New-Era®

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http://www.newera.co.jp/en/pneumatic/index.html
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PICO POSITIONER PXY Series

Error Absorption Unit
Pico Positioner Has Added A New Size!

Bore Size ϕ20!! (Conventional Product ϕ12)



RoHS Compliant

Features	Maximum Load Mass	Mounting Parallelism	Rated Static Load
	3kg	0.01mm	6010N

Issued by
CAT NO. PXY-20 18-01

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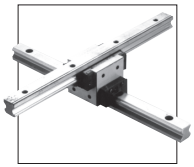
PICO POSITIONER

PXY Series (ϕ12 and ϕ20)

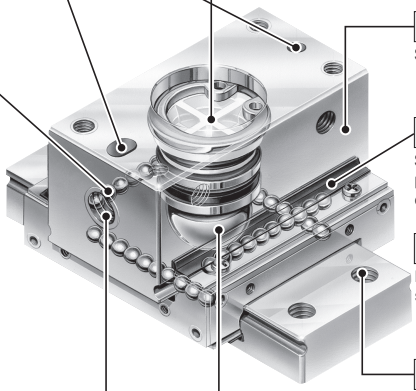
A Positioning Error Absorption Unit that Allows Light and Smooth Sliding Movement by Means of Cross Linear Guides, and can be Locked after Returning to the Center Position by Pressurizing

Center Position Repeatability ±0.05mm, Mounting Parallelism 0.01mm
(Standard Type)

Cross Linear Guide



High Accuracy, High Rigidity Linear Guide is built-in.



Positioning Pin Holes

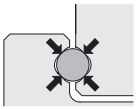
Pin holes for attaching / detaching reproducibility are provided on the top surface of the body and the side surface of the table.

Cross Linear Guide

Limited track type linear guides of high-accuracy and high-rigidity.

4-Point Contact

4-point contact guide which well endures fluctuating load and combined load, is adopted for the linear guide.



Piping Port

When air is supplied. the piston will make the positioning steel ball move towards the table.

Centering

The hole on the top of the body can be used for centering in relation to the hole on the table side surface.

Corrosion Resistance

Stainless steel is adopted.

Side Seals

Side seals are provided at four places to prevent the entry of dust.

Center Holding Type

Holding the center position by spring after exhausted.

Mounting of Workpiece

Workpiece can be mounted directly on the surface of the table.

Steel Ball for Positioning

This ball is for returning of the table to the center position and locking the table at its center position.

Countermeasure for Copper Parts

Copper parts are not used.

Lock-off Type

Lock is released by spring after exhausted.

Summary of The PICO POSITIONER

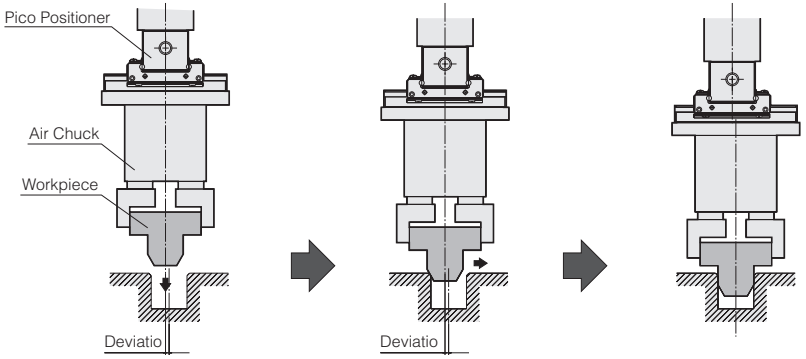
A device, which realizes light and smooth sliding movement on X-Y plane by means of the small-sized cross linear guides while maintaining high-accuracy and high-rigidity, and enables secure locking at center position with high repeatability by virtue of a built -in steel ball. This is “Pico Positioner”.

It can absorb a positioning error in the range of ϕ1mm to ϕ3mm (in the case of ϕ20) around the center position.It can be returned from the deviated position to its center position and locked by air pressure.

It is best suited for the use at the tip of a robot because of its thin and lightweight construction.

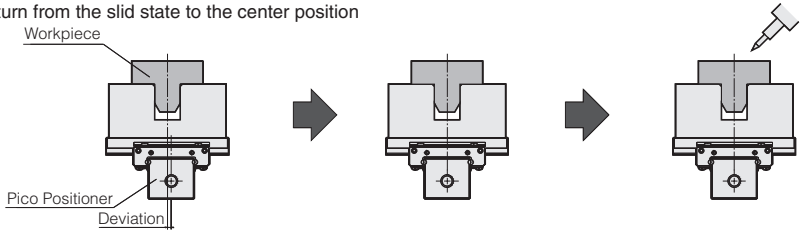
■Application Examples : PICO POSITIONER

●Positioning error absorption at the insertion of a workpiece



●Start of Insertion ●Absorption of Deviation (error) ●End of Insertion

●Return from the slid state to the center position

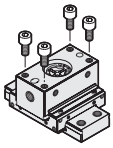


●End of Insertion ●The table returns to the center position and is locked when pressurized ●Finishing operation in locked state

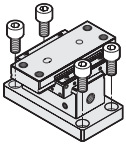
■MAIN BODY INSTALLATION

(Bolt as shown in the figure are not supplied with products)

Top Mounting
(Body Tap)



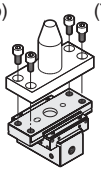
Top Mounting
(By Means of LB Fixture)
PXY12 Only



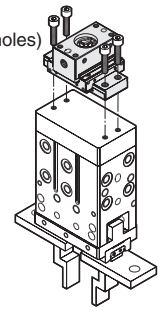
■MOUNTING

(Bolt as shown in the figure are not supplied with products)

Top Mounting
(Table Tap)



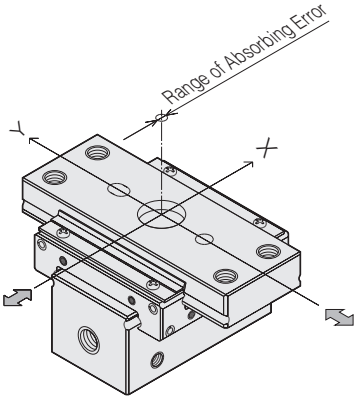
Bottom Mounting
(Table Through-holes)



OPERATING PRINCIPLE

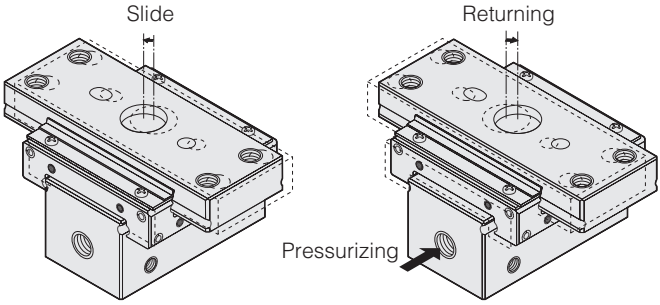
■Range of Absorbing Error

The table can slide in the range of the circumference on the X-Y plane around the center position in the non-pressurized state.



