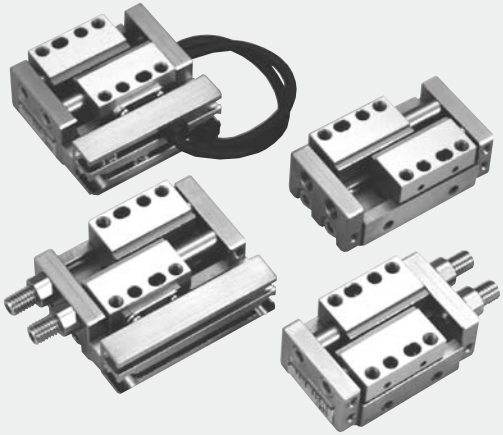
PICO SYNCHRO

PICO SYNCHRO®

PST Series



INDEX★

PICO SYNCHRO

PST Series(φ6)

A new idea, "Thin Type High Accurate Air Gripper" which is with Two Synchronously Moving Tables Arranged in Parallel.

Running Parallelism 0.005㎜ Mounting Parallelism 0.03㎜

Linear Guide

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

As tables or escapes·····Compactness, high-precision, high-rigidity and synchronized movement (table stroke: 5mm and 10 mm)
As air chucks·····Compactness, high-precision, high-rigidity and large open-close stroke (10mm and 20 mm)

Positioning Pin Hole

Pin holes for attaching/ detaching reproducibility are provided on top surface of the table and bottom surface of guide rail

Table for Work

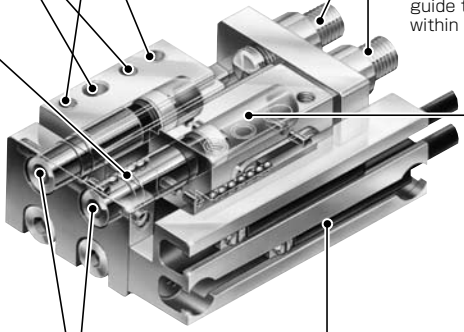
Work can be directly mounted on the table top and side surfaces.

Stroke Adjuster

Metal and rubber stoppers are available.
Stroke at the both ends of guide table is adjustable within one plane.

Linear Guide

High-precision. high-rigidity linear guide of limited Unear movement type

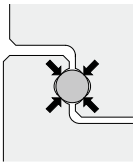


Corrosion Resistance

Stainless steel, with superior corrosion resistance is adopted for the linear guide

4-Points Contact

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



One-Side Concentrated Piping

Switch

8 types of switches can be mounted.

Countermeasure for Copper Parts

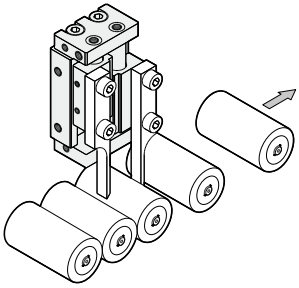
Copper parts are not used.

Summary of The PICO SYNCHRO

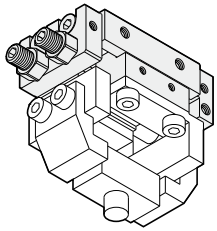
PICO SYNCHRO has been developed as a series of small high-accuracy air chucks capable of realizing the high accuracy and high rigidity of linear guides by integrating air cylinders in two small linear guides provided in parallel and operating in synchronization.
This innovative product solves problems with conventional air chucks such as "insufficient rigidity," "long overall length and longitudinal dimension," "short opening/closing stroke" and "non-adjustability of the opening/closing stroke."
It has excellent features including high accuracy and high rigidity, compact and thin unit and large opening/closing stroke. For stroke adjustment, two means have been made optionally available: metal stopper and rubber stopper.
The ports are concentrated on one side, providing a neat appearance.
The structure with linear guide tables provided in parallel operating in synchronization allows the product to be used for a wide variety of applications such as escape and transport table.

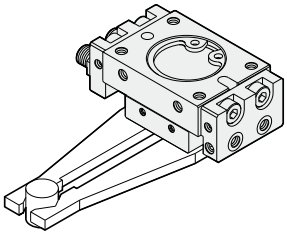
■Application Examples : PICO SYNCHRO

As an Escapement

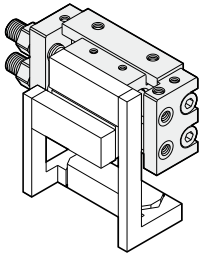


Chucking of Small Parts





Chucking of Electronic component

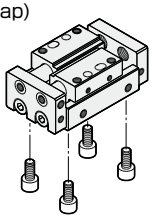


Chucking in a narrow place

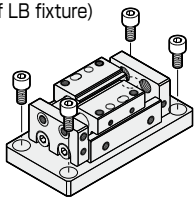
■MAIN BODY INSTALLATION

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

Top Mounting
(Body Tap)



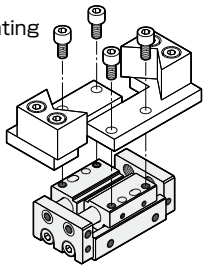
Top Mounting
(by Means of LB fixture)



■MOUNTING

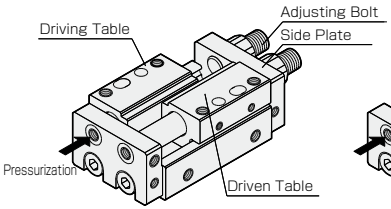
(Bolt as shown in the figure are not supplied with products)

Top Mounting

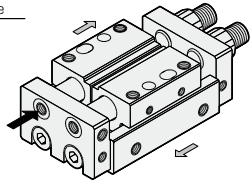


OPERATING PRINCIPLE

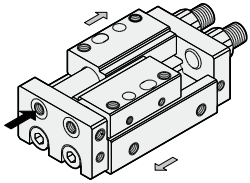
When a pressure is applied to the port of Pica Synchro, table of the pressurized side (driving table) starts move. At the same time, the other table which is not pressurized (driven table) moves in the direction opposite to driving table. When the driving table stops, driven table also stops.



Pressurization from the Port

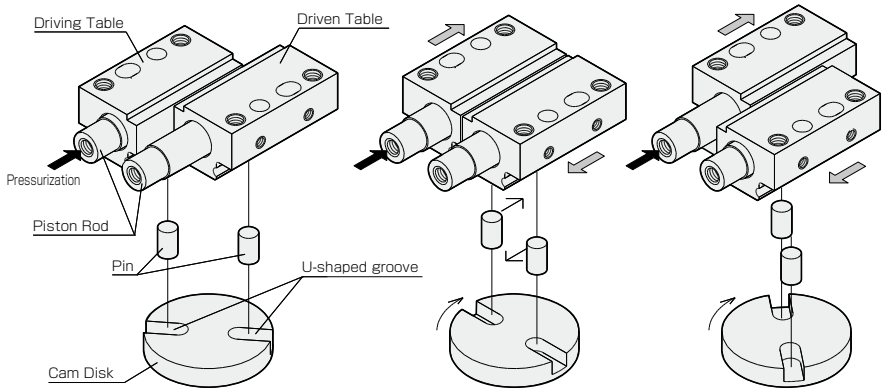


When the driving table starts to move, the driven table moves in the opposite direction.



