

PICO TABLE Clean Type

with Floating Mechanism
(with Buffer Mechanism)

PPTNF Series



P
P
T
N
F

PICO TABLE Clean Type with Floating

INDEX★

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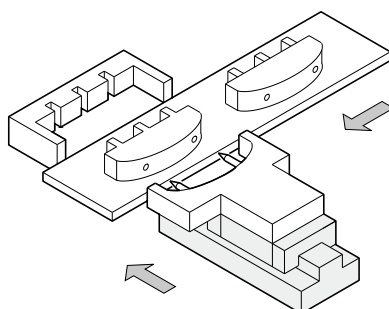
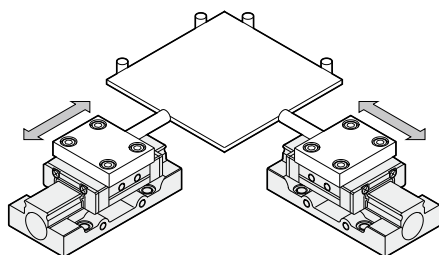
Summary of the PICO TABLE Clean Type with Floating(PPTNF)Series

"PICO TABLE"(PPT series) could achieve extraordinary small, high accuracy and rigidity which linear bearing guide has in kind. That is the reason why PICO TABLE is made by combination with air cylinder and precision linear bearing. The PPTNF series has been developed for clean room in PPTF series.

While operating, the tiny dust or particles can be exhausted through vacuum port on the PPTNF by evacuation. Because the vacuum port is designed between the slide part of piston and the linear bearing. And by that, particles generated at that part in PPTNF can be exhausted surely.

Application Examples : PICO TABLE Clean Type with Floating

Movement of Clamping Pin

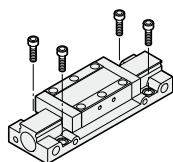


Feeding for Products

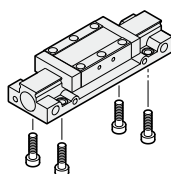
MAIN BODY INSTALLATION

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

Top Mounting
(Thru Hole used)



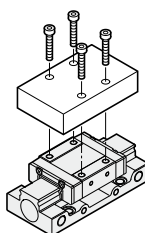
Bottom Mounting
(Body Tap)



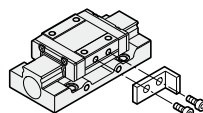
MOUNTING

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

Top Mounting



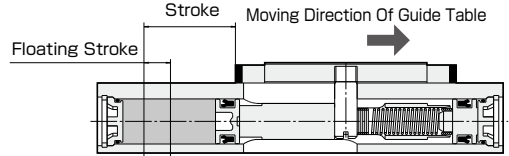
Side Mounting



MECHANISMS FOR FLOATING

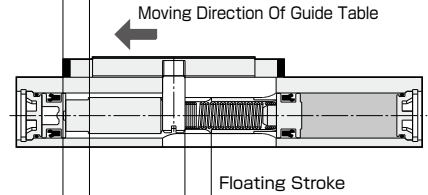
■Left cylinder room is pressurized

In this case, guide table is moved to the right end stroke by pressurized air.



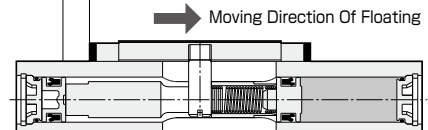
■At set; Right cylinder room is pressurized

When the right cylinder room in PPTNF is pressurized, guide table moves to left. At the left side end stroke, the position of guide table is hold by a spring, not pressurized air.



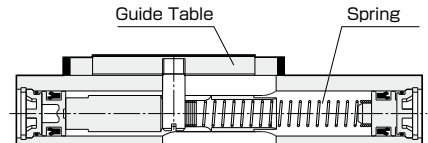
■At floating; floating effect

The right cylinder room is pressurized, but the guide table nevertheless can move to right for floating stroke according to external force.



■Both cylinder rooms are exhausted

In this case, the guide table might be around the left side by a spring. This mechanism for floating is different from one for spring return. Thus position of the guide table might not be the left end stroke.



Model Code Example

PPTNFS-SR10-10-TP-RB12LA

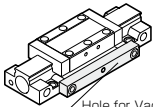
Series Name

Clean Type

With Floating

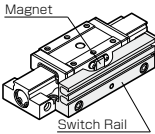
Magnet and Switch Rail

No Code None



Drawing: TA Type

S Magnet and Switch Rail



A magnet and switch rail is required when mounting switches.

Bore Size

10	φ10
12	φ12

Direction of Floating

SR	To Right
SL	To Left

For details Page287

Stroke

Model	Standard Stroke			
	10	15	20	25
PPTNF10	●	—	●	—
PPTNF12	—	●	—	●

Unit:mm

Cable Length

No Code	1 m
LA	3 m

Number of Switches

1	1
2	2

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

Piping

TP	Side Ported	PP	Base Mounted
	Vacuum Port Install the air fittings to the ports directly. 2-Piping Ports		Hole for Vacuum Attachment : Two O-ring By arranging the base, the air fittings can be mounted anywhere on it. The surface roughness of the base for O-ring should be Rz12.5 at the maximum. 2-O rings 2-Piping Ports Vacuum Port

Not available to shift the port position each other.

SPECIFICATIONS

Model	PPTNF10	PPTNF12
Bore Size	$\phi 10\text{mm}$	$\phi 12\text{mm}$
Maximum Load Mass	0.8kg	1.2kg
Piping Port for TP	M5×0.8	
Guide Mechanism	Precision Linear Ball Bearing	
Type of Operation	Double Acting	
Fluid	Air	
Maximum Operating Pressure	0.7 MPa	
Minimum Operating Pressure	0.15MPa	
Proof Pressure	1.05MPa	
Operating Temperature	5~60℃	
Minimum Operating Speed	30mm/s	
Maximum Operating Speed	60c.p.m.	
Lubrication	Prohibition	
Cushioning	None	

- Main Body and Load Bolt Mounting
🔗 Page 257
- Theoretical Deflection of Guide Table by Moment
🔗 Page 259
- Note for Safe Use
🔗 Page 260, 261
- Allowable Load and Moment
🔗 Page 262, 263

SPECIFICATIONS OF FLOATING

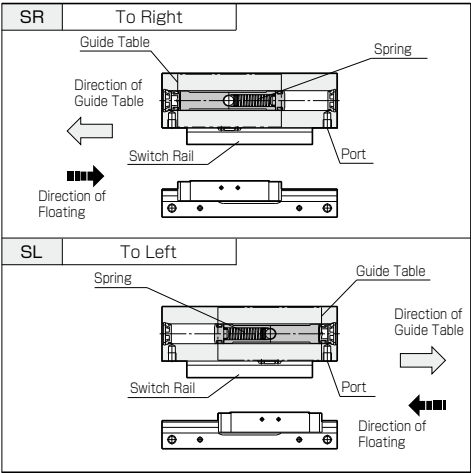
Unit: N

Model	Stroke (mm)	Theoretical Force of Spring		Stroke of Floating (mm)
		At Set	At Floating	
PPTNF10	10	3.8	4.6	3
	20	3.8	4.5	5
PPTNF12	15	4.4	5.5	
	25	4.4	5.1	

1N=0.102kgf

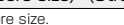
Note: "At set" is force of spring at the moment when floating stroke starts while pressurized.
"At floating" is force of spring when floating moves to the stroke end while pressurized.

