

PICO RODLESS®

PRD Series

Registration of Patent
Registration of a Design

PRD

PICO RODLESS

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PICO RODLESS

PRD Series

Directly Connected Linear Guide and Rodless Cylinder

Amazingly Thin Thickness 24mm (PRD16), 33 (PRD25), 42mm (PRD32)

Variety of Guide Variations

Linear Guide



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

End Plate Stopper

Metal stopper integrated at the end of shock absorber.

Linear Guide Table

Works can be installed directly to the table. You can make use of all the high-accuracy and high-rigidity features that a linear guide has. Possible to select one among 1, 2, 3, 4 pieces for the number of guide table.

Intermediate Stopper Unit

The stopper can be fixed at any position of the overall stroke. Fine adjustment is possible. A metal stopper is integrated at the end of the shock absorber.

Rodless Cylinder of New Structure

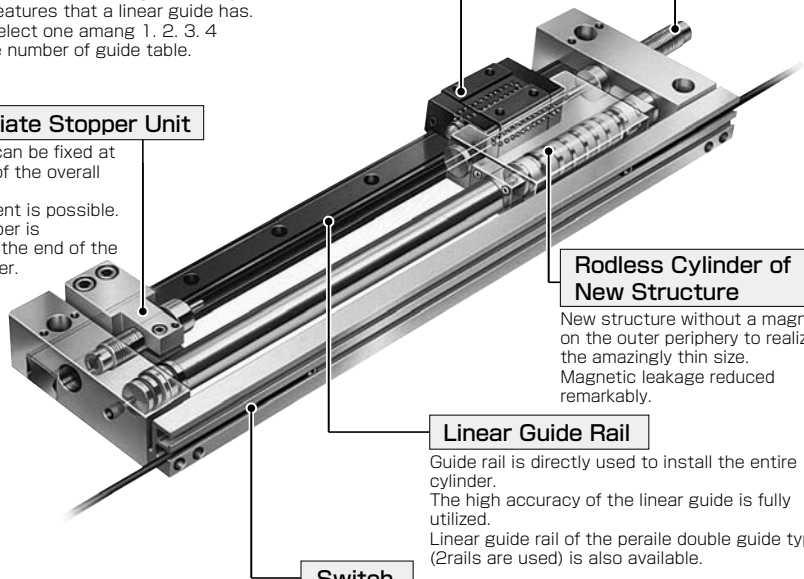
New structure without a magnet on the outer periphery to realize the amazingly thin size. Magnetic leakage reduced remarkably.

Linear Guide Rail

Guide rail is directly used to install the entire cylinder. The high accuracy of the linear guide is fully utilized. Linear guide rail of the periale double guide type (2rails are used) is also available.

Switch

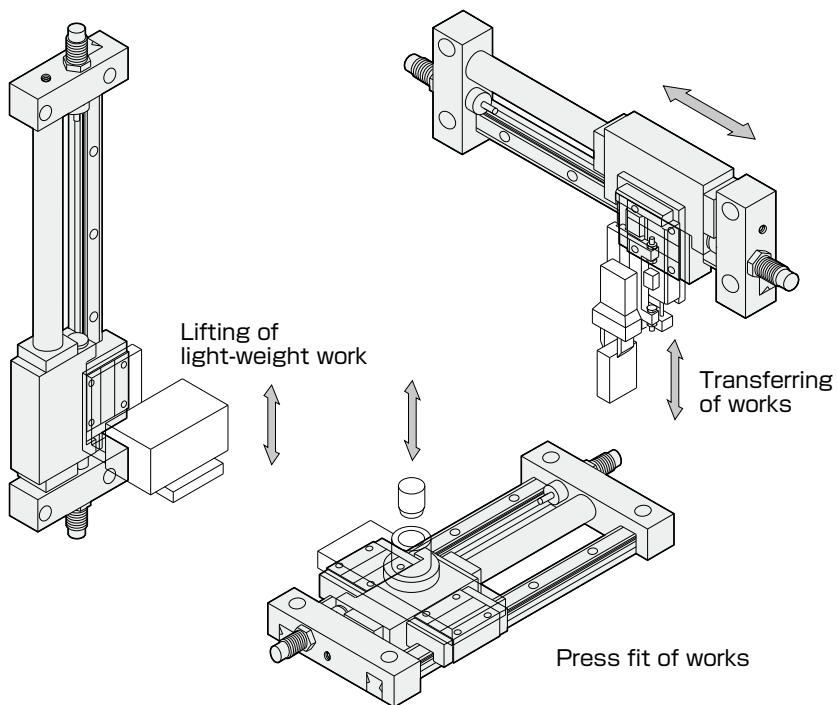
Switch can be installed on either cylinder side or guide side.



Summary of the Pico Rodless PRD Series

The PICO RODLESS CYLINDER has been developed as a longer stroke model of the PICO TABLE (linear guide incorporating cylinder) and PICO SLIDER (self-running linear guide) which both have gained public favor. The new structure with a magnet in the cylinder has realized an amazingly thin size. All of the air cylinder, shock absorber (with an intermediate stopper unit) and switch can be enhoused in the overall height of linear guide. As the result, when the cylinder is installed, the linear guide rail and linear guide table can be directly used. It enables to utilize the high accuracy, rigidity and installation accuracy of the linear guide fully. Five types of linear guides-single guide table, serial double guide tables, parallel double guide tables (2 rail used), 3 guide tables and 4 guide tables-are available according to the application .

Application Examples : PICO RODLESS

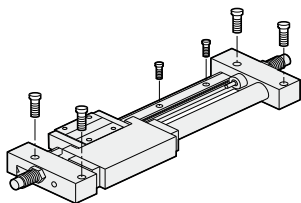


PRD

PICO RODLESS

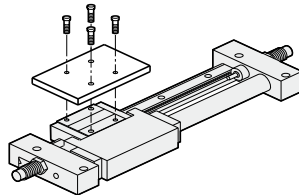
MAIN BODY INSTALLATION

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



MOUNTING

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



Model Code Example

PRDS-SD32-100-QD-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.

● Bore Size

| | |
|----|-----|
| 16 | φ16 |
| 25 | φ25 |
| 32 | φ32 |

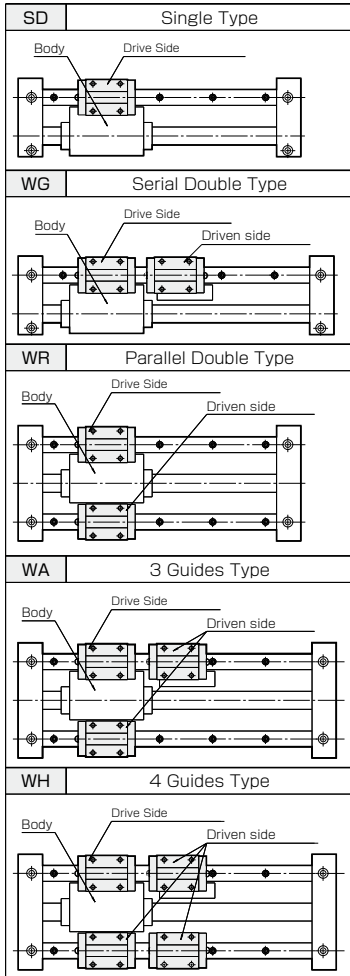
● Cable Length

| | |
|---------|----|
| No Code | 1m |
| LA | 3m |

● Number of Switches

| | |
|---|---|
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |

● Guide Type



● 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



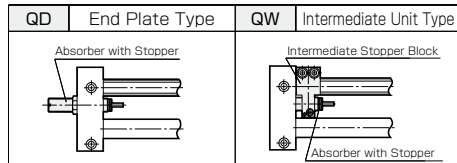
For details Page 1066, 1067

● Installation Positions of Magnet and Switch Rail

| | |
|---------|--------------------------|
| No Code | On Body Installation |
| RD | On Drive Side Guidetable |

For details Page 615

● Stopper Type



Note: The shock absorber has been changed to the new type. Option model along with it also has become a change. (QE→QD QC→QW)

Stroke Adjustment Method Page 619
Specifications, Dimensions Page 632, 633

● Stroke

| Model | Standard Stroke (mm) | | | | | | Max. Stroke |
|-------|----------------------|-----|-----|-----|-----|-----|--|
| | 50 | 100 | 150 | 200 | 250 | 300 | |
| φ16 | ● | ● | ● | ● | ● | ● | The intermediate stroke is specified in units of 50mm. 1200 |
| φ25 | ● | ● | ● | ● | ● | ● | 2000 |
| φ32 | ● | ● | ● | ● | ● | ● | 2000 |

Intermediate Stroke

Please adjust with Stopper (Shock Absorber)


SPECIFICATIONS

| | | | | |
|-----------------------------------|----|--|--------------------|-----------|
| Bore Size | | $\phi 16\text{mm}$ | $\phi 25\text{mm}$ | $\phi 32$ |
| Magnet Holding Force | | 130N | 310N | 506N |
| Note1: Maximum Load Mass | SD | 4kg | 10kg | 15kg |
| | WG | 8kg | 20kg | 30kg |
| | WR | 6.5kg | 16kg | 20kg |
| | WA | 8kg | 20kg | 30kg |
| | WH | 8kg | 20kg | 30kg |
| Piping Diameter | | M5×0.8 | Rc1/8 | Rc1/8 |
| Guide Mechanism | | Linear Guide | | |
| Type of Operation | | Double Acting | | |
| Fluid | | Air | | |
| Maximum Operating Pressure | | 0.6MPa | | |
| Minimum Operating Pressure | | 0.25MPa | 0.2MPa | 0.23MPa |
| Pressure | | 0.9MPa | | |
| Operating Temperature | | 5~60°C | | |
| Maximum Operating Speed | | 500mm/s | | |
| Note2: Minimum Operating Speed | | 150/s | 100mm/s | 100/s |
| Cushioning | | Shock Absorber(with Metal Stopper) | | |
| Note3: Stroke Adjustment Range | QW | Adjustable at any position on overall stroke | | |
| | QD | Adjustable at stroke end | | |
| Lubrication | | Not required | | |

Note1 : Specifications may vary depending on the operation conditions. Refer to page 628-631 for details.
 Note2 : If a unit is operated at speed below the minimum service speed,smooth movement may not be ensured.
 Note3 : See page 619 for details.

THE TYPE OF LINEAR GUIDE

| Model | Type |
|-------|-------------|
| PRD16 | THK SR15W-Y |
| PRD25 | THK SR25WY |
| PRD32 | THK SR30W |

Radial space  Page 623

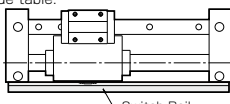
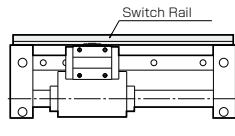
THEORETICAL THRUST

Unit: N

| Bore Size (mm) | Operating Pressure MPa | | | | |
|----------------|------------------------|-----|-----|-----|-----|
| | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 |
| $\phi 16$ | 40 | 60 | 80 | 100 | 120 |
| $\phi 25$ | 98 | 150 | 200 | 250 | 290 |
| $\phi 32$ | 160 | 240 | 320 | 400 | 480 |

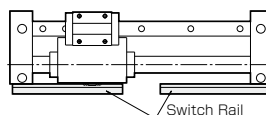
1MPa=10.2kgf/cm²
1N=0.102kgf

INSTALLATION POSITIONS OF MAGNET AND SWITCH RAIL

| No Code | On Body Installation | RD | On Driving Side Guide Table |
|---------|---|----|---|
| | In case of WR,WA,and WH types, magnet is installed on a driven side guide table. | | |
| |  | |  |

For details  Page 666, 667

When the stroke exceeds 1000 mm, the switch rail is split allowing adjustment within the range of 30 mm stroke respectively at both end.



OPTIONAL PARTS CODES


Name


Switch Fixture


Reed Switch(2 Wires, with Indicator Light)
Straight Outlet Cable Angle Outlet Cable


Reed Switch(2 Wires, without Indicator Light)
Straight Outlet Cable Angle Outlet Cable


| |
|---------------------------|
| PARTS CODE Note |
| PARTS CODE Note |
| Content |

| |
|---|
| BE(PRD) Screw, Nut |
|  |

| |
|---|
| RB1 (PRD) Cable Length:1m |
| RB1LA (PRD) Cable Length:3m |
|  |
| with fixture |

| |
|---|
| RC1 (PRD) Cable Length:1m |
| RC1LA (PRD) Cable Length:3m |
|  |
| with fixture |

| |
|---|
| RB2 (PRD) Cable Length:1m |
| RB2LA (PRD) Cable Length:3m |
|  |
| with fixture |

| |
|---|
| RC2 (PRD) Cable Length:1m |
| RC2LA (PRD) Cable Length:3m |
|  |
| with fixture |

PICO RODLESS

●RB,RC Switch


Conventional RG1, RG2 switches can be replaced to RB, RC switch

Comparison with old type


| Old type | Equivalent Current Type |
|----------|-------------------------|
| RG1 | RB1, RC1 RB2, RC2 |
| RG2 | RB4, RC4 RB5, RC5 |


Solid State Switch(2 Wires, with Indicator Light)
Straight Outlet Cable Angle Outlet Cable

| |
|---|
| RB4 (PRD) Cable Length:1m |
| RB4LA (PRD) Cable Length:3m |
|  |
| with fixture |

| |
|---|
| RC4 (PRD) Cable Length:1m |
| RC4LA (PRD) Cable Length:3m |
|  |
| with fixture |

Solid State Switch(3 Wires, with Indicator Light)
Straight Outlet Cable Angle Outlet Cable

| |
|---|
| RB5 (PRD) Cable Length:1m |
| RB5LA (PRD) Cable Length:3m |
|  |
| with fixture |

| |
|---|
| RC5 (PRD) Cable Length:1m |
| RC5LA (PRD) Cable Length:3m |
|  |
| with fixture |


Repair Parts Set

| |
|--|
| HP (PRD □) |
| Please put cylinder Bore Size in the □. |
| For details ☞ Page 618 |
| With Grease lllr cylinder part maintenance |

Grease for Cylinder Part Maintenance

| |
|--|
| HG (PRD) |
| Cylinder part only. Do not use it to the Guide part. |


Intermediate Stopper Unit

| |
|--|
| QW (PRD □) |
| Please put cylinder Bore Size in the □. |
|  |






Magnet

| |
|--|
| RK (PRD) |
| Before mounting, apply anaerobic adhesive to the screws. |
|  |
| with mounting screws |


Switch Rail

| |
|--|
| RJ (PRD-A B-C D) |
| Substitute: A: Guide type B: Cylinder inside diameter C: stroke D: Stopper type. Example: For RJ (PRD-SD16-100QW) is a rail for PRDS-8016-100-QW. |
|  |
| with fixing bolts |

Shock Absorber

| ABK10 For PRD16-QW | ABK12 For PRD16-QD, PRD25-QW | ABK14 For PRD25-QD | ABK18 For PRD32-QW | ABK20 For PRD32-QD |
|--|---|---|---|---|
| M10×1 | M12×1 | M14×1 | M18×1 | M20×1 |
|  |  |  |  |  |
| with nut | with nut | with nut | with nut | with nut |

Lock Nut for Shock Absorber

| Model | Parts Code |
|---|------------|
| ABK10 | NTS(M10) |
| ABK12 | NTS(M12) |
| ABK14 | NTS(M14) |
| ABK18 | NTS(M18) |
| ABK20 | NTS(M20) |
|  | |

- Shock absorber was replaced to new type. (ABK10, 12, 14)
- New type can be replaced with conventional Shock Absorber.
- ABK10 is 8mm longer than RABS10.
- ABK12 is same length as RABS12.
- ABK14 is 1.5mm shorter than RABS14.
- Spec. Outside Diameter ☞ Page 632, 633

PRODUCT MASS

●PRD16-QD Unit: g

| Guide Type | Basic Mass | Additional Mass | Magnet, Switch Rail Additional Mass |
|------------|------------|-----------------|-------------------------------------|
| SD | 1080 | 1.41×Stroke | 50+0.3×Stroke |
| WG | 1430 | | 70+0.3×Stroke |
| WR | 1510 | 2.61×Stroke | 50+0.3×Stroke |
| WA | 1950 | | 70+0.3×Stroke |
| WH | 2150 | | |

●PRD16-QW Unit: g

| Guide Type | Basic Mass | Additional Mass | Magnet, Switch Rail Additional Mass |
|------------|------------|-----------------|-------------------------------------|
| SD | 1200 | 1.41×Stroke | 60+0.3×Stroke |
| WG | 1550 | | 80+0.3×Stroke |
| WR | 1670 | 2.61×Stroke | 60+0.3×Stroke |
| WA | 2110 | | 80+0.3×Stroke |
| WH | 2310 | | |

●PRD25-QD Unit: g

| Guide Type | Basic Mass | Additional Mass | Magnet, Switch Rail Additional Mass |
|------------|------------|-----------------|-------------------------------------|
| SD | 2490 | 3.15×Stroke | 60+0.3×Stroke |
| WG | 3300 | | 90+0.3×Stroke |
| WR | 3530 | 5.85×Stroke | 60+0.3×Stroke |
| WA | 4620 | | 90+0.3×Stroke |
| WH | 5020 | | |

●PRD25-QW Unit: g

| Guide Type | Basic Mass | Additional Mass | Magnet, Switch Rail Additional Mass |
|------------|------------|-----------------|-------------------------------------|
| SD | 2880 | 3.15×Stroke | 70+0.3×Stroke |
| WG | 3680 | | 100+0.3×Stroke |
| WR | 4040 | 5.85×Stroke | 70+0.3×Stroke |
| WA | 5130 | | 100+0.3×Stroke |
| WH | 5530 | | |

●PRD32-QD Unit: g

| Guide Type | Basic Mass | Additional Mass | Magnet, Switch Rail Additional Mass |
|------------|------------|-----------------|-------------------------------------|
| SD | 5560 | 4.5×Stroke | 80+0.3×Stroke |
| WG | 7280 | | 100+0.3×Stroke |
| WR | 7720 | 8.3×Stroke | 80+0.3×Stroke |
| WA | 9550 | | 100+0.3×Stroke |
| WH | 10320 | | |

●PRD32-QW Unit: g

| Guide Type | Basic Mass | Additional Mass | Magnet, Switch Rail Additional Mass |
|------------|------------|-----------------|-------------------------------------|
| SD | 6650 | 4.5×Stroke | 105+0.3×Stroke |
| WG | 8360 | | 125+0.3×Stroke |
| WR | 9110 | 8.3×Stroke | 105+0.3×Stroke |
| WA | 10930 | | 125+0.3×Stroke |
| WH | 11700 | | |

●Switch Unit: g

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

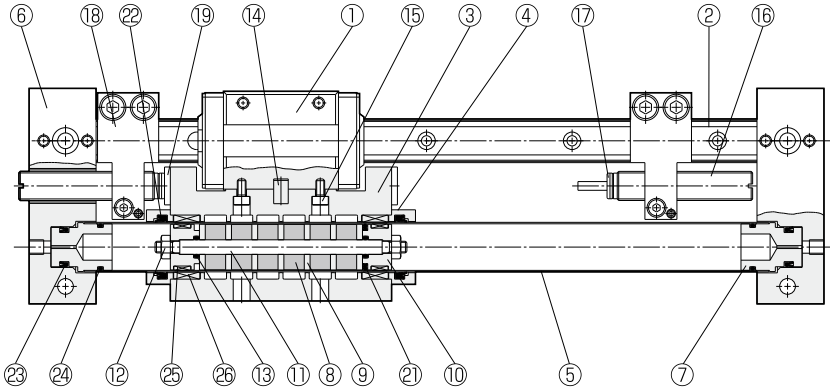
METHOD TO CALCULATE THE MASS

Ex. PRDS-WA16-200-QW-RD-RB42LA

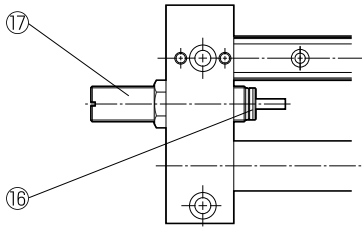
Basic Mass ······ 2110g
 Additional Mass ······ 2.61×200=522g
 Magnet, Switch Rail ······ 80+0.3×200=140g
 Switch ······ 35×2=70g
 2110+522+140+70=2842g

STRUCTURE AND PRINCIPAL COMPONENTS

STOPPER TYPE: QW (INTERMEDIATE UNIT TYPE)



STOPPER TYPE: QD (END PLATE TYPE)



Note: The tube will move in the axial direction (approx. 1.5mm Max.) and in the circumferential direction slightly. These are provided to prevent galling between the tube and the guide, and has nothing to do with abnormality.