When the driving table stops at the stroke end, the driven table stops as well.

When the driving table moves. a pin pushes U-shaped groove on the cam disk to rotate the cam disk, making the driven table move in the opposite direction synchronously.



Movement of both tables are synchronized by pins and a cam disk.

When the port at one side is pressurized. the driving table starts to move, making the pin move at thesame time. The pin makes the cam disk rotate to move the driven pin in the opposite direction. This, in turn, makes driven table move.

When the driving table is stopped by the side plate (or adjusting bolt), the driven table stops, too.

STOPPING ACCURACY OF DRIVEN TABLE

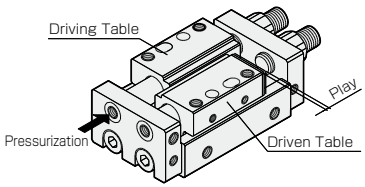
Pico Synchro is so constructed that the movement of both tables are synchronized by the pins and the cam disk. When this device is used in the manner where the pressurized (driving) tabte is stopped by being pressed against the side plate or adjusting bolt, the driven table is also stopped. As clearance is provided at pins, pin holes of tables and U-shaped grooves on the cam disk. there exists a slight play in the stroke direction. This play is approximately ±0.3mm.

●When used as a table or an escape

In designing a system, care should be taken to the play shown above.

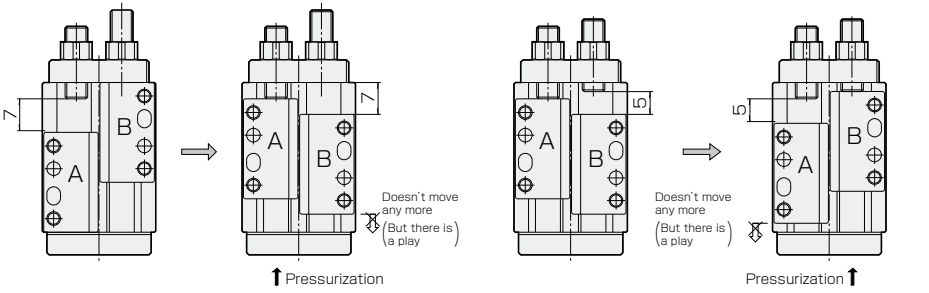
●When used as an air chuck

If a work is held by pressing it, the tables are stopped by the contact with the work without generating any play. In such cases as to hook a work where the table is stopped by being pressed against the side plate or adjusting bolt, a play will be generated at the driven table.



STROKE ADJUSTMENT MECHANISM

As Pico Synchro has a structure in which two tables are synchronized, if the stroke of the table on one side is adjusted, the stroke of the other table is also determined.
For example, when the stroke of the table A is set to 7mm and the table A is stopped by the stopper, table B is also stopped after a movement of 7 mm and doesn't move any more. As the table B works as the driven table in this case, a slight play will be generated in the stroke direction.
When the stroke of the table B is set to 5mm. the stroke of table A also becomes 5mm. As the table A works as the driven table in this case, a short play will be generated in the stroke direction.
As to play of stroke ☞Page 784 (Stopping accuracy of driven table)



Stroke of the table A is set to 7mm.

Stroke of the table B also becomes 7 mm.

Sets stroke of the table B is set to 5mm.

Stroke of the table B also becomes 5 mm.

When stroke is adjusted. also consider the position of the table not adjusted.

Necessary amount of stroke differs among applications. See page 787.

ABOUT STROKE

Necessary amount of Meaning of stroke to Pico Synchro is differs among applications.

●When used as a table or an escape

The stroke indicated in the model number of product (5mm or 10mm) is the maximum travel of the table.

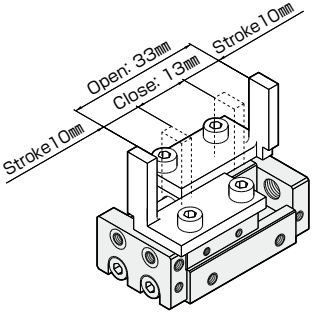
●When used as an air chuck

Double the stroke indicated in the model number of product (10mm or 20mm) is the open-close stroke to hold a work.

Application	Avalable Stroke	
	PST−SD6−5	PST−SD6−10
When used as a table or an escape	5	10
When used as an air chuck	10	20

Ex: When PST−SD6−10 is used as an air chuck.

When the maximum distance at opened claws is 33mm and the minimum distance at closed claws is 13 mm, then open-close stroke is 20mm.



Custom Made
Grease Converted Product
802 Page

PICO TABLE Standard Type
PPT Series
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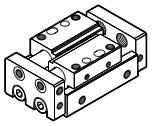
Model Code Example

PSTS-SD6-10-QR-RD-RB12LA

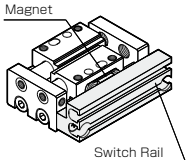
Series Name●

Magnet and Switch Rail●

No Code	None



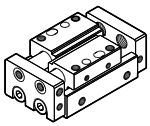
S	Magnet and Switch Rail



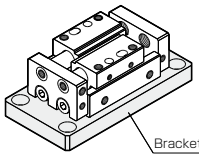
A magnet and switch rail is required when mounting switches.

Mounting●

SD	Basic



LB	With Bracket



Stroke●

5	5(∗1)
10	10(∗2)

Use with stroke adjuster mechanism for intermediate stroke.
for an air chuck application.

