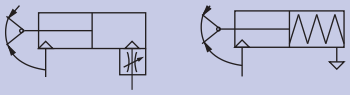
Pneumatic Air Grippers
Angular Style

Specification

Bore size (mm)			6	10	16	20	25	32
Acting type			Double Acting Single Acting					
Fluid			Air (to be filtered by 40μm filter element)					
Operating Pressure	Double Acting	Ø 6	0.15-0.7 MPa (22-100 psi) (1.5-7.0 bar)					
		Ø 10 - Ø 32	0.1-0.7 MPa (15-100 psi) (1.0-7.0 bar)					
	Single Acting	Ø 6	0.3-0.7 MPa (45-100 psi) (3.0-7.0 bar)					
		Ø 10 - Ø 32	0.15-0.7 MPa (22-100 psi) (1.5-7.0 bar)					
Temperature °C			-20°C to +70°C					
Lubrication			Cylinder: not required Gripper jaws: lubricate grease					
Cushion type			Bumper					
Maximum frequency			180 (cpm)					
Sensor switches*			DS1-H	CS1-G DS1-G				

*Sensor switch should be ordered separately.

Symbol



Double acting

Single acting and normally open

Ordering Code

KHFY — 20

Model	Bore Diameter
KHFY : Air finger (angle style, double acting)	06 : 6mm
KHFTY : Air finger (angle style, single acting and normally open)	10 : 10mm
	16 : 16mm
	20 : 20mm
	25 : 25mm
	32 : 32mm

Product Features

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

Gripping Force & Stroke

Acting	Model	Theoretical gripping torque (N-cm) Closed	Theoretical gripping torque (N-cm) Opened	Max. Length of gripping point	Opening angle	Closing angle
Double Acting	HFY6	7.4 x P	10.6 x P	30mm	30°	-10°
	HFY10	17.6 x P	29.4 x P	30mm		
	HFY16	90 x P	129 x P	40mm		
	HFY20	152 x P	252 x P	60mm		
	HFY25	304 x P	473 x P	70mm		
	HFY32	637 x P	904 x P	85mm		
Single Acting	HFTY6	5.7 x P	–	30mm		
	HFTY10	11.8 x P	–	30mm		
	HFTY16	71.2 x P	–	40mm		
	HFTY20	122.4 x P	–	60mm		
	HFTY25	252 x P	–	70mm		
	HFTY32	589 x P	–	85mm		

NB: the 'P' in the Gripping Torque above represents the actual use of air pressure.

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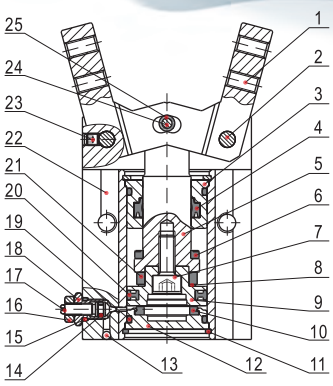
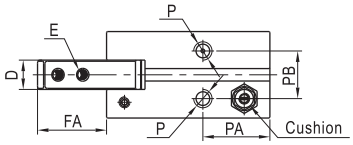
Inner Structure & Material of Major Parts

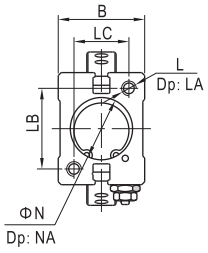


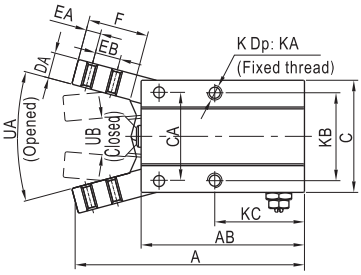
No.	Item	Material
1	Gripping jaws	Carbon steel
2	Pin	Stainless steel
3	Front cover	Aluminium alloy
4	Rod packing	NBR
5	Piston rod	Aluminium alloy/stainless steel
6	Bumper	TPU
7	Countersink screw	Carbon steel
8	Magnet washer	NBR
9	Piston	Aluminium alloy/stainless steel
10	Bumper	TPU
11	C clip	Spring steel
12	Back cover	Aluminium alloy

