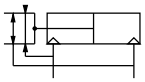
Air gripper——HFCQ Series

Parallel open/close hollow style



Ordering code

HFCQ 20 E

① ② ③

① Model

HFCQ: Air finger
(Double acting, parallel hollow type)

HFCQ series are all attached with magnet.

② Bore size

16 20 25 32 40 50 63

③ Push rod mechanism

Blank: Without push rod mehanism

E: Cylinder push rod mechanism

V: Spring push rod mechanism

[Note] The push rod mechanism can only be used with Φ32/Φ40/Φ50/Φ63.

Push rod mechanism

F-HFCQ 32 E

① ② ③

① Model

HFCQ: Air finger
(Double acting, parallel hollow type)

② Bore size

32 40 50 63

③ Push rod mechanism type

E: Cylinder push rod mechanism

V: Spring push rod mechanism

Specification

Bore size (mm)	16	20	25	32	40	50	63
Acting type	Double acting						
Fluid	Air(to be filtered by 40μm filter element)						
Operating pressure	28~100psi(0.2~0.7MPa)			22~100psi(0.15~0.7MPa)			
Temperature	-20~70℃						
Lubrication	Not required						
Repeatability mm	±0.01						
Max. frequency	120(c.p.m)			60(c.p.m)			
Sensor switches	CMSH/DMSH/EMSH						
Port size	M3×0.5	M5×0.8					
Hollow diameter	$\Phi3^{+0.05}_{+0}$	$\Phi3^{+0.05}_{+0}$	$\Phi4^{+0.05}_{+0}$	$\Phi6^{+0.05}_{+0}$	$\Phi10^{+0.05}_{+0}$	$\Phi12^{+0.05}_{+0}$	$\Phi16^{+0.05}_{+0}$
Push rod mechanism	-			Cylinder or Spring push rod mechanism			
Port size of push rod mechanism	-			M5×0.8			

[Note] Refer to P535 for detail of sensor.

HFCQ Series Bore size: Φ16, Φ20, Φ25, Φ32, Φ40, Φ50, Φ63

Specification of Cylinder push rod mechanism

Model	HFCQ32E	HFCQ40E	HFCQ50E	HFCQ63E
Acting type	Double acting			
Fluid	Air(to be filtered by 40μm filter element)			
Operating pressure	28~100psi(0.2~0.7MPa)	22~100psi(0.15~0.7MPa)		
Temperature	-20~70 ℃			
Lubrication	Not required			
Push stroke mm	7	8	14	15
Max. frequency	60(c.p.m)			
Sensor switches	CMSH/DMSH/EMSH			
Push force N(0.5MPa)	45	130	204	335
Weight g	560	790	1350	2280

Specification of Spring push rod mechanism

Model	HFCQ32V	HFCQ40V	HFCQ50V	HFCQ63V
Push stroke mm	7	8	14	15
Push spring force N	5~12	9~18	16~31	24~40
Weight g	530	730	1270	2190

Gripping force and stroke

Model	Gripping force per finger Effective valve(N)		Opening/Closing stroke (Both sides)(mm)	Weight (g)
	Internal	External		
HFCQ16	15	9	4	100
HFCQ20	26	21	4	140
HFCQ25	45	36	6	220
HFCQ32	77	62	8	430
HFCQ40	118	97	8	560
HFCQ50	187	155	12	950
HFCQ63	329	280	16	1600

Note) The gripping force in the above table is in the working pressure of 75psi, and with a gripping point of L=20mm(Φ16~Φ25) or L=30mm(Φ32~Φ63).

Add) Please refer to page 482 for the definition of "L".

