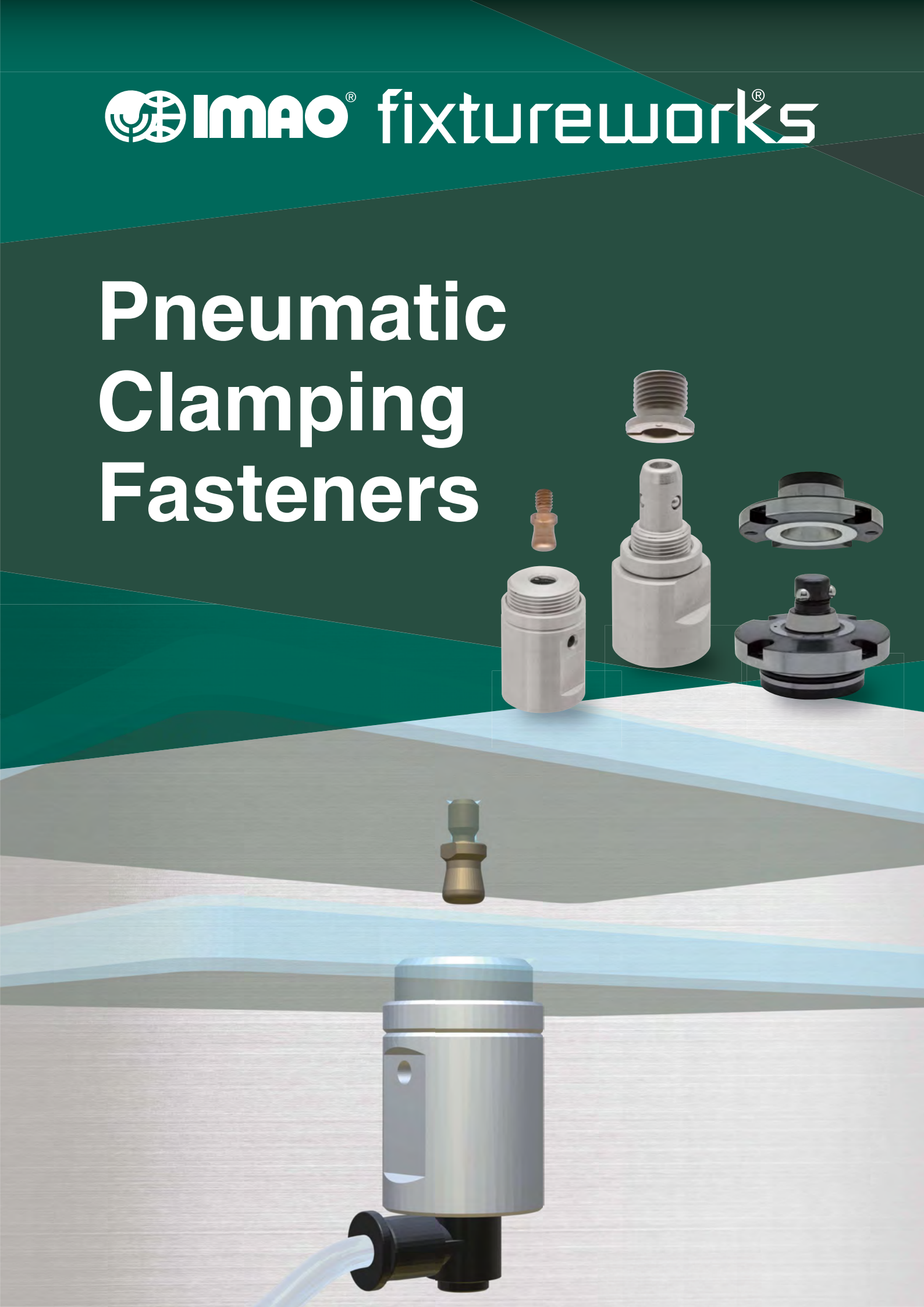
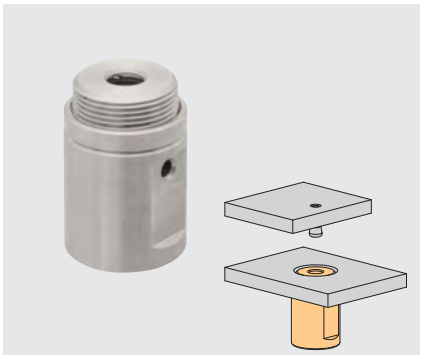
IMAO® fixtureworks®

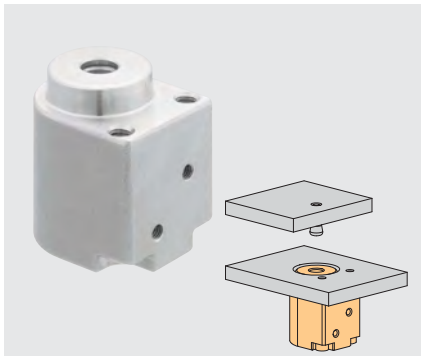
Pneumatic Clamping Fasteners





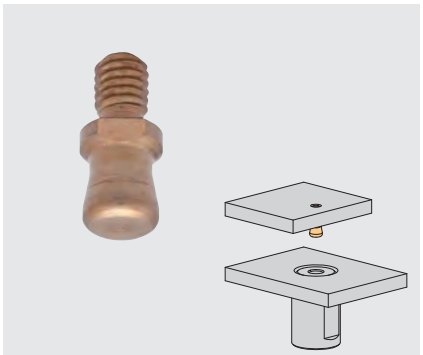
PNEUMATIC PIN HOLDING CLAMP

Part No. PPHC-S



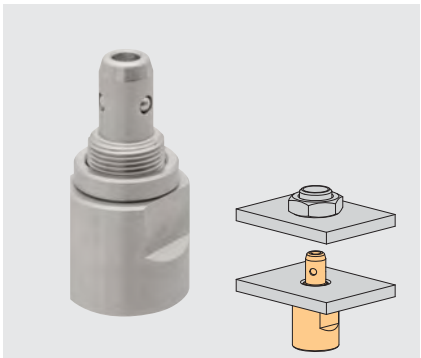
PNEUMATIC PIN HOLDING CLAMP

Part No. PPHC-D



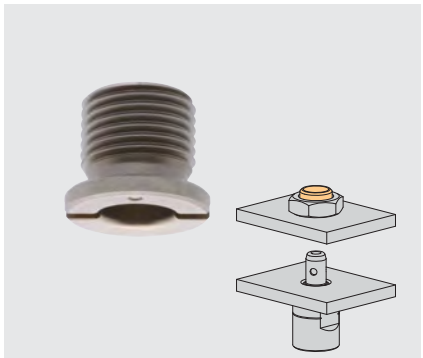
CLAMPING PIN

Part No. QCPC-M



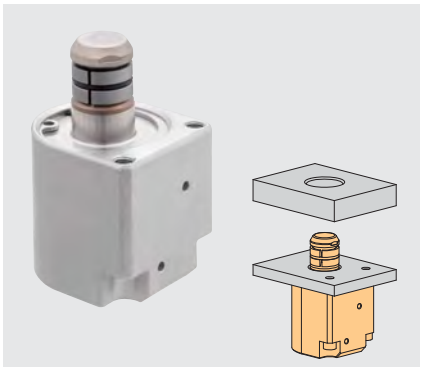
PNEUMATIC BALL-LOCKING CLAMPS

Part No. PBLC



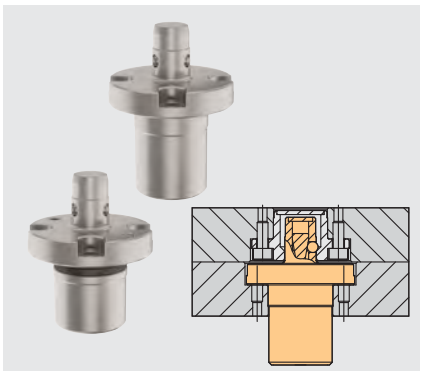
BALL-LOCK RECEPTACLE

Part No. PBLC-M



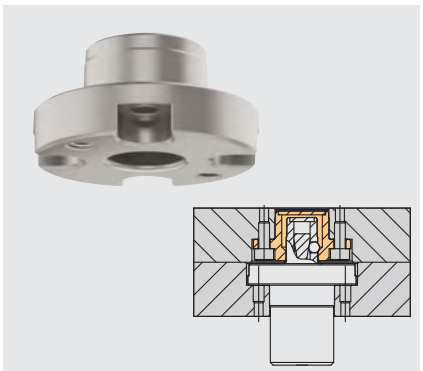
PNEUMATIC ID HOLDING CLAMP

Part No. PIDHC



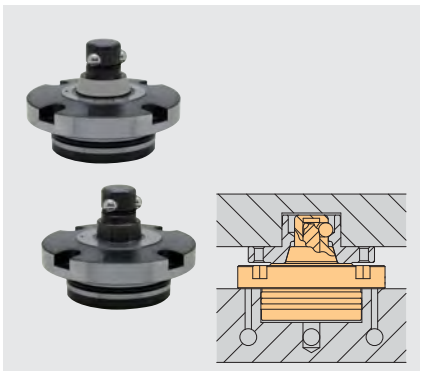
PNEUMATIC FLEX LOCATOR PINS

Part No. AMWF-L-S



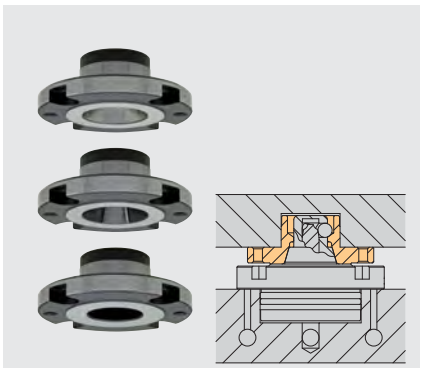
PNEUMATIC FLEX LOCATOR BUSHINGS

Part No. AMWF-BU



PNEUMATIC FLEX LOCATOR PINS

Part No. AMWF-W



PNEUMATIC FLEX LOCATOR BUSHINGS

Part No. AMWF-BU

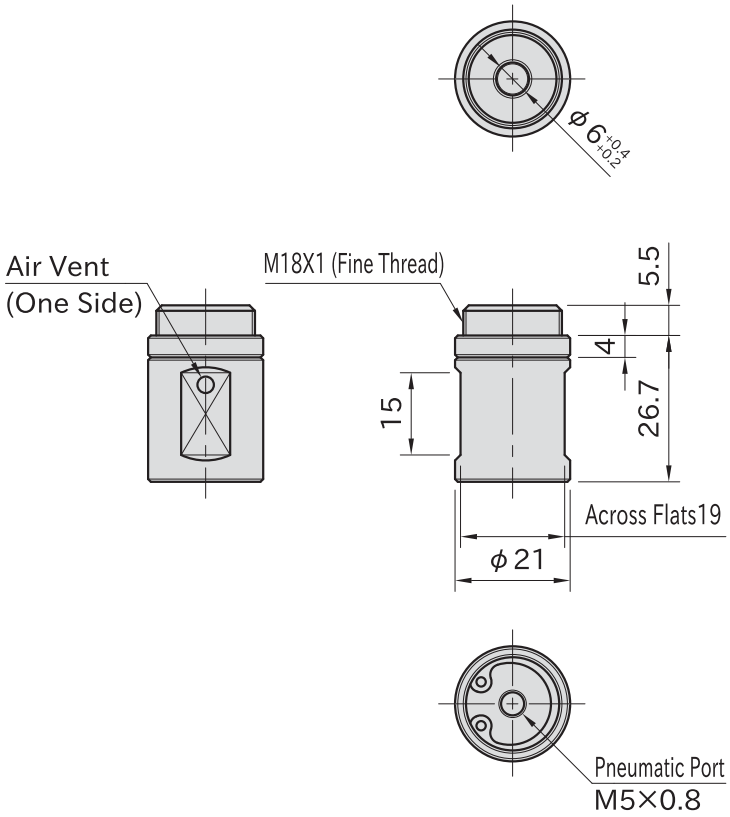
IMAO® fixtureworks®

PPHC-S PNEUMATIC PIN HOLDING CLAMP

RoHS Stainless Steel

Wedge

IMAO



★Key Point

Compact pull down clamp

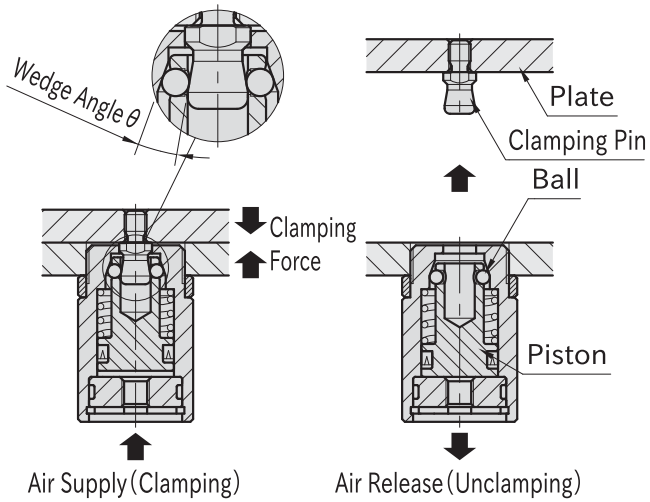
Body/Piston	Wedge/Ball	Spring	Retaining Ring	Seal
SUS303 stainless steel	SUS440C stainless steel Quenched and tempered	SUS304WPB stainless steel	SUS304 stainless steel	Nitrile rubber (NBR)

Part Number	Operating Air Pressure (MPa)	Clamping Force (N) *)	Weight (g)	Proper Clamping Pin
PPHC0621S-SUS	0.3~0.7	30	62	QCPC0625-M4-SUS

*) The clamping force above is at 0.5 MPa.

