

For Semiconductor Manufacturing

**Powerful Holding with Soft Touch** (Minimized Contact Force)

# Chattering/ Deformation Prevention



**NEW**

**"Soft Touch" Work Support**

**"Low Contact Force Work Support"**

**Line up : Air Advance Model, Spring Advance Model  
model WNS, WNS-E**

Prevents chattering and deformation by supporting equipment and devices from opposite side.

# Soft Touch Work Support

## Low Contact Force Work Support

Model WNS

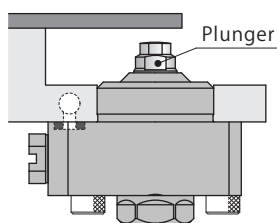


Strong Support from opposite side when load is applied.  
Prevents chattering and deformation by providing support underneath equipment and devices.

Compact Work Support Suitable for Semiconductor Manufacturing

With a soft touch that minimizes workpiece contact force,  
it powerfully holds the workpiece after contact.

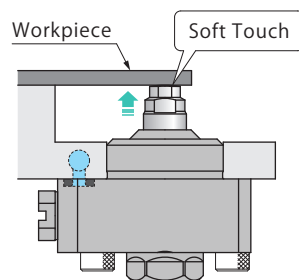
※ In case of Air Advance Model



**Released State**

Air Pressure **OFF**

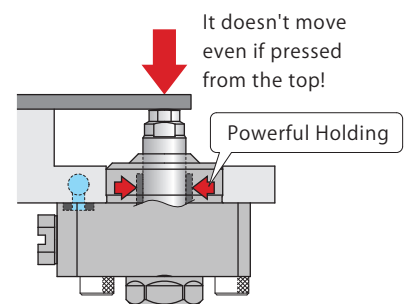
The state of plunger down.



Air Pressure **ON**

(During Pressure Increase)

The plunger lifts up with air pressure and stops after touching the workpiece.



**Locked State**

Air Pressure **ON**

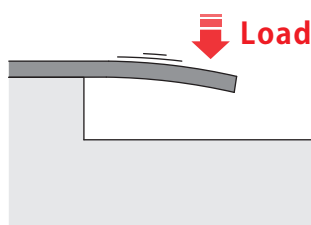
(Pressurization Completed)

When supply air is fully pressurized, the plunger is secured, preventing any deformation of the workpiece even if force is applied from the top.

**Before**

Without Work Support

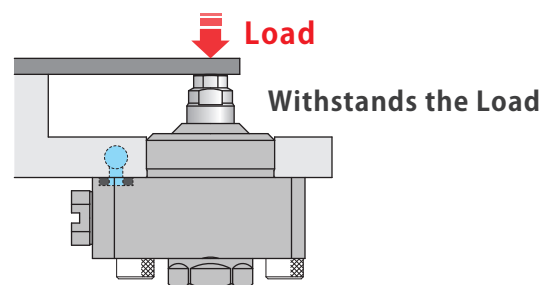
Chattering • Deformation



**After**

With Work Support

Prevents Chattering • Deformation



## Features

### Most Suitable Materials for Semiconductor Manufacturing

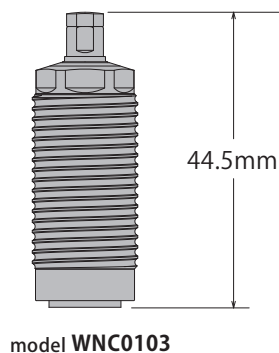
Body Material : Stainless Steel

Packing Material : Fluor Rubber, Silicone Rubber

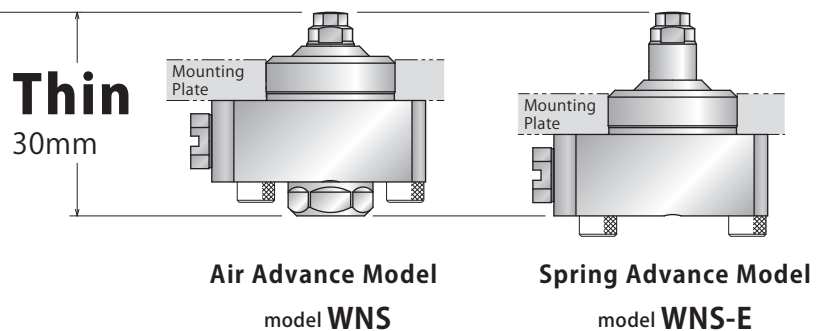
Internal Lubricant : Low-dust Grease for Clean Environments

### Compact Design Specialized for Low Profile

#### High-Power Pneumatic Work Support



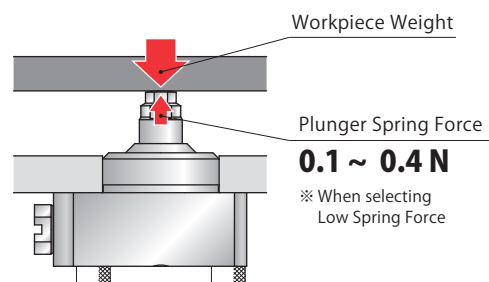
#### Soft Touch Work Support



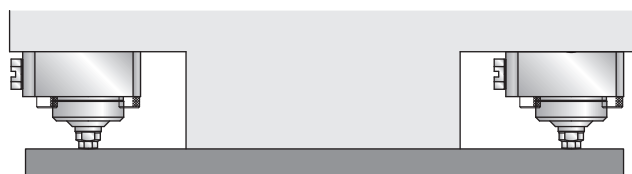
### Ultimate Soft Touch to Workpiece

The force required to actuate the plunger (plunger spring force) causes the workpiece to be lifted.

By minimizing the plunger spring force and achieving a soft touch on the workpiece, it prevents the workpiece from lifting.



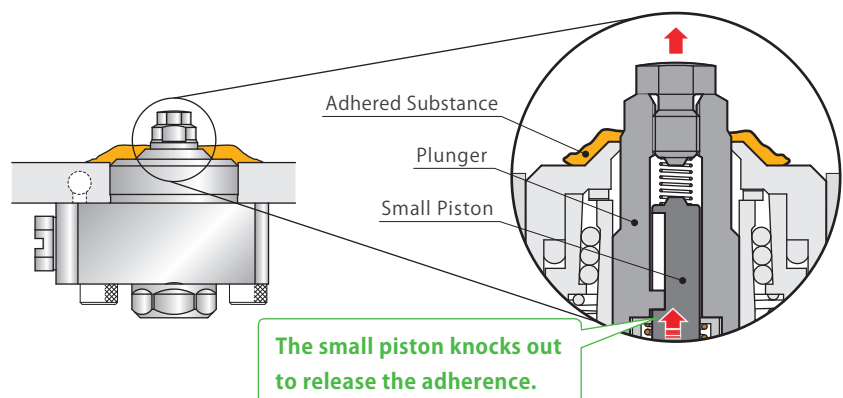
### Downward Mounting Also Possible



### Knockout Function

After a prolonged shutdown, if there is adhesion caused by grease, etc., the knockout function releases the adhesion.