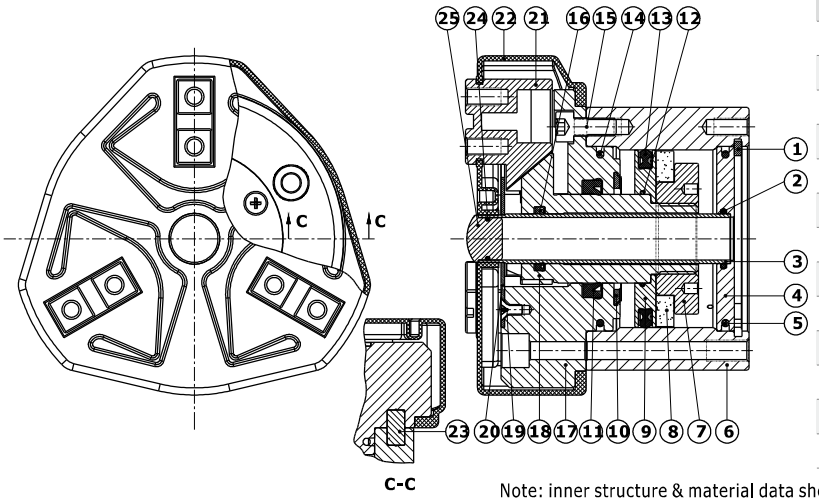
Air gripper(parallel open/close hollow style)

HFCQ Series

Bore size: Φ16, Φ20, Φ25, Φ32, Φ40, Φ50, Φ63

Inner structure

HFCQ32~63

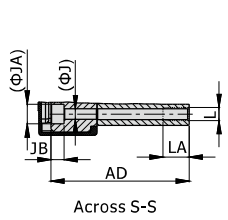


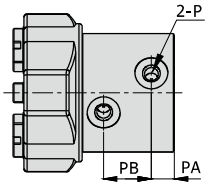
NO.	Item	NO.	Item
1	C clip	14	O-ring
2	O-ring	15	Countersink screw
3	Hollow tube	16	Rod packing
4	Back cover	17	Front cover
5	O-ring	18	Piston rod
6	Body	19	Screw
7	Magnet holder	20	Cover blank
8	Magnet	21	Jaw
9	Piston	22	Dustproof cover
10	Bumper	23	Pin
11	Rod packing	24	O-ring
12	O-ring	25	Dustproof pluger
13	Piston seal		

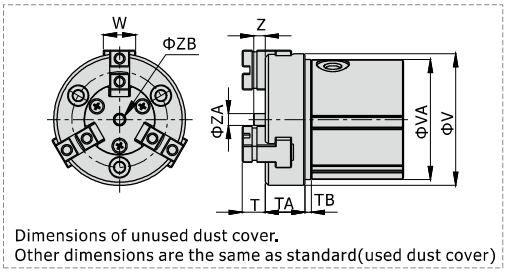
Note: inner structure & material data sheet is based on certain bore size.
Please contact AirTAC if you need inner structure & material data sheet for specific bore size.

Dimensions

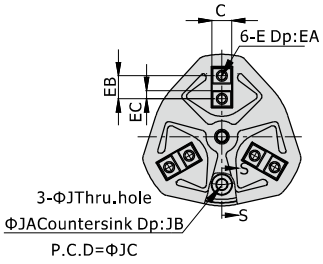
HFCQ16~25

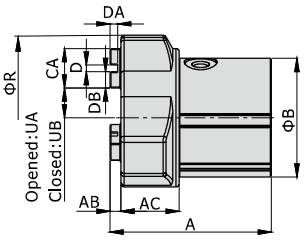


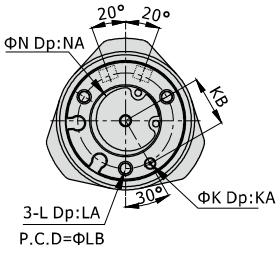




Dimensions of unused dust cover.
Other dimensions are the same as standard(used dust cover)







[Unit: mm]

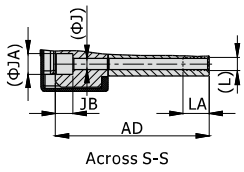
Bore size\Item	A	AB	AC	AD	B	C	CA	D	DA	DB	E	EA	EB	EC	J	JA	JB	JC	K	KA	KB	L
16	46	3	16	39	31	$5^{-0.01}_{-0.03}$	11	$2^{+0.04}_{+0.01}$	$2^{+0.2}_{0}$	4.5	M3×0.5	5	6	2	3.2	6	4	24	$3^{+0.04}_{+0.01}$	3	12	M4×0.7
20	49	3	18	42	36	$6^{-0.01}_{-0.03}$	12	$2^{+0.04}_{+0.01}$	$2^{+0.2}_{0}$	5	M3×0.5	5	7	2.5	3.2	6	4	29	$3^{+0.04}_{+0.01}$	3	15	M4×0.7
25	55	3	20	47	42	$6^{-0.01}_{-0.03}$	14	$2^{+0.04}_{+0.01}$	$2^{+0.2}_{0}$	6	M3×0.5	5	8	3	3.2	6	4	34	$3^{+0.04}_{+0.01}$	3	18	M4×0.7

