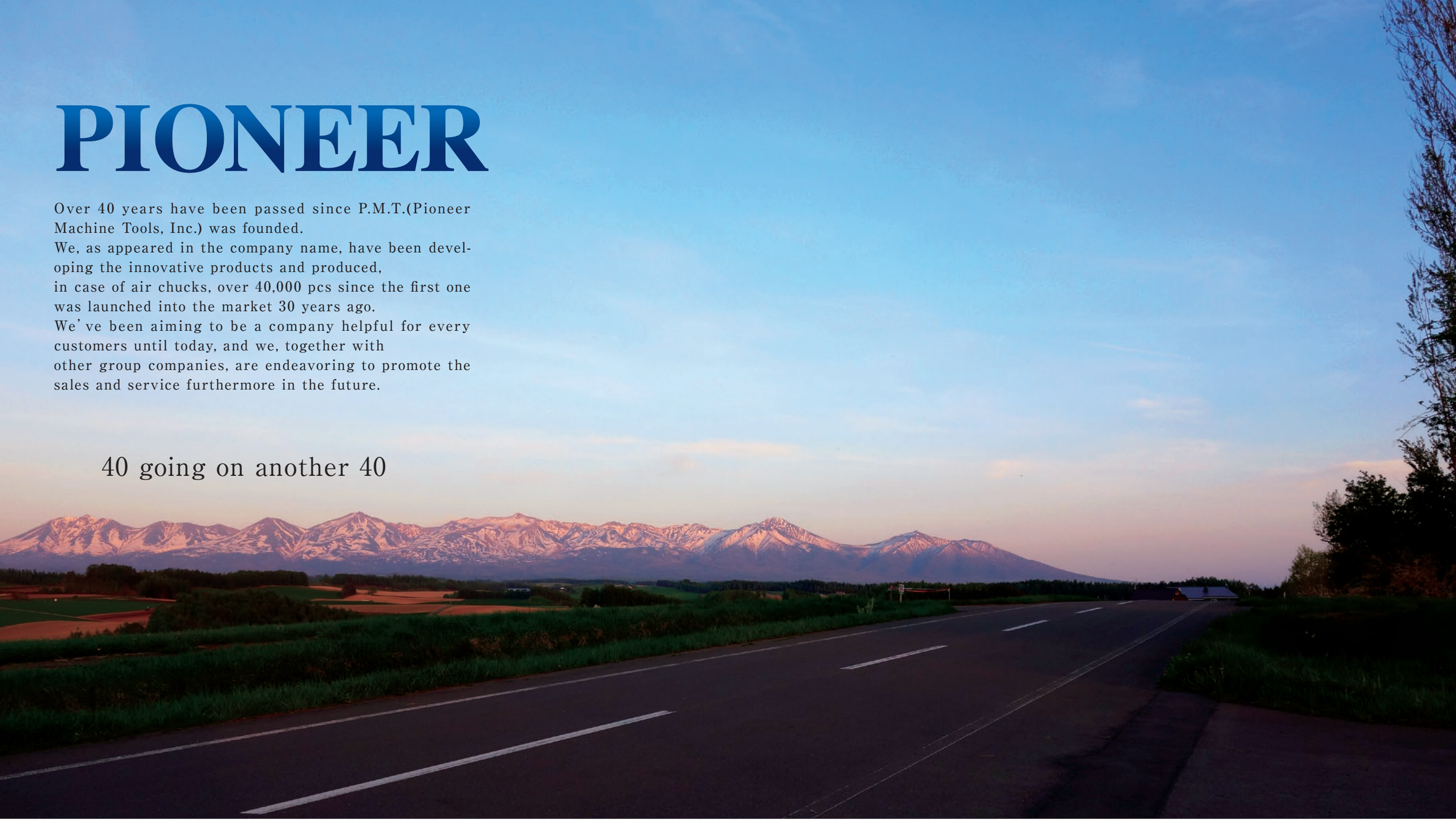
PIONEER

Over 40 years have been passed since P.M.T.(Pioneer Machine Tools, Inc.) was founded.
We, as appeared in the company name, have been developing the innovative products and produced,
in case of air chucks, over 40,000 pcs since the first one was launched into the market 30 years ago.
We' ve been aiming to be a company helpful for every customers until today, and we, together with
other group companies, are endeavoring to promote the sales and service furthermore in the future.

40 going on another 40



Contribute to High Tech Industries together with group companies!

PIONEER air chucks have been contributing to the progress of high tech industries such as automobile, computer, OA equipment and etc.

PIONEER = Synonym of High Precision Air Chucks & Reliability

It holds workpiece soft and evenly to reduce the distortion when clamping, and perform the highest accuracy in turning and grinding. There are two basic models to meet the various applications different in the shape, material, hardness, mass, wall thickness of clamping part, spindle speed, and the accuracy required.

❶ Diaphragm Type High Precision Air Chuck

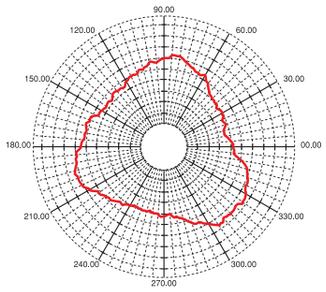
Soft & even contact to the workpiece for highest accuracy!

❷ Slide Jaw Type Precision Air Chuck

Variety of types for wide range of precision turning & grinding!

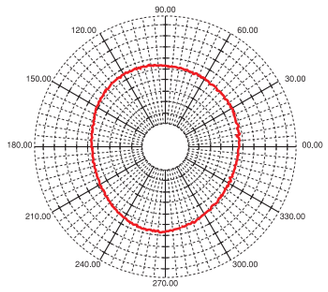
●Accuracy Comparison Example

Following is a guide of roundness comparison.
(It doesn' t necessarily fall to the every different applications.)



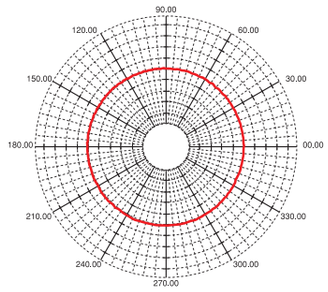
Hydraulic Chuck 6"

Roundness	0.00047"



Slide Jaw Type Precision Air Chuck 6"

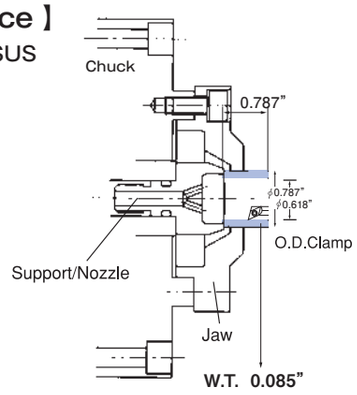
Roundness	0.000118"



Diaphragm Type High Precision Air Chuck 6"

Roundness	0.0000118"

【 Test piece 】
Material : SUS



■ Abbreviation being used in the catalog

AC····· Slide Jaw Type Air Chuck
DC····· Diaphragm Type Air Chuck
ASA····· Air Supply Apparatus
JMB····· Seats for Jaw

INDEX

Diaphragm Type Air Chuck DC

Slide Jaw Type Air Chuck AC

ASA Air Supply Apparatus ASA

Trouble Shooting ····· 59-61

Diaphragm Type Air Chuck

DC

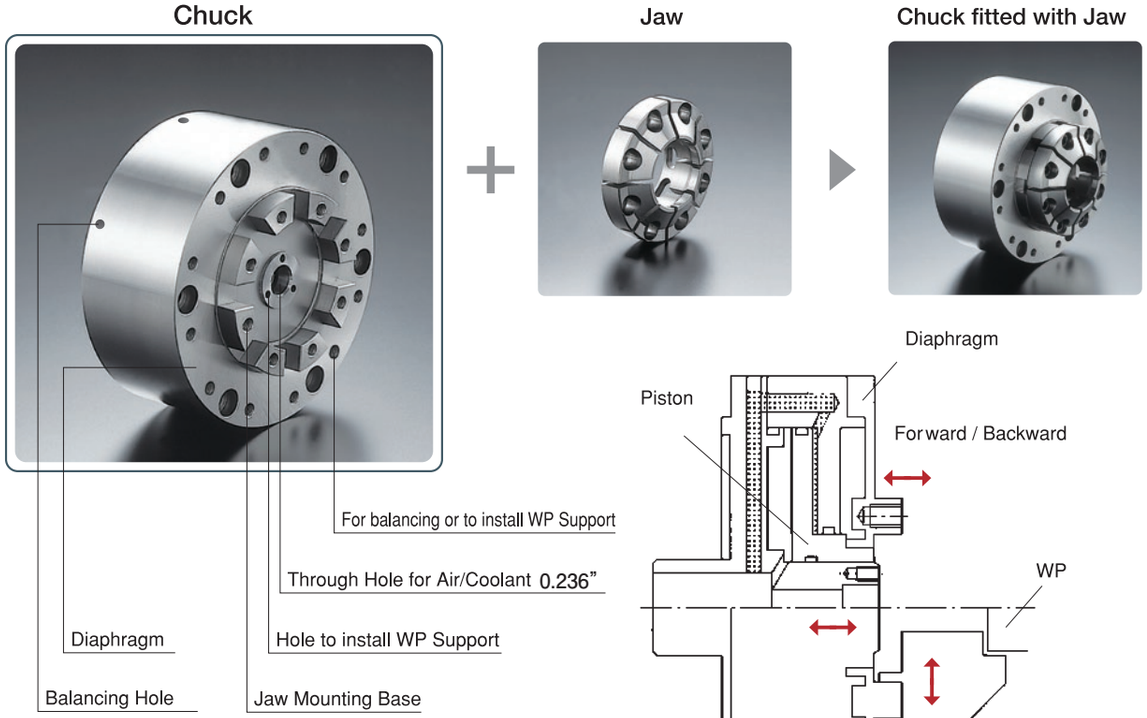
●Main Features

- ■Repeatability : Within0.0000157”
- ■100% sealed : No maintenance required (No lubrication required)
- ■Excellent high speed capability up to 12,000rpm (Counter-weight incorporated)
- ■Flexible adjustment of air pressure for flexible control of clamp power
- ■High durability & Long life
- ■Both internal & external clamp possible with one(1) chuck