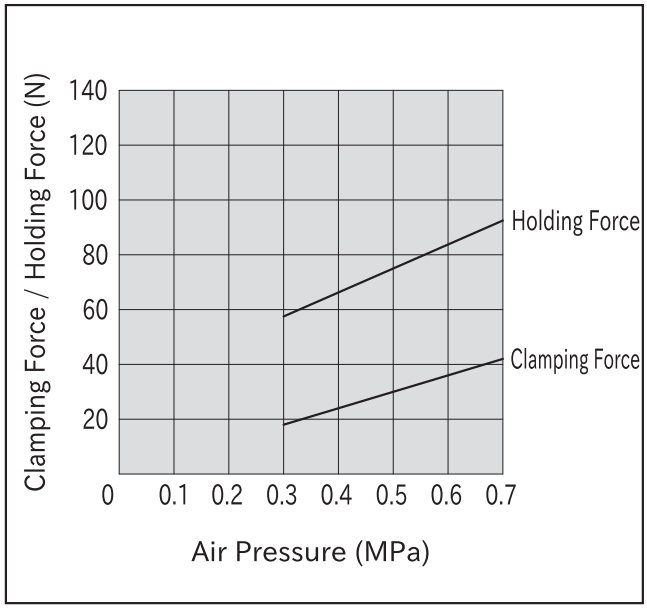
QCPC-M CLAMPING PIN

Feature

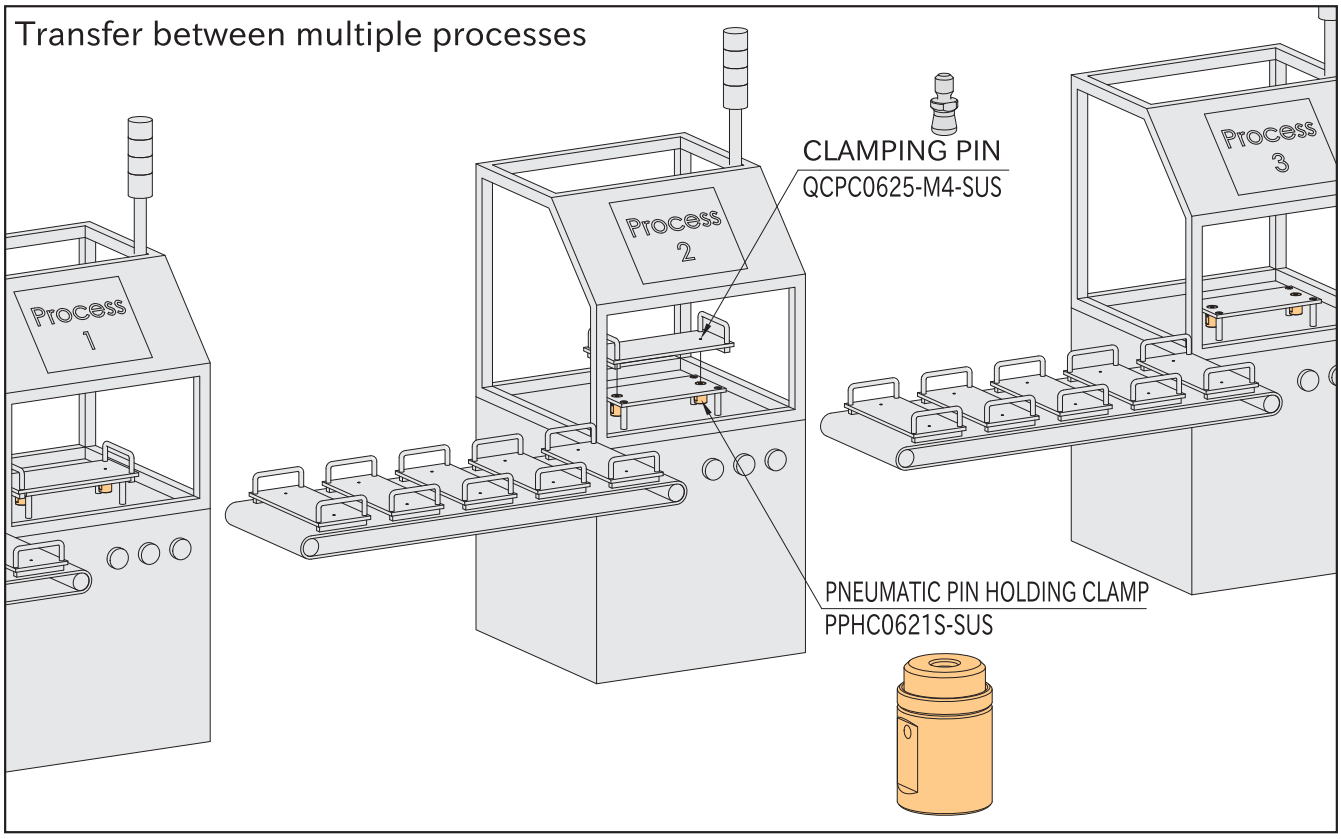


・The piston goes up by air supply and the balls move toward the center to pull down the clamping pin.
・The wedge clamping prevents the plate from lifting up.

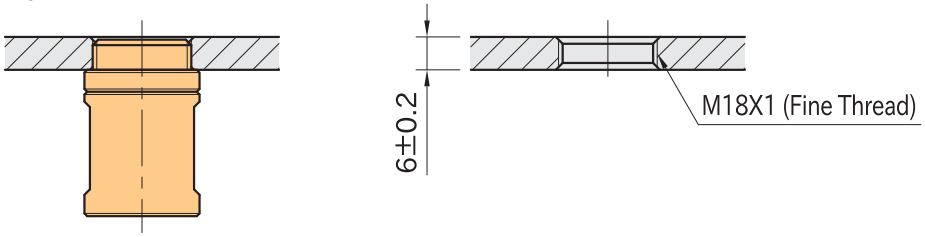
Performance Curve



Application Example



■Hole Preparation



■Machining Accuracy

Spacing tolerance for multiple use should be ±0.1.

■Repeatability

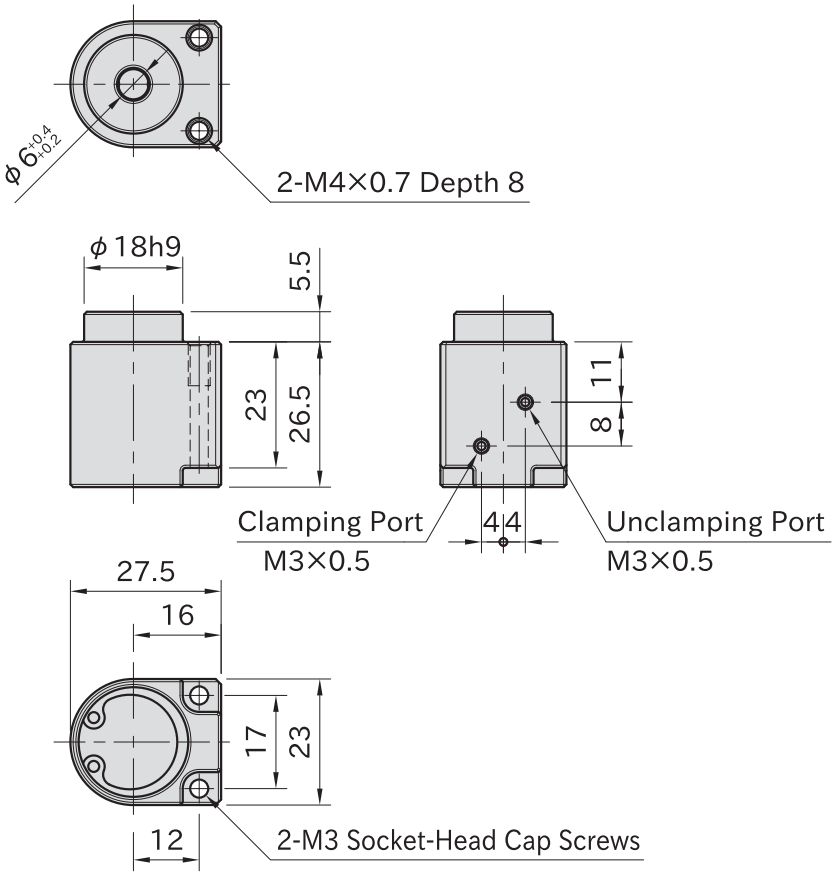
Repeatability is ±0.2.
For higher accurate locating, use locating pins.

PPHC-D PNEUMATIC PIN HOLDING CLAMP

RoHS Stainless Steel

Wedge

IMAO



★Key Point

Double-acting pull down clamp

Body	Piston	Wedge/Ball	Spring	Retaining Ring	Seal
SCS13 stainless steel (equivalent to SUS304)	SUS303 stainless steel	SUS440C stainless steel Quenched and tempered	SUS304WPB stainless steel	SUS304 stainless steel	Nitrile rubber (NBR)

Part Number	Operating Air Pressure (MPa)	Clamping Force (N)		Weight (g)	Proper Clamping Pin
		With Air *)	Without Air **)		
PPHC0623D-SUS	0.3~0.7	40	6	105	QCPC0625-M4-SUS

*) The clamping force above is at 0.5 MPa.

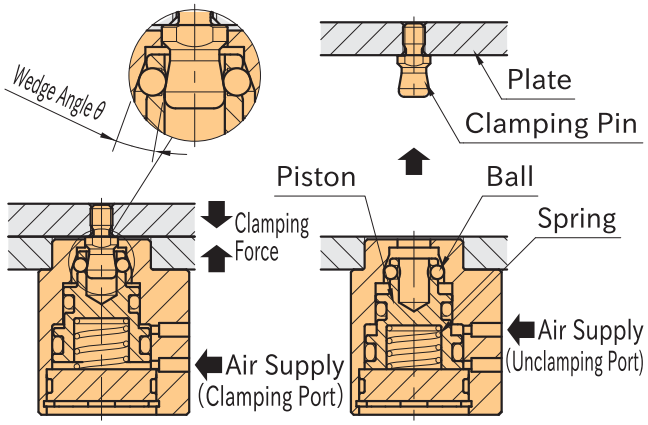
**) Inner spring provides clamping without air supply.