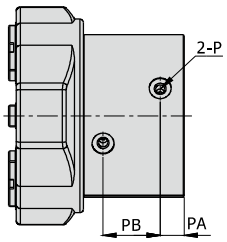
Bore size\Item	LA	LB	N	NA	P	PA	PB	R	UA	UB	T	TA	TB	V	VA	W	Z	ZA	ZB
16	8	24	$17^{+0.05}_{0}$	1.5	M3×0.5	7	14	44	9	7	7	10.5	3	34	31.5	8	3.5	3.7	$3^{+0.05}_{0}$
20	8	29	$21^{+0.05}_{0}$	1.5	M5×0.8	7	14	50	10	8	7	12	3	40	36.5	10	3.5	3.7	$3^{+0.05}_{0}$
25	8	34	$26^{+0.05}_{0}$	1.5	M5×0.8	8	17	59	12.5	9.5	8	13	3	47	42.5	12	4.5	4.7	$4^{+0.05}_{0}$

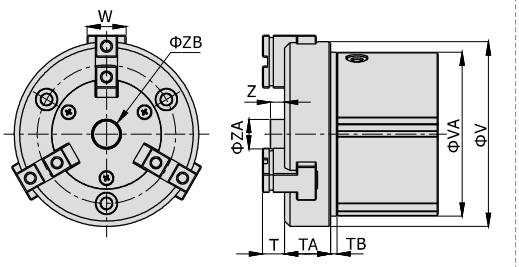
HFCQ Series

Bore size: Φ16, Φ20, Φ25, Φ32, Φ40, Φ50, Φ63

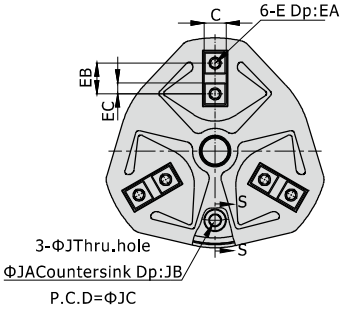
HFCQ32~63

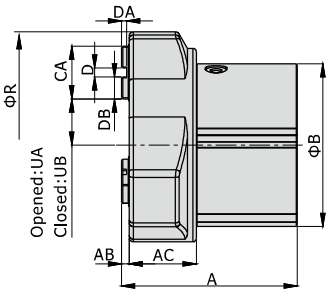


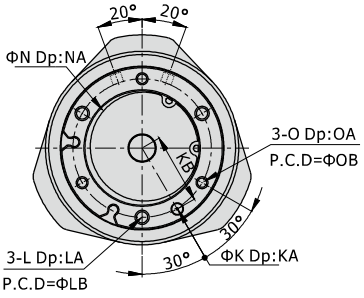




Dimensions of unused dust cover.
Other dimensions are the same as standard(used dust cover)







[Unit: mm]