DIRECTION OF FLOATING



Note: The direction of floating can not be changed.

PICO TABLE Clean Type with Floating

Switch Rail RJ(PPTN(Bore size)–(Stroke)) Fill in ☐ as bore size. Ex) In case PPTN10 20stroke TP Piping Switch Rail : RJ(PPTN10–20–TP) Note: For Only PPTN10,12  with fixing bolts	Magnet RK(PPT) Before mounting, apply anaerobic adhesive to the screws.  with fixing bolts	O-ring for Base Mounted HS(PPT) For all size CSϕ1, IDϕ10  10 O-rings
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Note : Is not included
spring for floating

Note : Available for
SB, SL, GR and GL

THE TYPE OF LINEAR BEARING

Model	Stroke	Type
PPTNF10	10	IKO LWL12
	20	IKO LWL12 long
PPTNF12	15	IKO LWL15
	25	IKO LWL15 long

Pre-load:Zero or slightly pre-loaded

MASS

●Mass of PPTNF

Unit: g

Model	Basic Mass	Additional Mass for Magnet and Switch Rail (PPTNFS)
PPTNF-10-10-TP	140	10
PPTNF-10-10-PP	135	15
PPTNF-10-20-TP	220	15
PPTNF-10-20-PP	210	25
PPTNF-12-15-TP	225	10
PPTNF-12-15-PP	215	20
PPTNF-12-25-TP	335	15
PPTNF-12-25-PP	320	30

Note:The same mass for SR and SL.

●MASS OF SWITCH

Unit: g

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

METHOD TO CALCULATE THE MASS

Ex.:PPTNFS-SR12-15-TP-RC42LA

Basic Mass..... 225g

Magnet, Switch Rail..... 10g

Switch..... 35×2=70g

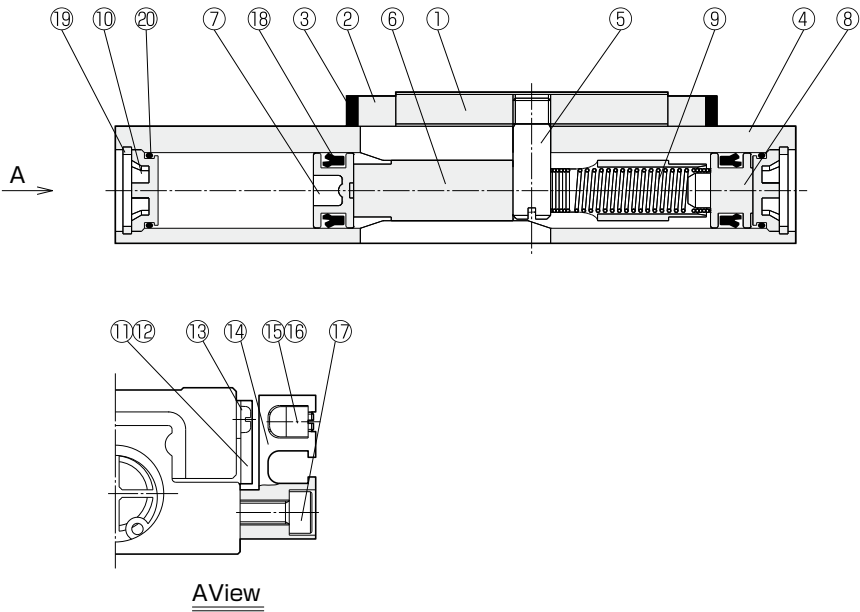
225+10+35×2=305g

THEORETICAL THRUST

Unit: N

Bore Size (mm)	Operating Pressure MPa					
	0.2	0.3	0.4	0.5	0.6	0.7
φ10	11	19	26	34	42	50
φ12	18	29	40	52	63	74

Spring Force at floating is excluded.



PRINCIPAL COMPONENTS

No.	Name	Material	Remarks	No.	Name	Material	Remarks
1	Guide Table	Stainless Steel	Heat Treatment	10	End Cover	Synthetic Resin	
2	Side Plate	Synthetic Resin		11	Shield	Carbon Steel	Nickel Plating
3	Dust Seal	Nbr, Stainless Steel		12	Magnet	Resin Magnet	Resin Magnet
4	Body	Stainless Steel	Heat Treatment	13	Screw	Stainless Steel	
5	Center Pin	Stainless Steel		14	Switch Rail	Aluminum Alloy	Anodic Oxide Coating
6	Center Piston	Synthetic Resin		15	Switch	Synthetic Resin	
7	Piston A	Synthetic Resin		16	Switch Fixture	Carbon Steel	Nickel Plating
8	Piston B	Synthetic Resin		17	Fixing Bolt	Carbon Steel	Nickel Plating
9	Spring	Stainless Steel					

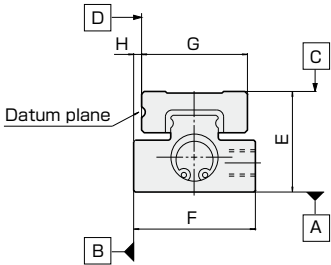
REPAIR PARTS

No.	Name	Material	Qty	Remarks	No.	Name	Material	Qty	Remarks
18	Piston Seal	NBR	2		20	O-ring	NBR	2	
19	Circlip	Carbon Steel	2	Nickel Plating					

ACCURACY

■ Linear Bearing Accuracy

SL, SR



Unit:mm

Model		PPTNF10, 12
Parallelism	Plane C with respect to plane A	0.02
	Plane D with respect to plane B	0.02
Running Parallelism	Plane C with respect to plane A	0.004
	Plane D with respect to plane B	0.004
Tolerance of Dimension E		±0.02
Tolerance of Dimension F		±0.2
Tolerance of Dimension G		±0.2
Tolerance of Dimension H		±0.025

PPTNF

PICO TABLE Clean Type with Floating

CAUTIONS IN DESIGN OR USE FOR FLOATING MECHANISM

Warning

Spring Force

Do not use floating mechanism for the purpose as single return or fall prevention of the actuator itself.

Actual Stroke

When floating, work is stopped at the position where only floating stroke moved backward from stroke of actuator.

Please pay attention when stroke is chosen.

Absorption of Collision Energy

The floating mechanism can not absorb the collision energy. For absorption of that energy, consider other mechanism such as air cushion or shock absorber.