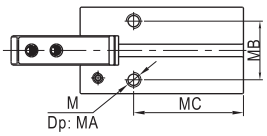
No.	Item	Material
13	Steel ball	Stainless steel
14	O-ring	NBR
15	O-ring	NBR
16	Screw cap	Carbon steel
17	Adjustable nut	Brass
18	Fixed nut	Brass
19	O-ring	NBR
20	Piston seal	NBR
21	Magnet	Sinered metal
22	Body	Aluminium alloy
23	Countersink screw	Carbon steel
24	Pin	Stainless steel
25	Pin sheath	Stainless steel

Dimensions









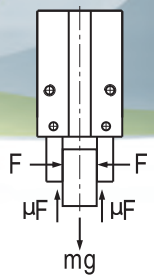
Bore size/item	A	AB	B	C	CA	D	DA	E	EA	EB	F	FA
6	47.5	36	10.5	20	14	4	4	M2 X 0.4	2.5	5	11	12
10	52.5	38.5	16.5	23	14	6.4	4	M2.5 X 0.45	3	5.7	12	14.5
16	62.5	44.5	23.5	30.5	24	8	7	M3 X 0.5	4	7	16	19
20	78	55	27.5	42	30	10	8	M4 X 0.7	5	9	20	23.5
35	92	60.5	33.5	52	36	12	10	M5 X 0.8	8	12	27	33
32	96.5	68	40	60	42	18	10	M6 X 1.0	6	14	27	29.5

Bore size/item	K	KA	KB	KC	L	LA	LB	LC	M	MA
6	M3 X 0.5	Through thread	12	26	–	–	–	–	–	–
10	M3 X 0.5	5	16	23	M3 X 0.5	6.4	18	12	M3 X 0.5	6
16	M4 X 0.7	7	24	24.5	M4 X 0.7	8	22	15	M4 X 0.7	8
20	M5 X 0.8	8	30	29	M5 X 0.8	10	34	18	M5 X 0.8	10
35	M6 X 1.0	10	36	30	M6 X 1.0	12	40	22	M6 X 1.0	10
32	M6 X 1.0	10	44	37.5	M6 X 1.0	18	46	26	M6 X 1.0	10

Bore size/item	MB	MC	N	NA	P	PA	PB	UA (open)	UB (closed)
6	–	–	7	1.5	M3 X 0.5	19	1.5	30°	10°
10	11.5	27	11	1.5	M3 X 0.5	19	10	30°	10°
16	16	30	17	1.5	M5 X 0.8	18.5	13	30°	10°
20	18.5	35	21	1.5	M5 X 0.8	22	15	30°	10°
35	22	36.5	26	1.5	M5 X 0.8	23.5	20	30°	10°
32	26	30	34	2	M5 X 0.8	31	24	30°	10°

Pneumatic Air Grippers
Angular Style

How to Select Product



1. Selection of gripping force

Please determine the gripping force according to the method below. 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.

$\mu = 0.2$	$\mu = 0.1$
$F = \frac{mg}{2 \times 0.2} \times 4 = 10 \times mg$	$F = \frac{mg}{2 \times 0.1} \times 4 = 20 \times mg$
10 times the mass of the gripped object	20 times the mass of the gripped object

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.