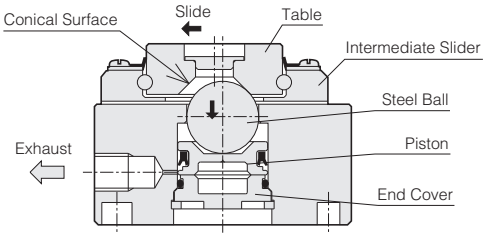
■Standard Type

When pressurized, the table will return to the center position and be locked.

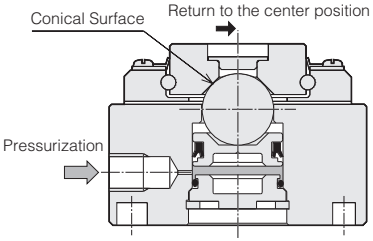


The state where the table is slid.
(The table is in a free state.)

When pressurized, the table will return to the center position and be locked.



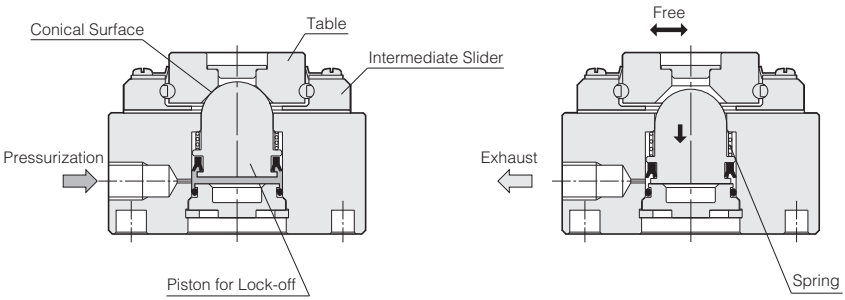
When the table slides by external force in the non-pressurized state, the steel ball and the piston will be pushed down and the piston will be stopped by the end cover.Table is in the free state. The range that the table can slide is restricted by the contact of the steel ball with the conical surface of the table.



When pressurized, the piston will push up the steel ball. The table will return to the center position and be locked by the contact of the steel ball with the conical surface in the table.

■Lock-off Type (LF)

After the air is discharged, the lock is released by the spring, which allows the table to move freely.

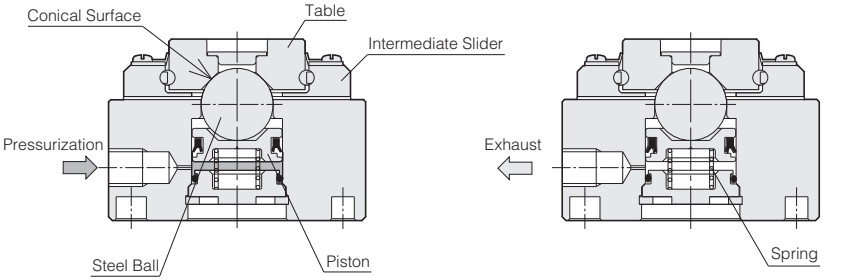


When pressure is applied, the spherical surface of the piston end is pressed against the conical surface of the table, which returns the table to the center where it is locked.

When the air is discharged, the piston is returned to the original position by the spring and the lock is released, which allows the table to move freely.

■Center Holding Type (BL, BM, BH)

The table center position is maintained by the spring after the air is discharged.



When pressure is applied, the steel ball is pressed against the conical surface of the table, which returns the table to the center where it is locked.

Even if the air is discharged, the piston keeps pressing the steel ball against the conical surface of the table because of the spring, which locks the table at the center position.Note that the table locking force is only the force by the spring.

Model Code Example

PXY-SD12-2-BL

Series Name

Bore Size

12	φ12
20	φ20

Additional Function

No Code	Standard Type	
LF	Lock-off Type	
BL	Center Holding Type	Holding Force Weak Type
BM		Holding Force Medium Type
BH		Holding Force Strong Type

Description of Additional Function ☞ Page 5
Change of Additional Function ☞ Page 13, 14
Holding Force of Center Hold Type ☞ Page 12

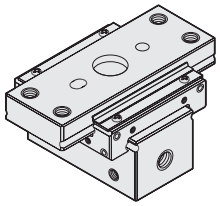
Error Absorption Range

Code	Error Absorption Range (mm)
1	φ1
2	φ2
3	φ3 Bore Size (φ20 Only)

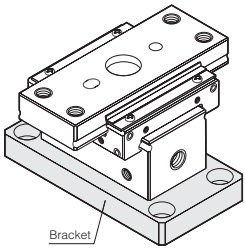
Tolerance of Error Absorption Range ☞ Page 7

Mounting

SD	Basic



LB	With Bracket (PXY12 Only)



SPECIFICATIONS

		PXY12		PXY20		
Locking Area	Bore Size	φ12㎜		φ20㎜		
	Pipe Diameter	M5×0.8				
	Returning System	Air Returning				
	Locking Pattern	Center Position Locking				
	Working Fluid	Air				
	Maximum Service Pressure	0.7MPa				
	Minimum Service Pressure	0.1MPa				
	Proof Pressure	1.05MPa				
	Service Temperature Range	5~60℃				
	Maximum Service Frequency	60c.p.m				
	Maximum Load Mass	1kg		3kg		
	Effective Returning Force	32N Note		91N Note		
	Effective Holding Force	76N Note		175N Note		
	Lubrication	Not required				
Sliding Area	Guide Mechanism	Cross Linear Guide				
	Error Absorption Range	$\phi 1^{+0.9}_{-0.2}$	$\phi 2^{+0.9}_{-0.2}$	$\phi 1^{+0.9}_{-0.2}$	$\phi 2^{+0.9}_{-0.2}$	$\phi 3^{+0.9}_{-0.2}$
	Rated Static Load	2310N		6010N		
	Rated Static Moment	7.62N·m		33.8N·m		
	Rated Static Torque	7.62N·m		40.3N·m		

Note: Standard Type at the air pressure 0.5 MPa. ☞ Page 11, 12

THE TYPE OF LINEAR GUIDE

Model	Type
PXY12	Wide Type Rail Size 9
PXY20	Wide Type Rail Size 12

Pressure: Zero or there is slight space.
Radial space ☞ Page 17

Product Mass

Unit : g

Model	Main Body Mass	Mass added with Bracket
PXY12	130	25
PXY20	300	Without Bracket

Standard Type, Lock-off Type, Center Holding Type are same mass.