∗1: Open-close stroke is 10mm

∗2: Open-close stroke is 20mm

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●Bore Size

6	φ6

●Switch

No Code	None		
RB1	Straight	DC12~24V 2 Wires Reed Switch	With Indicator Light
RC1	Angle		
RB2	Straight	DC12~24V 2 Wires Reed Switch	Without Indicator Light
RC2	Angle		
RB4	Straight	DC12~24V 2 Wires Solid State Switch	With Indicator Light
RC4	Angle		
RB5	Straight	DC5~24V 3 Wires Solid State Switch	With Indicator Light
RC5	Angle		

Direction of Cable Outlet

RB···· Straight Outlet Cable

RC···· Angle Outlet Cable

For details ☞Page 1066, 1067

●Cable Length

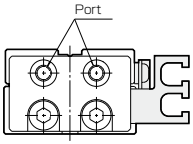
No Code	1m
LA	3m

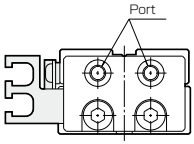
●Number of Switches

1	1
2	2

●Location of Magnet and Switch Rail

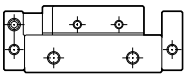
No Code	Right Side of the Port	RD	Left Side of the Port



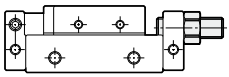


Stroke Adjustment Mechanism●

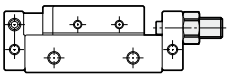
No Code	Without Stroke Adjustment	QR	Metal Stopper	QT	Rubber Stopper



Adjustment···5mm



Adjustment···5mm



SPECIFICATIONS

Bore Size		φ6㎜
Maximum Load Mass	Without Stroke Adjustment	0.1 kg
	With Rubber Stopper	0.1 kg
	With Shock Absorber	0.15kg
Port Size		M3×0.5
Guide Mechanism		Linear Guide
Type of Operation		Double Acting
Fluid		Air
Maximum Operating Pressure		0.7 MPa
Minimum Operating Pressure		0.3 MPa
Proof Pressure		1.05MPa
Operating Temperature		5～60℃
Maximum Operating Speed		120c.p.m
Lubrication		Not required

●Stroke and Adjustable Stroke Range

Pico Synchro is an actuator with two synchronously moving tables arranged in parallel.
On page 785. stroke and adjustable stroke mean the ones of each table.
Stroke and adjustable stroke. according to the application are as follows.

Application	PST−SD6−5	PST−SD6−10	Stroke Adjustment
Table, Escapement	5㎜	10㎜	5㎜
Air Chuck	10㎜	20㎜	Open Side 5㎜, Close Side 5㎜

THE TYPE OF LINEAR GUIDE

Model	Type
PST6	Rail Size 7

Pre-load:Zero or slightly pre-loaded

MASS

Unit: g

Model	Stroke	Basic Mass	Mass added for model with Magnet(PSTS)	Mass added for model with Stroke Adjuster		Mass added for model with Bracket(LB)
				Metal Stopper(QR)	Rubber Stopper(QT)	
PST6	5	70	8	5	5	27
	10	75	8	5	5	30

Mass of Switch

Unit: g

Type	Mass
RB1, RC1, RB2, RC2	15
RB4, RC4, RB5, RC5	
RB1LA, RC1LA, RB2LA, RC2LA	35
RB4LA, RC4LA, RB5LA, RC5LA	

METHOD TO CALCULATE THE MASS

Ex. PSTS−LB6−10−QT−RC52LA

Basic Mass ·····75g
Additional mass with magnet·····8g
Additional mass with bracket ·····30g
Additional mass with rubber stopper ··5g
Switch mass ·····35×2=70g

75+8+30+5+70=188g

Effective Thrust of Table (For air chuck application ☞Page 794)

Unit: N

Bore Size (㎜)	Table	Operating Pressure MPa				
		0.3	0.4	0.5	0.6	0.7
φ6	Drive Table	4.9	6.9	8.8	10.8	12.7
	Driven Table	2.1	2.7	3.4	4.1	4.8

OPTIONAL PARTS CODES

Name

PARTS CODE
Note
PARTS CODE
Note

Content

Switch Fixture

BF(PST)
Screw, Nut

Reed Switch(2 Wires, with Indicator Light)

Straight Outlet Cable	Angle Outlet Cable
RB1(PST) Cable Length:1m	RC1(PST) Cable Length:1m
RB1LA(PST) Cable Length:3m	RC1LA(PST) Cable Length:3m
 with fixture	 with fixture

Reed Switch(2 Wires, without Indicator Light)

Straight Outlet Cable	Angle Outlet Cable
RB2(PST) Cable Length:1m	RC2(PST) Cable Length:1m
RB2LA(PST) Cable Length:3m	RC2LA(PST) Cable Length:3m
 with fixture	 with fixture

Magnet

RK(PST)
Before mounting, apply anaerodic adhesive to the screws.

with mounting screws, spacer

Solid State Switch(2 Wires, with Indicator Light)

Straight Outlet Cable	Angle Outlet Cable
RB4(PST) Cable Length:1m	RC4(PST) Cable Length:1m
RB4LA(PST) Cable Length:3m	RC4LA(PST) Cable Length:3m
 with fixture	 with fixture

Solid State Switch(3 Wires, with Indicator Light)

Straight Outlet Cable	Angle Outlet Cable
RB5(PST) Cable Length:1m	RC5(PST) Cable Length:1m
RB5LA(PST) Cable Length:3m	RC5LA(PST) Cable Length:3m
 with fixture	 with fixture

Repair Parts Set

HP(PST6)

For details ☞ Page 789

Switch Rail

RJ(PST6−(Stroke))
Example: For 10 stroke
RJ(PST6-10)

with mounting screws

Adjuster Bolt with Lock Nut

Model	PARTS CODE
M5(M5×0.8)	NTA(M5)

Common use for Adjust Bolt, Adjust Bolt with Rubber

Adjuster Bolt with Lock Nut

Model	PARTS CODE
PST6− 5	AJ(M5−16)
PST6−10	

Adjuster Bolt with Rubber with Lock Nut

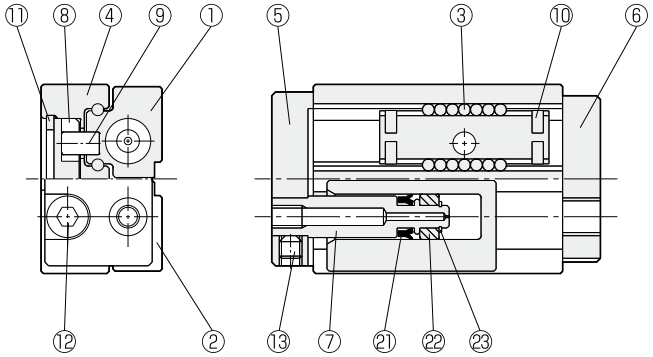
Model	PARTS CODE
PST6− 5	AR(M5−16)
PST6−10	

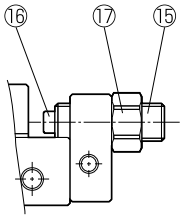
Bracket

LB(PST6−(Stroke))
Example: For 10 stroke
RJ(PST6-10)