PRINCIPAL COMPONENTS

| No. | Name | Material | Remarks | No. | Name | Material | Remarks |
|-----|-------------|-------------------|----------------------------|-----|-----------------|-------------------------------|----------------------------|
| 1 | Guide Table | Cr-Mo Steel | Reident | 11 | Rod | Stainless Steel | |
| 2 | Guide Rail | Carbon Steel | Reident | 12 | Nut | Steel | Nickel Plating |
| 3 | Body | Steel | Electroless Nickel Plating | 13 | O-ring | NBR | |
| 4 | Rod Cover | Aluminum Alloy | White Alumite | 14 | Pin | Carbon Steel (Heat Processed) | |
| 5 | Tube | Stainless Steel | Hard Chromium Plated | 15 | Fixing Bolt | Stainless Steel | |
| 6 | Plate | Aluminum Alloy | White Alumite | 16 | Shock Absorber | Carbon Steel | Electroless Nickel Plating |
| 7 | End Cover | Aluminum Alloy | White Alumite | 17 | Metal Stopper | Carbon Steel | Heat Treatment (Nitriding) |
| 8 | Magnet | Rare-earth Magnet | | 18 | Stopper Block | Steel | Electroless Nickel Plating |
| 9 | Inner York | Steel | Electroless Nickel Plating | 19 | Stopper Catcher | Steel (Heat Processed) | Electroless Nickel Plating |
| 10 | Piston | Aluminum Alloy | White Alumite | | | | |

Note: End Face of Guide Rail is not Reident Processed.

REPAIR PARTS (With special Grease HG)

| No. | Name | Material | Qty | Remarks | No. | Name | Material | Qty | Remarks |
|-----|-------------|-----------------|-------|---------|-----|-----------|-----------------|-----|---------|
| 21 | Piston Seal | NBR | 1 (2) | Note | 24 | O-ring | NBR | 2 | |
| 22 | Dust Seal | Urethane Rubber | 2 | | 25 | Wear Ring | Synthetic Resin | 2 | |
| 23 | Cover Seal | NBR | 2 | | 26 | Bush | Synthetic Resin | 2 | |

Note: Two Piston Seal for PRD32.

STROKEADJUSTMENT

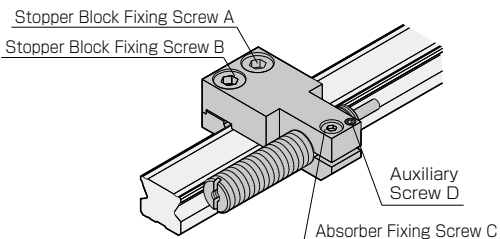
⚠ Caution

Adjust the stroke of the PSU as described below .

■ QW TYPE

① Approximate Stroke Adjustment

1. The stroke can be adjusted at any point of the overall stroke.
2. Loosen the stopper block fixing screws A and B.
3. Adjust the stopper block to an approximate position.
4. Tighten the stopper block fixing screws A and B securely.
5. By retightening the screws after several times of trial runs, the stopper block is more positively fixed.

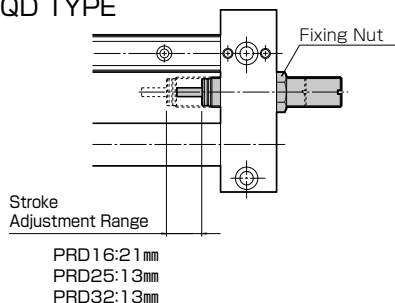


② Fine Stroke Adjustment

1. Loosen the absorber fixing screw C.
2. Adjust the stroke finely by turning the shock absorber with a blade screw driver.
3. Tighten the absorber fixing screw C securely.
4. If the absorber is hard to be turned after the absorber fixing screw C is loosened, tighten the auxiliary screw D slightly then adjusting becomes easier.
5. At this time, be sure to loosen the auxiliary screw D again before tightening the absorber fixing screw C.

| Model | Screw | Bolt for Use | Fixing Torque | Fine Stroke Adjustment Range |
|-------|-------|--------------|---------------|---------------------------------------|
| PRD16 | A, B | M5×0.8 | 7N·m | -32mm on one side |
| | C | M3×0.5 | 1.5N·m | |
| PRD25 | A, B | M6×1 | 11N·m | -31mm on one side |
| | C | M4×0.7 | 3.4N·m | |
| PRD32 | A, B | M8×1.25 | 22N·m | -29mm on one side +5mm on one side |
| | C | M6×1 | 11N·m | |

■ QD TYPE

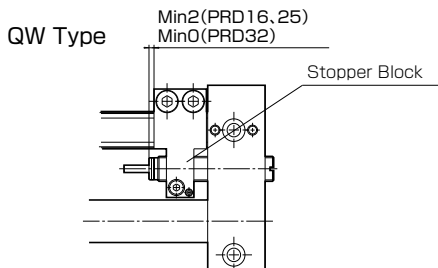
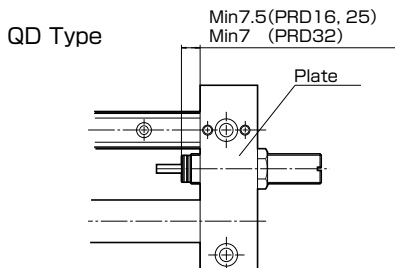


1. Loosen the fixing nut.
2. Adjust the stroke by turning the shock absorber.
3. Tighten the fixing nut while supporting the shock absorber.

| Model | Fixing Nut | Fixing Torque | Stroke Adjustment Range |
|-------|------------|---------------|---------------------------------------|
| PRD16 | M12×1 | 7.8N·m | -21mm on one side |
| PRD25 | M14×1 | 9.8N·m | -13mm on one side |
| PRD32 | M20×1 | 29.4N·m | -13mm on one side +5mm on one side |

⚠ Warning

Make sure that the stopper of the shock absorber protrudes from the end of the plate or the stopper block at least by the dimension shown in the figures. Otherwise, the rod cover of the body may contact during operation, causing a failure.



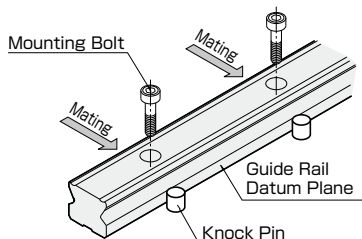
MAIN BODY INSTALLATION

⚠ Caution

Mount the main body of the PRO Pico Rodless as described in the procedures below. Incorrect mounting may affect the operation, precision and life of the PRD Pico Rodless.

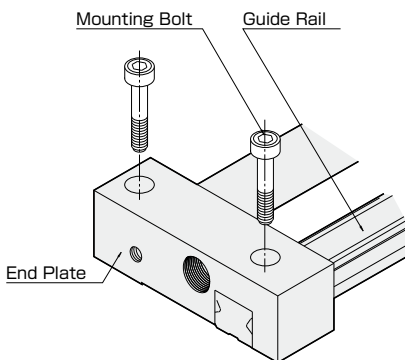
① Fixing the Guide Rail

Place mating surface or knock pin, etc. to a frame, to accept a guide rail datum plane. Tighten the mounting bolts slightly. Bring the guide rail datum plane into positive contact with the mating surface or knock pin and tighten the mounting bolts securely. Refer to page 623 for the guide rail datum plane.



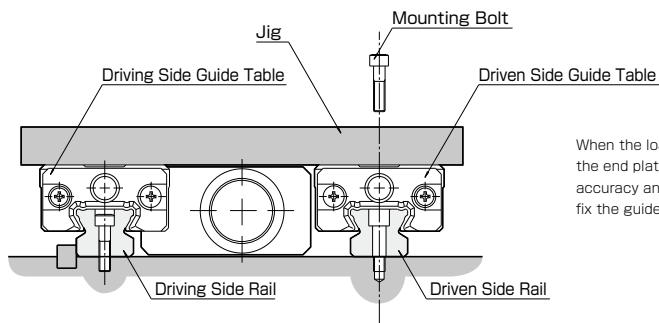
② Fixing the End Plate

Tighten the mounting bolt slightly. Tighten the mounting bolt on the guide rail side securely. Tighten another mounting bolt securely.



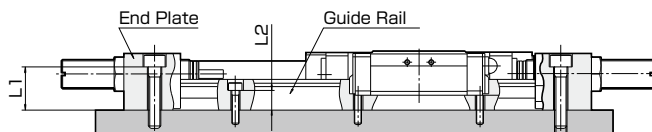
③ Fix the Driven Side Rail (WR, WA, WH)

Tighten the mounting bolt slightly. Interconnect the driving side guide table and driven side guide table with a work or jig to be used. Tighten the mounting bolts in succession from the rail end, confirming smooth movement of the table.



When the load is light, it may be enough to fix the end plates only. When the load is high or accuracy and rigidity are required, be sure to fix the guide rail also.

■ Main Body Mounting Screw Dimensions



End Plate Mounting Bolt

| Model | Bolt for Use | Fixing Torque N·m | Through Hole Length L1 (mm) |
|-------|--------------|-------------------|-----------------------------|
| PRD16 | M5 | 5.1 | 17.5 |
| PRD25 | M8 | 22 | 23.5 |
| PRD32 | M10 | 43 | 30.5 |

End Plate Mounting Bolt

| Model | Bolt for Use | Fixing Torque N·m | Through Hole Length L2 (mm) |
|-------|--------------|-------------------|-----------------------------|
| PRD16 | M3 | 1.1 | 8 |
| PRD25 | M6 | 8.6 | 9 |
| PRD32 | M8 | 22 | 11 |

WORK MOUNTING

⚠ Caution

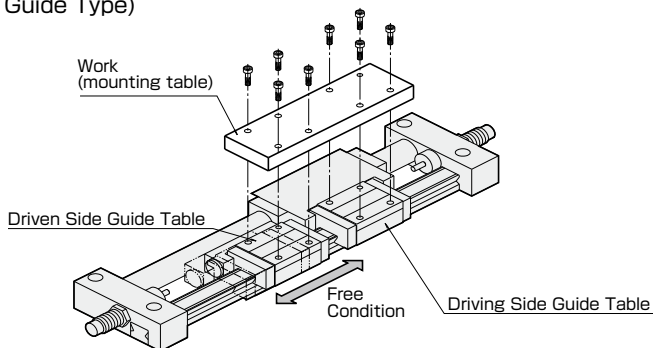
Connect and fix multiple guide tables with using work or work mounting plate in case of WG Type (Serial Double Guide), WR Type (Parallel Double Guide), WA (Three Guide Type) and WH (Four Guide Type).

The driving guide table and driven guide tables are not connected and fixed. The driven guide table is free.

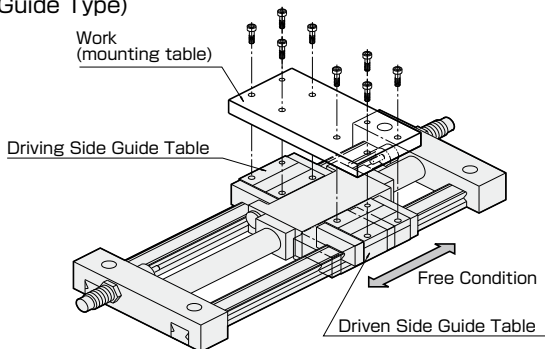
Design the mounting table with full consideration of the strength, hardness and flatness.

Be sure to use all mounting screws on the guide tables (four screws for the driving guide table and four screws for the driven guide table) to mount the mounting table.

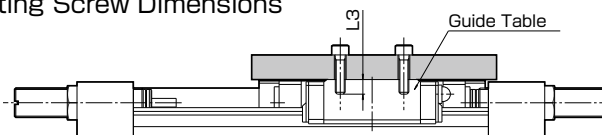
WG(Serial Double Guide Type)



WR(Parallel Double Guide Type)



■ Work Mounting Screw Dimensions



| Model | Bolt for Use | Fixing Torque N·m | Screw Depth L3(mm) |
|-------|--------------|----------------------|-----------------------|
| PRD16 | M4×0.7 | 2.5 | 7 |
| PRD25 | M6×1 | 8.6 | 9 |
| PRD32 | M8×1.25 | 22 | 12 |

PRECAUTIONS FOR MAINTENANCE AND DISASSEMBLY

Caution

| Step | Notes |
|------|---|
| 1 | <ul style="list-style-type: none"> Loosen bolts B, which connect between the plate and the guide rail. Remove the plate and end cover. |
| 2 | <ul style="list-style-type: none"> Force the body to be displaced from the piston. <ul style="list-style-type: none"> Do this without pulling the tube out of the body. Move to a point where the holding force that connects between the body and the piston disappears. Pulling the tube out of the body while the holding force remains makes it impossible to remove because of the magnetism of the magnet. |
| 3 | <ul style="list-style-type: none"> Pull the piston out of the tube. <ul style="list-style-type: none"> Do this without pulling the tube out of the body. The magnet may be broken if dropped or hit. Use sufficient care in handling the magnet. Ensure that the piston seal housing is not scratched. For the grease, use the special grease included in the repair parts set. Piston seals need to be correctly oriented. |
| 4 | <ul style="list-style-type: none"> Replace the wear rings, bushing and packing and dust seal of the end cover. <ul style="list-style-type: none"> Apply a sufficient amount of grease. Inadequate application may adversely affect durability. For the grease, use the special grease included in the repair parts set. Ensure that the housing is not scratched. |
| 5 | <ul style="list-style-type: none"> Apply grease on the outer circumference of the piston and inner circumference of the cylinder tube. <ul style="list-style-type: none"> Apply a sufficient amount of grease on the entire surface of the piston. Inadequate application may adversely affect durability. For the grease, use the special grease included in the repair parts set. |
| 6 | <ul style="list-style-type: none"> Push in the piston so that the piston and the body are at the right positions (the centers are aligned). Use bolts A to secure the dust cover. Mount the end cover on the tube. Mount the plate on the guide rail and secure with bolts B. <ul style="list-style-type: none"> If they are displaced, sufficient holding force cannot be obtained, which may cause malfunction. Ensure that the end faces of the body and the piston are roughly at the same position. Tighten bolts A with the specified torque. (See Table below) Apply an anaerobic adhesive on bolts B. Tighten bolts B with the specified torque. (See Table below) |

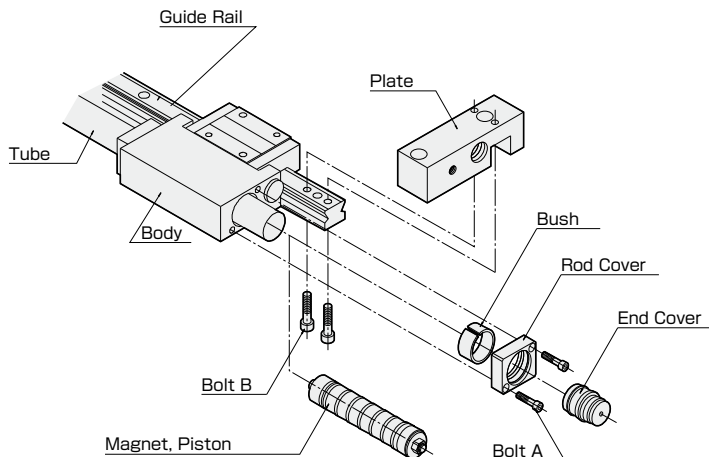
Notes on Magnetic Products

The piston in the tube contains a magnet with strong magnetism. Bringing it close to any magnetic recording medium may cause the data to be erased. Do not bring it close to any device that may malfunction due to magnetism.

Timing of Replacement of Repair Parts

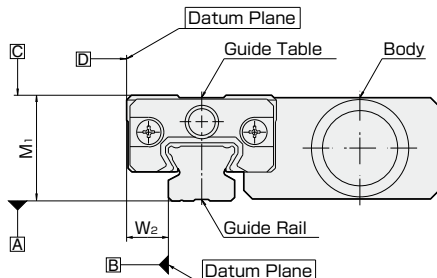
As a rule, replace at intervals of travel of about 1000 km.

| Model | Fixing Screws | Bolt Size | Fastening Torque |
|-------|---------------|-----------|------------------|
| PRD16 | A | M2.5×0.45 | 0.5N·m |
| | B | M4 ×0.7 | 2.5N·m |
| PRD25 | A | M3 ×0.5 | 1 N·m |
| | B | M6 ×1 | 9.0N·m |
| PRD32 | A | M4 ×0.7 | 2.5N·m |
| | B | M8 ×1.25 | 15 N·m |

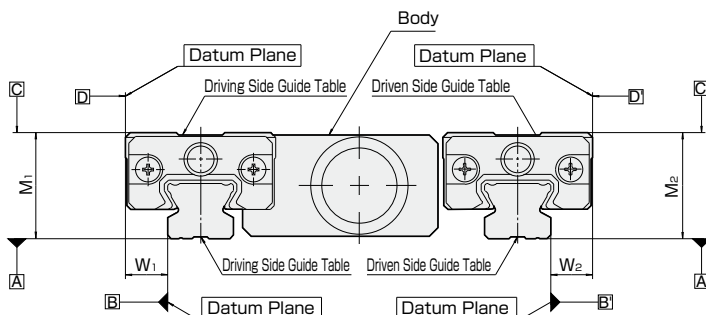


ACCURACY AND DATUM PLANE

SD, WG TYPE



WR, WA, WH TYPE



PRD
PICO RODLESS

ACCURACY

Unit: mm

| Model | PRD16 | PRD25 | PRD32 |
|--|-------|-------|-------|
| Running parallelism of C(C') with respect to A(A') | 0.023 | 0.030 | 0.030 |
| Running parallelism of O(O') with respect to B(B') | 0.023 | 0.030 | 0.030 |
| Tolerance of height M1 and M2 | ±0.03 | ±0.04 | ±0.04 |
| Difference of pair height M1 and M2 | 0.02 | 0.02 | 0.02 |
| Tolerance of width W1 and W2 | ±0.1 | ±0.1 | ±0.1 |
| Difference of pair width W1 and W2 | 0.02 | 0.03 | 0.03 |

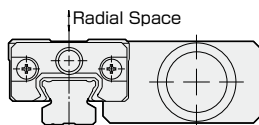
DIFFERENCE OF PAIR HEIGHT M1 AND M2

Difference between maximum and minimum dimensions of Height M1 (M2) of multiple guide tables on a same guide rail

DIFFERENCE OF PAIR WIDTH W1 AND W2

Difference between maximum and minimum dimensions of Width W1 (W2) between multiple guide tables and rails on a same guide rail

Radial Space and Pre-load



Radial Space is numerical movement value of table center part when guide table is activated to axis by constant power.

Pre-load is with-stand load of the purpose of to lose space and to enhance rigidity.

Unit: mm

| Model | PRD16 | PRD25 | PRD32 |
|--------------|---------------|---------------|---------------|
| Radial Space | +0.002~-0.004 | +0.003~-0.006 | +0.004~-0.007 |

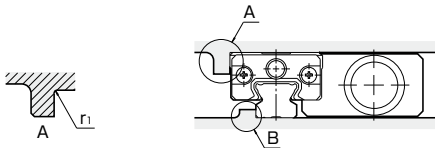
PRECAUTIONS FOR DESIGN AND USE

⚠ Caution

Accuracy of Mounting Surface

①The upper surface of the guide table and the bottom surface of the guide rail of Pico Rod Less are finished by precision grinding. Stable and highly accurate linear motion can be obtained by making the mounting surfaces of the mating parts such as machines, devices and jigs flat without staggers and projections, machining them with high precision and mounting them correctly. Poor accuracy of the mounting surfaces or incorrect mounting will cause plays, higher rolling resistance and an adverse effect on product life. Reference surfaces for mounting of the guide table and the table page 623

②Provision of relief area is recommended to the fillet shape of the mating surfaces of the guide table and the guide rail. An alternative is to provide an R as shown in the figures below. If the fillet shape is larger than the chamfered dimension of the body or the guide table, the mating part may not be brought to contact with the butting surface in the correct manner.

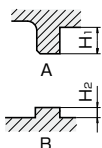


| Fillet shape | | Unit: mm | |
|--------------|----------------|----------------|--|
| Model | r ₁ | r ₂ | |
| PRD16 | R0.2 or less | R0.2 or less | |
| PRD25 | R0.5 or less | R0.5 or less | |
| PRD32 | R0.5 or less | R0.5 or less | |

③Make sure that no squareness error exists on the mounting surfaces and the butting surfaces of the guide table and the guide rail. If the squareness is poor, the mounting surface may not be brought to contact with the butting surface in the correct manner.



④For designing the butting surface, pay attention to the height and the thickness of the butting surface. If the thickness is not large enough, an adverse effect will be given to accuracy because of insufficient rigidity when subjected to lateral load or insufficient rigidity of the butting surface when subjected to positioning by means of lateral bolts.



| Recommended dimensions of the butting surfaces | | Unit: mm | |
|--|----------------|----------------|--|
| Model | H ₁ | H ₂ | |
| PRD16 | 4 | 3 | |
| PRD25 | 5 | 4.5 | |
| PRD32 | 6 | 4 | |

Rigidity of Mounting Base (fixed portion)

Inappropriate fixing method of the product or insufficient rigidity of the mounting area may result in the failure of fully demonstrating high rigidity | accuracy of Pico Rod Less. When designing devices, pay due attention to rigidity of the areas such as mounting bases.

Max. Service Pressure

The piston area which is subjected to air pressure and the body area to which a work is mounted are connected by the magnetic force of the magnet at the piston area. Therefore, if the service pressure exceeds the Max. service pressure 0.6MPa, the body area will be disconnected to become free and uncontrollable. Be sure to use this machine at the pressure not higher than the Max. service pressure.

Intermediate Stopping

Intermediate stopping at the air pressure circuit by using a valve of the closed center, etc. is prohibited. If the piston area only is stopped forcefully, inertia force of the body and the work will disconnect the magnetic connection between the body and the piston, and the machine will become uncontrollable. Likewise, do not switch over the operation during stroke.