OPTIONAL PARTS CODES

Name

PARTS CODE

Note

Content

Repair part set

HP(PXY□)

Bore Size

For details
☞ Page 9

Bracket (PXY12 Only)

LB(PXY12)



With mounting bolts and positioning pins

End Cover Kit (PXY12)

EC(PXY12–1)	EC(PXY12–2)
For Error Absorption Range φ1 End Cover Color : Black	For Error Absorption Range φ2 End Cover Color : White
	

Use when changing the error absorption range.
☞ Page 13

Lock-off Kit

LF(PXY□)

Bore Size

For details
☞ Page 10

Common to Error Absorption Ranges φ1, φ2 and φ3.

Center Hold Spring

BL(PXY□)	BM(PXY□)	BH(PXY□)
Bore Size	Bore Size	Bore Size
		

Common to Error Absorption Ranges φ1, φ2 and φ3.

End Cover Kit (PXY20)

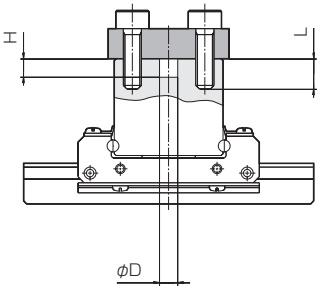
EC(PXY20–□)

Error Absorption Range

For details
☞ Page 13

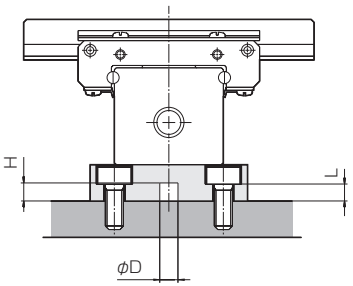
BODY INSTALLATION

Top Mounting (Body Tap)



Model	Bolt Size	Screw Depth L(mm)	Fastening Torque N·m	Pin Holes for Positioning ϕD×H(mm)
PXY12	M3×0.5	5	1.1	$\phi 3^{+0.05}_{0}$ depth 3
PXY20	M4×0.7	5	2.5	$\phi 4^{+0.05}_{0}$ depth 4

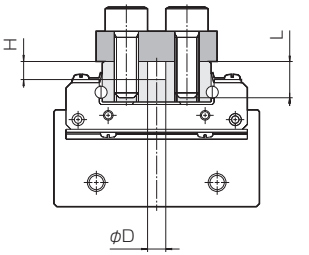
Mounting by Bracket (Through-hole)



Model	Bolt Size	Through-hole Length L(mm)	Fastening Torque N·m	Pin Holes for Positioning ϕD×H(mm)
PXY12	M3×0.5	2.8	1.1	$\phi 3^{+0.05}_{0}$ depth 3
PXY20	None (Without bracket)			

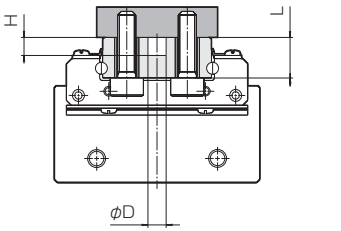
MOUNTING ON TABLE

Top Mounting



Model	Bolt Size	Screw Depth L(mm)	Fastening Torque N·m	Pin Holes for Positioning ϕD×H(mm)
PXY12	M4×0.7	6.7	2.5	$\phi 3^{+0.05}_{0}$ depth 3
PXY20	M5×0.8	8	5.1	$\phi 4^{+0.05}_{0}$ depth 4

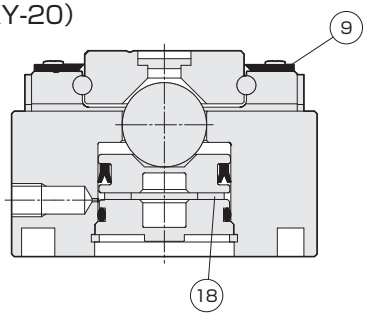
Bottom Mounting



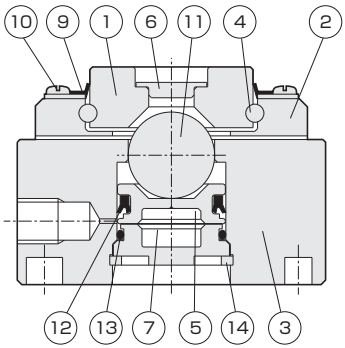
Model	Bolt Size	Through-hole Length L(mm)	Fastening Torque N·m	Pin Holes for Positioning ϕD×H(mm)
PXY12	M3×0.5	6.7	1.1	$\phi 3^{+0.05}_{0}$ depth 3
PXY20	M4×0.7	8	2.5	$\phi 4^{+0.05}_{0}$ depth 4

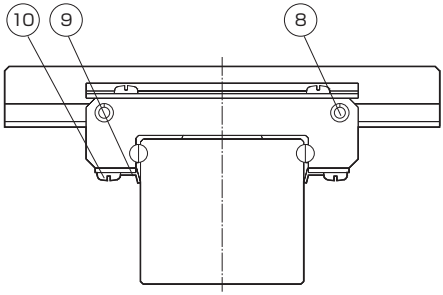
STRUCTURE AND PRINCIPAL COMPONENTS

(PXY-20)



(PXY-12)





PRINCIPAL COMPONENTS

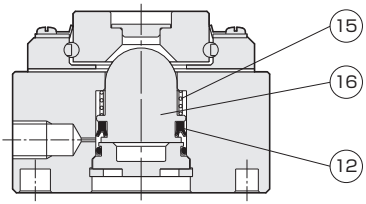
No.	Name	Material	Remarks	No.	Name	Material	Remarks
1	Table	Stainless Steel (Heat Treatment)		7	End Cover	Aluminum Alloy	Anodized Finish
2	Intermediate Slider	Stainless Steel (Heat Treatment)		8	Spring Pin	Stainless Steel	PXY12 Only
3	Body	Stainless Steel (Heat Treatment)		9	Side Seals	Stainless Steel+NBR (PXY12)	POM (PXY20)
4	Ball	Stainless Steel (Heat Treatment)		10	Screw	Stainless Steel	
5	Piston	Steel (Heat Treatment)		18	Spacer	Stainless Steel	PXY20-ϕ1, ϕ2 Only
6	Front Cover	Synthetic Resin					

REPAIR PARTS

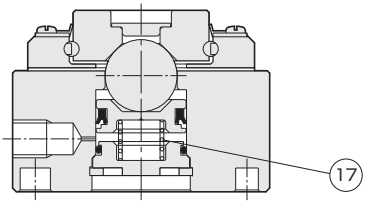
No.	Name	Material	Qty	Remarks	No.	Name	Material	Qty	Remarks
11	Steel Ball	Stainless Steel (Heat Treatment)	1		13	O-ring	NBR	1	
12	Piston Seal	NBR	1		14	Snap Ring	Steel	1	Nickel Plating