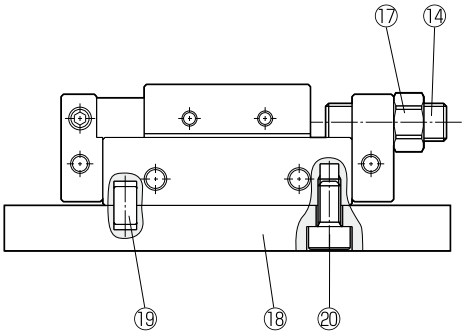
with mounting bolt

STRUCTURE AND PRINCIPAL COMPONENTS





With Rubber Stopper



With Metal Stopper, with Bracket

PRINCIPAL COMPONENTS

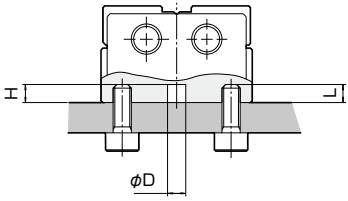
	Name	Material	Remarks		Name	Material	Remarks
1	Guide Table	Stainless Steel (Heat Treatment)		11	Circlip	Steel	Nickel Plating
2	Guide Table	Stainless Steel (Heat Treatment)		12	Hexagon Socket Bolt	Steel	Nickel Plating
3	Ball	Stainless Steel (Heat Treatment)		13	Hexagon Socket Locking Screw	Steel	Nickel Plating
4	Guide Rail	Stainless Steel (Heat Treatment)		14	Adjusting Bolt	Steel (Heat Treatment)	Nickel Plating
5	Side Plate	Aluminum Alloy	Electroless Nickel Plating	15	Adjusting Bolt with Rubber	Stainless Steel	
6	Side Plate	Steel	Electroless Nickel Plating	16	Cushion Rubber	Urethane Rubber	
7	Piston Rod	Aluminum Alloy	Electroless Nickel Plating	17	Lock Nut	Steel	Nickel Plating
8	Cam Disk	Stainless Steel (Heat Treatment)		18	Bracket	Aluminum Alloy	Electroless Nickel Plating
9	Pin	Steel (Heat Treatment)		19	Pin	Steel (Heat Treatment)	
10	Spring Pin	Steel		20	Hexagon Socket Bolt	Steel	Nickel Plating

REPAIR PARTS

	Name	Material	Qty	Remarks		Name	Material	Qty	Remarks
21	Piston Seal	NBR	2		23	Stopper Ring for Shaft	Steel	2	
22	Wear Ring	Synthetic Resin	2						

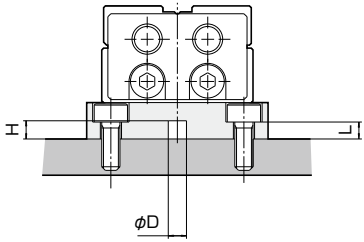
BODY INSTALLATION

Bottom Mounting(Body Tap)



Model	Bolt Size	Screw Depth L(mm)	Fastening Torque N·m	Pin Holes for Positioning ϕD×H(mm)
PST6	M3×0.5	3	1.1	$\phi 3^{+0.05}_{0}$ depth3

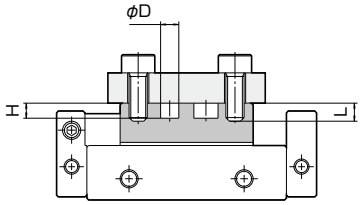
Mounting by Bracket (Thru Hole)



Model	Bolt Size	Thru Hole Length L(mm)	Fastening Torque N·m	Pin Holes for Positioning ϕD×H(mm)
PST6	M3×0.5	2.8	1.1	$\phi 3^{+0.05}_{0}$ depth3

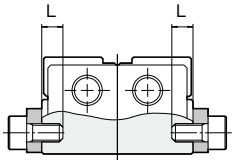
MOUNTING ON TABLE

Top Mounting



Model	Bolt Size	Screw Depth L(mm)	Fastening Torque N·m	Pin Holes for Positioning ϕD×H(mm)
PST6	M3×0.5	3	1.1	$\phi 3^{+0.05}_{0}$ depth2.5

Side Mounting

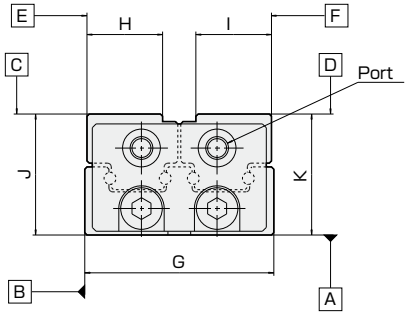


Model	Bolt Size	Screw Depth L(mm)	Fastening Torque N·m
PST6	M3×0.5	3	1.1

Note: The surface can not be used in case of with Magnet and Switch Rail.

Accuracy

■Bearing Accuracy



Unit:mm

Model		PST6
Parallelism	Plane C and D with respect to Plane A	0.03
	Plane E and F with respect to Plane B	0.03
Running Parallelism	Plane C and D with respect to Plane A	0.005
	Plane E and F with respect to Plane B	0.005
Level difference between surface C and D		0.02
Tolerance of Dimension G		0 −0.1
Tolerance of Dimension H		0 −0.1
Tolerance of Dimension I		0 −0.1
Tolerance of Dimension J		±0.05
Tolerance of Dimension K		±0.05

⚠ Warning

Breakdown in Power Supply and Abnormal Condition in Supply Pressure

If supply pressure goes up/ down abnormally by a breakdown of power supply such as electricity or air pressure, thrust power of actuator also changes corresponding to that and malfunction may occur. Take measures against this situation not to damage human or devices.

Thrust Power

By the structure of Pico Synchro. effective thrust is different between pressurized table (driving table) and not pressurized table (driven table). Take note this fact when this device is used as a table or an escape.
Effective thrust ☞ Page 787

Gripping Power

When the device is used as an air-chuck, allow enough margin of safety for effective holding power.
Effective holding power ☞ Page 794

Gripping Point

When the device is used as an air-chuck, in case limit range of holding point is exceeded, moment load acted on a guide table becomes larger, it may cause a breakdown.

Reliable Gripping

When the device is used as an air-chuck, hold a work at the place near the center of mass with stability. A work shall be hold at the middle of open-close stroke as possible.

Attachment

When the device is used as an air-chuck, if attachment to hold a work is long and large or heavy, an inertial force at open-close action and moment load generated at a guide table become larger, which may have a deleterious effect on performance.

Stroke

When the device is used as an air -chuck, design shall be made considering work dimension and variations in holding position. If there is little margin of safety, mal-holding or fall of a work may occur. If a switch is used, consider responding difference for the open-close stroke. Non-contact type switch with a short working range is recommended for a short stroke operation. Set a stroke to act as longer as possible. If a stroke isset shorter, guide table and sliding surface of cylinder lack enough lubrication, which may cause malfunction. If operating stroke can't be set enough longer, operate it regularly with a long stroke to maintain enough lubrication.

