

AC2010 AC3010 AC4010

FR.L Unit



◆ Specifications

Model	AC2010-01 F2	AC2010-02 F2	AC3010-02 F2	AC3010-03 F2	AC3010-04 F2	AC4010-03 F2	AC4010-04 F2	AC4010-06 F2	
Working Medium	Clean Air(after 40 μ m filtration)								
Proof Pressure(MPa)	1.5								
Working Pressure Range(MPa)	0.15~1.0								
Pressure Adjustment Range(MPa)	0.05~0.9,Low pressure type 0.05~0.4								
Working Temperature(℃)	-5~60 (No freezing)								
Filter Precision	40 μ m/5 μ m optional								
Recommended Oil	Turbine No.1 Oil, ISO VG32								
Bowl Material	PC(Polycarbonate)								
Water Bowl Capacity(CC)	11		40			75			
Oil Bowl Capacity(CC)	30		76			183			
Weight(g)	388		585			1628			
Component	Filter regulator	AW2000-01 F2	AW2000-02 F2	AW3000-02 F2	AW3000-03 F2	AW3000-04 F2	AW4000-03 F2	AW4000-04 F2	AW4000-06 F2
	Lubricator	AL2000-01 F2	AL2000-02 F2	AL3000-02 F2	AL3000-03 F2	AL3000-04 F2	AL4000-03 F2	AL4000-04 F2	AL4000-06 F2

◆ How to Order?

Series No.	Port size	Drain Type	Type No.	Pressure Gauge	Pressure Gauge Type	Scale Unit	Filter Precision	Thread Type
AC2010: A2000 series FR.L Units		Blank: Manual drain type C: Semi-auto drain D: Auto Drain type①		Blank: With pressure gauge N: No pressure gauge		②	Blank: 40 μ m 5M: 5 μ m	Blank: G P: PT T: NPT
AC3010: A3000 series FR.L Units								
AC4010: A4000 series FR.L Units	2000 3000 4000	01: 1/8" 02: 1/4" 03: 3/8" 04: 1/2" 06: 3/4"	Blank: Standard type	F: Square pressure gauge Y: Round pressure gauge		Square pressure gauge optional Round pressure gauge optional	1: MPa 2: Bar 3: Psi 4: Mpa/Psi 5: Bar/Psi	

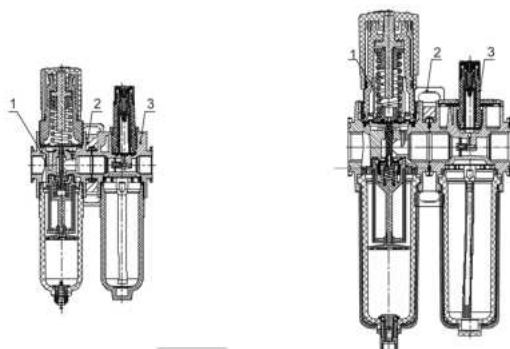
Order Example:

AC series FR.L unit, port size of 1/2", differential pressure drain type, with square pressure gauge, Mpa, 5 μ m, G thread, the ERP code is: AC3010-04CF15M

Remark: ①2000 series without automatic drainage type

②Square pressure gauge is single scale, round pressure gauge is double scale.

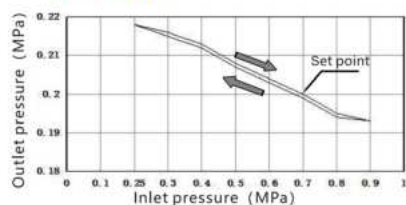
Internal Structure



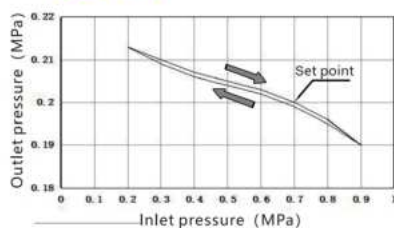
No.	Part Name
1	AC Series filter regulator
2	T type bracket
3	AC Series lubricator

Pressure Feature

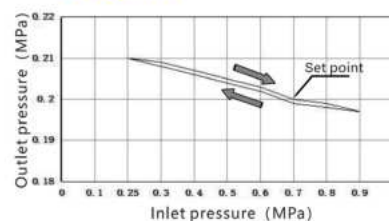
AC2010



AC3010



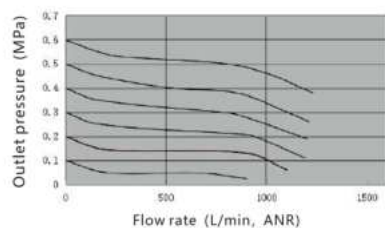
AC4010



Flow Chart

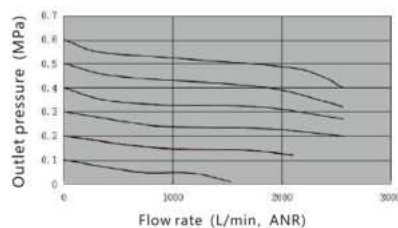
AC2010

Flow chart(Inlet pressure 0.7Mpa)



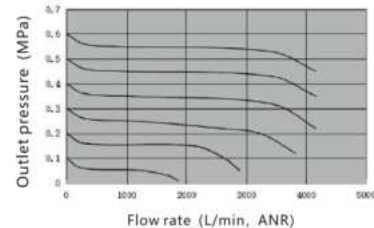
AC3010

Flow chart(Inlet pressure 0.7Mpa)

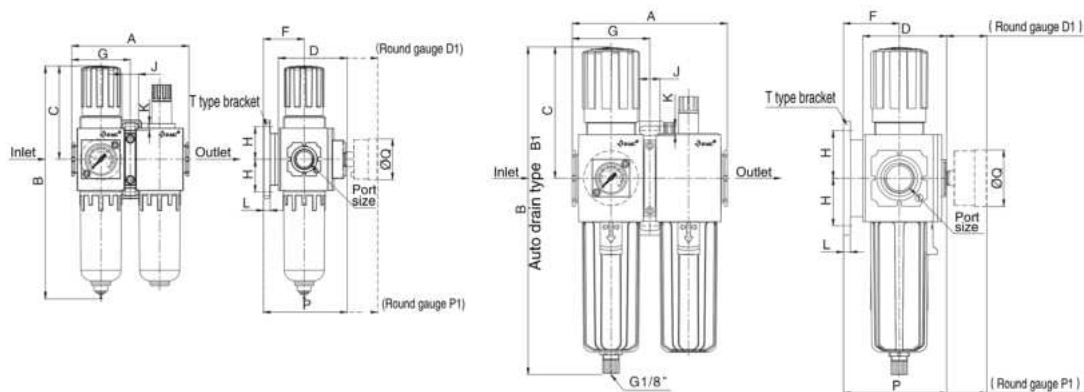


AC4010

Flow chart(Inlet pressure 0.7Mpa)



Main Dimensions



Model	Port Size	A	B	B1	C	D	D1	F	G	H	J	K	L	P	P1	Q
AC2010	1/8", 1/4"	86	171.2	-	68.6	50.6	73	30	43	24	12.5	5.5	5	61.6	84	30
AC3010	1/4", 3/8", 1/2"	114	239.6	236.6	96.6	61.6	91.2	41	57	35	15	7	5	75.8	105.4	41.5
AC4010	3/8", 1/2", 3/4"	160	270.2	264.5	105.4	82.1	110.7	50	80	40	17.5	8.5	7	95.3	123.8	41.5

AR2000 AR3000 AR4000

Regulator



◆ Specifications

Model	AR2000-01 F2	AR2000-02 F2	AR3000-02 F2	AR3000-03 F2	AR3000-04 F2	AR4000-03 F2	AR4000-04 F2	AR4000-06 F2
Working Medium	Clean Air(after 40 μm filtration)							
Proof Pressure(MPa)	1.5							
Max. Working Pressure(MPa)	1.0							
Pressure Adjustment Range(Mpa)	0.05~0.9,Low pressure type 0.05~0.4							
Working Temperature(°C)	-5~60 (No freezing)							
Weight(g)	166		380			684		

◆ How to Order?

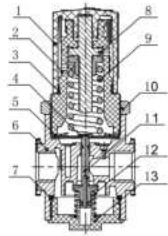
Series No.	Port size	Type No.	Pressure Gauge	Pressure Gauge Type	Bracket Code	Scale Unit	Thread Type
AR2000: A2000 series Regulator AR3000: A3000 series Regulator AR4000: A3000 series Regulator			Blank: With pressure gauge N: No pressure gauge		Blank: With bracket J: No bracket	①	Blank: G P: PT T: NPT
	2000 01: 1/8" 02: 1/4" 02: 1/4" 3000 03: 3/8" 04: 1/2" 4000 03: 3/8" 04: 1/2" 06: 3/4"	Blank: Standard type		F: Square pressure gauge Y: Round pressure gauge		Square pressure gauge optional { 1: MPa 2: Bar 3: Psi Round pressure gauge optional { 4: Mpa/Psi 5: Bar/Psi	

Order Example:

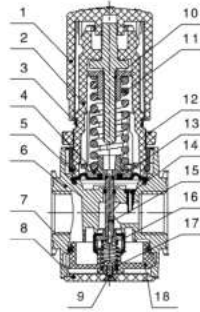
AR series Regulator, port size of 1/2", with square pressure gauge, with bracket, Mpa, G thread,
the ERP code is: AR3000-04F1

Remark: ① Port of round pressure gauge is M6; It is not allowed to distribute pressure gauges to customers.

◆ Internal Structure



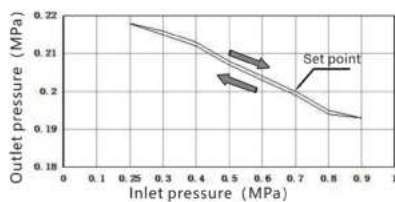
No.	Part Name	Material
1	Pressure regulating handle	Plastics
2	Pressure regulating valve cover	Plastics
3	Marking ring	Plastics
4	Diaphragm	SUS304+NBR
5	Gaskets	6061
6	Valve body	Aluminum alloy
7	Seal	NBR
8	Water bowl	Plastics
9	Pressure regulating screw/ Screw set	Free-cutting steel
10	Spring	SWC
11	Octagonal caps	Aluminum alloy
12	Valve stem	Brass
13	Spring	SUS304
14	Water separator propeller	Plastics
15	Valve core	Plastics
16	Water baffle	Plastics



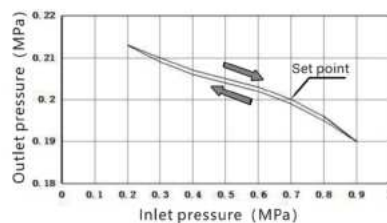
No.	Part Name	Material
1	Pressure regulating handle	Plastics
2	Pressure regulating valve cover	Plastics
3	Marking ring	Plastics
4	Pressure regulating spring seat	Plastics
5	Cover plate	Plastics
6	Valve body	Aluminum alloy
7	Seal	NBR
8	Valve seat cover	Plastics
9	Screw	Mild steel
10	Pressure regulating screw/ Screw set	Free-cutting steel
11	Spring	SWC
12	Octagonal caps	Plastics
13	Diaphragm	NBR
14	Interline	Plastics
15	Valve stem	Brass
16	Valve core	6061+NBR
17	Spring	Plastics
18	Pressure regulating valve seat	Plastics

◆ Pressure Feature

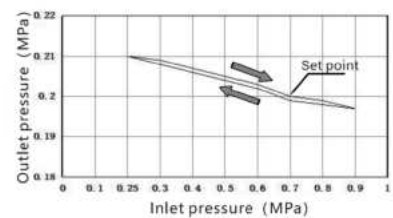
AR2000



AR3000

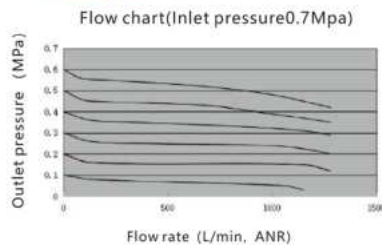


AR4000

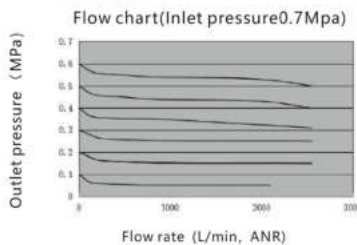


◆ Flow Chart

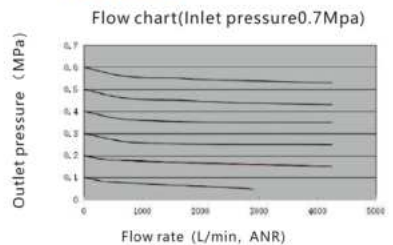
AR2000



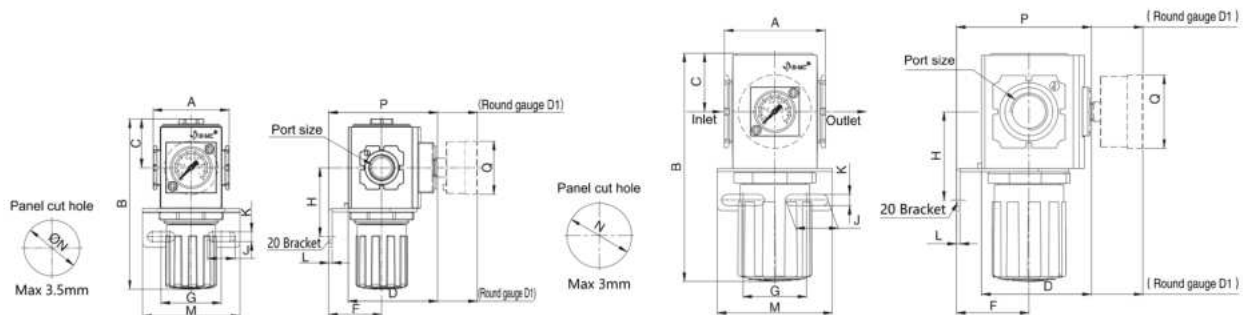
AR3000



AR4000



◆ Main Dimensions



Model	Port Size	A	B	C	D	D1	F	G	H	J	K	L	M	N	P	P1	Q
AR2000	1/8", 1/4"	43	96.3	27.5	50.6	73	30	34	39	15.5	5.5	2	55	31.5	61.6	84	30
AR3000	1/4", 3/8", 1/2"	57	129.1	33	62.1	91.2	41	36	50	24	6.5	2	65	36.5	76.3	105.4	41.5
AR4000	3/8", 1/2", 3/4"	80	141.6	36	82.1	110.7	50	38	53	28	8.5	2.5	72	52.5	95.3	123.9	41.5

AW2000 AW3000 AW4000

Filter Regulator



Specifications

Model	AW2000-01 F2	AW2000-02 F2	AW3000-02 F2	AW3000-03 F2	AW3000-04 F2	AW4000-03 F2	AW4000-04 F2	AW4000-06 F2
Working Medium	Clean Air(after 40 μ m filtration)							
Proof Pressure(MPa)	1.5							
Working Pressure Range(MPa)	0.15~1.0							
Pressure Adjustment Range(MPa)	0.05~0.9, Low pressure type 0.05~0.4							
Working Temperature(°C)	-5~60 (No freezing)							
Filter Precision	40 μ m/5 μ m optional							
Recommended Oil	Turbine No.1 Oil, ISO VG32							
Container Material	PC (Polycarbonate)							
Water Bowl Capacity(CC)	11		40		75			
Weight(g)	197		477		853			

How to Order?

Series No.	Port size	Drain Type	Type No.	Pressure Gauge	Pressure Gauge Type	Bracket Code	Scale Unit	Filter Precision	Thread Type
AW2000: A2000 series Filter regulator		Blank: Manual drain type C: Semi-auto drain D: Auto Drain type①		Blank: With pressure gauge N: No pressure gauge		Blank: With bracket J: No bracket	②	Blank: 40 μ m 5M: 5 μ m	Blank: G P: PT T: NPT
AW3000: A3000 series Filter regulator	2000 01: 1/8" 02: 1/4" 02: 1/4"		Blank: Standard type	F: Square pressure gauge Y: Round pressure gauge			Square pressure gauge optional Round pressure gauge optional	1: MPa 2: Bar 3: Psi 4: Mpa/Psi 5: Bar/Psi	
AW4000: A4000 series Filter regulator	3000 03: 3/8" 04: 1/2" 03: 3/8" 4000 04: 1/2" 06: 3/4"								

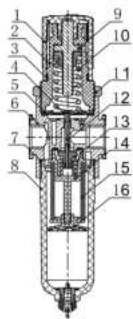
Order Example:

AW series FR unit, port size of 1/2", differential pressure drain type, with square pressure gauge, with bracket, Mpa, 5 μ m, G thread, the ERP code is: AW3000-04CF15M

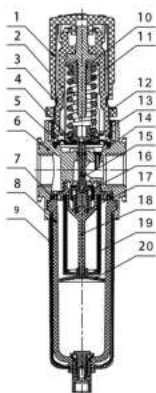
Remark: ① 2000 series without automatic drainage type

② Square pressure gauge is single scale, round pressure gauge is double scale.

Internal Structure



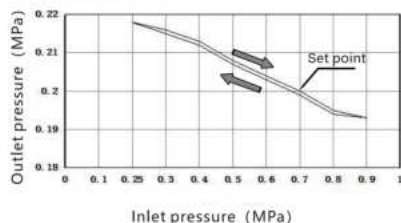
No.	Part Name	Material
1	Pressure regulating handle	Plastics
2	Pressure regulating valve cover	Plastics
3	Marking ring	Plastics
4	Diaphragm	SUS304+NBR
5	Gaskets	6061
6	Valve body	Aluminum alloy
7	Seal	NBR
8	Water bowl	Plastics
9	Protection guard	Plastics
10	Pressure regulating screw/Screw set	Free-cutting steel
11	Spring	SWC
12	Octagonal caps	Aluminum alloy
13	Spring	SUS304
14	Water separator propeller	Plastics
15	Valve core	Plastics
16	Water baffle	Plastics



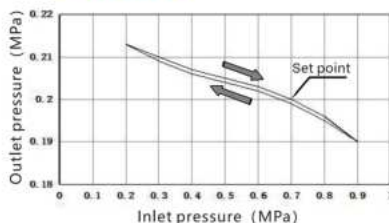
No.	Part Name	Material
1	Pressure regulating handle	Plastics
2	Pressure regulating valve cover	Plastics
3	Marking ring	Plastics
4	Pressure regulating spring seat	Plastics
5	Cover plate	Plastics
6	Valve body	Aluminum alloy
7	Seal	NBR
8	Water bowl	Plastics
9	Protection guard	Plastics
10	Pressure regulating screw/Screw set	Free-cutting steel
11	Spring	SWC
12	Octagonal caps	POM with glass fiber/Zinc alloy
13	Diaphragm	NBR
14	Interline	Plastics
15	Valve stem	Brass
16	Valve core	6061+NBR
17	Spring	SUS304
18	Water separator propeller	Plastics
19	Filter element	Plastics
20	Water baffle	Plastics

Pressure Feature

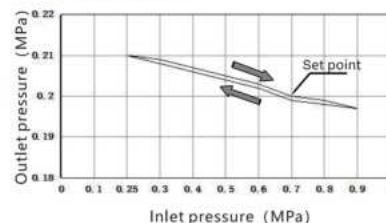
AW2000



AW3000

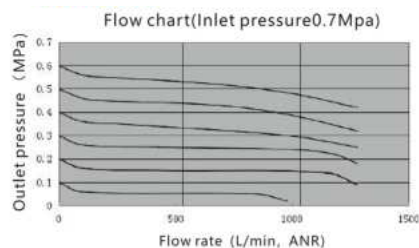


AW4000

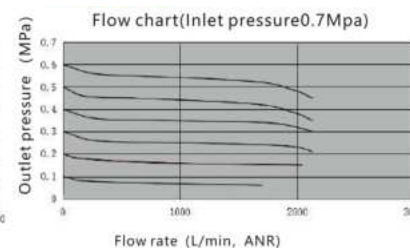


Flow Chart

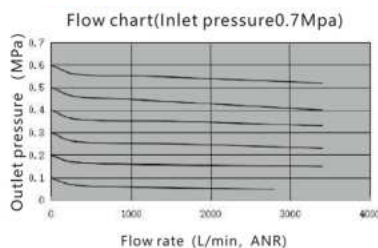
AW2000



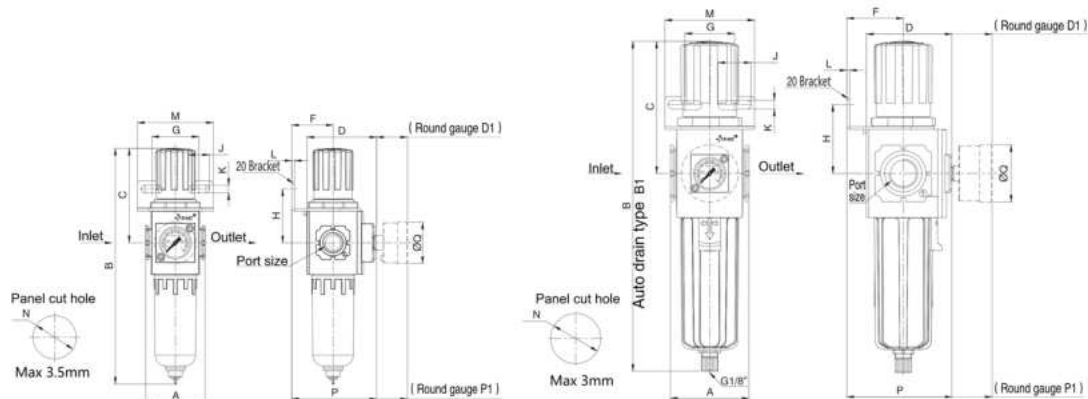
AW3000



AW4000



Main Dimensions



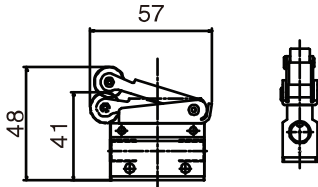
Model	Port Size	A	B	B1	C	D	D1	F	G	H	J	K	L	M	N	P	P1	Q
AW2000	1/8", 1/4"	43	171.2	—	68.6	50.6	73	30	34	39	15.5	5.5	2	55	31.5	61.6	84	30
AW3000	1/4", 3/8", 1/2"	57	239.6	236.6	96.6	62.1	91.2	41	36	50	24	6.5	2	65	36.5	76.3	105.4	41.5
AW4000	3/8", 1/2", 3/4"	80	270.2	264.5	105.4	82.1	110.7	50	38	53	28	8.5	2.5	72	52.5	95.3	123.9	41.5

EMOV

Mechanical Valve

EMOV321-R

◆ Graphic Symbol



◆ Product Features

- 1、The mechanical valve uses manual mode to directly control the opening and closing of the spool, and does not rely on external energy sources (such as electricity, air pressure, etc.) to work;
- 2、Due to its relatively simple structure, the mechanical valve can still work normally in the case of no power supply or control system failure, with high reliability and self-locking;
- 3、Mechanical valve internal parts less, less affected by environmental factors, maintenance is relatively simple, long service life;
- 4、Compared with electronic control or pneumatic smoke, the action response speed of the mechanical valve may be slow, and the adjustment accuracy is relatively low, but it is suitable for occasions without complex adjustment or accurate control of flow and pressure;
- 5、The cost of the mechanical valve is relatively low, easy to install, the technical requirements of the operator is not high, so it is widely used in many industrial fields and civil facilities;
- 6、There are a variety of buttons, switches can be selected, suitable for use under different working conditions.

◆ How to order

Series code	Valve body size	Nozzle diameter	Button Type	—	Button color
EMOV: EMOV series	32: 3/2 way	1:G1/8"(EMOV, EMV series optional)	Air self: basic type		R: red
EMJ: EMJ series	52: 5/2 way	2:G1/4"(EMV, EMJ series optional)	R: Roller type		G: Green
EMV: EMV series (Only EMV series optional)		3:PT1/8"(EMOV, EMV series optional)	PP: Parallel button		B: Black
		4:PT1/4"(EMV, EMJ series optional)	EB: Button with lock		Y: Yellow
		5:NPT1/8"(EMOV, EMV series optional)	PPL: Concave button		
		6:NPT1/4"(EMV, EMJ series optional)	PB: Big round button		
		The conventional thread is G-thread	TB: Select button		

Ordering example:

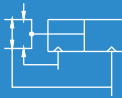
EMV series mechanical valve , 2/3 way, nozzle diameter 1/8, G thread,select button, its ERP code is EMV321-TB.