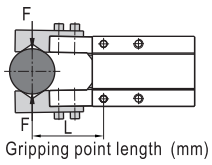
The work pieces as shown to the left:
F: gripping force (N)
μ: friction coefficient between fittings and work pieces.
m: mass of work pieces
g: acceleration of gravity (=9.8m/s²)

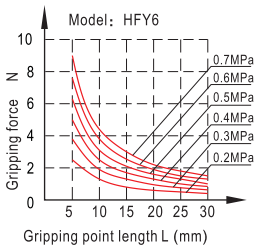
The condition that the work pieces won't drop is: $2 \times \mu F > mg$	Safety coefficient is a, so F is:
$F > \frac{mg}{2 \times \mu}$	$F > \frac{mg}{2 \times \mu} \times a$

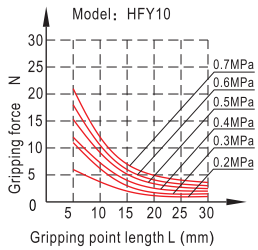
2. Selection of gripping point

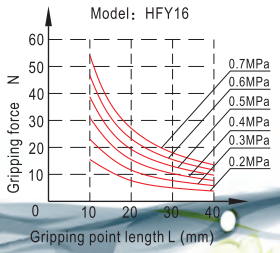
When the gripping force is determined, select the gripping point according to the limitation ranges shown in the below charts. If the gripping point is above the limit, the gripping jaw will be subjected to excessive moment load, and lead to shortened life of the air gripper.

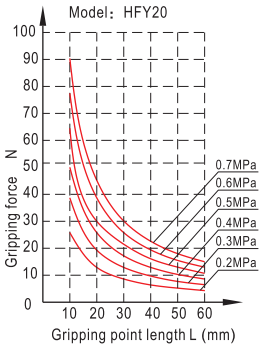
Double acting, closed gripping force

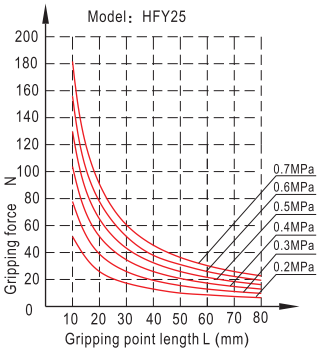


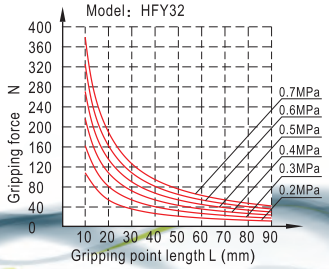




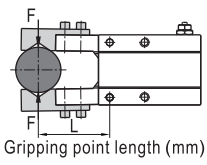


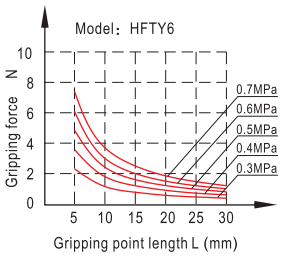


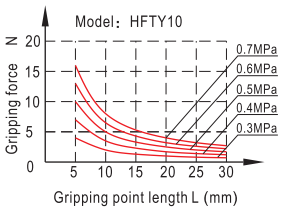


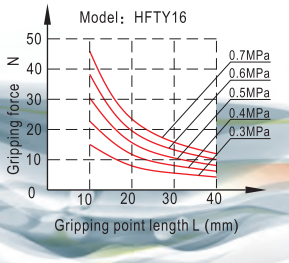


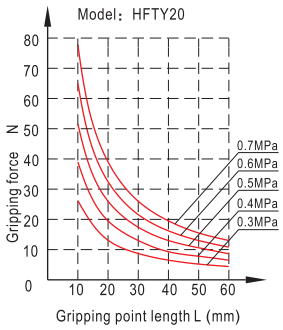
Single acting, closed gripping force

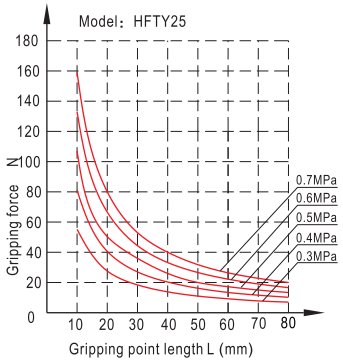


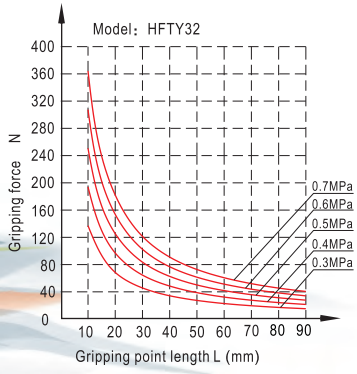












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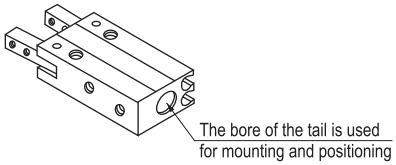
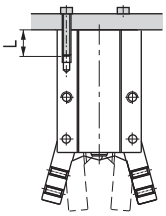
Pneumatic Air Grippers
Angular Style