For High Precision turning, grinding & measuring

1 DC Operation System (Structure & Function)

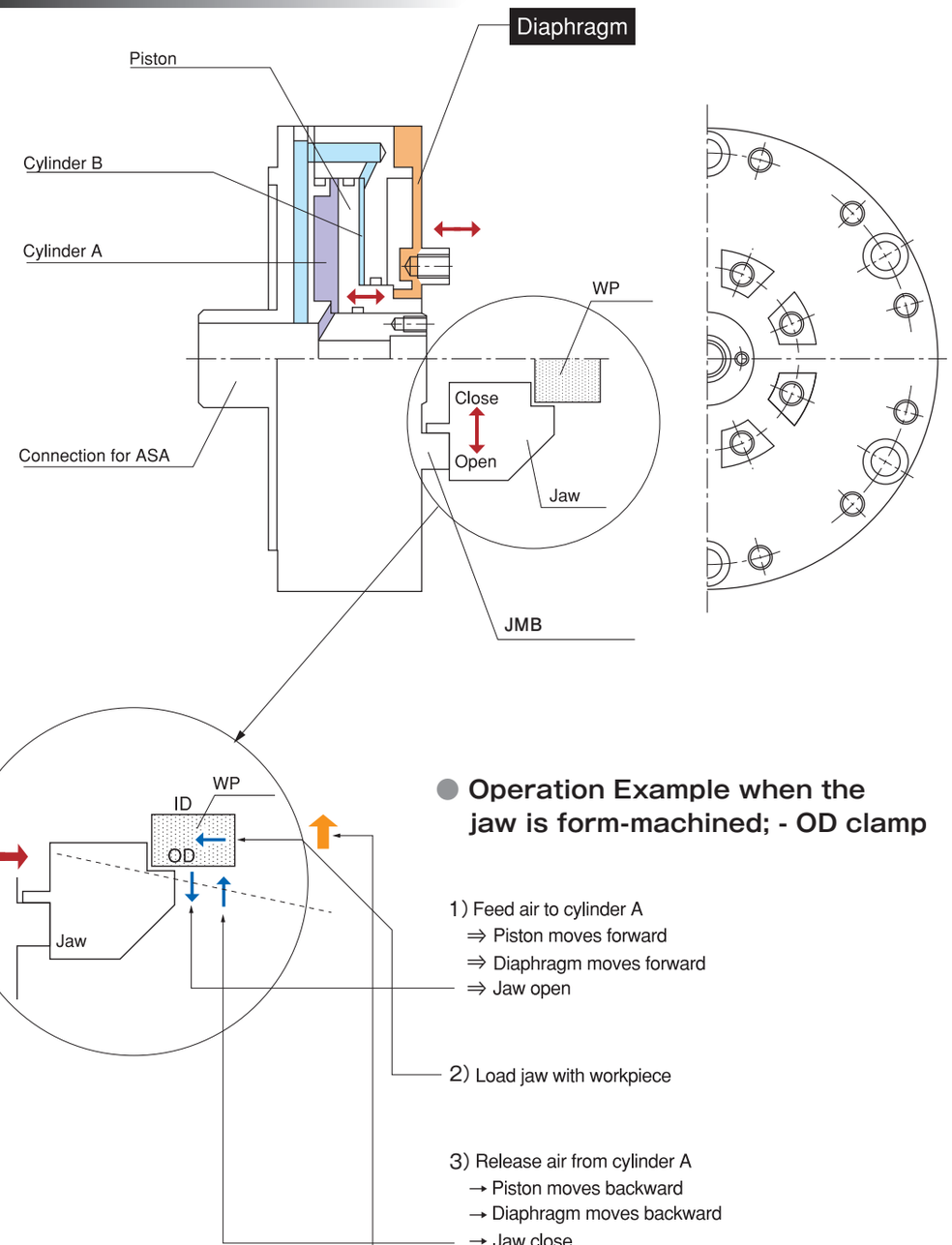
●Structure & Mechanism



DC is to clamp WP by utilizing the elasticity of diaphragm material, which is generated when the diaphragm move back and forth through the piston to be actuated by air.

Diaphragm Type Air Chuck

Example: OD Clamping



● Operation Example when the jaw is form-machined; - OD clamp

1) Feed air to cylinder A
   ⇒ Piston moves forward
   ⇒ Diaphragm moves forward
   ⇒ Jaw open

2) Load jaw with workpiece

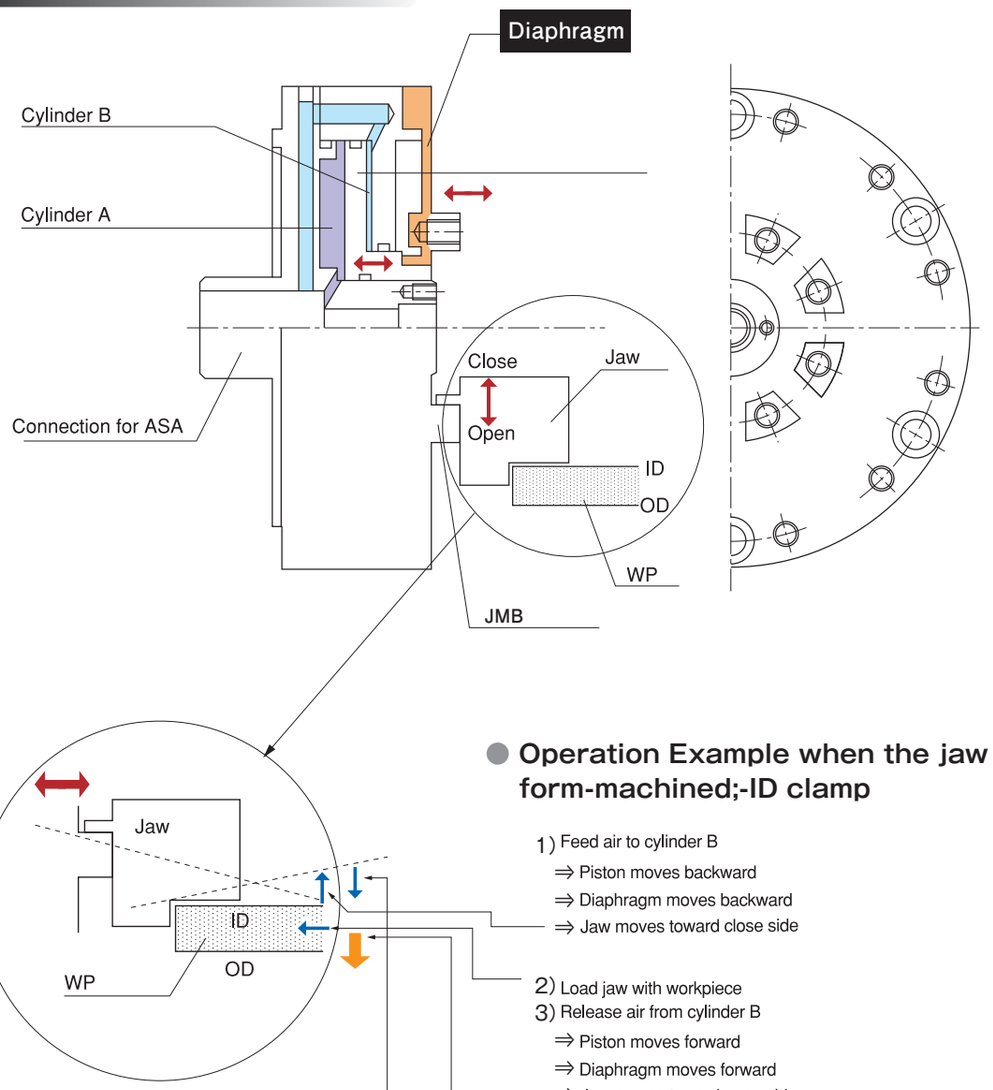
3) Release air from cylinder A
   → Piston moves backward
   → Diaphragm moves backward
   → Jaw close

4) Workpiece is clamped.＊＊
   ＊＊Feed air to cylinder B when more clamping power is required.
   ⇒ Piston moves backward further
   ⇒ Diaphragm moves backward further
   ⇒ Clamping power is increased by the additional clamping power obtained from above operation

This example is the operation example when WP is clamped by the pressure to be caused when the jaw returns to the original position after released the air from cylinder A.
The air pressure to open the jaw, in the procedure 1), need to be bigger than the one used when form-machining the jaw to get the clearance for loading/unloading of WP.
(Refer to page 19)

1 DC Operation System (Structure & Function)

Example:ID Clamping



Operation Example when the jaw is form-machined;-ID clamp

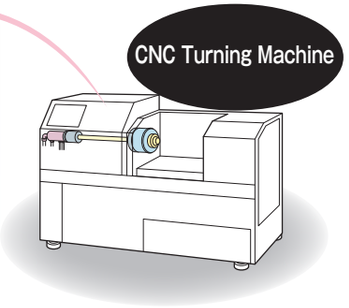
1) Feed air to cylinder B
⇒ Piston moves backward
⇒ Diaphragm moves backward
⇒ Jaw moves toward close side

2) Load jaw with workpiece

3) Release air from cylinder B
⇒ Piston moves forward
⇒ Diaphragm moves forward
⇒ Jaw moves toward open side

4) WP is clamped. **
** Feed air to cylinder A when more clamping power is required.
⇒ Piston moves forward further
⇒ Diaphragm moves forward further
⇒ Clamping power is increased by the additional clamping power obtained from above operation

This example is the operation example when WP is clamped by the pressure to be caused when the jaw returns to the original position after released the air from cylinder B.



System Outline

※Air set consists of the followings
- Air Filter
- Air Regulator

A	CLOSE
B	OPEN

Intensifying system is to stabilize the supply of air pressure during the operation, and/or to use higher air pressure than the normal std. factory air pressure (usually 72.5psi) to increase the clamping power.

Name and Performance of each access

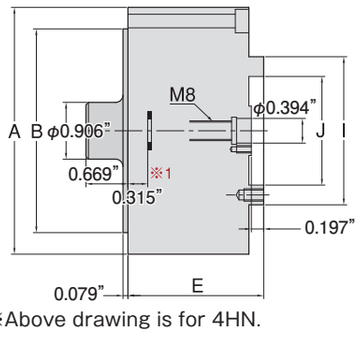
No.	Part Name	Performance	For more inf.
①	Jaw	Clamp workpiece	P.14~
②	DC	High Precision Diaphragm Chuck Body	P.05~
③	Chuck Adapter	To fix DC with spindle nose	—
④	Pipe	To feed air and/or coolant to DC	—
⑤	ASA Adapter	To fix ASA with rear end of spindle	—
⑥	S.R.Bushing	To install ASA with DC, and for safety	P.48
⑦	Rotary Journal	Rotary bearing housing perform also as terminal for air and coolant	P.48~50
⑧	Port	For coolant and air blow	—
⑨	Port	To drain returned coolant	—
⑩	Regulator	To regulate the air to open and close the jaw	—
⑪	Solenoid Valve	Auto change valve for On/Off of air	—
⑫	Air Set	Consists of air regulator and air filter	—
A	Air for Jaw Close	Port/Regulator for jaw close	—
B	Air for Jaw Open	Port/Regulator for jaw open	—

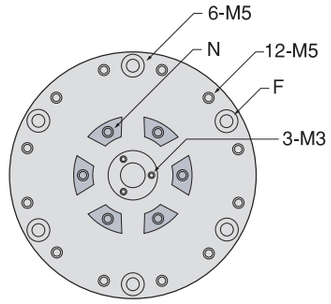
Diaphragm Type Air Chuck

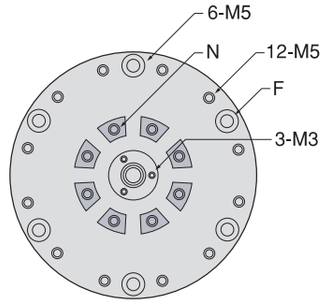
2 Model No./Dimension/Spec.

6div

8div

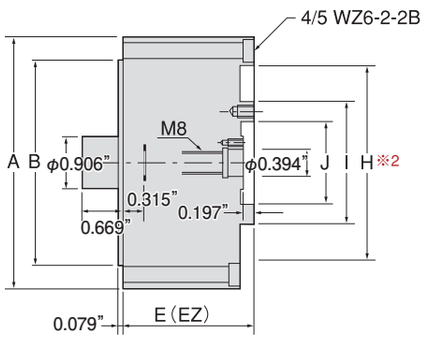


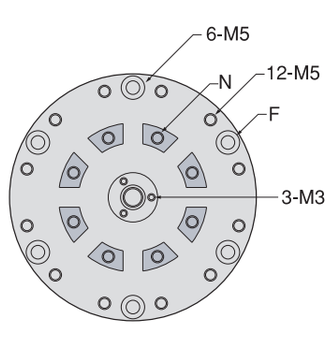


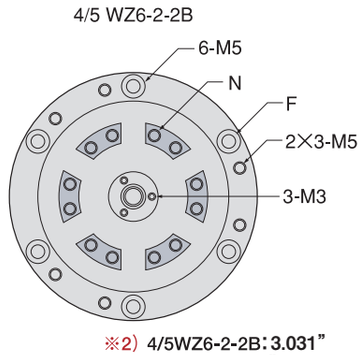


※Above drawing is for 4HN.