◆ Specification

Model number	EMOV321	EJM322	EMV321	EMV521
Working medium	Clean air(After 40 μm filtration)			
Acting type	External control			
Lubrication	unnecessary			
Working pressure(Mpa)	0~0.8			
Maximum pressure resistance(Mpa)	1.2			
Working temperature(°C)	-5~60			
Maximum operating frequency	5 cycles/s			
Nozzle diameter	1/8", 1/4"			

GHF

Low Profile Air Gripper



Specification

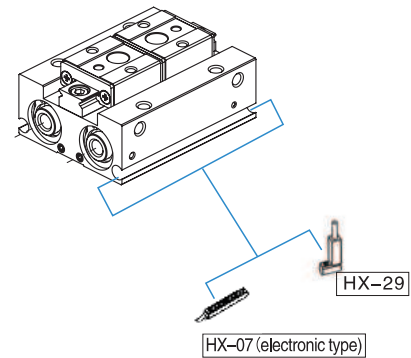
Bore Size		12	16
Acting Type		Double Acting	
Working Medium		Clean air(40 µm filtration)	
Applicable Pressure Reage		0.1~0.7MPa	
Working Temperature		-20~70 (No freezing)	
Oil		Not required	
Repetition accuracy ①		± 0.05mm	
Maximum Frequency	Short Stroke	120c.p.m	
	Medium Stroke	120c.p.m	
	Long Stroke	60c.p.m	
Port Size		M5X0.8	

① Is the value of the gripper without the role of bias load state; conversely, affected by the tooth gap between the rack and gear, the maximum value is 15mm

How to Order?

Series No.	Bore Size	Double Acting	Stroke	Connecting Type	Magnet No
GHF:Low Profile Air Gripper	12 16	D	Blank 1 2	Short Stroke Medium Stroke Long Stroke	Blank:Axial Ported R:Side ported
			Blank:Axial Ported	R:Side Ported	
			Piping hole	Piping hole	

Optional Accessories



Note:Short stroke please use HX-29 series due to limited space.

Order Example: GHF Compact air gripper,Bore12,Medium stroke,Side air intake, with magnet,ERP code is:GHF12D1R

Products Features

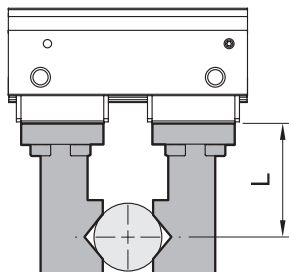
1. Stainless steel gripper & linear ball guide design, high precision, good rigidity,good corrosion resistance for longer life spans.
2. Double piston structure design can provide bigger clamping force.
3. The bottom of the body is equipped with positioning pin holes to effectively enhance the installation accuracy and improve the consistency of repeated disassembly and positioning.
4. The Gripper can be installed from four directions freely.
5. Compared with the parallel air gripper with the same clamping force, this thin body design reduces the overall height by 50%, which effectively reduces the installation space and shaking torque, reduces the deviation, and improves the accuracy.
6. The body is designed with a buried induction switch slot to reduce the space.
7. All series are with magnetic.

Standrad Stroke

Stroke/Bore(mm)		Ø 12	Ø 16
Short Stroke		12mm	16mm
Medium Stroke		24mm	32mm
Long Stroke		48mm	64mm

Note: The short, medium and long strokes are standardized for each bore, and the most suitable stroke can be selected to be easier matched.

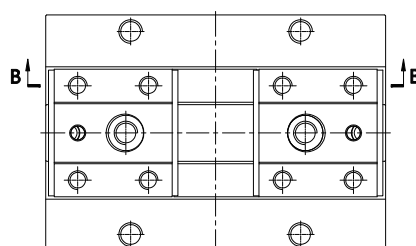
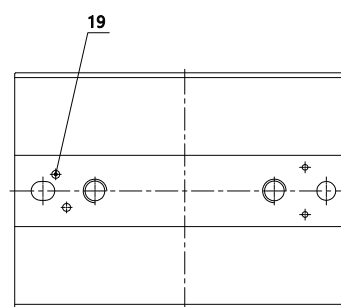
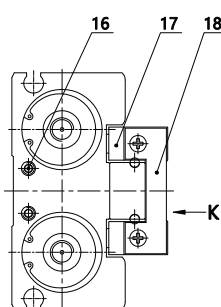
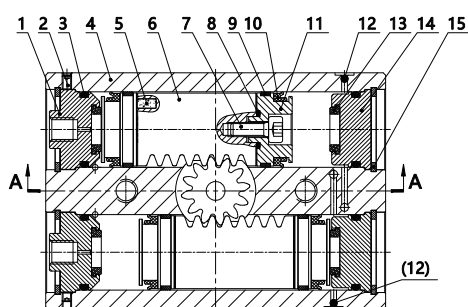
◆ Clamping Force



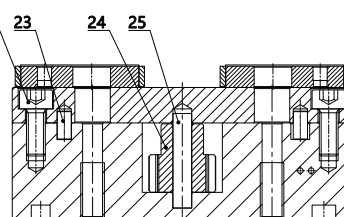
Model Number	Effective clamping force of a single gripper(N)(*)	Weight(g)
GHF12D	48	145
GHF12D1		185
GHF12D2		270
GHF16D	90	344
GHF16D1		441
GHF16D2		642

*Pressure 0.5MPa, clamping point L=20mm, and the value at the center of the stroke.

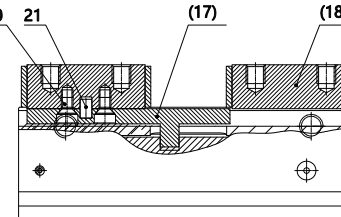
◆ Internal Structure



K Directional view



A-A Cutaway view



B-B Cutaway view

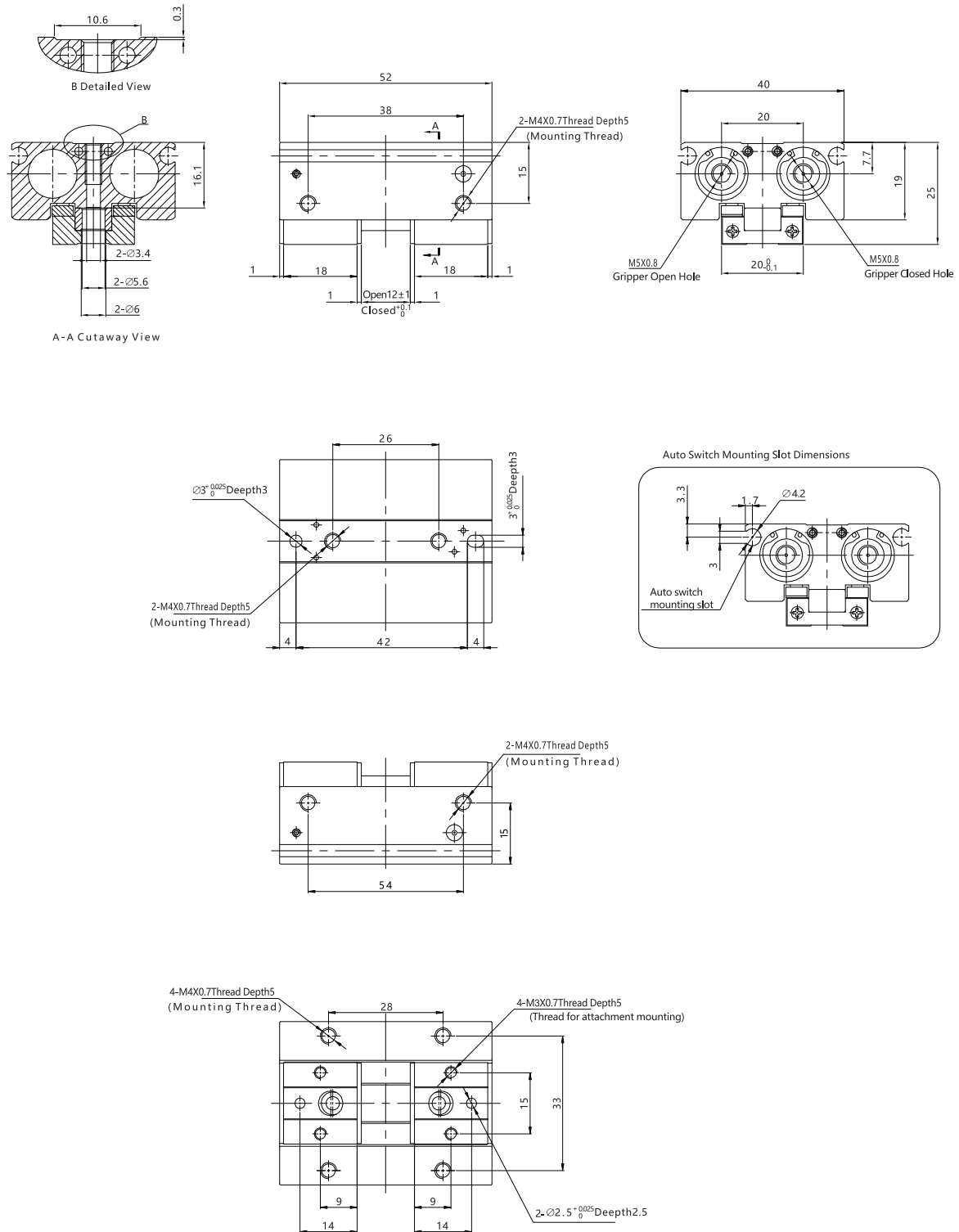
No.	Part Name	Material	No.	Part Name	Material	No.	Part Name	Material
1	Front cover	Aluminum alloy	10	Piston seal	NBR	19	Steel ball	Stainless steel
2	Hexagon socket set screw	Q235	11	Piston	Aluminum alloy	20	Screws	Stainless steel
3	O-ring	NBR	12	Steel ball	Stainless steel	21	Pin	Bearing Steel
4	Barrel	Aluminum alloy	13	Anti-bump cushion	TPU	22	Hexagon socket cap screw	Stainless steel
5	Magnet	Sintered NdFeB	14	Rear cover	Aluminum alloy	23	Positioning pins	Stainless steel
6	Rack	Stainless steel	15	C type ring	Spring steel	24	Gear	Carbon Steel
7	Hexagon socket cap screw	Stainless steel	16	Hexagon socket set screw	Q235	25	Pin	Bearing Steel
8	O-ring	NBR	17	Connector	Stainless steel			
9	Wear ring	PTFE	18	Linear ball sliding guide	Combined parts			

Note: 1. Commercially available socket cap screws are sufficient when E04-SHF12, 16 compact air grippers are used for body through-hole mounting.

2. In the above table, SE04-HF12D short stroke without wear ring.

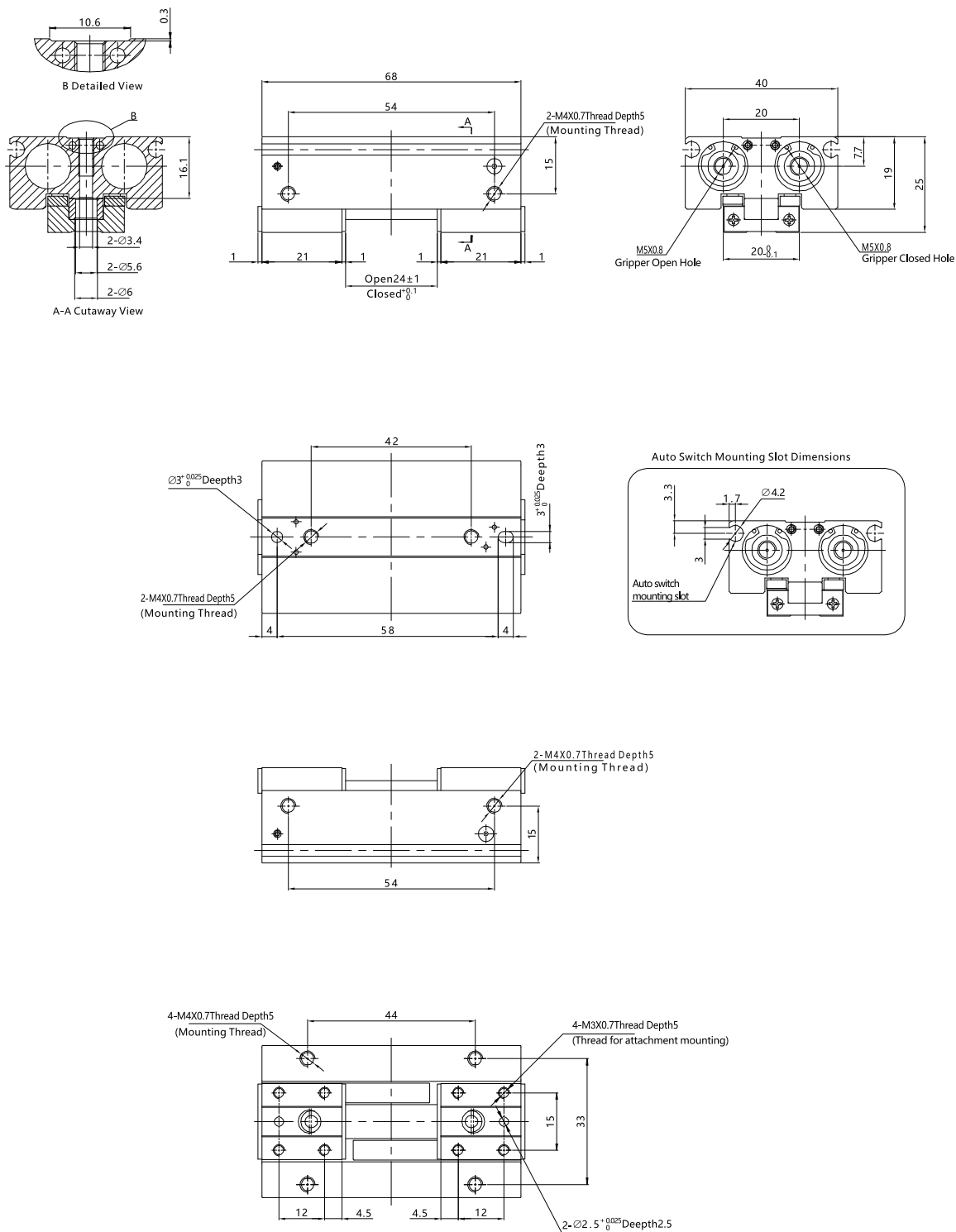
◆ Main Dimension

GHF12D

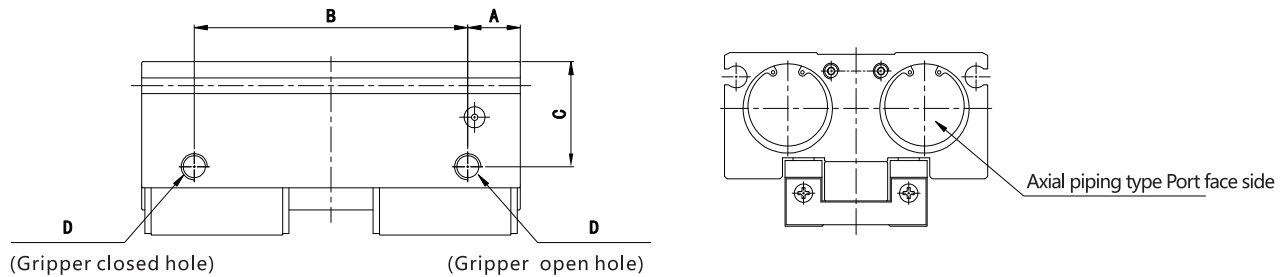


◆ Main Dimension

GHF12D1



◆ Main Body Options: Side Ported Type

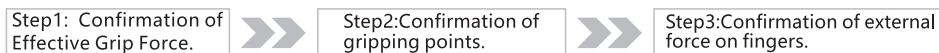


Model Number	GHF12DR	GHF12D1R	GHF12D2R	GHF16DR	GHF16D1R	GHF16D2R
A	7			9		
B	38	54	90	54	76	124
C	14.8			19		
D	M5×0.8			M5×0.8		

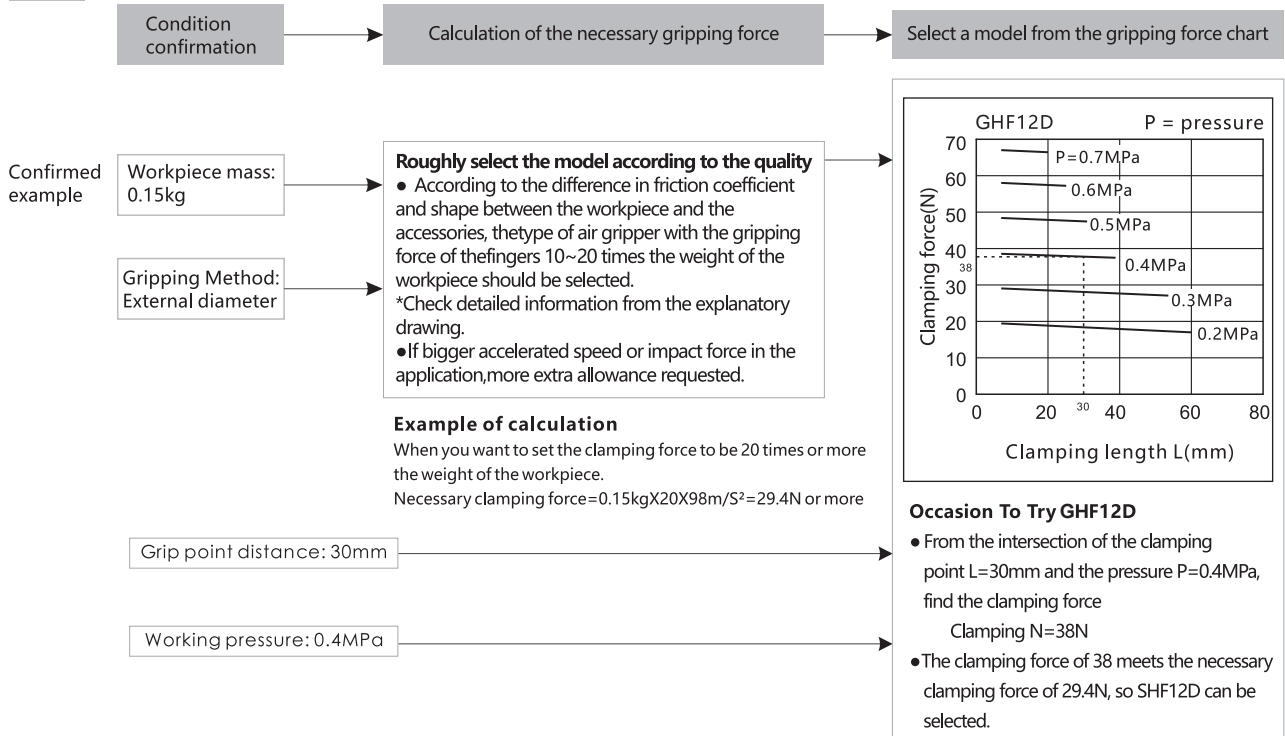
Note: Dimensions other than the above are the same as the Horizontal ported type

◆ Model Selection

Selected Steps

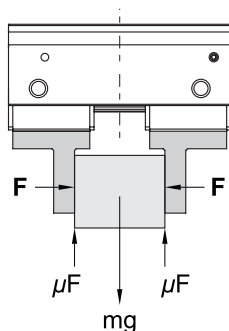


Step1 Effective gripping force confirmation



Model Selection

Model selection instructions



About 10-20 times the weight of the workpiece

- The recommended value (more than 10-20 times the weight of the workpiece) is calculated based on the impact generated by normal handling, etc., under the condition of the safety value $a=4$.

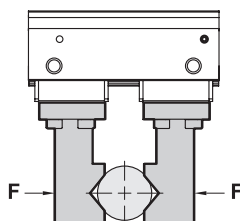
When $\mu=0.2$	When $\mu=0.1$
$F = \frac{mg}{2 \times 0.2} \times 4$ $= 10 \times mg$	$F = \frac{mg}{2 \times 0.1} \times 4$ $= 20 \times mg$
10 times the workpiece mass	20 times the workpiece mass

Note: 1. When the friction coefficient is higher than $\mu=0.2$, for safety, our company recommends that the model should be selected at 10 to 20 times the weight of the workpiece.

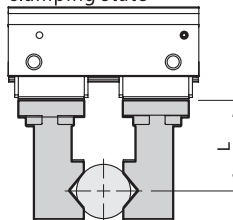
2. For excessive acceleration and impact, it is necessary to select a larger safety value.

Step 1 Confirmation of Effective Grip Force

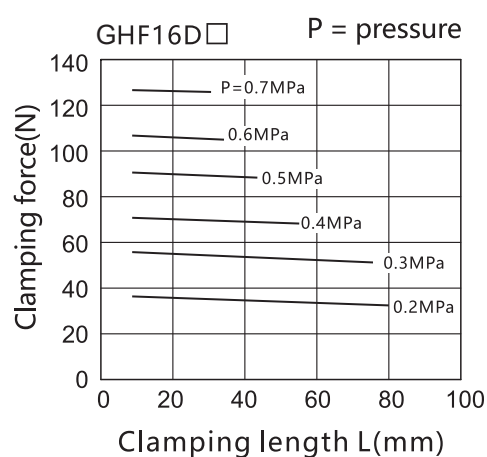
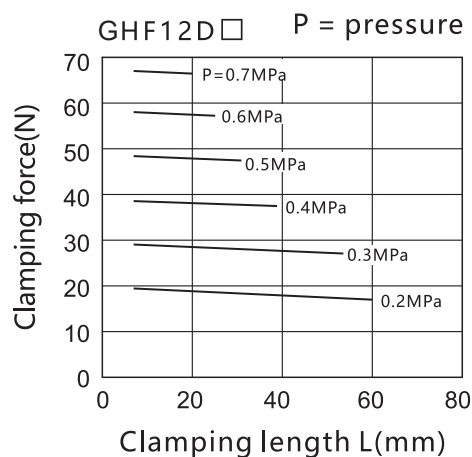
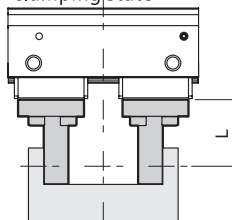
- Representation of Effective Grip Force**
The effective clamping force of the right picture, as shown in the figure below, the two fingers and accessories are in contact with the workpiece together, and the thrust on one finger is represented by F.



Outer diameter clamping state



Inner diameter clamping state



When clamping the workpiece shown on the left

F: Clamping force(N)

μ : Friction coefficient of attachments and work pieces

m: Workpiece mass(kg)

g: Gravitational acceleration(=98m/s²)

mg: Workpiece gravity(N)

If the workpiece does not fall

$$2 \times \mu F > mg$$

Number of Fingers

Then

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

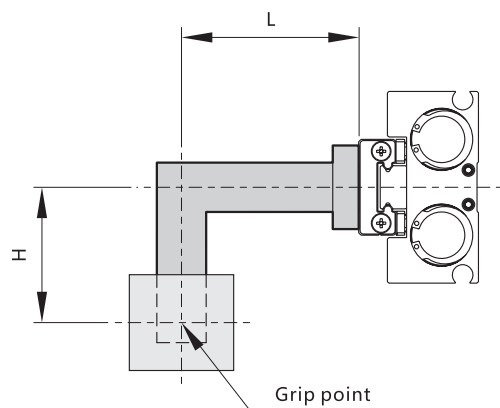
The safety value is represented by a, and F is determined

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

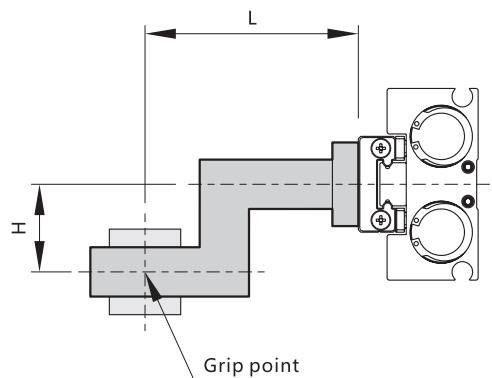
Model Selection

Step 2 Confirmation of clamping point

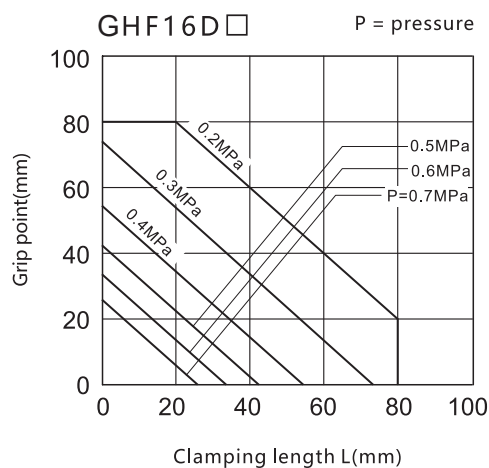
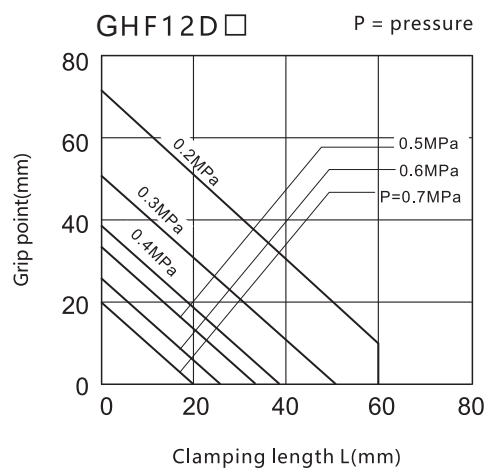
1. The clamping point of the workpiece, according to the operating pressure, should be within the range shown in the figure below.
2. If the clamping point of the workpiece are out of the range, it will reduce the service life of the gripper.