Vertical Installment

If the actuator will be installed vertically, the direction of floating should not be downward. In this case the floating can not be effective.

Position of Guide Table when Air Pressure is Absent Inside the Actuator

When air pressure is exhausted, the guide table may locate to either stroke end by spring for floating inside the actuator. At the time, the spring extends freely. (for reference to mechanics for floating) Besides, the spring force becomes weaker than theoretical spring force as set at this condition.

Exchange of Spring

An original spring inside the actuator can be exchanged to another spring arranged by a customer.

Specification and Design for spring for floating
page 293.

Over extension or over compression may cause malfunction for floating.

SPRING FOR FLOATING

For designed value of spring for PPTNF, refer to the list below.

For designing the spring by yourself, refer to the below JIS.

JIS B 2702 Hot Formed Coil Spring
JIS B 2704 Design Criteria of Extension Coil Spring and Compression
JIS B 2707 Cold Formed Compression Coil Spring

Model	Floating Stroke (mm)	The Minimum Internal Diameter of Spring (mm)	The Maximum External Diameter of Spring (mm)	The Length of Spring as Set (mm)	The Length of Spring at Stroke End (mm)	The Length of Spring as Free (mm)
PPTNF10-10	3	4.8	5.9	9.4	6.4	22
PPTNF10-20	5	4.8	5.9	19.4	14.4	42
PPTNF12-15	5	5.7	6.9	14.4	9.4	32
PPTNF12-25	5	5.7	6.9	24.4	19.4	52

Explanation

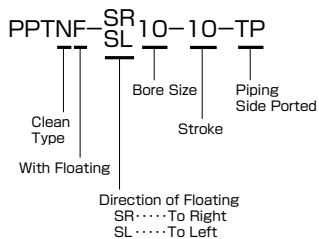
Item	Explanation	Caution
Floating Stroke	The value is set for every code.	Not arranged. Keep value in the list.
The Minimum Internal Diameter of Spring	Internal dimensions of spring.	Keep value or more in the list, otherwise, the spring can not be installed with the piston.
The Maximum External Diameter of Spring	External dimensions of spring.	Keep value or less in the list, otherwise, the spring can not be installed with the piston.
The Length of Spring as Set	The length of spring when the floating starts to work.	Not arranged. Keep value in the list.
The Length of Spring at Stroke End	The length of spring when the floating works at the end of its stroke.	Not arranged. Keep value in the list.
The Length of Spring as Free	The length of spring when it is free(not compressed).	Keep value or more in the list.
The Number of End Turn	The shape of spring at the end.	Wind the spring for two times or more at the either seat.

NOTE: Consider the resistance of bearing for calculating spring force

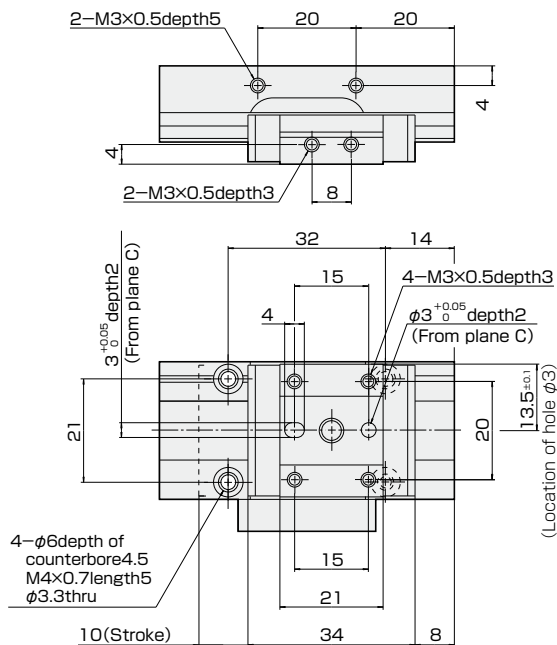
Exchange of Spring

Procedure	Comment
1. Remove the stopper ring 2. Remove the end cover 3. Remove the piston from body	The piston and end cover may be sent out by the compressed spring while disassembling.
4. Put the another spring into body 5. Put the piston into body 6. Put the end cover 7. Put the stopper ring to fix these parts	Check the direction of spring for assembling. Confirm that spring, piston and end cover are fixed surely.

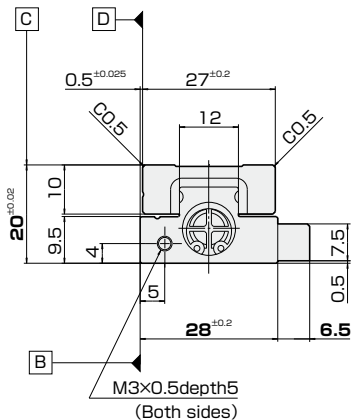
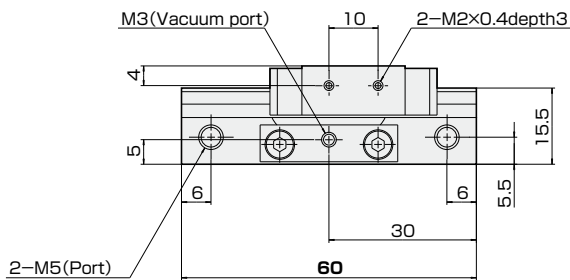
DIMENSIONS(mm) PPTNF-SR(SL)10-10-TP