※1) 3SN8(6)0.236"

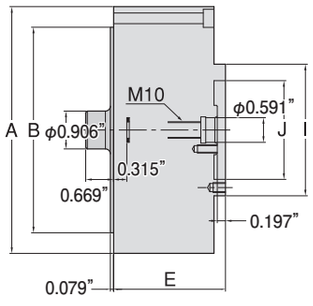


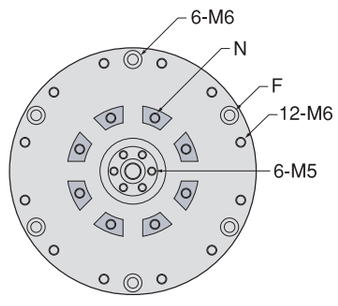




※2) 4/5WZ6-2-2B:3.031"
5WZ8-3:3.937"

※Above drawing is for 4/5HN





※Above drawing is for 6HN

Dimensions & Specification

*8 or 6 after HN signity the number of seats where the jaw is mounted on, i.e., the number of slits of jaw to be used with DC.

	Model No.	A φ	B φ	E	I φ	J φ	PCD F	PCD N	N	Speed ※3	Chucking cap. ※4	Wgt. lb
③	3SN8(6)-3	3.228"	2.362"	1.417"	1.417"	0.984"	2.756"	1.201"	8(6)-M4	12,000rpm	0.079"~1.575"	2.2
	3HN8(6)-3	3.228"	2.362"	2.165"	1.417"	0.984"	2.756"	1.201"	8(6)-M4	12,000rpm	0.079"~1.575"	3.7
④	4HN6-3	3.937"	3.250"	2.165"	1.890"	1.260"	3.500"	1.575"	6-M5	12,000rpm	0.079"~2.362"	5.7
	4HN8-3	3.937"	3.250"	2.165"	1.890"	1.260"	3.500"	1.575"	8-M5	12,000rpm	0.079"~2.362"	5.7
	4/5HN8-3	3.937"	3.250"	2.165"	2.362"	1.732"	3.500"	2.047"	8-M5	10,000rpm	0.079"~2.362"	5.7
⑥	6HN8-3	5.906"	4.920"	2.677"	3.150"	2.362"	5.346"	2.756"	8-M6	8,000rpm	0.118"~3.543"	15.7
	6/8HN8-3	5.906"	4.920"	2.677"	4.016"	3.031"	5.346"	3.543"	2×8-M6	8,000rpm	0.118"~3.543"	15.7
④	4/5WZ6-2-2B	3.937"	3.250"	2.087"	2.362"	1.732"	3.500"	2047."	2×6-M5	8,000rpm	0.079"~2.362"	5.1
⑤	5WZ8-3	4.961"	4.000"	2.283"	2.362"	1.732"	4.500"	2.047"	8-M5	8,000rpm	0.118"~2.756"	8.4

BTO

WZ Type

Original design. There's a projection around the outer surface of type WZ, and that is to allow the additional machining to arrange the workpiece support. Additional machining to arrange workpiece support around the outer DC surface is now possible on all HN models without the projection.

■Jaw Stroke

Attention to secure the clearance required for auto loading/unloading is required as the law stroke of DC is relatively small, much smaller than that of slide jaw type air chuck. Refer to page 13 for stroke chart.

■Gripping Force

Refer to the graph of page 13.

※3 ■Speed

Speeds described above are nearly considered as max. Generally speaking, higher the spindle speed, bigger the centrifugal force. The mass of workpiece, therefore, will affect the speed. The max. speed will also depend on the cutting conditions, the accuracies required and etc. Generally speaking, smaller and lighter the mass, higher the spindle speed can be applied. On the other hands, bigger and heavier the mass, lower the speed will have to be applied.

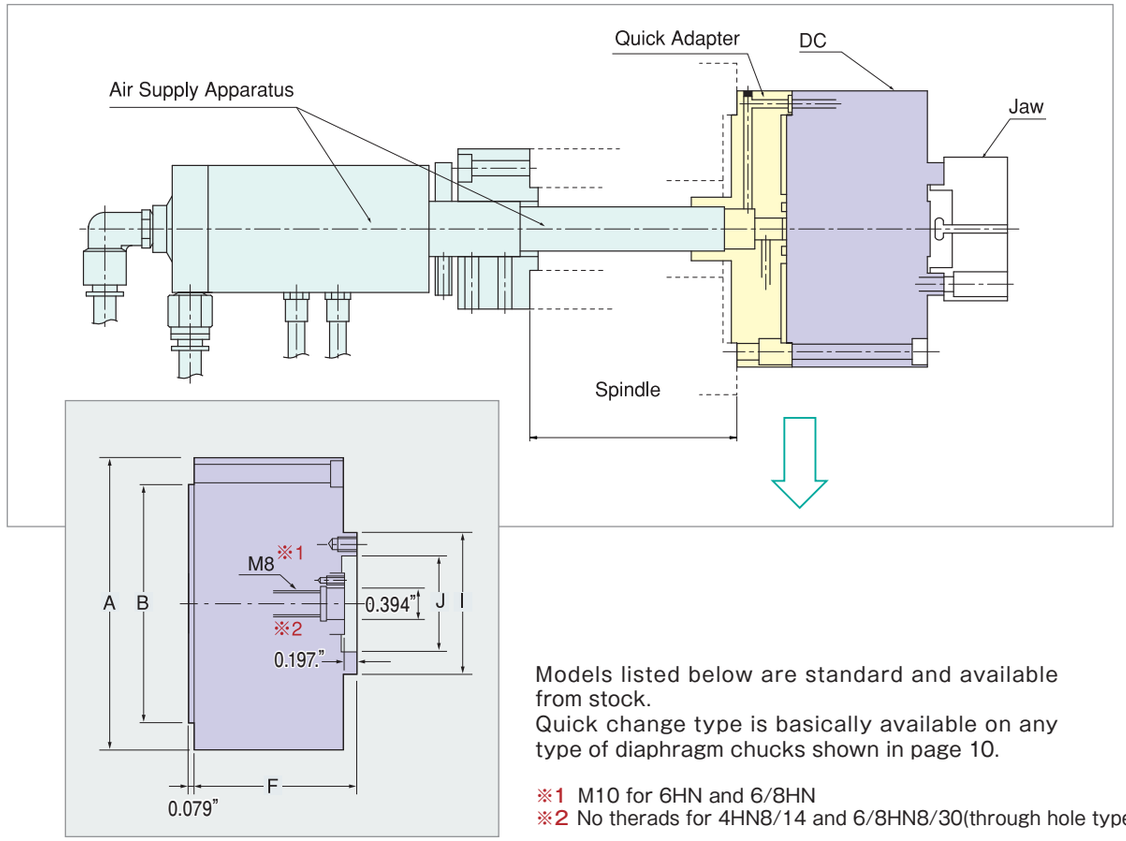
※4 ■Chucking Range

The chucking capacity (range) can't be summed up easily due to the unique contiguration of jaw. It has to be affected by the configuration, weight, material of workpiece, spindle speed, cutting conditions and accuracies required. Please take the figures described above as the reference range.
In general, as an example, when the real high accuracy, micron or sub micron, is required, usually the workpiece has to be relatively light and small, and its diameter needs to be smaller than the PCD of bolt hole of jaw.

Diaphragm Type Air Chuck

3 Quick Change System

Chuck can be changed without dismounting the ASA.
Changeover time is drastically reduced, and machine's down time is also significantly reduced.



Models listed below are standard and available from stock.
Quick change type is basically available on any type of diaphragm chucks shown in page 10.

※1 M10 for 6HN and 6/8HN
※2 No therads for 4HN8/14 and 6/8HN8/30(through hole type)

●Dimensions & Specification

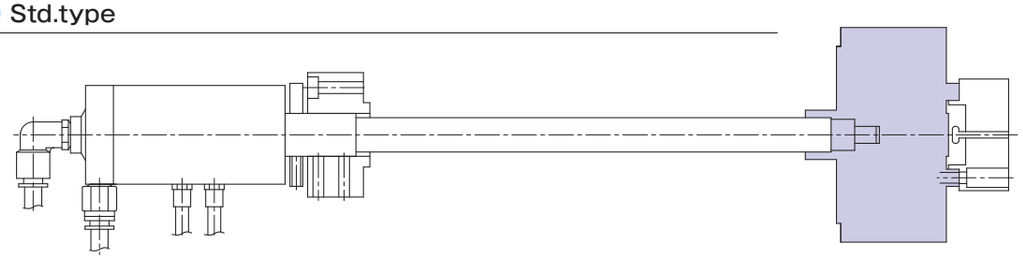
Refer to the equivalent model of page 10 for the spec. of mounting bolt etc,

	Model No.	A ϕ (inch)	B ϕ (inch)	F (inch)	I ϕ (inch)	J ϕ (inch)	Wgt. lb
③	3HN6-3-QTN	3.228"	2.362"	1.772"	1.417"	0.984"	4.9
	3HN8-3-QTN	3.228"	2.362"	1.772"	1.417"	0.984"	4.9
④	4HN6-3-Q	3.937"	3.250"	2.165"	1.890 "	1.260"	5.7
	4HN8-3-Q	3.937"	3.250"	2.165"	1.890"	2.165"	5.7
	4/5HN8-3-Q	3.937"	3.250"	2.165"	2.362"	1.732"	5.7
	4HN8/14-3-Q	3.937"	3.250"	2.165"	1.890"	1.260"	5.5
	New triple piston						
	4HN8-3-QT	3.937"	3.250"	2.165"	2.047"	1.260"	6.4
⑥	6HN8-3-Q	5.906"	4.920"	2.667"	3.150"	2.362"	15.7
	6/8HN8-3-Q	5.906"	4.920"	2.677"	4.016"	3.031"	15.7
	6/8HN8/30-3-Q	5.906"	4.920	2.677"	4.016"	3.031"	15.0

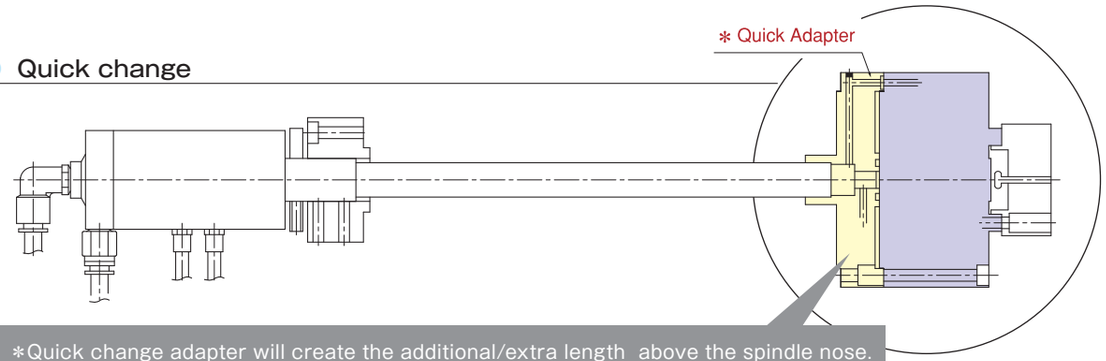
*8 or 6 after HN signify the number of seats where the jaw is mounted on, i.e.,the number of slits of jaw to be used with DC.
*Triple piston···has the equivalent repeatability to double piston type, and 1.4 times in gripping power.