STRUCTURE AND PRINCIPAL COMPONENTS

■Lock-off Type



■Center Holding Type



Lock-off Kit

No.	Name	Material	Qty	Remarks	No.	Name	Material	Qty	Remarks
12	Piston Seal	NBR	1		16	Piston for Lock-off	Steel (Heat Treatment)	1	Hard Chromium Plated
15	Spring for Lock-off	Stainless Steel	1						

Spring for Center Holding

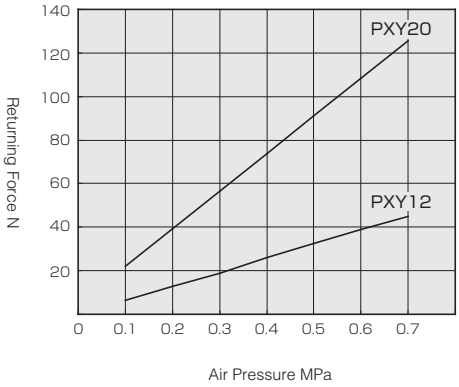
No.	Name	Material	Qty	Remarks
17	Spring	Stainless Steel	1	

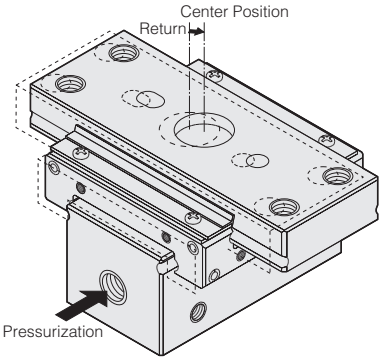
End Cover Kit

No.	Name	Material	Qty	Remarks	No.	Name	Material	Qty	Remarks
7	End Cover	Aluminum Alloy	1	Anodized Finish	14	Snap Ring	Steel	1	Nickel Plating
13	O-ring	NBR	1		18	Spacer	Stainless Steel	1	PXY ϕ1, ϕ2 Only

■Effective Returning Force (Standard Type, Lock-off Type)

Returning force is the force with which the table returns to the center position when pressurized in the state where the table is deviated from its center position.

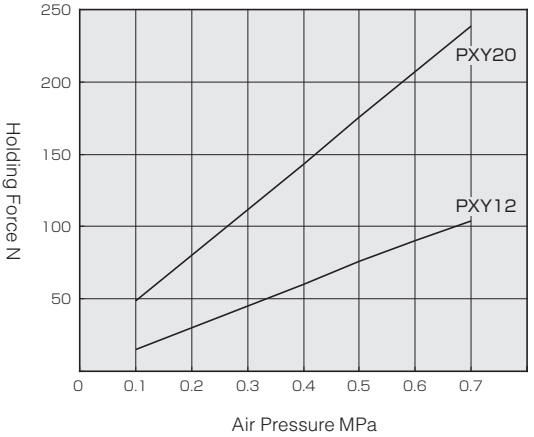




■Effective Holding Force

Holding force is the force with which the table is locked and held at its center position in the state where the table has returned to its center position and been locked by pressurization.

●Effective Holding Force when pressurized (Standard Type, Lock-off Type, Center Holding Type)



●Effective Holding Force by Spring Force Only (Center Hold Type)

For the effective holding force by the force of the built-in spring alone without pressurizing the air, refer to the table below. Note that the values are reference values. Be sure to allow for a margin.

PXY12

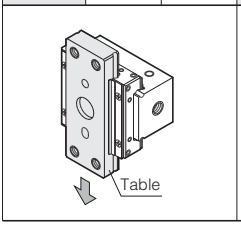
Option Code	Effective Holding Force (Reference Value)
BL	2～4N
BM	3.5～6.5N
BH	6.5～11N

PXY20

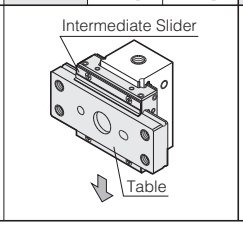
Option Code	Effective Holding Force (Reference Value)
BL	8～14N
BM	14～21N
BH	21～28N

When the PICO POSITIONER is used as it is laid on the side as shown in the figures below, consider the mass of the table, intermediate slider and body in addition to the mass of the mounted load with reference to the effective return force and effective holding force.

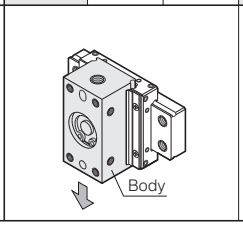
	PXY12	PXY20
Table	40g	90g



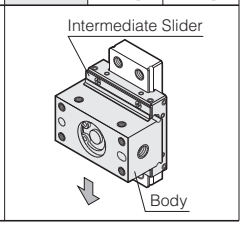
	PXY12	PXY20
Table	40g	90g
Intermediate Slider	25g	55g



	PXY12	PXY20
Body	65g	155g



	PXY12	PXY20
Body	65g	155g
Intermediate Slider	25g	55g



CHANGE OF FUNCTION

The following shows how to make changes to the standard type to add other functions.
Refer to this explanation also for making changes to types other than the standard type to add other functions.

■Change of Error Absorption Range

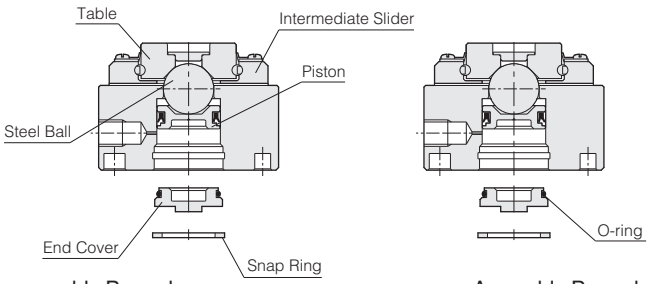
The error absorption range can be changed by replacing with the end cover kit separately offered. The end cover is common to the lock off, center hold and standard types.
(See Table on the Right) Details of Separately Offered Part ☞ Page 7, 10

Error Absorption Range and End Cover Color (PXY12)

Error Absorption Range	End Cover Color
φ1	Black
φ2	White

Error Absorption Range and Spacer Thickness (PXY20)

Error Absorption Range	Spacer Thickness
φ1	1.0mm
φ2	0.5mm
φ3	None



Disassembly Procedure

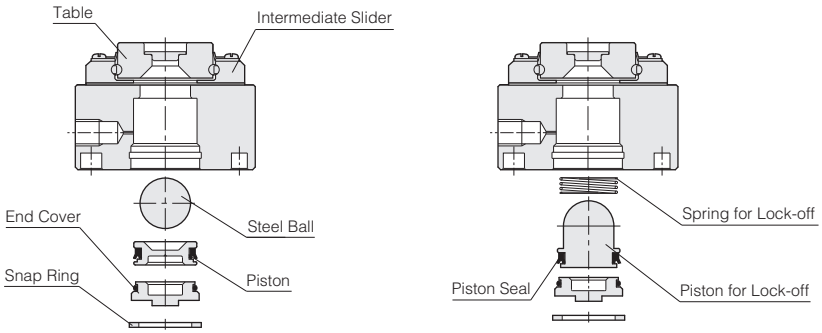
Step	1. Remove the retaining ring for hole. 2. Remove the end cover.
Note	When the end cover is removed, the piston and steel ball may easily fall off. Without the piston and the steel ball, the table and intermediate slider move freely and may fall off. Use caution when handling.