Speed Adjustment of Guide Table

When the device is used as an air -chuck, if impulsive force at holding a work is large, moment generated at guide table becomes larger to bring about breakdown or damage of work. Hold a work as softly as possible using a speed controller, etc. At test run, operate the device at low speed manually or make the supply pressure small verifying that impulse is not exerted on the guide table.

Removal of an Actuator

If an actuator is removed from the device in the case of modification or maintenance, check that it doesn't hold a work, cut off supply of compressed air and exhaust residual pressure.

At operation

When actuator is moving or power supply is not cut off, if the moving part of the device or the actuator is touched by fingers, hands or tools, it may cause injury or accident.

Setting of a Cover

Water, oil, cutting fluid, dust. iron powder, spatter, etc are deposited on sliding part or linear guide part of the guide table, damage or rust of bearing and packing, etc, may occur to cause leakage of air or mal-function. Set a cover on the part to prevent the deposition.

Mounting, Adjustment

When a part is mounted on the guide table, bear the part with a wrench, etc, to prevent applying load and impulse to the guide table. When Pico Synchro is used as an air-chuck, set up a clearance in order not to apply load and impulse to the guide table by the crash of work or attachment at finger open-close or stroke end of transfer.

Dimensional Restrictions on Joints and Speed Controllers

The distance from the table top side to the port is 4.5 mm. Accordingly, if the part mounted on the table top side may come above the joint or speed controller, provide a recess for avoiding contact. Use of the following joints eliminates the need for providing a recess.
Recommended one-touch joints
NITTA·····AC4–M3A–M
NIHON PISCO·····POC4–M3M

Rolling Feel in Linear Guide

When the table is moved by hand, 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 preload of the linear guide and does not affect the performance.

Positioning Pin Holes in Table and Rail

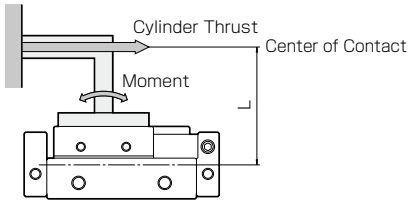
Press-fitting a pin into a positioning pin hole may cause failure due to deformation of the rolling surface of the linear guide or excessive load applied during press-fitting. The pin hole is hardened by heat treatment and crack or damage may occur. Ensure that the fit allows for a clearance between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

⚠ Caution

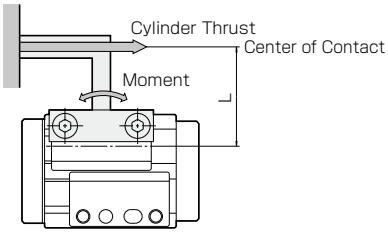
Moment due to Cylinder Thrust in case of Offset Contact

When a loaded work contacts the objective at the offset point from thebearing in the middle of stroke. a large moment will be generated due tothe thrust by the cylinder itself. Static rated moment ☞Page 797.

Pitching moment



Yawning Moment

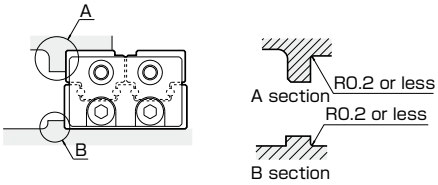


Accuracy of Mounting Surface

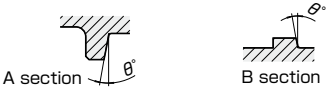
①The performance of the Pico Table will be seriously affected by the accuracy of the mating mounting surface and the datum mounting surface. Accordingly it is necessary to consider the machining accuracy of the mouning surface. (The recommended flatness shall be 0.05mm or less.)

②Datum plane of the guide rail and guide table. ☞Page 791

③If the corner of the surface to which the guide rail or guide table is to be installd has a larger roundness than the guide rail or guide table chanter dimensions, they may not come in proper contact with the mating surface. Design the dimensional contour as shown below.



④If the guide rail or guide table installation surface and its mating surface have improper squareness. proper contact can not be gotton. Care should be taken to the angle error of the squareness.



⑤When designing the mating surface. its height and thickness should be carefully determined. If it is too high, it may interfere with the guide table. If too low. on the contraty, proper mating cannot be provided due to the chanter of the guide rail or guide table. If the thickness is not enough, proper accuracy may not be obtained due to insufficient rigidity when lateral load is given or insufficient rigidity of the mating surface when positioning with a cross feed bolt.

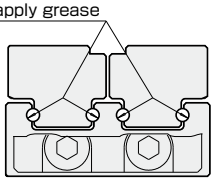
Rigidity of Mounting Base (fixed portion)

Since the accuracy of a machinery as a whole varies with the rigidity of the component parts even if the same actuator equipped, be sure to design a machinery in full consideration of the regidity of the component parts such as mounting base and table.

Oiling

Lubricant is enclosed in the linear guide in advance but the performance will be deteriorated by a long operating time, operating conditions, environment, etc. Using without lubrication may accelerate wear of the rolling part or cause earlier end of the service life. The timing of regreasing depends on the operating conditions and environment. As a rule, regrease at intervals of travel of 100 km or one month.
After wiping the old grease off, supply lithium soap-based grease to the bearing rolling surface of the guide rail.
Supplying a different type of grease may cause malfunction or failure due to lubrication performance degradation or chemical change. Turbine oil can be applied or drop-fed for use. Do not use spindle oil or machine oil because they adversely affect the packing.

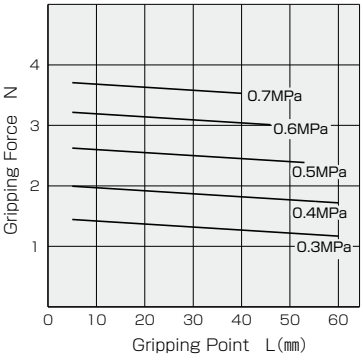
Area to apply grease



Magnetization of Table and Rail

Martensite stainless steel, as material of table and body, must be magnetized easily by contacting magnet and magnetic thing. Once that steel is magnetized, it keeps this state.
Note that there is a possibility that the switch might not work correctly by this magnetization.