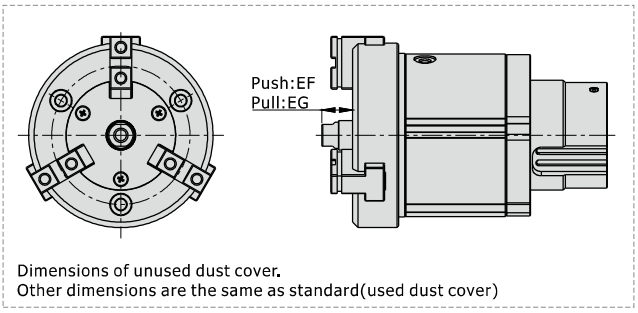
Bore size\Item	A	AB	AC	AD	B	C	CA	D	DA	DB	E	EA	EB	EC	J	JA	JB	JC	K	KA	KB	L
32	63	3	24	54	55	$8^{-0.01}_{-0.03}$	20	$2^{+0.04}_{+0.01}$	$2^{+0.2}_{0}$	9	M4×0.7	8	11	4.5	4.2	8	7	44	$4^{+0.04}_{+0.01}$	4	22	M5×0.8
40	66	3	26	57	62	$8^{-0.01}_{-0.03}$	21	$3^{+0.04}_{+0.01}$	$2^{+0.2}_{0}$	9	M4×0.7	8	12	4.5	4.2	8	7	52	$4^{+0.04}_{+0.01}$	4	26	M5×0.8
50	80	3	31	70	74	$10^{-0.01}_{-0.03}$	24	$4^{+0.04}_{+0.01}$	$2^{+0.2}_{0}$	10	M5×0.8	10	14	5	5.1	9.5	8	63	$5^{+0.04}_{+0.01}$	5	32	M6×1.0
63	91	4	37	79	92	$12^{-0.01}_{-0.03}$	28	$6^{+0.04}_{+0.01}$	$3^{+0.2}_{0}$	11	M5×0.8	10	17	5.5	6.6	11	8	78	$6^{+0.04}_{+0.01}$	6	40	M8×1.25

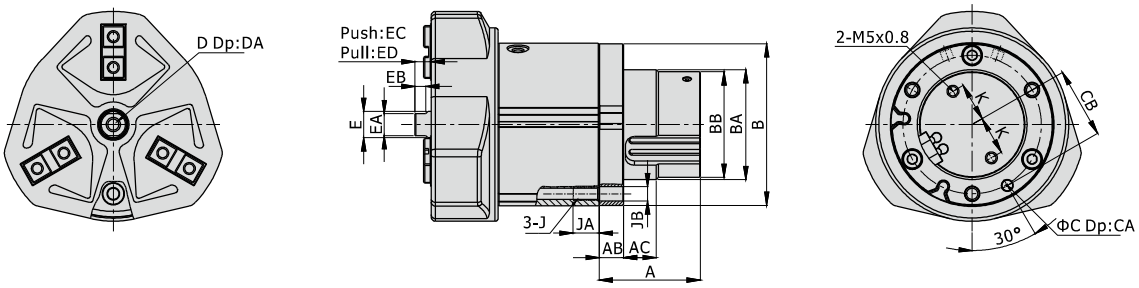
Bore size\Item	LA	LB	N	NA	O	OA	OB	P	PA	PB	R	UA	UB	T	TA	TB	V	VA	W	Z	ZA	ZB
32	10	44	$34^{+0.05}_{0}$	2	M4×0.7	8	44	M5×0.8	10	19	76	15.5	11.5	9	15.5	2.5	62	55.5	14	5	7.4	$6^{+0.05}_{0}$
40	10	52	$42^{+0.05}_{0}$	2	M4×0.7	8	52	M5×0.8	11	19	86	19	15	9	17.5	2.5	72	62.5	16	5	11.4	$10^{+0.05}_{0}$
50	12	63	$52^{+0.05}_{0}$	2	M5×0.8	10	63	M5×0.8	11	26	103	24	18	10	21	3	84	74.5	18	6	13.4	$12^{+0.05}_{0}$
63	16	78	$65^{+0.05}_{0}$	2.5	M6×1.0	12	78	M5×0.8	13	29	125	31	23	12	26	3	102	92.5	24	7	17.4	$16^{+0.05}_{0}$

HFCQ Series

Bore size: Φ16, Φ20, Φ25, Φ32, Φ40, Φ50, Φ63

HFCQ32E~63E **(With Cylinder push rod mechanism)**





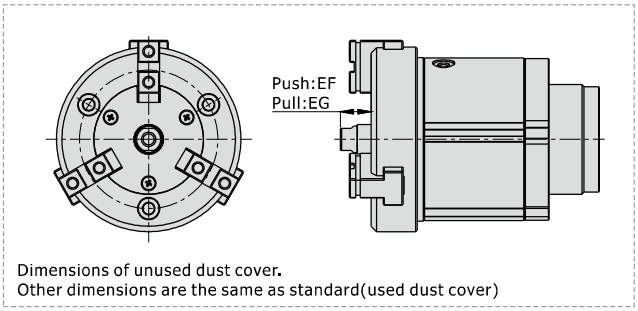
[Unit: mm]