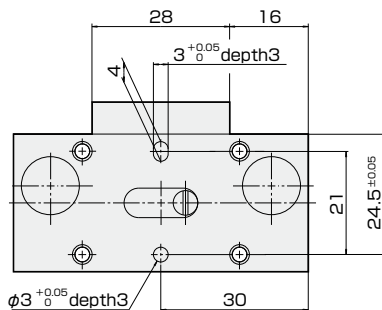
Position of Switch  Page 278



Direction of floating



B **D** - Datum plane

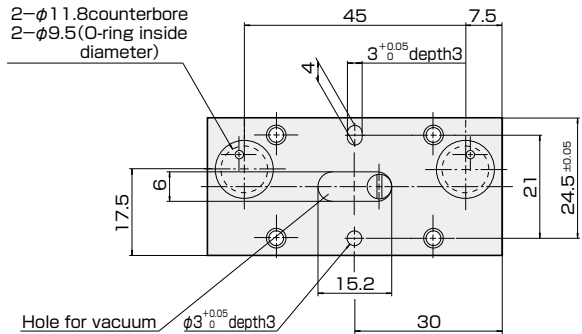
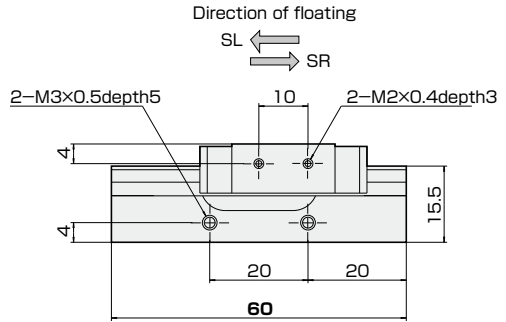
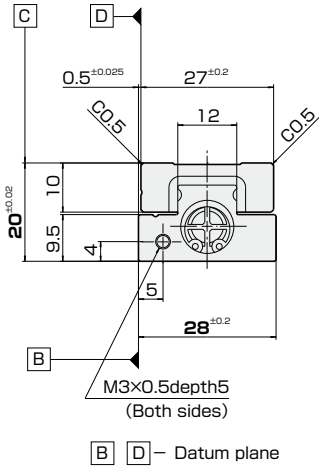
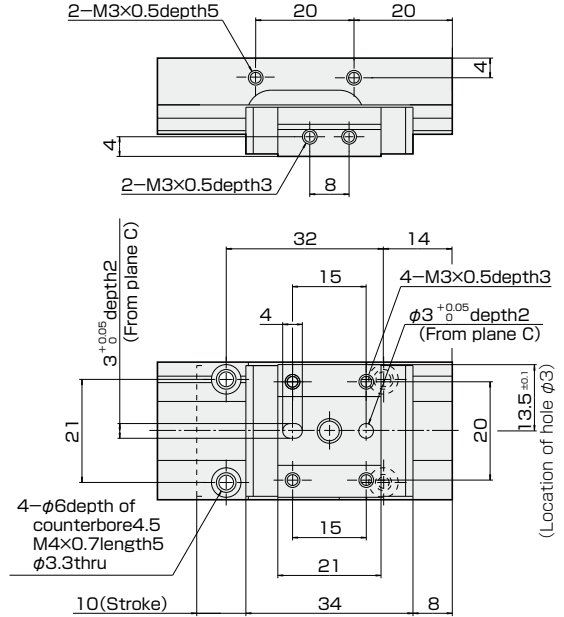


DIMENSIONS(mm) PPTNF-SR(SL)10-10-PP

PPTNF—SR—10—10—PP

Clean Type
With Floating
Bore Size
Stroke
Piping Side Ported

Direction of Floating
SR.....To Right
SL.....To Left

Position of Switch Page 278

DIMENSIONS(mm) PPTNF-SR(SL)10-20-TP

PPTNF-SR
SL 10-20-TP

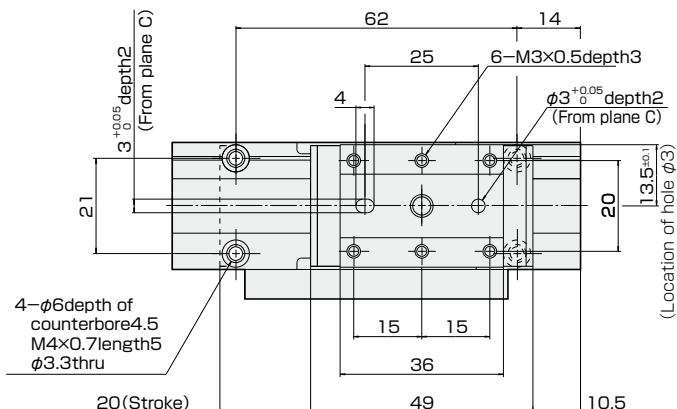
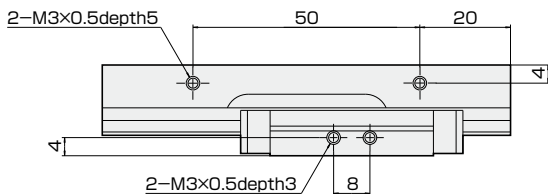
Clean Type
With Floating

Bore Size
Stroke

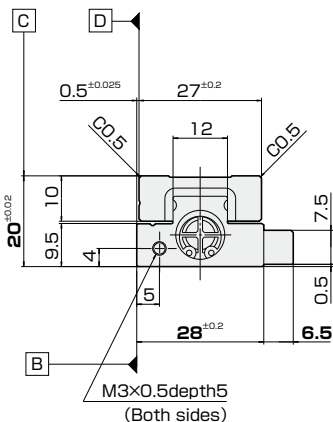
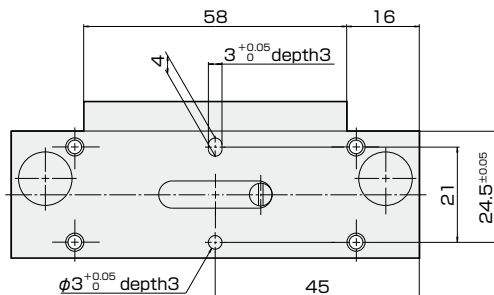
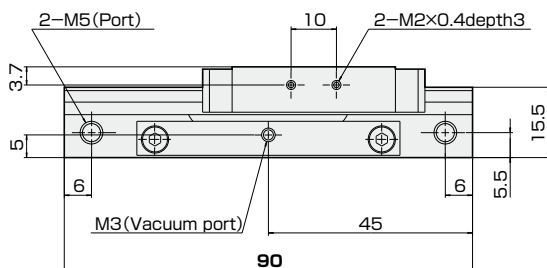
Piping Side Ported

Direction of Floating
SR.....To Right
SL.....To Left

Position of Switch  Page 278



Direction of floating



[B] [D] - Datum plane

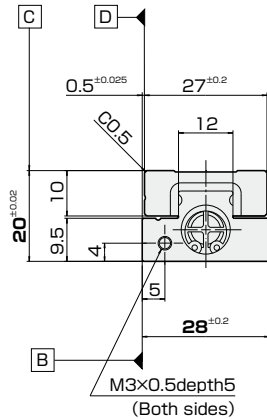
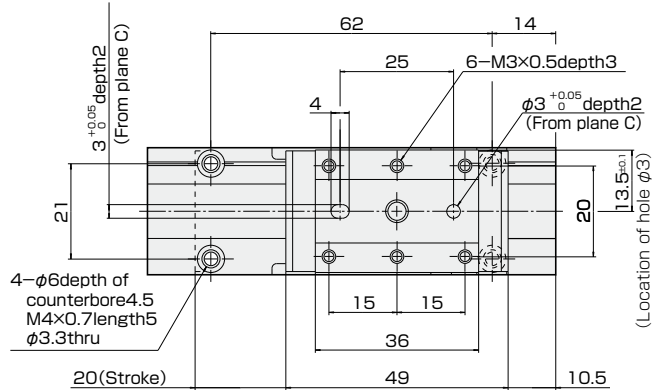
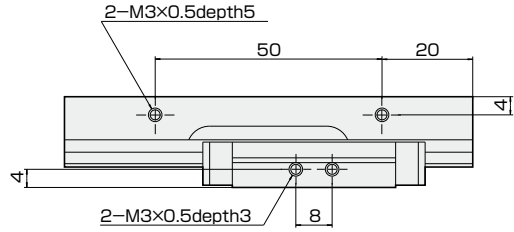
DIMENSIONS(mm) PPTNF-SR(SL) 10-20-PP