Connection with Load

Sufficient aligning is indispensable for connection with a load which is provided with external supporting mechanism. Though this machine can be used by directly applying a load within the allowable range on it, insufficiently aligned connection with a load which is provided with external supporting mechanism will give an adverse effect on operation, product life, etc.

The longer the stroke becomes, the larger the dislocation of the shaft center becomes. Therefore, use this machine by giving due consideration to the connecting method which will tolerate this misalignment.

Center of Gravity of Load

Bring the center of gravity of the load as close to the center of the table as possible. If the center of gravity of the load is located away from the center of the table, a large moment will be generated, giving an adverse effect on product life and rigidity. Use this machine within the allowable load and moment.

Stroke Adjustment

Stop the stroke by bringing the shock absorber into contact with the stopper at the body end. If the shock absorber is removed or adjustment is inappropriate, the rod cover will contact the plate at both ends, causing failure. Adjusting method page 619

Lubrication of the Linear Guide

Though inside of the guide table is filled with lubricant beforehand, the performance will deteriorate depending on the operating time, working conditions, environment, etc. Therefore, lubricant must be supplied periodically.

The use of the machine without proper refilling of lubricant may result in increased wear of the rolling areas or shorter product life.

Though the refilling interval of grease varies depending on the working conditions and environment, an interval of approximately 100km of running or one month is recommended.

After wiping off old grease, supply lithium soap-based grease through the grease nipples on the guide table. Supply of different grease may cause deterioration of lubrication performance or chemical change, leading to malfunction or failure.

Lubrication by application or dripping of turbine oil is also allowed.

Do not use spindle oil or machine oil because they will give an adverse effect on packings.

Lubrication of the peripheral surface of the tube

Apply the exclusive grease (urea-based grease) on the peripheral surface of the tube periodically (approx. every 300km).

Depletion of grease may give an adverse effect on durability.

The exclusive grease is included in the service parts set which is sold separately.

Oil supply compressed air

Operate this machine by using oil-less compressed air since initial lubrication is provided to the internal surface of the tube with the exclusive grease.

When grease is to be applied at the time of repair, use the exclusive grease which is included in the service parts set.

Play of the tube

The tube will move in the axial direction (approx. 1.5mm Max.) and in the circumferential direction slightly.

These are provided to prevent galling between the tube and the guide, and has nothing to do with abnormality.

Rolling Feel in Linear Guide

When the machine is moved manually, the rolling of the ball inside the linear guide may give you somewhat a feel of discontinuous operation, or rolling resistance may differ from one machine to another.

This is caused by the pre-load of the linear guide, and will give no influence on the performance.

Magnetizing of the body and the guide table

Since the body and the guide table are made of iron, if any magnet or magnetic product is brought to contact, they will be magnetized. Even after the magnet or the magnetic product is removed, the body and the guide table will remain magnetized.

If a switch is being used, this magnetism may cause malfunction of the switch. So, pay due attention to this phenomenon.

Projection and Stick-Slip

Magnetic rodless cylinders are subject to slight projection at the start of operation due to their structure.

In the middle of a stroke movement, a slight stick-slip phenomenon may occur.

Effect of Magnetic Force

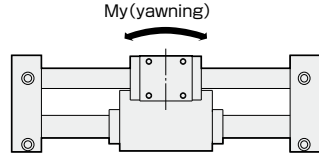
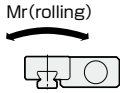
The piston integrates a magnet. Do not bring close to it any product or part that may be affected by magnetic force.

Linear guide of rust

Linear guide counterbore part of the rail end and for the bolts that connect the rail to the plate because there is no surface treatment (Raydent processing), we have applied the grease for rust, but handling state, the environment of use, duration of use, etc. some may be slightly rust occurs.

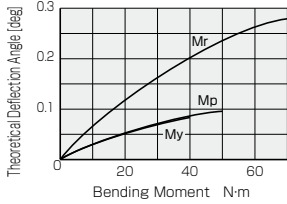
THEORETICAL DISPLACEMENT OF TABLE BY MOMENT

When external force is applied to the guide table or and the gravity acting on the loaded work, slight angular displacement occurs. Theoretical values of the displacement angle of the guide table by moment in each direction are shown in the graphs.

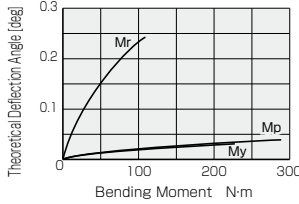


PICO RODLESS

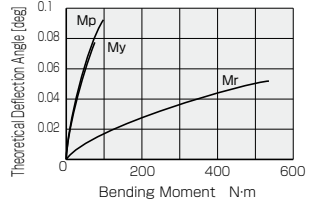
PRD-SD16



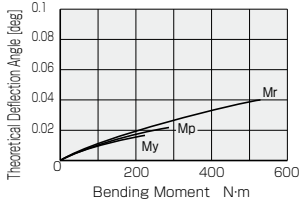
PRD-WG16



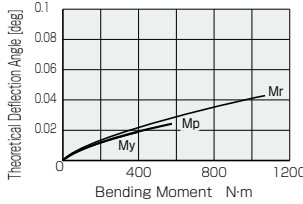
PRD-WR16



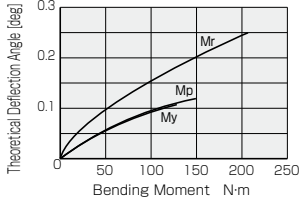
PRD-WA16



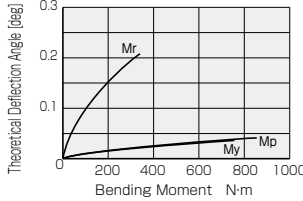
PRD-WH16



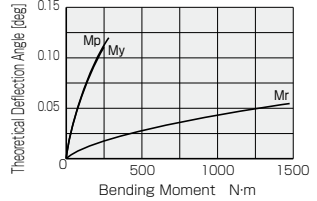
PRD-SD25



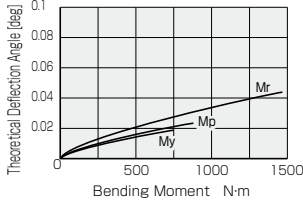
PRD-WG25



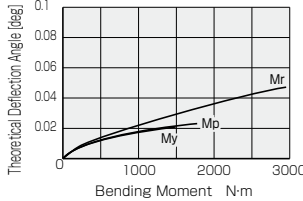
PRD-WR25



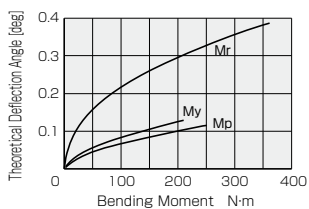
PRD-WA25



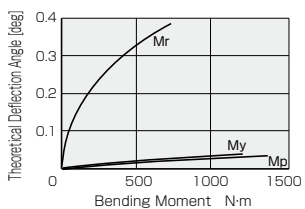
PRD-WH25



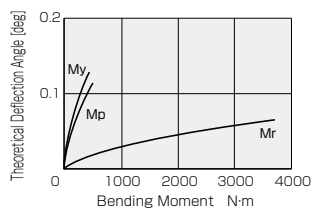
PRD-SD32



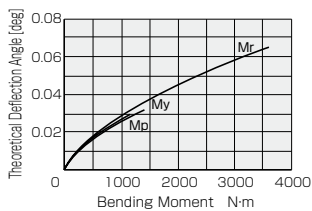
PRD-WG32



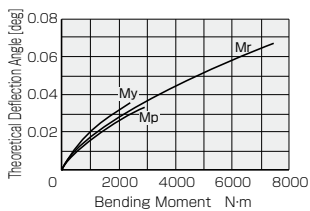
PRD-WR32



PRD-WA32



PRD-WH32



PICO RODLESS

■ ALLOWABLE LOAD MASS AND ALLOWABLE LOAD AND ALLOWABLE MOMENT

⚠ Caution

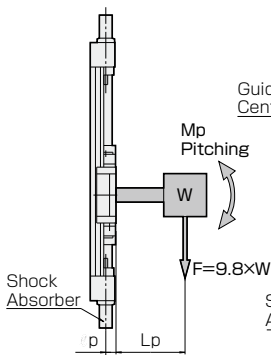
Allowable limit of load or force acting on the actuator is different according to the types of the load. Application under larger load than these allowable limits, gives bad influence to operation, accuracy and life of the actuator and in worst case the actuator may break down.

| Types of Load | Situation of Actuator | Situation of Load | Item to be confirmed |
|-----------------|-----------------------|---------------------|---|
| Mounted Load(W) | Operating | Continuously Acting | Basic Static Rated Load, Static Rated Moment, Allowable Inertia Mass, Allowable Absorber Collision Energy |
| External Force | Stopping | Temporarily Acting | Basic Static-load Rating, Allowable Static Moment |

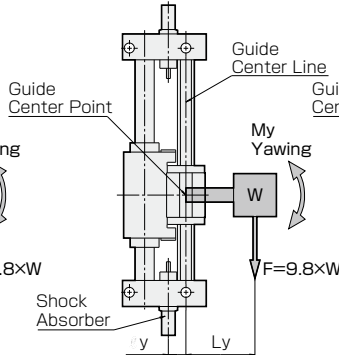
■ Directions of the Moment and the Positions of the Guide Center Line and the Shock Absorber

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

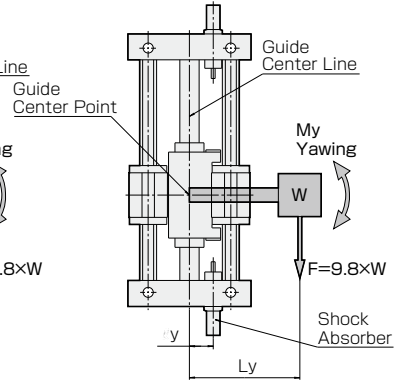
Pitching



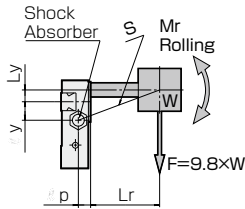
Yawing(SD, WG)



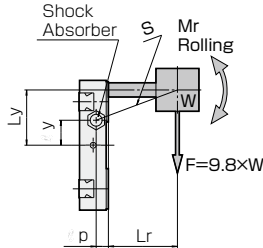
Yawing(WR, WA, WH)



Rolling(SD, WG)



Rolling(WR, WA, WH)



Lp, Ly, Lr..... Distance between guide center line and center of gravity of mounted load(m)
 p, y..... Distance between the center line of the guide and shock absorber(m)
 S..... Distance between center line of a loaded work and shock absorber(m)
 W..... Mounted load mass(kg)
 F..... Gravity applied on load(N)

POSITION OF THE SHOCK ABSORBER

Unit: m

| Shock Absorber Position | PRD16 | | PRD25 | | PRD32 | |
|-------------------------|--------|------------|--------|------------|--------|------------|
| | SD, WG | WR, WA, WH | SD, WG | WR, WA, WH | SD, WG | WR, WA, WH |
| ℓ p | 0.0095 | | 0.0110 | | 0.0150 | |
| ℓ y | 0.0155 | 0.0210 | 0.0205 | 0.0275 | 0.0280 | 0.0370 |

■ Allowable mass and Allowable moment in case of a loaded work, Allowable inertia mass


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

① Allowable Load Mass

Unit: kg

| Model | Guide Type | | | | |
|-------|-----------------|-------------------|---------------------|-------------------|-------------------|
| | Single Type(SD) | Serial Double(WG) | Parallel Double(WR) | 3 Guides Type(WA) | 4 Guides Type(WH) |
| PRD16 | 4 | 8 | 6.5 | 8 | 8 |
| PRD25 | 10 | 20 | 16 | 20 | 20 |
| PRD32 | 15 | 30 | 20 | 30 | 30 |

⚠ Caution

When this machine is used in the vertical direction, a thrust strong enough for the mass of the load may not be obtained depending on the air pressure even when used within the Max. loading mass, causing failure to operate at a required speed or to push the shock absorber to the stroke end.
Theoretical thrust  Page 615

② Allowable Loaded Work Moment

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

$$\begin{aligned} \text{(Mounted load moment)} &= (\text{Gravity applied on load: } F) \times (\text{Distance between guide center line and center of gravity of mounted load: } L) \\ &= 9.8 \times (\text{Mounted load mass: } W) \times (\text{Distance between guide center line and center of gravity of mounted load: } L) \end{aligned}$$

$$(\text{Gravity applied on load: } F) = 9.8 \times (\text{Mounted load mass: } W)$$

$$\text{Pitching} \cdots M_p (\text{N}\cdot\text{m}) = 9.8 \times W (\text{kg}) \times L_p (\text{m})$$

$$\text{Yawning} \cdots M_y (\text{N}\cdot\text{m}) = 9.8 \times W (\text{kg}) \times L_y (\text{m})$$

$$\text{Rolling} \cdots M_r (\text{N}\cdot\text{m}) = 9.8 \times W (\text{kg}) \times L_r (\text{m})$$

Allowable Loaded Work Moment

Unit: N·m

| Model | Guide Type | Allowable Loaded Work Moment (N·m) | | |
|-------|---------------------|------------------------------------|-----|-----|
| | | Mp | My | Mr |
| PRD16 | Single Type(SD) | 1.8 | 1.6 | 2.4 |
| | Serial Double(WG) | 10 | 9.4 | 4.0 |
| | Parallel Double(WR) | 2.9 | 2.6 | 21 |
| | 3 Guides Type(WA) | 10 | 9.4 | 21 |
| | 4 Guides Type(WH) | 17 | 15 | 32 |
| PRD25 | Single Type(SD) | 5.6 | 5.0 | 8.1 |
| | Serial Double(WG) | 32 | 29 | 13 |
| | Parallel Double(WR) | 9.0 | 8.1 | 59 |
| | 3 Guides Type(WA) | 32 | 29 | 59 |
| | 4 Guides Type(WH) | 54 | 49 | 91 |
| PRD32 | Single Type(SD) | 9.9 | 8.3 | 14 |
| | Serial Double(WG) | 56 | 48 | 23 |
| | Parallel Double(WR) | 15 | 13 | 118 |
| | 3 Guides Type(WA) | 56 | 48 | 118 |
| | 4 Guides Type(WH) | 90 | 78 | 237 |

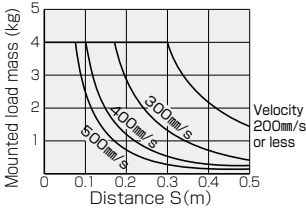
1N·m=0.102kgf·m

③ Allowable Inertia Mass

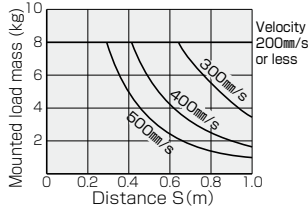
When the shock absorber runs against the stopper support of the body and the actuator stops, a force is generated due to the inertia of the loaded work. The value of the force varies depending on the shape of loaded work, mounting method, mounting position, working pressure, and various other conditions. It is, therefore, very difficult to obtain uniform allowable values.

Here, the relation among "collision speed contact with a shock absorber", "mass of loaded work" and "distance between the center of gravity of loaded work and shock absorber position" are theoretically calculated as shown in the graph below. Refer to this as a criterion for judging the allowable values of a loaded work. The distance S is the distance between the center of gravity of the loaded work and the shock absorber. Refer to the figure of rolling under the title of "Direction of moment and center line position of guide and shock absorber" on previous page.

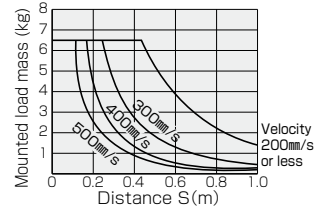
PRD-SD16



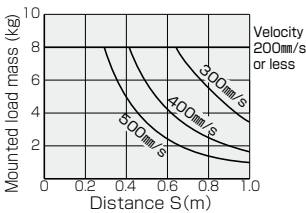
PRD-WG16



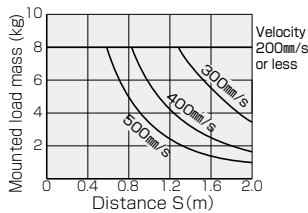
PRD-WR16



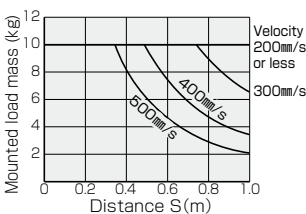
PRD-WA16



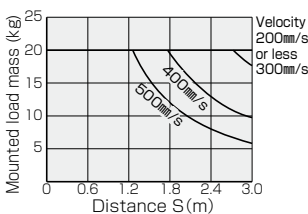
PRD-WH16



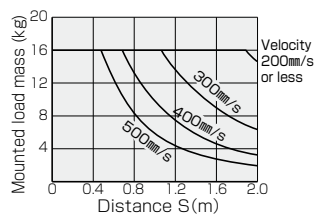
PRD-SD25



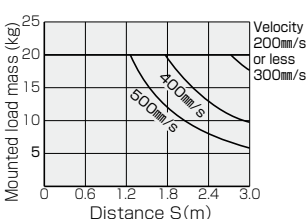
PRD-WG25



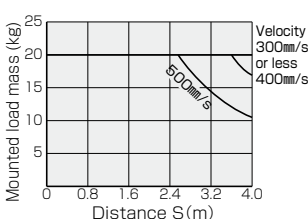
PRD-WR25



PRD-WA25

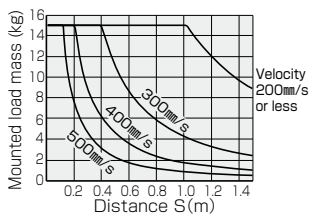


PRD-WH25

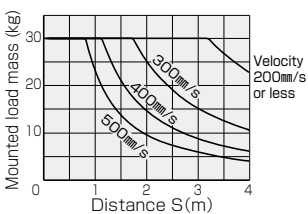


NOTE: When stopping the actuator using an external metal stopper a very large shock force is generated. Determine allowable load mass to be a value of about 1/5~1/10 of the loaded mass shown in the above graphs.

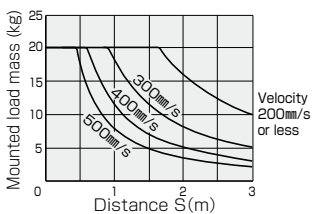
PRD-SD32



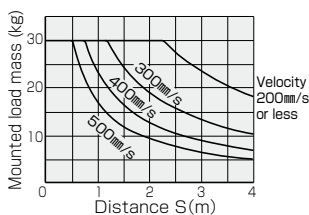
PRD-WG32



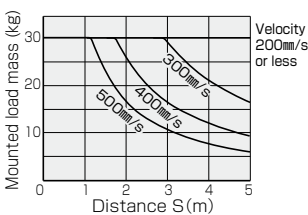
PRD-WR32



PRD-WA32



PRD-WH32

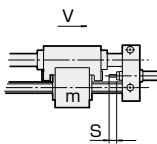
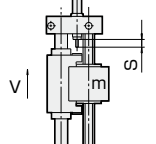
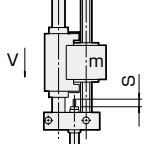


④ Shock Absorber Collision Energy

The energy that the shock absorber of the stopper must absorb consists of three elements: kinetic energy, energy of cylinder thrust and energy due to gravity.

The energy upon collision is the total of all these.

See the shock absorber specifications and energy absorption graph below to use the product within the shock absorber specifications.

| Usage Condition Example | Horizontal Use | Vertical Upward Use | Vertical Downward Use |
|-------------------------|---|---|---|
| |  |  |  |
| Collision Energy E | $E = 1/2(mV^2) + Fs$ | $E = 1/2(mV^2) + Fs - mgs$ | $E = 1/2(mV^2) + Fs + mgs$ |

E : Collision Energy(J)
 m : Colliding Mass(kg)
 V : Collision Velocity(m/s)
 F : Cylinder Thrust(N)
 s : Shock Absorber Stroke(m)
 g : Gravity Acceleration(9.8m/s²)

SHOCK ABSORBER SPECIFICATIONS

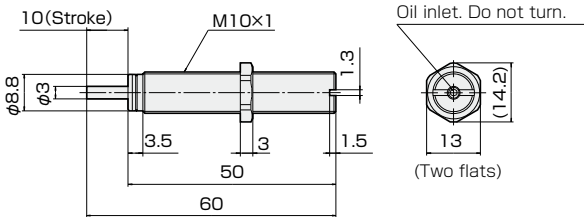
| Model | ABK10 | ABK12 | ABK14 | ABK18 | ABK20 |
|------------------------------|-----------------|----------------------|----------|----------|----------|
| * Max Energy Absorption | 3J | 6.86J | 9.8J | 19.6J | 29.4J |
| Stroke | 10mm | 10mm | 12mm | 15mm | 16mm |
| Energy Absorption Per Minute | 60.8J/min | 98J/min | 176J/min | 294J/min | 343J/min |
| Max. Collision Velocity | 1m/s | | | | |
| Usage Frequency | 60c.p.m or less | | | | |
| Operating Temperature Range | -5~70°C | | | | |
| Piston Rod Return Force | 4.9N | 9.8N | 8.9N | 20.6N | 30N |
| Applicable Model | PRD16-QW | PRD16-QD PRD25-QW | PRD25-QD | PRD32-QW | PRD32-QD |

Refer to the absorption energy graph on page 632, 633 for details.