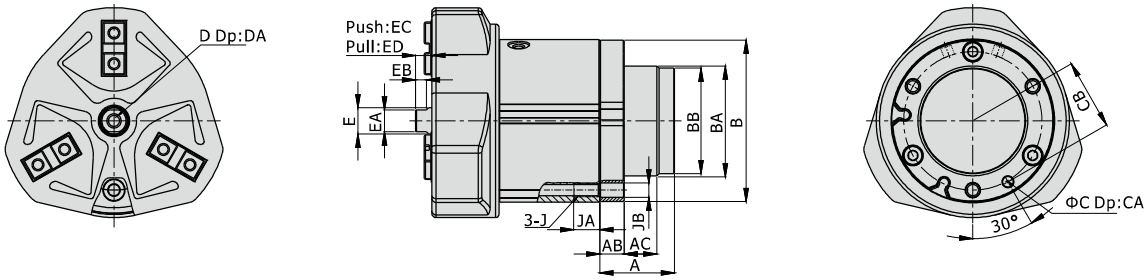
Bore size\Item	A	AB	AC	B	BA	BB	C	CA	CB	D	DA	E	EA	EB	EC	ED	EF	EG	J	JA	JB	K
32	36	9	9	54.5	$32_{-0.05}^{0}$	30	$4^{+0.04}_{+0.01}$	4	22	M3×0.5	6	6	5	3.5	14	7	20	13	M5×0.8	10	5.5	9.5
40	38	9	12	61.5	$40_{-0.05}^{0}$	38	$4^{+0.04}_{+0.01}$	4	26	M5×0.8	10	10	8	4.5	15	7	21	13	M5×0.8	10	5.5	13.5
50	48	11	15	73.5	$50_{-0.05}^{0}$	48	$5^{+0.04}_{+0.01}$	5	32	M6×1.0	12	12	10	5	21	7	28	14	M6×1.0	12	6.6	17.5
63	53	13	18	91.5	$60_{-0.05}^{0}$	58	$6^{+0.04}_{+0.01}$	6	40	M8×1.25	16	16	14	7	24	9	32	17	M8×1.25	16	8.6	20

HFCQ Series

Bore size: Φ16, Φ20, Φ25, Φ32, Φ40, Φ50, Φ63

HFCQ32V~63V **(With Spring push rod mechanism)**





[Unit: mm]

Bore size\Item	A	AB	AC	B	BA	BB	C	CA	CB	D	DA	E	EA	EB	EC	ED	EF	EG	J	JA	JB
32	20	9	11	54.5	$32_{-0.05}^{0}$	-	$4_{+0.01}^{+0.04}$	4	22	M3×0.5	6	6	5	3.5	14	7	20	13	M5×0.8	10	5.5
40	24	9	15	61.5	$40_{-0.05}^{0}$	-	$4_{+0.01}^{+0.04}$	4	26	M5×0.8	10	10	8	4.5	15	7	21	13	M5×0.8	10	5.5
50	34	11	15	73.5	$50_{-0.05}^{0}$	48	$5_{+0.01}^{+0.04}$	5	32	M6×1.0	12	12	10	5	21	7	28	14	M6×1.0	12	6.6
63	40	13	18	91.5	$60_{-0.05}^{0}$	58	$6_{+0.01}^{+0.04}$	6	40	M8×1.25	16	16	14	7	24	9	32	17	M8×1.25	16	8.6

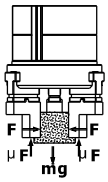
HFCQ Series Bore size: Φ16, Φ20, Φ25, Φ32, Φ40, Φ50, Φ63

How to select product

Please select pneumatic finger according to the following steps:

①The selection of the effective gripping force >>> **②the confirmation of the gripping point**

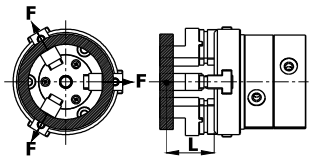
1. The selection of the gripping force
The gripping work-pieces shown below, on the impact condition of ordinary handling state, taking safety coefficient a=4, have a gripping force that is more than 10-20 times of the mass of the gripped objects.