Diaphragm Type Air Chuck

● Std.type



● Quick change



*Quick change adapter will create the additional/extra length above the spindle nose. It is therefore, suggested to check if there's enough space among tool post, loader arm and the top of jaw before adopting the quick change system, to avoid interference.

●Procedure & Time required for changing chuck

1.Remove ASA from the spindle.
2.Remove chuck from the spindle
3.Mount new chuck to the spindle/Not tightening the bolts to full extent.
4.Secure the chuck firmly by tightening the bolts to the full extent and do centering again.
5.Install ASA into the chuck.
6.Center ASA and secure it firmly.

Normally, it will take about an hour for above operation.

In Case of Quick Change

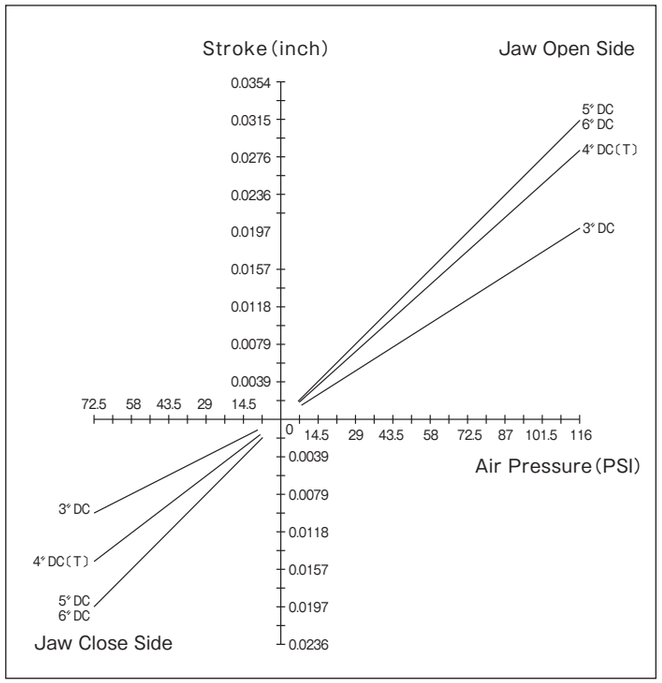
Eliminate operation 5,6 of above procedure,
and changeover time is reduced to 15 min. or so.

Reduce Down-Time Drastically!

●Note
More procedures than written here are required to be done in the practical operation, Refer to the operation/instruction manual of AC and/or DC for what need to be done exactly.

Quick change system is ideal, because of above feature, for in case the workpiece is changed time to time and require high precision.

●Air pressure & Jaw Stroke



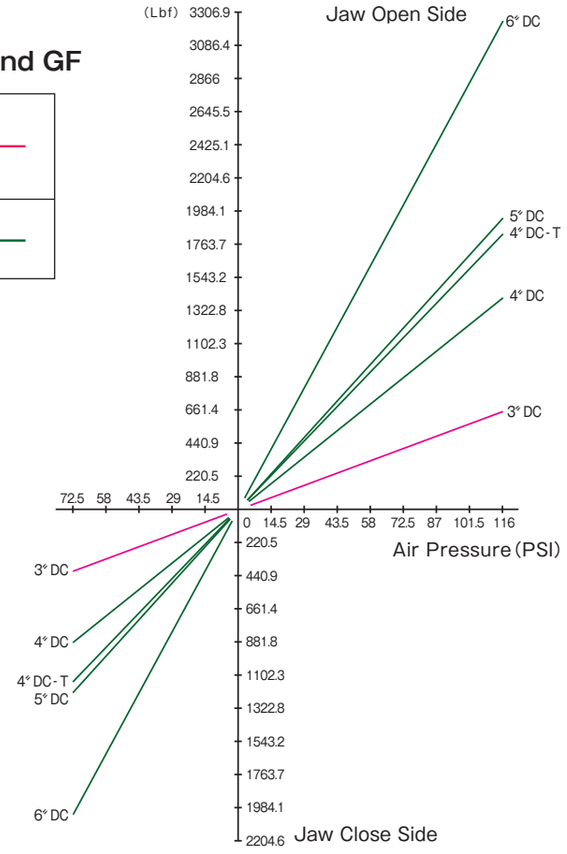
Max. Air Pressure
Jaw Open : 116psi
Jaw Close : 72.5psi

※Stroke amount is not exactly like the graph shown above. There is always a little variation with it depending on the chuck. Stroke amount of Jaw opening side and closing side under the same air pressure is not exactly and directly proportional to each other. It is always with a little variation and difference. Take the stroke amount shown above in left graph, therefore, as the guide value.

It may affect the durability and life of diaphragm to use any higher pressure described above, breakage of diaphragm after relatively a short period of use in the worst case.
Stroke, described above, was measured at 0.906" H of Jaw.

Correlation Diagram between AP and GF

3" DC (Jaw Height:0.787") [3HN8(6)]
4" 5" 6" DC (Jaw Height:0.906")



4 Jaw/Form Machining

■One piece collet type. Special material that has very high rigidity and elasticity to insure high accuracy and long life, is used.
■Hardened and tempered steel is used as std. and its hardness is about HRC40. Harder jaw to HRC55-60 is available. Due to the unique collet like design of jaw, and as it's usually designed to light weight for high speed operation, and form-machined to relatively thin meat, each segment of jaw is relatively thin. Therefore, and in general, any material over HRC30 is recommended for use.

●How to order std. blank jaw

Chuck Size
4HN⇒4 4/5HN⇒ 5 6HN⇒ 6
3HN⇒3 6/8HN⇒ 8 5WZ⇒ 5

Jaw Height
e.g:23=23mm⇒0.906" (4")
25=25mm⇒0.984" (5" , 6" , 8")

4 A 8 1 – 10 – 23

Type A or B
Number of slit (8or 6)
Jaw Hardness (see Note 3)
Width of slit
e.g:05=0.5mm⇒0.02"
10=1.0mm⇒0.039"
15=1.5mm⇒0.059"

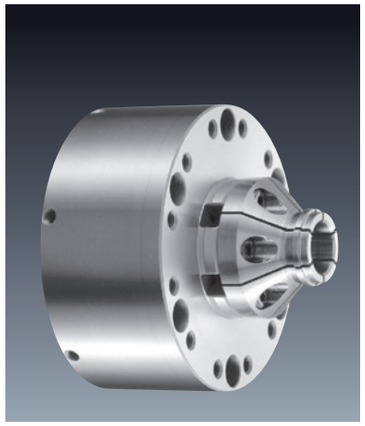
Note 1: In case of 4/5WZ6-2-2B, the last number have to be 25(std.) instead of 23 unless other special size is requested. Two bolts are used per jaw. So, it actually has to be 25-2B,

Note 2:Most popular size of slit being used like standard is 0.039". Other sizes such as 0.020", 0.059" and 0.079" are also available. Generally speaking, wider the slit, better the chips removal. If, often the chips get stuck at the slit, it will be recommendable trying 0.059" or 0.079". If, however, the accuracy required is severe, in micron or sub-micron order, you will kindly be requested to expect the decrease of accuracy along with the increase of slit width. If the out of roundness, for example, required is like 0.0008" to 0.0012" or more, it won't be necessary for you to be concerned about the width of slit.

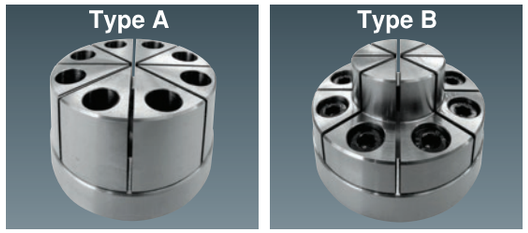
Note 3: Pre-hardened mold alloy steel (HRC40) is used as standard. Any other material being considered feasible can be used. There's no data showing the difference of performance among each different material. It is generally suggested to pick up any one which have enough hardness, machinability, and durability to clamp and turn the WP. FYI, soft and flex. Clamp with DC is largely because of the material of diaphragm and designing related to it.

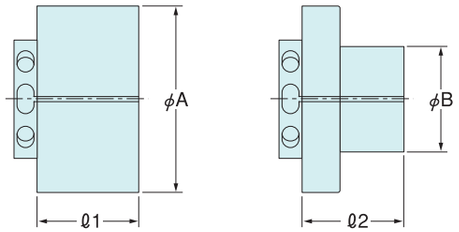
Form-Machined Jaws

4HN6-3 supplied w/machined jaw



●Outline Drawing of Std.Jaws





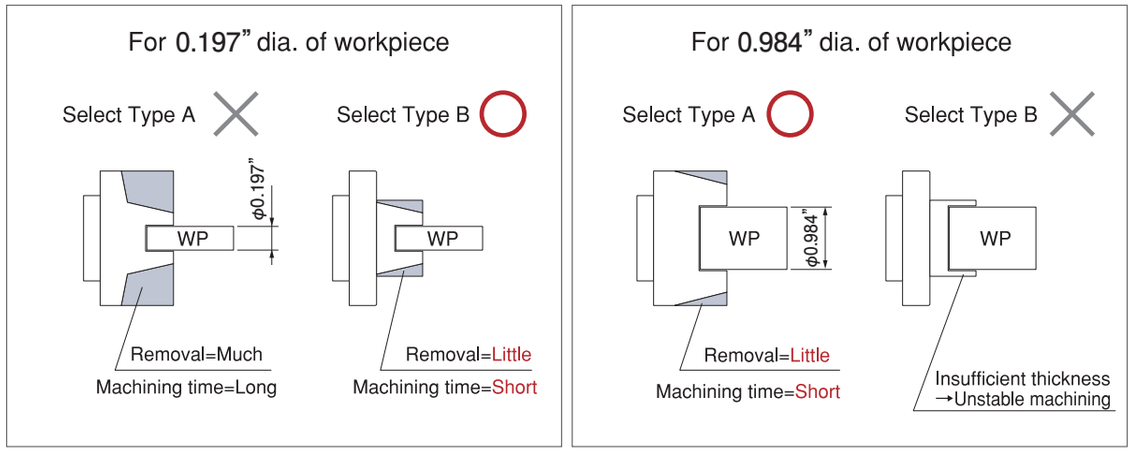
●Dimensions of Std.jaw

Chuck \ Jaw	Type A				Type B			
	ϕA (inch)	ℓ 1 (inch)		Wgt (lb)	ϕB (inch)	ℓ 2 (inch)		Wgt (lb)
3SN 3HN	1.575	0.906	1.181	—	0.866	0.906	1.181	—
4HN	2.047	0.906	1.181	0.84	1.102	0.906	1.181	0.66
5WZ 4/5HN	2.480	0.984	1.181	—	1.575	0.984	1.181	—
6HN	3.228	0.984	1.181	—	1.969	0.984	1.181	—
6/8HN	4.331	0.984	1.181	—	—	—	—	—

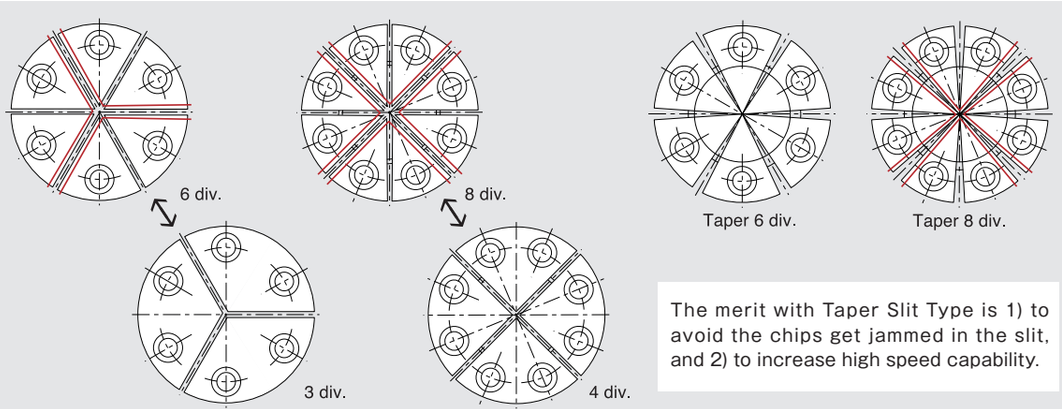
Other sizes available on request as option.