Supplied With

2 of socket-head cap screws(stainless steel), M3×0.5-28L

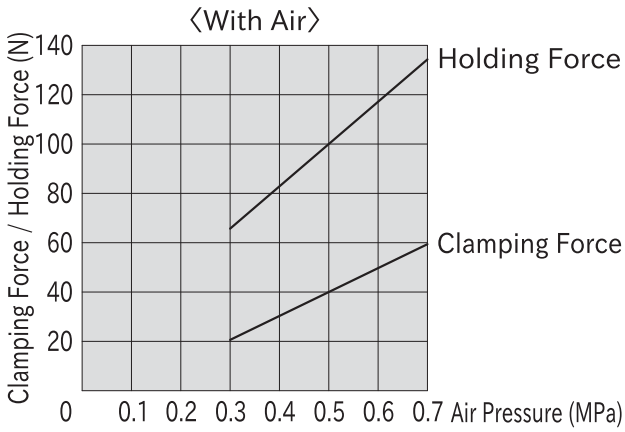
QCPC-M CLAMPING PIN

Feature



・The piston goes up by air supply from clamping port and the balls move toward the center to pull down the clamping pin.
・The wedge clamping prevents the plate from lifting up.
・Inner spring keeps clamping without air supply.

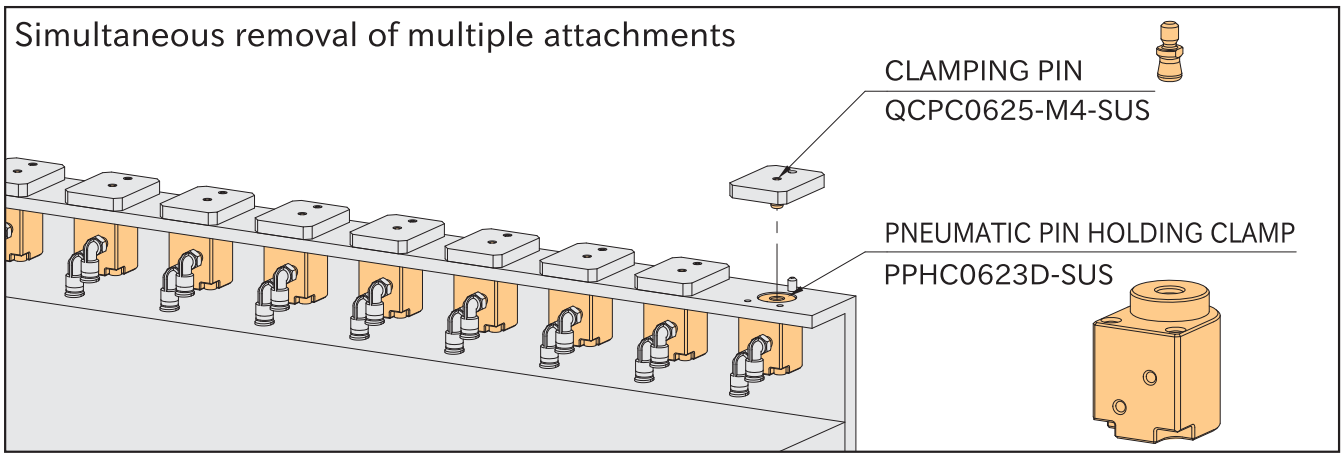
Performance Curve



〈Without Air〉

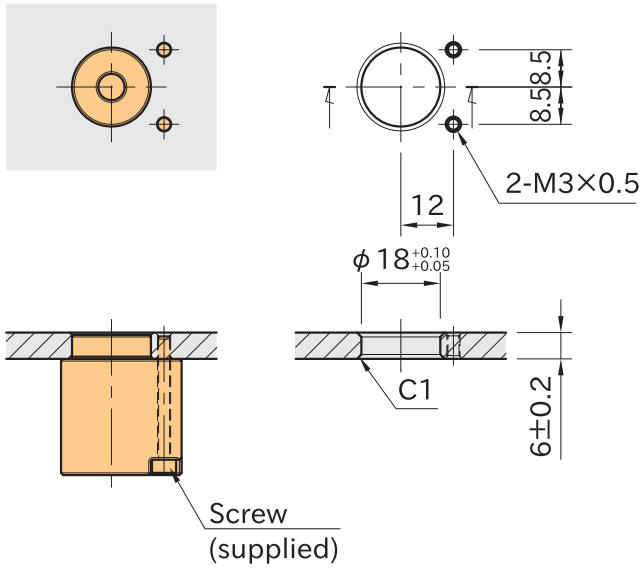
Clamping Force (N)	Holding Force (N)
6	40

Application Example

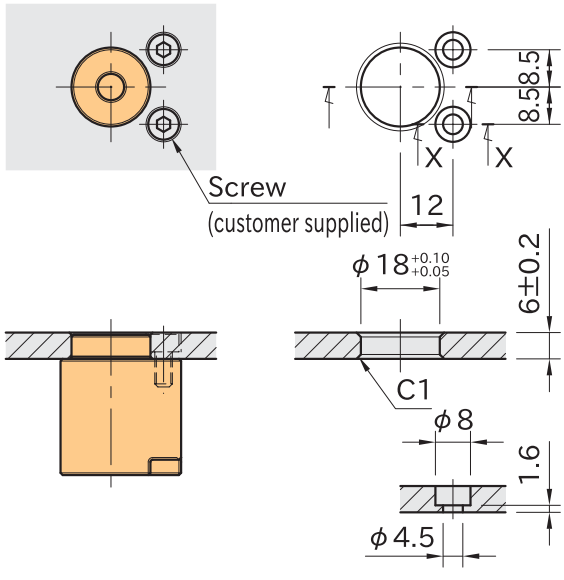


■Hole Preparation

With M3 Socket-Head Cap Screws (supplied)



With M4 Socket-Head Cap Screws (customer supplied)



■Machining Accuracy

Spacing tolerance for multiple use should be ±0.1.

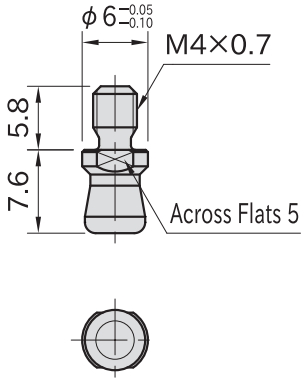
■Repeatability

Repeatability is ±0.2
For higher accurate locating, use locating pins.

QCPC-M CLAMPING PIN

RoHS Stainless Steel

IMAO



Body
SUS630 stainless steel Precipitation hardened

Part Number	Weight (g)	Proper pneumatic pin holding clamps
QCPC0625-M4-SUS	2	PPHC0621S-SUS, PPHC0623D-SUS

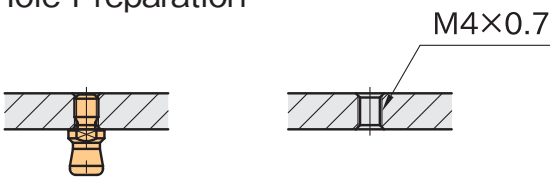
Note: Spacing tolerance for multiple use should be ±0.1.
Refer to the product pages of clamps for repeatability.

Note

Color difference by the hardening treatment does not affect function or quality of the product.

How To Install

Hole Preparation



IMAO® fixtureworks®

PBLC PNEUMATIC BALL-LOCKING CLAMPS

RoHS Stainless Steel

IMAO

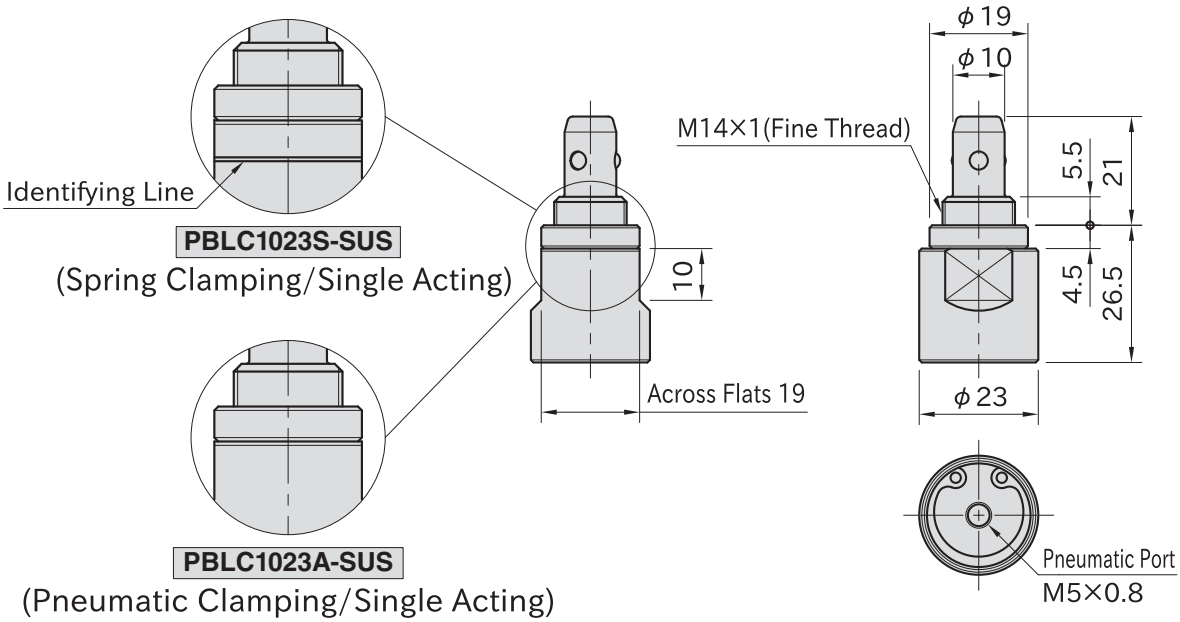
Wedge

PBLC1023S-SUS
(Spring Clamping/Single Acting)

PBLC1023A-SUS
(Pneumatic Clamping/Single Acting)

★Key Point
Two clamping types are available.

Body	Shaft	Ball	Spring	Retaining Ring	Seal
SUS303 stainless steel	SUS420J2 stainless steel Electroless nickel plated Quenched and tempered	SUS440C stainless steel Quenched and tempered	SUS304WPB stainless steel	SUS304 stainless steel	Nitrile rubber (NBR)



Part Number	Operating Air Pressure (MPa)	Clamping Force (N)	Weight (g)	Proper Receptacle
PBLC1023S-SUS	0.3~0.7	50	71	PBLC-M16-SUS
PBLC1023A-SUS		150 *)		

*) The clamping force above is at 0.5 MPa.

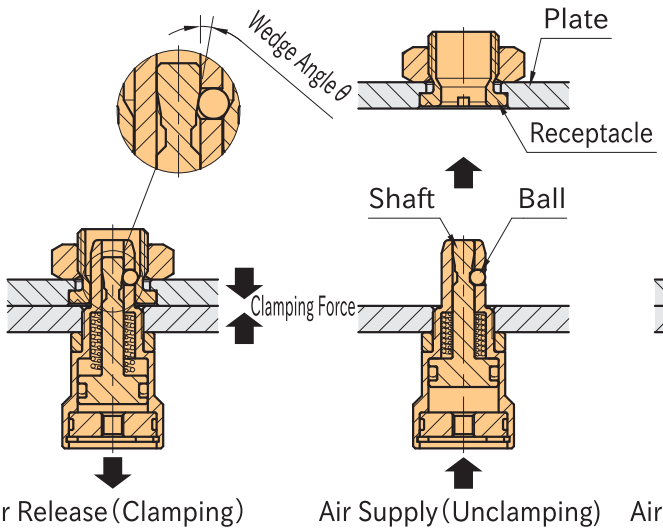
PBLC-M BALL-LOCK RECEPTACLE

Note

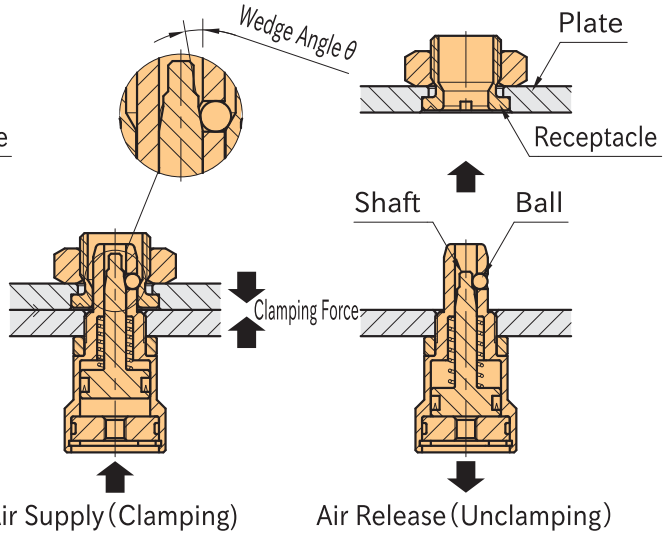
PBLC1023S-SUS has an identifying line and PBLC1023A-SUS does not.