PPTNF-SR
SL 10-20-PP

Clean Type
Bore Size
Piping Side Ported
Stroke
Direction of Floating
SR.....To Right
SL.....To Left

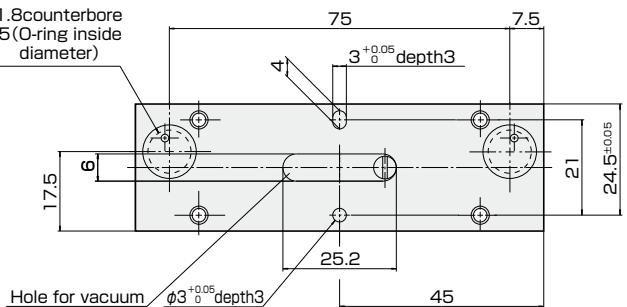
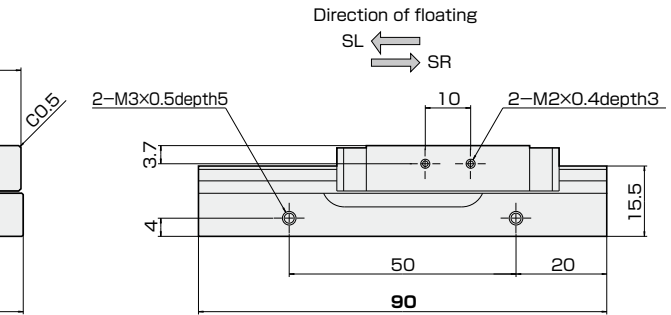
With Floating

Position of Switch  Page 278



[B] [D] - Datum plane

2-φ11.8counterbore
2-φ9.5(O-ring inside diameter)

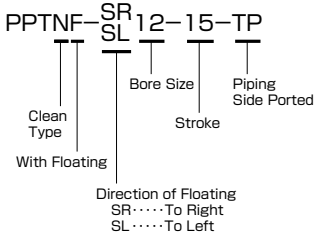


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P
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N
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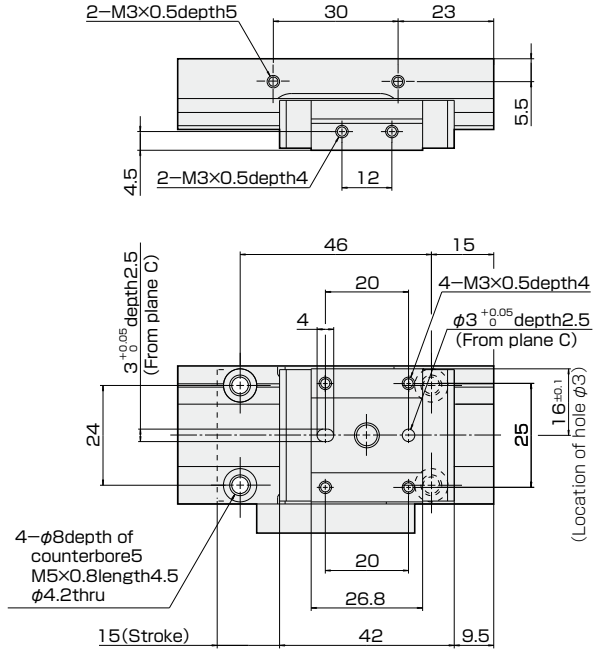
PICO TABLE Clean Type with Floating

PPTNF-SR(SL) 10-20-PP

DIMENSIONS(mm) PPTNF-SR(SL)12-15-TP

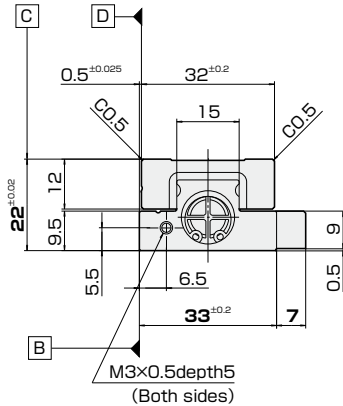
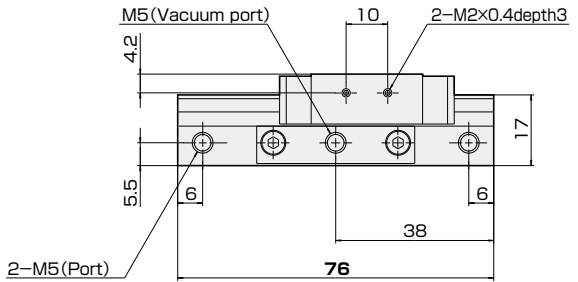