※ Only for Air Advance Model

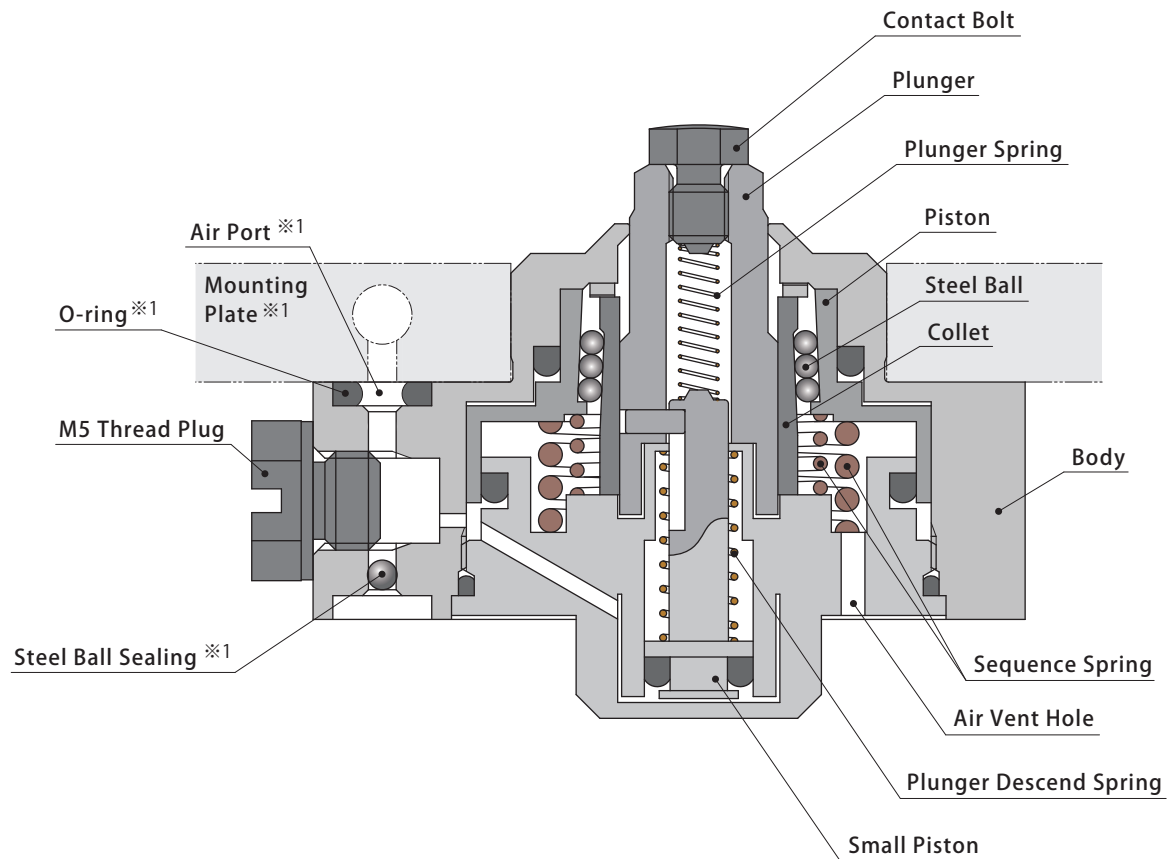


This product must not be used in environments where contaminants or liquids can enter, such as machining environments. There is no built-in scraper (dustproof structure).

## Cross Section

### Air Advance Model : WNS

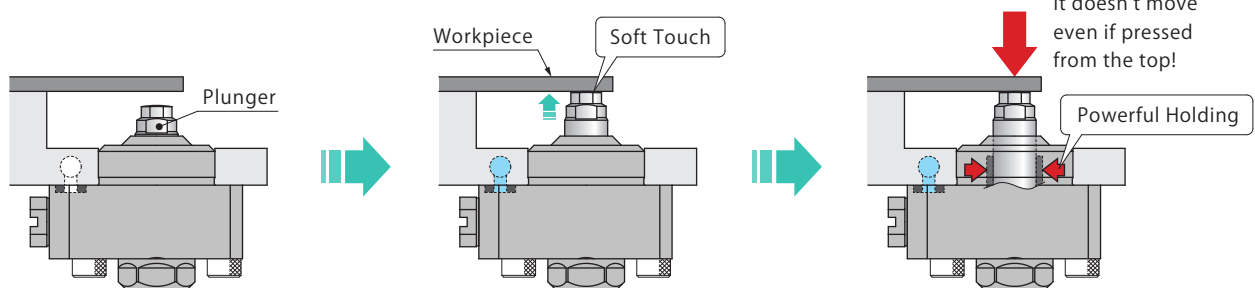
- ※ This drawing shows when selecting the bolt up mounting.
- ※ This is a simplified drawing. Actual components are different.



※1. For the bolt down mounting, the steel ball sealing is positioned on the upper side, while the mounting plate, air port and o-ring are positioned on the lower side.

## Action Description

### Air Advance Model : WNS



#### Released State

Air Pressure **OFF**

The state of plunger down.

Air Pressure **ON**  
(During Pressure Increase)

The plunger lifts up with air pressure and stops after touching the workpiece.  
※ The load applied to the workpiece is only the plunger spring force.