	The work-pieces as shown in the left :		μ=0.2	μ=0.1
	n: number of gripper 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: n×μF>mg so: $F>\frac{mg}{n\times\mu}$ Safety coefficient is a, so F is: $F=\frac{mg}{n\times\mu}\times a$	$F=\frac{mg}{2\times0.2}\times4=10\times mg$	$F=\frac{mg}{2\times0.1}\times4=20\times mg$
			10 times of the mass of the gripped objects	20 times of the mass of the gripped objects

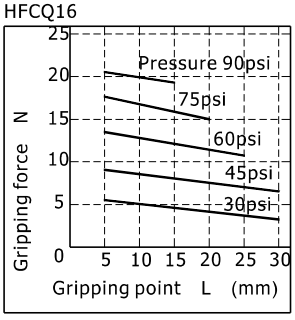
Note) If the friction coefficientμ>0.2, for safety, please also select clamping force according to the principle of 10~20 times of the mass of the clamped objects. As for large acceleration and shock, it requires for greater safety coefficient.

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

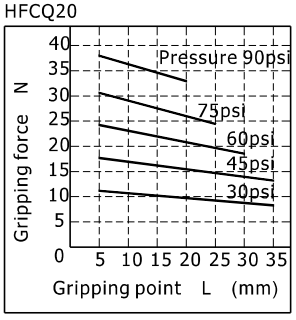
Opened gripping force



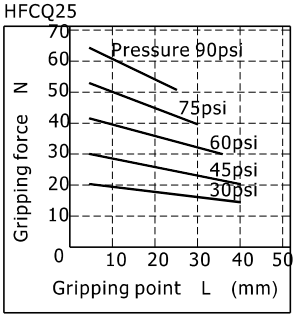
HFCQ16



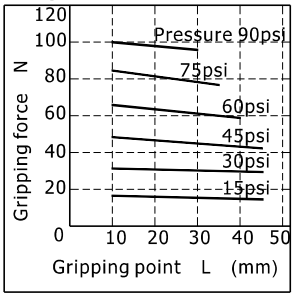
HFCQ20



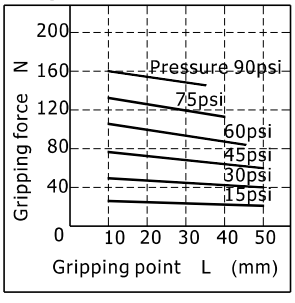
HFCQ25



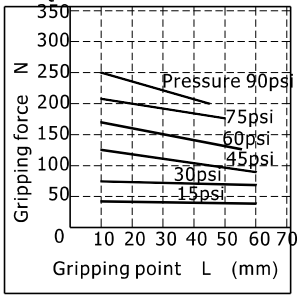
HFCQ32



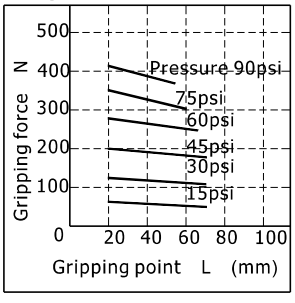
HFCQ40



HFCQ50



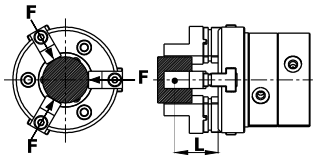
HFCQ63



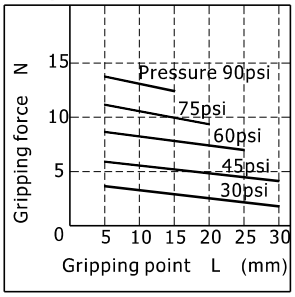
HFCQ Series

Bore size: Φ16, Φ20, Φ25, Φ32, Φ40, Φ50, Φ63

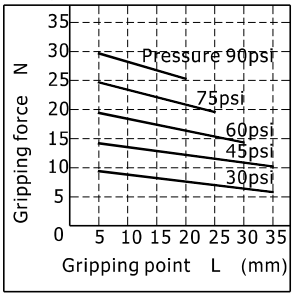
Closed gripping force