Feature

PBLC1023S-SUS (Spring Clamping)



PBLC1023A-SUS (Pneumatic Clamping)



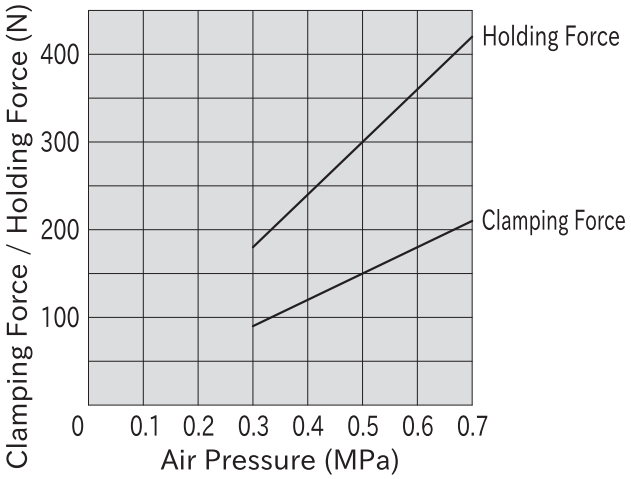
・The shaft pushes out the balls onto the tapered surface of the receptacle to pull down the plate.
・The wedge clamping prevents the plate from lifting up.
・Spring clamping type can keep clamping without air supply.

Performance Curve

PBLC1023S-SUS (Spring Clamping)

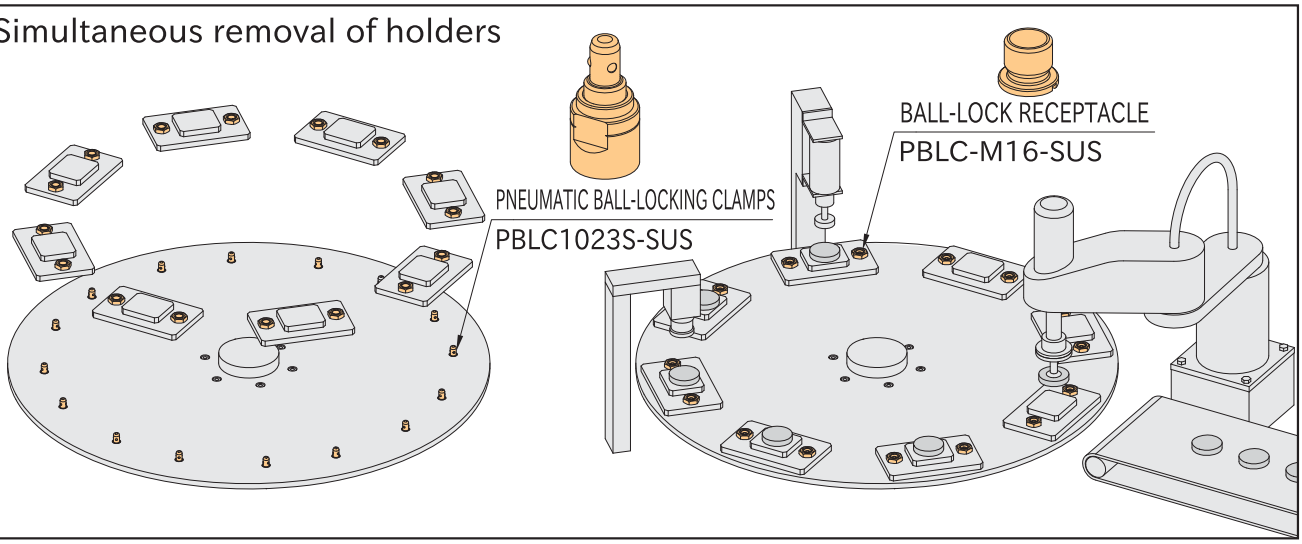
Clamping Force (N)	Holding Force (N)
50	150

PBLC1023A-SUS (Pneumatic Clamping)



Application Example

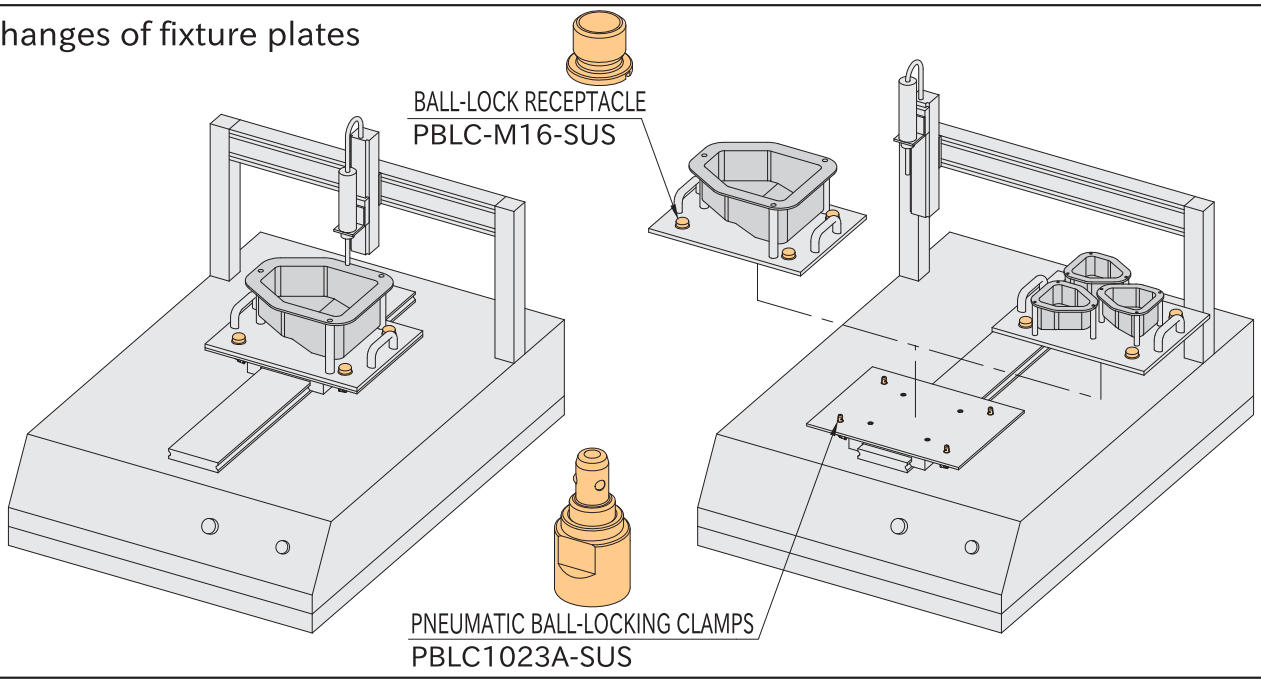
Simultaneous removal of holders



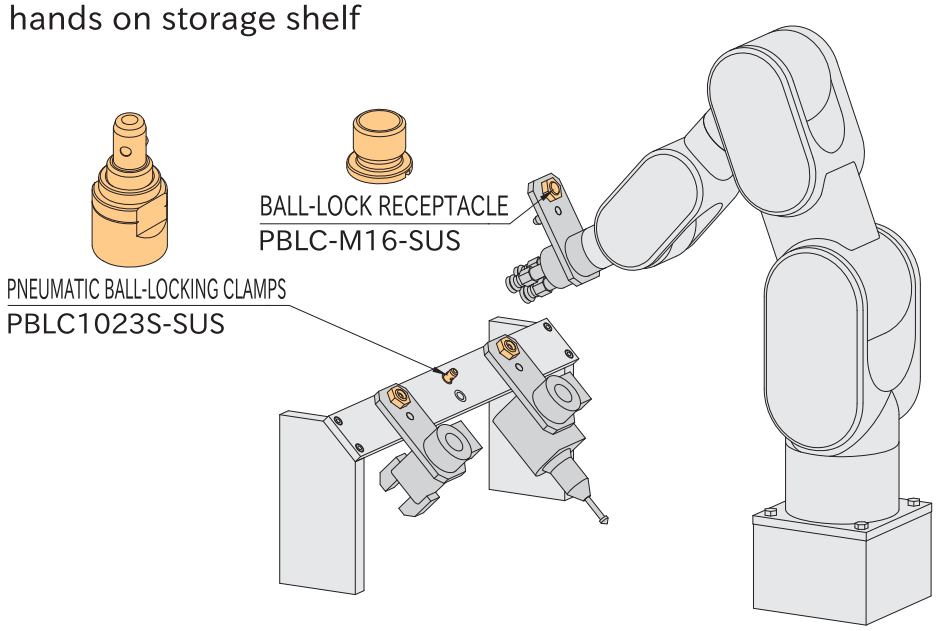
Continuing on Next Page

Application Example

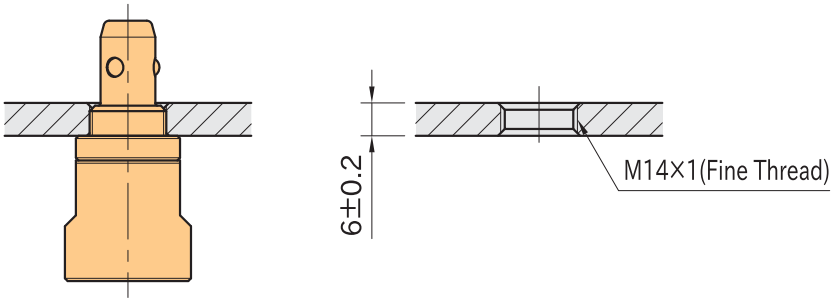
Changes of fixture plates



Fixing robot hands on storage shelf



■Hole Preparation



■Machining Accuracy

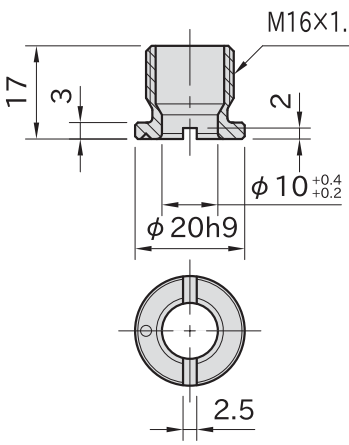
Spacing tolerance for multiple use should be ±0.1.

■Repeatability

Repeatability is ±0.2.
For higher accurate locating, use locating pins.

PBLC-M BALL-LOCK RECEPTACLE

RoHS Stainless Steel



Body
SUS630 stainless steel Precipitation hardened

Part Number	Proper Plate Thickness	Weight (g)	Proper Pneumatic Ball-Locking Clamps
PBLC-M16-SUS	6 or more	13	PBLC1023S-SUS, PBLC1023A-SUS

※Note: Spacing tolerance for multiple use should be ±0.1.
Refer to the product pages of clamps for repeatability.

Note

Color difference by the hardening treatment does not affect function or quality of the product.