Inner diameter clamping state

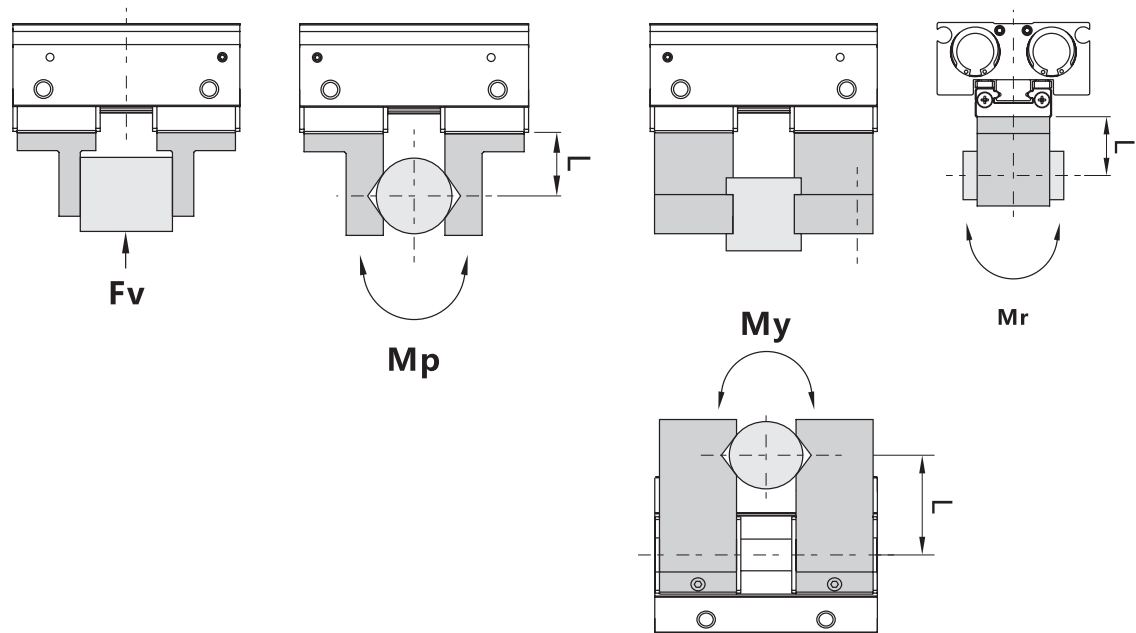


Outer diameter clamping state



Model Selection

Step3 Confirmation of external force on fingers



L: The distance to the load application point

Model	Vertical direction Allowable load Fv(N)	Maximum allowable torque		
		Bending torque Mp(N.m)	Deflection torque My(N.m)	Rotation torque Mr(N.m)
GHF12D	98	0.68	0.68	1.4
GHF16D	176	1.4	1.4	2.8

Note:The load and moment values in the table are static values

Calculation of allowable external force (when moment load is applied)	Example of calculation
$\text{Allowable load } F(\text{N}) = \frac{M(\text{maximum allowable moment}) (\text{N.m})}{L \times 10^{-3} \times \text{※}}$ (※ Is the unit conversion constant)	When the actual static load f=10N, the bending moment of the point L=30mm from the end face of the jaw of SHF2-12D $\text{Allowable load } F = \frac{0.68}{30 \times 10^{-3}}$ $= 22.7 \text{ (N)}$ Load f=10(N) < 22.7(N) so you can use.

Installation and Use

1. When installing, do not let the air gripper fall or be hit, so as to avoid damage to the product and dents.

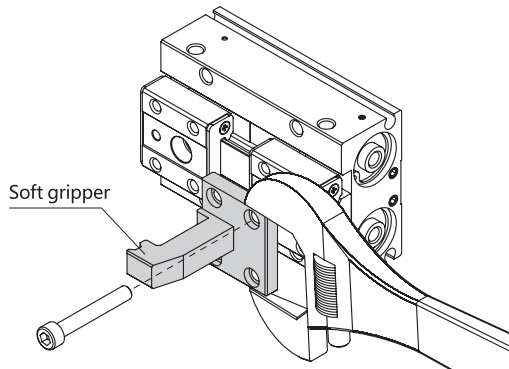
Slight deformation will cause poor accuracy and work not well.

2. When installing accessories, please properly tighten the screws within the limited torque range.

Tightening with a torque out of the torque range may cause malfunction, and if the tightening torque is insufficient, positional displacement or drop may occur.

How to install the gripper attachment

Attach the attachment to the mounting female thread of the jaws with screws, etc., using the tightening torque in the table below.



Model	Screws used	Maximum tightening torque N.m
GHF12D	M4×0.7	0.63
GHF16D	M5×0.8	1.5

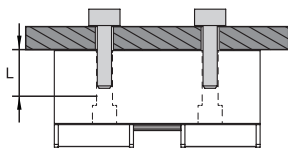
3. When installing the air gripper, please properly tighten the screws within the limited torque range.

Bad action if bigger tighten torque;

Position offset or fall if smaller tighten torque.

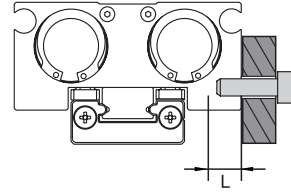
How to install the gripper attachment

Top mount type (main body screw hole)



Model	Screws used	Maximum tightening torque N.m	Maximum thread entry depth Lmm
GHF12D	M4×0.7	2.2	10
GHF16D	M5×0.8	4.5	12

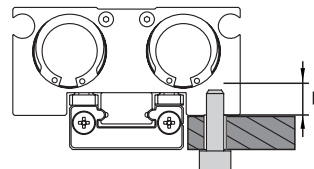
Side Mount Type (Through Hole in Body)



Model	Screws used	Maximum tightening torque N.m	Maximum thread entry depth Lmm
GHF12D	M4×0.7	1.5	5
GHF16D	M5×0.8	3	5.5

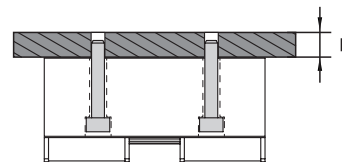
Bottom mount type (main body screw hole, main body through hole)

1. Use the main body screw holes



Model	Screws used	Maximum tightening torque N.m	Maximum thread entry depth Lmm
GHF12D	M4×0.7	1.5	5
GHF16D	M5×0.8	3	5.5

2. Use the empty holes without thread



Model	Screws used	Maximum tightening torque N.m	Maximum thread entry depth Lmm
GHF12D	M3×0.5	0.63	—
GHF16D	M4×0.7	1.5	—

Note: When the SHF12, 16 thin air gripper is installed through the main body, the commercially available hexagon socket screws can be used; the screw depth depends on the specific installation situation.

Use Environment



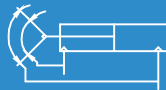
Pay attention to the corrosion resistance of linear guides.

The materials of Fingers & guides are martensitic stainless steel, which is weaker than. Martensitic stainless steel is used on fingers and rails; compared with austenitic stainless steel, the corrosion resistance is weak; especially in the environment where there are water droplets such as freezing dew, there is a problem of rust

GHR

Air gripper

GHR: Standard double acting type



Specifications

Bore size(mm)	10	16	20	25
Action type	Double Acting			
Working medium	Clean Air(40 μ m filtration)			
Operating pressure	0.15~0.7MPa(22~100psi)(1.5~7.0bar)			
Ambient and fluid temperature(°C)	-20~70(No freezing)			
Lubrication	Cylinder: Not required Gripper: Fingers: grease required			
Theoretical gripping force (N.m)①	0.16	0.55	1.10	2.30
Max. operating frequency	60(C.P.M)			
Opening/Closing angle (°)	Open:180±2, Close:-2~5			
Repeatability (mm)	±0.2			
Cushion type	Rubber cushion			
Port size	M5X0.8			
Weight(g)	67	142	312	552

① The indicated gripping forces were measured at room temperature at an operating pressure of 0.5Mpa

How to Order?

Series	Bore	—	Magnet No.
GHR:180° Open/Close Style Air gripper	10 16 20 25	—	S : With magnet (Magnet is standard)

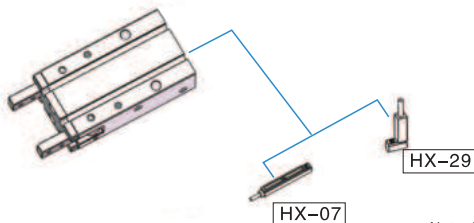
Order Example:

GHR Series 180° Open/Close Style Air gripper,
Bore25,with magnet,ERP code is:GHR25-S

Product Features

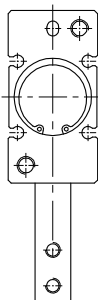
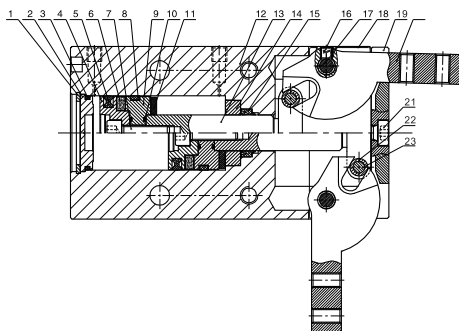
1. Unique design for the opening and closing, effectively preventing foreign objects from entering
2. Special shutter used between fingers and body, reducing wearing and extending lifetime
3. 180° opening and closing type, simplify gripping and releasing, avoid workpiece motion space, wider applications
4. Built-in sensor switch groove, easy for mounting
5. Multi mounting types, convenient for using under different conditions
6. All sizes are built with magnet, easy for controlling

Optional Accessories



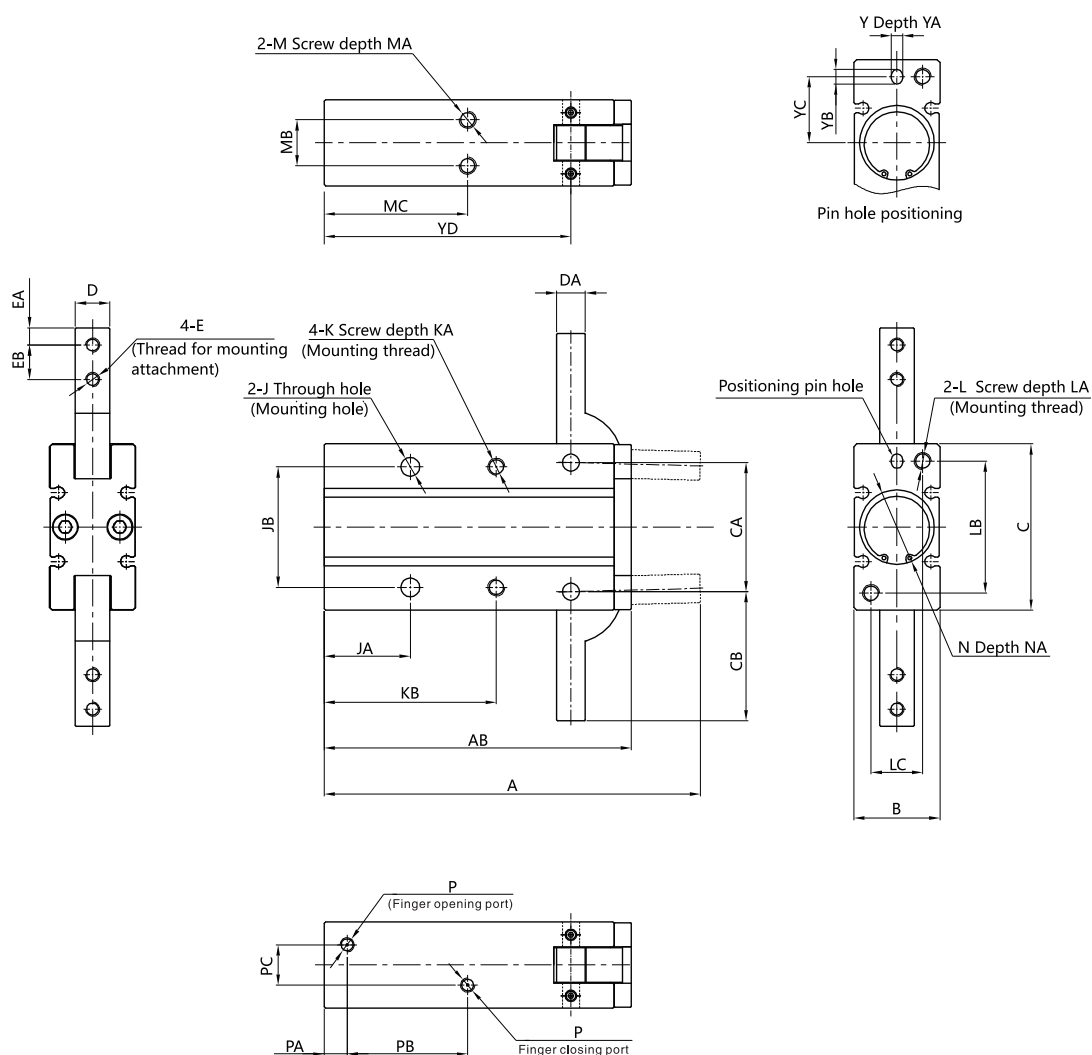
Note: For shorter stroke, due to limited space, please use HX-29

Internal Structure



No.	Part Name	Material	No.	Part Name	Material
1	Type C retaining ring	Spring steel	13	Joint	Stainless steel
2	Rear cover	Aluminum alloy	14	Dust baffle	Brass
3	O-ring	NBR	15	Piston rod seal	NBR
4	Piston	Aluminum alloy	16	Hexagon socket set screw	Carbon steel
5	Piston seal	NBR	17	Pin	Stainless steel
6	Rutie Boron	Rutie Boron	18	Blade	Stainless steel (φ 16、φ 20、φ 25) φ 10无
7	Hexagon socket cap screw	Carbon steel (φ 16、φ 20、φ 25) φ 10无 φ 10Cres required counterbore head screws	19	Cover plate	Aluminum alloy
8	Wear ring	PTFE	20	Gripper	Stainless steel
9	Magnet	Aluminum alloy	21	Hexagon socket cap screw	Carbon steel
10	O-ring	NBR (φ 16、φ 20、φ 25) φ 10无	22	Pin sleeve	Stainless steel (φ 20、φ 25) φ 10、φ 16无
11	Anti-bump cushion	TPU (φ 10、φ 16、φ 20) NBR (φ 25)	23	Pin	Stainless steel
12	Body	Aluminum alloy			

Main Dimension

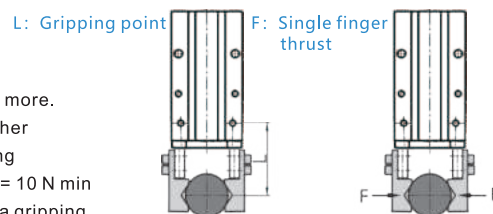


Bore/Sign	A	AB	B	C	CA	CB	D	DA	E	EA	EB	J	JA	JB	K	KA	KB	L	LA	LB	LC
GHR10	71	58	15	30	22	23.5	6	4	M3X0.5	3	6	Ø3.4	18	24	M3X0.5	6	35	M3X0.5	6	24	9
GHR16	84	69	20	38	28	28.5	8	5	M3X0.5	4	7	Ø4.5	20	30	M4X0.7	8	41	M4X0.7	8	30	12
GHR20	106	86	26	48	36	37	10	8	M4X0.7	5	9	Ø5.5	25	36	M5X0.8	10	50	M5X0.8	10	38	16
GHR25	131	107	30	58	45	45	12	10	M5X0.8	6	12	Ø6.6	30	42	M6X1.0	12	60	M6X1.0	12	46	18
Bore/Sign	M	MA	MB	MC	N	NA	P	PA	PB	PC	Y	YA	YB	YC	YD						
GHR10	M3X0.5	4	9	30	Ø11 ^{+0.05} ₀	1.7	M5X0.8	7	23	3	3 ^{+0.03} ₀	3	4	9	47.5						
GHR16	M4X0.7	5	12	33	Ø17 ^{+0.05} ₀	2	M5X0.8	7	25	8	3 ^{+0.03} ₀	3	4	15	55.5						
GHR20	M5X0.8	8	14	42	Ø21 ^{+0.05} ₀	2	M5X0.8	8	32	12	4 ^{+0.03} ₀	4	5	19	69						
GHR25	M6X1.0	10	16	50	Ø26 ^{+0.05} ₀	2	M5X0.8	8	42	14	4 ^{+0.03} ₀	4	5	23	88						

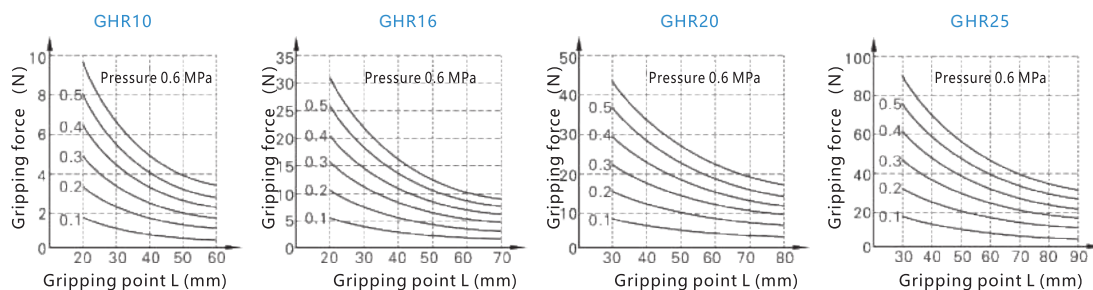
◆ How to select product

1. Confirmation of effective gripping force

- 1.1 Although the coefficient of friction between the attachments and the workpiece differ, select a model that can provide a gripping force of 10 to 20 times the workpiece mass, or more.
- 1.2 If high acceleration, deceleration or impact forces are encountered during motion, a further margin of safety should be considered. Example) given workpiece mass: 0.05kgs, gripping point L: 30mm, the pressure: 5kgf/cm² Required gripping force = $0.05 \text{ kg} \times 20 \times 9.8 \text{ m/s}^2 = 10 \text{ N min}$
Model selection: HFR16 is recommended. The gripping force is 17N, therefore satisfies a gripping force setting value of 20 times or more
- 1.3 The effective gripping force shown in the graphs to the right is expressed as F, when both fingers and attachments are in full contact with the workpiece.

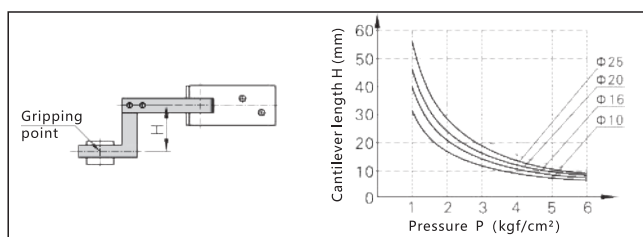


2. Connection between gripping force and gripping point distance



3. The selection of the gripping point

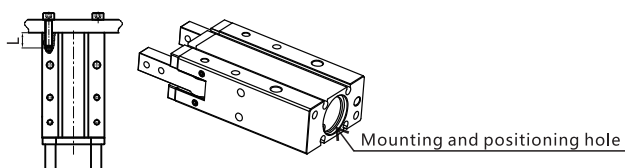
- 3.1 Workpiece should be held at a point within the range of overhanging distance (H) for a given pressure indicated in the tables below. When the workpiece is held at a point outside of the recommended range for a given pressure, it may cause adverse effect on the product life.
- 3.2 Within the allowable range of gripping point, the fixture shall be shore and light; when it is long and heavy, the inertia force when finger open and close, it will influence the performance and lifetime of the fingers at the same time.



Installation and application

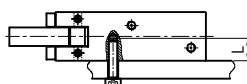
- Due to the abrupt changes, the pressure is low, which will lead to the decrease of the gripping force and falling of the work-pieces.
In order to avoid the harm to the human body and damage to the equipment, anti-dropping device must be equipped.
- Don't use the air gripper under strong external force and impact force.
- When install and fix the air gripper, avoid falling down, collision and damage.
- When fixing the gripping jaw parts, don't twist the gripping jaw.
- 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 Mounting Type



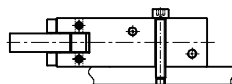
Bore	Bolt Size	Max.Locking Torque (Nm)	Max.Screwed Depth L (mm)	Tail Positioning Bore Dia(mm)	Tail positioning Depth(mm)
10	M3X0.5	1	6	φ 11	1.5
16	M4X0.7	2	8	φ 17	2
20	M5X0.8	4.5	10	φ 21	2
25	M6X1.0	7	12	φ 26	2

Mounting by front tapped hole



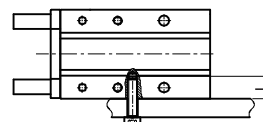
Bore	Bolt Size	Max.Locking Torque (Nm)	Max.Screwed Depth L (mm)
10	M3X0.5	0.9	6
16	M4X0.7	1.6	8
20	M5X0.8	3.3	10
25	M6X1.0	5.9	12

Mounting by front through hole



Bore	Bolt Size	Max.Locking Torque (Nm)
10	M3X0.5	1
16	M4X0.7	2
20	M5X0.8	4.5
25	M6X1.0	7

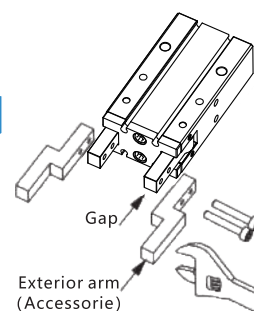
Mounting by side tapped hole



Bore	Bolt Size	Max.Locking Torque (Nm)	Max.Screwed Depth L (mm)
10	M3X0.5	0.6	4
16	M4X0.7	1.5	5
20	M5X0.8	3.5	8
25	M6X1.0	6	10

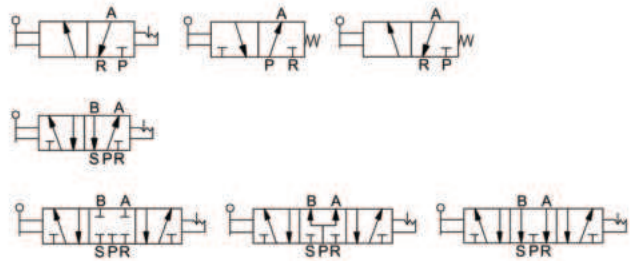
- The installation method of the gripping jaw fittings.
When install the gripping jaw fittings, you have to pay particular attention that you can only hold the gripping jaw by using spanner, and then lock the screws with allen wrench. Never clamp the body directly and then lock the screws, otherwise the parts will be easily damaged.
Please refer to below chart for the locking torque.
- When gripping, the workpiece must be located in the center line between fingers, and the two fingers shall touch the workpiece at the same time, otherwise they could easily get broken.
- Confirm that there is no additional external forces exerted on the fingers.
Transverse load acts on the fingers, which will cause impact load, leading 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.
- When workpieces inserted, the center line should be coaxial, no offset, in case there are additional external force generated on the jaw. When testing, it is specially required that the manual operation should be reduced and the pressure should be used to run it at a low speed, and guarantee the safety and no impact.
- Please use the flow control valve to adjust the opening and closing speed of gripping jaw if too fast.
- People cannot enter the movement path of air gripper and articles cannot be placed on the path too.
- Before removing the air gripper, please confirm that it is out of working state, and then discharge of compressed air.