#### Locked State

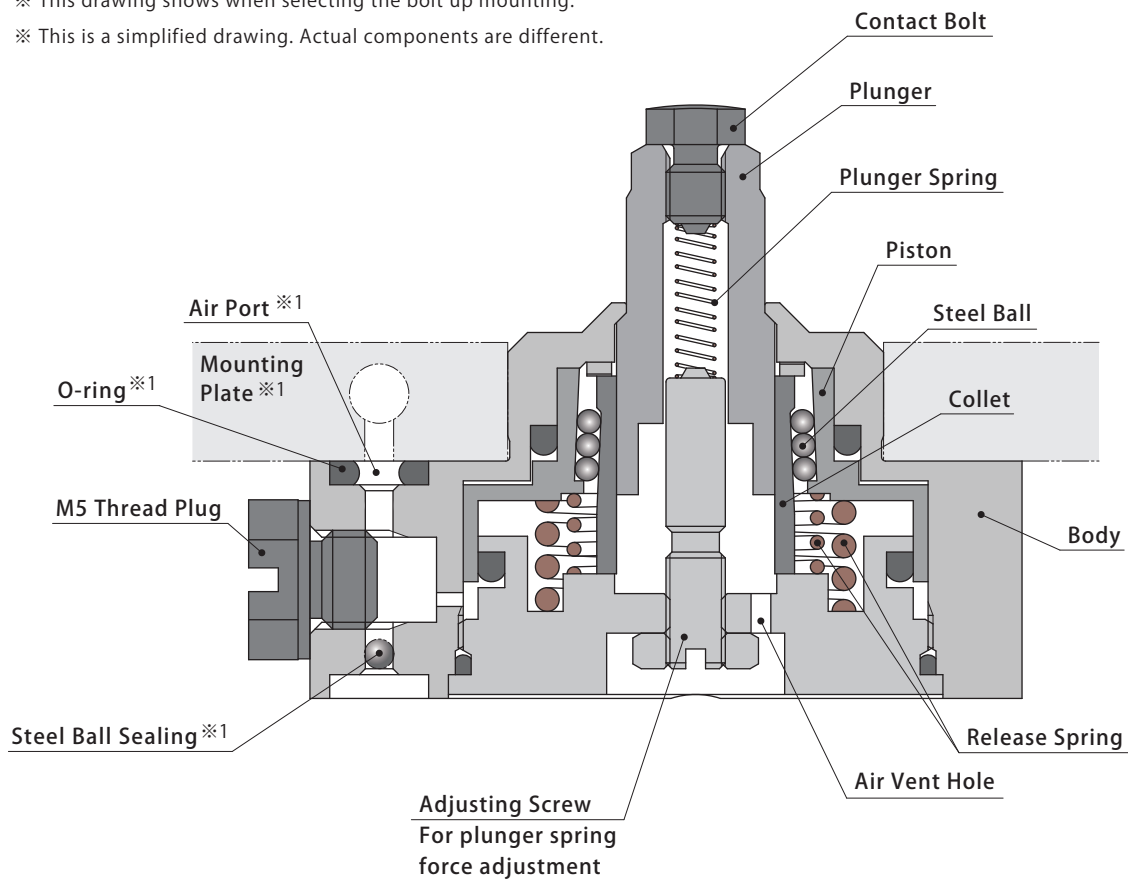
Air Pressure **ON**  
(Pressurization Completed)

When supply air is fully pressurized, the plunger is secured, preventing any deformation of the workpiece even if force is applied from the top.

### Spring Advance Model : WNS-E

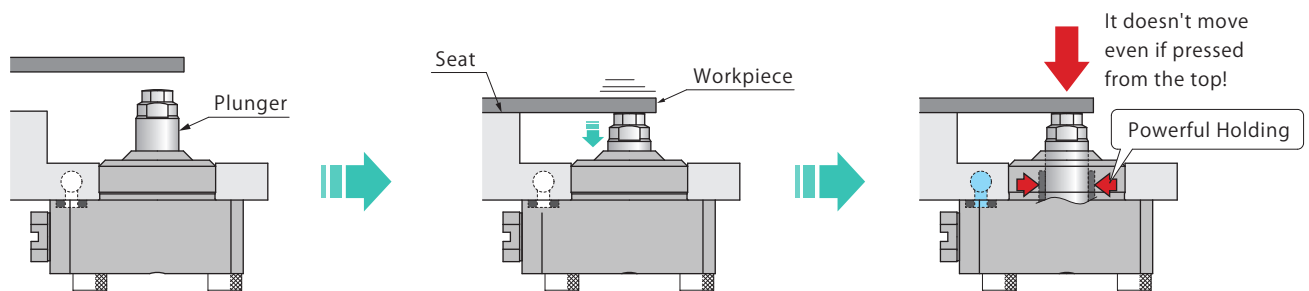
※ This drawing shows when selecting the bolt up mounting.

※ This is a simplified drawing. Actual components are different.



※1. For the bolt down mounting, the steel ball sealing is positioned on the upper side, while the mounting plate, air port and o-ring are positioned on the lower side.

### Spring Advance Model : WNS-E



#### Released State

Air Pressure **OFF**

The state of plunger up.

Air Pressure **OFF**

When the workpiece is positioned, the plunger begins to descend under the weight of the workpiece and lowers until it reaches the seating surface (installed separately).

※ The load applied to the workpiece is only the plunger spring force.

#### Locked State

Air Pressure **ON**  
(Pressurization Completed)

When supply air is fully pressurized, the plunger is secured, preventing any deformation of the workpiece even if force is applied from the top.

## Model No. Indication

WNS **005** **0** - **U** **L** - **E**

1   2   3   4   5

### 1 Support Force

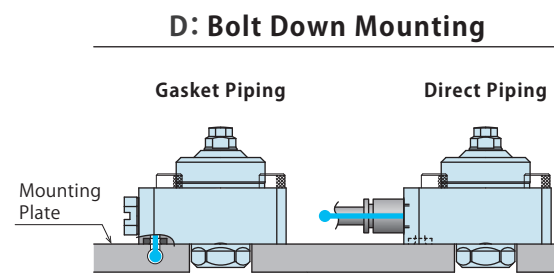
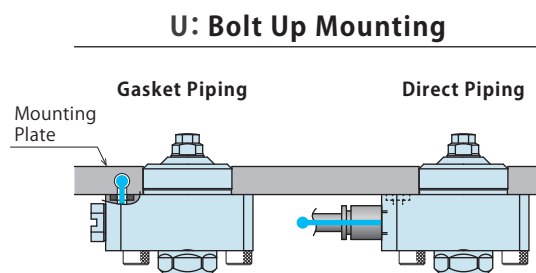
- 005** : Support Force 50N (Supply Air Pressure 0.5MPa)  
**015** : Support Force 150N (Supply Air Pressure 0.5MPa)

### 2 Design No.

- 0** : Revision Number

### 3 Mounting Method

- U** : Bolt Up Mounting (Suspended)  
**D** : Bolt Down Mounting (Placed Flat)

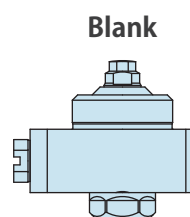


### 4 Plunger Spring Force

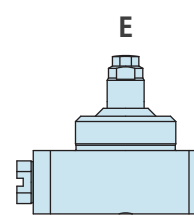
- L** : Low Spring Force  
**H** : High Spring Force