How To Install

■Hole Preparation

Plate thickness: 6mm to 10mm

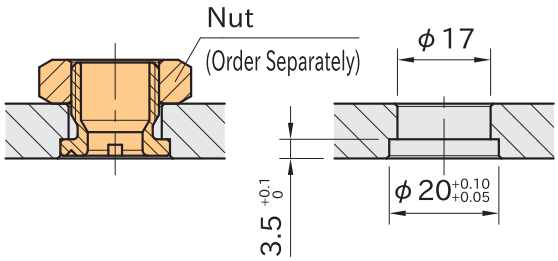
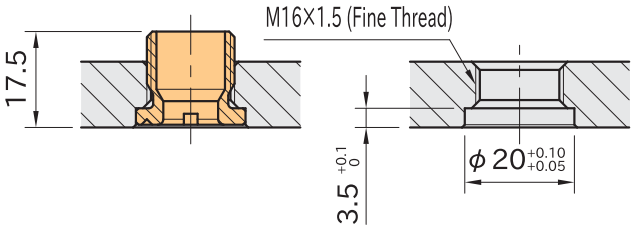
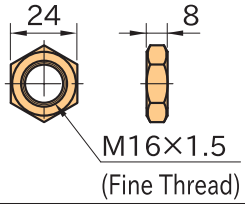


Plate thickness: over 10mm



Order Separately Nut (Stainless Steel)



Part Number
NDX16-NUT-SUS

Order Separately Installation Wrench

Part Number
PW16

PIDHC PNEUMATIC ID HOLDING CLAMP

RoHS Stainless Steel

IMAO

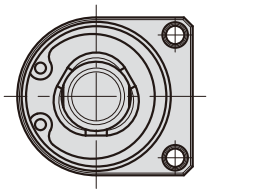
(Double Acting)

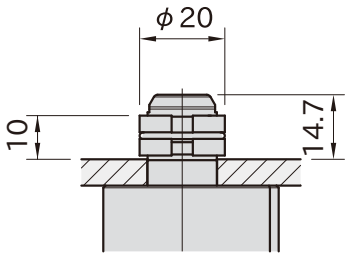
★Key Point
Holds the internal diameter

Body	Jaw/Washer	Piston
SCS13 stainless steel (Equivalent to SUS304)	SUS630 stainless steel Precipitation hardened	SUS303 stainless steel

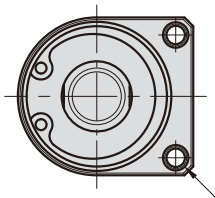
Pulling Shaft	Spring	Retaining Ring	Seal
SUS420J2 stainless steel Electroless nickel plated Quenched and tempered	SUS304WPB stainless steel	SUS304 stainless steel	Nitrile rubber (NBR)

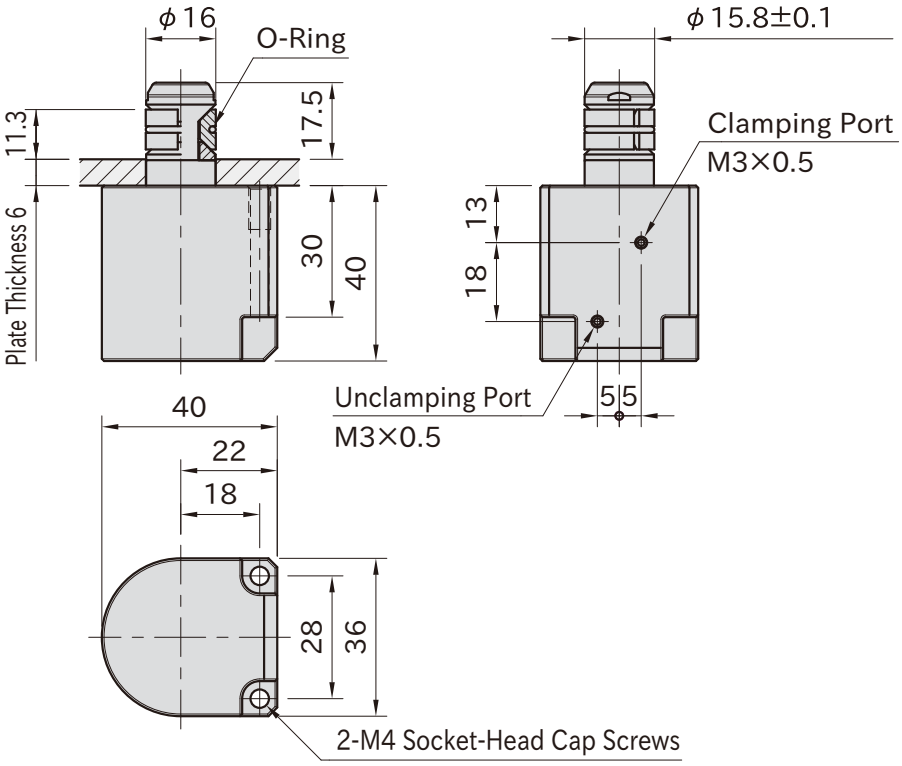
Clamping Dia. ϕ20





Clamping Dia. ϕ16





Part Number	Recommended Clamping Dia.*)	Operating Air Pressure (MPa)	Holding Force (N) **)	Weight (g)	O-Ring Size for Replacement
PIDHC20-SUS	ϕ16～ϕ20	0.3～0.7	77	336	S12 (CS 1.5/ID 11.5)

*) Maximum Clamping Dia. is ϕ22.
**) The holding force above is with 0.5 MPa air pressure and SUS304 (surface roughness Ra1.6) workpiece.

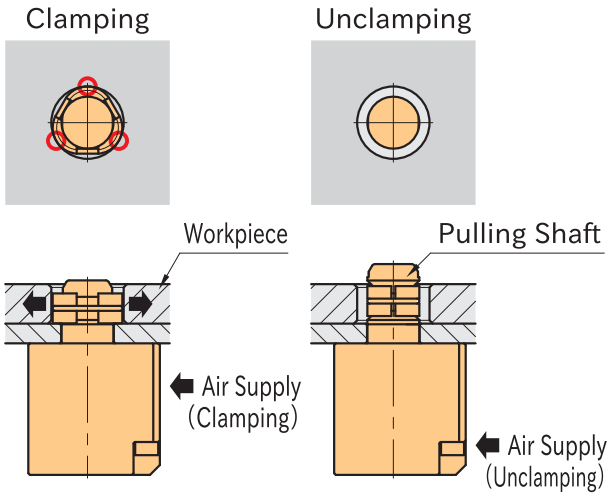
Supplied With

2 of socket-head cap screws(stainless steel), M4×0.7-35L

Note

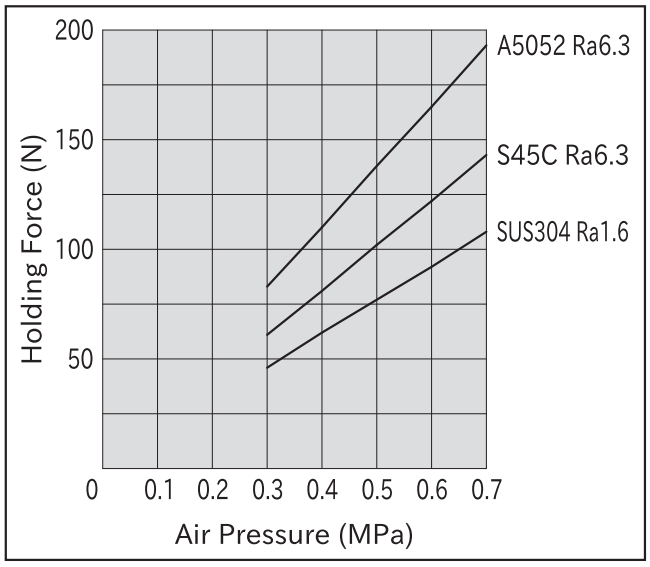
- Color difference by the hardening treatment does not affect function or quality of the product.
- Use clean air by removing moisture and debris with an air dryer and air filter.
- Impurities in the compressed air can cause malfunction.

Feature



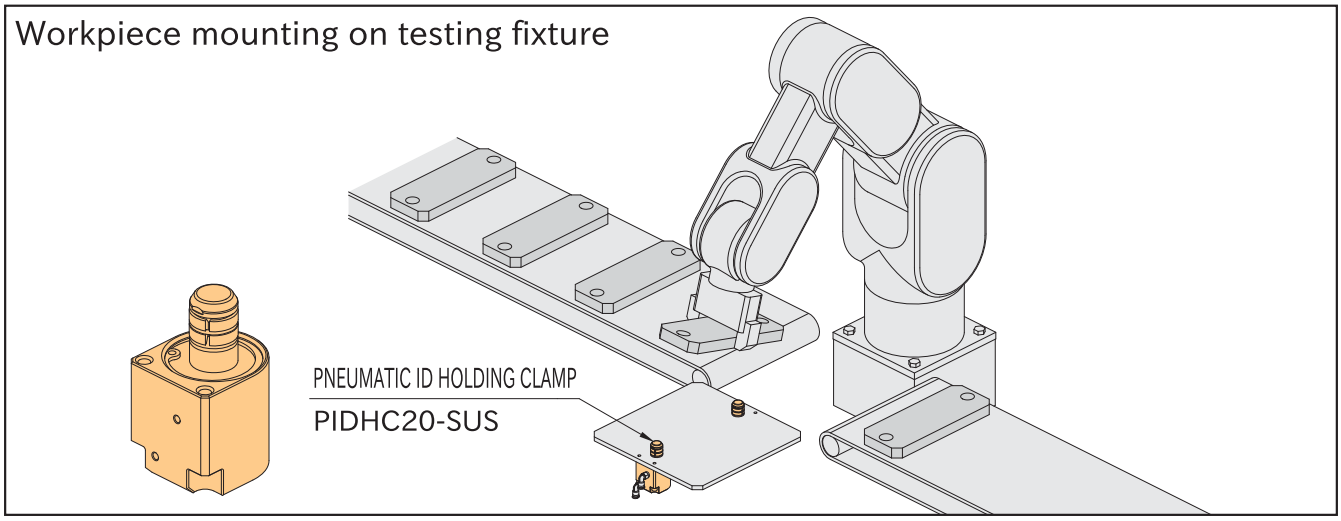
- The pulling shaft goes down by air supply from clamping port and the jaws expand to hold the workpiece.
- The clamp makes a line contact with the workpiece at 3 places.

Performance Curve



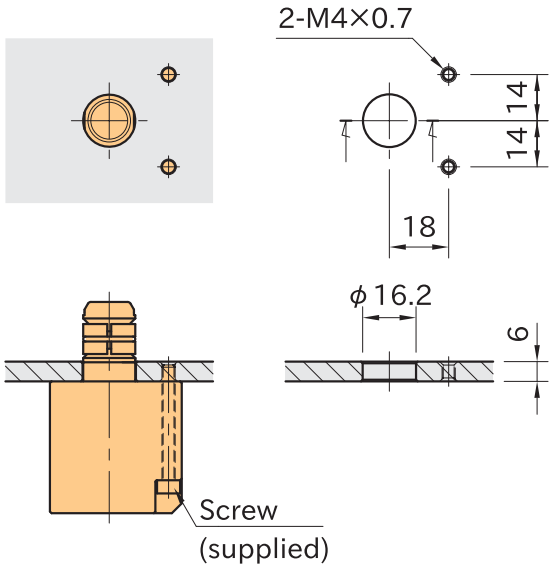
Application Example

Workpiece mounting on testing fixture

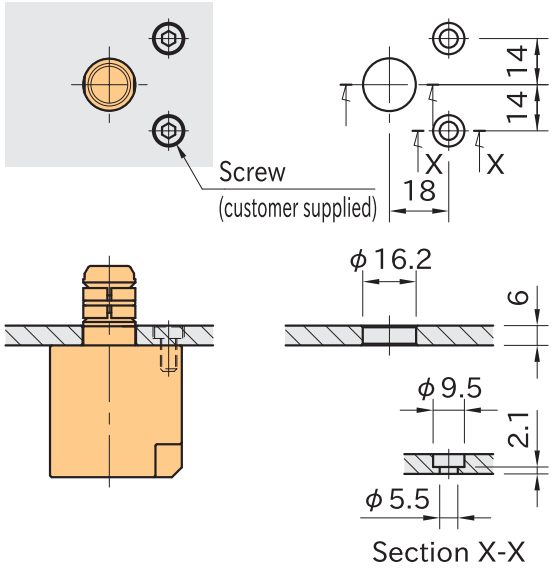


■Hole Preparation

With M4 Socket-Head Cap Screws (supplied)



With M5 Low-Head Cap Screws (customer supplied)
(Dimension: head dia. 8.5, head height 3.5)



■Repeatability

Estimated repeatability is ±0.2 (clamping dia. ϕ20, without any load)