Bore	Bolt Size	Max.Locking Torque (Nm)
10	M3X0.5	0.6
16	M3X0.5	0.6
20	M4X0.7	0.8
25	M5X0.8	1.5



H

Hand Push Valve (5/2)



How to Order?

Series No.	Ways	Positions	Valve body size	Original Status	Port size	Reset	Thread Type
H	3:3 ways 5:5 ways	2:2 positions 2:2 positions 3:3 positions	1: 1 Series 2: 2 Series 3: 3 Series 4: 4 Series	C: Center close P: Center pressure E: Center exhaust (Only for 5/3 way)	1 Series M5: M5 06: 1/8" 2 Series 06: 1/8" 08: 1/4" 3 Series 08: 1/4" 10: 3/8" 4 Series 10: 3/8" 15: 1/2"	Blank: Manual reset S: Spring return	Blank: G P: PT T: NPT

Order Example

H series hand push valve, 5/2 way, 2 series valve body, NC type, 1/4" port size, manual reset, black valve body, G thread, ERP code is: H522-08

Remarks: Manual reset of two position tee can be divided into non opening and non closing

Specifications

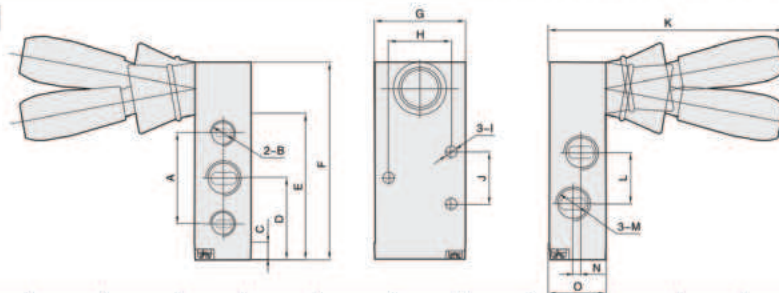
Model	H Series Hand Valve
Working medium	Clean air(After 40 μm filtration)
Acting type	External control
Lubrication	Not required
Working pressure(MPa)	0~0.8
Guaranteed pressure (MPa)	1.2
Working temperature (°C)	-5~60
Seal material	NBR

Product Features

- * Manual operated
- * Various working style are available

Main Dimension

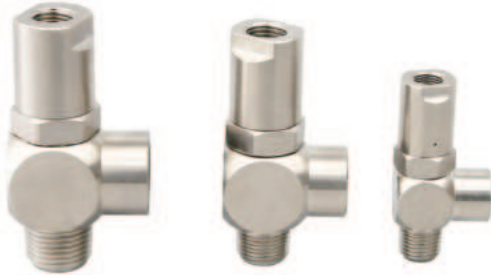
H521/H522/H523/H524



Model/Sign	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
H521-06	28	G1/8	6.7	28.2	49.7	69.7	27	19	Φ3.3	14	83.8	16	G1/8	3	18
H522-08	35	G1/8	6.7	31.7	56.7	76.7	35	24	Φ4.3	20	91.3	20	G1/4	3	22
H523-10	45	G1/4	7.5	40	72.5	92.5	40	28	Φ4.3	24	96.5	24	G3/8	4	27
H524-15	63	G1/2	10	57	104	132	50	36	Φ5.5	28	105	36	G1/2	4	34

QPC

Pilot Non - Return Valve



◆ Product Features

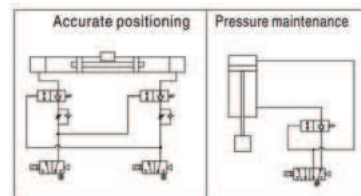
1. Can make cylinder momentary stop, accurate orientation;
2. Prevent cylinder moving after stopped;
3. Can be used for safety loop of pressure holding;
4. Can be used for special loop.

◆ How to Order?

Series	—	Port Size
QPC		08: 1/4" 10: 3/8" 15: 1/2"

Order Example:

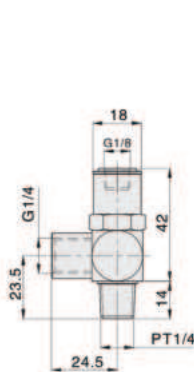
QPC series valve, 1/4" port size, ERP code is: QPC-08



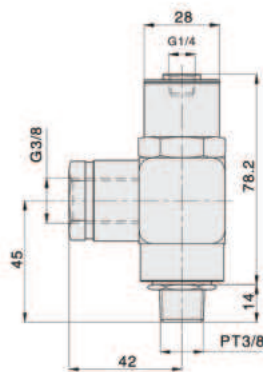
◆ Specifications

Model	QPC - 08	QPC - 10	QPC - 15
Working medium	Clean air(After 40 μm filtration)		
Sectional (mm)	24	79	79
Working pressure(MPa)	0.1~1.0		
Guaranteed pressure(MPa)	1.5		
Working temperture(°C)	-20~70		
Operating Frequency (Times/min)	60	40	40
Valve material	Nickel plated brass	Aluminum alloy	Aluminum alloy
Port size	1/4"	3/8"	1/2"
Pilot Port Size	1/8"		

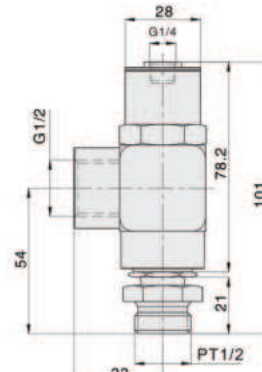
◆ Main Dimension



QPC - 08



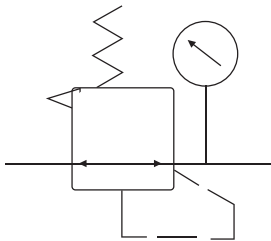
QPC - 10



QPC - 15

PFRH

High Pressure Filter Regulator



How to order

PFRH	Valve Body Size	Port Size
PFRH Series	20: 2000 Valve body 30: 3000 Valve body 40: 4000 Valve body 50: 5000 Valve body	02: G1/4 " 03: G3/8 " 04: G1/2 " 06: G3/4 " 10: G1 "

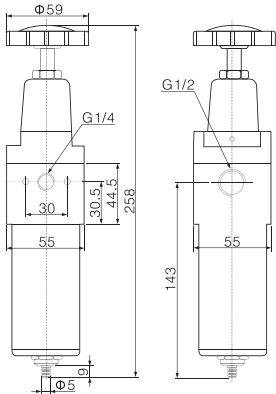
Order Example:

PFRH Series, 4000 Valve body, Port Size: G1/2 " , EPR Code: PFRH 40-04

Specification

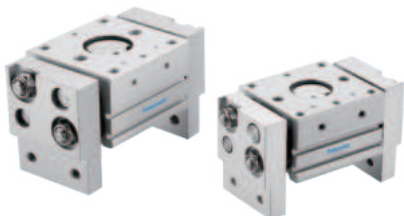
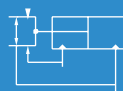
Model	PFRH-02	PFRH-03	PFRH-04	PFRH-06	PFRH-10
Working Medium	Air				
Port Size	G1/4	G/8	G1/2	G3/4	G1
Filter Precision	20 u m/40 u m				
Pressure Adjustment Range	0.15 - 3.5MPa				
Max.Input Pressure	4MPa				
Working Temperature	5 - +80°C				

Main Dimensions



PHL

Wide Type Parallel Style Air Gripper



Specification

Bore Size(mm)	16	20	25	32
Acting Type	Double acting			
Fluid	Air(to be filtered by 40 μm or better)			
Operating pressure	0.15~0.7MPa(22~100psi)(1.5~7bar)			
Temperature°C	-20~70(No freezing)			
Lubrication	Cylinder.No necessary			
Max.frequency	40 cycle/minute			20 cycle/minute
Gripping force(N) ①	45	74	131	228
Proof pressure	1.2MPa(175psi)			
Repeatability(mm)	± 0.1			
Cushion type	Bumper			
Port Size	M5X0.8			G1/8②

① Grip point distance is 40mm(φ16~φ25) or 80mm(φ32) at 0.5 MPa

② G、PT、NPT thread Optional

How to order?

Series	Bore	X	Stroke	—	Magnet No	□ (缸径32)
PHL: Wide air gripper (Double acting)	16 20 25 32		Listed below		S:With magnet (Magnet is standard)	Blank: G P: PT T: NPT

Order Example:

PHL Series air gripper,Bore 25mm,Stroke 60mm,With magnet,ERP code is:SHL25X60-S

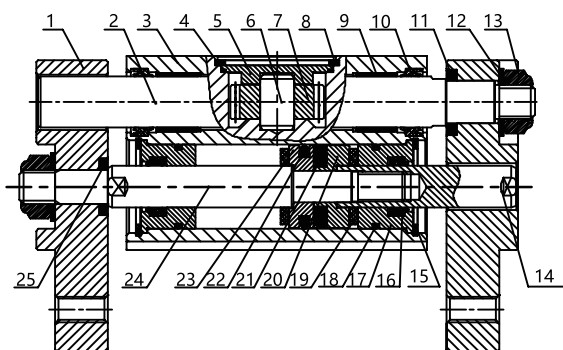
Stroke

Bore(mm)	Standard Stroke(mm)					Max.Stroke(mm)
16	30	40	60	80		80
20	40	60	80	100		100
25	40	60	80	100		100
32	60	80	100	150		150

Product feature

- 1.The gripper opening or closing can be precisely synchronized with the rack & pinion mechanism.
2. Two round and two square Slots on the barrel, Multiple magnet switch are available.
- 3.Multiple bore size and stroke are available.
- 4.Double pistons design to increase the clamping force.
- 5.Multiple options for installing and fixing .
- 6.Convenience to mount workpiece.
- 7.Design for large workpiece.
- 8.Magnet is included in the standard configuration.

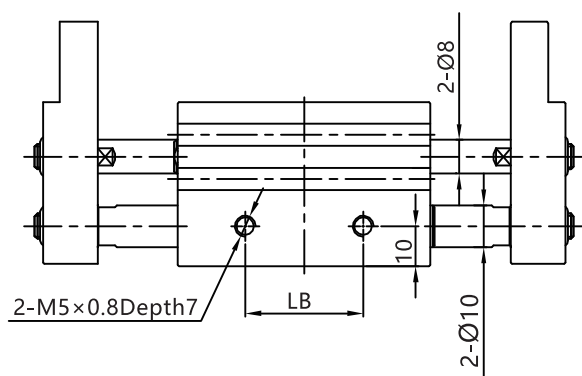
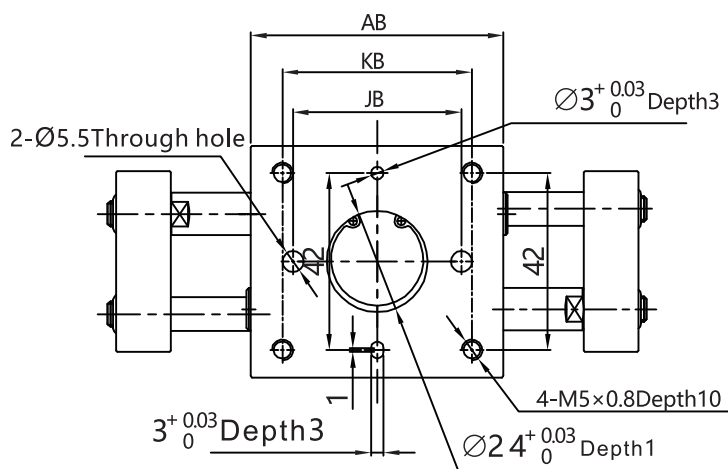
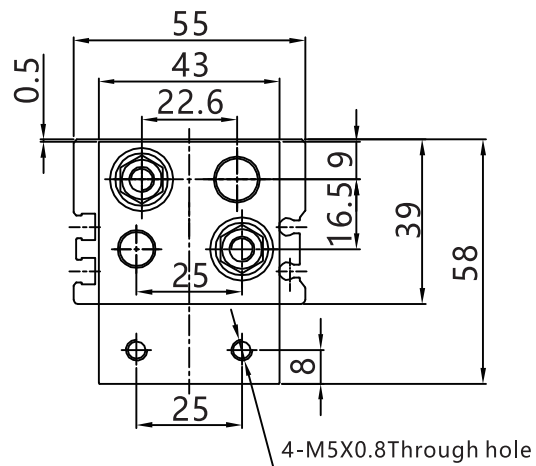
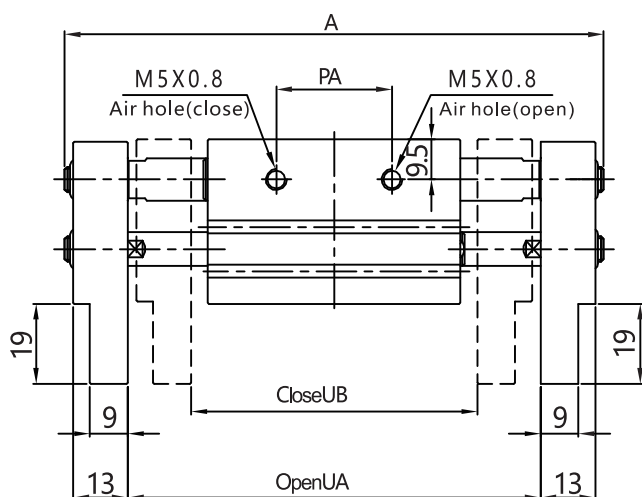
Internal Structure



No.	Part Name	Material	No.	Part Name	Material
1	Face plate	Aluminum alloy	14	Piston rod B	Stainless steel
2	Rack	Stainless steel	15	C Type retaining ring	Spring steel
3	Bore	Aluminum alloy	16	Piston rod seal	NBR
4	O-ring	NBR	17	Head cover	Aluminum alloy
5	Gear cover	Aluminum alloy	18	O-ring	NBR
6	Gear axes	Stainless steel	19	Bumper	TPU
7	Gear	Mould steel	20	Magnet seat	Aluminum alloy
8	C Type retaining ring	Spring steel	21	Magnet	Sintered metal (Neodymium-iron-boron)
9	Bearing	Wear resistant material	22	Piston seal	NBR
10	Piston rod seal	NBR	23	Piston	Aluminum alloy
11	Washer	Carbon steel	24	Piston rod A	Stainless steel
12	Washer	Stainless steel	25	Washer	Carbon steel
13	Nut	Stainless steel			

外形尺寸图

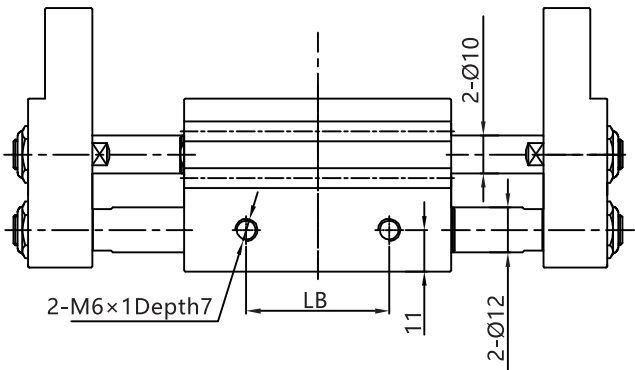
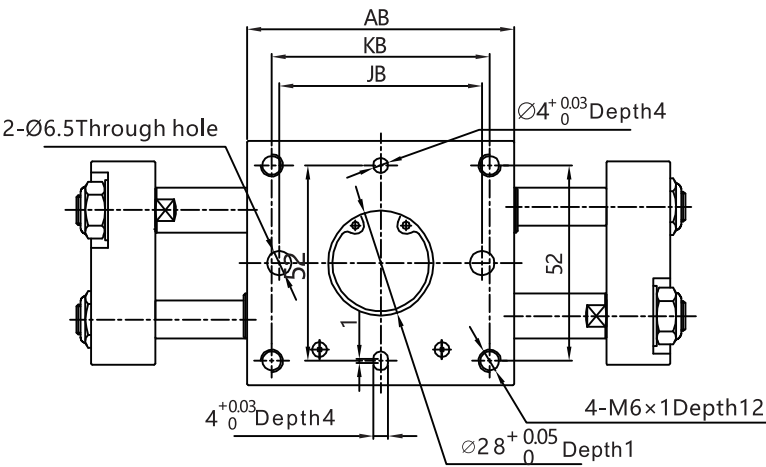
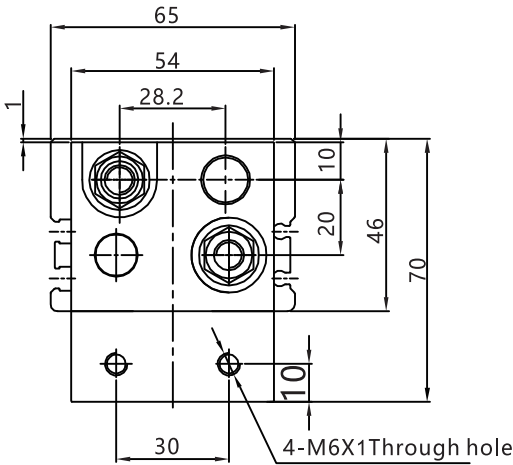
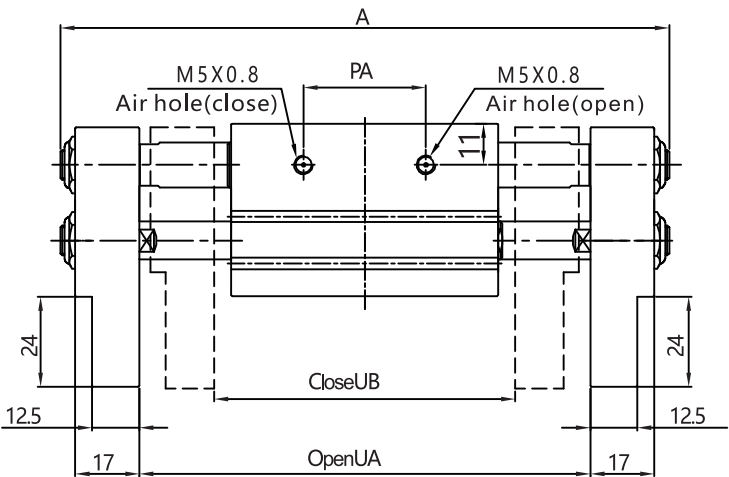
PHL16



Sign/Bore	30	40	60	80
A	128	148	194	234
AB	60	70	90	110
JB	40	50	70	90
KB	45	55	75	95
LB	28	38	58	78
PA	25	30	40	51.6
UA(Open)	98	118	164	204
UB (Close)	68	78	104	124

外形尺寸图

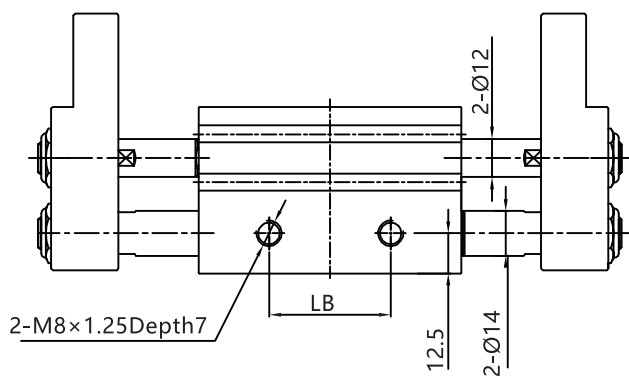
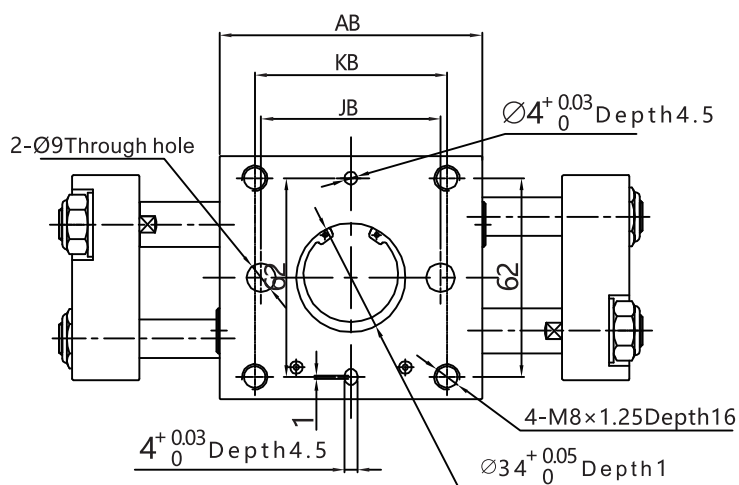
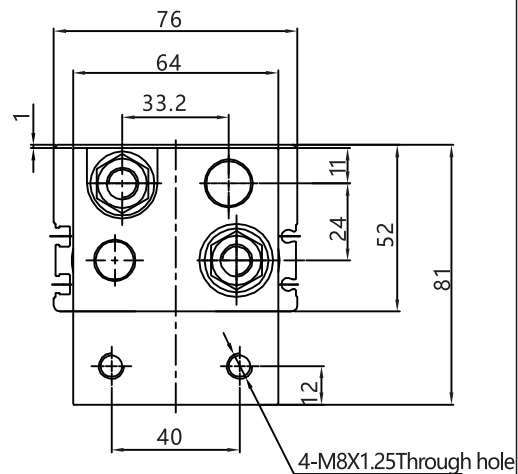
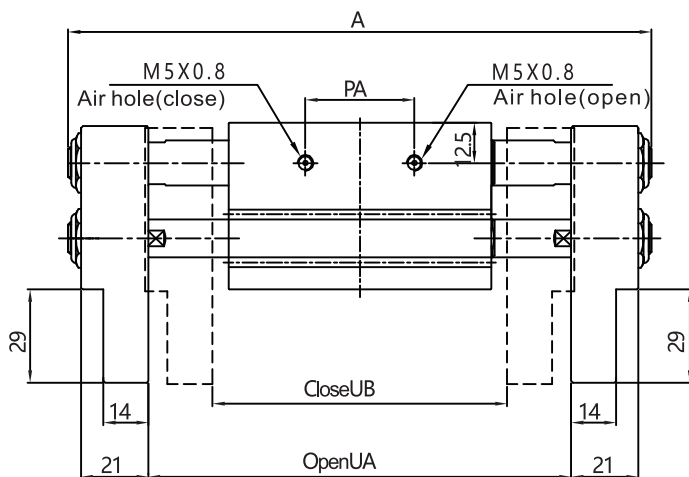
PHL20



Sign/Bore	40	60	80	100
A	162	202	254	294
AB	71	91	113	133
JB	54	74	96	116
KB	58	78	100	120
LB	38	58	80	100
PA	32.6	42.6	52.6	64
UA(Open)	120	160	212	252
UB (Close)	80	100	132	152