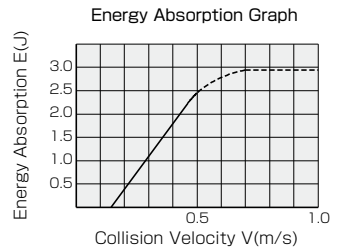
Note: Shock absorber was replaced to new type.
 New shock absorber can be replaced to conventional shock absorber.

DIMENSION OF SHOCK ABSORBER

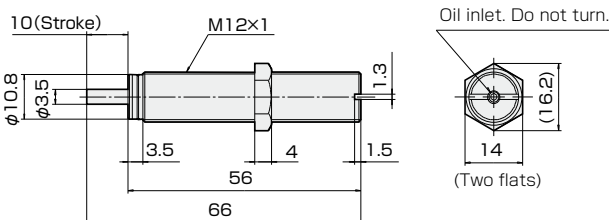
MODEL: ABK10(FOR PSD16-QW)



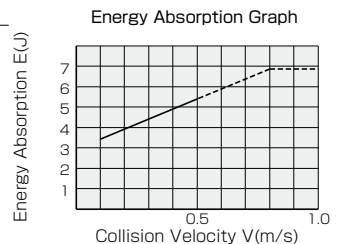
ABK10 is 8mm shorter than RABS10.



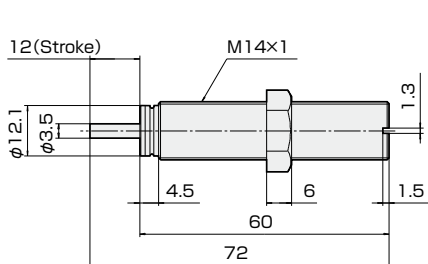
MODEL: ABK12(FOR PRD16-QD, PRD25-QW)



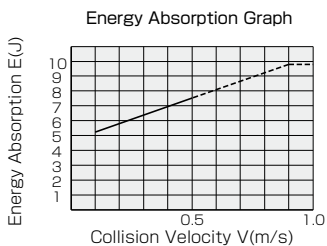
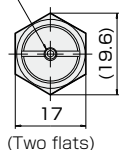
ABK12 is same length as RABS12.



MODEL: ABK 14(FOR PRD25-QD)

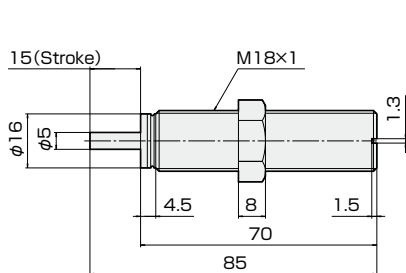


Oil inlet. Do not turn.

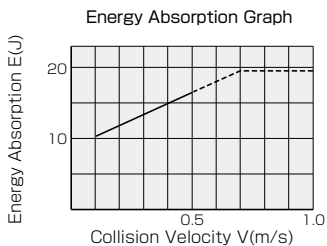
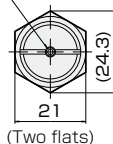


ABK10 is 1.5mm shorter than RABS14.

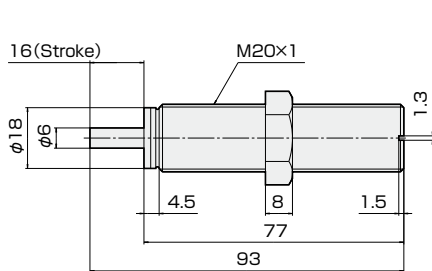
MODEL: ABK 18(FOR PRD32-QW)



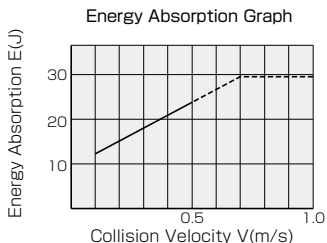
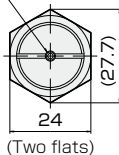
Oil inlet. Do not turn.



MODEL: ABK20(FOR PRD32-QD)



Oil inlet. Do not turn.



■ Allowable Load and Allowable Moment for External Force (Motionless)

In the case that an external force is applied temporarily when the actuator stops at the stroke end or so, confirm that the following two values are within allowable range.

① External Force Value (Basic Static Load Rating)

② External Moment (Static Moment Rating)

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

If a guide table receives an excessive load or a large impact, 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 load rating C_0 , the static moment rating M_{p0} , M_{y0} and M_{r0} mean such a static load and static moment of constant direction and the total of the permanent deformation values at the ball rolling surface is 0.0001 times of the ball diameter on the contact surface receiving the maximum stress.

The static moment applied to the table is limited under C_0 , M_{p0} , M_{y0} and M_{r0} with considering about static safety factor, f_s .

$C_0 \geq f_s \cdot P$ C_0 : basic static load rating N $M_{p0} \geq f_s \cdot M_{p1}$ M_{p0} , M_{y0} , M_{r0} : Static moment rating N·m
 P : static load N $M_{y0} \geq f_s \cdot M_{y1}$ M_{p1} , M_{y1} , M_{r1} : Static moment N·m
 f_s : static safety factor $M_{r0} \geq f_s \cdot M_{r1}$ f_s : Static safety factor

STATIC SAFETY FACTOR f_s

| Load Conditions | Lower Limit of f_s |
|------------------------|----------------------|
| Impact with Light Load | 1.0~1.3 |
| Impact with Heavy Load | 2.0~3.0 |

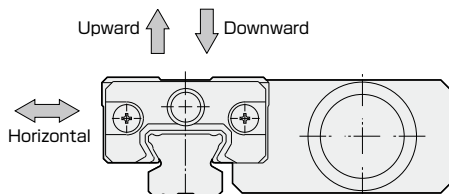
BASIC STATIC LOAD RATING, STATIC MOMENT RATING

| Model | Guide Type | Basic Static Load Rating KN | Static Moment Rating N·m | | |
|-------|--------------------------|--------------------------------|--------------------------|----------|----------|
| | | | M_{p0} | M_{y0} | M_{r0} |
| PRD16 | Single Type(SD) | 19.3 | 50 | 40 | 70 |
| | Serial Double Type(WG) | 31.2 | 290 | 230 | 110 |
| | Parallel Double Type(WR) | 31.2 | 100 | 80 | 540 |
| | 3 Guides Type(WA) | 41.6 | 290 | 230 | 540 |
| | 4 Guides Type(WH) | 50.9 | 580 | 460 | 1080 |
| PRD25 | Single Type(SD) | 39.5 | 150 | 130 | 210 |
| | Serial Double Type(WG) | 63.9 | 870 | 760 | 340 |
| | Parallel Double Type(WR) | 63.9 | 300 | 260 | 1470 |
| | 3 Guides Type(WA) | 85.3 | 870 | 760 | 1470 |
| | 4 Guides Type(WH) | 104 | 1740 | 1520 | 2940 |
| PRD32 | Single Type(SD) | 56.8 | 250 | 210 | 360 |
| | Serial Double Type(WG) | 92 | 1410 | 1220 | 583 |
| | Parallel Double Type(WR) | 92 | 490 | 420 | 3690 |
| | 3 Guides Type(WA) | 122 | 1410 | 1220 | 3690 |
| | 4 Guides Type(WH) | 150 | 2820 | 2440 | 7380 |

$1N \cdot m = 0.102 \text{ kgf} \cdot m$
 $1N = 0.102 \text{ kgf}$

BASIC RATED STATIC LOAD, RATED STATIC MOMENT

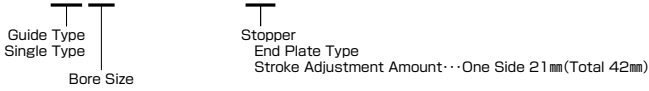
Basic rated static load C_0 listed in the table above indicates a value of downward load. Upward and horizontal load values can be obtained by the table below.



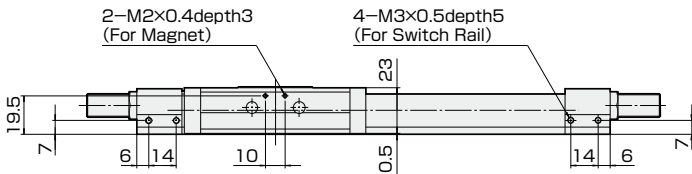
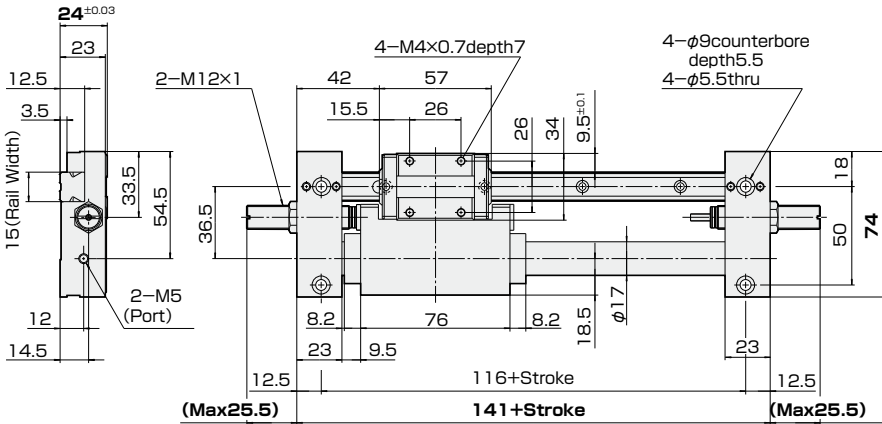
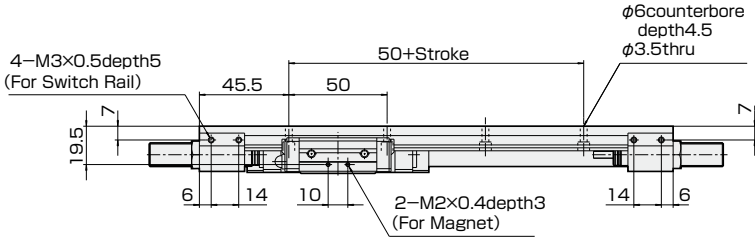
| Rated Load | Basic Rated Static Load |
|------------|-------------------------|
| Downward | C_0 |
| Upward | $0.5C_0$ |
| Horizontal | $0.43C_0$ |

DIMENSIONS(mm) PRD16 WITH SINGLE GUIDE TYPE END PLATE STOPPER

PRD-SD16-(Stroke)-QD



Standard Stroke Page 614



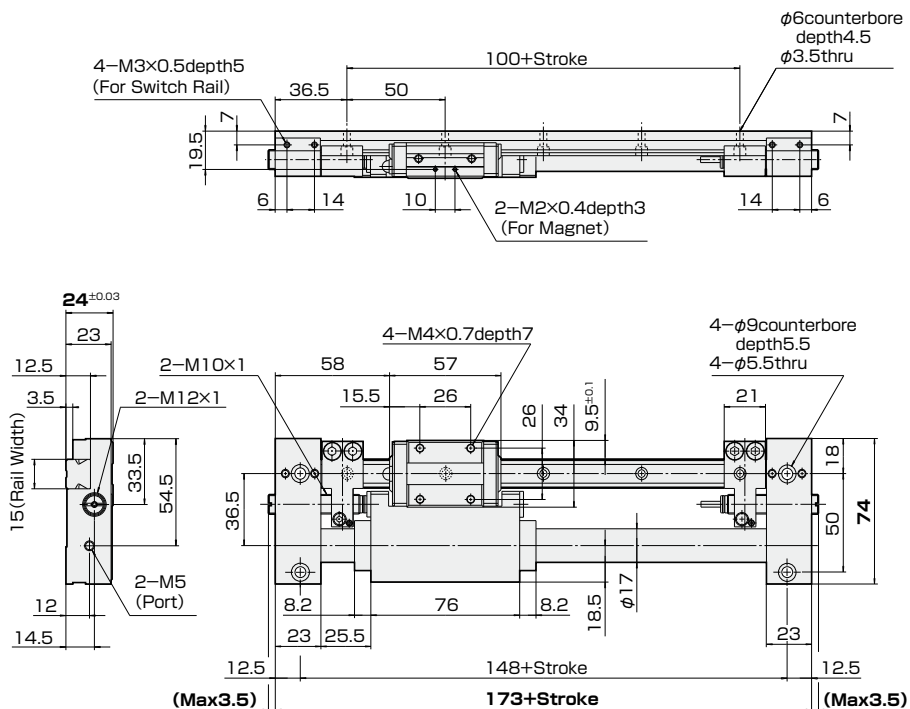
Dimensions of switch installed type PRDS (with magnet) Page 666

DIMENSIONS(mm) PRD16 WITH SINGLE GUIDE TYPE INTERMEDIATE UNIT TYPE STOPPER

PRD-SD16-(Stroke)-QW



Standard Stroke Page 614



PRD-SD16-QW PICO RODLESS



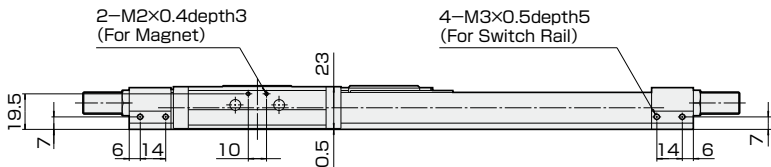
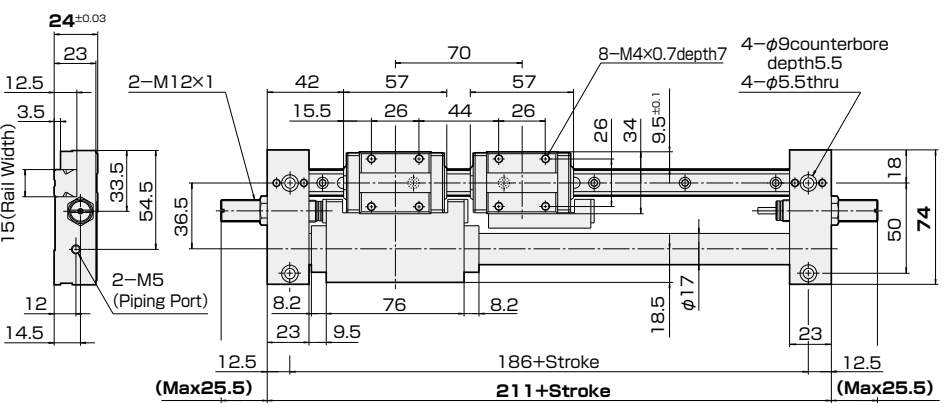
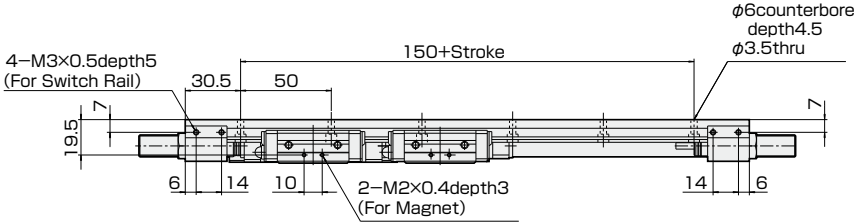
Dimensions of switch installed type PRDS (with magnet) Page 666

DIMENSIONS(mm) PRD16 WITH SERIAL DOUBLE GUIDE TYPE END PLATE STOPPER

PRD-WG16-(Stroke)-QD

Guide Type
 Serial Double Type
 Bore Size
 Stopper
 End Plate Type
 Stroke Adjustment Amount...One Side 21mm (Total 42mm)

Standard Stroke Page 614



Dimensions of switch installed type PRDS (with magnet) Page 666

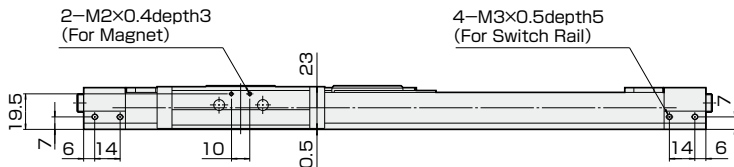
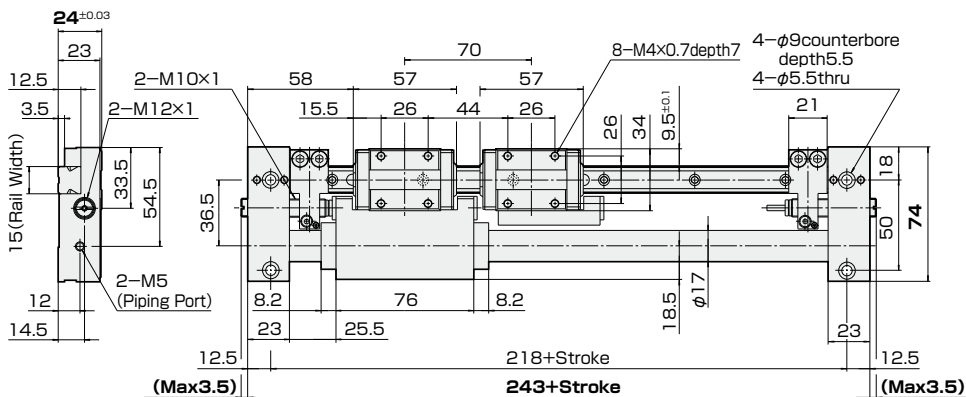
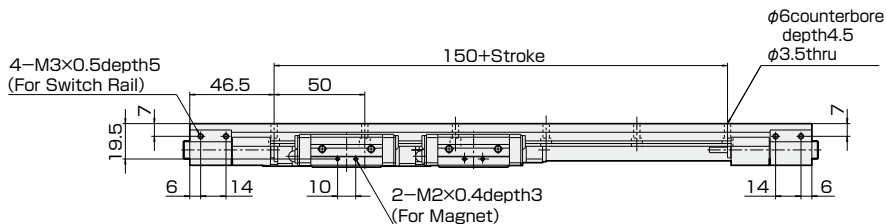
DIMENSIONS(mm) PRD16 WITH SERIAL DOUBLE GUIDE TYPE INTERMEDIATE UNIT TYPE STOPPER

PRD-WG16-(Stroke)-QW

Guide Type
Serial Double Type
Bore Size

Stopper
Intermediate Unit Type
Stroke Adjustment Amount...0~Stroke Value

Standard Stroke Page 614



Dimensions of switch installed type PRDS (with magnet) Page 667

PRD-WG16-QW PICO RODLESS

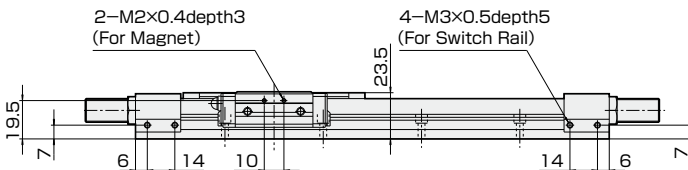
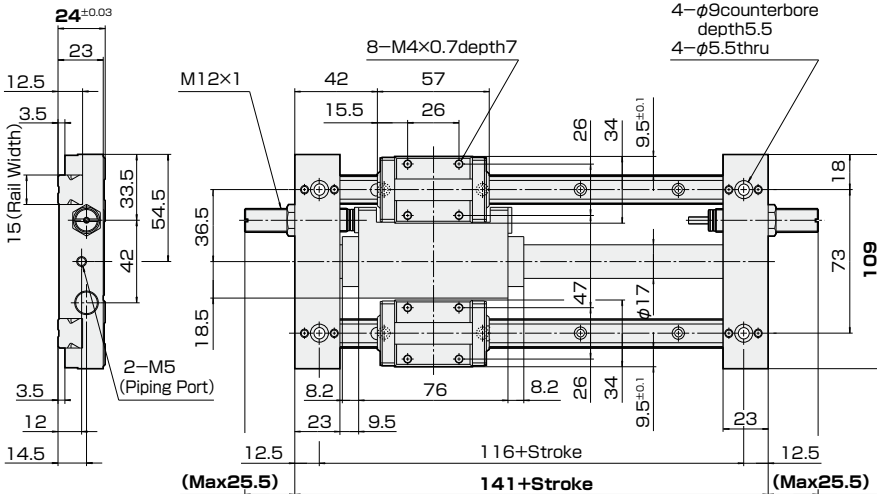
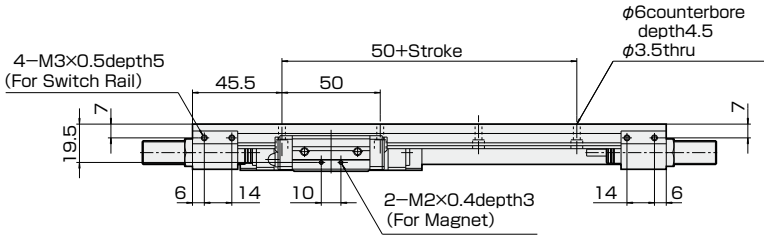
DIMENSIONS(mm) PRD16 WITH PARALLEL DOUBLE GUIDE TYPE END PLATE STOPPER