Type A is basically for OD clamping, and Type B is for ID clamping. The selection of A or B depends on how fast and efficiently it can be form-machined to the required shape.

●Example of Std. Jaw Selection



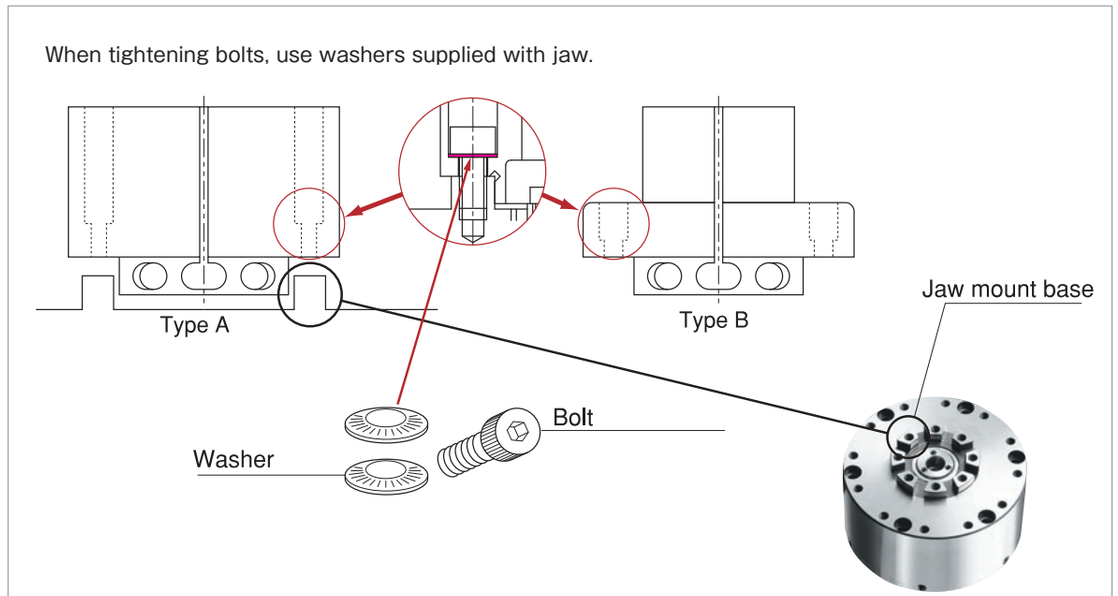
●Type of Jaw



The merit with Taper Slit Type is 1) to avoid the chips get jammed in the slit, and 2) to increase high speed capability.

●Mounting of Jaw

1) Mount the jaw onto the JMB. Remove the chips and dust from the surface of JMB, and from the seating surface of Jaw. Tighten the bolts not to full extent, leaving a little allowance for further final tightening. This operation should be done under no air pressure to the chuck.



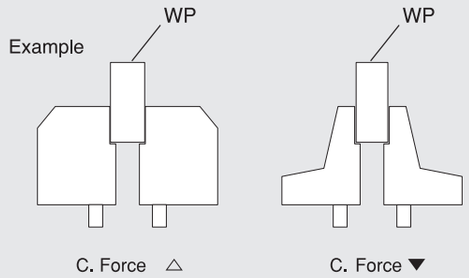
2) Tighten the bolts to secure the jaw to the chuck. It is recommended to use the torque wrench by setting it to 6N-m for M4, or, 12N-m for M5 and 15N-m for M6. When tightening the bolts by torque wrench, apply 21.75psi to 29psi of closing air pressure to clamp the pilot of jaw. This operation is to remove the clearance between the pilot of jaw and the internal surface of JMB, and thence to make it possible to clamp the workpiece accurately with good concentricity.

3) After tightening bolts, release the air pressure and make sure again the tightening torque. Make sure, in other words, if the jaw is tightened with the chuck with the right torque.

4) Machine the jaw to the shape and dimensions required to clamp the workpiece. There are slits with the jaw, and therefore, the machining will have to be intermittent. It is suggested, therefore, to set the feed rate, removal rate etc. as small as possible. Enough attention need to be paid for this operation.

■ Form-machining of Jaw Sample

①Machine to the shape and dimension to make clamping possible
②Machine by considering where to clamp, range for clamping, and where/how to be supported on the workpiece to achieve the accuracy required.
③For as higher speed of operation as possible, remove as much meat as possible from the jaw to reduce the mass.



■ Finish-Machining

If once the Jaw is dismounted from the chuck after finished with the chuck, it will have to be off-centered. If the accuracy required is high, re-machining of jaw may have to be required when the jaw is put back to the original chuck or onto another chuck. (Occasionally, and when the required accuracy is not high, it might be used without re-machining.)

■ How to test cut to find most feasible air pressure for form-machining

If, for example, once the jaw is machined by 14.5psi of air pressure for opening, then, it can not be re-machined by any higher air pressure than 14.5psi. Therefore, it is suggested to use highest possible air pressure to machine the jaw at the beginning. After machining of jaw, test cut is done and the machining accuracy is measured. If the accuracy to be obtained by that air pressure is not good enough, and if lower pressure considered to be better, reduce the air pressure perhaps by 7.25psi, and then, try a test cut and measure again. If still not good enough, try further lower air pressure.
Note: Lower the air pressure is, lower the gripping force will be. So, in case the air pressure is lowered, the use of additional air pressure to move the law to closing side have to be considered to compensate the loss of clamping force.

●Attention need to be paid when for-machining jaw

Refer to next page

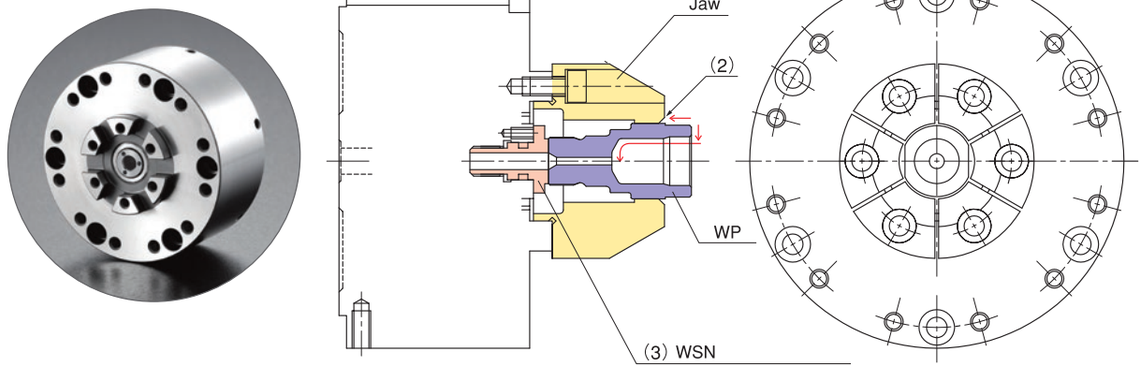
①Select most feasible air pressure to clamp WP is critical.

Lower the air pressure, better the accuracy. If, however, the air pressure is too low, WP will be force-moved by the centrifugal force while rorating/turning, Air pressure should be needed is to make it possible to turn WP at as higher rpm as possible, and to reduce the distortion when clamped WP to the smallest degree as possible. (Refer to page 11 and 20)

②WP should be clamped as close to the machining area as possible to get max. possible accuracy.

③Arrange WS

Example
4HN6—3—Q



●3 patterns for finishing/arranging the jaw

1 Pattern 1

Order std, jaw type A or B. (supplied with support ring as std.) → Clamp the support ring and semi-finishing with other machine than the one to be used for practical production. (Make sure if the jaw is tightened firmly with support ring by the bolts.)Remove the semi-finished jaw from the chuck, and support ring from the semi-finished jaw. Then, mount it onto the chuck to be used for finishing. (Support ring is no longer in use.) Secure the chuck and jaw firmly and evenly by torque wrench. → Carry out finish-machining. → Ready

2 Pattern 2

Order the semi-finished jaw. (Support ring is used to avoid any deformation when shipping.) → Remove the support ring, and mount the semi-finished jaw on the chuck to be used for practical production. → Carry out finish-machining. → Ready

3 Pattern 3

Order the jaw finished with the chuck as a set. → Jaw is already centered against the chuck. Do the centering on the chuck after installed with the machine spindle preferably within 0.00004". → Ready

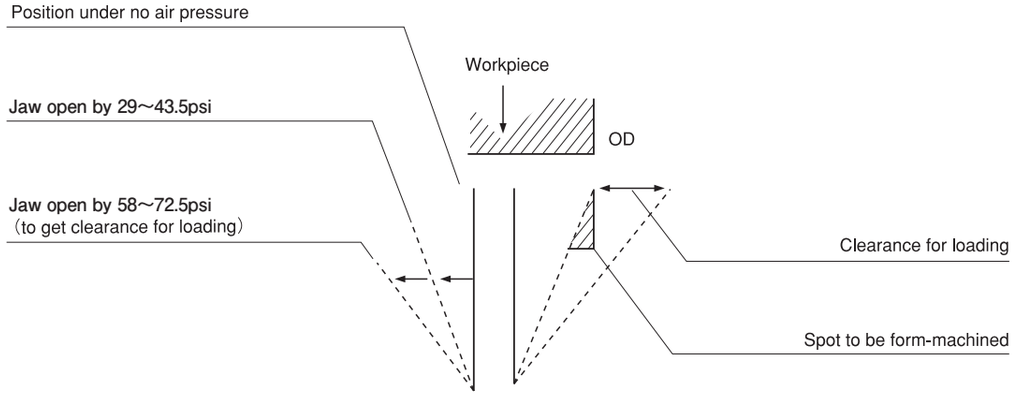
Order the finish-machined jaw Independently → No matter how the jaw is finished, it will have to be off-centered when it's shipped independently and remounted to the chuck. → Therefore, it has to be re-machined with the chuck and machine to be used for practical production.

●Form-machining of Jaw

①Form-Machining of Jaw for OD Clamping

The pressure to be set at regulator A means the clamping power. In case 29~43.5psi air pressure is considered enough to hold the workpiece, machine the jaw by opening it by 29~43.5psi. If the loading accuracy or auto loading/unloading equipment is good, or, if the loading/unloading is done manually, usually 58~72.5psi air pressure to be set at regulator A is enough to get the clearance for loading/unloading.