Position of Switch  Page 278

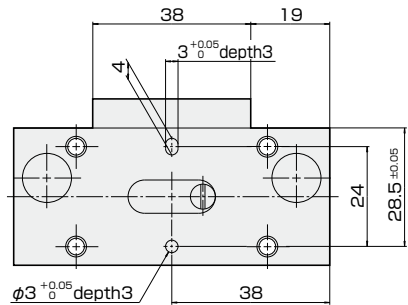


Direction of floating

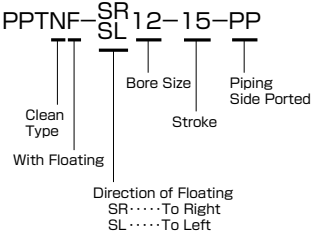
SL ←
→ SR



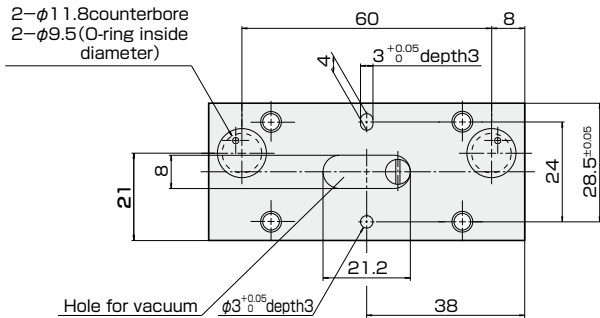
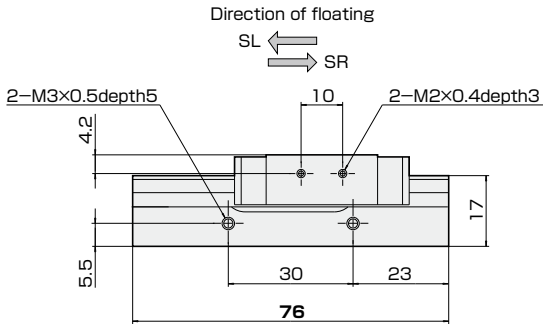
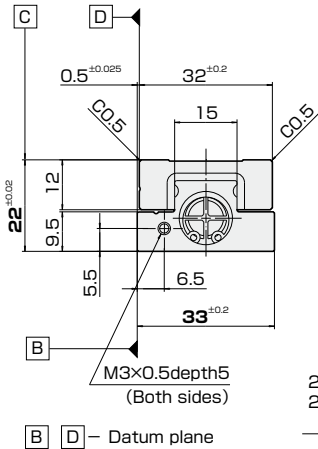
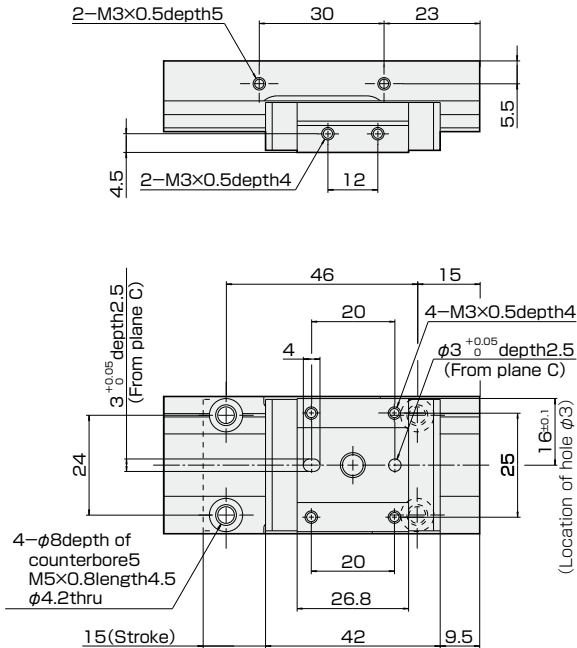
B D - Datum plane



DIMENSIONS(mm) PPTNF-SR(SL) 12-15-PP



Position of Switch  Page 278

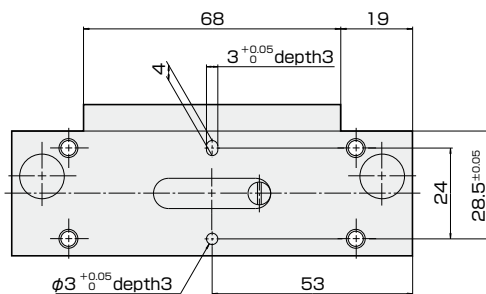


P
T
I
C
O

PICO TABLE Clean Type with Floating

PPTNF-SR(SL) 12-15-PP

PPTNF-SR(SL)12-25-TP

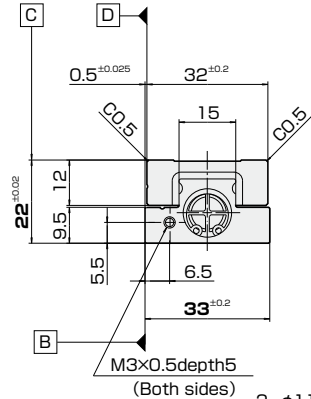
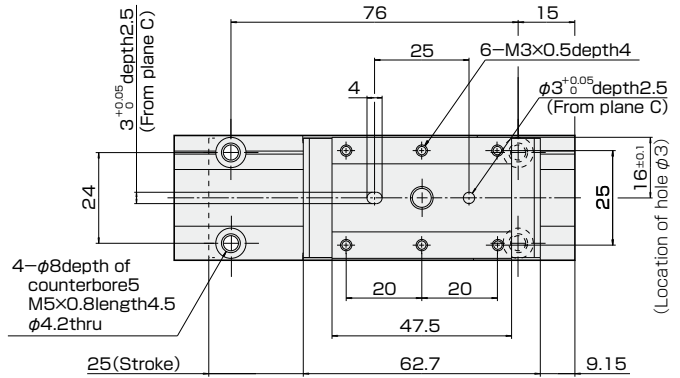
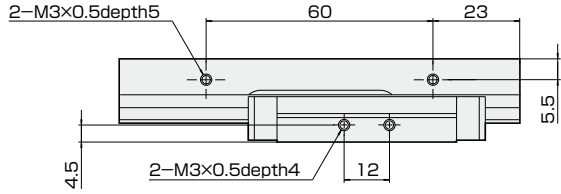
Position of Switch  Page 278

DIMENSIONS(mm) PPTNF-SR(SL) 12-25-PP

PPTNF-SR
SL 12-25-PP

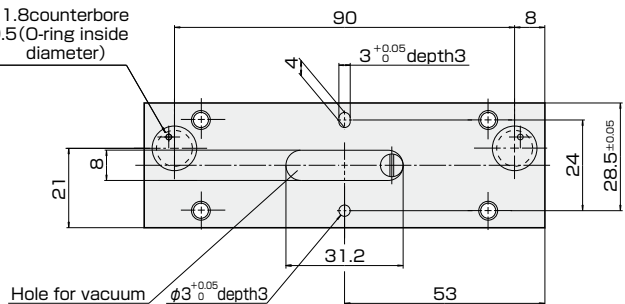
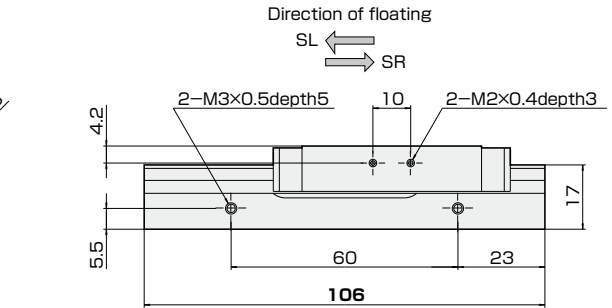
Clean Type
With Floating
Bore Size
Stroke
Piping Side Ported
Direction of Floating
SR.....To Right
SL.....To Left

Position of Switch  Page 278



B **D** - Datum plane

2-φ11.8counterbore
2-φ9.5(O-ring inside diameter)