Assembly Procedure

Step	1. Mount the O-ring on the replacement end cover. 2. Mount the end cover and secure with the retaining ring for hole.
Note	Make sure that the retaining ring for hole is correctly mounted.

■Change to Lock Off Type

The standard type can be changed to the lock off type by replacing with the lock off kit separately offered.
Details of Separately Offered Part ☞ Page 7, 10



Disassembly Procedure

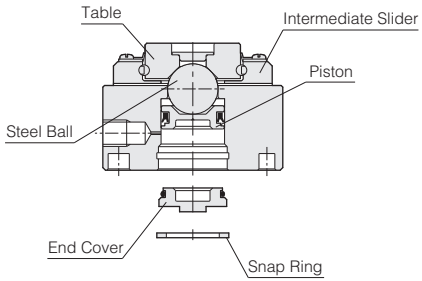
Step	1. Remove the retaining ring for hole. 2. Remove the end cover. 3. Remove the piston and the steel ball.
Note	When the end cover is removed, the piston and steel ball may easily fall off. Without the piston and the steel ball, the table and intermediate slider move freely and may fall off. Use caution when handling.

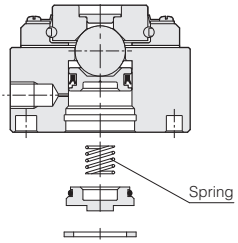
Assembly Procedure

Step	1. Mount the piston seal on the piston for lock off. 2. Assemble the spring for lock off and piston for lock off. 3. Mount the end cover and secure with the retaining ring for hole.
Note	When the end cover is removed, the piston and steel ball may easily fall off. Without the piston and the steel ball, the table and intermediate slider move freely and may fall off. Use caution when handling.

■Change to Center Hold Type

The standard type can be changed to the center hold type by integrating a spring separately offered. Replacing with another spring separately offered allows the center holding force to be changed.
Details of Separately Offered Part ☞ Page 7, 10





Disassembly Procedure

Step	1. Remove the retaining ring for hole. 2. Remove the end cover.
Note	When the end cover is removed, the piston and steel ball may easily fall off. Without the piston and the steel ball, the table and intermediate slider move freely and may fall off. Use caution when handling.

Assembly Procedure

Step	1. Mount the spring on the piston. 2. Mount the end cover and secure with the retaining ring for hole.
Note	Until the cover is secured with the retaining ring for hole, the end cover may be pushed away by the spring force. Use caution when handling.

For the design value of the spring used for the center hold type, refer to the table below.

For designing the spring, refer to the following JIS Standards.
JIS B 2702 Hot Formed Helical Springs
JIS B 2704 Helical Compression and Extension Springs -- Design Criteria
JIS B 2708 Cold Formed Helical Extension Springs

Model	Spring Outer Diameter (mm)	Spring Set Height (mm)	Set Load Value (N)	Stroke End Height (mm)
PXY12-BL	φ6	5.4	1.5	4.2
PXY12-BM	φ6	5.4	3	4.2
PXY12-BH	φ6	5.4	6	4.2
PXY20-BL	φ6	8.7	4.8	7.2
PXY20-BM	φ6	8.7	11.1	7.2
PXY20-BH	φ6	8.7	15	7.2

The value for the stroke end height given is for the error absorption range φ2 (PXY12) or φ3 (PXY20).

Item Descriptions and Precautions

Item	Item Descriptions	Note
Spring Outer Diameter	Any value larger than those in the table hinders mounting on the piston and end cover.	Ensure that the value is that shown in the table or smaller.
Spring Set Height	Spring length as it is set.	Ensure that the value is that shown in the table.
Set Load Value	Spring load value as it is set.	———
Stroke End Height	Spring length with the piston directly touches the end cover.	Ensure that the value is that shown in the table.

⚠ Warning

Failure of Power Supply and Abnormal Condition of Supply Pressure

If supply pressure goes up/ down abnormally due to failure or other troubles of power sources such as electricity or air pressure. returning and holding forces of Pico Positioner will also change accordingly and malfunction may occur. Take necessary measures against this situation not to hurt human or damage devices.

Range of Positioning Error Absorption

An error beyond this range will generate excessively large load or moment to cause failure of Pico Positioner or breakage of a workpiece.

Shock Absorption at Stopping

In the case Pico Positioner is moved straight or turned around by a robot or another actuator. and stopped suddenly. the lock may be unlatched or the linear guide may be broken due to excessively large inertia force. Shock absorption by cushioning, shock absorbers, etc. shall be considered on designing.

Resistance of Piping and Wiring

Smooth movement of Pico Positioner may be hindered by the resistance of piping or wiring. Consider the resistance against smooth operation in the design stage.

Removal of Pico Positioner

When the Pico Positioner is to be removed from a device for modification or maintenance, shut off the supply of compressed air and discharge the residual pressure.

At Operation

When actuator is in operation or power supply is not shut off. never put your fingers. hands. tools, etc. into the moving area of devices or Pico Positioner inadvertently to prevent injury or accident.

Setting of Covers

If water. oil, cutting fluid, dust. iron powder, spatter. etc. are deposited on the linear guides, damage, rust, etc. may occur to cause malfunction. Set covers on the linear guides to prevent such deposition.

Mounting and Adjustment

When mounting a workpiece on the guide table, support the workpiece with a wrench, etc. to prevent any load or impact applied to the table.

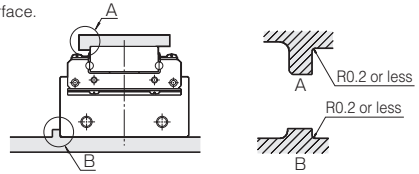
Rigidity of Mounting Base

If rigidity of mounting base or mounting method of Pico Positioner on the machinery is not adequate, it may be impossible for Pico Positioner to demonstrate its high-rigidity and high-accuracy.
On designing, due consideration shall be given to rigidity of machinery such as mounting base.