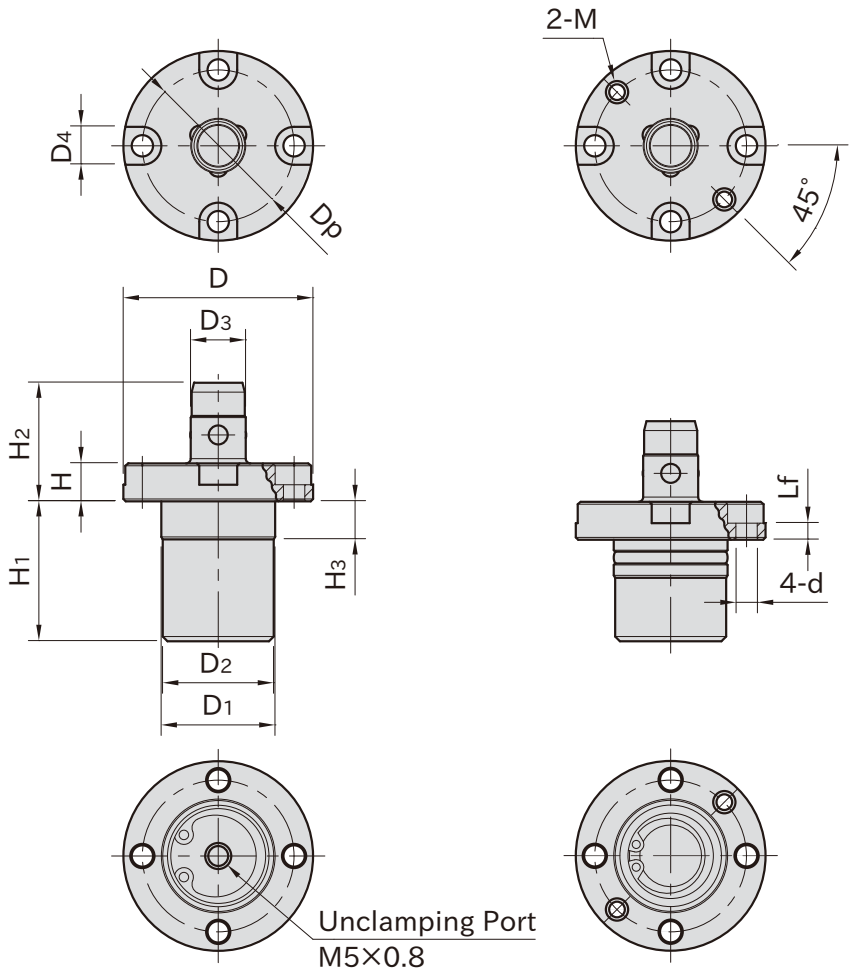
AMWF-L-S PNEUMATIC CLAMPING LOCATORS

RoHS

Wedge

AMWF-L-S

AMWF-L-S-G



AMWF-L-S (Port Style) AMWF-L-S-G (Direct Style)

Body	Ball	Coiled Spring
S45C steel Electroless nickel plated	SUS440C stainless steel	SUS304WPB stainless steel

Part Number	D_1 (g6)	H_3	D_2	H_1	D	H	D_3 (h8)	H_2	d	Lf	D_4	Dp
AMWF18L-4S	24	8	23.4	29.5	40	8	12	25	4.5	3.5	8	32
AMWF26L-4S	32	8.5	31.4	31.7	51	9.5	16	28.5	5.5	4	9.5	41
AMWF18L-4S-G	24	8	23.4	24.5	40	8	12	25	4.5	3.5	8	32
AMWF26L-4S-G	32	8.5	31.4	25.5	51	9.5	16	28.5	5.5	4	9.5	41

Part Number	M	Air Pressure (MPa)	Clamping Force (N)	Weight (g)
AMWF18L-4S	—	0.5	250	154
AMWF26L-4S	—		350	289
AMWF18L-4S-G	M4×0.7		250	136
AMWF26L-4S-G	M5×0.8		350	252

Related Product

AMWF-BU LOCATING RECEIVERS

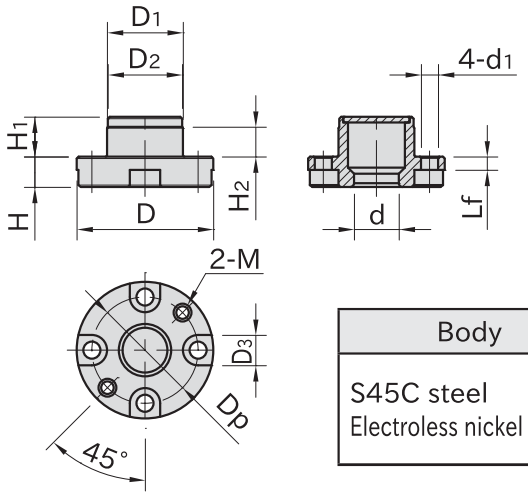
Reference

- How To Install PNEUMATIC FLEX LOCATORS
- How To Use PNEUMATIC FLEX LOCATORS

Note

- Use clean air by removing moisture and debris with an air dryer and air filter.
- Impurities in the compressed air can cause malfunction.

AMWF-BU PNEUMATIC FLEX LOCATOR BUSHINGS



Body
S45C steel Electroless nickel plated

Part Number	D_1 (g6)	H_2	D_2	H_1	D	H	d (E7)	d_1	Lf	D_3	M	Dp	Weight (g)
AMWF18-BU	20	7.5	19.6	10.5	36	8	12.1	4.5	3.5	8	M4×0.7	28	57
AMWF26-BU	25	7	24.6	11	44	9.5	16.1	5.5	4	9.5	M5×0.8	34	97

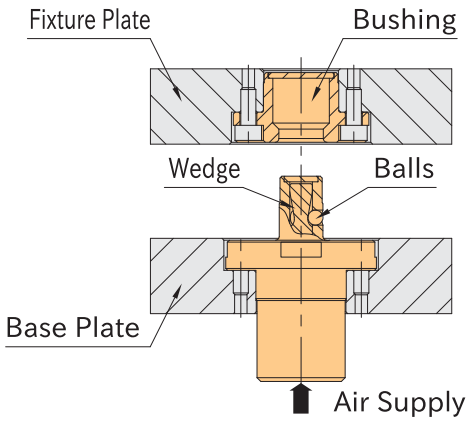
Reference

- How To Install PNEUMATIC FLEX LOCATORS
- How To Use PNEUMATIC FLEX LOCATORS

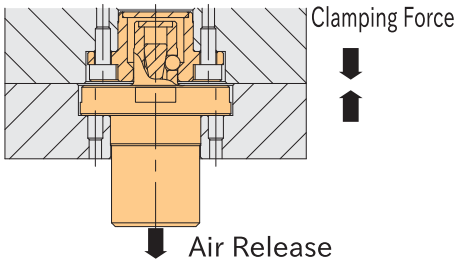
Related Product

AMWF-L-S PNEUMATIC FLEX LOCATOR PINS

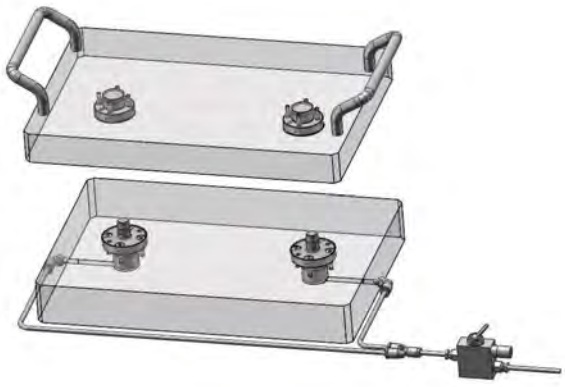
Feature



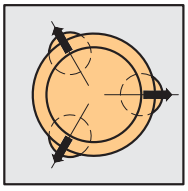
Supply air for unclamping.
The wedge goes up and releases the balls.



Release air for clamping. The wedge goes down and pushes the balls to pull down the bushing.
Can keep clamped without air supply.



Quick clamping and unclamping reduce set-up time in production equipment.



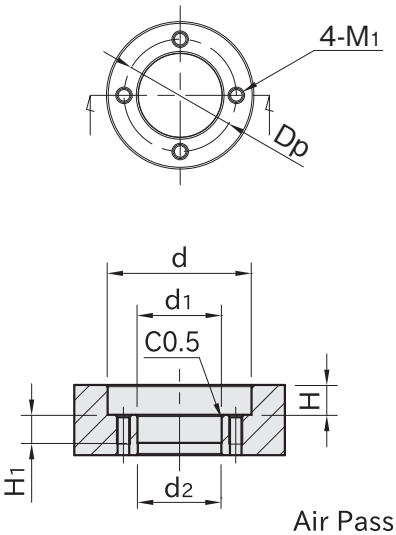
Locating Repeatability : ±10μm
The bushing is centered and clamped when the 3 balls are pushed out to gain high locating repeatability.

How To Install PNEUMATIC FLEX LOCATORS

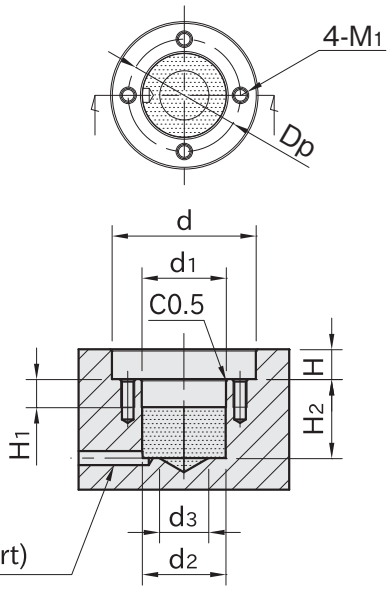
■Mounting Hole Dimensions

・Pins

AMWF-L-S (Port Style)



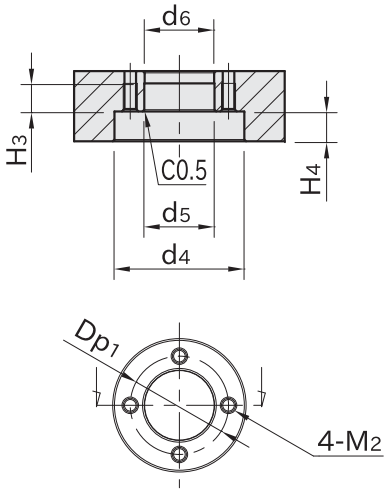
AMWF-L-S-G (Direct Style)



Part Number	d_1 (H7)	H_1	d_2	H_2	d_3	d	H (±0.05)	M_1	Dp
AMWF18L-4S	24	8.5	23.8	—	—	41	8.5	M4×0.7 Depth 8	32
AMWF26L-4S	32	9	31.8	—	—	52	10	M5×0.8 Depth10	41
AMWF18L-4S-G	24	8.5	23.8	25.5	14	41	8.5	M4×0.7 Depth 8	32
AMWF26L-4S-G	32	9	31.8	26.5	20	52	10	M5×0.8 Depth10	41

・Bushings

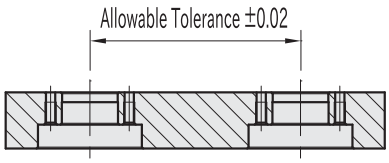
AMWF-BU (Bushing)



Part Number	d_5 (H7)	H_3	d_6	d_4	H_4 (±0.05)	M_2	Dp_1
AMWF18-BU	20	8	19.8	37	8.5	M4×0.7 Depth 8	28
AMWF26-BU	25	7.5	24.8	45	10	M5×0.8 Depth10	34

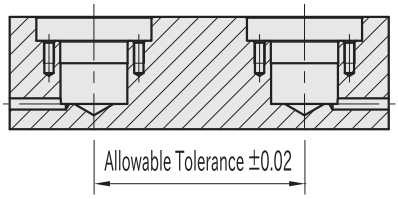
■Spacing Tolerance

AMWF-BU (Bushing)



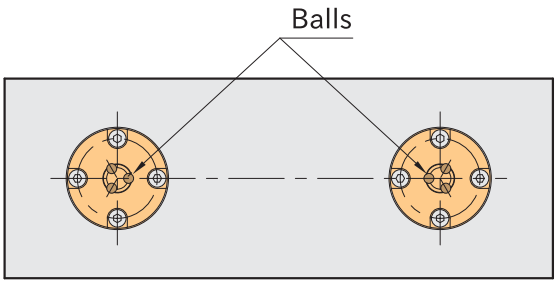
AMWF-L-S (Port Style)

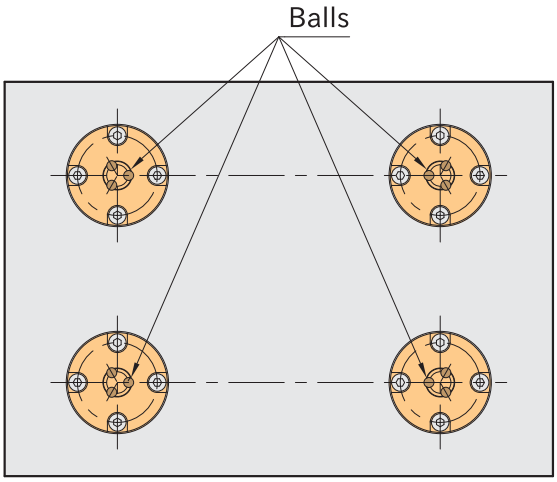
AMWF-L-S-G (Direct Style)



How To Use PNEUMATIC FLEX LOCATORS

■How to Use

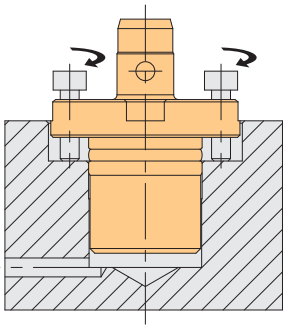




The pins should be mounted in the direction shown in the above figures.