### 5 Options

- Blank** : Air Advance Model (Standard)  
**E** : Spring Advance Model



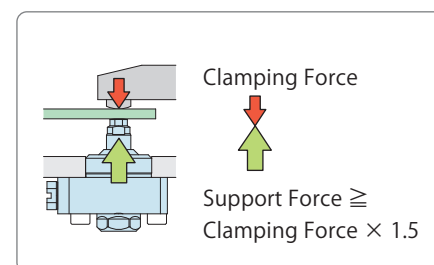
Air Advance Model



Spring Advance Model

## Specifications

Model No.		WNS0050-□□ WNS0050-□□-E	WNS0150-□□ WNS0150-□□-E
Support Force ※1	at 0.7 MPa	117	300
	N at 0.5 MPa	50	150
Plunger Stroke	mm	5.0	
Effective Stroke	5 Blank	4.7	
	mm 5 E	5.0	
Cylinder Capacity	5 Blank	0.3	0.5
	cm³ 5 E	0.2	0.4
Plunger Spring Force ※2	L : Low Spring	0.2 ~ 0.4 at shipment (min. 0.1 when adjusted) ※3	
	N H : High Spring	0.3 ~ 0.6 at shipment (min. 0.1 when adjusted) ※3	
Max. Operating Pressure	MPa	0.7	
Min. Operating Pressure	MPa	0.4	0.35
Withstanding Pressure	MPa	1.0	
Usable Fluid		Dry Air	
Operating Temperature	°C	0 ~ 70	
Grease		Low-dust Grease for Clean Environments (AFF manufactured by THK)	
Weight	5 Blank	65	85
	g 5 E	55	75

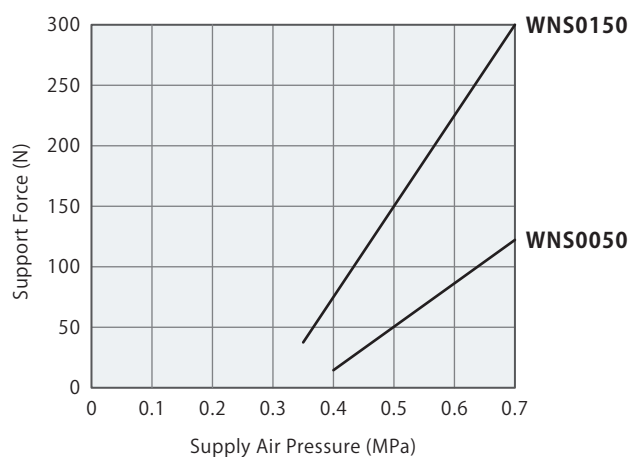


Notes :

- ※1. When used in opposition to a clamp, please ensure the support force is at least 1.5 times greater than the clamping force.
- ※2. The plunger spring force value indicates the spring design value.
- ※3. When selecting **5 E : Spring Advance Model**, the plunger spring force can be adjusted using the adjustment screw on the bottom of the body.
  1. This product is locked by air pressure and released by spring force.
  2. Do not use in machining environments. Not equipped with a scraper (dust-proof structure) due to its slim design.

## Performance Curve

Support Force Graph ※ This graph shows the support force under static load condition.



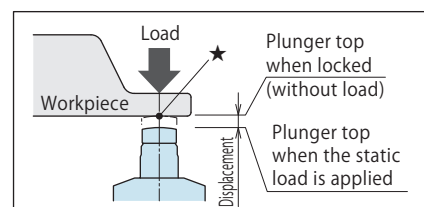
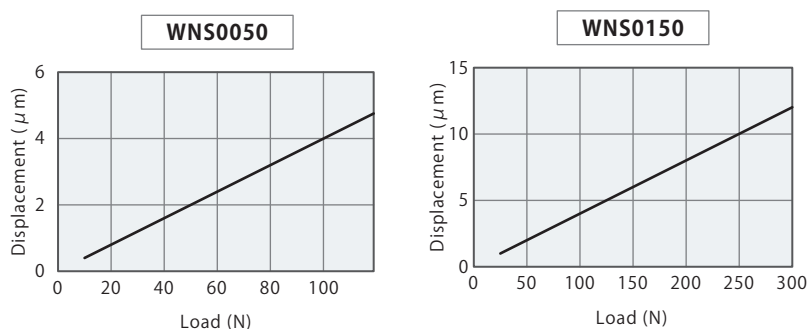
Model No.	Support Force (N)	
	WNS0050-□ WNS0050-□-E	WNS0150-□ WNS0150-□-E
Supply Air Pressure (MPa)		
0.7	117	300
0.6	84	225
0.5	50	150
0.4	17	75
0.35	—	38
Support Force Formula ※4 kN	$333 \times P - 116$	$750 \times P - 225$

Note :

※4. P : Supply Air Pressure (MPa)

※ This graph shows the static load-displacement of a single work support at supply air pressure 0.7MPa.

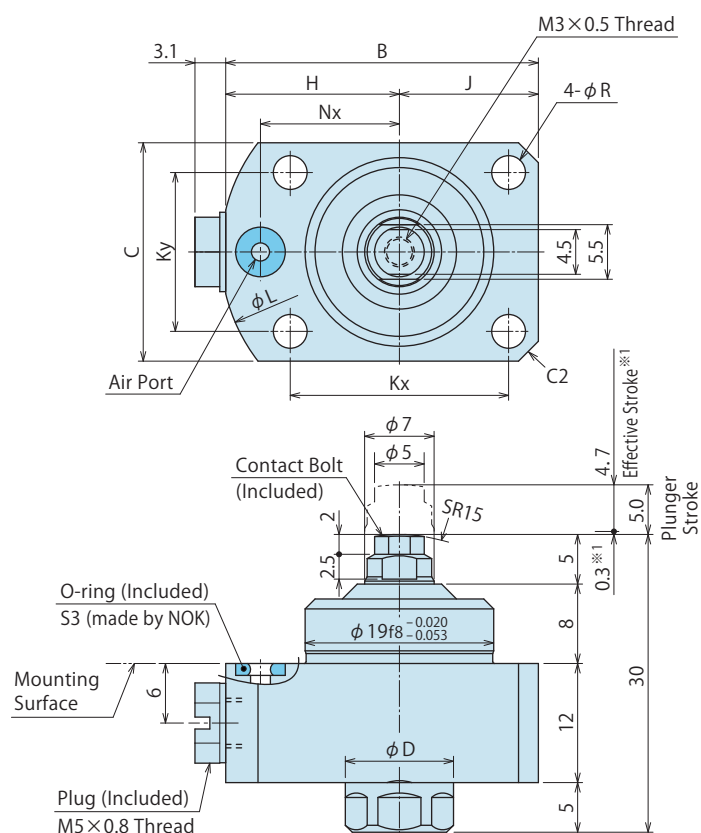
Load / Displacement Graph Not including the displacement of the workpiece side due to unevenness at ★ mark and surrounding clamps.