PRD-WR16-(Stroke)-QD

Guide Type
Parallel Double Type
Bore Size

Stopper
End Plate Type
Stroke Adjustment Amount...One Side 21mm(Total 42mm)

Standard Stroke Page 614



Dimensions of switch installed type PRDS (with magnet) Page 666

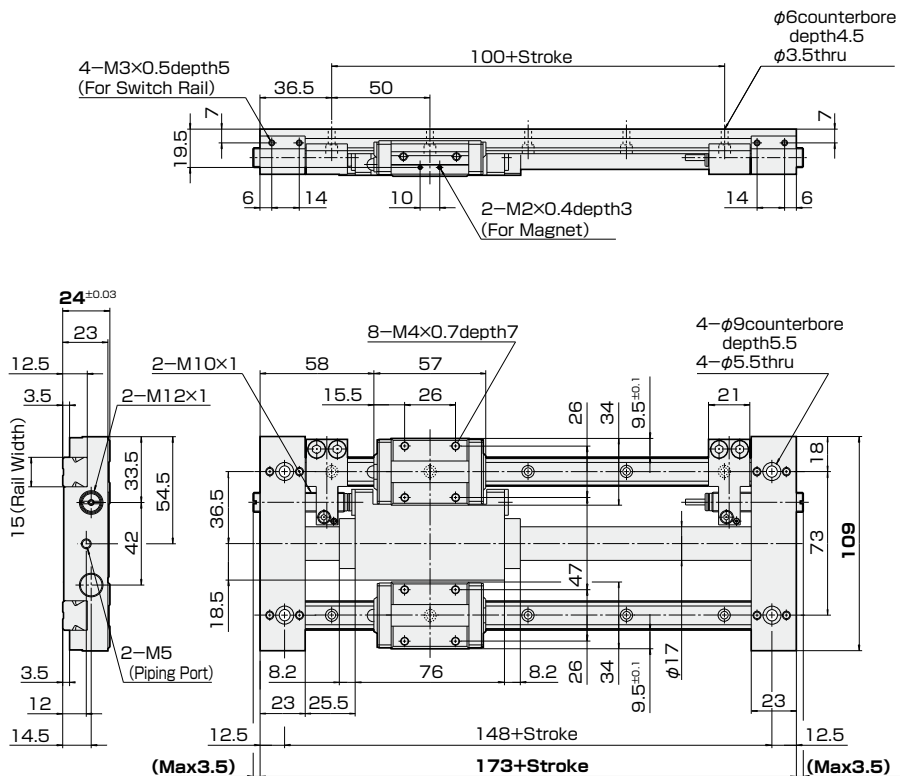
DIMENSIONS(mm) PRD16 WITH PARALLEL DOUBLE GUIDE TYPE INTERMEDIATE UNIT TYPE STOPPER

PRD-WR16-(Stroke)-QW

Guide Type
Parallel Double Type
Bore Size

Stopper
Intermediate Unit Type
Stroke Adjustment Amount...0~Stroke Value

Standard Stroke Page 614



PRD-WR16-QW PICO RODLESS

Dimensions of switch installed type PRDS (with magnet) Page 666

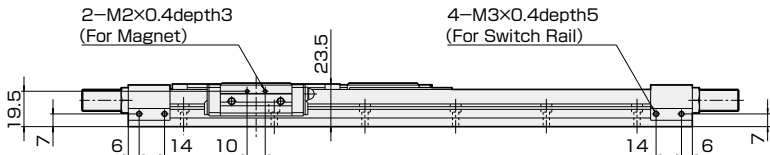
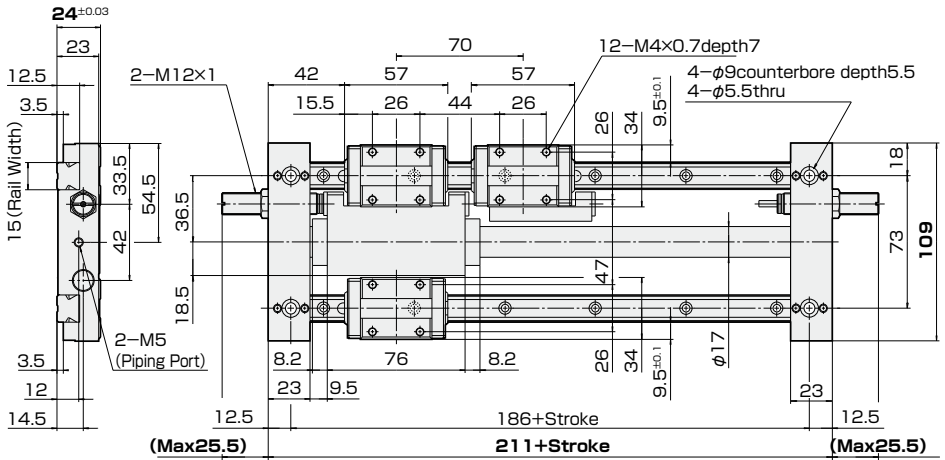
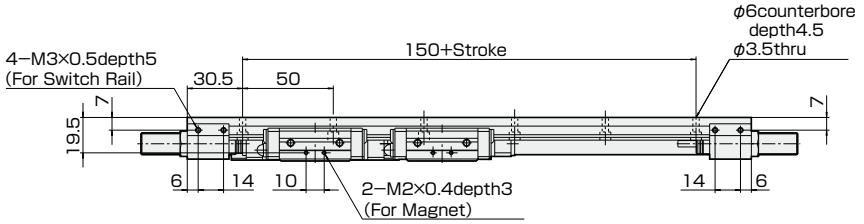
DIMENSIONS(mm) PRD16 WITH 3 GUIDES TYPE END PLATE STOPPER

PRD-WA16-(Stroke)-QD

Guide Type
3 Guides Type
Bore Size

Stopper
End Plate Type
Stroke Adjustment Amount...One Side 21mm(Total 42mm)

Standard Stroke Page 614



Dimensions of switch installed type PRDS (with magnet) Page 666

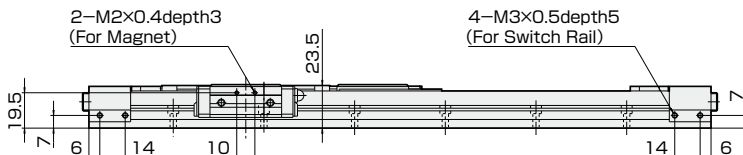
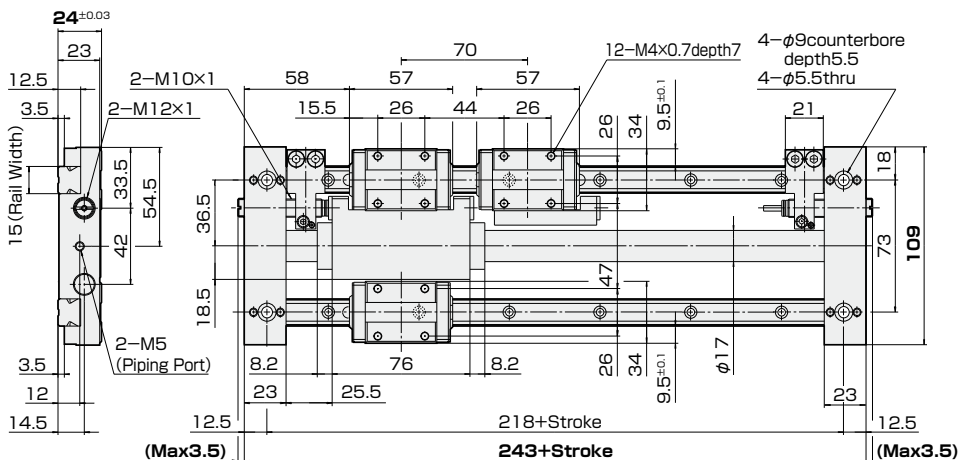
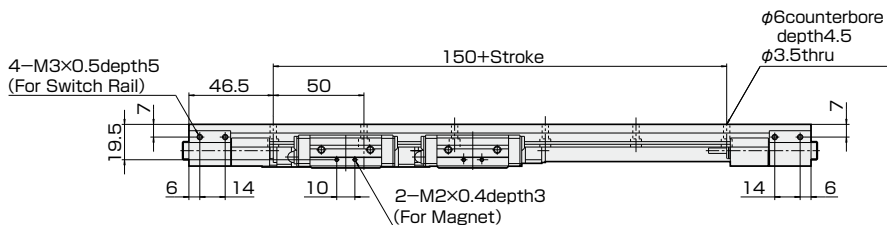
DIMENSIONS(mm) PRD16 WITH 3 GUIDES TYPE INTERMEDIATE UNIT TYPE STOPPER

PRD-WA16-(Stroke)-QW

Guide Type
3 Guides Type
Bore Size

Stopper
Intermediate Unit Type
Stroke Adjustment Amount...0~Stroke Value

Standard Stroke Page 614



Dimensions of switch installed type PRDS (with magnet) Page 667

PRD-WA16-QW PICO RODLESS



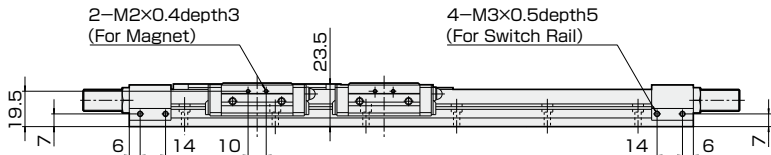
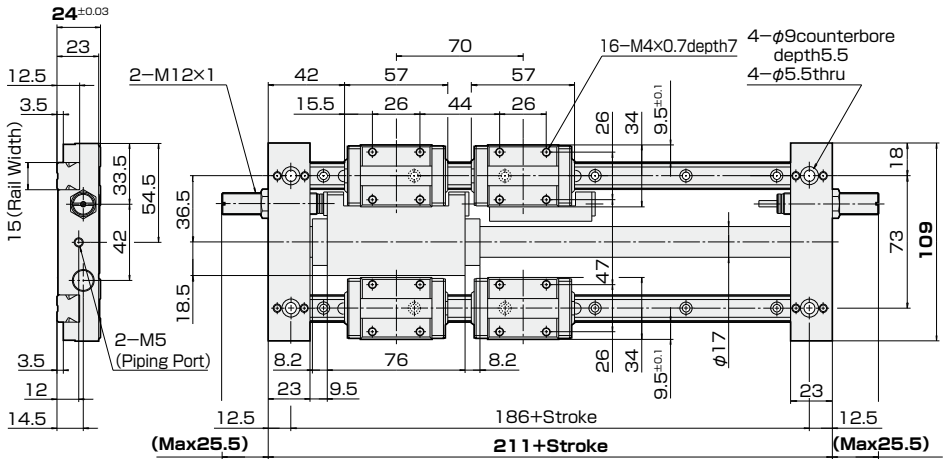
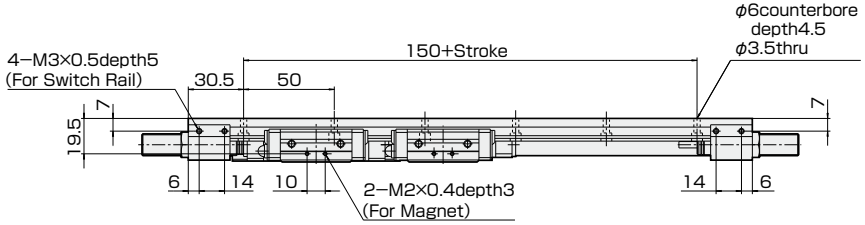
DIMENSIONS(mm) PRD16 WITH 4 GUIDES TYPE END PLATE STOPPER

PRD-WH16-(Stroke)-QD

Guide Type
4 Guides Type
Bore Size

Stopper
End Plate Type
Stroke Adjustment Amount...One Side 21mm(Total 42mm)

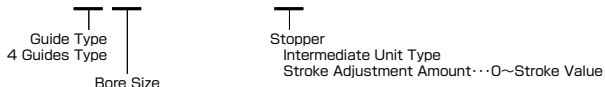
Standard Stroke Page 614



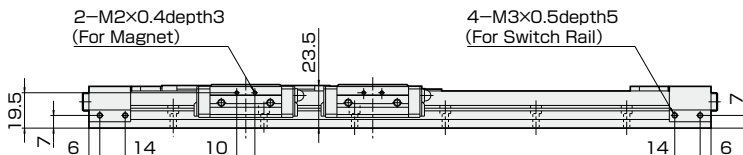
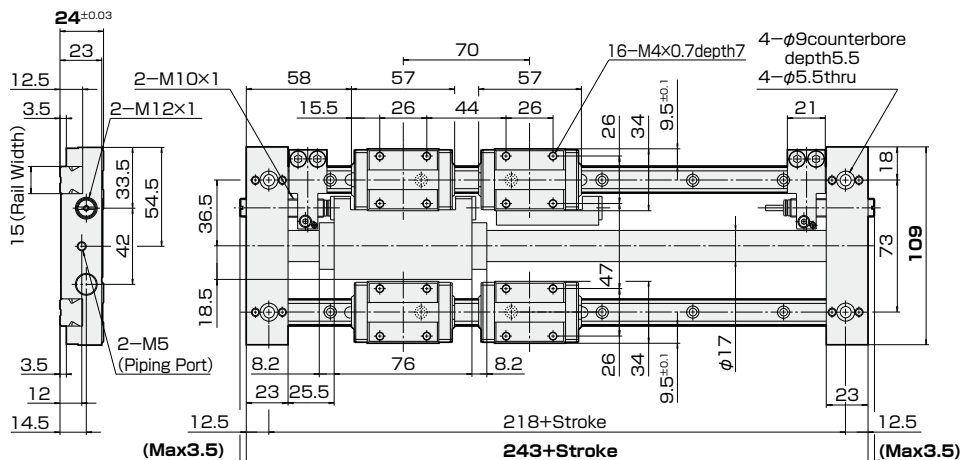
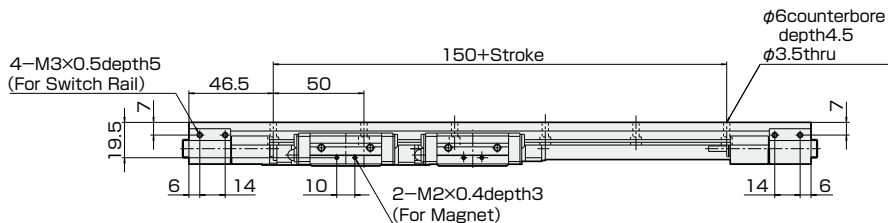
Dimensions of switch installed type PRDS (with magnet) Page 667

DIMENSIONS(mm) PRD16 WITH 4 GUIDES TYPE INTERMEDIATE UNIT TYPE STOPPER

PRD-WH16-(Stroke)-QW



Standard Stroke Page 614



Dimensions of switch installed type PRDS (with magnet) Page 667

PRD-WH16-QW PICO RODLESS



DIMENSIONS(mm) PRD25 WITH SINGLE GUIDE TYPE END PLATE STOPPER

PRD-SD25-(Stroke)-QD

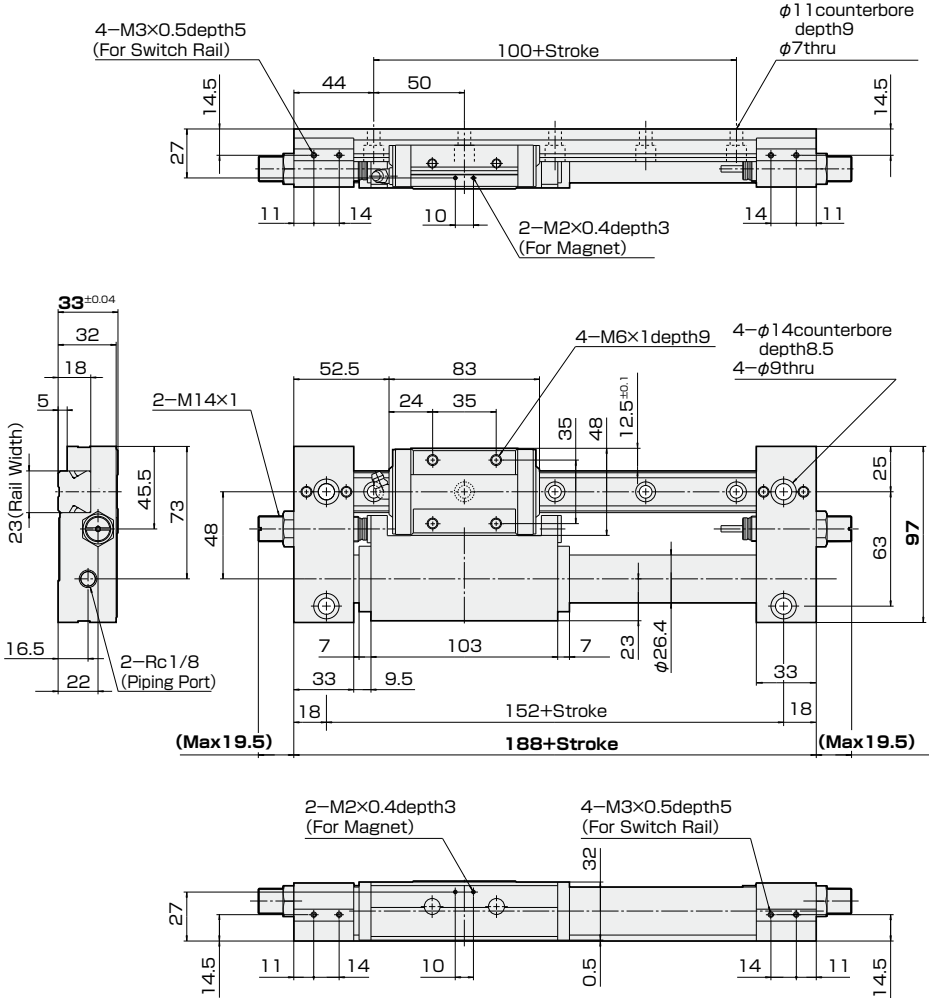
Guide Type
Single Type
Bore Size

Stopper
End Plate Type
Stroke Adjustment Amount...One Side 13mm(Total 26mm)