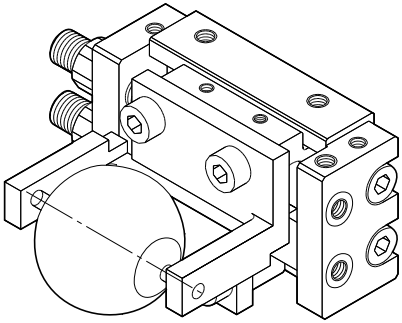
■Effective Gripping Force in Close Direction



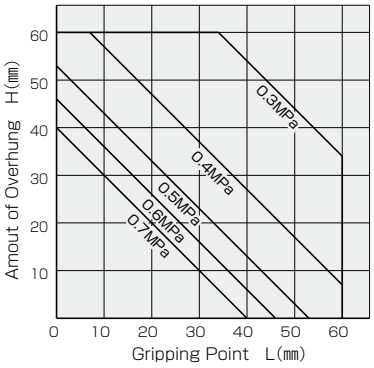
⚠ Caution

●Model Selection for Mass of Work

Mass of work to be hold shall be 5-10% of effective holding power depending on material, shape and surface condition of work and attachment. In the case large acceleration or impulse is exerted with high speed movement made by robot when work is hold, sufficient margin of safety shall be provided in gripping force.



■Range of Gripping Point

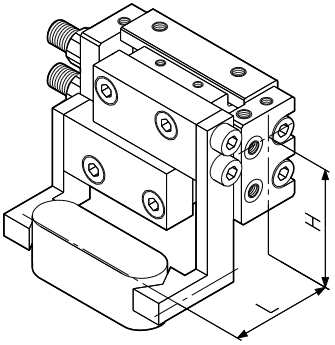


Distance of gripping point L and amount of overhang H is measured from center of guide. For dimension of guide position, see p.796.

⚠ Warning

●Attachment

Distance of gripping point L and amount of overhang H, which indicate work holding point of attachment shall be within the range shown in the diagram. If it exceeds the range, too large moment will be applied to guide section and may shorten life by backlash generated in guide section.
Even if it is within the limit, attachment shall be small and light as possible. If attachment is long and heavy, it has larger inertial force at open-close, which affects adversely guide section.



ALLOWABLE LOAD MASS, ALLOWABLE LOAD AND ALLOWABLE MOMENT

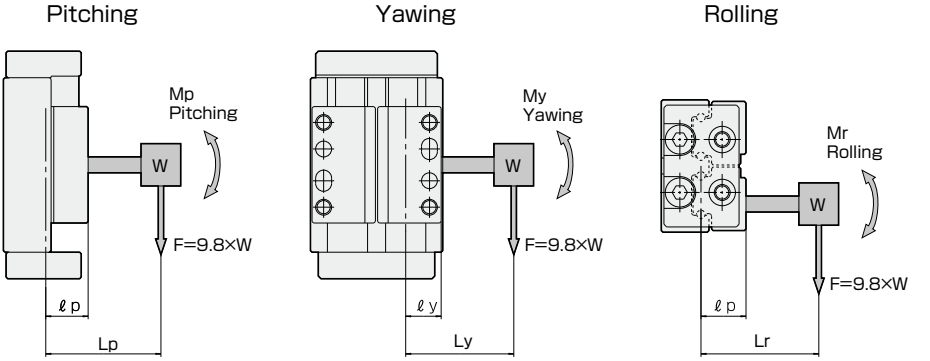
⚠Caution

Use this device 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 the breakage.

Type of Load	Situation of the Actuator	Situation of Load	Items to be confirmed
Loaded Work	Operating	Continuous Acting	Allowable Load Mass, Allowable Work Moment, Allowable Inertial Mass
External Force	Not operating	Temparary Acting	Basic Static Rated Load, Static Rated Moment

■Direction of Moment

The moment directions are classified into three types in accordance with the mounting condition of a load to the actuator.



Unit: m

Model	Distance between Guide Center Line and Table End Surface	
	ℓp	ℓy
PST6	0.0085	0.0067

W(kg): Mass of loaded work
F(N): Gravitation acting on a loaded work
Lp、Ly、Lr(m): Distance between guide center line and center of gravity of load
ℓp、ℓy(m): Distance between guide center line and table end surface

■Allowable Load Mass, Allowable Loaded Work Moment

When the actuator is operated with a load mounted, confirm that the following two values are respectivety within the allowable range.

①Allowable Load Mass

Unit: kg

Model	Standard Type	Metal Stopper(QR)	Rubber Stopper(QT)
Maximum Mass of Load	0.1	0.1	0.15

②Allowable Loaded Work Moment

The moment in each direction generated by the gravity acting on aloaded work is calculated by the formulas below. These calculated values shall not exceed the allowable loaded work moment.

(Loaded work moment)=(Gravity acting on a load: F)X(Distance between guide center line and center of gravity of a loaded work: L)
=9.8X(Load mass: W)X(Distance between guide center line and center of gravity of a loaded work:L)
(Gravity acting on a load: F)=9.8X(Load mass: W)

Pitching: Mp (N·m)=9.8 X W(kg) X Lp(m)
Yawing: My (N·m)=9.8 X W(kg) X Ly(m)
Rolling: Mr (N·m)=9.8 X W(kg) X Lr(m)

Allowable Loaded Work Moment Unit: N·m

Model	Allowable Moment of Load		
	Mp	My	Mr
PST6	0.29	0.29	0.54

■Allowable Load and Allowable Moment in case of an External force (When the actuator is stopped)

When an external force is applied temporarily with the actuator stopped at the stroke end and the like, confirm that the following two values are respectively within the allowable range.

①External Force Value (Basic Static Rated Load)
②External Force Moment (Static Rated Moment)

Note: The arm length of a monent shall be obtained as a length from the guide center and the point where an external force is applied.

When an excessive load or impact is applied with the table stopped. permanent deformation is locally generated between the ball and the ball rolling surface. This deformation will prevent the actuator from smooth operation when it develops more than the allowable limit. The basic static rated load C_0, the static rated moment Mp_0, My_0, and Mr_0 mean such a static load and static moment of constant direction and value that the sum of the permanent deformation values at the ball and ball rolling surface is 0.0001 of times the ball diameter on the contact surface receiving the maximum stress.

$C_0 \geqq fs \cdot P$

C_0 : Basic rated static load N
P : Static load N
fs : Static safety coefficient

$Mp_0 \geqq fs \cdot Mp_1$
$My_0 \geqq fs \cdot My_1$
$Mr_0 \geqq fs \cdot Mr_1$

Mp_0、My_0、Mr_0 : Rated static moment N·m
Mp_1、My_1、Mr_1 : Static morment N·m
fs : Static safely coefficiente

Static Safety Coefficient fs

Load Conditions	Lower Lmit of fs
In case with a Light Load and no Impact	1.0～1.3
In case with a Heavy Load and no Impact	2.0～3.0

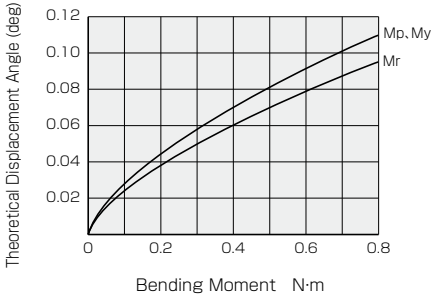
Basic Rated Static Load, Rated Static Moment

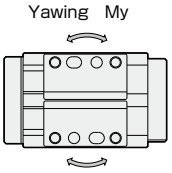
Model	Stroke(mm)	Basic Rated Static Load C_0 N	Rated Static Moment N·m		
			Mp_0	My_0	Mr_0
PST6	5	1040	2.02	2.02	3.79
	10				

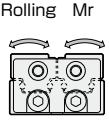
THEORETICAL DISPLACEMENT OF TABLE BY MOMENT

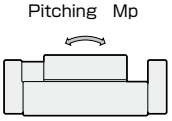
Bearings used for PST are preloaded, but the table incline under external moment because of elastic deformation of balls and races.