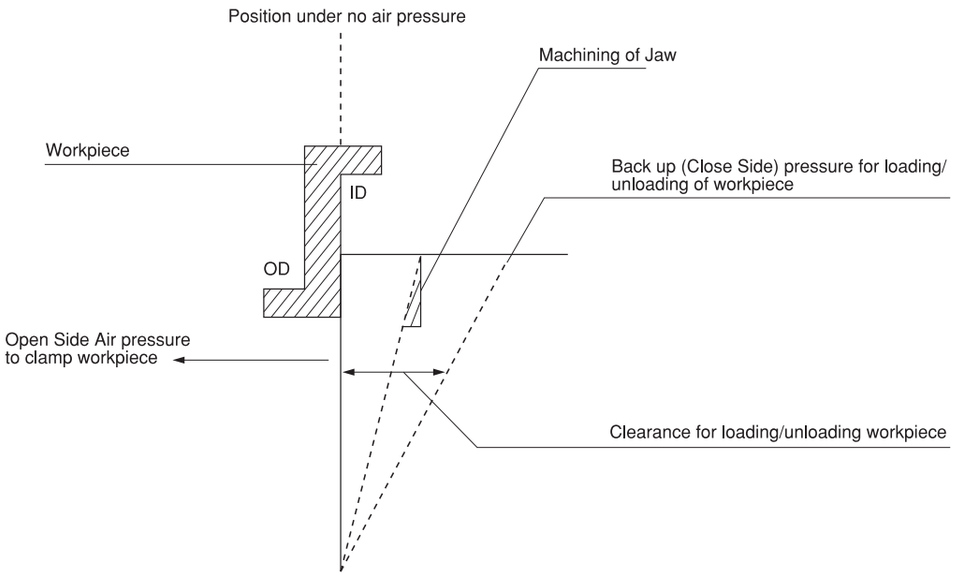
Note: Max. air pressure can be used to open the jaw; 116psi



②Form-Machining of Jaw for ID Clamping

The pressure to be set at regulator B means the clamping power. In case 14.5~29psi of air pressure is enough to hold the workpiece, machine the jaw by closing it by 43.5~58psi when loading the workpiece. If the loading accuracy of auto loader/unloader is good, and/or, if the loading/unloading is done manually, usually 43.5~58psi of air pressure is enough to get the clearance for loading/unloading.

Note: Max. air pressure can be used to close the jaw ; 72.5psi



●Operation for OD clamping

1. In case the air pressure used for form-machining of jaw is 43.5psi, as an example, set the air pressure at regulator B (this regulator is to control the air to open the jaw) higher than 43.5psi.

Example: For manual loading/unloading ⇒ 50.76psi
For auto loading/unloading ⇒ 58~72.5psi

Above pressure can be determined from the comparison chart of air pressure and stroke.

In case of 4" DC fitted with 0.906"(h) of jaw, the displacement of stroke per 14.5psi of change of air pressure is approx. 0.004". The following is the guide to select air pressure in case of both 0.004" or lower loading clearance and between 0.008" and 0.004" loader clearance.

	In case Loading Accuracy is below 0.004"							In case Loading Accuracy is between 0.008" and 0.004"					
Air Pressure to machine the Jaw (psi)	101.5	87.0	72.5	58.0	43.5	29.0	14.5	87.0	72.5	58.0	43.5	29.0	14.5
Air Pressure for loading Workpiece (psi)	116.0	101.5	87.0	72.5	58.0	43.5	29.0	116.0	101.5	87.0	72.5	58.0	43.5

2. The air pressure to be set at regulator A (this regulator is to control the air to close the jaw) will be the additional pressure for clamping WP in addition to the power to be obtained at the point where WP is clamped, where the jaw was form-machined, when releasing the air from cylinder B.

In case of O.D. Clamping, finish-machine the clamping part of jaw to approx. +0.0004" above the dimension of workpiece.

●Operation for ID clamping

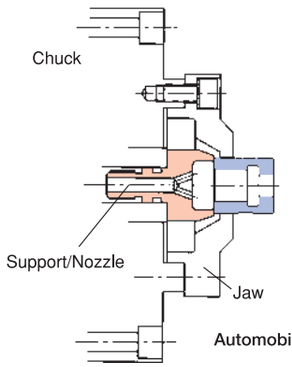
1. In case the air pressure used to form-machine the Jaw is 29psi, set the pressure at regulator A (this regulator is to control the air pressure to close the jaw) higher than 29psi to get the clearance for loading/unloading WP.

Example: Manual loading/unloading ⇒ 36.25psi
Auto loading/unloading ⇒ 43.5~58psi

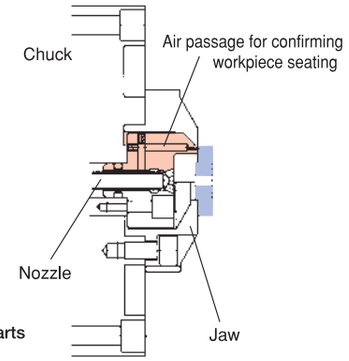
2. Set the pressure at regulator B (this regulator is to control the air pressure to open the jaw), in ID clamp operation, will be the additional pressure for clamping WP in addition to the power to be obtained at the point where WP is clamped, where the jaw was form-machined, when releasing the air from cylinder A.

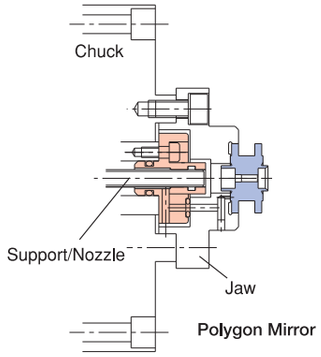
In case of I.D. clamping, finish-machine the clamping part of jaw to approx. -0.0004" below the dimension of workpiece.

5 Application Examples

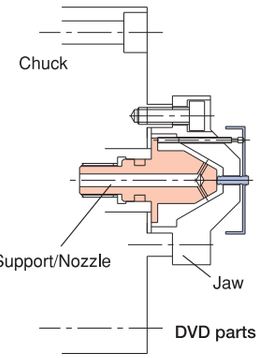


Automobile parts

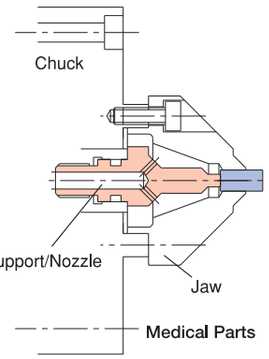




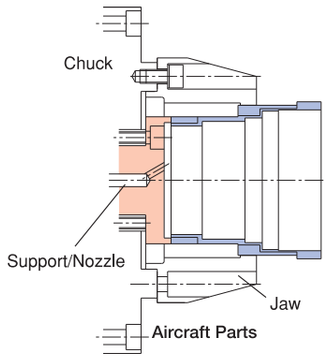
Polygon Mirror



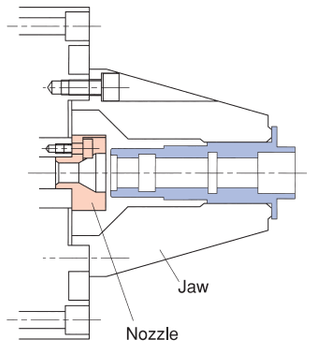
DVD parts



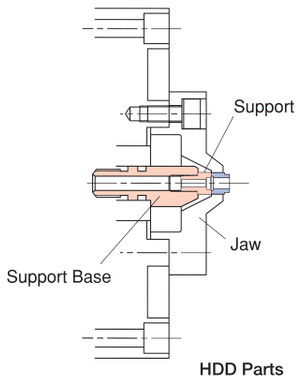
Medical Parts



Aircraft Parts



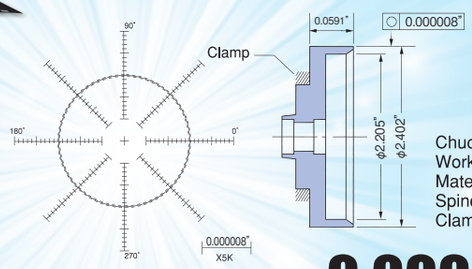
Sleeve for Transmission



HDD Parts

Flashback !

VHS, Beta system is no longer in the production, but when they were main stream for VTR, the key component to achieve fine image sharpness was how accurately the drum (aka: cylinder) is machined. Our diaphragm chuck made it possible to achieve all time high 0.000008".

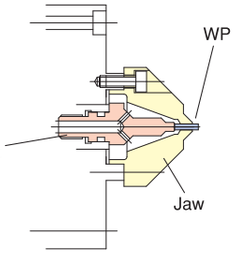


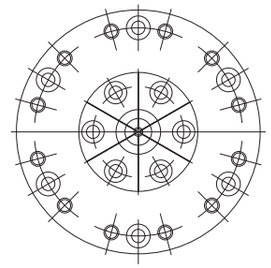
Chuck : 4HN8-3
Workpiece : VCR drum
Material : Aluminium
Spindle RPM : 8,000rpm
Clamp : O.D.Clamp

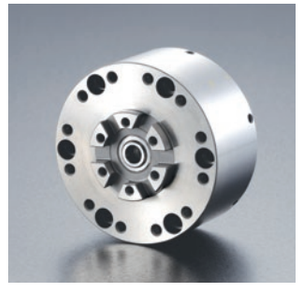
Out of roundness — **0.000008"**

Diaphragm Type Air Chuck

3HN6-3
O.D.clamp



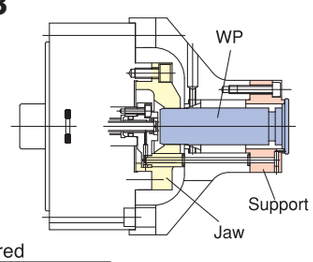


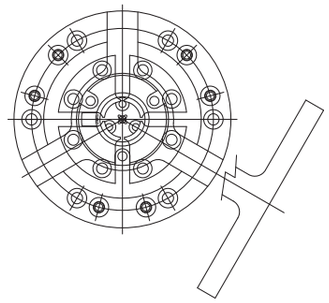


3HN6-3

Accuracy Required
Repeatability required : Within 0.00004"

4/5HN8-3
O.D.clamp

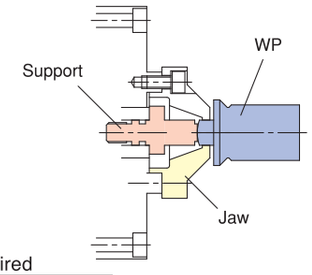


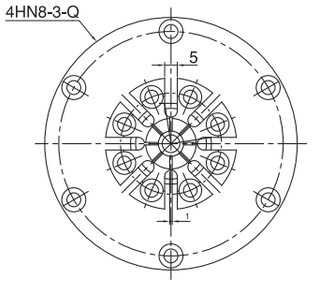


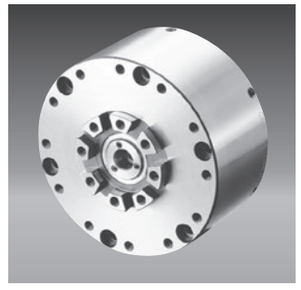
4/5HN8-3

Accuracy Required
Cylindricity : 0.0003"
Out of roundness : 0.0002"