## External Dimensions

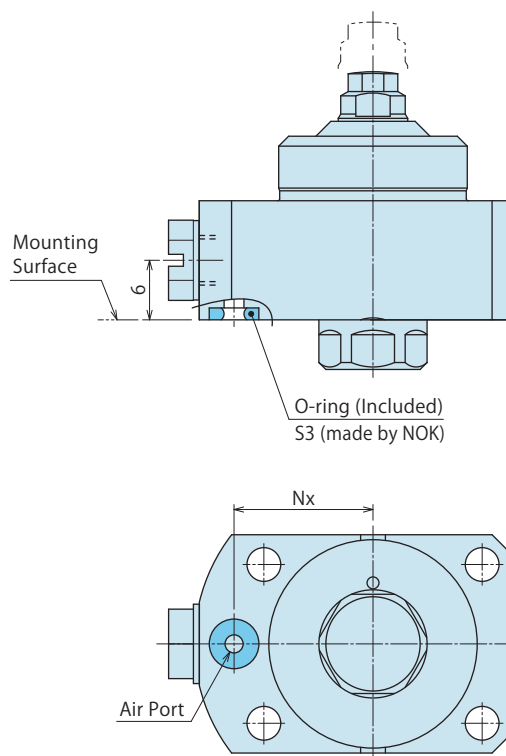
※ This drawing shows the released state of **WNS : Air Advance Model** (before the plunger is lifted).

**WNS**   **-U** L H Air Advance Model  
Bolt Up Mounting (Suspended)



**WNS**   **-D** L H Air Advance Model  
Bolt Down Mounting (Placed Flat)

※ Refer to **U : Bolt Up Mounting** for unlisted dimensions.



### Notes :

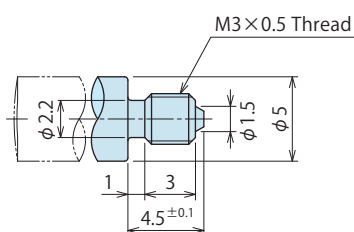
1. Mounting bolts are not provided with the product. Please prepare them according to the mounting height.

※ 1. Please use the work support within the effective stroke range.

When the work support touches a workpiece within short stroke range, 0.3mm from the plunger retract-end, a force which is larger than the plunger spring force will be applied to the workpiece.

## Contact Bolt Design Dimensions

※ Reference for designing a contact bolt (attachment) by customer other than the included contact bolt.  
Be sure to refer to "Notes on Contact Bolt (Attachment) Design" on P.11.

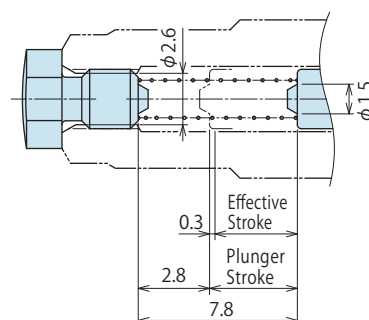


Contact Bolt Tightening Torque	0.6 N·m
Reference: Material	Pre-hardened Steel
Reference: Quenching Hardness	HRC29 ~ 33

## Plunger Spring Chamber Dimensions

※ Reference for designing a plunger spring (attachment) by customer other than the included plunger spring.  
When designing a plunger spring, be sure to refer to "Notes on Contact Bolt (Attachment) Design" on P.11.

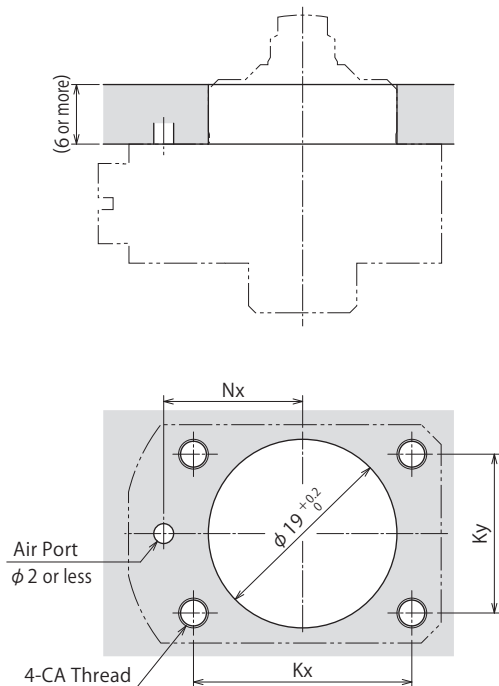
※ This drawing shows the released state.



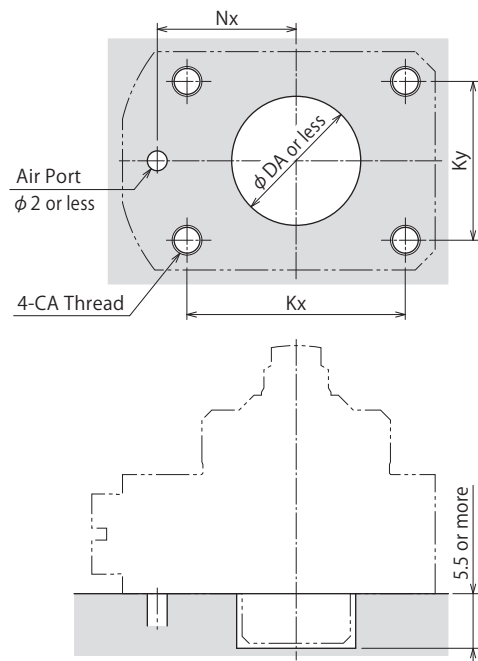


## Machining Dimensions of Mounting Area

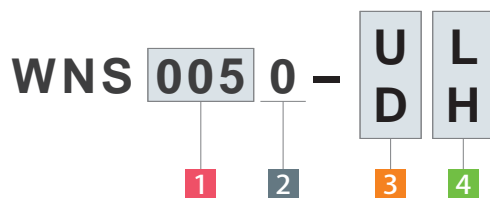
**WNS**    - **U** L H Air Advance Model  
Bolt Up Mounting (Suspended)