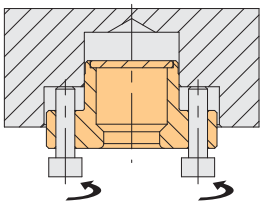
■How to Remove (Direct Style Pins)

For easier removal, insert screws into the tapped holes and screw them.



■How to Remove (Bushings)

For easier removal, insert screws into the tapped holes and screw them.



Note

Size	Max. Loading Weight (kg)
AMWF18	40
AMWF26	56

- If the total weight exceeds the maximum loading weight, the locating repeatability may exceed ±10 μm.
- In vertical use, the locating repeatability may exceed ±10 μm.
- Pins and Bushings should be positioned equally against the center of the fixture plate.
- For Port Style Pins, use with air joint that is available commercially.

Note: The maximum loading weight is the entire sum of the weight of fixture plates, fixtures and workpieces.

Note: The maximum loading weight shown is the value when two sets each of AMWF-L-S Pins and AMWF-BU Bushings are used.

AMWF-W PNEUMATIC CLAMPING LOCATORS

RoHS

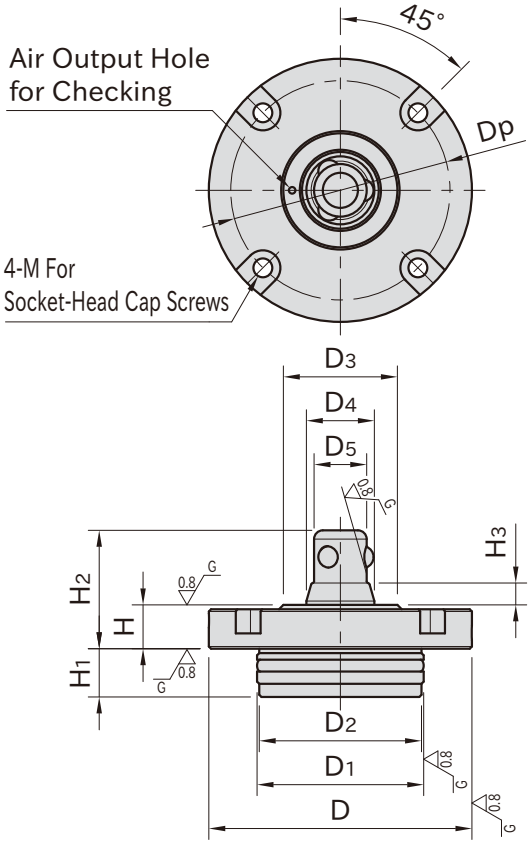
Wedge

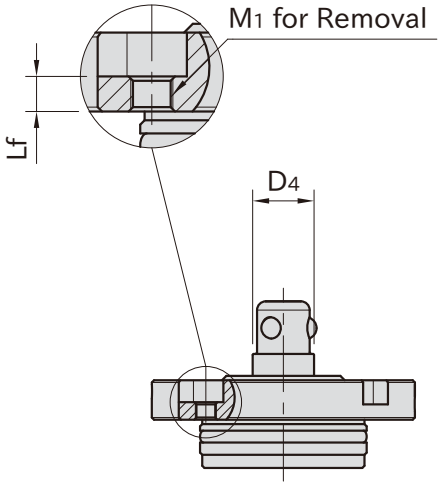
IMAO

(Tapered Type)

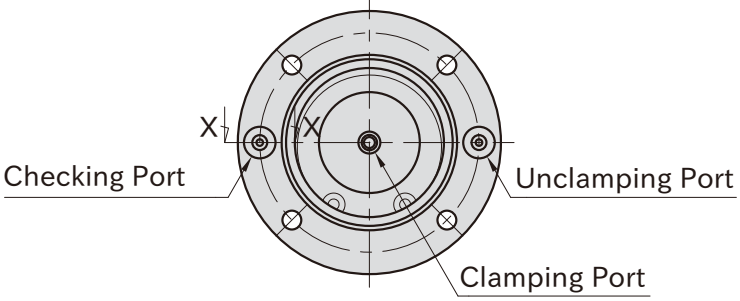
(Straight Type)

Body	Cylinder	Ball
SCM440 steel Induction hardened Black oxide finished Precision ground	S45C steel Induction hardened Electroless nickel plated	SUS440C stainless steel

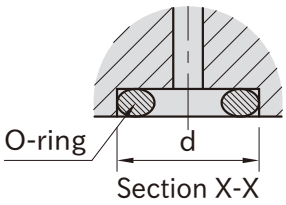




AMWF-W-T (Tapered Type)



AMWF-W-S (Straight Type)



Reference

- How To Use PNEUMATIC FLEX LOCATORS
- How To Install PNEUMATIC FLEX LOCATORS

Note

- Use clean air by removing moisture and debris with an air dryer and air filter.
- Impurities in the compressed air can cause malfunction.

Size		D_1 (g6)	D_2	H_1	D	D_3	H (±0.003)	M	H_3	D_5 $(^{-0.05}_{-0.15})$	H_2	Lf	M_1	Dp
AMWF-W-T	40	48	47.5	15	70	38	12	M5	8	16	35	5	M6×1 (Drilled Hole ϕ5.2)	60
AMWF-W-S	50	58	57.5	19	85	48	15	M6	10	20	44	6	M8×1.25(Drilled Hole ϕ6.8)	72

Size		d	Furnished O-ring	Operating Air Pressure(MPa) *)	Clamping Force(kN)
AMWF-W-T	40	7.2	P4	0.5	4
AMWF-W-S	50	8.2	P5		6.3

*) At least 0.45 MPa is required for unclamping.
The maximum operating air pressure is 1 MPa.

Related Product

AMWF-BU PNEUMATIC FLEX LOCATOR BUSHINGS

AMWF-W-T (Tapered Type)

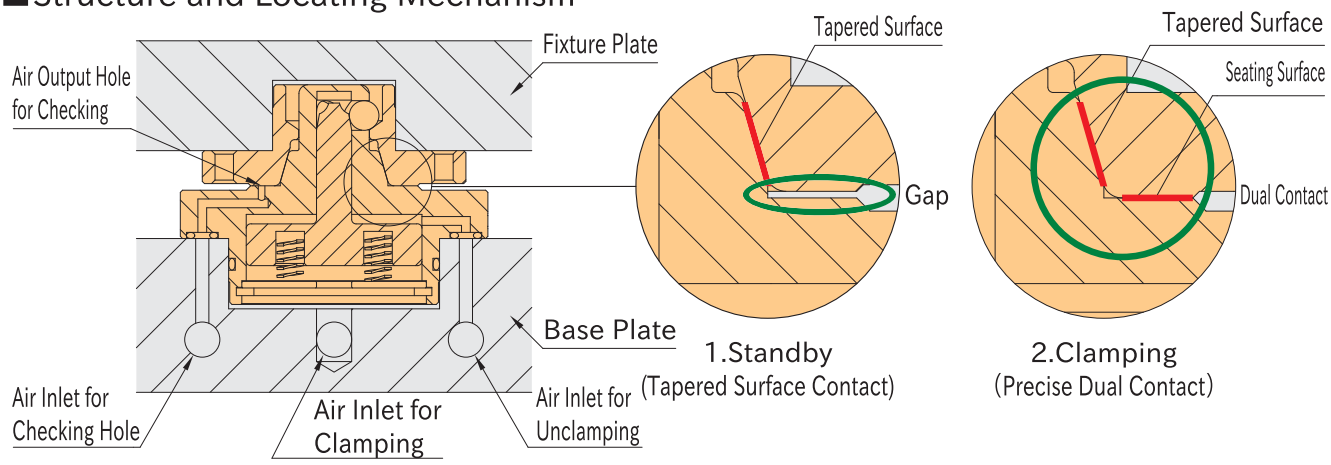
Part Number	D_4	Weight (g)
AMWF40-W-T	24.5	450
AMWF50-W-T	31.5	820

AMWF-W-S (Straight Type)

Part Number	D_4	Weight (g)
AMWF40-W-S	20	440
AMWF50-W-S	26	810

Feature

■Structure and Locating Mechanism



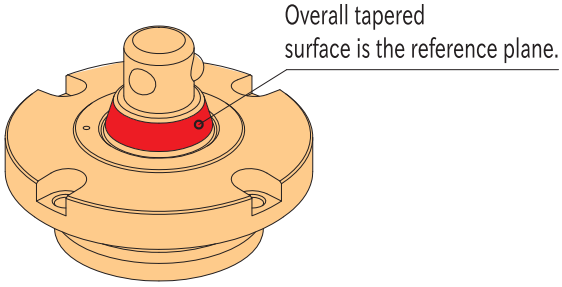
・When the air pressure is lowered by an air leakage, the wedge mechanism and the spring prevent prompt lowering of the clamping force.
Clamping Force at 0 Mpa Air Pressure (Clamping Force of Spring)
・AMWF40Type…1.2kN
・AMWF50Type…1.8kN

・Can check if the fixture plate is clamped properly by applying air through the checking hole.

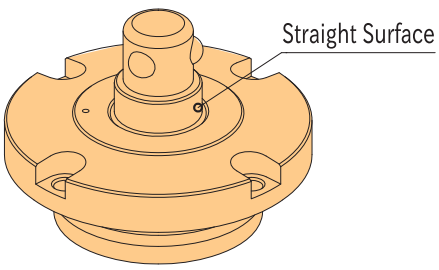
・Precise dual contact provides excellent locating repeatability at 3μm.