4HN8-3-Q
O.D.clamp





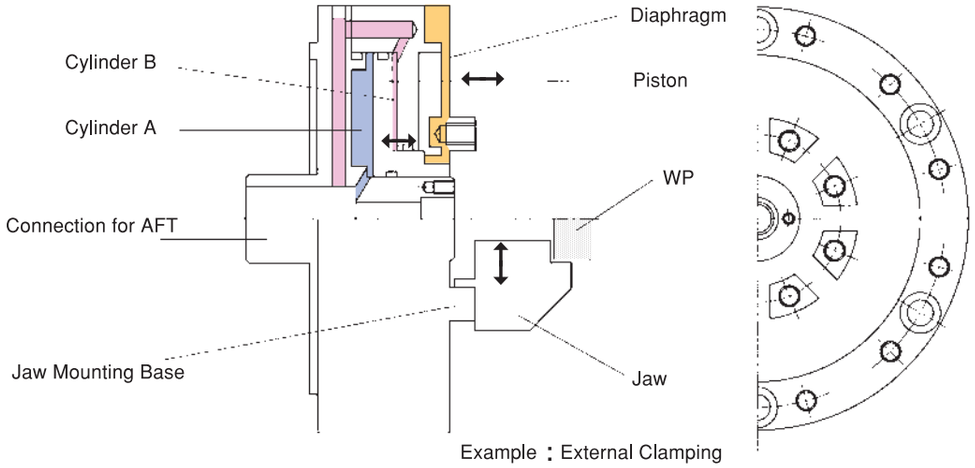


4HN8-3-Q

Accuracy Required
Out of roundness : 0.0001"
Cylindricity : 0.0001"
Rectangularity : 0.0002"

Work Example

6 How Diaphragm Chuck Work



Example：External Clamping

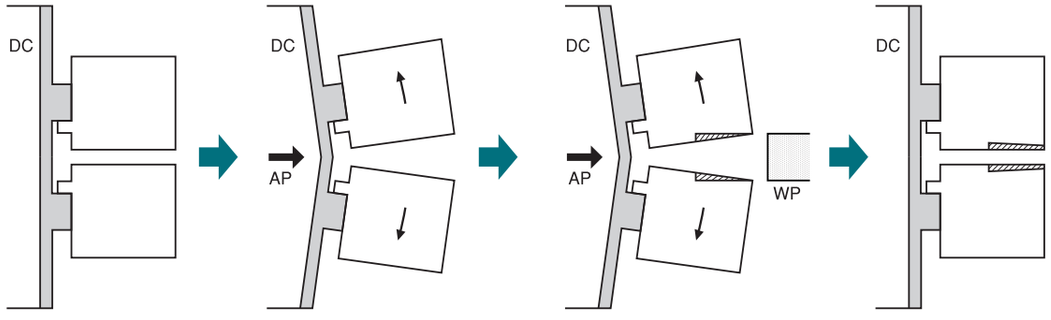
●Mechanism of diaphragm movement

Air to Cylinder **A**	Air to Cylinder **B**
↓	↓
Piston Move **Forward**	Piston Move **Backward**
↓	↓
Jaw Open	Jaw Close

●Work Example：External Clamping

AP to form machine the jaw=29psi

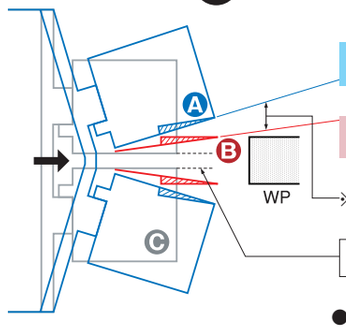
1. Before machining of jaw
2. Open the jaw by 29psi for form machining
3. Machine the oblique part to the dia. of workpiece
4. Release air ⇨Jaw come back to original position



Form machining is finished, and go into practical operation for machining & production

Diaphragm Type Air Chuck

❺ Jaw Open⇨WP loading ⇨ Release AP=Clamp WP ⇨Machining starts Ⓑ



Open the jaw by 72.5psi of AP Ⓐ

↓

Load the jaw w/WP⇨Release air⇨Clamp WP Ⓑ

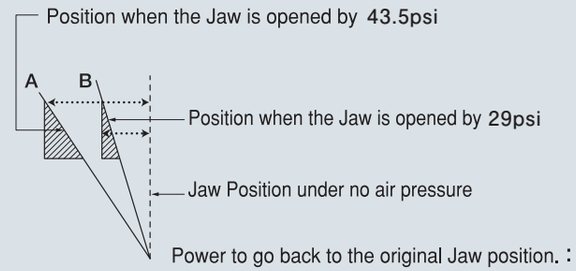
※Secure the clearance for loading/unloading

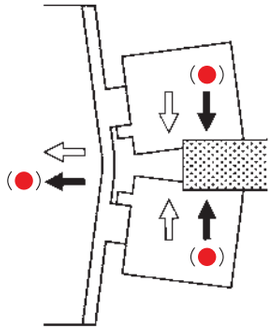
Original pos. of jaw Ⓒ

● Jaw tries to return to the original pos. by the elasticity of diaphragm material. That represent clamp power.

■Clamping Power

As shown right, higher the AP to form machine the jaw, stronger the clamp power. Lower the AP to form machine the jaw, weaker the clamp power.



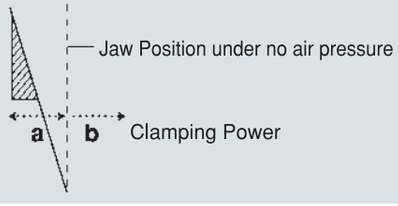


※Air pressure to cylinder A-Piston is forced to move backward-Diaphragm is moved backward, and thus the additional clamping force is obtained.

❻ When the clamp power is not enough under the clamp condition of ❺, the additional air pressure for additional clamping power(●)can be applied by feeding the air into the cylinder A.

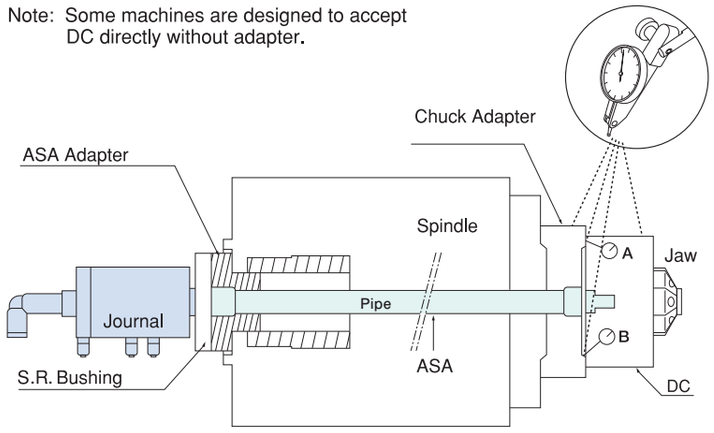
❼ In case of ❺, after finished the machining, WP can be unclamped by opening the jaw to Ⓐposition. After that, the jaw can be moved back to the original C position where it should be under no air pressure, by releasing the air from cylinder B.

The clamping power can be flexibly adjusted by air pressure to be used for both machining the Jaw and additional clamping power.



M1 Installation

Note: Some machines are designed to accept DC directly without adapter.



Installation of DC

1. Mount adapter onto the spindle nosel temporarily & not fully, leaving a little allowance for final firm tightening
2. Center the adapter at its OD within 0.000079".
3. Tighten the bolts firmly to secure the adapter with the spindle nose. Make sure the runout at OD is still within 0.000079". If not, and out of 0.000079", loosen the bolts a little and repeat procedure 2 until within 0.000079" of runout is obtained.
4. Check the runout of surface A and B. Runout of surface A have to be within 0.000079", and B within 0.0004".
5. Mount DC onto the adapter by tightening 6 bolts temporarily & not fully, leaving a little allowance for final firm tightening, and do the centering at its OD. Runout at 0.197-0.394" away from the chuck surface is required to be within 0.00004".
6. After centering, tighten 6 bolts to secure DC with adapter firmly.
7. If DC is not centered within 0.00004", loosen 6 bolts a little and try centering again from procedure 5 mentioned above.
8. Torque wrench is recommended to be used for tightening bolts.
   Recommended torque: 3",4",5" DC ⇨ M5 12N-m
   : 6" ⇨ M6 15N-m

M2 Maintenance & Caution

1.Handling

·If once the jaw is dismounted, after finishing, from the SFJ of DC, and when it's put back onto the SFJ, usually approx. 0.0001" to 0.0004" of off-centering is caused. So, if once the jaw is dismounted, carry out re-machining of jaw. As to the air pressure to be set for re-machining, refer to aforementioned instruction.
·Jaw is split into 8 (or 6) pieces, and all 8 pcs are linked together only at the bottom of jaw. This linkage is relatively small and thin. So, it is recommended to pay enough attention to the handling of jaw to avoid deformation or damage.
·Jaw can get rusted. When it's not in use, carry out the anti-corrosion treatment. It is also recommended to be kept with Ring which was originally supplied with the jaw.

2.Storage

When DC is not in use, apply anti-corrosion oil to it, and wrap it up by clean nylon cover etc. to avoid dust, chips etc.

3.Maintenance

a.Cutting Chips
·On auto operation, stop the machine periodically and check if there are any cutting chips with the clamping area of jaw. If there are, they have to be removed and cleaned.
·To avoid cutting chips cumulated at the bottom area of jaw, set-up the angle and position of nozzle for coolant and/or air blow right.
·If the cutting chips piled up, that may affect the jaw's movement. and eventually to the cutting accuracy.
·If cutting chips are found piled up, remove them by using a wire or whatever through the slits of jaw.
·If is recommended to install coolant nozzle to avoid the cutting chips stay on the clamping surface of jaw. Coolant nozzle should be arranged according to the shape of workpiece, taking efficiency into consideration. Clamp surface of jaw will be kept clean by feeding the coolant and for air through ASA, DC and nozzle.

b.Exchange of Jaw
When the jaw need to be changed, follow the aforementioned instruction about the installation and machining.

c.It is requested not to dis-assemble DC any time.
The manufacturer and supplier is completely free from any responsibility on the trouble or problem resulted from disassembly.

d.Because of erroneous operation or whatever, when some shock is given to the jaw, and naturally to the SFJ of DC, off centering may have to be caused on both jaw and SFJ.
If off-centering take place, the machining accuracy will have to be lost.
If the accuracy is found went wrong after collision, and/or the deformation of jaw is found, the chuck will have to be repaired, and the jaw will also have to be newly made.

e.Jaw can wear. When it's worn, and when it's necessary to be re-machined, follow afore-mentioned instruction in Article 10.

4. Check the Air Filter periodically to see if there is any damage with it, or if it stuffed heavily with chips, sludge etc. If the chips or sludge etc. get into the air, malfunction of air chuck and/or ASA assembly is caused.

5. When the coolant is used through the center hole of DC supplied with the nozzle to flow the chips away while cutting, make sure the coolant is relatively clean, and not dirty. Especially when the nozzle is inside the jaw, and if the coolant is not clean, back pressure against the coolant flow is increased, and much coolant will flow back to the journal. In this case, occasionally, the coolant get into the bearing area, and wash grease away. If this happen, Bearings will generate the heat, and eventually the jamming of journal may have to be caused.

6. For the maintenance of ASA, refer to the separate instruction manual of ASA.

7. When the chuck supplied with the jaw accidentally had the collision with the Tool Post or whatever, usually the jaw will be damaged 100% of the case, and will have to be replaced with new one. Since, in this case, the chuck itself (Mainly the Diaphragm and SFJ) may also have to be damaged, though difficult to be found visually. In case of collision by operational mistake or whatever, it is recommended to send the chuck to the local distributor or to the manufacturer for precise inspection.

