum alloy
23	Countersink screw	Carbon steel
24	Pin	Stainless steel
25	Pin sheath	Stainless steel

HFY
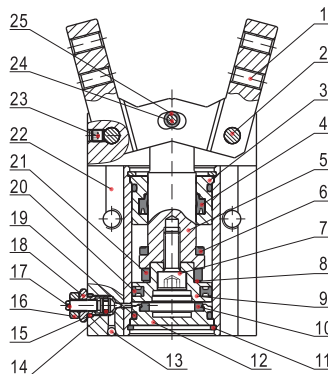
Dimensions
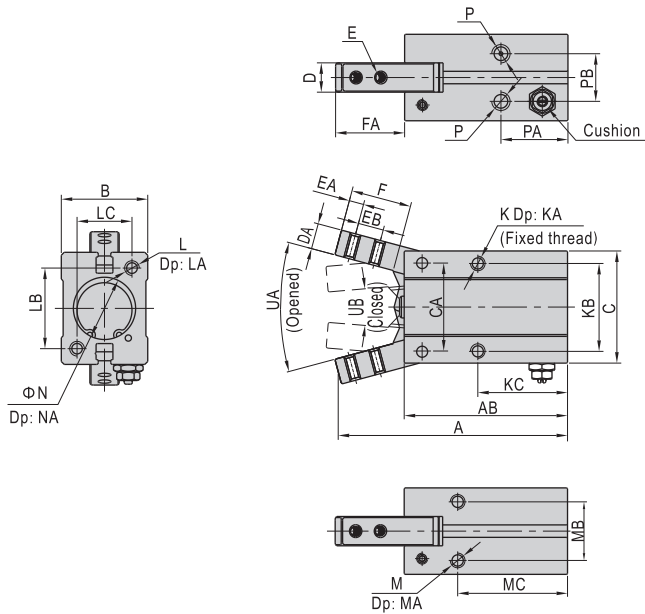
Bore size\Item	A	AB	B	C	CA	D	DA	E		EA	EB	F	FA
6	47.5	36	10.5	20	14	4	4	M2×0.4		2.5	5	11	12
10	52.5	38.5	16.5	23	14	6.4	4	M2.5×0.45		3	5.7	12	14.5
16	62.5	44.5	23.5	30.5	24	8	7	M3×0.5		4	7	16	19
20	78	55	27.5	42	30	10	8	M4×0.7		5	9	20	23.5
25	92	60.5	33.5	52	36	12	10	M5×0.8		8	12	27	33
32	96.5	68	40	60	42	18	10	M6×1.0		6	14	27	29.5

Bore size\Item	K	KA	KB	KC	L	LA	LB	LC	M	MA
6	M3×0.5	Thru. thread	12	26	-	-	-	-	-	-
10	M3×0.5	5	16	23	M3×0.5	6	18	12	M3×0.5	6
16	M4×0.7	7	24	24.5	M4×0.7	8	22	15	M4×0.7	8
20	M5×0.8	8	30	29	M5×0.8	10	32	18	M5×0.8	10
25	M6×1.0	10	36	30	M6×1.0	12	40	22	M6×1.0	10
32	M6×1.0	10	44	37.5	M6×1.0	12	46	26	M6×1.0	10

Bore size\Item	MB	MC	N	NA	P	PA	PB	UA(Opened)	UB(Closed)
6	-	-	$7^{+0.05}_{0}$	1.5	M3×0.5	19	1.5	30°	10°
10	11.5	27	$11^{+0.05}_{0}$	1.5	M3×0.5	19	10	30°	10°
16	16	30	$17^{+0.05}_{0}$	1.5	M5×0.8	18.5	13	30°	10°
20	18.5	35	$21^{+0.05}_{0}$	1.5	M5×0.8	22	15	30°	10°
25	22	36.5	$26^{+0.05}_{0}$	1.5	M5×0.8	23.5	20	30°	10°
32	26	30	$34^{+0.05}_{0}$	2	M5×0.8	31	24	30°	10°

How to select product

1. The selection of gripping force
Please determine the gripping force according to the below methods.
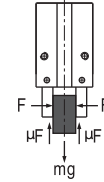
The work-pieces as shown in the left :
F: Gripping force (N)
μ : friction coefficient between fittings and work-pieces.
m: mass of work-pieces
g: acceleration of gravity (=9.8m/s²)