HFCQ16



HFCQ20



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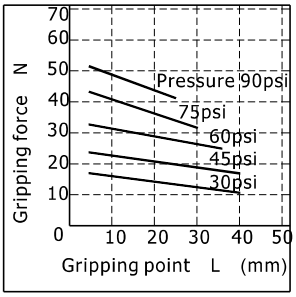

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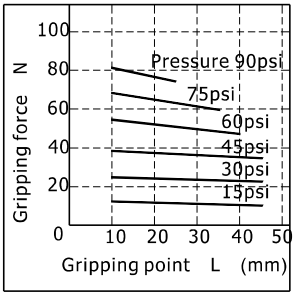

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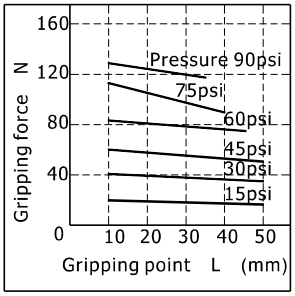

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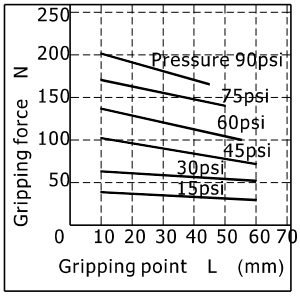

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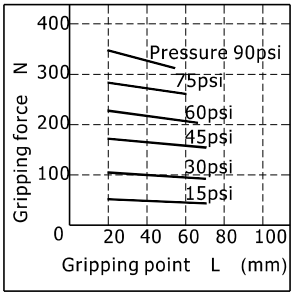
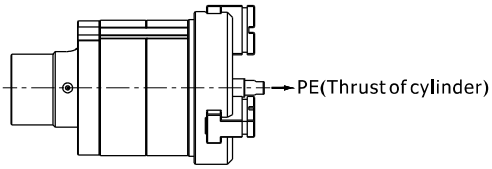
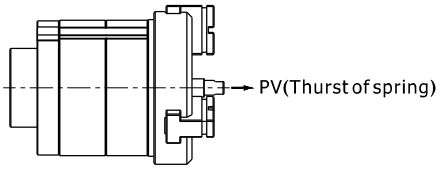


Effective thrust of Push rod mechanism





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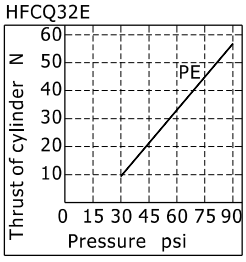

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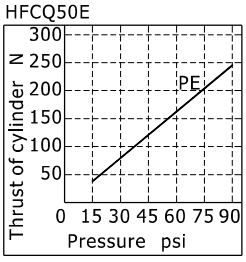

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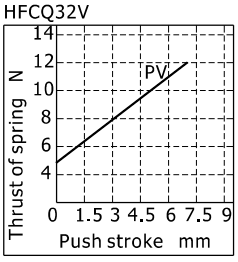

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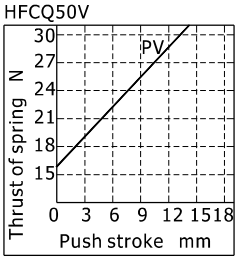

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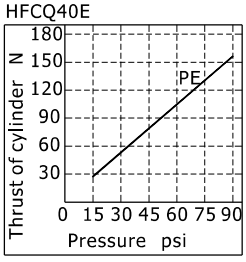

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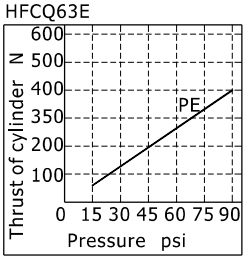

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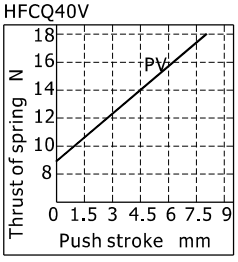