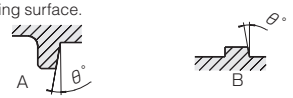
Mounting Surface Accuracy

① The table top side and the body bottom side of PICO POSITIONER are precision-ground. Ensure that the mating mounting surface of a machine, equipment, jig, etc. is a flat surface machined to high precision without unevenness or projections and mounting is correct in order to achieve stable, high-accuracy linear motion.
Low mounting surface accuracy or incorrect mounting may cause looseness, increase the rolling resistance or adversely affect the service life.
Mounting Datum Plane of Table and Body ☞ Page 17

② It is recommended to provide a recess in the corner of a mating mounting surface of the table and the body but a curve as shown in the figure below can be made for use.
A larger corner profile than the chamfer dimension of the body or table may cause inaccurate contact with the abutting surface.



③ Ensure that there is no squareness error between the table or body mounting surface and the abutting surface.
Inadequate squareness may cause inaccurate contact with the abutting surface.



④ When designing the abutting surface, pay attention to the height and thickness of the abutting surface.
Inadequate thickness may lead to poor accuracy due to insufficient rigidity against transverse load or positioning with a lateral pressing bolt.

Rolling Feel in Linear Guide

When the table is moved by hand without pressurizing the air, rolling of balls inside the linear guide may cause slight feel of operation discontinuity or difference in the rolling resistance between products. This is due to radial clearance of the linear guide and does not affect the performance.

PICO POSITONER Movement

When moving the PICO POSITIONER with another actuator, etc., pressurize the air to lock the table.
Pressurize the air and lock the table also for the center hold type.
If the table is not locked by the air, the inertial force of the mounted load may cause damage or injury to equipment or human body.

Positioning Pin Holes in Table and Body

Press-fitting a pin into a positioning pin hole may cause failure due to deformation of the rolling surface of the linear guide or excessive load applied during press-fitting. The pin hole is hardened by heat treatment and crack or damage may occur. Ensure that the fit allows for a clearance between the hole and the pin (clearance fit: tolerance class position g max.).

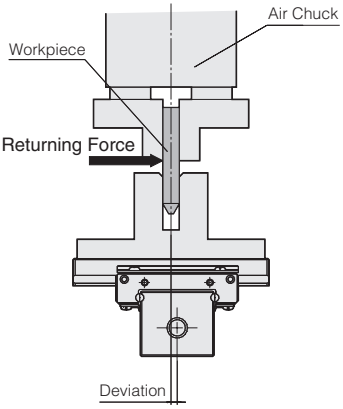
⚠ Caution

Moment by the Returning Force

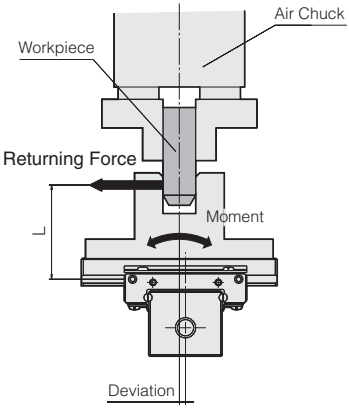
In the case the table returns from the slid position after insertion of a workpiece to the center position as shown in the figure below. if the actuator is pressurized before the release of the workpiece, the workpiece and/or the linear guide may be damaged by the returning force and a large moment generated by it.

Rated static moment ☞ Page 20

●Possibility of Damage of a Workpiece



●Generation of a Large Moment



Greasing

Bearing ball area is filled with grease before dispatch the actuator. During operation. depending on operating time, operating condition. environment and etc., grease deteriorate. And this cause the bearing to shorten its life because of wear of rolling area.

As this actuator has small amount of movement of table (slide amount), enough rolling of the ball of the linear guide cannot be obtained and loss of oil film may occur to generate local corrosion. ("fretting corrosion") Periodic regreasing is necessary to the ball rolling surfaces.

Greasing interval depends on the operating condition and environment. As a guide, perform greasing every one to three months in the ordinary operation.

For grease, please use lithium soap base one.

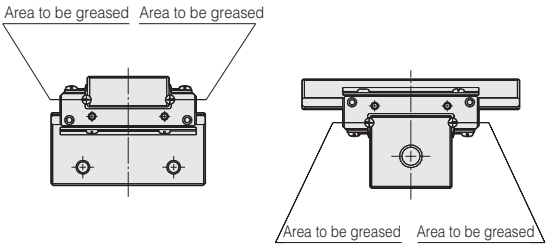
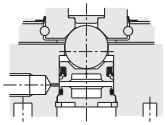


Table Slide Resistance (Standard Type)

When pressure is applied, the piston lifts up the steel ball and returns the table to the center position, where it is locked.

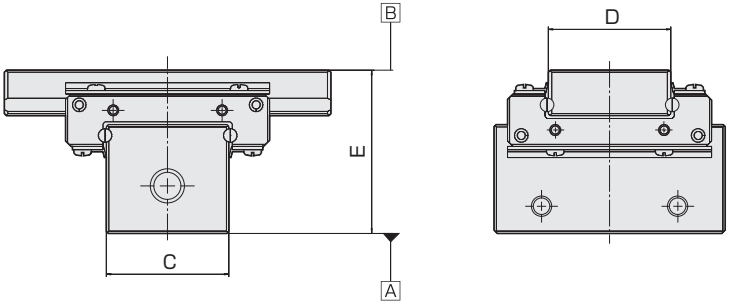
With the standard type, the piston and the steel ball stays at their positions even if the air is discharged.(Locking force is not generated.)

Accordingly, the force to move the piston and the steel ball to the end cover side required when the table is slid by external force after the air is discharged translates to the slide resistance. Use caution to prevent any damage to workpiece and jig. Use of the lock off type is recommended.



Accuracy

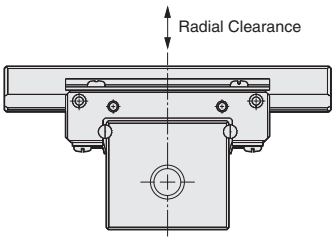
■Bearing Accuracy



Unit : mm

Model	PXY12	PXY20
Parallelism of plane B against plane A	0.01	0.01
Running Parallelism of plane B against plane A	0.01	0.01
Dimensional tolerance of C	0 −0.1	0 −0.1
Dimensional tolerance of D	0 −0.1	0 −0.1
Dimensional tolerance of E	±0.05	±0.08

■Radial Clearance



Unit : mm

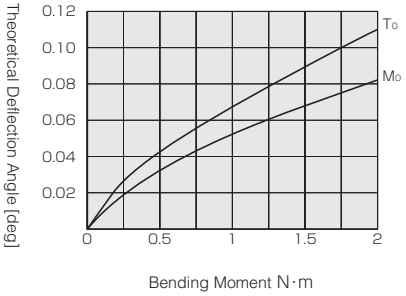
Model	PXY12・PXY20
Radial Clearance	0～+0.004

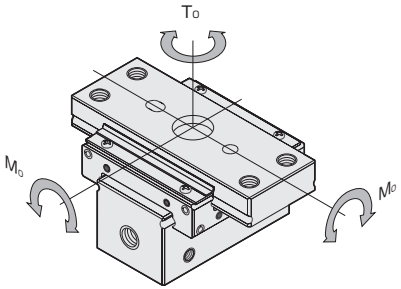
- Radial clearance is the numeric value of the movement of the center of the table when the guide table is moved up and down lightly by a constant force.
- Pico Positioner is not pre-loaded because it is so designed as to absorb positioning error by sliding lightly and smoothly.
- Radial clearance indicated is the value for one unit of the linear guide.As Pico Positioner adopts the cross linear guides, having a structure in which two units of linear guide are combined. So. radial clearance for one Pico Positioner is twice the indicated value.