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

so: $F> \dfrac{mg}{2× \mu}$

Safety coefficient is a, so F is:

$$F= \dfrac{mg}{2× \mu} ×a$$

The gripping work-pieces shown above, 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.
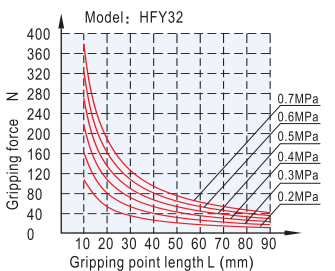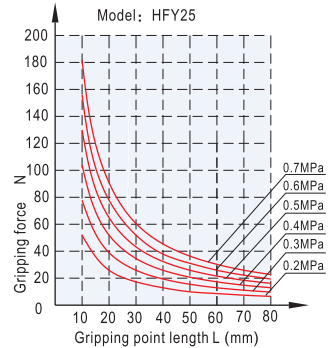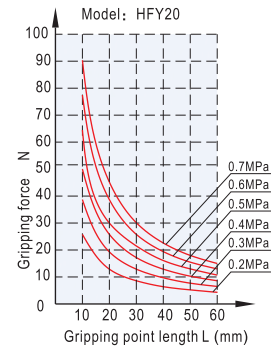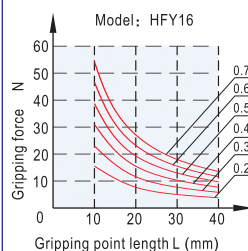
μ =0.2	μ =0.1
$F= \dfrac{mg}{2×0.2} ×4$ $=10×mg$	$F= \dfrac{mg}{2×0.1} ×4$ $=20×mg$
10 times of the mass of the gripped objects	20 times of the mass of the gripped objects

Note) If the friction coefficient μ >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.

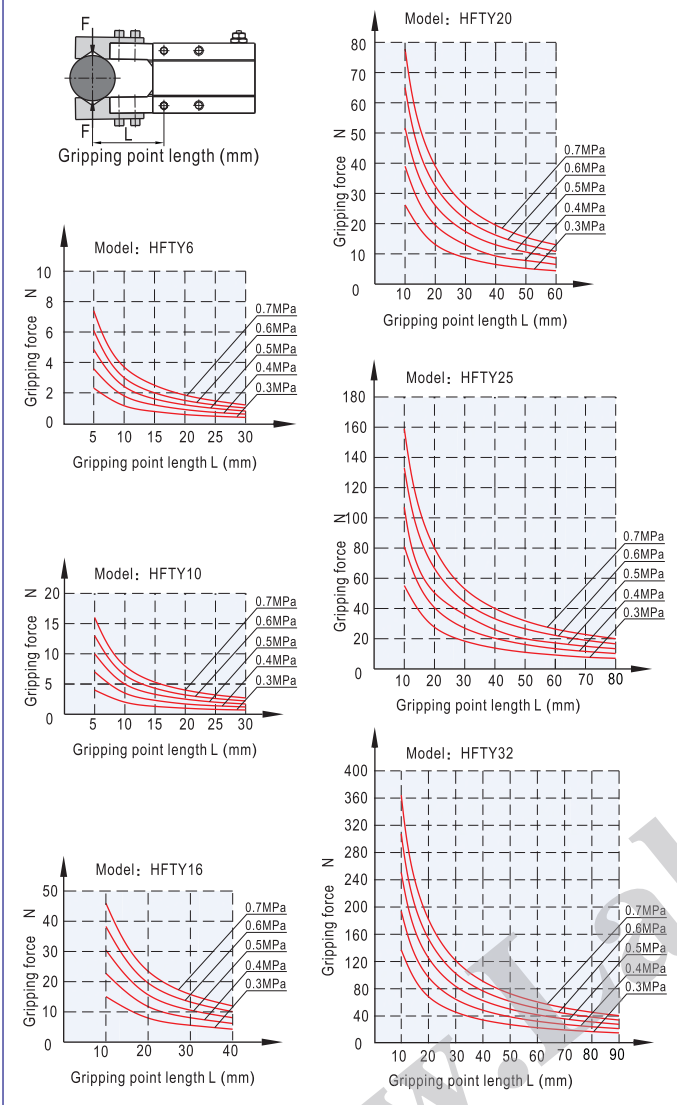**2. The selection of the gripping point**
When the gripping force is determined, select the gripping point according to the limitation ranges shown in the below chart. If the gripping point is over the limit, the gripping jaw will be subjected to excessive moment load, and lead to short life of air gripper.