Standard Stroke Page 614

DJI

PRD-SD25-QD PICO RODLESS



Dimensions of switch installed type PRDS (with magnet) Page 666

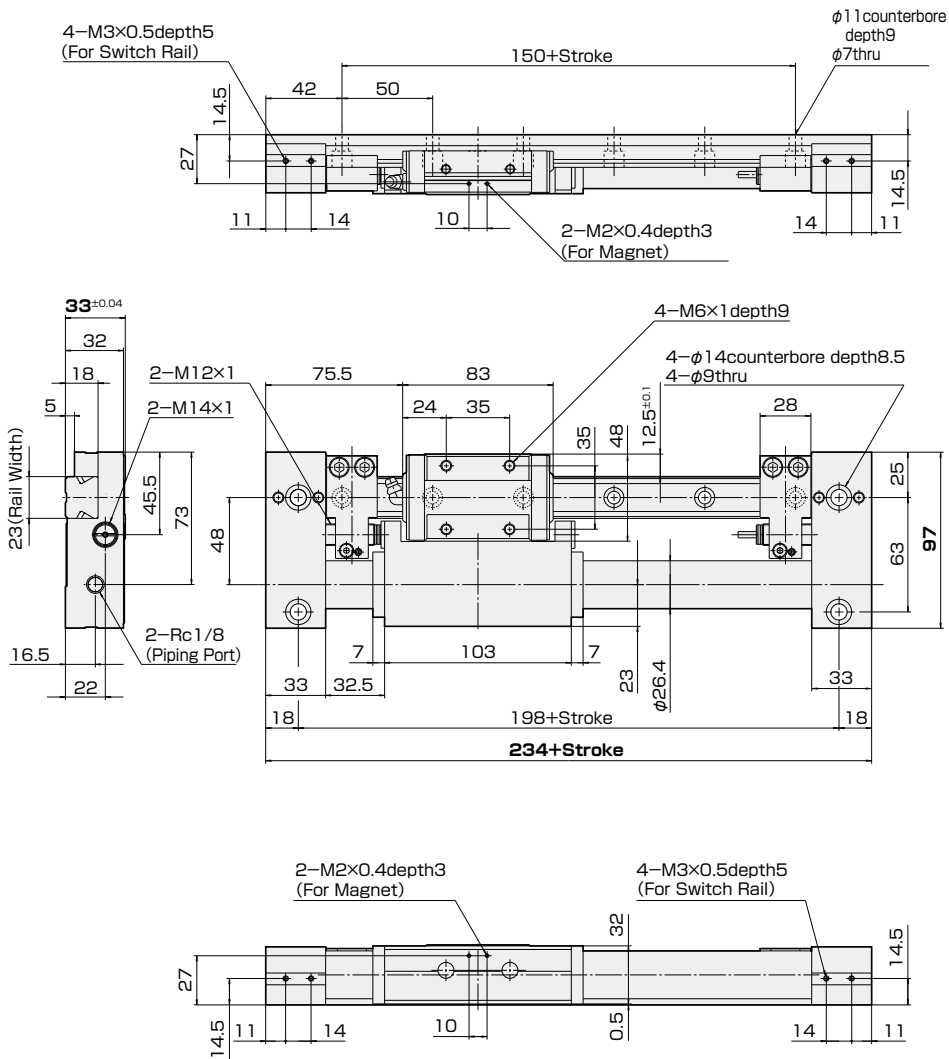
DIMENSIONS(mm) PRD25 WITH SINGLE GUIDE TYPE INTERMEDIATE UNIT TYPE STOPPER

PRD-SD25-(Stroke)-QW

Guide Type
Single Type
Bore Size

Stopper
Intermediate Unit Type
Stroke Adjustment Amount...0--Stroke Value

Standard Stroke Page 614



PRD-SD25-QW PICO RODLESS

Dimensions of switch installed type PRDS (with magnet) Page 666

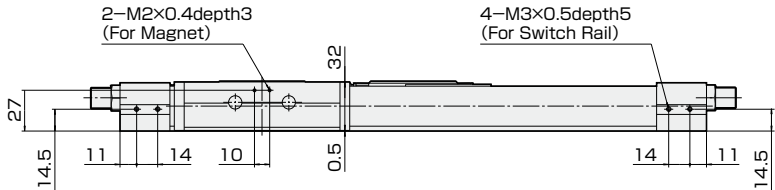
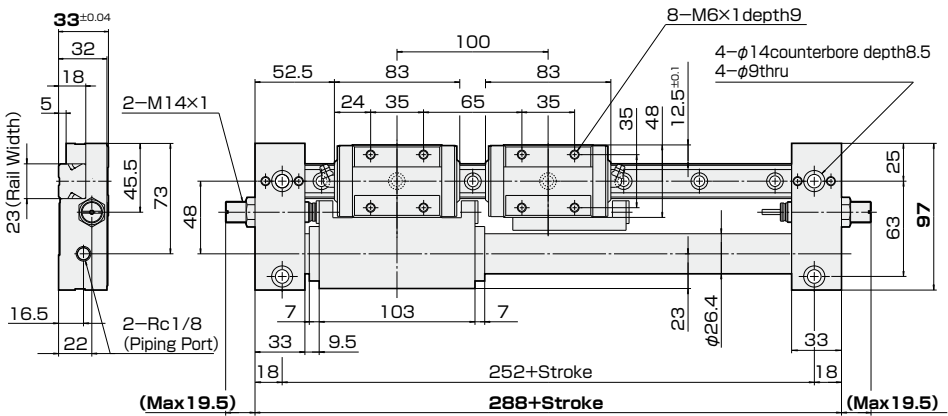
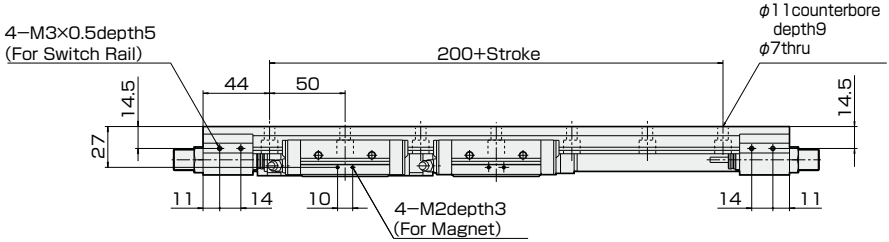
DIMENSIONS(mm) PRD25 WITH SERIAL DOUBLE GUIDE TYPE END PLATE STOPPER

PRD-WG25--(Stroke)-QD

Guide Type
Serial Double Type
Bore Size

Stopper
End Plate Type
Stroke Adjustment Amount...One Side 13mm(Total 26mm)

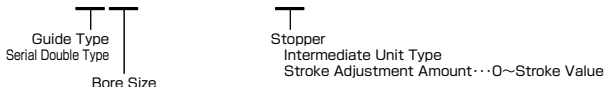
Standard Stroke Page 614



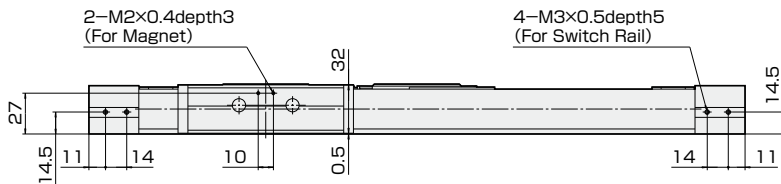
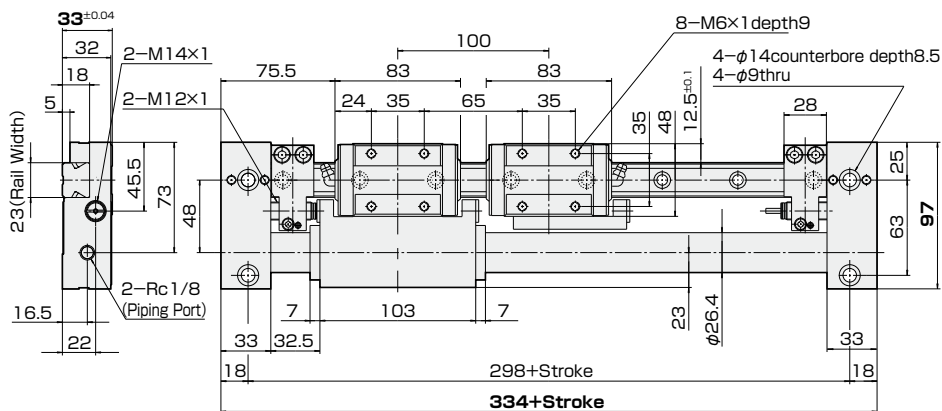
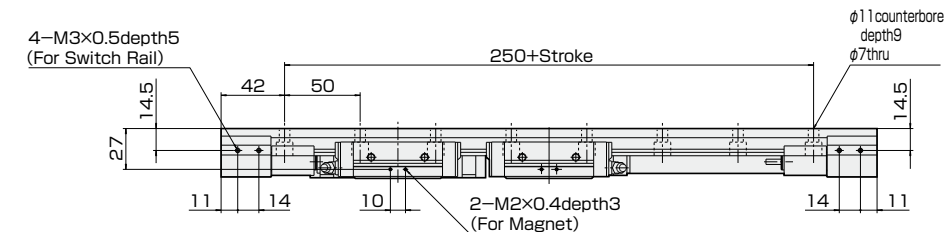
Dimensions of switch installed type PRDS (with magnet) Page 666

DIMENSIONS(mm) PRD25 WITH SERIAL DOUBLE GUIDE TYPE INTERMEDIATE UNIT TYPE STOPPER

PRD-WG25-(Stroke)-QW



Standard Stroke Page 614



Dimensions of switch installed type PRDS (with magnet) Page 667

QW

PRD-WG25-QW PICO RODLESS

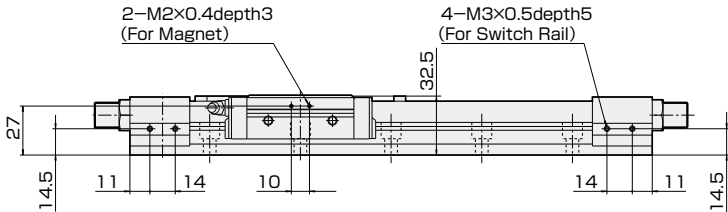
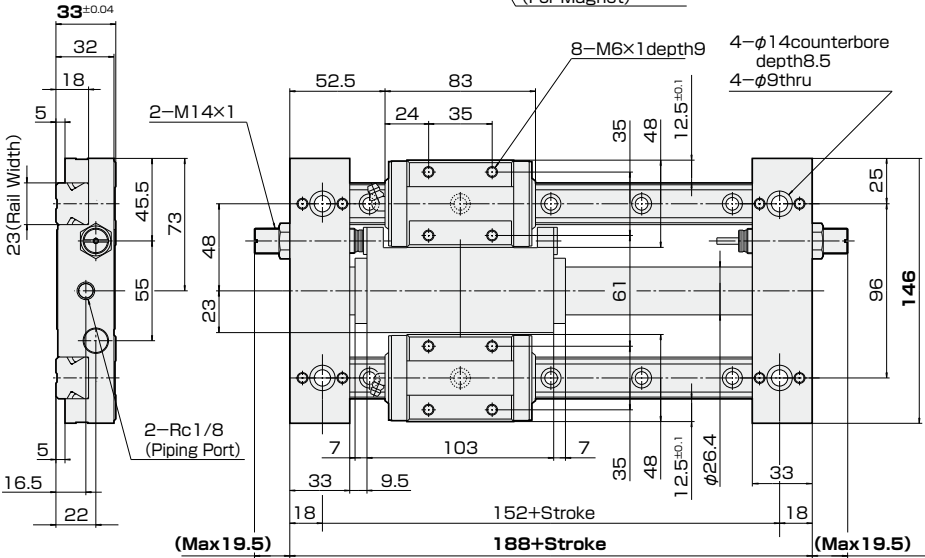
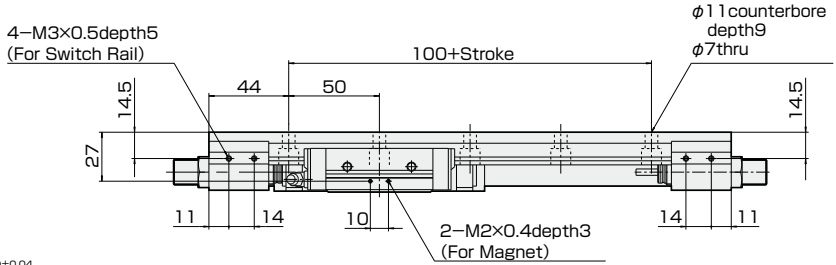
DIMENSIONS(mm) PRD25 WITH PARALLEL DOUBLE GUIDE TYPE END PLATE STOPPER

PRD-WR25-(Stroke)-QD

Guide Type
Parallel Double Type
Bore Size

Stopper
End Plate Type
Stroke Adjustment Amount...One Side 13mm(Total 26mm)

Standard Stroke Page 614



Dimensions of switch installed type PRDS (with magnet) Page 666

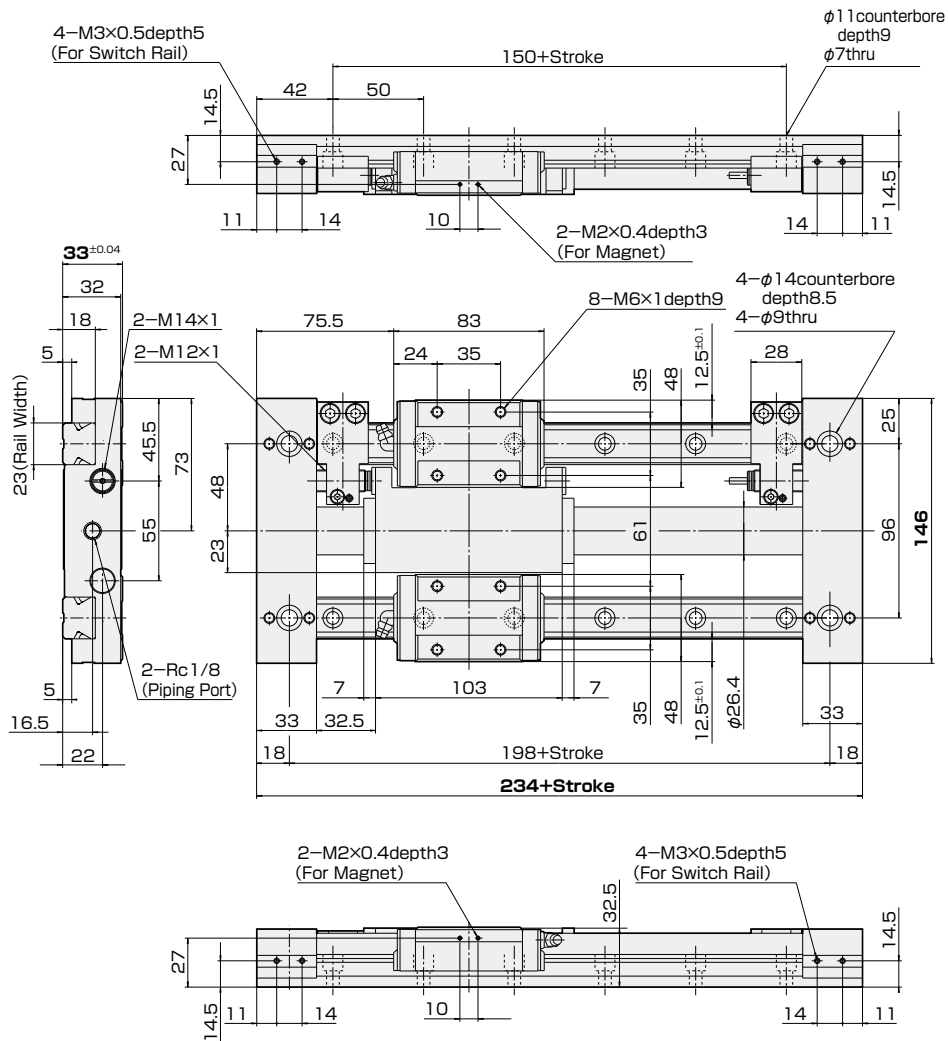
DIMENSIONS(mm) PRD25 WITH PARALLEL DOUBLE GUIDE TYPE INTERMEDIATE UNIT TYPE STOPPER

PRD-WR25-(Stroke)-QW

Guide Type
Parallel Double Type
Bore Size

Stopper
Intermediate Unit Type
Stroke Adjustment Amount...0~Stroke Value

Standard Stroke Page 614



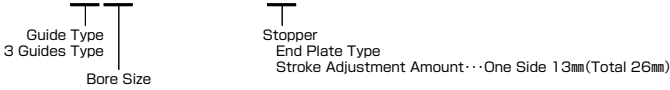
Dimensions of switch installed type PRDS (with magnet) Page 666



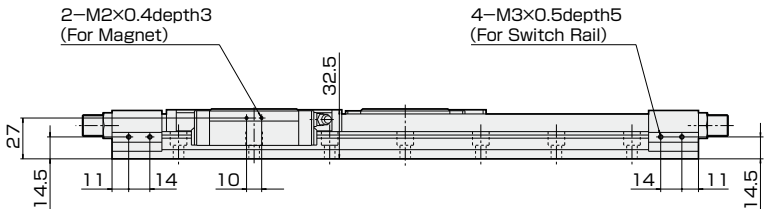
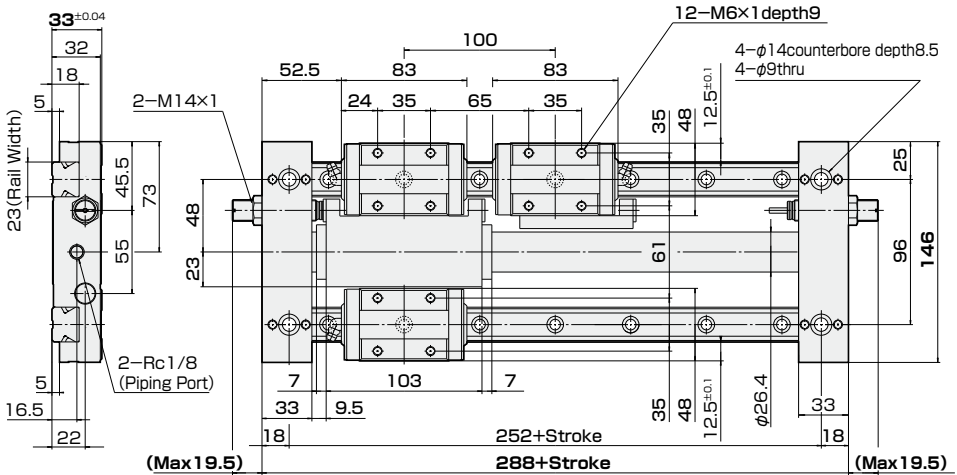
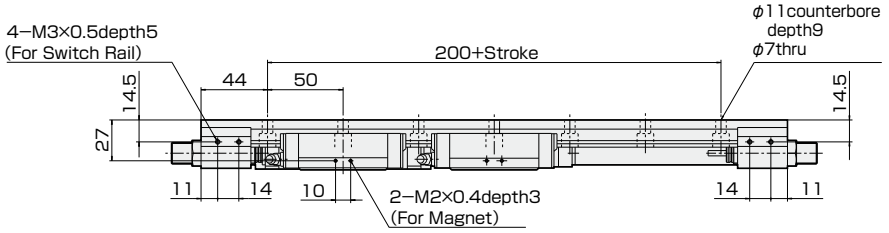
PRD-WR25-QW PICO RODLESS

DIMENSIONS(mm) PRD25 WITH 3 GUIDES TYPE END PLATE STOPPER

PRD-WA25-(Stroke)-QD



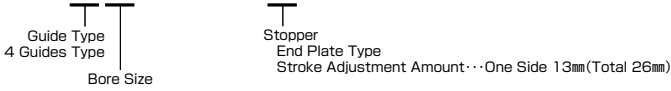
Standard Stroke Page 614



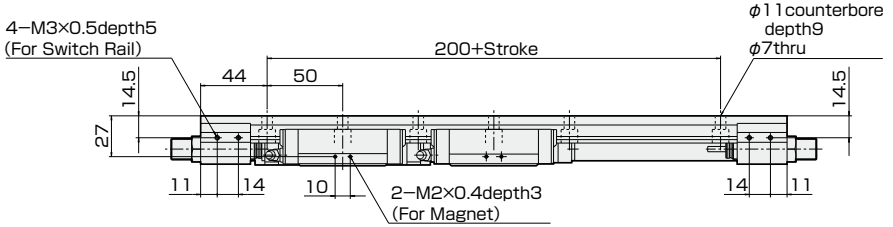
Dimensions of switch installed type PRDS (with magnet) Page 667

DIMENSIONS(mm) PRD25 WITH 4 GUIDES TYPE END PLATE STOPPER

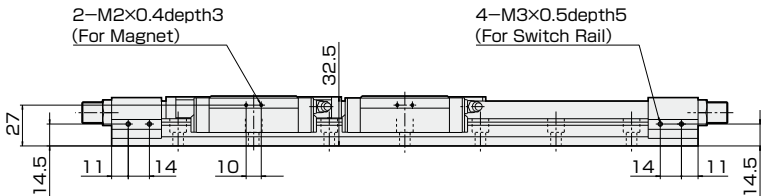
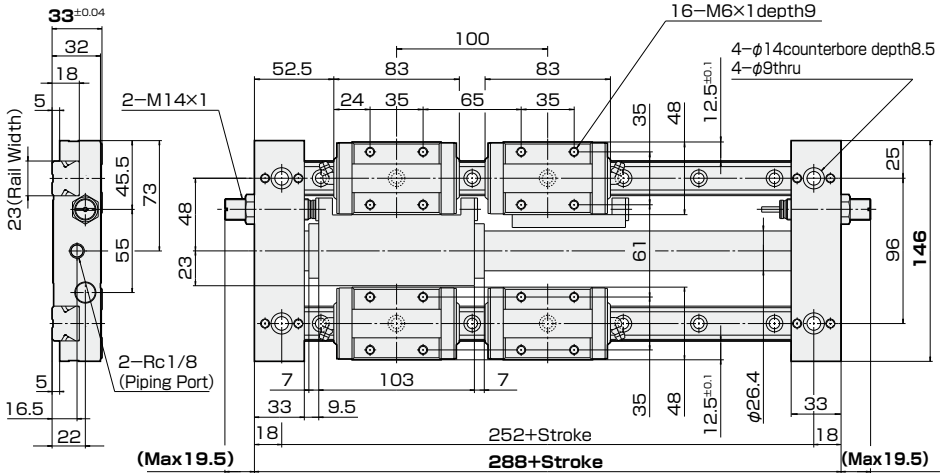
PRD-WH25-(Stroke)-QD



Standard Stroke Page 614



PRD-WH25-QD PICO RODLESS



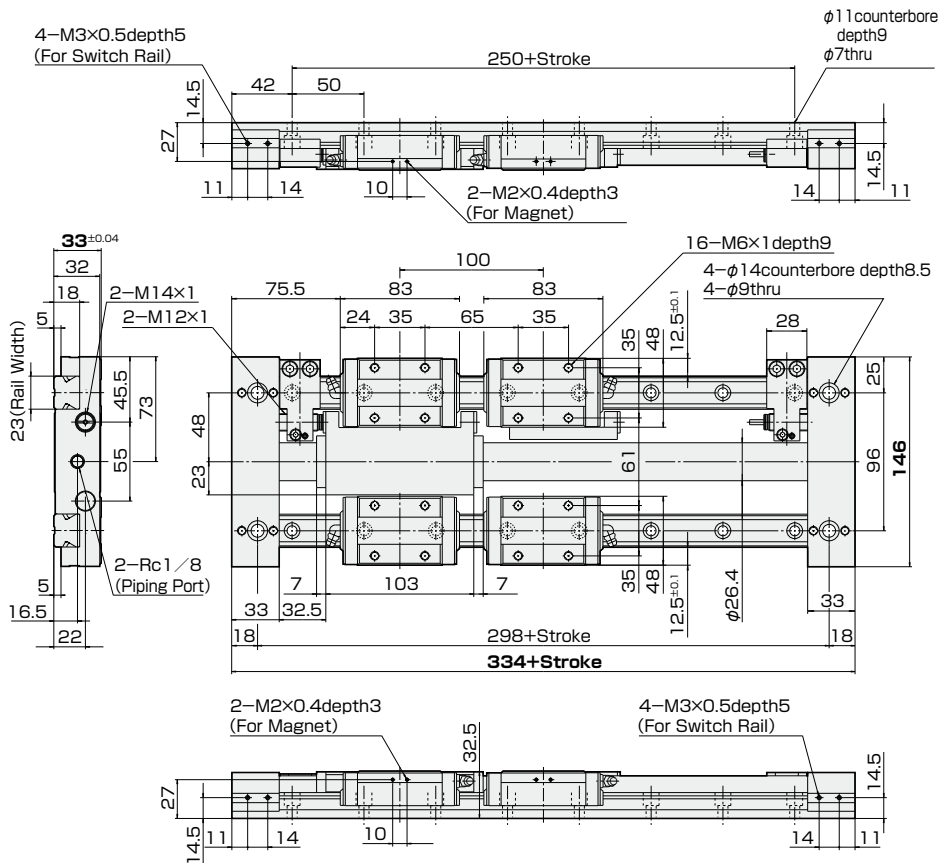
Dimensions of switch installed type PRDS (with magnet) Page 667