P
T
I
C
O

PICO TABLE Clean Type with Floating

PPTNF-SR(SL) 12-25-PP

DIMENSIONS(mm) PPTNFS-SR(SL) 10-10

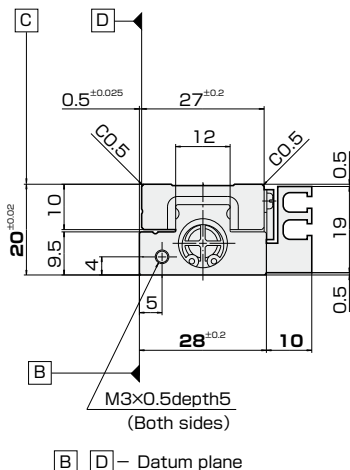
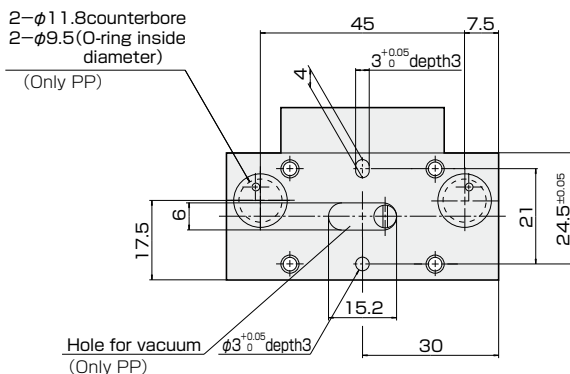
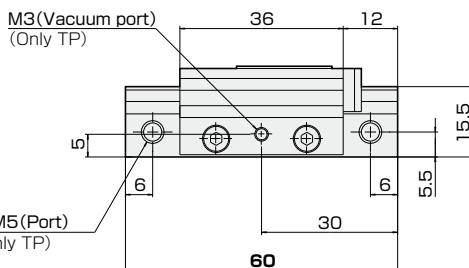
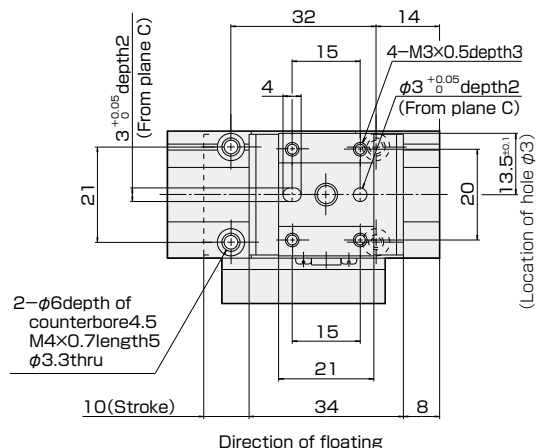
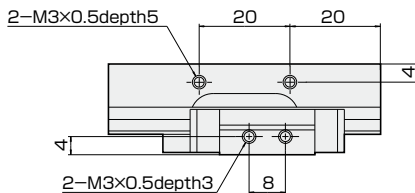
PPTNFS-SR 10-10-TP
SL PP

Clean Type
With Floating
With magnet, switch rail

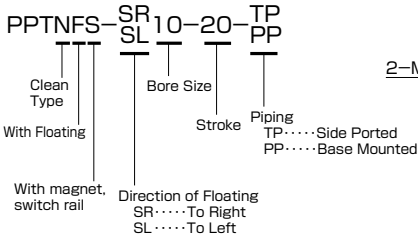
Bore Size
Stroke
Direction of Floating
SR.....To Right
SL.....To Left

Piping
TP.....Side Ported
PP.....Base Mounted

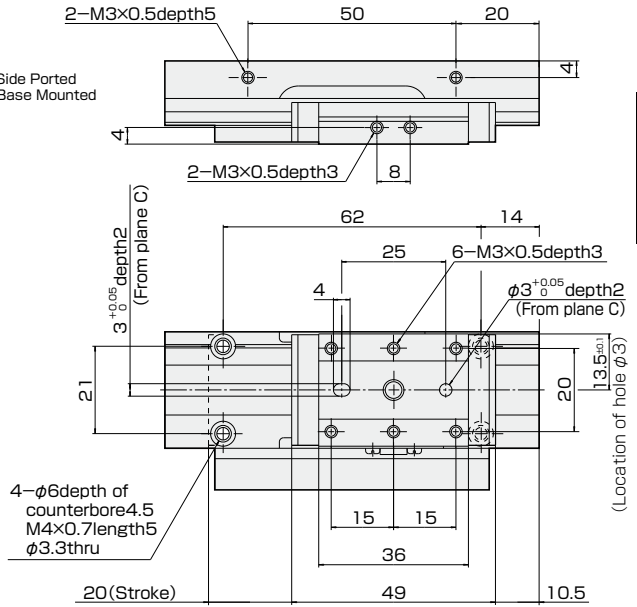
Position of Switch  Page 278



DIMENSIONS(mm) PPTNFS-SR(SL) 10-20

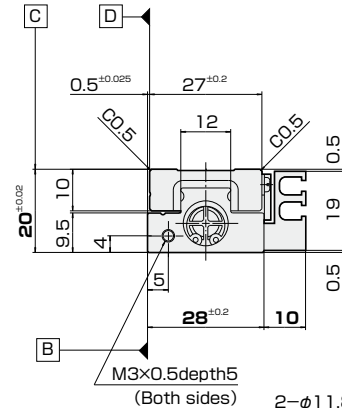


Position of Switch  Page 278



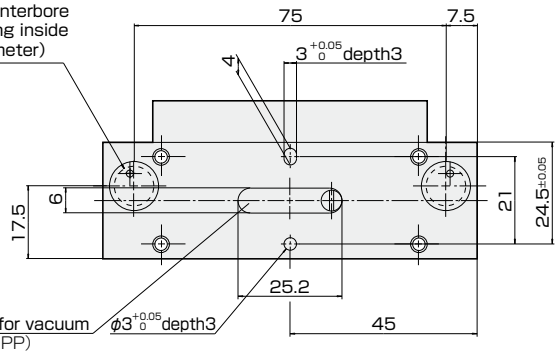
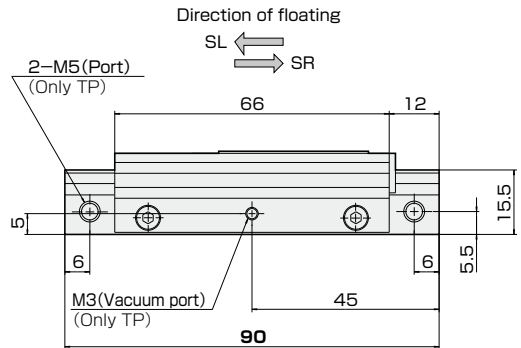
PPTNFS-SR(SL) 10-20
PICO TABLE Clean Type with Floating