**WNS**    - **D** L H Air Advance Model  
Bolt Down Mounting (Placed Flat)



## Model No. Indication



(Format Example : WNS0050-UL, WNS0150-DH)

**1** Support Force

**2** Design No.

**3** Mounting Method

**4** Plunger Spring Force

**5** Option

Blank : Air Advance Model (Standard)

## External Dimensions and Machining Dimensions for Mounting (mm)

Model No.	WNS0050-□□	WNS0150-□□
B	31.5	36
C	22	26
D	10.9	12.4
H	17.5	19.5
J	14	16.5
L	36	40
R	3.4	4.5
CA	M3×0.5	M4×0.7
DA	11	12.5
Kx	22	26
Ky	16	19
Nx	14	16
Mounting Bolt (Prepared by customer)	M3×0.5	M4×0.7
Tightening Torque for Main Body <sup>※2</sup> N·m	1.3	3.2

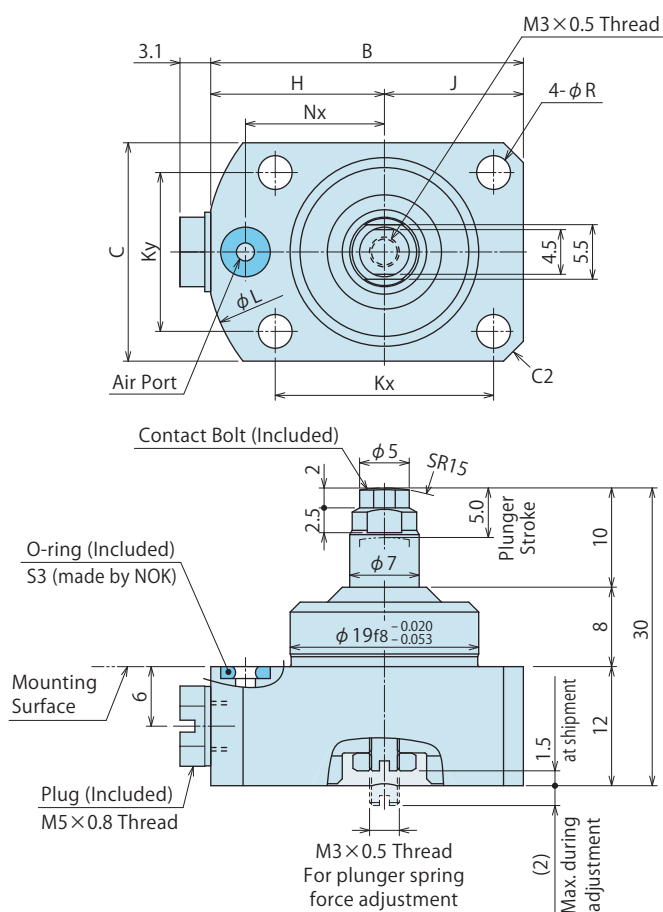
Note :

※2. Please follow the tightening torque in the list when mounting Work Support.

## External Dimensions

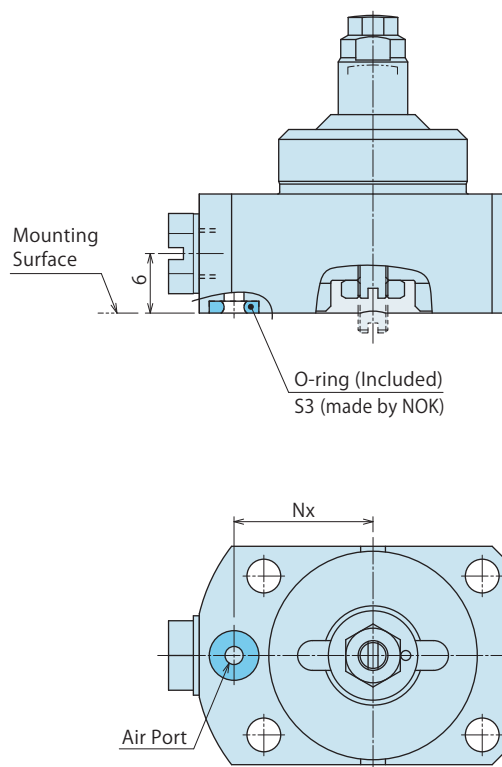
※ This drawing shows the released state of **WNS-E : Spring Advance Model** (before the plunger is retracted).

**WNS-□-U<sub>LH</sub>-E** Spring Advance Model  
Bolt Up Mounting (Suspended)



**WNS-□-D<sub>LH</sub>-E** Spring Advance Model  
Bolt Down Mounting (Placed Flat)

※ Refer to **U : Bolt Up Mounting** for unlisted dimensions.

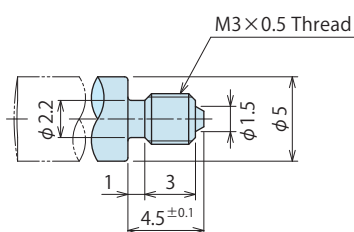


Note :

1. Mounting bolts are not provided with the product. Please prepare them according to the mounting height.

## Contact Bolt Design Dimensions

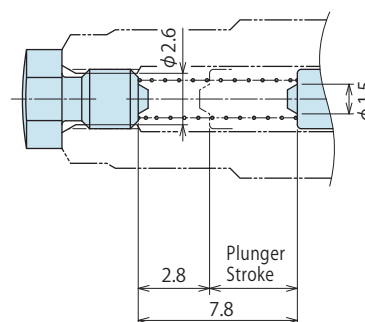
※ Reference for designing a contact bolt (attachment) by customer other than the included contact bolt.  
Be sure to refer to "Notes on Contact Bolt (Attachment) Design" on P.11.