Double acting type closed gripping force


Gripping point length (mm)

Model：HFY20

Model：HFY6

Model：HFY25

Model：HFY10

Model：HFY16

Model：HFY32
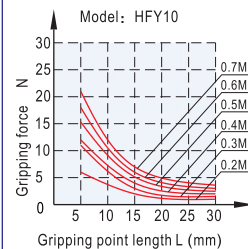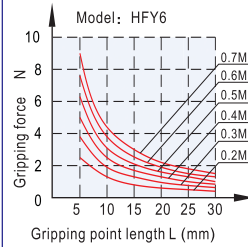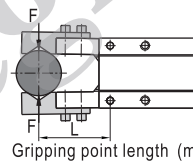
HFY

Single acting closed gripping force

Gripping point length (mm)

Model：HFTY6

Gripping force N

Gripping point length L (mm)

Model：HFTY10

Gripping force N

Gripping point length L (mm)

Model：HFTY16

Gripping force N

Gripping point length L (mm)

Model：HFTY20

Gripping force N

Gripping point length L (mm)

Model：HFTY25

Gripping force N

Gripping point length L (mm)

Model：HFTY32

Gripping force N

Gripping point length L (mm)

0.7MPa
0.6MPa
0.5MPa
0.4MPa
0.3MPa

Installation and application

1. Due to the abrupt changes, the 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. When install and fix the air gripper, avoid falling down, collision and damage.
4. When fixing the gripping jaw parts, don't twist the gripping jaw.
5. There are several kinds of installation method, and the torque of fastening screw must be within the prescribed moment range shown in the below chart. If the locking moment is too large, it will cause the dysfunctional. If the locking moment 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
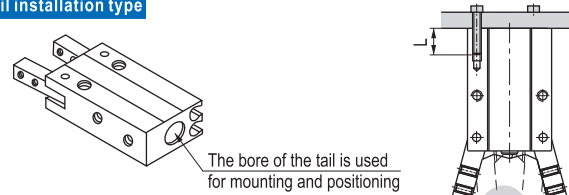
Bore size	The bolts type	Max. locking moment (Nm)	Max. screwed depth (mm)	The aperture of the positioning bore(mm)	The depth of the positioning bore(mm)
6	-	-	-	Φ 7H9	1.5
10	M3 × 0.5	0.88	6	Φ 11H9	1.5
16	M4 × 0.7	2.1	8	Φ 17H9	1.5
20	M5 × 0.8	4.3	10	Φ 21H9	1.5
25	M6 × 1.0	7.3	12	Φ 26H9	1.5
32	M6 × 1.0	7.3	12	Φ 34H9	1.5

The installation of front threaded hole
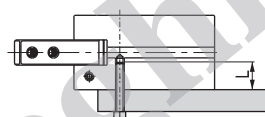
Bore size	The bolts type	Max. locking moment (Nm)	Max. screwed depth (mm)
6	M3 × 0.5	0.69	5
10	M3 × 0.5	0.69	5
16	M4 × 0.7	2.1	7
20	M5 × 0.8	4.3	8
25	M6 × 1.0	7.3	10
32	M6 × 1.0	7.3	10

The installation of front through hole
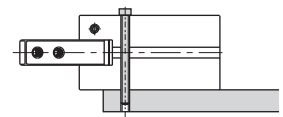
Bore size	The bolts type	Max. locking moment (Nm)	Max. screwed depth (mm)
6	M2.5 × 0.45	0.49	5
10	M2.5 × 0.45	0.49	5
16	M3 × 0.5	0.88	7
20	M4 × 0.7	2.1	8
25	M5 × 0.8	4.3	10
32	M5 × 0.8	4.3	10

Surface installation type
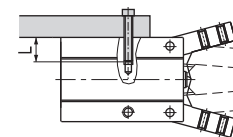
Bore size	The bolts type	Max. locking moment (Nm)	Max. screwed depth (mm)
10	M3 × 0.5	0.88	6
16	M4 × 0.7	1.6	6.5
20	M5 × 0.8	3.3	8
25	M6 × 1.0	5.9	10
32	M6 × 1.0	5.9	10

6. 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

Exterior arm
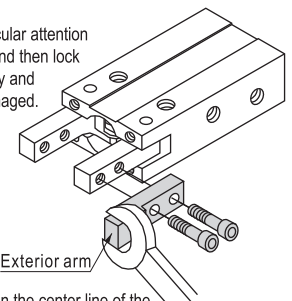
7. When gripping work-piece, the work-piece must be located in the center line of the two gripping jaws, and the two gripping jaws also need to touch the work-piece at the same time, otherwise they will be easily damaged.
8. Confirm that there is no additional external forces that are exerted on the 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.
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.
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.

HFY