外形尺寸图

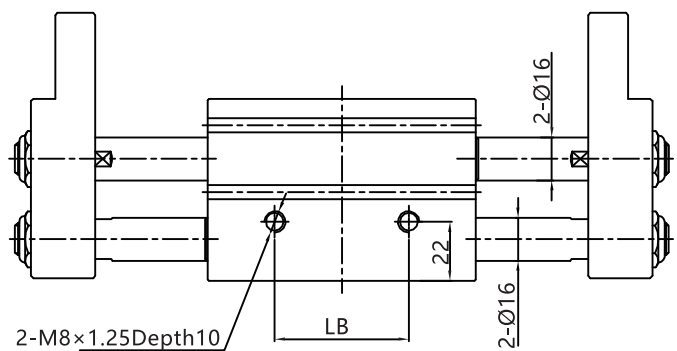
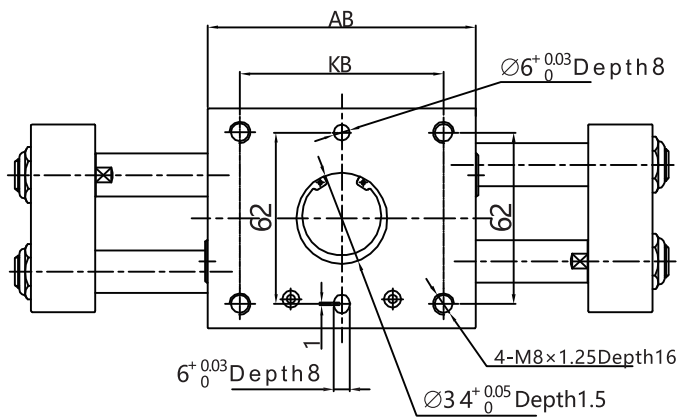
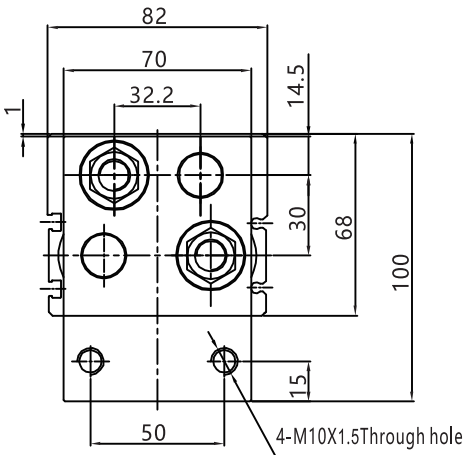
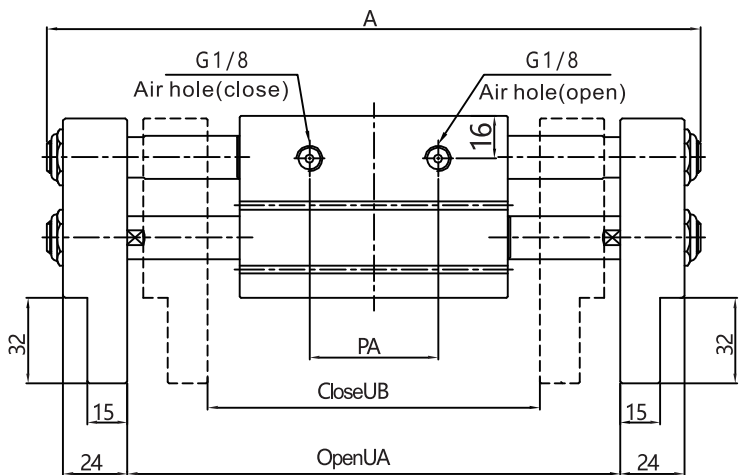
PHL25



Sign/Bore	40	60	80	100
A	182	222	276	316
AB	82	102	122	142
JB	56	66	100	120
KB	60	70	104	124
LB	38	48	82	102
PA	34	44	54	64
UA(Open)	132	172	226	266
UB (Close)	92	112	146	166

◇ 外形尺寸图

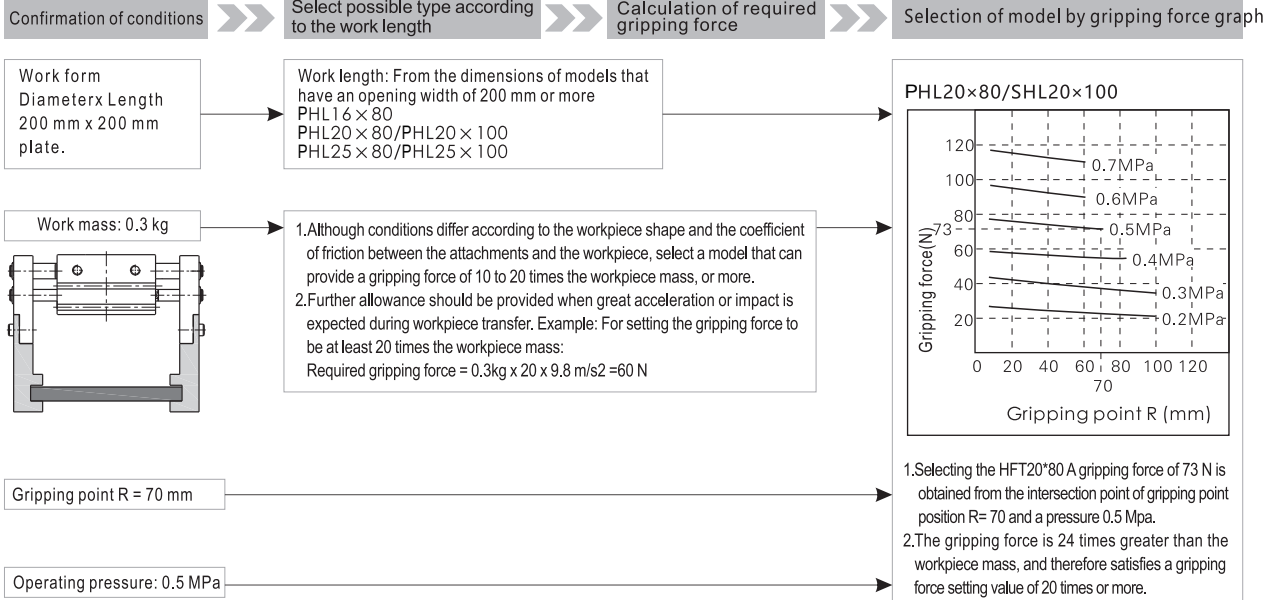
PHL32



Sign/Bore	60	80	100	150
A	244	284	342	442
AB	100	120	158	208
KB	76	86	134	184
LB	50	60	108	158
PA	45	55	65	90
UA(Open)	184	224	282	382
UB (Close)	124	144	182	232

Product type

1、Please select pneumatic finger according to the following steps

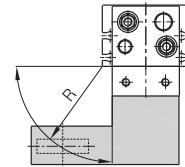
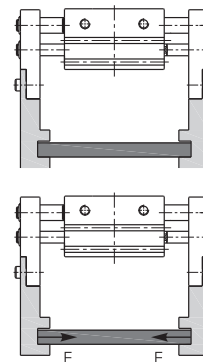


2、Gripping Point

- 2.1、The workpiece gripping point distance should be within the gripping force ranges given for each pressure in the effective gripping force graphs below.
- 2.2、If operated with the workpiece gripping point beyond the indicated ranges, the load that will be applied to the fingers or the guide will become excessively unbalanced. As a result, the fingers could become loosened and adversely affect the service life of the unit.

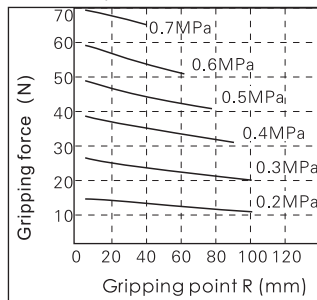
3、Effective Gripping Force

The gripping force shown in the tables represents the gripping force of one finger when all fingers and attachments are in contact with the work.

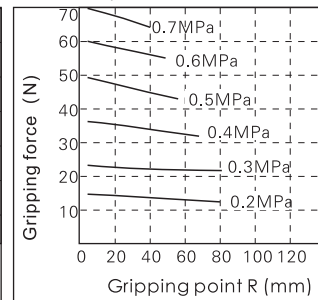


R: Gripping position (mm)

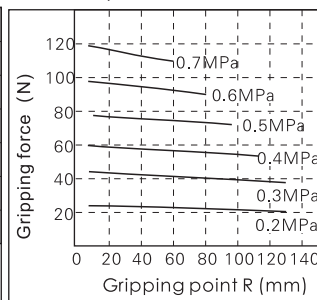
PHL16 x 30/SHL16 x 40



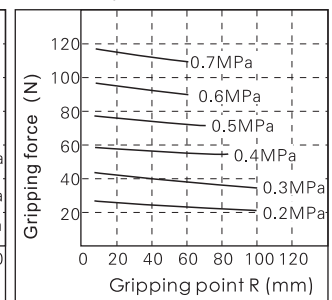
PHL16 x 60/PHL16 x 80



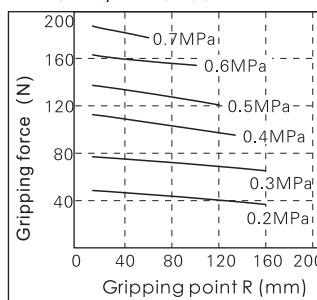
PHL20 x 40/PHL20 x 60



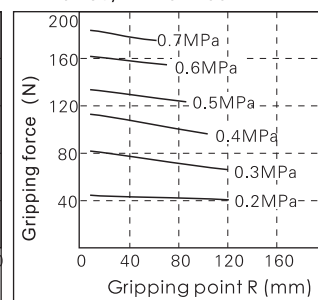
PHL20 x 80/PHL20 x 100



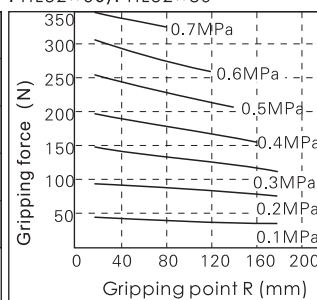
PHL25 x 40/PHL25 x 60



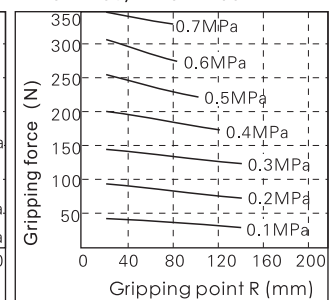
PHL25 x 80/PHL25 x 100



PHL32 x 60/PHL32 x 80

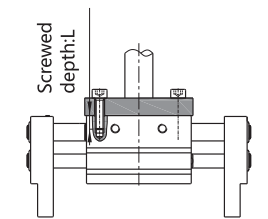


PHL32 x 100/PHL32 x 150

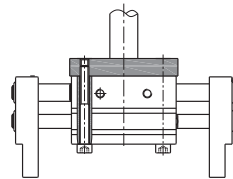


◆ Installation and application

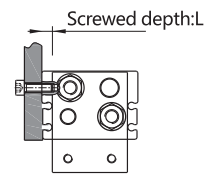
1. Due to the abrupt changes, the circuit pressure is low, which will lead to the decrease of the gripping force and falling of the work-pieces. In order to avoid the harm to the human body and damage to the equipment, anti-dropping device must be equipped.
2. Don't use the air gripper under strong external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



Axial mounted(thread hole)



Axial mounted(through hole)



Beside mounted

Bore size	The bolts type	Max.locking moment (Nm)	Max.screwed depth (mm)
16	M5 × 0.8	4.3	10
20	M6 × 1.0	7.3	12
25	M8 × 1.25	17.7	16
32	M8 × 1.25	17.7	16

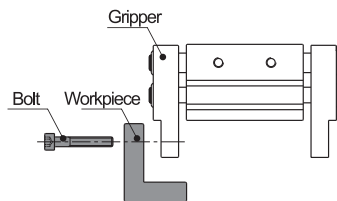
Bore size	The bolts type	Max.locking moment (Nm)
16	M5 × 0.8	4.3
20	M6 × 1.0	7.3
25	M8 × 1.25	17.7

Note: Not available for Ø32

Bore size	The bolts type	Max.locking moment (Nm)	Max.screwed depth (mm)
16	M5 × 0.8	2.8	7
20	M6 × 1.0	4.8	7
25	M8 × 1.25	12	7
32	M8 × 1.25	12	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 alien wrench. Never clamp the body directly and then lock the screws, otherwise the parts will be easily damaged.

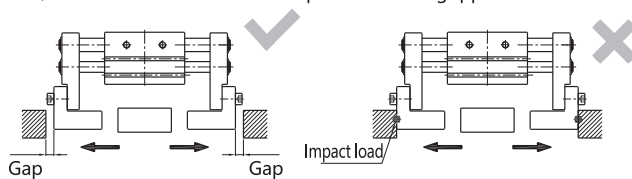


Bore size	The bolts type	Max.locking moment (Nm)
16	M5 × 0.8	2.8
20	M6 × 1.0	4.8
25	M8 × 1.25	12
32	M10 × 1.5	24

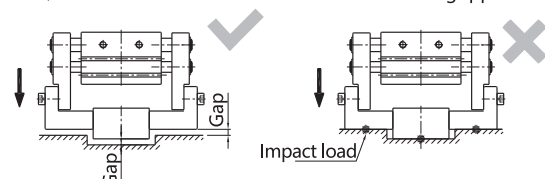
7. Confirm that there is no external forces exerted on the gripping jaw.

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.

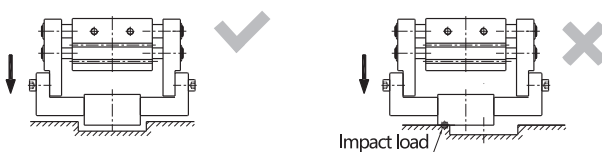
7.1. The end of stroke under the open state of air gripper



7.2. The end of stroke under the move state of air gripper



8. 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.



9. Please use the flow control valve to adjust the opening and closing speed of gripping jaw if too fast.
10. People can not enter the movement path of air gripper and articles can not be placed on the path too.
11. Before removing the air gripper, please confirm that it is out of working state, and then discharge of compressed air.



Specifications

Bore size(mm)			10	16	20	25
Acting type			Double Acting/Single Acting			
Working medium			Clean Air(40 μ m filtration)			
Applicable pressure range	Double acting	Φ 10	0.15~0.7MPa(22~100psi)(1.5~7.0bar)			
		Φ 16~Φ 25	0.1~0.7MPa(15~100psi)(1.0~7.0bar)			
	Single acting	Φ 10	0.3~0.7MPa(45~100psi)(3.0~7.0bar)			
		Φ 16~Φ 25	0.25~0.7MPa(36~100psi)(2.5~7.0bar)			
Working temperature			-20~70℃(No freezing)			
Oil			Not required			
Maximum frequency			180(C.P.M)			
Port size			M3X0.5	M5X0.8		
Weight(g)			52	120	236	430

How to Order?

Series	—	Type No.	—	Bore	—	Magnet No.
PHZ:		Blank:		10		S : With magnet
Parallel air gripper		SA: Single acting (N.O.)		16		(Magnet is standard)
		SB: Single acting (N.C.)		20		
				25		

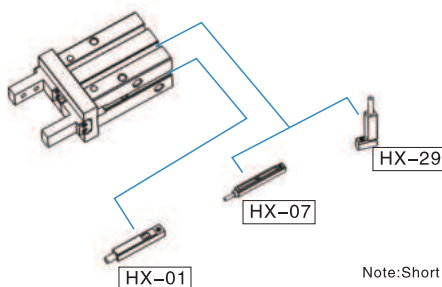
Order Example:

Parallel air gripper, Bore 20, with magnet, ERP code is: SHZ20-S

Product Features

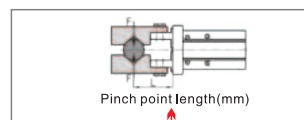
1. Integrated design of linear guide rail, high rigidity, high precision;
2. Positioning pin at the bottom of the linear guide rail, efficiently preventing deviation of guide rail from the body;
3. Deeper attached fixing benchmark centering hole, improving fixing accuracy, and improving consistency after repeated dismounting and fixing
4. According to the actual requirements of the customer, the initial position of the claw can be customized to meet the different needs under different working conditions.

Optional Acces



Note: Short stroke please use HX-29 series due to limited space.

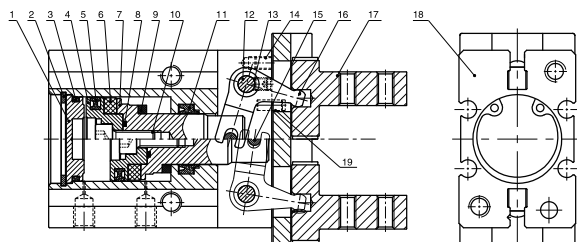
Clamping Force and Stroke



Acting Type	Type	Clamping force effective value of single air finger(N)		Stroke(two sides) (L) (mm)
		Closure clamping torque	Open clamping torque	
Double acting	PHZ10	11	17	4
	PHZ16	34	45	6
	PHZ20	45	68	10
	PHZ25	69	102	14
Single acting (N.O.)	PHZSA10	7	—	4
	PHZSA16	27	—	6
	PHZSA20	35	—	10
	PHZSA25	55	—	14
	PHZSB10	—	13	4
	PHZSB16	—	38	6
	PHZSB20	—	59	10
	PHZSB25	—	87	14

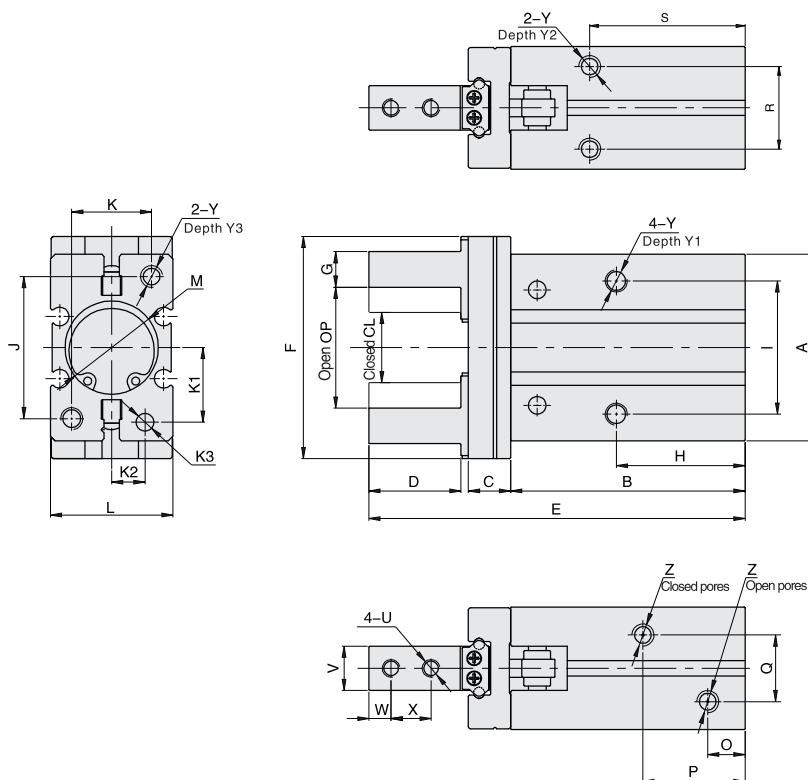
Note: The value of the clamping force in above table is when the working pressure is 0.5Mpa and the L value of the clamping point is 20mm.

Internal Structure



No.	Part Name	Material	No.	Part Name	Material
1	Rear cover	Aluminum alloy	11	Piston rod seal	TPU/NBR(Φ25)
2	C type retainer ring	Spring steel	12	Pin	Stainless steel
3	O-ring	NBR	13	Hexagon set screw	Carbon steel
4	Piston	Aluminum alloy/ Stainless steel(Φ10)	14	Hexagon socket cap screw	Carbon steel
5	Piston seal	NBR	15	Pin	Stainless steel
6	Magnet	Plastic	16	Bent lever	Alloy steel
7	Piston rod	Aluminum alloy/ Stainless steel (Φ10, Φ16)	17	Clamping jaw assembly	Assembly
8	O-ring	NBR	18	Barrel	Aluminum alloy
9	Anti-bump cushion	PTEE	19	Pin	Stainless steel
10	Hexagon socket cap screw	Carbon steel			

Main Dimension

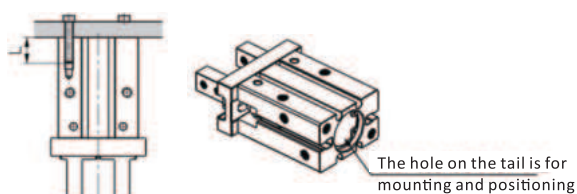


Bore/Sign	A	B	C	D	E	F	G	H	I	J	K	L	M	O	P	Q	K1	K2	K3
PHZ10	23	37.6	6	12.3	57	29	4 ⁰ _{-0.05}	23	16	18	12	16.4	11 ^{+0.05} ₀ Depth2	7	18.8	10	7.6	5.2	2 ^{+0.05} ₀ Depth3
PHZ16	30.6	42.5	7.5	15.5	67.3	38	5 ⁰ _{-0.05}	24.5	24	22	15	23.6	17 ^{+0.05} ₀ Depth2	7.1	18.5	13	11	6.5	3 ^{+0.05} ₀ Depth3
PHZ20	42	52.8	9.5	20.7	84.7	50	8 ⁰ _{-0.05}	29	30	32	18	27.6	21 ^{+0.05} ₀ Depth3	8.4	23	15	16.8	7.5	4 ^{+0.05} ₀ Depth4
PHZ25	52	63.6	11	25.5	102.7	63	10 ⁰ _{-0.05}	30	36	40	22	33.6	26 ^{+0.05} ₀ Depth3.5	9.5	23.5	19.5	21.8	10	4 ^{+0.05} ₀ Depth4
Bore/Sign	R	S	U	W	V	X	Y	Y1	Y2	Y3	Z	OP	CL						
PHZ10	11.4	27	M2.5X0.45	3	5 ⁰ _{-0.05}	5.7	M3X0.5	6	6	6	M3X0.5	14.8 ⁺² ₀	11.4 ⁰ _{-0.7}						
PHZ16	16	30	M3X0.5	4	8 ⁰ _{-0.05}	7	M4X0.7	9.5	5.5	8	M5X0.8	20.8 ⁺² ₀	14.8 ⁰ _{-0.7}						
PHZ20	18.6	35	M4X0.7	5	10 ⁰ _{-0.05}	9	M5X0.8	11.5	8	10	M5X0.8	26 ⁺² ₀	16.2 ⁰ _{-0.7}						
PHZ25	22	36.5	M5X0.8	6	12 ⁰ _{-0.05}	12	M6X1.0	14.5	10	12	M5X0.8	33.5 ⁺² ₀	19.2 ⁰ _{-0.7}						

Installation and Use

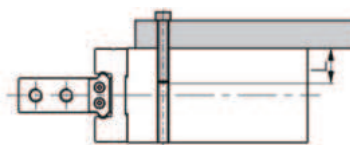
1. Installing a fall prevention device is recommended when applying a lowering clamping force.
In the case of a sudden pressure decrease due to emergency stop, these prevention devices can help to avoid personal or equipment injuries.
2. Don't use air gripper upon strong external force and impact force. Air grippers are not intended for use under external or impact forces.
3. When installing or repairing your air gripper take precautions to safely use your component.
4. Please contact with us when using the single acting type gripper for specific spring action force information.
5. Don't reverse the clamping gripper when installing clamping parts.
6. The locking torque of the fastening screw must be within the prescribed torque range shown in the chart below. If the locking torque is not set properly the unit will not perform correctly.

Tail Mounting Type



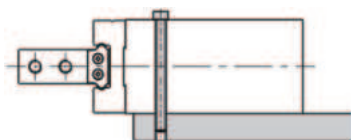
Bore	Bolt Size	Max.Locking Torque (Nm)	Max.Screw Depth (mm)	Tail Positioning Bore Dia.(mm)	Tail positioning Depth(mm)
10	M3X0.5	0.88	6	$\phi 11^{+0.05}_0$	2
16	M4X0.7	2.1	8	$\phi 17^{+0.05}_0$	2
20	M5X0.8	4.3	10	$\phi 21^{+0.05}_0$	3
25	M6X1.0	7.3	12	$\phi 26^{+0.05}_0$	3.5

Front Tapped Hole Mounting



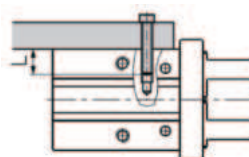
Bore	Bolt Size	Max.Locking Torque (Nm)	Max.Screw Depth (mm)
10	M3X0.5	0.69	5
16	M4X0.7	2.1	8
20	M5X0.8	4.3	10
25	M6X1.0	7.3	12

Through Hole Mounting



Bore	Bolt Size	Max.Locking Torque (Nm)	Max.Screw Depth (mm)
10	M2.5X0.45	0.49	5
16	M3X0.5	0.88	8
20	M4X0.7	2.1	10
25	M5X0.8	4.3	12

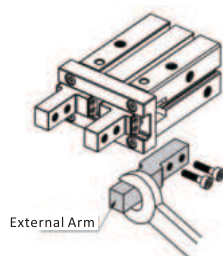
Side Tapped Hole Mounting



Bore	Bolt Size	Max.Locking Torque (Nm)	Max.Screw Depth (mm)
10	M3X0.5	0.9	6
16	M4X0.7	1.6	4.5
20	M5X0.8	3.3	8
25	M6X1.0	5.9	10

7. Clamping Jaw Installation:

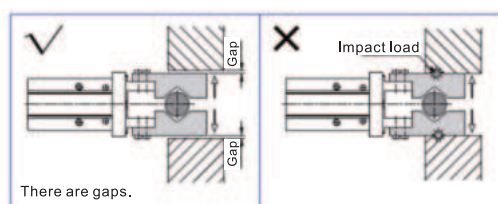
Never clamp the body directly and then lock the screws.
The gripping jaw should be held by the spanner and the screw should be locked using a hex wrench.