THEORETICAL DISPLACEMENT OF TABLE BY BENDING MOMENT

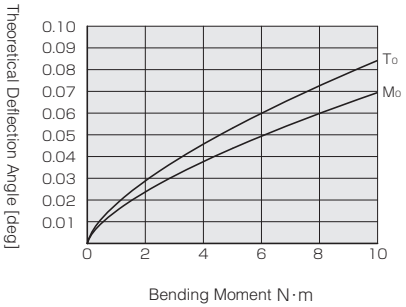
If an external force is applied to the table, the table inclines slightly because of elastic deformation of balls and races. Refer to the following graph of theoretical angular displacement of the guide table for each moment shown below.

PXY12





PXY20



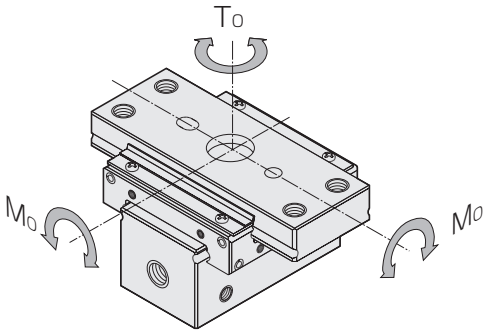
⚠ Caution

Use this unit after verifying that the applied load is within the allowable value.
Any service conditions exceeding the allowable values may affect operation, accuracy and life, and may even result in breakage.

Types of Load	Situation of Actuator	Situation of Load	Item to be confirmed
Mounted Load	Operating	Continuously Acting	Allowable Load Mass, Allowable Range of the Center of Gravity of Workpiece
External Force	Stopping	Temporarily Acting	Basic Rated Static Load, Rated Static Moment, Rated Static Torque

■Direction of Moment

Direction of moment can be classified into the following three.



■Allowable Load Mass and Allowable Range of the Center of Gravity of Workpiece

When Pico Positioner is operated with a load mounted, confirm that the following two items are respectively within the allowable values.

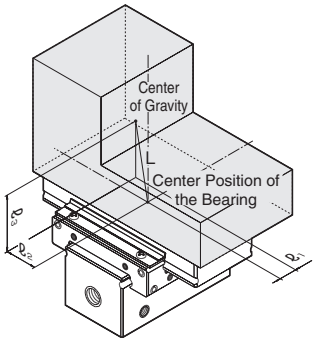
①Maximum Load Mass

PXY12	PXY20
1kg	3kg

②Allowable Range of the Center of Gravity of Workpiece 50mm

In the case the unit with a workpiece is moved straight or turned around by a robot or other actuator, too large moment may be generated by the inertia force of the workpiece. The distance L between the center position of the bearing and the center of gravity shall be within the restricted range.

$\sqrt{\ell_1^2+\ell_2^2+\ell_3^2}=L\leqq 50mm$



■Allowable Load Mass and Allowable Moment for External Force (under stopped state)

In the case that an external force is applied temporarily on the actuator under stopped state such as the stroke end, verify that each value in the following 2 items is within the allowable value.

①Magnitude of the External Force (Basic Rated Static Load)
②Moment of the External Force (Rated Static Moment and Rated Static torque)

Note: Calculate the moment by using the distance between the center position of guide and the position of external force as the length of arm of moment.

If an excessively large load or impact load is exerted on the table while it is standing still, permanent deformation is locally generated between the ball of the guide and the ball rolling surface. This permanent deformation will prevent the actuator from smooth operation when it develops more than the allowable limit.
The basic rated static load Co, the rated static moment Mo and the rated static torque To respectively mean such a static load, static moment and static torque of fixed direction and magnitude that the sum of the permanent deformation at the ball and the ball rolling surface is 0.0001 of times the ball diameter on the contact surface receiving the maximum stress.
The static force applied to the table shall be within the range to meet the following formulas.

$C_0 \geqq fs \cdot P$ C_0 : Basic Rated Static Load N
P : Static Load N
fs : Static Safety Factor

$M_0 \geqq fs \cdot M_1$ M_0 : Rated Static Moment N·m
M_1 : Static Moment N·m
fs : Static Safety Factor

$T_0 \geqq fs \cdot T_1$ T_0 : Rated Static Moment N·m
T_1 : Rated Static Moment N·m
fs : Static Safety Factor

Static Safety Factor fs

Load Condition	Lower limit of fs
Light Load without Impact	1.0～1.3
Heavy Load without Impact	2.0～3.0

Basic Rated Static Load, Rated Static Moment And Rated Static Torque

Model	Basic Rated Static Load C_0 N	Rated Static moment M_0 N·m	Rated Static Torque T_0 N·m
PXY12	2310	7.62	7.62
PXY20	6010	33.8	40.3

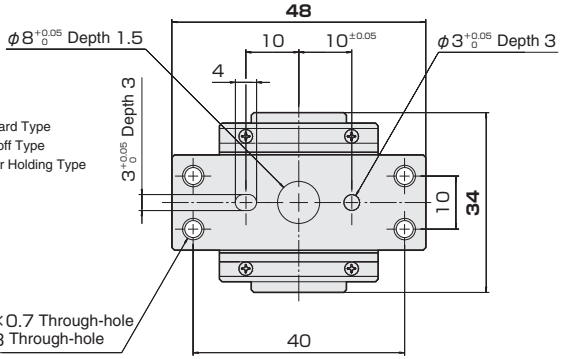
PXY−SD12−$\frac{1}{2}$−LF / BL / BM / BH