DIMENSIONS(mm) PRD25 WITH 4 GUIDES TYPE INTERMEDIATE UNIT TYPE STOPPER

PRD-WH25-(Stroke)-QW



Standard Stroke Page 614

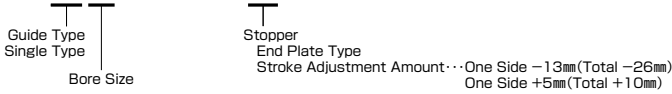


PRD-WH25-QW PICO RODLESS

Dimensions of switch installed type PRDS (with magnet) Page 667

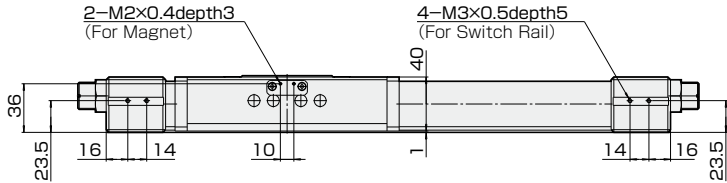
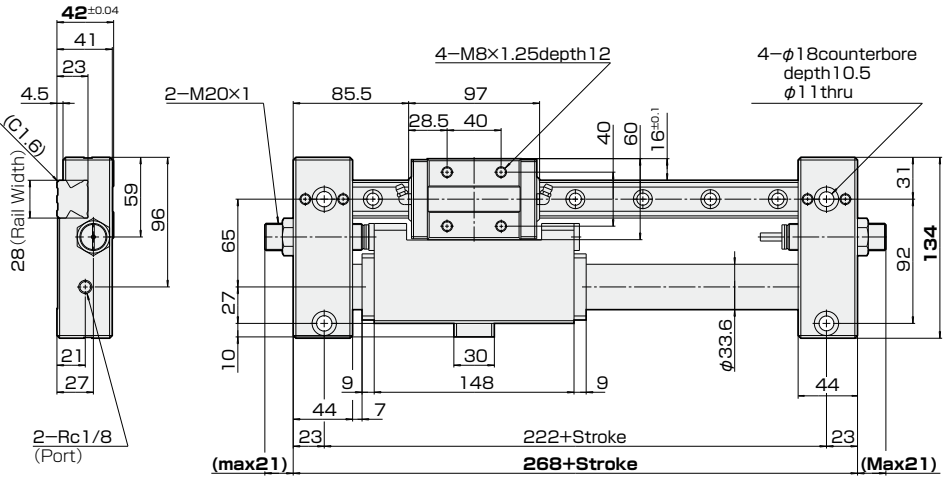
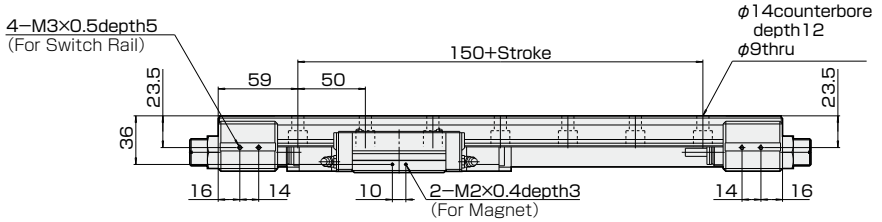
DIMENSIONS(mm) PRD32 WITH SINGLE GUIDE TYPE END PLATE STOPPER

PRD-SD32-(Stroke)-QD



Standard Stroke Page 614

Dimension of Shock Absorber Page 633



Dimensions of switch installed type PRDS (with magnet) Page 666

DIMENSIONS(mm) PRD32 WITH SINGLE GUIDE TYPE INTERMEDIATE UNIT TYPE STOPPER

PRD-SD32-(Stroke)-QW

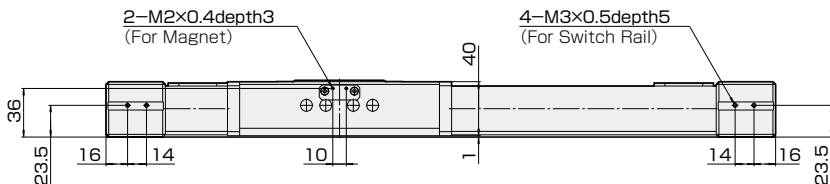
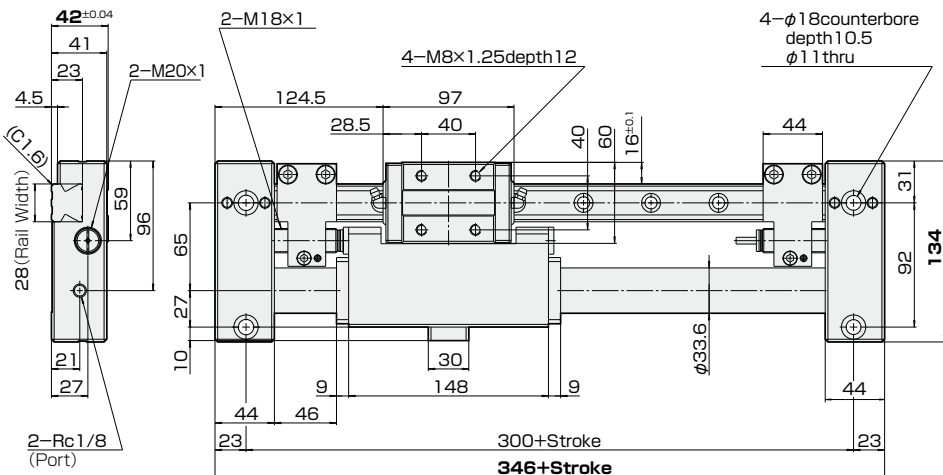
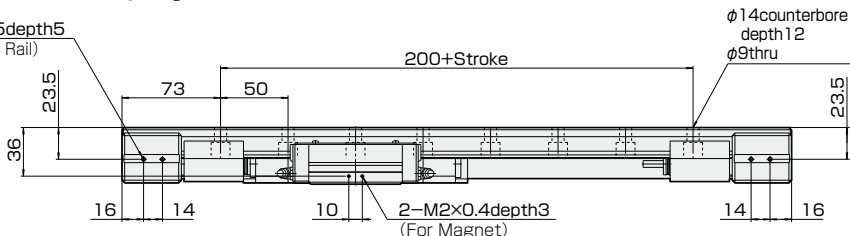
Guide Type
Single Type
Bore Size

Stopper
Intermediate Unit Type
Stroke Adjustment Amount...0~Stroke Value
One Side +5mm(Total +10mm)

Standard Stroke Page 614

Dimension of Shock Absorber Page 633

4-M3×0.5depth5
(For Switch Rail)



Dimensions of switch installed type PRDS (with magnet) Page 666



PRD-SD32-QW PICO RODLESS

DIMENSIONS(mm) PRD32 WITH SERIAL DOUBLE GUIDE TYPE END PLATE STOPPER

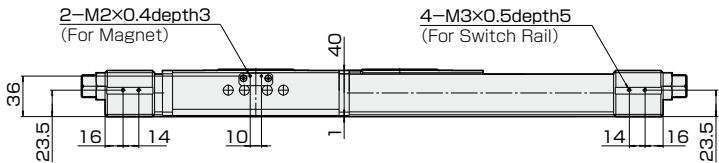
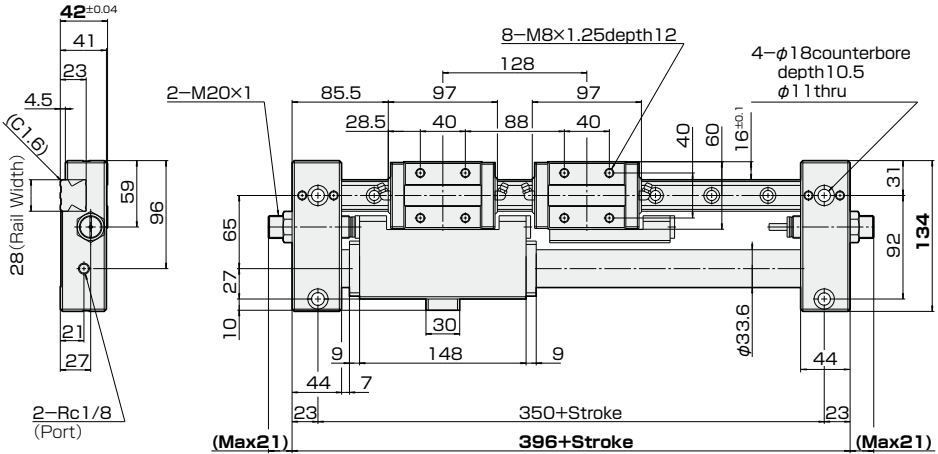
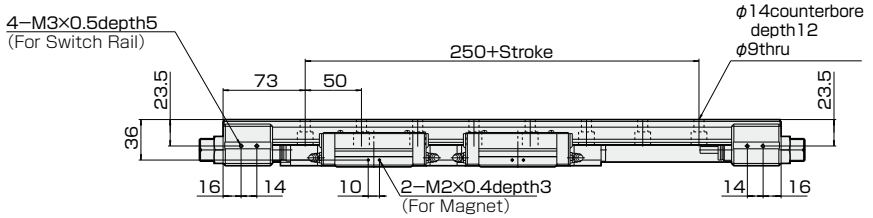
PRD-WG32--(Stroke)--QD

Guide Type
 Serial Double Type
 Bore Size

Stopper
 End Plate Type
 Stroke Adjustment Amount... One Side -13mm(Total -26mm)
 One Side +5mm(Total +10mm)

Standard Stroke Page 614

Dimension of Shock Absorber Page 633



Dimensions of switch installed type PRDS (with magnet) Page 667

DIMENSIONS(mm) PRD32 WITH SERIAL DOUBLE GUIDE TYPE INTERMEDIATE UNIT TYPE STOPPER

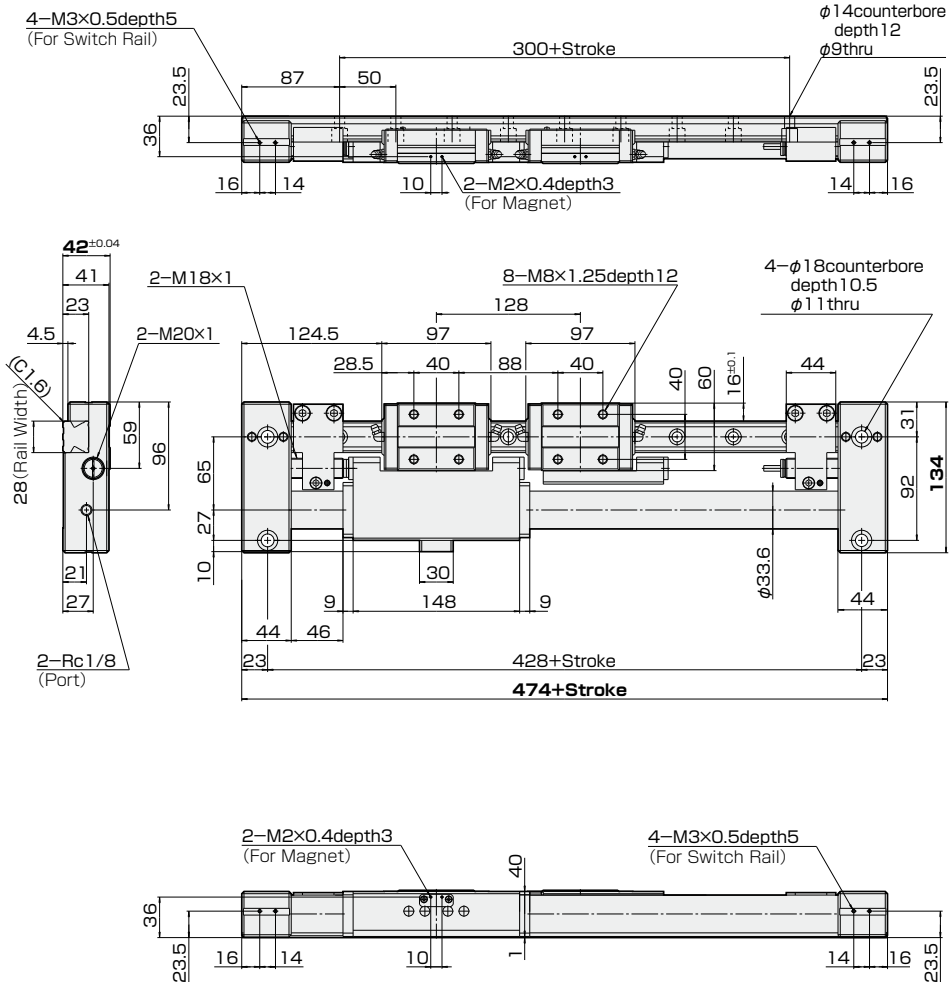
PRD-WG32-(Stroke)-QW

Guide Type
Serial Double Type
Bore Size

Stopper
Intermediate Unit Type
Stroke Adjustment Amount...0~Stroke Value
One Side +5mm(Total +10mm)

Standard Stroke Page 614

Dimension of Shock Absorber Page 633



PRD

PRD-WG32-QW PICO RODLESS

Dimensions of switch installed type PRDS (with magnet) Page 667

DIMENSIONS(mm) PRD32 WITH PARALLEL DOUBLE GUIDE TYPE END PLATE STOPPER

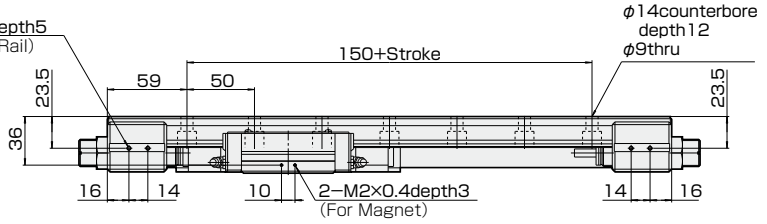
PRD-WR32-(Stroke)-QD

Guide Type
Parallel Double Type
Bore Size

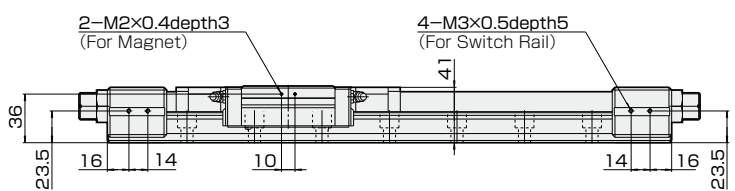
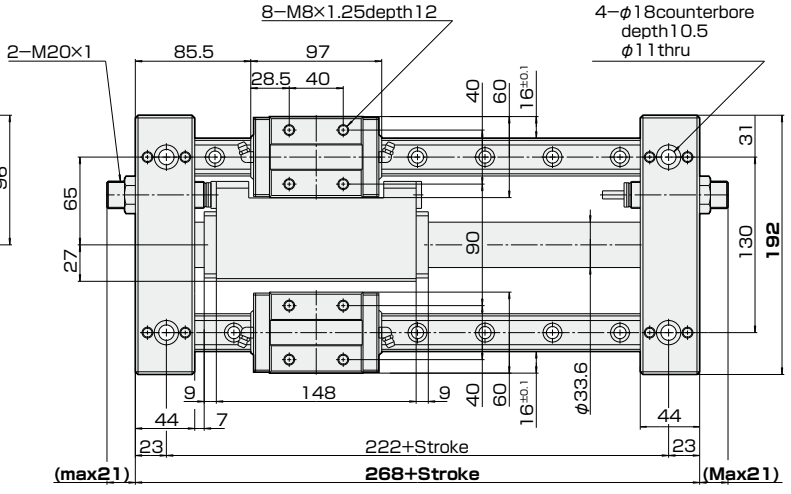
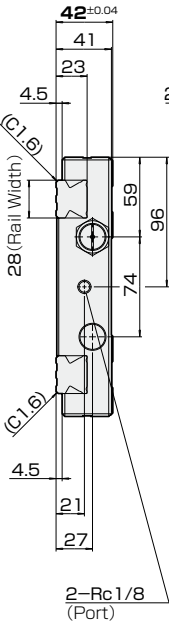
Stopper
End Plate Type
Stroke Adjustment Amount... One Side -13mm (Total -26mm)
One Side +5mm (Total +10mm)

Standard Stroke Page 614

Dimension of Shock Absorber Page 633



PRD-WR32-QD PICO RODLESS



Dimensions of switch installed type PRDS (with magnet) Page 666

DIMENSIONS(mm) PRD32 WITH PARALLEL DOUBLE GUIDE TYPE INTERMEDIATE UNIT TYPE STOPPER

PRD-WR32-(Stroke)-QW

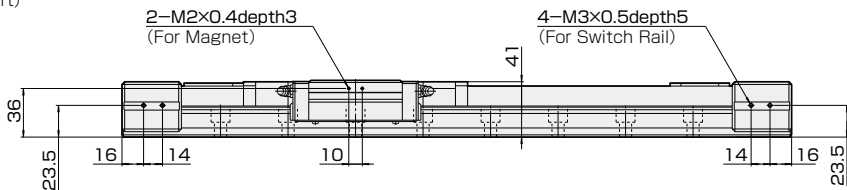
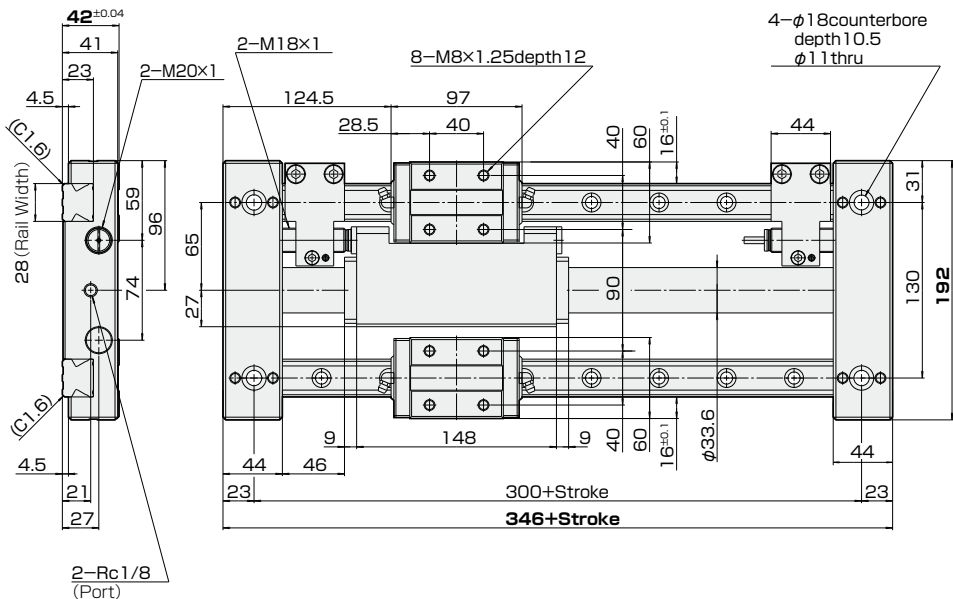
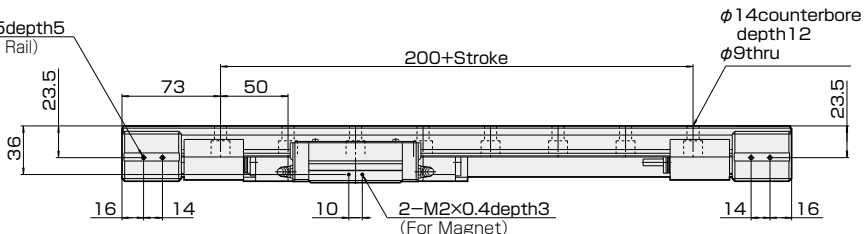
Guide Type
Parallel Double Type
Bore Size

Stopper
Intermediate Unit Type
Stroke Adjustment Amount... 0-Stroke Value
One Side +5mm(Total +10mm)

Standard Stroke Page 614

Dimension of Shock Absorber Page 633

4-M3×0.5depth5
(For Switch Rail)