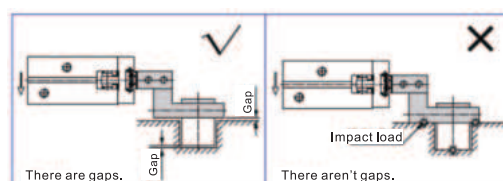
Bore	Bolt Size	Max.Locking Torque (Nm)
10	M2.5X0.45	0.31
16	M3X0.5	0.59
20	M4X0.7	1.4
25	M5X0.8	2.8

8. Avoid applying external forces to the gripping jaw.

8.1 The air gripper end of stroke in open status.

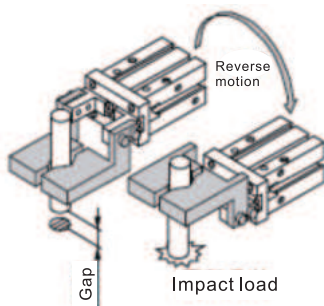


8.2 The air gripper end of stroke in moving status.

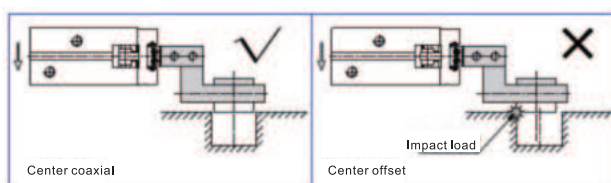


◆ Installation and Use

8.3 When reversing your loaded air gripper make sure the object being gripped is centred.



9. When ripping an object the item should always be centred. When testing, you must reduce the pressure for low speed running, to guarantee the safety and no impact.



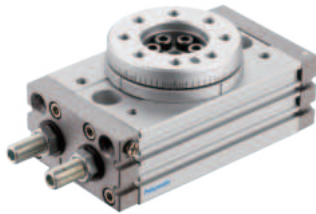
10. Please use the flow control valve to adjust the opening and closing speed of your gripper.

11. Always ensure the gripper path is clear of obstruction.

12. Before removing your air gripper, please make sure all power is disconnected and you've discharged residual compressed air.

PMQ

Rotary Cylinder



Specifications

Specifications		7	10	20	30	50
Acting type		Double Cylinder,Rack & Pinion Style,Double Acting				
Working medium		Clean Air(40um filtration or better)				
Working pressure range	With angle adjustable screw	0.1~0. 7MPa	0.1~1.0MPa			
	With shock absorber	None	0.1~0.6MPa			
Proof pressure(MPa)		1.5MPa				
Working temperature (°C)		-20~70(No freezing)				
Angle adjustable range		0~190°				
Repeat Accuracy	With angle adjustable screw	0.2°				
	With shock absorber	None	0. 05°			
Theoretical Torque(NM)(0.5Mpa)		0.63	1.1	2.2	2.8	5.0
Cushion	With angle adjustable screw	Rubber bumper(Standard)				
	With shock absorber	None	Shock absorber(Optional)			
Port size	Front port	M5x0.8			G1/8①	
	Side port				M5x0.8	
Weight(g)	With angle adjustable screw	270	530	1020	1310	2130
	With shock absorber	None	540	1020	1310	2140

Note: When setting the rotation angle for rotary tables with shock absorbers, following the above table. Failing to follow the guide may result in a decrease in energy absorption capacity.

① PT, NPT port size is optional

Bore Size(mm)	10	20	30	50
Minimum rotation angle that will not allow decrease of energy absorption ability	61°	52°	46°	66°

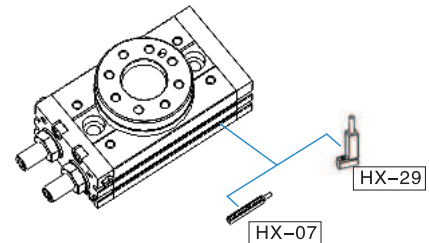
How to Order?

Series No	Specifications	Magnet No	Cushion Type	Thread Type
PMQ	7 10 20 30 50	S: With magnet (Magnet is standard)	A: With adjustment bolt R: With shock absorber (7 series no shock absorber is optional)	Blank: G P : PT T : NPT

Order Example:

PMQ Series Rotary Cylinder, Specifications 30, with adjustment bolt, G Thread, ERP code is: PMQ30-S-A
Note: Specific Bore and Stroke of the cylinder subject to the drawing.

Optional Accessories



Note: Short stroke please use HX-29 series due to limited space.

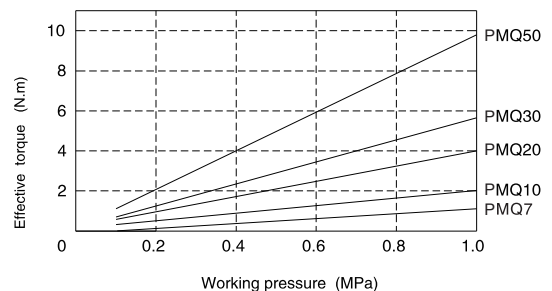
Allowable Kinetic Energy and Rotation Time Adjustment Range

Model	Allowable kinetic energy (J)		Rotation time adjustment range for stable operation (s/90°)	
	With adjutment bolt	With shcok absorber	With adjutment bolt	With shcok absorber
PMQ7	0.006	None	0.2~1.0	None
PMQ10	0.01	0.04	0.2~1.0	0.2~0.7
PMQ20	0.025	0.12	0.2~1.0	0.2~0.7
PMQ30	0.05	0.12	0.2~1.0	0.2~0.7
PMQ50	0.08	0.30	0.2~1.0	0.2~0.7

Note 1. If operated where the kinetic energy exceeds the allowable value, this may cause damage to the internal parts and result in product failure. Please pay special attention to the kinetic energy levels when designing and during operation to avoid exceeding the allowable limit.

2. When the rotation time of the type with an internal absorber is set longer than the time shown in the table above, energy absorption of the shock absorber greatly decreases.

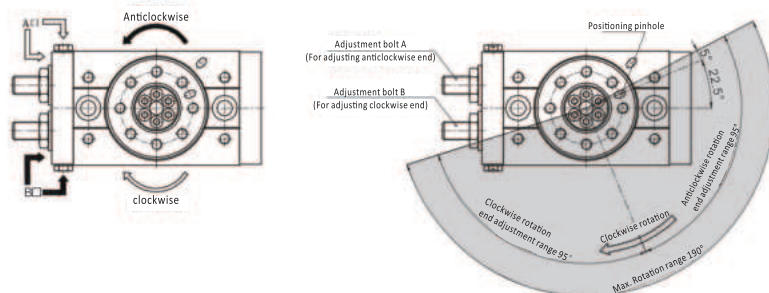
Effective Output Torque



Installation and Use

1. Rotation direction and rotation angle

- 1.1 When pressurized from port A, the shaft rotates clockwise and counter-clockwise when pressurized from port B.
- 1.2 To obtain the desired rotation angle, the rotation ends can be set within the range shown in the diagram by regulating the adjustment bolt.
- 1.3 Rotary table with a shock absorber is available to adjust the rotation angle.

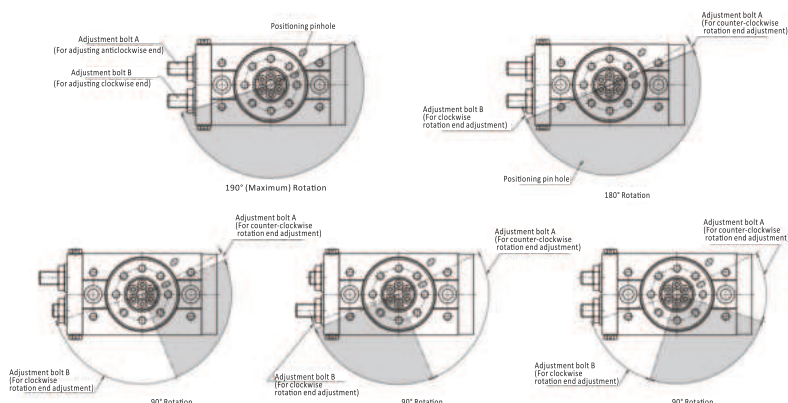


Note:

- * The figure above shows the rotation range of from the positioning pinhole.
- * Position of the pinhole in the figure above shows a counter-clockwise rotation where the rotation angle is set at 180° by equally tightening the A & B adjustment bolts.
- * The adjustment bolt of the shock absorber is factory set to the maximum output. Please adjust inward for first use if necessary.

2. Rotation range example:

- 2.1 Rotation can be set by adjusting the A & B adjuster bolts.
- 2.2 Rotary tables with shock absorbers can be set to various angles.



3. Adjustment angle per rotation (Adjustment bolt or shock absorber)
The adjustment angle of the turntable for each turn is as follows:

Bore size	Adjustment angle per rotation
7	10.2°
10	10.2°
20	7.4°
30	6.5°
50	8.2°

4. The rotation angle has been adjusted to the maximum output at the factory. Please do not extend the rotation angle beyond the maximum factory setting.
5. The movement energy should not exceed the maximum allowable energy, or the inner components can be damaged.
6. The rotary parts do not require lubrication.
7. Minimum operation pressure for a rotary table with a shock absorber is no less than 0.1Mpa.

8. Refer to the table below for tightening torques of the shock absorber setting nut.

Shock absorber size	Max. tightening torque (Nm)
M8X1.0	2.5
M10X1.0	3.5
M14X1.5	11

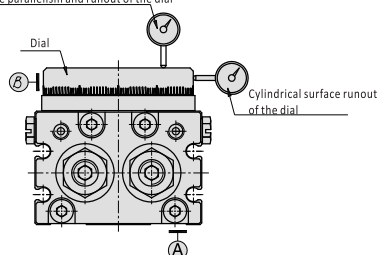
9. Never loosen the bottom screw of the shock absorber. That may cause oil leakage.

10. Shock absorbers are consumable parts. When a decrease in energy absorption capacity is noticed, it must be replaced.

Series	Shock Absorber Type and Ordering code	Thread Type
PMQ10	AC0806-SN	M8X1.0
PMQ20	AC1007-SN	M10X1.0
PMQ30	AC1007-SN	M10X1.0
PMQ50	AC1412-SN	M14X1.5

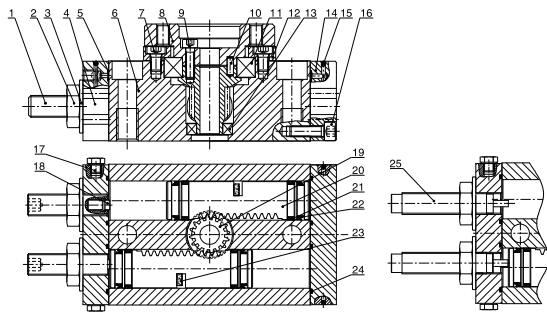
11. Control the runout and parallelism of the dial according to the requirements of the following table:

Plane parallelism and runout of the dial



Items	Specific Requirements (mm)	Relative Datum
Plane parallelism of the dial	0.1	A
Plane runout of the dial	0.1	A
Cylindrical surface runout of the dial	0.1	B

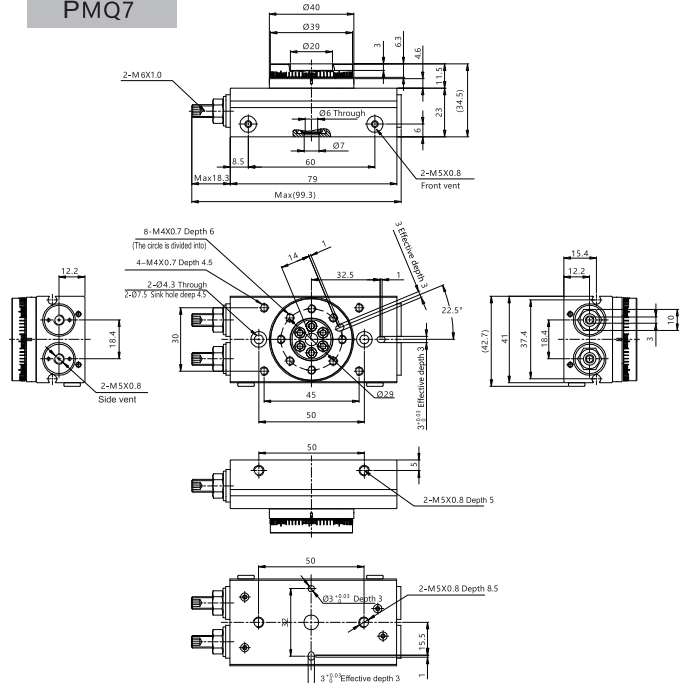
Internal Structure



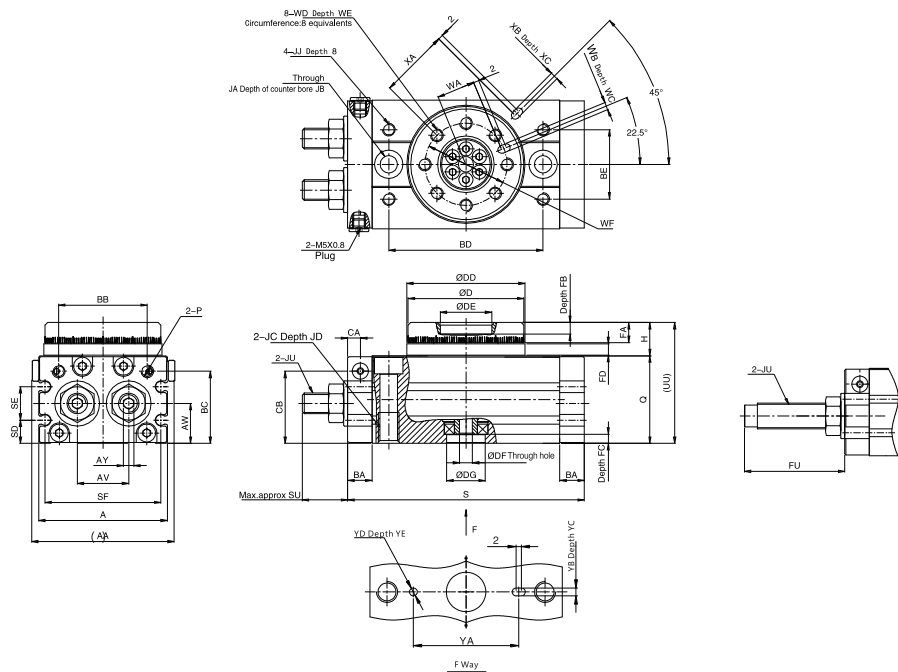
No.	Part Name	Material	No.	Part Name	Material
1	Adjustment screw	Carbon steel	14	Rear cover	Aluminum alloy
2	Hexagon nut	Carbon steel	15	Steel ball	Stainless steel
3	Seal washer	Carbon steel rubber coating	16	Hexagon socket head set screw	Carbon steel
4	Head cover	Aluminum alloy	17	Plug	Carbon steel
5	O-ring	NBR	18	Cushion pad	NBR
6	Barrel	Aluminum alloy	19	Pinion	Alloy steel
7	Hexagon socket head set screw	Carbon steel	20	Rack	Alloy steel
8	Dial	Aluminum alloy	21	Wear ring	PTFE
9	Hexagon socket head set screw	Carbon steel	22	Piston seal	NBR
10	Positioning pin	Stainless steel	23	Magnet	Sintered NdFeB
11	Deep groove ball bearing	Subassembly	24	O-ring	NBR
12	Plate	Aluminum alloy	25	Shock absorber	Subassembly
13	Deep groove ball bearing	Subassembly			

Main Dimension

PMQ7



PMQ10~50



型号	AA	A	AV	AW	AY	BA	BB	BC	BD	BE	CA	CB	D	DD	DE	DF	DG	FA	FB	FC	FD	H	J	JA	JB	JC	FU
10	52.8	50	20	15.5	4	9.5	34.5	28	60	27	5	28	45 ^{+0.062} ₀	46 ^{+0.062} ₀	20 ^{+0.052} ₀	9	15 ^{+0.043} ₀	7.8	4.5	3.5	4.5	13	6.8	11	6.5	M8X1.25	30.9
20	67.8	65	27.5	16	5	12	47	30	76	34	6.5	30	60 ^{+0.074} ₀	61 ^{+0.074} ₀	28 ^{+0.052} ₀	9	17 ^{+0.043} ₀	9.8	6.5	3	6.5	17	8.6	14	8.5	M10X1.5	34.8
30	72.4	70	29	18.5	5	12	50	32.5	84	37	7	33.5	65 ^{+0.074} ₀	67 ^{+0.074} ₀	32 ^{+0.062} ₀	10	22 ^{+0.052} ₀	9.8	5	3.5	6.5	17	8.6	14	8.5	M10X1.5	34.8
50	82.4	80	38	22	6	15.5	63	37.5	100	50	10	37.5	75 ^{+0.074} ₀	77 ^{+0.074} ₀	35 ^{+0.062} ₀	11	26 ^{+0.052} ₀	11.8	5.5	3.5	7.5	20	10.3	18	10.5	M12X1.75	54.3
型号	JD	JJ	JU	P	Q	S	SD	SE	SF	SU	UU	WA	WB	WC	WD	WE	WF	XA	XB	XC	YA	YB	YC	YD	YE		
10	12	M5X0.8	M8X1	M5X0.8	34	92	9	13	45	17.3	47	15	3 ^{+0.025} ₀	3.5	M5X0.8	8	32	27	3 ^{+0.03} ₀	3.5	40	3 ^{+0.03} ₀	3.5	Ø3 ^{+0.03} ₀	3.5		
20	15	M6X1	M10X1	M5X0.8	37	117	10	12	59.7	24.8	54	20.5	4 ^{+0.03} ₀	4.5	M6X1	10	43	36	4 ^{+0.03} ₀	4.5	50	4 ^{+0.03} ₀	4.5	Ø4 ^{+0.03} ₀	4.5		
30	15	M6X1	M10X1	1/8"	40	127	11.5	14	64.7	24.8	57	23	4 ^{+0.03} ₀	4.5	M6X1	10	48	39	4 ^{+0.03} ₀	4.5	58	4 ^{+0.03} ₀	4.5	Ø4 ^{+0.03} ₀	4.5		
50	18	M8X1.25	M14X1.5	1/8"	46	152	14.5	15	74.7	31.3	66	26.5	5 ^{+0.03} ₀	5.5	M8X1.25	12	55	45	5 ^{+0.03} ₀	5.5	68	5 ^{+0.03} ₀	5.5	Ø5 ^{+0.03} ₀	5.5		

PR 2000/3000/4000

Precision Pressure Regulator



◆ Product Features

- High precision , sensitive response.
- Steady output pressure.
- Large flow rate and steady flow output.
- Easy installation : Independent installation by bracket ; Bottom installation; Direct installation with existing modular air preparation.
- High pressure type, medium pressure type and low pressure type optional.

◆ How to Order?

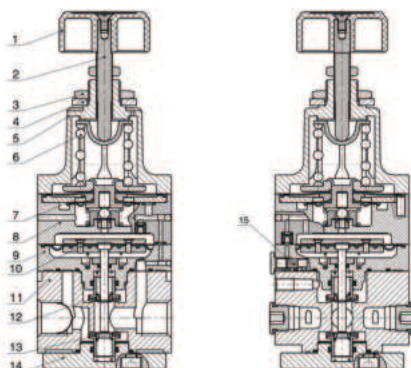
Series No.	Port size	Pressure Range	Pressure Gauge Code	Bracket Code	Scale Unit	Thread Type
PR2000	2000 01:1/8"	L: 0.005 ~ 0.2MPa	Blank: With pressure gauge	Blank: With bracket	4: MPa/psi	Blank: G
PR3000	3000 02:1/4"	M: 0.01 ~ 0.4MPa	N: No pressure gauge	J: No bracket		P: PT
PR4000	4000 02:1/4"	L: 0.01 ~ 0.2MPa				T:NPT
	03:3/8"	M: 0.01 ~ 0.4MPa				
	04:1/2"	H: 0.01 ~ 0.8MPa				

Order Example: PR3000 high precision regulator , 1/4" port, pressure range 0.01~0.8MPa , with gauge.with bracket.scale unit MPa/psi,G thread.
RP code is PR3000-02H

◆ Specifications

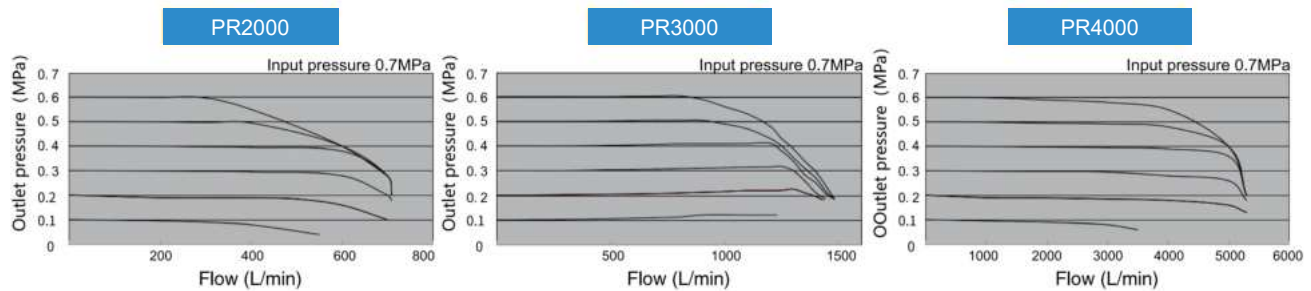
Model No.	PR2000-01	PR3000-02	PR4000-02	PR4000-03	PR4000-04
Working Medium	Clean air(After 5 μ m filtration)				
Max. Supply Pressure(Mpa)	1.0				
Min. Supply Pressure(Mpa)	Setting pressure+0.05		Setting pressure+0.1		
Proof Pressure(Mpa)	1.5				
Set Pressure	Low Pressure	L:0.005 ~ 0.2MPa		L:0.01 ~ 0.2MPa	
	Medium Pressure	M:0.01 ~ 0.4MPa			
	High Pressure	H:0.01 ~ 0.8MPa			
Sensitivity	Within 0.2% of full scale				
Repeatability	Within ± 0.5% of full scale				
Air Consumption	≤4.4L/min (ANR)		≤11.5L/min (ANR)		
Port Size	1/8"	1/4"	1/4"	3/8"	1/2"
Pressure Gauge Port Size	G1/8(2 locations)				
Working Temperature(℃)	-20~70 (No freezing)				
Weight(g)	140	420	710		

◆ Internal Structure

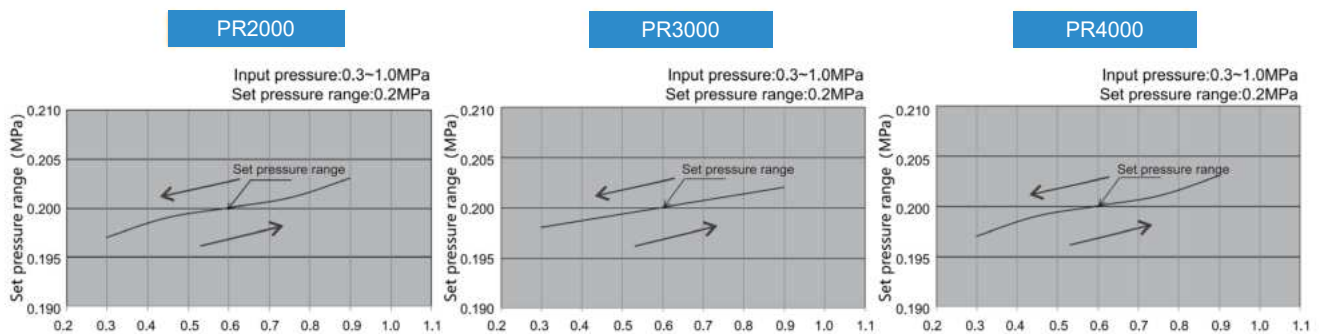


No.	Part Name	Material
1	Pilot regulate button	Plastic
2	Pilot regulate axle	Carbon steel
3	Hex nut	Free Machining Steel
4	Flat washer	SPCC
5	Pilot regulate seat	Aluminum
6	Spring	Spring steel
7	Pilot diaphragm assy	Assy
8	Nozzle	Aluminum
9	Middle valve body	Aluminum
10	Main regulate diaphragm	Assy
11	Main valve body	Aluminum
12	Exhaust valve core	Assy
13	Inlet valve core	Assy
14	Bottom cover	Aluminum
15	Filter element	High polymer material

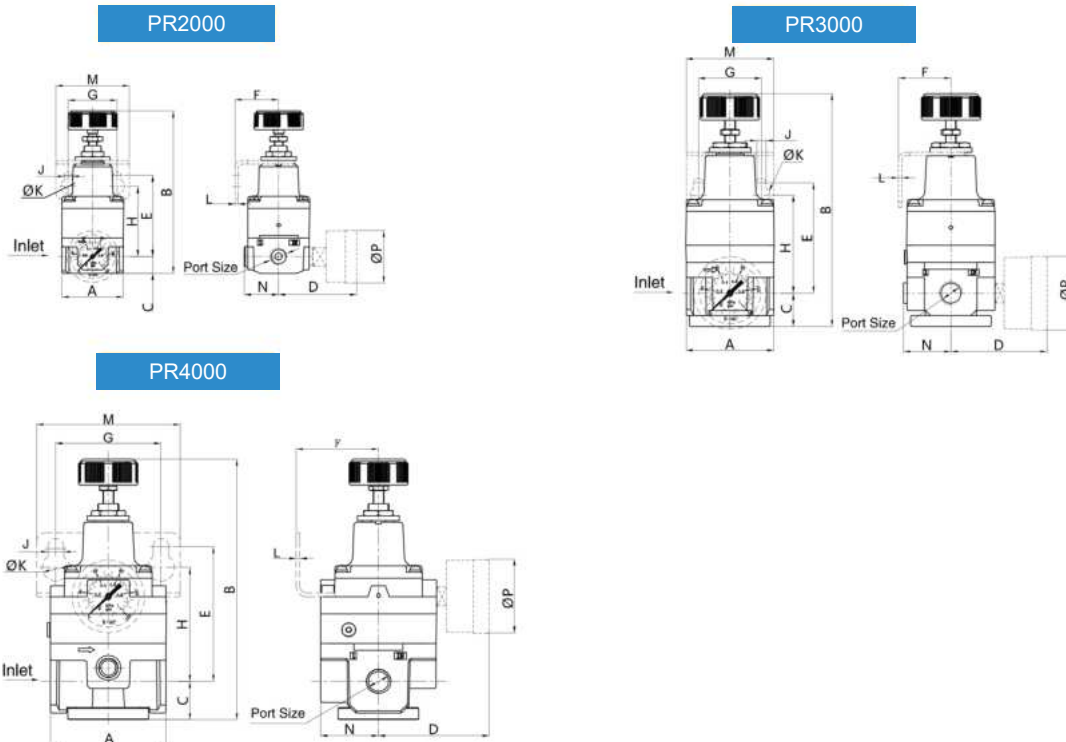
◆ Flow Chart



◆ Pressure Characteristic Diagram



◆ Main Dimension



Model	Port Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P
PR2000	1/8"	35	93	9.5	44.5	46.5	25	28	40	4.5	8.5	2	42	19.5	30
PR3000	1/4"	50	133	19	55	63	30	36	56	5.5	9.5	2	50	27	42
PR4000	1/4", 3/8", 1/2"	66	149	22	63.5	77	47	60	65	9	15.5	2	82	33	42

PS30

Digital Display Pressure Switch



◆ Product Features

- Compact appearance and easy to assemble.
- The current value and reference value are displayed simultaneously, and the reference value can be directly set.
- Dual screen, three color display of red, green, and orange.
- Digital display, more recognizable.