PST6—5, —10









DIMENSIONS(mm) PST6–5 BASIC

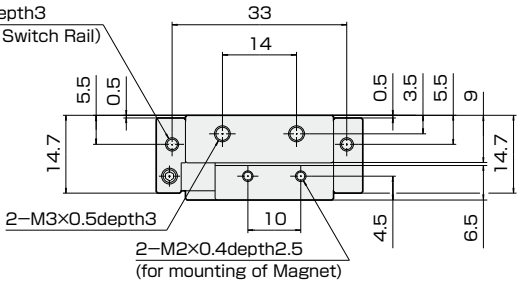
PSTS–SD6–5(–RD)

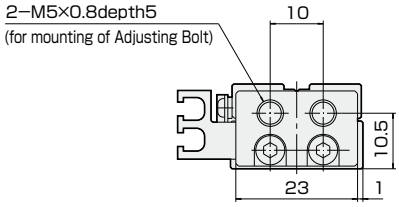
Bore Size

Stroke

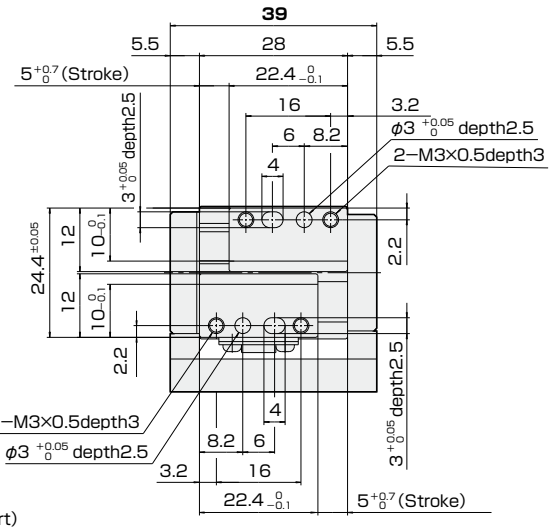
With Magnet and Switch Rail

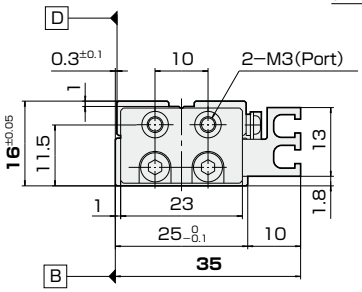
Option mark RD means mounting position of magnet and switch rail is on the opposite side of the center line of the figure.



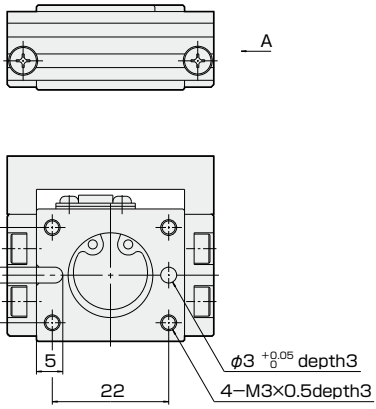


A Arrow view





B D – Datum Plane

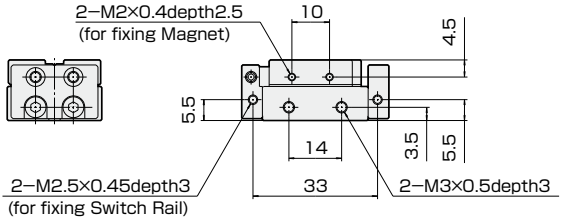


PICO SYNCHRO

PST

Without Magnet and Switch Rail

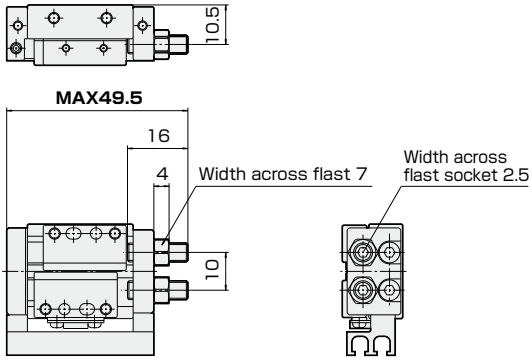
PST−SD6−5



With Metal Stopper, Rubber Stopper

PST(S)−SD6−5−$\frac{QR}{QT}$

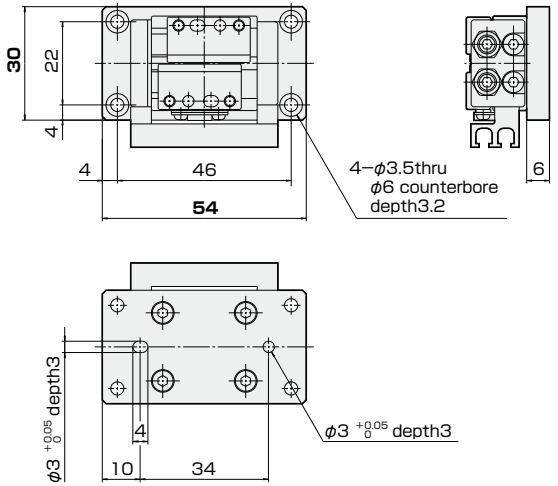
OR: Metal Stopper
QT: Rubber Stopper
Stroke Adjustment: 5mm



With Bracket

PST(S)−LB6−5

With Bracket



DIMENSIONS(mm) PST6−10 BASIC

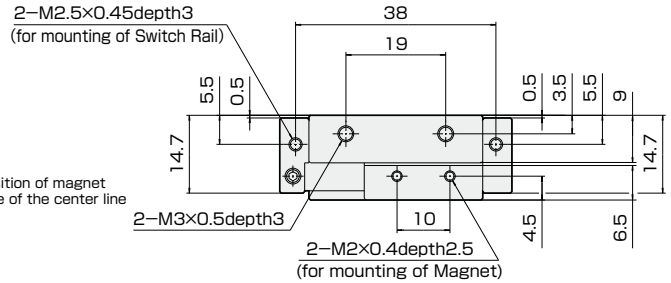
PSTS−SD6−10(−RD)