PRD-WR32-QW PICO RODLESS

Dimensions of switch installed type PRDS (with magnet) Page 666

DIMENSIONS(mm) PRD32 WITH 3 GUIDES TYPE END PLATE STOPPER

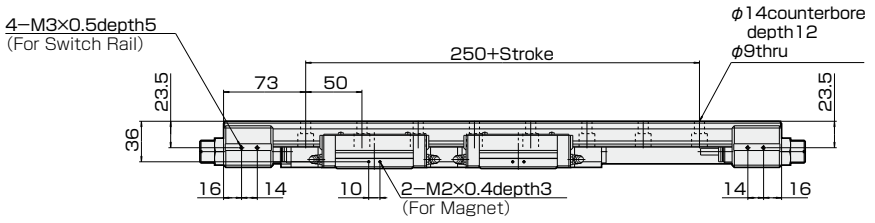
PRD-WA32-(Stroke)-QD

Guide Type
3 Guides Type
Bore Size

Stopper
End Plate Type
Stroke Adjustment Amount...One Side -13mm(Total -26mm)
One Side +5mm(Total +10mm)

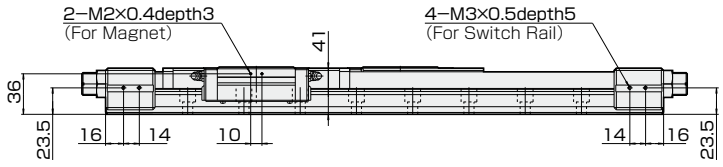
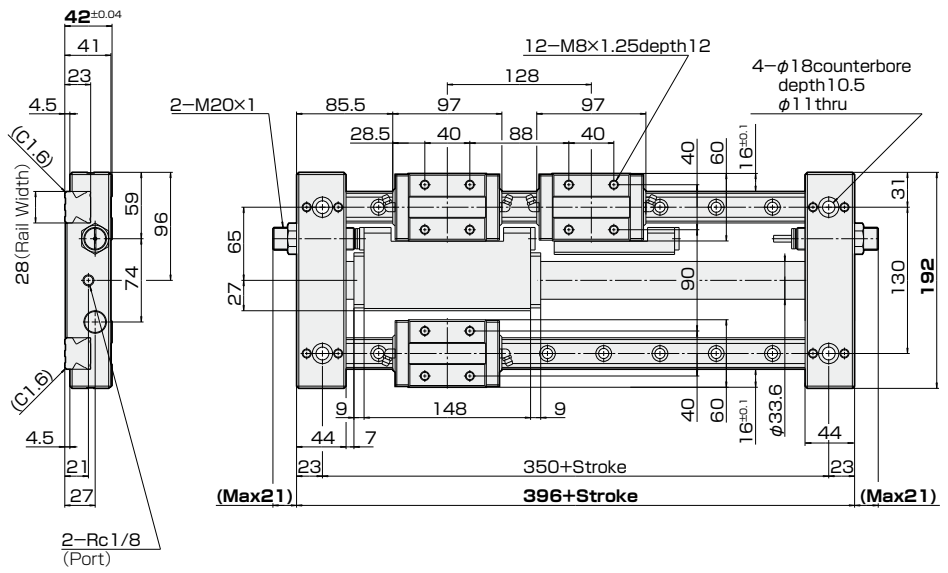
Standard Stroke Page 614

Dimension of Shock Absorber Page 633



DJI

PRD-WA32-QD PICO RODLESS



Dimensions of switch installed type PRDS (with magnet) Page 667

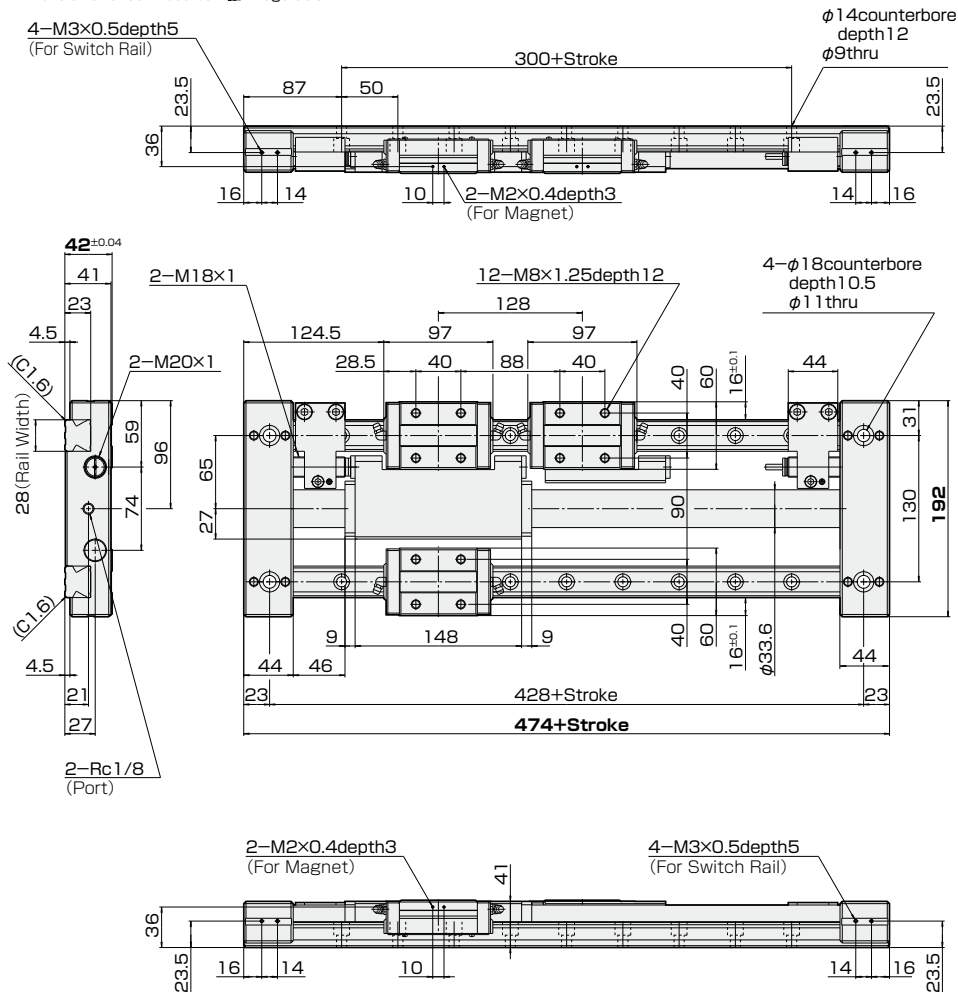
DIMENSIONS(mm) PRD32 WITH 3 GUIDES TYPE INTERMEDIATE UNIT TYPE STOPPER

PRD-WA32-(Stroke)-QW

Guide Type
3 Guides Type
Bore Size
Stopper
Intermediate Unit Type
Stroke Adjustment Amount... 0~Stroke Value
One Side +5mm(Total +10mm)

Standard Stroke Page 614

Dimension of Shock Absorber Page 633



PICO

PRD-WA32-QW PICO RODLESS

Dimensions of switch installed type PRDS (with magnet) Page 667

DIMENSIONS(mm) PRD32 WITH 4 GUIDES TYPE END PLATE STOPPER

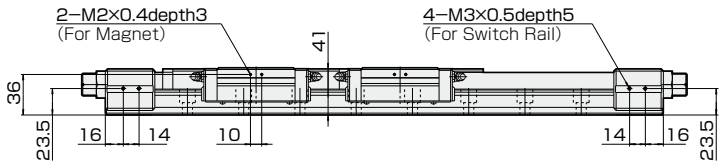
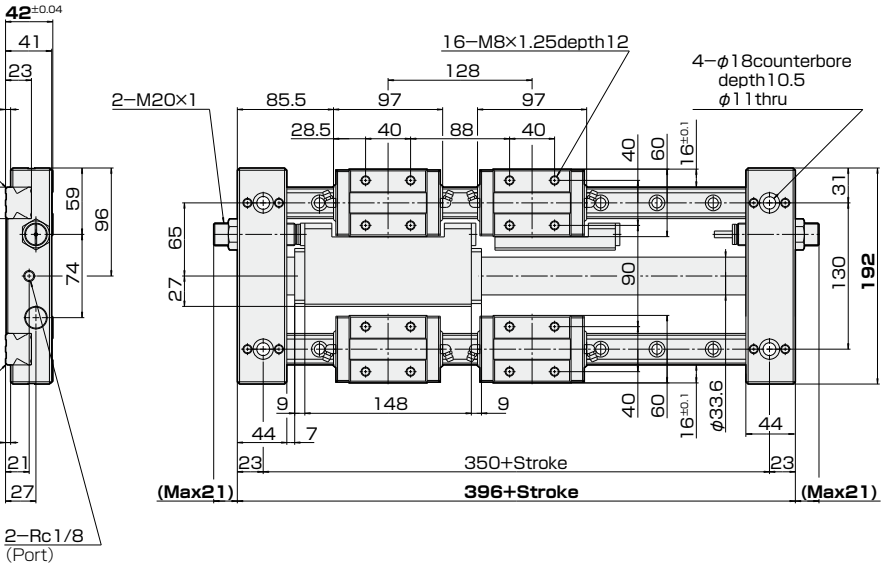
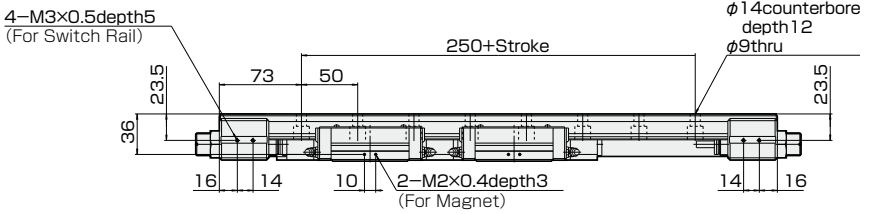
PRD-WH32--(Stroke)--QD

Guide Type
 4 Guides Type
 Bore Size

Stopper
 End Plate Type
 Stroke Adjustment Amount... One Side -13mm(Total -26mm)
 One Side +5mm(Total +10mm)

Standard Stroke Page 614

Dimension of Shock Absorber Page 633



Dimensions of switch installed type PRDS (with magnet) Page 667

DIMENSIONS(mm) PRD32 WITH 4 GUIDES TYPE INTERMEDIATE UNIT TYPE STOPPER

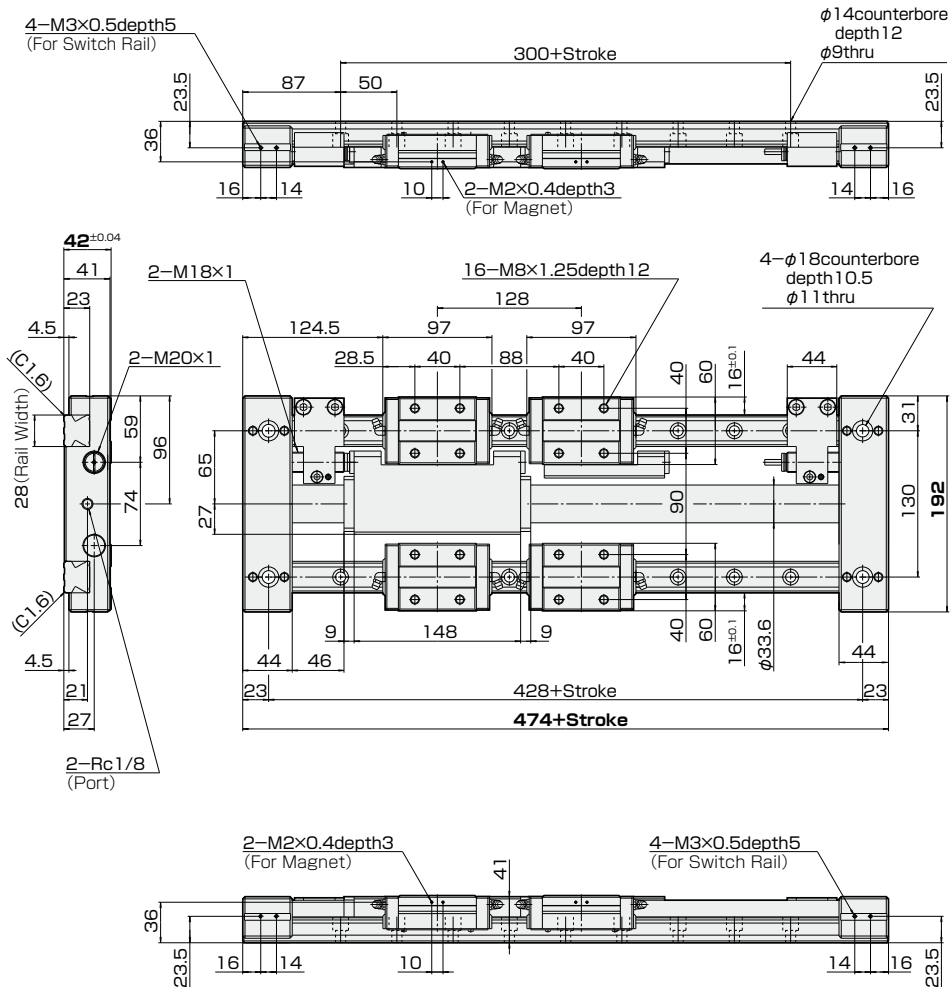
PRD-WH32-(Stroke)-QW

Guide Type
4 Guides Type
Bore Size

Stopper
Intermediate Unit Type
Stroke Adjustment Amount...0~Stroke Value
One Side +5mm (Total +10mm)

Standard Stroke Page 614

Dimension of Shock Absorber Page 633



PRD

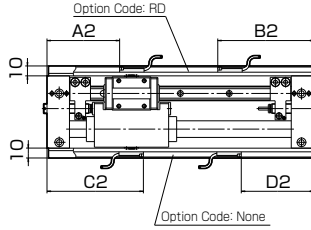
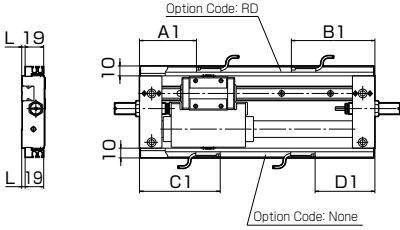
PRD-WH32-QW PICO RODLESS

Dimensions of switch installed type PRDS (with magnet) Page 667

SWITCH SETTING POSITION

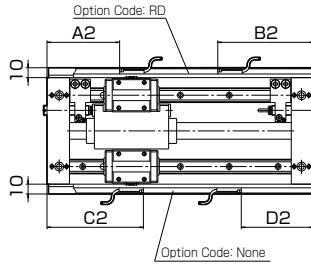
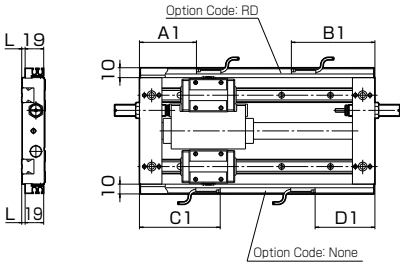
Guide Type :SD(Single Type)
 Stopper Type :QD(End Plate Type)

Guide Type :SD(Single Type)
 Stopper Type :QW(Intermediate Unit Type)



Guide Type :WR(Parallel Double Type)
 Stopper Type :QD(End Plate Type)

Guide Type :WR(Parallel Double Type)
 Stopper Type :QW(Intermediate Unit Type)



L Dimension
 PRD16.....3.5mm
 PRD25.....11mm
 PRD32.....20mm

RB(RC) 1, 2 Switch

Unit: mm

| Model | A1 | B1 | C1 | D1 |
|-------|------|------|------|------|
| PRD16 | 58.5 | 82.5 | 82.5 | 58.5 |
| PRD25 | 82 | 106 | 106 | 82 |
| PRD32 | 122 | 146 | 146 | 122 |

RB(RC) 1, 2 Switch

Unit: mm

| Model | A2 | B2 | C2 | D2 |
|-------|------|------|------|------|
| PRD16 | 74.5 | 98.5 | 98.5 | 74.5 |
| PRD25 | 105 | 129 | 129 | 105 |
| PRD32 | 161 | 185 | 185 | 161 |

RB(RC)4, 5 Switch

Unit: mm

| Model | A1 | B1 | C1 | D1 |
|-------|------|------|------|------|
| PRD16 | 60.5 | 80.5 | 80.5 | 60.5 |
| PRD25 | 84 | 104 | 104 | 84 |
| PRD32 | 124 | 144 | 144 | 124 |

RB(RC)4, 5 Switch

Unit: mm

| Model | A2 | B2 | C2 | D2 |
|-------|------|------|------|------|
| PRD16 | 76.5 | 96.5 | 96.5 | 76.5 |
| PRD25 | 107 | 127 | 127 | 107 |
| PRD32 | 163 | 183 | 183 | 163 |

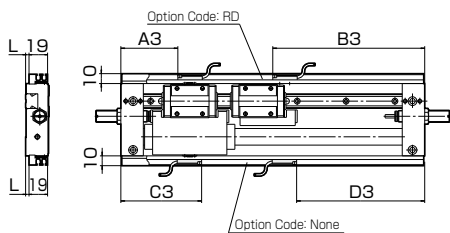
Custom made

■To change grease

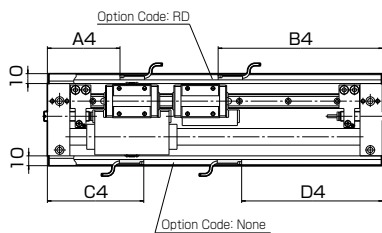
- Change the grease of bearing part to the other grease.
- There is a case might not be handled depends on kind of grease or request.
- Cylinder part is lithium soap grease or fluorine grease.
- Grease of purchased item can not be exchanged.

Please ask us for more detailed information.

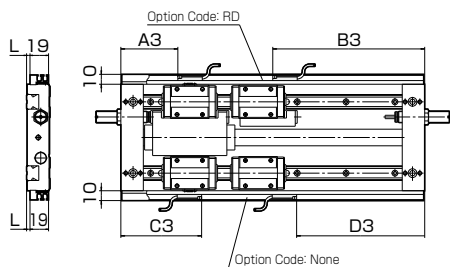
Guide Type :WG(Serial Double Type)
Stopper Type :QD(End Plate Type)



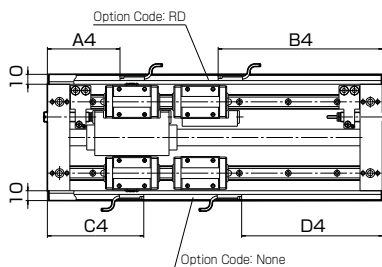
Guide Type :WG(Serial Double Type)
Stopper Type :QW(Intermediate Unit Type)



Guide Type :WA(3 Guides Type), WH(4 Guides Type)
Stopper Type :QD(End Plate Type)



Guide Type :WA(3 Guides Type), WH(4 Guides Type)
Stopper Type :QW(Intermediate Unit Type)



L Dimension
PRD16.....3.5mm
PRD25.....11mm
PRD32.....20mm

RB(RC) 1, 2 Switch

Unit:mm

| Model | A3 | B3 | C3 | D3 |
|-------|------|-------|------|-------|
| PRD16 | 58.5 | 152.5 | 82.5 | 128.5 |
| PRD25 | 82 | 206 | 106 | 182 |
| PRD32 | 122 | 274 | 146 | 250 |

RB(RC) 1, 2 Switch

Unit:mm

| Model | A4 | B4 | C4 | D4 |
|-------|------|-------|------|-------|
| PRD16 | 74.5 | 168.5 | 98.5 | 144.5 |
| PRD25 | 105 | 229 | 129 | 205 |
| PRD32 | 161 | 313 | 185 | 289 |

RB(RC) 4, 5 Switch

Unit:mm

| Model | A3 | B3 | C3 | D3 |
|-------|------|-------|------|-------|
| PRD16 | 60.5 | 150.5 | 80.5 | 130.5 |
| PRD25 | 84 | 204 | 104 | 184 |
| PRD32 | 124 | 272 | 144 | 252 |

RB(RC) 4, 5 Switch

Unit:mm

| Model | A4 | B4 | C4 | D4 |
|-------|------|-------|------|-------|
| PRD16 | 76.5 | 166.5 | 96.5 | 146.5 |
| PRD25 | 107 | 227 | 127 | 207 |
| PRD32 | 163 | 311 | 183 | 291 |

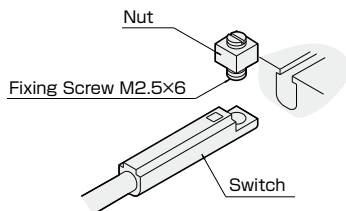
On Hold Distance, Hysteresis Unit: mm

| Model | On Hold Distance(L) | Hysteresis(C) |
|-------------|---------------------|---------------|
| RB(RC) 1, 2 | 6 | 1 |
| RB(RC) 4, 5 | 2 | 1 |

Explanation of hysteresis and on hold distance. ☞ see 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 torque of fixing screw must be 0.1 N·m.



■ MEMO ■

■ MEMO ■

■ MEMO ■

■ MEMO ■

■ MEMO ■