◆ How to Order?

Series No.	Pressure Type	—	Output Type	—	Port Size
PS30: Economical type	P: Positive pressure C: Continuous pressure		NP: 1-circuit switching value, adjustable, its factory default NPN) NPV: 1-circuit switching value, adjustable, its factory default NPN)+ 1-analog voltage output(1~5V) NPA: 1-circuit switching value, adjustable, its factory default NPN)+ 1-analog current output(4~20mA)		01: PT1/8(M5)

◆ Installation Accessories: Sold Separately

Panel Installation bracket	MS-PS-01	PS30 and PS42 are interchangeable
Front protective cover	MS-PS-02	
Front protective cover	MS-PS-03	
L-shaped bracket	MS-PS-04	
Z-shaped bracket	MS-PS-05	

◆ Product Profile

Type	Positive pressure	Continuous pressure
1000kPa		
100kPa		
-100kPa		
Rated pressure range	-0.1MPa~1.0MPa	-100kPa~100kPa
Set pressure range	-0.1MPa~1.0MPa	-100kPa~100kPa

◆ Specifications

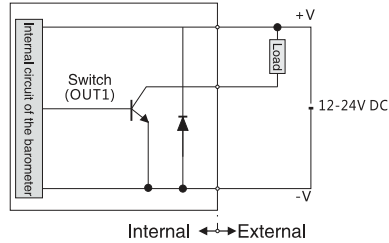
Models	Positive Pressure	Continuous Pressure
Type of pressure	Standard pressure	
Rated pressure range*	-0.1MPa~1.0MPa	-100kPa~100kPa
Set pressure range*	-0.1MPa~1.0MPa	-100kPa~100kPa
Pressure resistance	1.5MPa	500kPa
Applicable fluid	Non corrosive gas	
Supply voltage	12~24V DC ± 5%	
Consumption current	24V 30mA Max 12V 60mA Max	
Switch output	NPN O.C output:80mA/24VDCMax or PNP O.C output :80mA/24VDC	
Repetitive accuracy	± 0.2%F.S.	± 0.5%F.S.
Reaction time	Select through key operation:2.5ms,5ms,10ms,25ms,50ms,100ms,250ms,500ms,1000ms,5000ms	
Analog output	Voltage output	0.6V~5V (or slightly lower)
	Current output	2.4mA~20mA(or slightly lower)
	Linearity: ± 1%F.S. Maximum load impedance, when the supply voltage is 12V :300Ω ; 24V power supply: 600Ω minimum load impedance :50Ω	Linearity: ± 1%F.S. Output impedance: 1KΩ
Range of temperature	Working temperature :0~50℃ Storage temperature : -10~60℃(no condensation, no icing)	
Range of humidity	35~85%RH	
Temperature characteristics	± 1%F.S.(25℃)	
Protection level	IP40	
Material	Outer shell: Nylon + glass fiber LCD display: Propylene Pressure port: External thread POM+ inlaid N5 copper Seal ring: H-NBR Keys: Silicone rubber	
Overall dimensions	30 x 30 x 25mm(plastic part)/30 x 30 x 43mm (including connectors)	
Weight	Approx 80g (barometer body + user interface connector)	

※ Note: Due to the influence of temperature and linear compensation, there may be slight fluctuation near the upper/lower range of the barometer, which is positive Panel description

I/O Circuit Diagram and Wiring Diagram

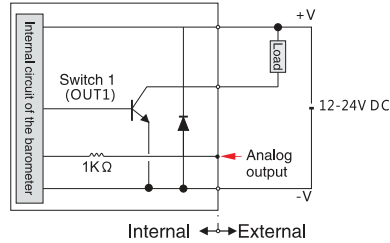
Output type without analog

Output type NPN

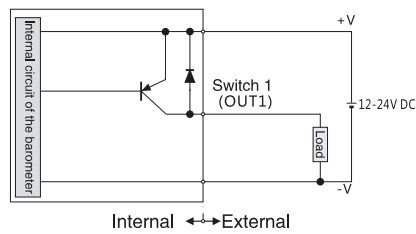


Output type with analog

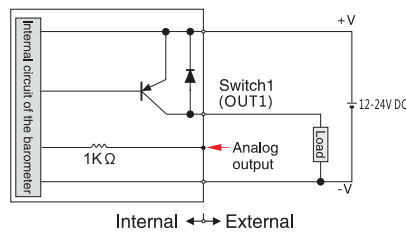
Output type NPN



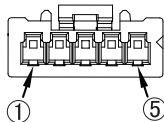
Output type PNP



Output type PNP

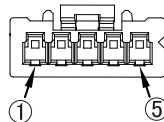


Terminal arrangement diagram



Connector Pin NO	Terminal name
① Brown	+V
② Black	Switch output1
③ White	-
④ Orange	-
⑤ Blue	0V

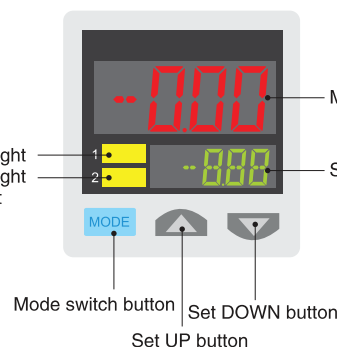
Terminal arrangement diagram



Connector Pin NO	Terminal name
① Brown	+V
② Black	Switch output1
③ White	-
④ Orange	Analog output
⑤ Blue	0V

Panel Description

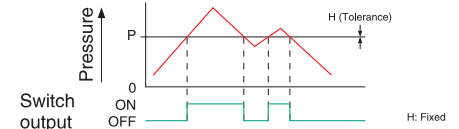
Switch output 1 working status indicator light
Switch output 2 working status indicator light
(Multifunctional type is an indicator light about analog voltage output working)



Input Mode and Output Mode

① EASYmode

Mode for switch output ON/OFF control

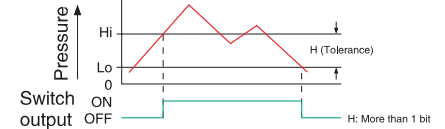


(Note 1): The stress can be fixed at level 8.

(Note 2): The auxiliary display unit displays "P-1" when the switch outputs 1
Displayed "P-2" when switching output 2

② Lag mode

Mode for switch output ON/OFF control

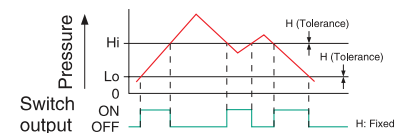


(Note 1): The auxiliary display unit displays "Hi-1", "Lo-1" when the switch outputs 1

Displayed "Hi-2", "Lo-2" when switching output 2

③ Window comparison mode

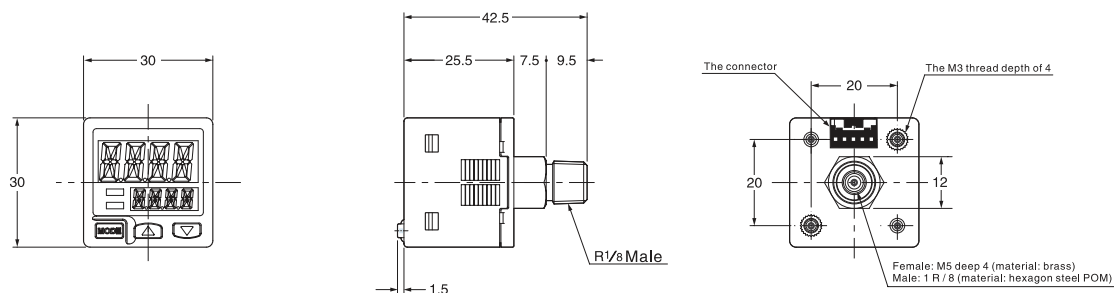
Set the switch to ON or OFF mode according to the pressure within the set range



(Note 1): The stress can be fixed at level 8.

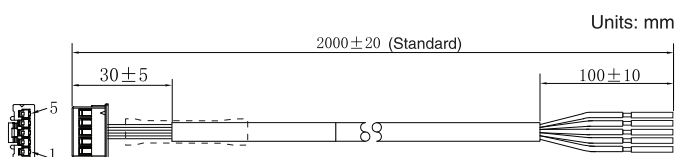
(Note 2): The auxiliary display unit displays "Hi-1", "Lo-1" when the switch outputs 1
Displayed "Hi-2", "Lo-2" when switching output 2

Outline Dimensional Drawing



Accessories Parts

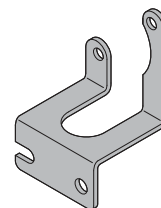
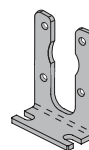
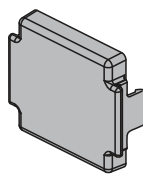
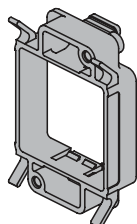
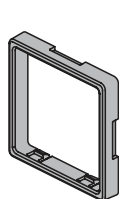
Accessories parts(1): cables



Please use the attached form a complete set of connecting cable with plug.

Note: remove, please hold the connection head part to be removed, otherwise it will cause cable bolt, connecting cable damage.

Accessories parts(2): the mounting bracket (sold separately)



Type 01 panel support
(MS-PS-01)

Type 02 panel support
(MS-PS-02)

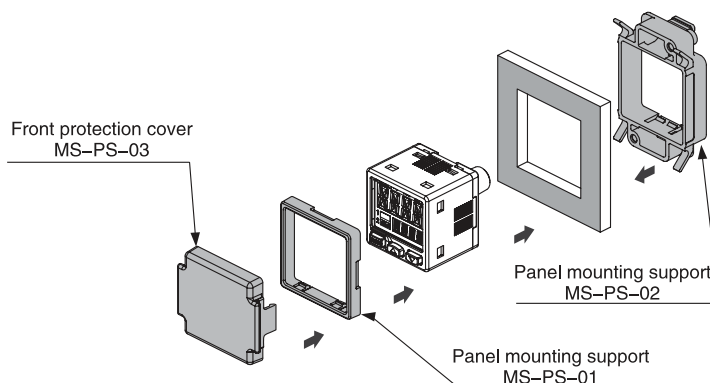
Type 03 front protection cover
(MS-PS-03)

Type 04 sensor mounting support
(MS-PS-04)

Type 05 sensor mounting support
(MS-PS-05)

Product name	Type number	Type number
Sensor mounting bracket	MS-PS-04	Sensors can be mounted on the bottom or top side, or multiple sensors can be installed closely.
	MS-PS-05	The sensor can be mounted in the rear direction, or multiple sensors can be installed closely.
Panel mounting bracket	MS-PS-02	When used together, the sensor can be mounted on a panel with a thickness of 1 to 6mm, or multiple sensors can be installed closely.
	MS-PS-01	
Panel mounting bracket	MS-PS-03	Protect the adjusting surface of the sensor. (This protective cover can be installed when mounting the bracket using the panel.)

Insyallation Instruction



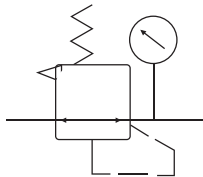
PRH

High Pressure Reducing Valve



Product Features

- Use pressure up to 3.5MPa, reliable pressure regulation and stable pressure;
- 20/30/40/50 series are available;
- Connection caliber 1/4" 3/8" 1/2" 3/4" 1".



How to order

PRH	Valve Body Size	Receiver Caliber
PRH Series	20: 2000 Valve body 30: 3000 Valve body 40: 4000 Valve body 50: 5000 Valve body	02: G1/4 " 03: G3/8 " 04: G1/2 " 06: G3/4 " 10: G1 "

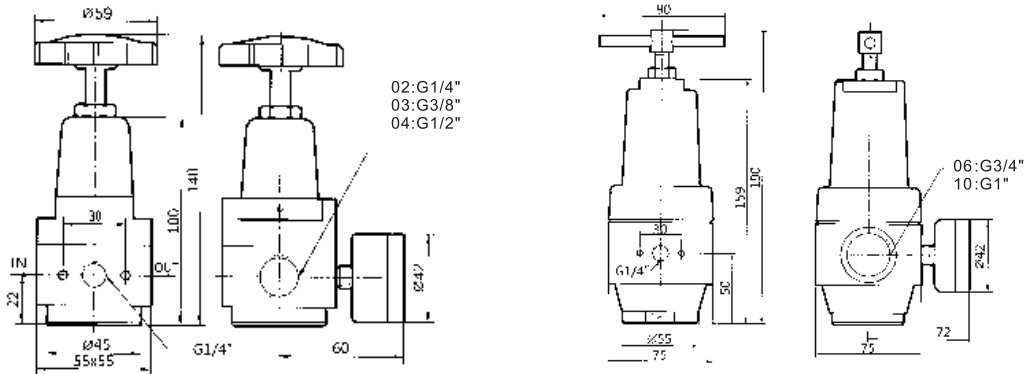
Order Example:

PRH Series, 4000 Valve body, Receiver caliber: G1/2 " , The PRH Code: PRH 40-04

Standard

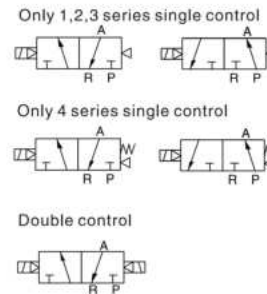
Model	PRH-02	PRH-03	PRH-04	PRH-06	PRH-10
Fluid to be used	Air				
Tube Caliber	G1/4	G/8	G1/2	G3/4	G1
Regulating Pressure Range	0.5 - 3.5MPa				
Max.Input Pressure	4MPa				
Operating Temperature Range	25 - +80°C				

External Dimensions



PV

Standard / Low Power Solenoid Valve (3/2)



How to Order?

Low Power Solenoid Valve

Series	Valve body size	ID code	Positions	Ways	Controls	Original Status	Port Size	Reset Type	Voltage	Connection Mode	Cover Color	Acting Type	Patchcord	Thread Type
N	1: 1Series 2: 2Series 3: 3Series 4: 4Series		2: positions 3: 3 ways	1: Single control 2: Double control		M5: M5 06: 1/8" 08: 1/4" 10: 3/8" 15: 1/2"		E1: AC110V E2: AC220V E4: DC24V (for 1series, only DC24V available)		Blank: Brown translucent J: Colorless and translucent B: Black (Only black color available for water proof connector)		Blank: Internal pilot WB: External pilot		Blank: G P: PT T: NPT
	P: Standard armature + Energy saving coil				Blank: Normal close H: Normal open		Blank: Spring (4 series single control only) Q: Air (1,2,3 series single control)		Blank: DIN connector type L: Plug-in Type K: Water proof connector type (only for 2,3,4 series)				Blank: Patchcord length is 0.3 meter 0.6M: Patchcord length is 0.6 meter 1M: Patchcord length is 1 meter (Options for "L: Plug-in type" Only)	

Order Example:

PV series energy saving solenoid valve, 2 series valve body size, 3/2 ways, double control, 1/8" port size, AC220V, DIN connector, G thread, ERP code is :N2P232-06E2

Specifications

Model No.	N1P231-M5 N1P232-M5	N1P231-06 N1P232-06	N2P231-06 N2P232-06	N2P231-08 N2P232-08	N3P231-08 N3P232-08	N3P231-10 N3P232-10	N4P231-10 N4P232-10	N4P231-15 N4P232-15
Port size	M5	G1/8	G1/8	G1/4	G1/4	G3/8	G3/8	G1/2
Sectional area(mm)	5.5(CV=0.31)	12(CV=0.67)	14(CV=0.78)	16(CV=0.89)	25(CV=1.40)	30(CV=1.68)	50(CV=2.79)	50(CV=2.79)
Working medium	Clean air(After 40 μ m filtration)							
Acting type	Internal pilot type/External pilot type							
Reset type	Air reset						Spring reset /Air reset	
Lubrication	Not required							
Working pressure(MPa)	0.15~0.8							
Guaranteed pressur(MPa)	1.2							
Working temperature(℃)	-20~70(No freezing)							
Voltage range	-15%~10%							
Power consumption	DC24V:0.6W		DC24V:0.7W AC220V:0.9VA AC110V:1.4VA					
Insulation class	Class F							
Protective class	IP65(DIN40050)							
Max. acting frequency	5 Cycles/s							
Activate time(S)	<0.05							
Weight(g)	N1P231:102 N1P232:169		N2P231:107 N2P232:169		N3P231:260 N3P232:370		N4P231:443 N4P232:569	

Note: Normal open is same as normal close.

◆ How to Order?

Standard Solenoid Valve

Series No.	Ways	Positions	Valve Body ID Code	Controls	Original Status	Port Size	Reset Type	Voltage	Connection Mode	Cover Color	Valve Color	Patchcord	Thread Type
PV		2: 2 positions 3: 3 ways	1: 1Series 2: 2Series 3: 3Series 4: 4Series	1: Single control 2: Double control	Blank: Normal close H: Normal open	M5: M5 06: 1/8" 08: 1/4" 10: 3/8" 15: 1/2"	Blank: Spring (Only 4 series single control) Q: Air (1,2,3 series single control)	E1: AC110V E6: AC36V E2: AC220V E7: AC24V E3: AC380V E8: DC110V E4: DC24V E9: DC48V E5: DC12V E10: DC36V	Blank: DIN connector L: Plug-in Type F: Flying leads K: Waterproof DIN connector (Only 2, 3, 4 series is optional for K/M)	Blank: Brown translucent J: Colorless and translucent B: Black (Only Waterproof DIN connector)	Blank: Internal pilot WB: External pilot	Blank: Patchcord length is 0.3 meter 0.6M: Patchcord length is 0.6 meter 1M: Patchcord length is 1 meter (Options for "L: Plug-in type" and "F: Flying leads type" Only)	Blank: G P: PT T: NPT

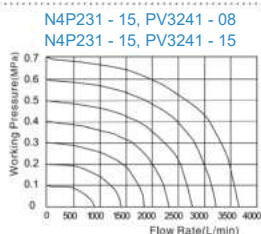
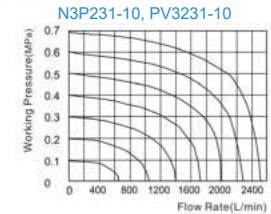
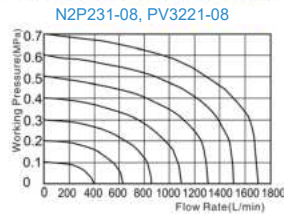
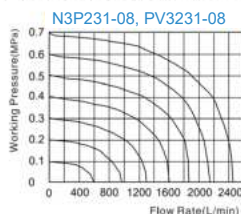
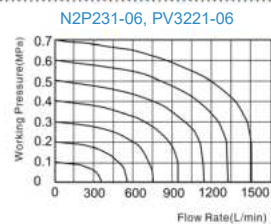
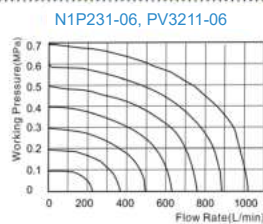
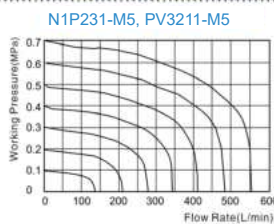
Order Example:

PV series solenoid valve, 2 series valve body size, 3/2 ways, single control, 1/8" port size, air return, standard coil, AC220V, DIN connector, G thread, ERP code is :PV3221-06QE2

◆ Specifications

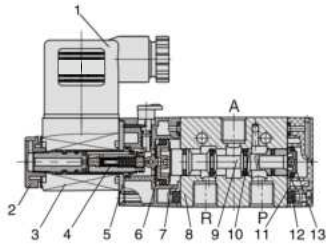
Model No.	PV3211-M5 PV3212-M5	PV3211-06 PV3212-06	PV3221-06 PV3222-06	PV3221-08 PV3222-08	PV3231-08 PV3232-08	PV3231-10 PV3232-10	PV3241-10 PV3242-10	PV3241-15 PV3242-15
Port size	M5	G1/8	G1/8	G1/4	G1/4	G3/8	G3/8	G1/2
Sectional area(mm)	2 way:5.5(CV=0.31)	2 way:12(CV=0.67)	2 way:14(CV=0.78)	2 way:16(CV=0.89)	2 way:25(CV=1.40)	2 way:30(CV=1.68)	2 way:50(CV=2.79)	2 way:50(CV=2.79)
Working medium	Clean air(After 40 μ m filtration)							
Acting type	Internal pilot type/External pilot type							
Reset type	Air reset						Spring reset /Air reset	
Lubrication	Not required							
Working pressure(MPa)	0.15~0.8							
Guaranteed pressur(MPa)	1.2							
Working temperature(℃)	-20~70(No freezing)							
Voltage range	-15%~10%							
Power consumption	DC:2.8W ; AC:3.0VA		DC:3.0W ; AC:4.0VA					
Insulation class	Class F							
Protective class	IP65(DIN40050)							
Max. acting frequency	5 Cycles/s							
Activate time(S)	<0.05							
Weight(g)	PV3211: 102 PV3212: 169		PV3221: 102 PV3222: 303		PV3231: 260 PV3232: 370		PV3241: 443 PV3242: 569	