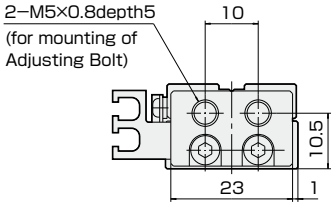
Bore Size

Stroke

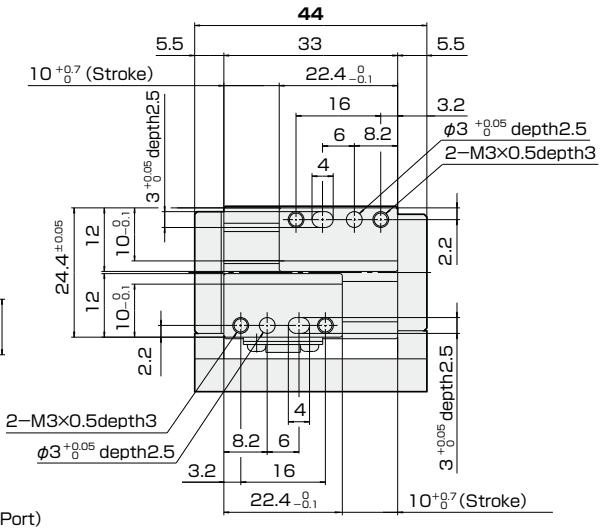
With Magnet and Switch Rail

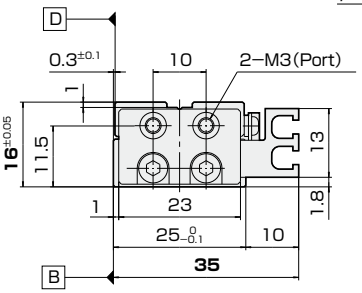
Option mark RD means mounting position of magnet and switch rail is on the opposite side of the center line of the figure.



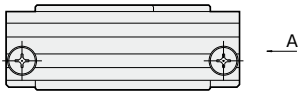


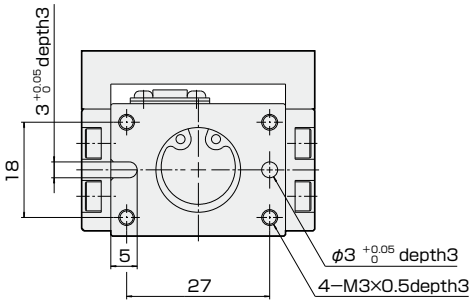
A Arrow view





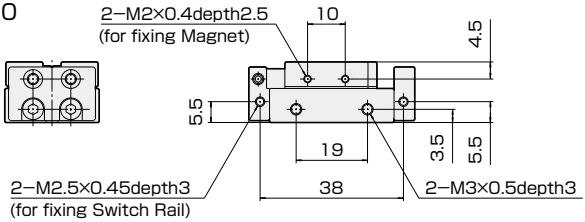
B D − Datum Plane





Without Magnet and Switch Rail

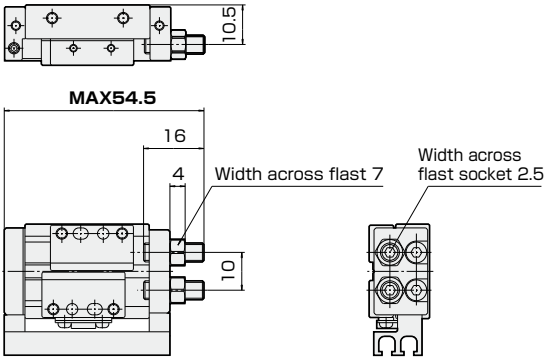
PST−SD6−10



With Metal Stopper, Rubber Stopper

PST(S)−SD6−10−QR / QT

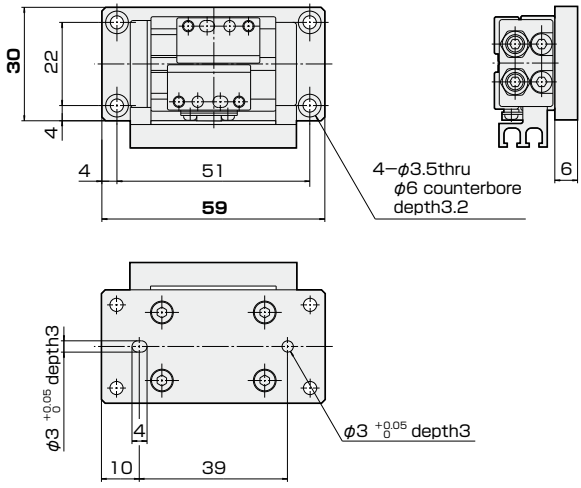
QR: Metal Stopper
QT: Rubber Stopper
Stroke Adjustment: 5mm



With Bracket

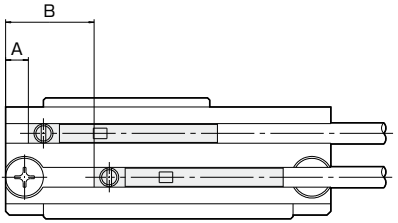
PST(S)−LB6−10

With Bracket



INSTALLATION OF SWITCH

■Switch Setting Position



RB(RC)1, 2 Switch

Unit: mm

Model	Switch Setting Position		On Hold Distance (ℓ)	Hysteresis (c)
	A	B		
PST6− 5	3	9	6	1 or less
PST6−10	3	14		

RB(RC)4, 5 Switch

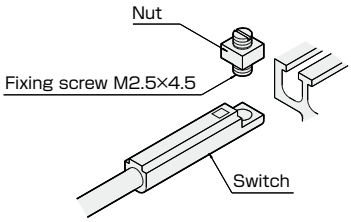
Unit: mm

Model	Switch Setting Position		On Hold Distance (ℓ)	Hysteresis (c)
	A	B		
PST6− 5	5	11	2.5	1 or less
PST6−10	5	16		

Explanation of hysteresis and on hold distance. ☞Switch Catalogue

■Installataion of Switch

Assemble the fixing screw with a nut to the switch.
Insert the switch into the groove.
After setting the position, fasten the screw by a screwdriver.
Fastening torgue of fixing screw must be 0.1 N·m.



CUSTOM MADE

■To change grease

- ●Change the grease of bearing part to the other grease.
- ●There is a case might not be handled depends on kind of grease or request.
- ●Cylinder part is lithium soap grease or fluorine grease.
- ●Grease of purchased item can not be exchanged.
- ●Please contact us if double packing is requied.

Please ask us for more detailed infomation.

MEMO

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