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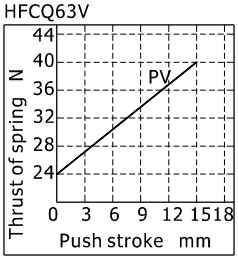
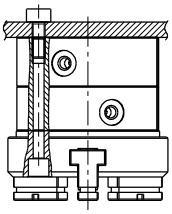


Installation and application

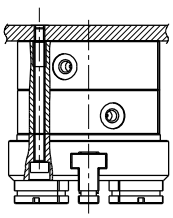
1. Due to the abrupt changes, the circuit pressure is low, which will lead to the decrease of the gripping force and falling of the work-pieces. In order to avoid the harm to the human body and damage to the equipment, anti-dropping device must be equipped.
2. Don't use the air gripper under strong external force and impact force.
3. 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 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



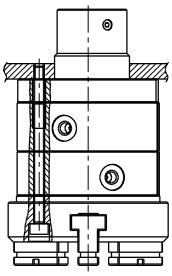
Bore size	The bolts type	Max. locking moment(N.m)	Max. screwed depth(mm)	The aperture of the positioning bore(mm)	The depth of the positioning bore(mm)
16	M4×0.7	2.1	8	Φ17 $^{+0.05}_{0}$	1.5
20	M4×0.7	2.1	8	Φ21 $^{+0.05}_{0}$	1.5
25	M4×0.7	2.1	8	Φ26 $^{+0.05}_{0}$	1.5
32	M4×0.7	2.1	8	Φ34 $^{+0.05}_{0}$	2
	M5×0.8	4.3	10	Φ34 $^{+0.05}_{0}$	2
40	M4×0.7	2.1	8	Φ42 $^{+0.05}_{0}$	2
	M5×0.8	4.3	10	Φ42 $^{+0.05}_{0}$	2
50	M5×0.8	4.3	10	Φ52 $^{+0.05}_{0}$	2
	M6×1.0	7.3	12	Φ52 $^{+0.05}_{0}$	2
63	M6×1.0	7.3	12	Φ65 $^{+0.05}_{0}$	2.5
	M8×1.25	18	16	Φ65 $^{+0.05}_{0}$	2.5

The installation of the front through hole



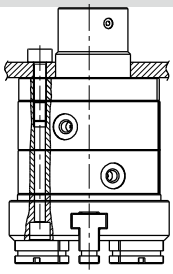
Bore size	The bolts type	Max. locking mement(N.m)
16	M3×0.5	0.88
20	M3×0.5	0.88
25	M3×0.5	0.88
32	M4×0.7	2.1
40	M4×0.7	2.1
50	M5×0.8	4.3
63	M6×1.0	7.3

The installation of the front through hole(with push rod)



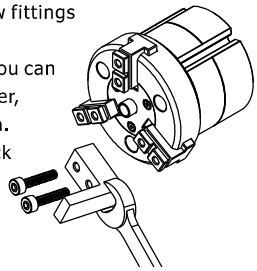
Bore size	The bolts type	Max. locking mement(N.m)
32	M4×0.7	2.1
40	M4×0.7	2.1
50	M5×0.8	4.3
63	M6×1.0	7.3

Tail installation type(with push rod)



Bore size	The bolts type	Max. locking moment(N.m)	Max. screwed depth(mm)	The aperture of the positioning bore(mm)
32	M5×0.8	4.3	10	Φ32 $^{0}_{-0.05}$
40	M5×0.8	4.3	10	Φ40 $^{0}_{-0.05}$
50	M6×1.0	7.3	12	Φ50 $^{0}_{-0.05}$
63	M8×1.25	18	16	Φ60 $^{0}_{-0.05}$

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.



Install the gripping jaw fittings

Bore size	The bolts type	Max. locking mement(N.m)
16	M3×0.5	0.59
20	M3×0.5	0.59
25	M3×0.5	0.59
32	M4×0.7	1.4
40	M4×0.7	1.4
50	M5×0.8	2.8
63	M5×0.8	2.8