◆ Flow Chart

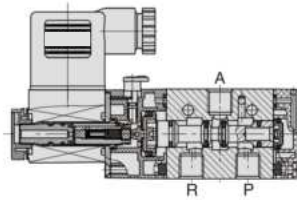


Internal Structure

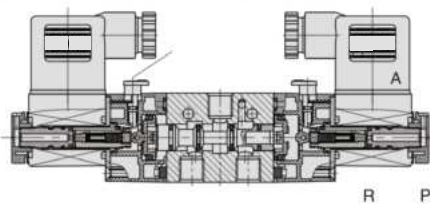
Single Solenoid Valve (Normal Close)



Single Solenoid Valve (Normal Open)



Double Solenoid Valve (Normal Close)



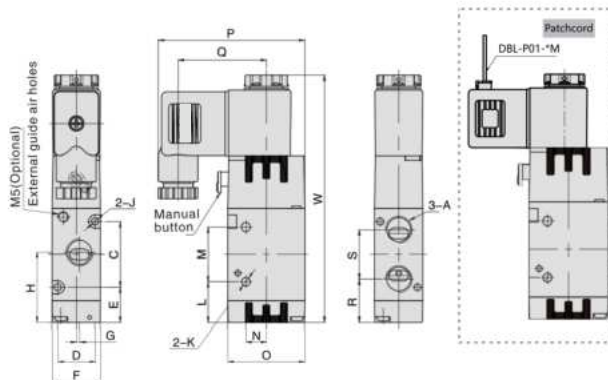
No.	Part Name	Material
1	Connector	Engineered plastics
2	Nut	POM
3	Coil	Cu+ Thermosetting resin
4	Pilot units	Pure iron + copper + stainless steel
5	Plate	Carbon steel
6	Piston	POM
7	Pilot seat	Engineered plastics
8	Valve body	Aluminum alloy
9	Spool	Aluminum alloy
10	O-ring	NBR
11	Rear cover	Engineered plastics
12	Filter	Synthetic material
13	Piston	Engineered plastics
14	Manual button	Engineered plastics

Main Dimension

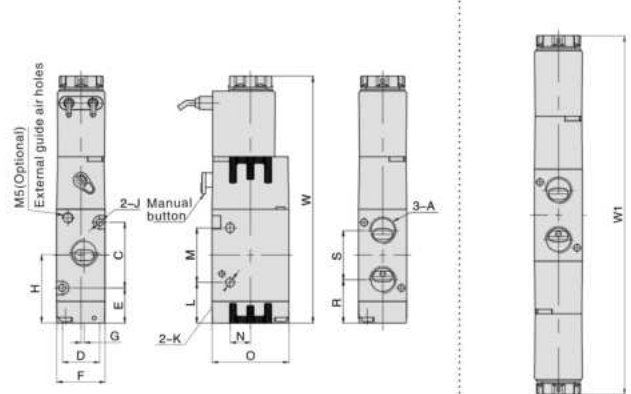
Single Solenoid Valve

Double Solenoid Valve

DIN Type



Flying Leads Type

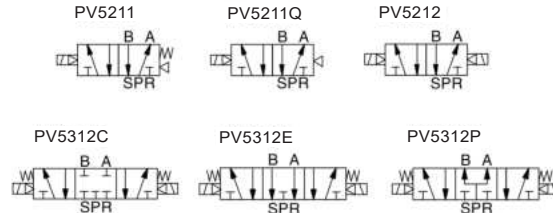


Model/Sign	A	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	W	W1*
PV3211-M5	M5	19	13	16.5	18	0	26	3.3	3.1	15.5	21	6	27	55.2	33.9	18.9	14.2	92.1	132.2
PV3211-06	G1/8	19	13	16.5	18	1.5	27	3.3	3.1	15.5	21	6	27	55.2	33.9	18	16	92.1	132.2
PV3221-06	G1/8	30	17	16	22	0	31	3.3	4.2	18.5	25	9.3	35	66.7	40.2	20	22	112.7	163.4
PV3221-08	G1/4	30	17	16	22	1.5	32	3.3	4.2	18.5	25	9.3	35	66.7	40.2	19.8	22.5	112.7	163.4
PV3231-08	G1/4	35	20	19.1	27	0	36.6	4.3	4.3	21.6	30	9.5	40	69.2	40.2	24.6	24	124.3	175.4
PV3231-10	G3/8	35	20	19.1	27	2	36.6	4.3	4.3	21.6	30	9.5	40	69.2	40.2	24.6	24	124.3	175.4
PV3241-10	G3/8	40.5	27	24.8	34	0	45	4.3	5.2	21	48	11.5	50	74.2	40.2	29.3	31.5	144.7	199.4
PV3241-15	G1/2	40.5	27	24.8	34	2	45	4.3	5.2	21	48	11.5	50	74.2	40.2	29.3	31.5	144.7	199.4

Note: The dimension of NR series and PV series are same, The dimension of normal open type and normal close type are same, W1* is the dimension of double control solenoid valve.

PV

Standard / Low Power Solenoid Valve (5/2,5/3)



How to Order?

Low Power Solenoid Valve

Series No.	Valve body size	ID Code	Positions	Ways	Controls	Original Status	Port Size	Reset Form	Voltage	Connection Mode	Cover Color	Acting Type	Patchcord	Thread Type
N	1: 1Series 2: 2Series 3: 3Series 4: 4Series	P: Standard armature +Energy saving coil	2: 2 positions 3: 3 positions	5:5 ways	1: Single control 2: Double control	C: Center close P: Center pressure E: Center exhaust (Only for 5/3 way)	M5: M5 06: 1/8" 08: 1/4" 10: 3/8" 15: 1/2"	Blank: Spring Q: Air (Only single control)	E1: AC110V E2: AC220V E4: DC24V (1 Series only DC24V)	Blank: DIN connector type L: Plug-in Type K: Water proof connector type (only for 2,3,4 series)	Blank: Brown translucent J: Colorless and translucent B: Black (K/M connector is only available in black)	Blank: Internal pilot WB: External pilot		Blank: G P: PT T: NPT

Order Example:

PV series solenoid valve, 2 series valve body size, standard pilot+Energy saving coil, 5/2 way, single control, 1/4" port size, standard coil, DC24V, DIN connector, G thread, ERP code is: N2P251-08E4

Blank: Patchcord length is 0.3 meter
0.6M: Patchcord length is 0.6 meter
1M: Patchcord length is 1 meter
(Options for "L: Plug-in type" Only)

Specifications

Model No.	N1P251-M5 N1P252-M5 N1P352-M5	N1P251-06 N1P252-06 N1P352-06	N2P251-06 N2P252-06 N2P352-06	N2P251-08 N2P252-08 N2P352-08	N3P251-08 N3P252-08 N3P352-08	N3P251-10 N3P252-10 N3P352-10	N4P251-10 N4P252-10 N4P352-10	N4P251-15 N4P252-15 N4P352-15
Port size	M5	G1/8	G1/8	G1/4(Ex.G1/8)	G1/4	G3/8(排气G1/4)	G3/8	G1/2
Sectional area(mm²)	5/2:5.5(CV=0.31) 5/3:5.5(CV=0.28)	5/2:12(CV=0.67) 5/3:9(CV=0.50)	5/2:14(CV=0.78) 5/3:12(CV=0.67)	5/2:16(CV=0.89) 5/3:12(CV=0.67)	5/2:25(CV=1.40) 5/3:18(CV=1.00)	5/2:30(CV=1.68) 5/3:18(CV=1.00)	5/2:50(CV=2.79) 5/3:30(CV=1.67)	5/2:50(CV=2.79) 5/3:30(CV=1.67)
Working medium	Clean air(After 40 μ m filtration)							
Acting type	Internal pilot type / External pilot type							
Reset Type	Air reset						Spring reset /Air reset	
Lubrication	Not required							
Working pressure(MPa)	0.15~0.8							
Guaranteed pressure(MPa)	1.2							
Working temperature(℃)	-20~70(No freezing)							
Voltage range	-15%~10%							
Power consumption	DC24V:0.6W		DC24V:0.7W AC220V:0.9VA AC110V:1.4VA					
Insulation class	Class F							
Protective class	IP65(DIN40050)							
Max. acting frequency	5/2: 5 Cycles/s; 5/3: 3 Cycles/s							
Activate time(S)	<0.05							
Weight(g)	N1P251: 110 N1P252: 171 N1P352: 181		N2P251: 209 N2P252: 314 N2P352: 357		N3P251: 289 N3P252: 400 N3P352: 450		N4P251: 528 N4P252: 638 N4P352: 727	

◆ How to Order?

Standard Solenoid Valve

Series No.	Ways Positions	Valve body size	Controls	Original Status	Port Size	Reset Form	Voltage	Connection Mode	Cover Color	Acting Type	Patchcord	Thread Type
PV	5:5 ways 2:2 positions 3:3 positions	1: 1Series 2: 2Series 3: 3Series 4: 4Series	1: Single control 2: Double control	C: Center close P: Center pressure E: Center exhaust (Only for 5/3 way)	M5: M5 06: 1/8" 08: 1/4" 10: 3/8" 15: 1/2"	Blank: Spring Q: Air (Only single control)	E1: AC110V E6: AC36V E2: AC220V E7: AC24V E3: AC380V E8: DC110V E4: DC24V E9: DC48V E5: DC12V E10: DC36V	Blank: DIN connector L: Plug-in type F: Flying leads K: Waterproof DIN connector (Only 2, 3, 4 series is optional for K/M)	Blank: Brown translucent J: Colorless and translucent B: Black (K/M connector is only available in black)	Blank: Internal pilot WB: External pilot	Blank: Patchcord length is 0.3 meter 0.6M: Patchcord length is 0.6 meter 1M: Patchcord length is 1 meter (Options for "L: Plug-in type" and "F: Flying leads type" Only)	Blank: G P: PT T: NPT

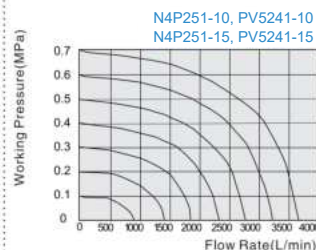
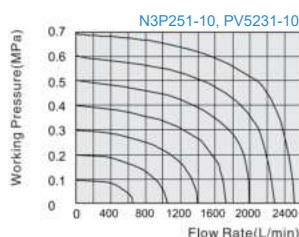
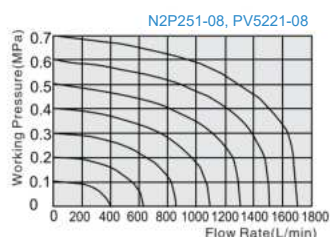
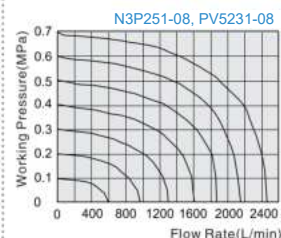
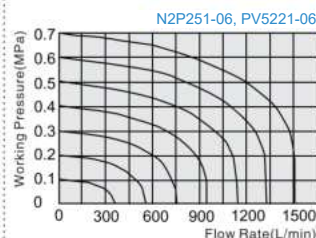
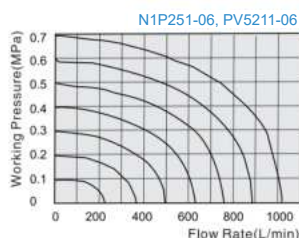
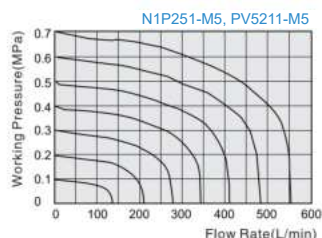
Order Example:

PV series solenoid valve, 2 series valve body size, 5/2 way, single control, 1/4" port size, standard coil, DC24V, DIN connector, G thread, ERP code is: PV5221-08E4

◆ Specifications

Model No.	PV5211-M5 PV5212-M5 PV5312-M5	PV5211-06 PV5212-06 PV5312-06	PV5221-06 PV5222-06 PV5322-06	PV5221-08 PV5222-08 PV5322-08	PV5231-08 PV5232-08 PV5332-08	PV5231-10 PV5232-10 PV5332-10	PV5241-10 PV5242-10 PV5342-10	PV5241-15 PV5242-15 PV5342-15
Port size	M5	G1/8	G1/8	G1/4(Ex.G1/8)	G1/4	G3/8(Ex.G1/4)	G3/8	G1/2
Sectional area(mm ²)	5/2:5.5(CV=0.31) 5/3:5.5(CV=0.28)	5/2:12(CV=0.67) 5/3:9(CV=0.50)	5/2:14(CV=0.78) 5/3:12(CV=0.67)	5/2:16(CV=0.89) 5/3:12(CV=0.67)	5/2:25(CV=1.40) 5/3:18(CV=1.00)	5/2:30(CV=1.68) 5/3:18(CV=1.00)	5/2:50(CV=2.79) 5/3:30(CV=1.67)	5/2:50(CV=2.79) 5/3:30(CV=1.67)
Working medium	Clean air(After 40 μ m filtration)							
Acting type	Internal pilot type / External pilot type							
Reset Type	Air reset						Spring reset /Air reset	
Lubrication	Not required							
Working pressure(MPa)	0.15~0.8							
Guaranteed pressure(MPa)	1.2							
Working temperature(℃)	-20~70(No freezing)							
Voltage range	-15%~10%							
Power consumption	DC:2.8W ; AC:3.0VA		DC:3.0W ; AC:4.0VA					
Insulation class	Class F							
Protective class	IP65(DIN40050)							
Max. acting frequency	5/2: 5 Cycles/s; 5/3: 3 Cycles/s							
Activate time(S)	<0.05							
Weight(g)	PV5211: 110 PV5212: 171 PV5312: 181		PV5221: 209 PV5222: 314 PV5322: 357		PV5231: 289 PV5232: 400 PV5332: 450		PV5241: 528 PV5242: 638 PV5342: 727	

◆ Flow Chat



PVSH

Pressure Relief Valve (3/2)



PVSH



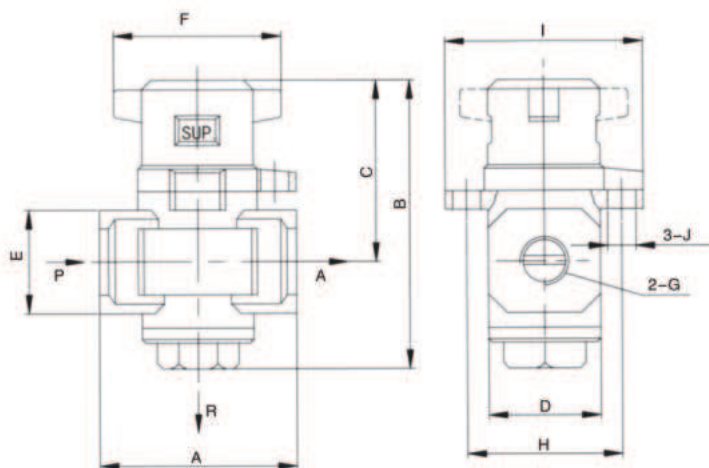
How to Order?

Series No.	Positions	Port size	Thread Type
PVSH Series	2000: 2000 Body 3000: 3000 Body 4000: 4000 Body 5000: 5000 Body	01: 1/8" 02: 1/4" 03: 3/8" 04: 1/2" 06: 3/4" 10: 1"	Blank: G P: PT T: NPT

Order Example:

PVSH series 3/2 way check valve, 2000 body size, 1/4" port size, PT thread, ERP code is: PVSH2000-02-P

Main Dimension



Model	G	Exhaust Port	A	B	C	D	E	F	H	I	J
PVSH2000-01	1/8	1/8	40	59	39	28	22	40	32	41	Φ6
PVSH2000-02	1/4	1/8	40	59	39	28	22	40	32	41	Φ6
PVSH2000-02	1/4	1/4	53	78	49	30	28	45	41.5	53	Φ7.5
PVSH2000-03	3/8	1/4	53	78	49	30	28	45	41.5	53	Φ7.5
PVSH2000-03	3/8	3/8	70	84	52	36	36	45	41.5	53	Φ7.5
PVSH2000-04	1/2	3/8	70	84	52	36	36	45	41.5	53	Φ7.5
PVSH2000-10	1	1/2	90	136	72	54	48	68	77	90	Φ8.5

HX-07

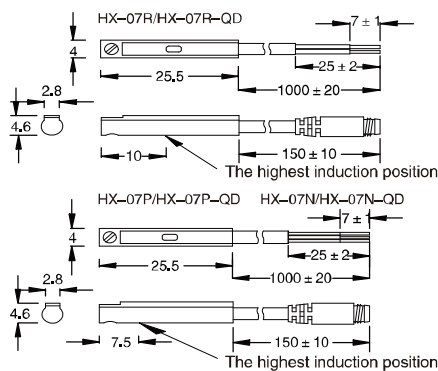
Magnet Switch



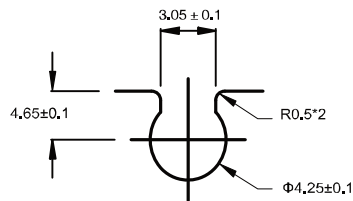
How to Order?

HX	-	07	D	-	2M
Product code		Series NO.	Switch Type D: Two wire without contact switch N: NPN type P: PNP type R: Two wire reed switch		Wire length 2M: 2M 5M: 5M 10M: 10M QD8: QD8 Male connector QD12: QD12 Male connector Note: The standard wire length of the quick connector is 0.15m. Other wire lengths cannot be ordered

Dimension



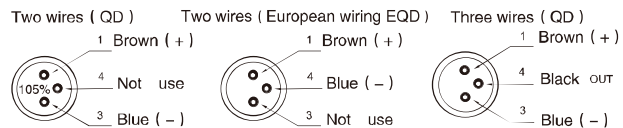
Groove Dimension



Suitable for cylinder:

SQ/SQM/EU/EUK/
EUM/EUP/SF/SFM/
SQK/SG//EMQ/ELS/
ELQ/EXH/ESWT
*SHY/SHZ(except Φ10)

M8/M12 male wiring diagram



Specifications

Type	HX-07D		HX-07N		HX-07P		HX-07R	
Connect Diagram								
Parameter								
Wiring method	2-Wire Type		3-Wire Type				2-Wire Type	
Switching logic	Electronic no contact type N.O.							
Sensor type	None contact type		NPN type (Input)		PNP type (Output)		Reed switch	
Operating voltage	10-28V DC		5-30V DC				5-240V DC/AC	
Max. switching current	50mA max		200mA max.				100mA max.	
Contact rating	1.4 W max		6W max.				10W max.	
Current consumption	40 μ Amax@24V		8mAmax@24V(Switch Active)				None	
Voltage drop	2.8 V max.		1 V max.@200mA DC				2.5 V max.	
Leakage current	90 μ Amax@28V		0.01mA max.				None	
Indicator	Red LED							
Max. exchange frequency	1000Hz							
Temperature range	-10-70℃							
Shock	50G							
Vibration	9G							
Enclosure classification	IEC 529 IP67 (NEMA 6)							
Protection circuit	2、4		3、4				1	
Cable	2.6Φ,2C,Black color,oil resistance PVC		2.6Φ,3C,Black color,oil resistance PVC				2.6Φ,2C,Gray color,oil resistance PVC	
Switch sensitive	40-750G							
	70G							

VS Series 2/2 Solenoid Valve (Normal Close)

VS

2/2 Solenoid Valve (N.C.)



VS small orifice

Product Features

- * Normal close/Normal open, available body: brass, SS304, SS316
- * Multiple seals are available for different medium
- * To reduce the power consumption of 80% energy-saving
- * Wide size range from 1/8" to 2", with both thread and flange connection
- * Diaphragm pilot solenoid valve, with lower working pressure (10mm is special)

How to Order?

Series No.	Port size	Original status	Orifice	ID Code	Voltage	Valve body material	Seal material	Thread type
VS: Thread connection VSF: Flange connection		Blank: NC H: NO		Blank: Standard type N: Low power type		Blank: Brass S1: SS316 S2: SS304	Blank: NBR E: EPDM V: VITON Si: Silicon (smaller than $\Phi 25\text{mm}$ is optional)	Blank: G P: PT T: NPT
	06: 1/8"		025: 2.5mm		E1: AC110V	E6: AC36V		
	08: 1/4"		025: 2.5mm 100: 10mm		E2: AC220V	E7: AC24V		
	10: 3/8"		040: 4mm 160: 16mm		E3: AC380V	E8: DC110V		
			100: 10mm		E4: DC24V	E9: DC48V		
	15: 1/2"		100: 10mm 160: 16mm		E5: DC12V	E10: DC36V		
	20: 3/4"		200: 20mm					
	25: 1"		250: 25mm					
	32: 1-1/4"		350: 35mm					
	40: 1-1/2"		400: 40mm					
	50: 2"		500: 50mm					
	Flange connection		250: 25mm 650: 65mm					
			320: 32mm 800: 80mm					
			400: 40mm 1000: 100mm					
			500: 50mm					

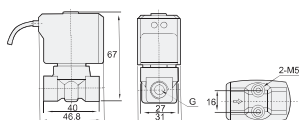
(Note: cancel if same with port size)

Order Example:

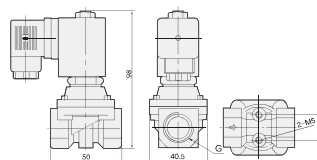
VS series solenoid valve, 1/2" port size, NC, 16mm orifice, standard type, AC110V, Brass valve body, NBR seal, G thread, ERP code is: VS15-160E1
Note: 2.5mm small orifice valve only with flying leads coil, other orifice with DIN connector coil.

Main Dimension

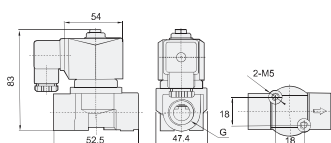
$\Phi 2.5\text{mm}$ 1/8" 1/4"



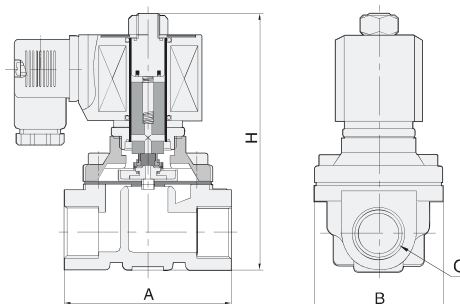
10mm, 1/4", 3/8", 1/2"



$\Phi 4\text{mm}$ 3/8"



Large diameter



Specifications

Port size (G)	Orifice (mm)	CV value	Min. pressure	Pressure difference (Bar)						Max. temperature (°C)	Power		Order code 220VAC		Main dimension Length x Width x Height A x B x H(mm)
				Max. working pressure							AC 220	DC 24V	Brass	Stainless steel 304	
				Air、 Gas		Hot water、 Liquid		Light oil ≤20CST							
1/4 "	2,5	0,23	0	7	5	7	5	7	5	80	13	8,5	VS08-025E2	VS08-025E2S2	46,8 x 31 x 67
	2,5	0,23	0	7	5	7	5	-	-	120	13	8,5	VS08-025E2E	VS08-025E2S2E	46,8 x 31 x 67
	2,5	0,23	0	7	5	7	5	7	5	120	13	8,5	VS08-025E2V	VS08-025E2S2V	46,8 x 31 x 67
	10	1	0	20	16	20	16	20	16	80	22	13	VS08-100E2	-	50 x 40,5 x 98
	10	1	0	20	16	20	16	-	-	120	22	13	VS08-100E2E	-	50 x 40,5 x 98
	10	1	0	20	16	20	16	20	16	120	22	13	VS08-100E2V	-	50 x 40,5 x 98
1/2 "	10	1,9	0	20	16	20	16	20	16	80	22	13	VS15-100E2	-	69 x 75 x 106
	10	1,9	0	20	16	20	16	-	-	130	22	13	VS15-100E2E	-	69 x 75 x 106
	10	1,9	0	20	16	20	16	20	16	120	22	13	VS15-100E2V	-	69 x 75 x 106
	16	4,8	0	10	6	10	6	7	4	80	33	20	VS15-160E2	S15-160E2S2	69 x 75 x 106
	16	4,8	0	10	6	10	6	-	-	130	33	20	VS15-160E2E	S15-160E2S2E	69 x 75 x 106
	16	4,8	0	10	6	10	6	7	4	120	33	20	VS15-160E2V	S15-160E2S2V	69 x 75 x 106