■Functions

Locating with Tapered Type



Clamping with Straight Type



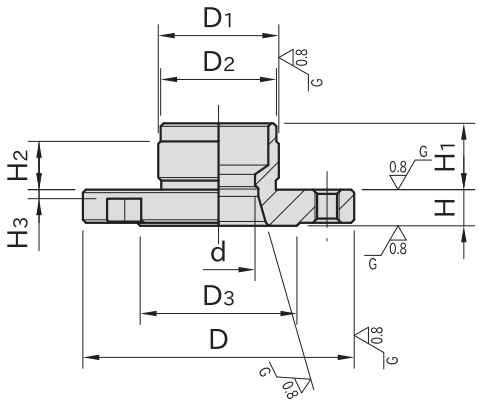
AMWF-BU PNEUMATIC FLEX LOCATOR BUSHINGS

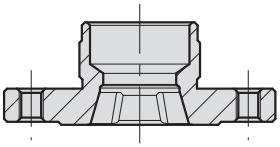
(Tapered Type)

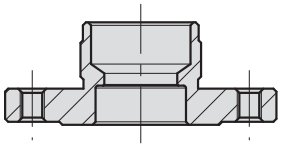
(Diamond Type)

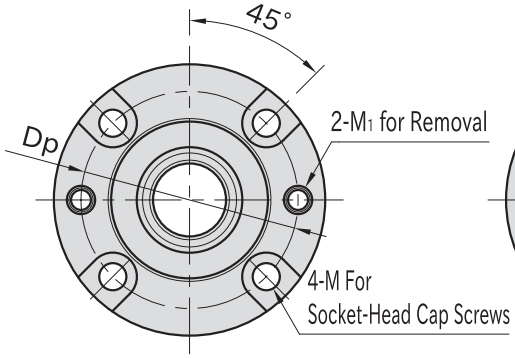
(Straight Type)

Body
SCM440 steel Quenched & tempered Black oxide finish Precision ground

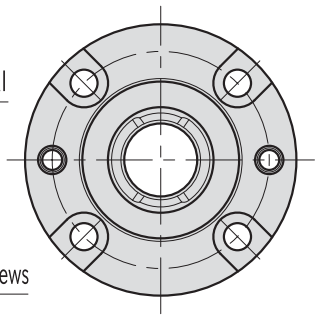




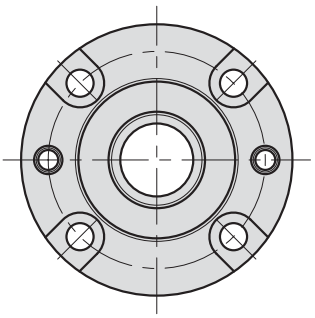




AMWF-BU-T
(Tapered Type)



AMWF-BU-D
(Diamond Type)



AMWF-BU-S
(Straight Type)

Size		D1 (g6)	H2	D2	H1	M	H3	D	D3	H (±0.003)	d (+0.15 +0.05)	M1	Dp
AMWF-BU-T AMWF-BU-D AMWF-BU-S	40	28	10	27.5	15	M5	2.5	60	38	8	16	M5×0.8	50
	50	36	14	35.5	19	M6	3.5	75	48	10	20	M6×1	62

AMWF-BU-T (Tapered Type)

Part Number	Weight (g)
AMWF40-BU-T	160
AMWF50-BU-T	323

AMWF-BU-D (Diamond Type)

Part Number	Weight (g)
AMWF40-BU-D	159
AMWF50-BU-D	322

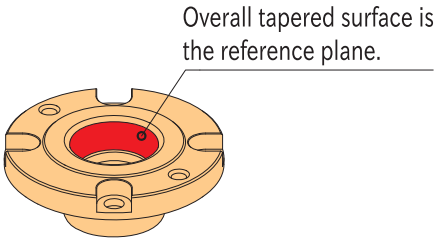
AMWF-BU-S (Straight Type)

Part Number	Weight (g)
AMWF40-BU-S	163
AMWF50-BU-S	330

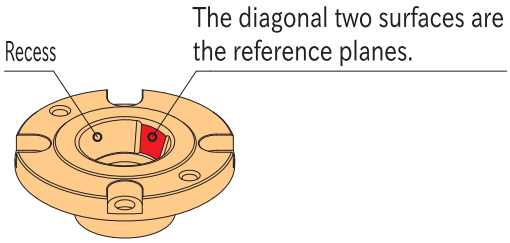
Feature

■Function

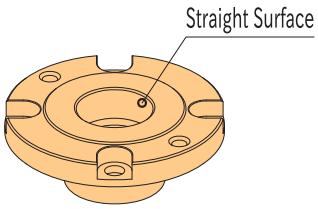
Locating with Tapered Type
For setting reference position



Locating with Diamond Type
For locating reference at rotational direction



Clamping with Straight Type



Related Product

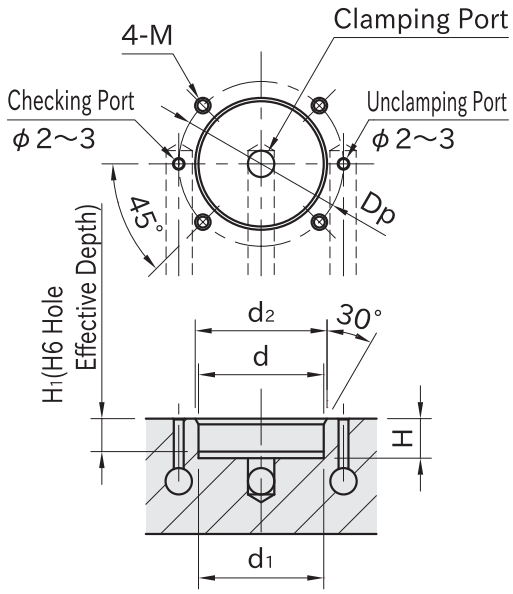
AMWF-W PNEUMATIC FLEX LOCATOR PINS

Reference

・How To Use PNEUMATIC FLEX LOCATORS
・How To Install PNEUMATIC FLEX LOCATORS

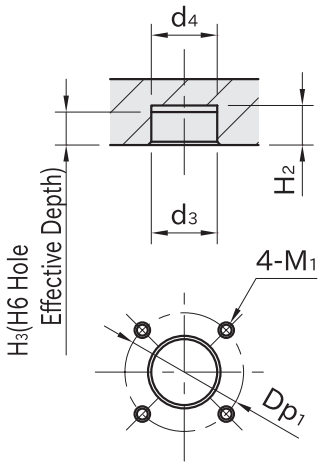
How To Install PNEUMATIC FLEX LOCATORS

■Mounting Hole Dimensions for Pins



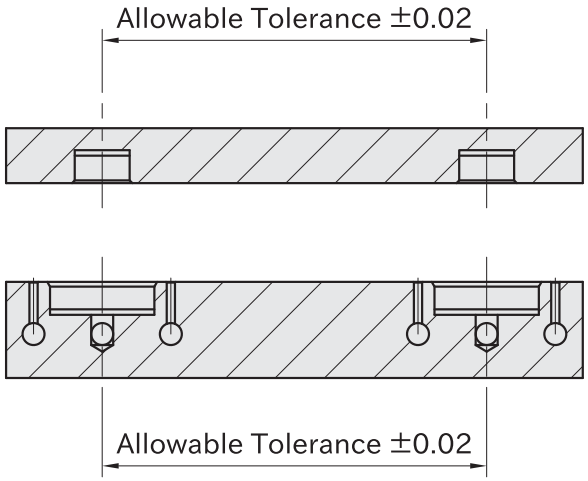
Size	d (H6)	H_1	d_1 $^{-0.1}_{-0.3}$	H	d_2	M	Dp
AMWF40-W	48	12	48	16	50	M5×0.8	60
AMWF50-W	58	16	58	20	60	M6×1	72

■Mounting Hole Dimensions for Bushings



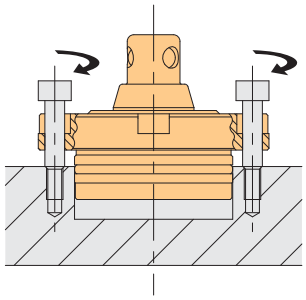
Size	d_3 (H6)	H_3	d_4 $^{-0.1}_{-0.3}$	H_2	M_1	Dp_1
AMWF40-BU	28	12	28	16	M5×0.8	50
AMWF50-BU	36	16	36	20	M6×1	62

■Spacing Tolerance



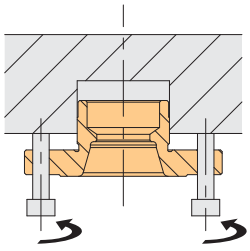
■How to Remove Pins

For easier removal, insert screws into the tapped holes and screw them.



■How to Remove Bushings

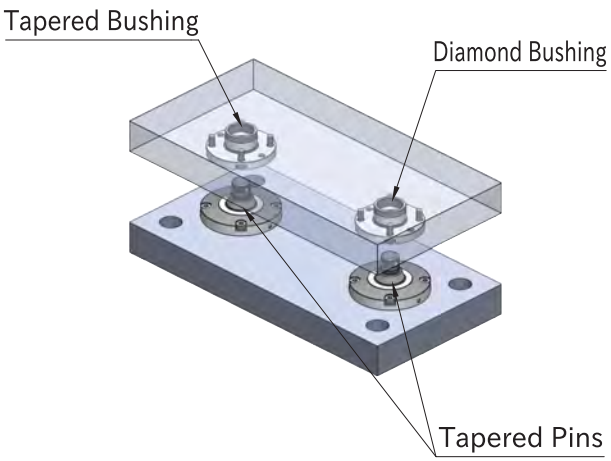
For easier removal, insert screws into the tapped holes and screw them.



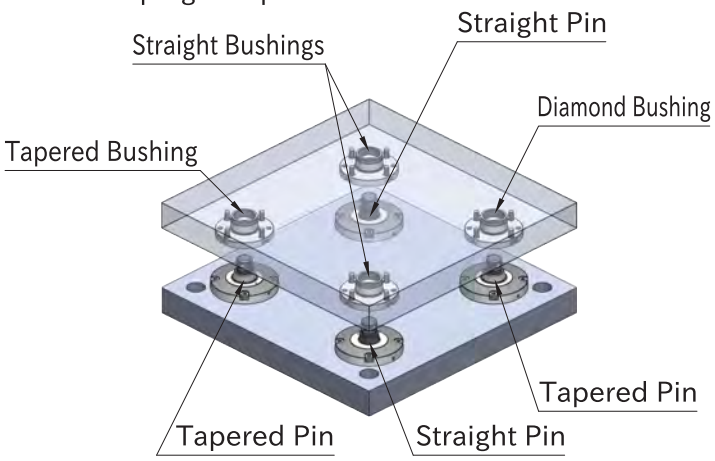
How To Use PNEUMATIC FLEX LOCATORS

Application Example

For clamping at 2 points



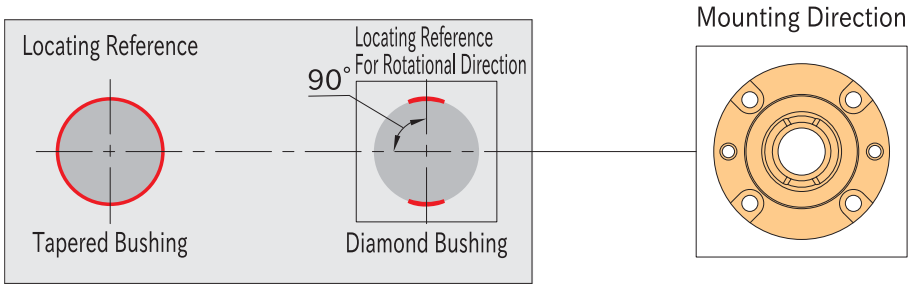
For clamping at 4 points



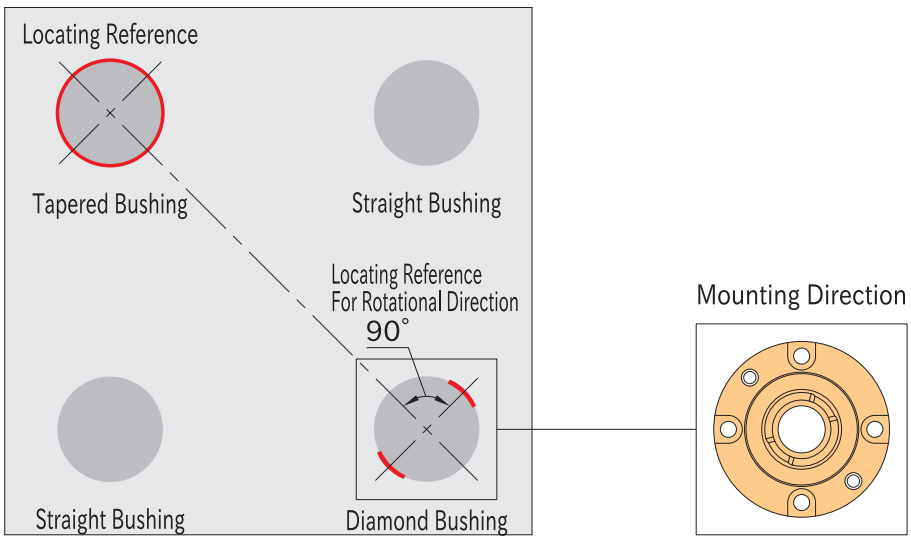
■Positioning Order of Bushings

Mount the Tapered Bushings and Diamond Bushings as in the figure below for locating fixture plates. Pay attention to the mounting direction of the Diamond Bushings, since the direction for use at 2 points and the direction for use at 4 points differ.

For clamping at 2 points



For clamping at 4 points



IMAO® fixtureworks®

33792 Doreka Dr. Fraser, MI 48026
586-294-1188
cs@fixtureworks.com