Contact Bolt Tightening Torque	0.6 N·m
Reference:Material	Pre-hardened Steel
Reference:Quenching Hardness	HRC29 ~ 33

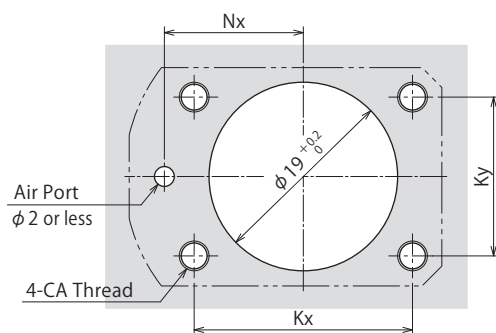
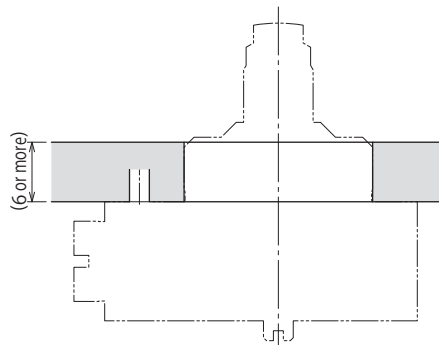
## Plunger Spring Chamber Dimensions

※ Reference for designing a plunger spring (attachment) by customer other than the included plunger spring.  
When designing a plunger spring, be sure to refer to "Notes on Contact Bolt (Attachment) Design" on P.11.  
※ This drawing shows the released state.

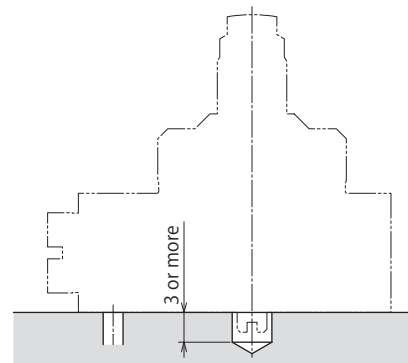
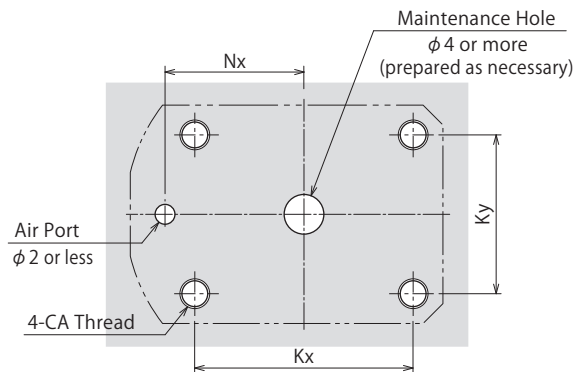


## Machining Dimensions of Mounting Area

**WNS**   - **U** L H - **E** Spring Advance Model  
Bolt Up Mounting (Suspended)



**WNS**   - **D** L H - **E** Spring Advance Model  
Bolt Down Mounting (Placed Flat)



## Model No. Indication

**WNS** 005 0 - U D L H - E

1   2   3   4   5

( Format Example : WNS0050-UL-E, WNS0150-DH-E )

- 1 Support Force
- 2 Design No.
- 3 Mounting Method
- 4 Plunger Spring Force
- 5 Option ( In case of E )  
E : Spring Advance Model

## External Dimensions and Machining Dimensions for Mounting (mm)

Model No.	WNS0050-□□-E	WNS0150-□□-E
B	31.5	36
C	22	26
H	17.5	19.5
J	14	16.5
L	36	40
R	3.4	4.5
CA	M3×0.5	M4×0.7
Kx	22	26
Ky	16	19
Nx	14	16
Mounting Bolt (Prepared by customer)	M3×0.5	M4×0.7
Tightening Torque for Main Body <sup>※1</sup> N·m	1.3	3.2

Note :

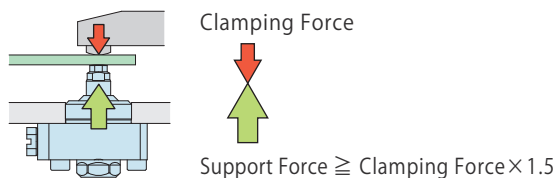
※1. Please follow the tightening torque in the list when mounting Work Support.

## Cautions

### Notes for Design

#### 1) Check Specifications

- Please use each product according to the specifications.
- Operating Air Pressure  
WNS0050 : max. 0.7MPa, min. 0.4MPa.  
WNS0150 : max. 0.7MPa, min. 0.35MPa.
- When using the work support in opposition to a clamp, please ensure the support force is at least 1.5 times greater than the clamping force.



#### 2) Install a temporary stopper for a workpiece if necessary.

- When multiple work supports are used for a light workpiece, the plunger spring force may be higher than the weight of the workpiece causing.

#### 3) Attachment Required for the Plunger

- Be sure to use the work support with the attachment properly installed. There is nothing securing the plunger spring, so the plunger does not ascend. Furthermore, if contaminants enter through the threaded part of the plunger top, it may cause operational malfunctions.

#### 4) Use it in a clean environment.

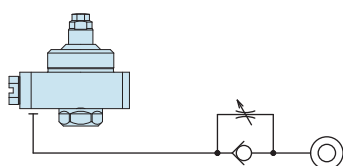
- This product must not be used in environments where contaminants or liquids can enter, such as machining environments. There is no built-in scraper (dustproof structure). Using in the environment with cutting chips, cutting fluid or spatter will cause plunger malfunction.

#### 5) Regarding applications subject to centrifugal force

During cycles involving centrifugal force, please use the work support in the locked state.

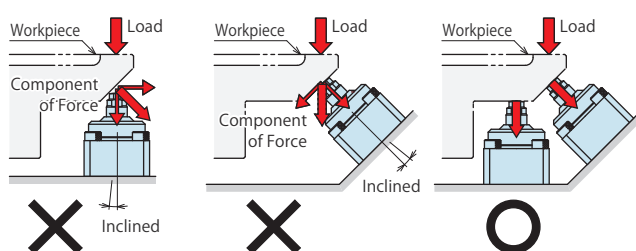
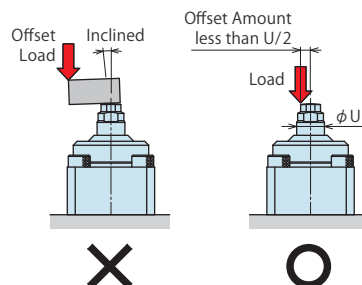
#### 6) Adjust plunger operating time with the amount of supplied air (Excluding -E : Spring Advance Model)

- As a guideline, the duration for a full stroke is approximately 0.5 to 1 second.
- As with single-acting cylinders, use a flow control valve with a check valve (meter-in) with a cracking pressure of 0.05 MPa or less, considering the speed reduction during release.
- If the plunger advances too fast, it may bounce back and lock itself resulting in a gap between the workpiece and the plunger.



#### 7) Make sure that offset load and component of force do not affect the product.

- If using the product as illustrated below, the displacement against load will be increased. Also, large load will damage the internal parts.