Installation & Application

1. Due to the abrupt changes, the pressure is low, which will lead to the decrease of the gripping force and failing 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. Of 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.

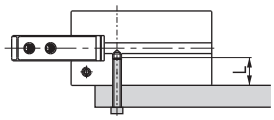
Tail Installation Type





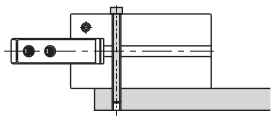
Bore size	Bolt types	Max. locking moment (Nm)	Max. screwed depth (mm)	Positioning bore aperture (mm)	Positioning bore depth (mm)
6	–	–	–	Ø 7H9	1.5
10	M3 X 0.5	0.88	6	Ø 1159	1.5
16	M4 X 0.7	2.1	8	Ø 17H9	1.5
20	M5 X 0.8	4.3	10	Ø 21H9	1.5
25	M6 X 1.0	7.3	12	Ø 26H9	1.5
32	M6 X 1.0	7.3	12	Ø 34H9	1.5

Installation of front threaded hole



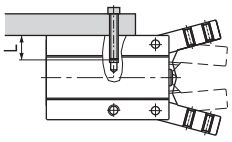
Bore size	Bolt types	Max. locking moment (Nm)	Max. screwed depth (mm)
6	M3 X 0.5	0.69	5
10	M3 X 0.5	0.69	5
16	M4 X 0.7	2.1	7
20	M5 X 0.8	4.3	8
25	M6 X 1.0	7.3	10
32	M6 X 1.0	7.3	10

Installation of front through hole



Bore size	Bolt types	Max. locking moment (Nm)	Max. screwed depth (mm)
6	M2.5 X 0.45	0.49	5
10	M2.5 X 0.45	0.49	5
16	M3 X 0.5	0.88	7
20	M4 X 0.7	2.1	8
25	M5 X 0.8	4.3	10
32	M5 X 0.8	4.3	10

Surface installation type



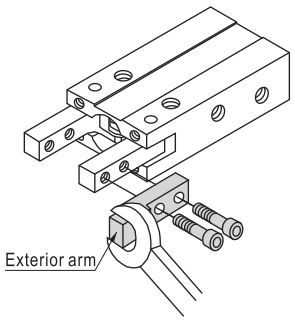
Bore size	Bolt types	Max. locking moment (Nm)	Max. screwed depth (mm)
10	M3 X 0.5	0.88	6
16	M4 X 0.7	1.6	6.5
20	M5 X 0.8	3.3	8
25	M6 X 1.0	5.9	10
32	M6 X 1.0	5.9	10

Pneumatic Air Grippers Angular Style

Installation & Application

6. Please note: when installing the gripping jaw fittings you can only hold the gripping jaw 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 types	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



7. When gripping the work piece, it must be located in the centre 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 no additional external forces 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 the gripping jaw. Ensure gaps are included so that the air gripper will not severely contact work pieces or accessories at the end of its movement.
9. When the work pieces are inserted, the centre line should be coaxial, no offset, in case there are external forces generated on the gripping jaw. When testing, it is specifically required that the manual operation should be reduced, the pressure should be used to run it at a low speed to guarantee the safety and no impact.
10. Please use the flow control valve to adjust the opening and closing speed of the gripping jaw if too fast.
11. People or items should not enter the movement path of the air gripper.
12. Before removing the air gripper, please confirm that it is out of its working state, and then discharge any compressed air.