PPTNFS-SR(SL) 10-20

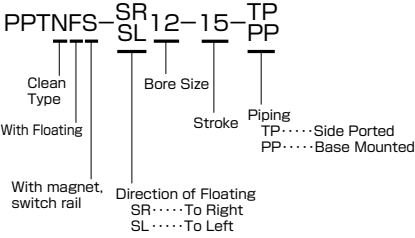


B D - Datum plane

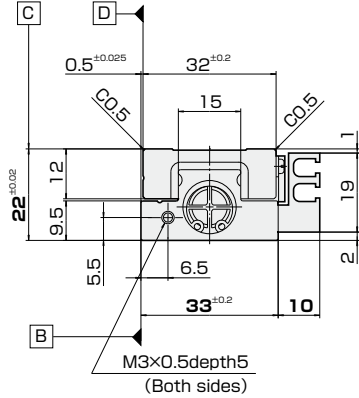
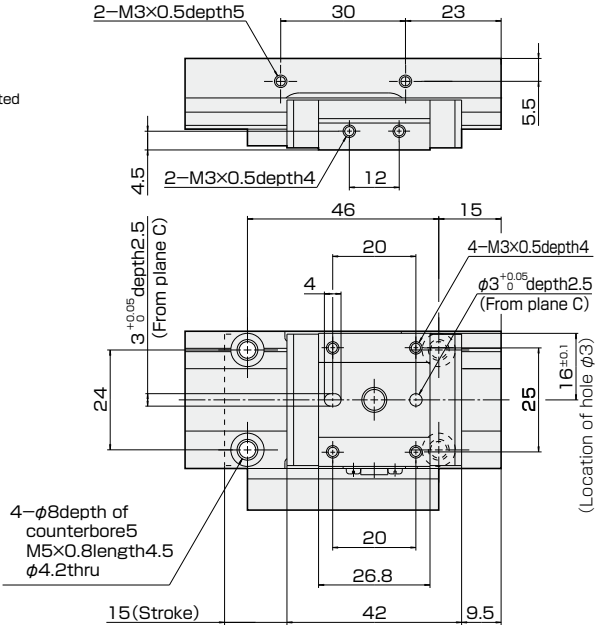
2-φ11.8counterbore
2-φ9.5(O-ring inside diameter)
(Only PP)



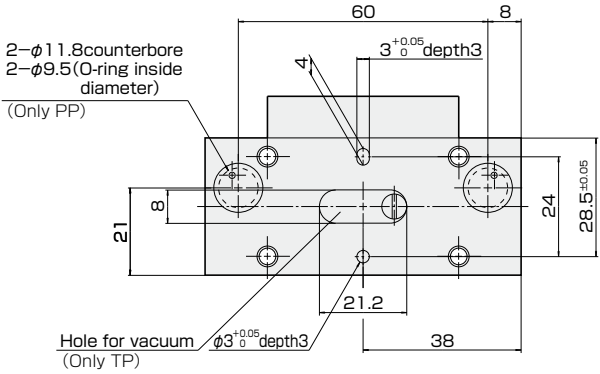
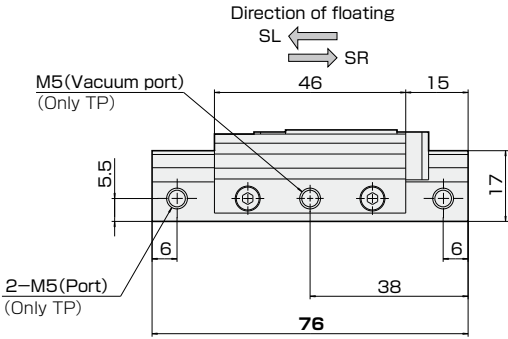
DIMENSIONS(mm) PPTNFS-SR(SL) 12-15



Position of Switch  Page 278



B D - Datum plane



PICO TABLE Clean Type with Floating

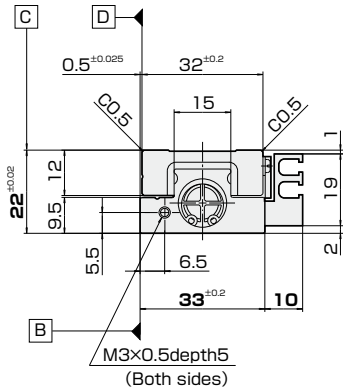
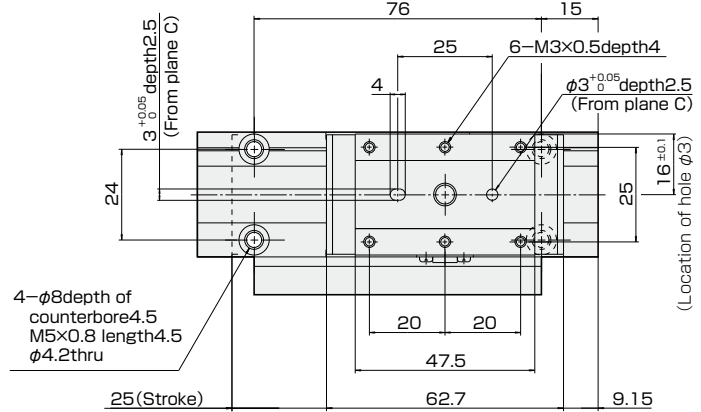
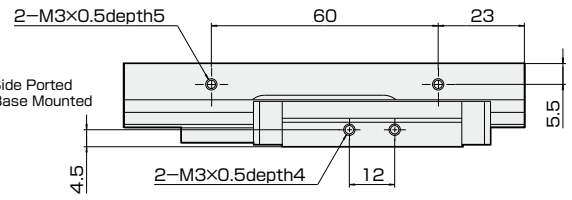
PPTNFS-SR(SL) 12-15

DIMENSIONS(mm) PPTNFS-SR(SL) 12-25

PPTNFS-SR 12-25-TP
SL PP

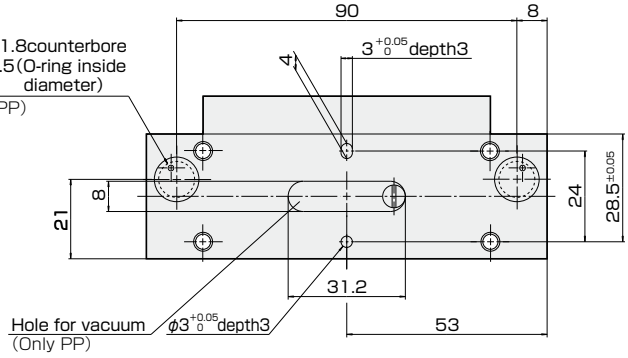
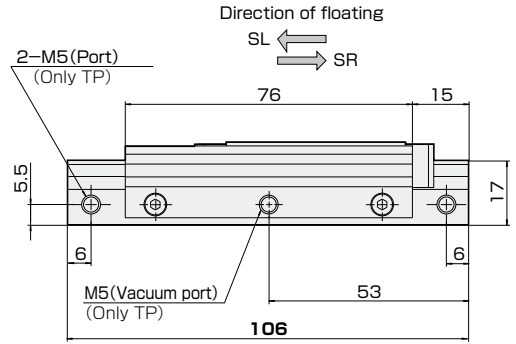
Clean Type
With Floating
With magnet, switch rail
Bore Size
Stroke
Piping
TP...Side Ported
PP...Base Mounted
Direction of Floating
SR...To Right
SL...To Left

Position of Switch Page 278



[B] [D] - Datum plane

2-φ11.8counterbore
2-φ9.5(O-ring inside diameter)
(Only PP)



PPTNF

PICO TABLE Clean Type with Floating

PPTNFS-SR(SL) 12-25

■ MEMO ■

■ MEMO ■

■ MEMO ■