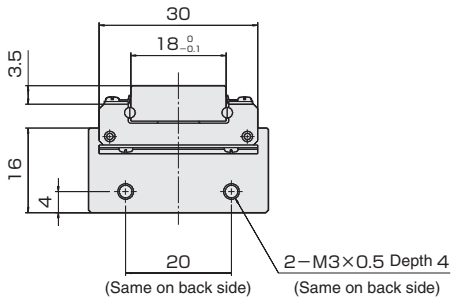
Basic

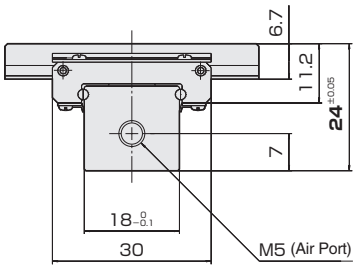
Bore Size

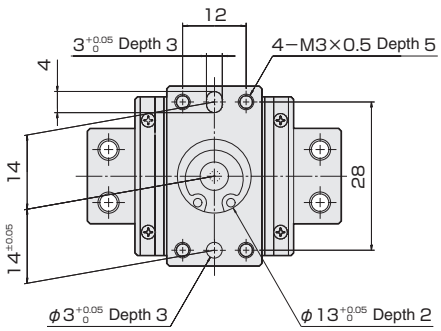
Error Absorption Range

Additional Function
No Code・・・・・・Standard Type
LF・・・・・・・・Lock-off Type
BL, BM, BH・・Center Holding Type









Note :
Figures show unit at the locked state on center position.

DIMENSIONS PXY12 WITH BRACKET

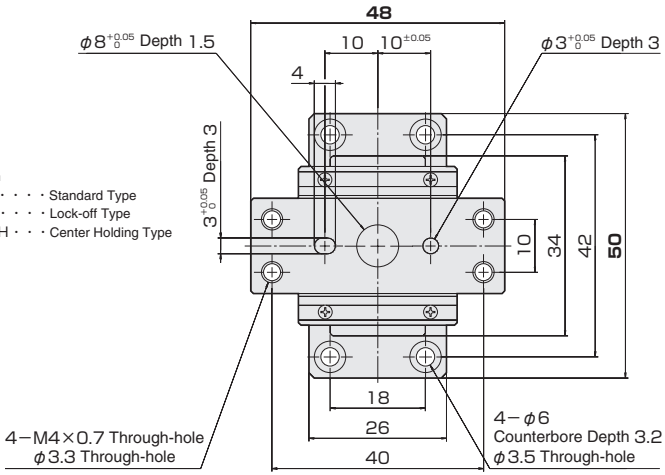
PXY−LB12−1/2−LF / BL / BM / BH

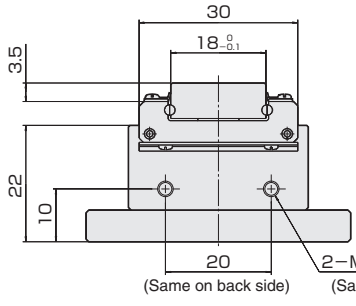
With Bracket

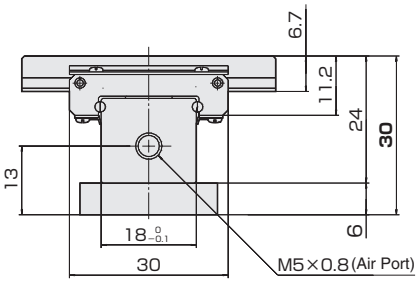
Bore Size

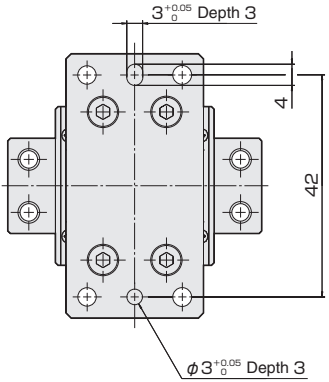
Error Absorption Range

Additional Function
No Code · · · · · · · Standard Type
LF · · · · · · · · · Lock-off Type
BL, BM, BH · · · Center Holding Type





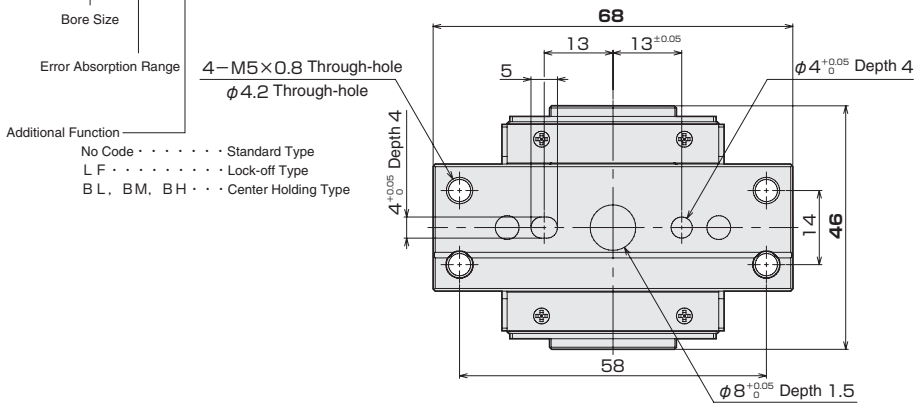


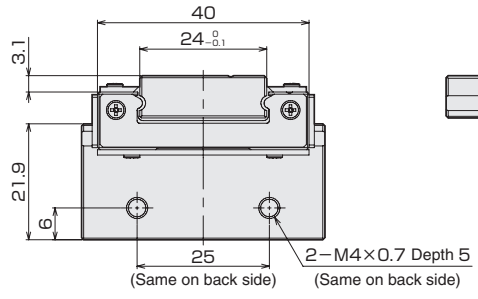


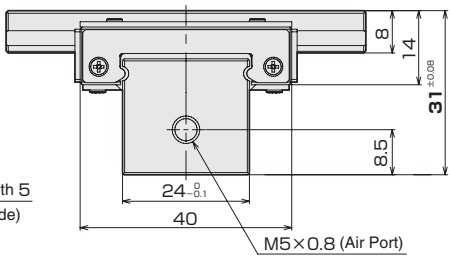
Note :
Figures show unit at the locked state on center position.

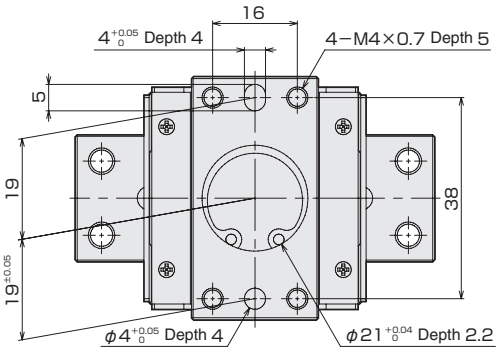
PXY−SD20−1 LF / 2 BL / 3 BM / BH

- Basic
- Bore Size
- Error Absorption Range
- Additional Function
  - No Code · · · · · · · Standard Type
  - LF · · · · · · · · · · Lock-off Type
  - BL, BM, BH · · · Center Holding Type









Note :
Figures show unit at the locked state on center position.