#### 8) Notes on Contact Bolt (Attachment) Design

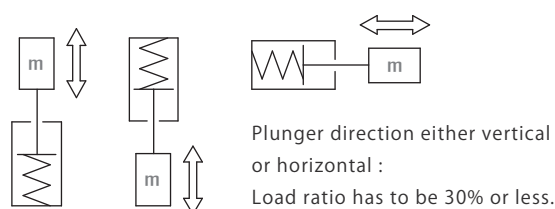
- When designing an attachment, make sure the attachment weight is 30% or less of the plunger spring force.

Ex.) In case of **WNS0050-L**

Plunger Spring Force **0.2 ~ 0.4N**

Max. Weight of Contact Bolt =  $0.2 \times 0.3 / 0.0098 = 6g$

Since it may vary depending on sliding resistance of the plunger and characteristic of the spring, it is recommended to design the contact bolt as light as possible.



- The dimensions of the mounting thread area need to be processed according to the design dimensions for contact bolts as shown on the respective External Dimensions pages (P.7 ~ P.10).
- The knockout function is used to release fixation of plunger spring and adherence after machine stop for a long time. Using an attachment with different thread part dimension leads to inappropriate spring force and effective stroke, causing damage and malfunctions.

## ● Installation Notes

### 1) Check the Usable Fluid

- Please supply filtered clean dry air.
- Oil supply with a lubricator etc. is unnecessary.

### 2) Preparation for Piping

- The pipeline, piping connector and fixture circuits should be cleaned and flushed thoroughly.  
Dust and cutting chips in the circuit can lead to fluid leakage and malfunction
- There is no filter provided with this product for prevention of contaminants in the air circuit.

### 3) Applying Sealing Tape

- Wrap with tape 1 to 2 times following the screwing direction.
- Pieces of the sealing tape can lead to air leakage and malfunction.
- In order to prevent contaminants from going into the product during the piping work, it should be carefully cleaned before working.

### 4) Installation of the Product

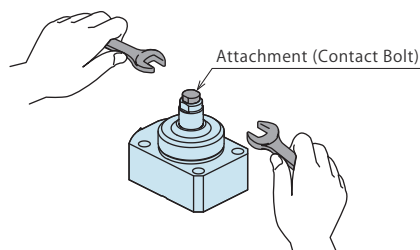
- For installation, tighten the product with the torque shown in the table below.
- Tightening with greater torque than recommended may lead to malfunction.

Model No.	Thread Size	Tightening Torque (N·m)
<b>WNS0050</b>	M3×0.5	1.3
<b>WNS0150</b>	M4×0.7	3.2

### 5) Replacement of Attachment

- Be careful not to lose the plunger spring.
- With the supply pressure to the work support released, secure the wrench onto the two flat sides of the plunger tip to prevent rotation, and tighten it with the torque shown in the table below.  
Applying torque to the plunger tip while supplying air pressure may cause damage to internal components.

Model No.	Head Thread Size	Tightening Torque (N·m)
<b>WNS0050</b>	M3×0.5	0.6
<b>WNS0150</b>		



## ● Cautions

### ● Notes on Handling

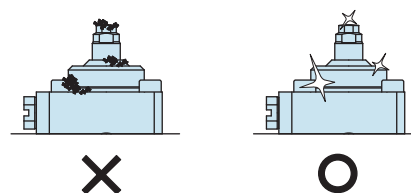
- 1) It should be operated by qualified personnel.
- Machines and devices with hydraulic and pneumatic products should be operated and maintained by qualified personnel.
- 2) Do not operate or remove the product unless the safety protocols are ensured.
  - ① Machines and devices can only be inspected or prepared when it is confirmed that the safety devices are in place.
  - ② Before the product is removed, make sure that the above-mentioned safety devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
  - ③ After stopping the product, do not remove until the temperature drops.
  - ④ Make sure there is no trouble/issue in the bolts and respective parts before restarting a machine or device.
- 3) Do not touch a work support while it is working.  
Otherwise, your hands may be injured due to clinching.



- 4) Do not disassemble or modify.
  - If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

### ● Maintenance and Inspection

- 1) Removal of the Machine and Shut-off of Pressure Source
  - Before the machine is removed, make sure that safety devices and preventive devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
  - Make sure there is no abnormality in the bolts and respective parts before restarting.
- 2) Regularly clean the area around the plunger.
  - If it is used when the surface is contaminated with dirt, it may lead to malfunctioning and fluid leakage.



- 3) Regularly tighten pipe line, mounting bolt, attachment and others to ensure proper use.
- 4) Make sure there is a smooth action without an irregular noise.
  - Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.
- 5) The products should be stored in the cool and dark place without direct sunshine or moisture.
- 6) Please contact us for overhaul and repair.

## ● Warranty

### 1) Warranty Period

- The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.

### 2) Warranty Scope

- If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense.  
Defects or failures caused by the following are not covered.
  - ① If the stipulated maintenance and inspection are not carried out.
  - ② If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
  - ③ If it is used or operated in an inappropriate way by the operator.  
(Including damage caused by the misconduct of the third party.)
  - ④ If the defect is caused by reasons other than our responsibility.
  - ⑤ If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
  - ⑥ Other caused by natural disasters or calamities not attributable to our company.
  - ⑦ Parts or replacement expenses due to parts consumption and deterioration.  
(Such as rubber, plastic, seal material and some electric components.)

Damages excluding from direct result of a product defect shall be excluded from the warranty.

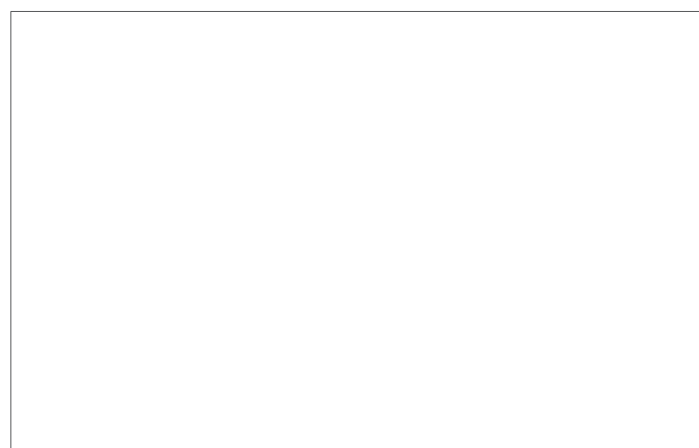


## KOSMEK LTD.

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- For Further Information on Unlisted Specifications and Sizes, Please call us.
- Specifications in this Leaflet are Subject to Change without Notice.



JQA-QMA10823  
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