Diaphragm Type Air Chuck

❶ Power

Turn off power while changing Chuck or ASA, or while doing inspection.

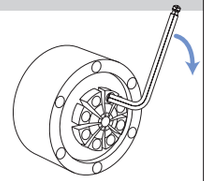
OFF

❷ Shock

Refrain from hitting DC, Jaw and WP by hammer etc.

❸ Bolt

Tighten the bolts, for both chuck and jaw, firmly and evenly, by using the torque wrench at the torque specified at page 16 and 25.



❹ Change Valve

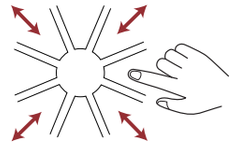
Do not operate Valve (Manual or Solenoid) while Spindle is rotating.
Operate it only after Spindle is stopped.

❺ Rotation Speed

Use of higher RPM than that specified in the catalog may have workpiece fly from Jaws because of the depression of clamping force. Depending on the cutting conditions etc., even the RPM specified in the catalog may occasionally not be used. When high RPM is required to be used. Contact manufacturer or local representative.

❻ Hand

Be careful with finger not to be caught by Jaws.



❼ Spindle Start

For the safety, set System so that the spindle can not be started when the door is open.

❽ Coolant

Max. pressure to be used to feed the coolant ranges to 58psi max. Any higher pressure may harm Journal of ASA.

Model	Max. Coolant pressure
4L3	58psi
JHP3HS	58psi
JHP3	58psi
JHP2	58psi
JHP3AHPR	145psi
4L3AHPR	145psi

❾ Air Pressure

Max. Air Pressure to Open The Jaw : 116psi
Max. Air Pressure to Close The Jaw : 72.5psi

Use of any higher pressure than above will shorten the life of DC.

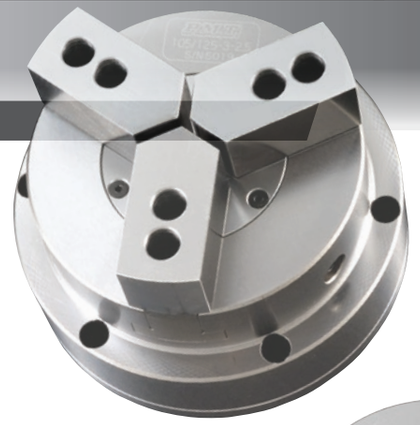
Notice: Water contained in the air to be used for the chuck and ASA will affect their life and performance. Dehumidification by supplying air dryer etc. is recommended.

Slide Jaw Type Air Chuck

AC

●Main Features

- Size: 2.5” to 10”
- Nbr. of Jaw: 2, 3, 4 (3 kinds)
- Repeatability: Within 0.000059”

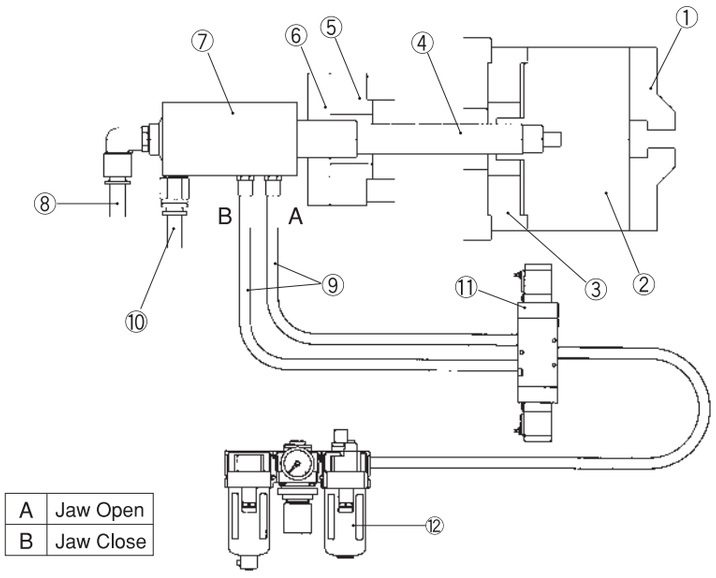


High Accuracy, Flexibility & Performance

From the vast sales & experience, and the built up technique and know-how therewith, PIONEER deliver precision air chucks most reliable now in the market.
As a solution provider, PIONEER will offer various ideas to cope with misc. applications which are hard to be done in the precision turning/grinding.

1 AC Operation System (Structure & Function)

●System Outline



#	PART NAME
①	Top Jaw
②	Air Chuck
③	Chuck Adapter
④	Pipe
⑤	ASA Adapter
⑥	S.R.Bushing
⑦	Rotary Journal
⑧	Coolant or Air Blow
⑨	Air Hose
⑩	Drain Hose
⑪	Solenoid Valve
⑫	※Air Set

A	Jaw Open
B	Jaw Close

※AirSet : ①Filter + ②Lubricator + ③Regulator

●Std. accessories for Air Chucks

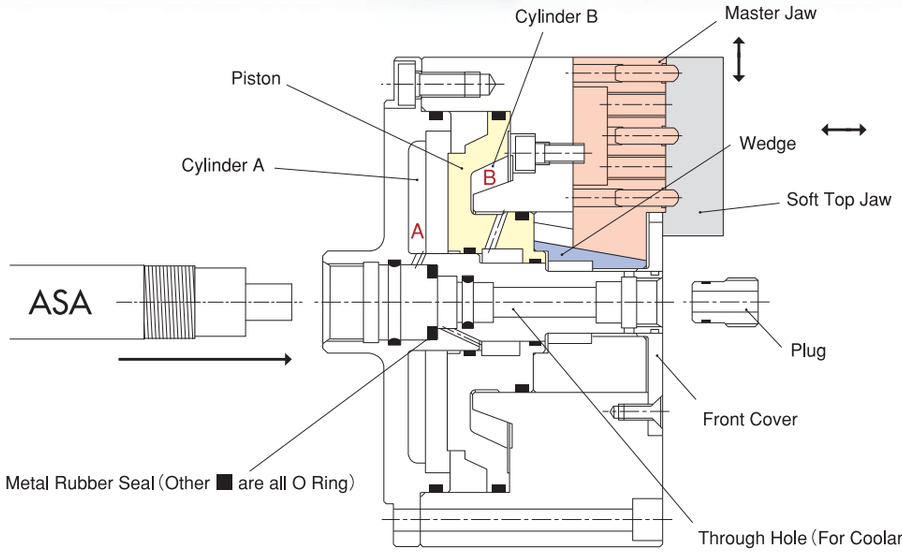
1.Lubrication Oil	This is to lubricate the slide ways among MJ, Wedge and body, and also to remove the sludge among them. Periodical lubrication is recommended for long life and accuracy. Oil is Shell Tona S3M 68. (Equivalent can be used.)
2.Mounting Bolts	Bolts to install the chuck to the spindle/adapter.
3.Soft Top Jaw 1 set	One（1) set of soft top jaw is supplied with any chuck as standard unless any special is requested.
4.Plug	The one（1）to enable coolant through spindle and chuck is supplied as std.

●Optional Accessories

1.Loading Pin	To be used for form-machining of jaw (For outer clamping). This should not necessarily be purchased/used. It can be any one to fit the purpose and application. (Refer to the manual)
2.Loading Ring	To be used for form-machining of jaw (internal clamping). As explained above, this also should not necessarily be used. Any one to fit the purpose and application can be used. (Refer to the manual)
3.Special Plug	One is for when the oil mist is used with the chuck and another is for when the coolant is not used. (Refer to operation manual)
4.Wrench 1pc	Wrench to tighten the bolts

※Loading pin and Loading ring should not necessarily be purchased from us. They can be arranged to any one to fit the purpose and application. (Refer to the manual)

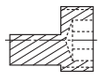
Example：100-3-2.5



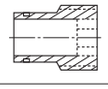
Air to Cylinder A → Piston/Wedge Move Forward → Jaw Open

Air to Cylinder B → Piston/Wedge Move Backward → Jaw Close

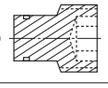
1.In case of mist air application;
(Mist air will be delivered to all three jaws inside the chuck and perform auto lubrication.) → <Option> (A)



2.In case the coolant need to be fed through the chuck; → <Standard>

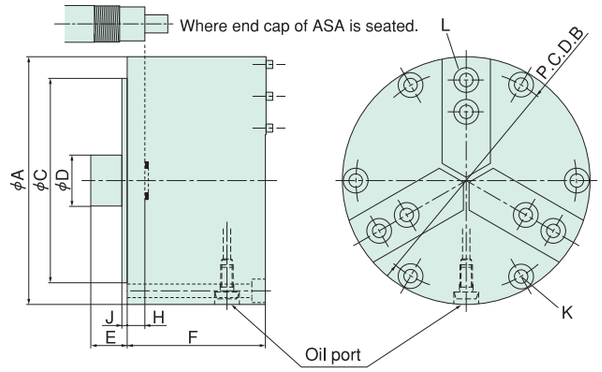


3.In case of no coolant/no mist air application; → <Option> (B)



2-1 3 Jaw Rotary Air Chuck

Model No./Dim./Spec



Dimension

inch

Model No.		Dimension									
		A	B	C	D	E	F	H	J	K	L
③	83-3-2.5	3.268	2.756	2.362	0.827	0.571	2.165	0.276	0.079	6-M5	3-M5
④	100-3-1.2	3.937	3.5	3.25	0.827	0.571	2.165	0.276	0.079	6-M5	6-M5
	100-3-2.5	3.937	3.5	3.25	0.827	0.571	2.165	0.276	0.079	6-M5	6-M5
	100-3-2.5-Q	3.937	3.5	3.25	—	—	2.165	—	0.079	6-M5	6-M5
⑤	125-3-2.5	4.921	4.5	4	0.984	0.571	2.165	0.276	0.079	6-M5	9-M5
⑥	150-3-2.5	5.906	5.374	4.921	0.984	0.571	2.165	0.276	0.079	6-M6	12-M5
	150-3-2.5-Q	5.906	5.334	4.921	—	—	2.165	—	0.079	6-M6	12-M5
⑧	200-3-2.5	7.992	7.205	6.598	—	—	3.15	0.728	0.276	6-M10	9-3/8-24UNF
⑩	250-3-2.5	10	9.201	8.496	0.827	0.472	2.913	0.492	0.276	6-M10	12-3/8-24UNF

BTO

Specifications

Model No.		Stroke (inch)	Nbr.of Jaw	Chucking Cap.		※ Gripping Force (Lbf)	Max.rpm (Nominal)	Wgt.lb
				O.D (inch)	I.D (inch)			
③	83-3-2.5	0.098	3	0.118-2.874	0.236-2.874	944	6,000	4.4
④	100-3-1.2	0.047	3	0.118-3.543	0.236-3.543	1664	4,500	6.0
	100-3-2.5	0.098	3	0.118-3.543	0.236-3.543	1664	4,500	6.0
	100-3-2.5-Q	0.098	3	0.118-3.543	0.236-3.543	1664	4,500	6.0
⑤	125-3-2.5	0.098	3	0.118-4.331	0.394-4.331	2316	4,300	9.9
⑥	150-3-2.5	0.098	3	0.118-5.315	0.394-5.315	2316	4,000	14.3
	150-3-2.5-Q	0.098	3	0.118-5.315	0.394-5.315	2316	4,000	14.3
⑧	200-3-2.5	0.098	3	0.630-7.205	0.630-7.205	7194	3,000	39.9
⑩	250-3-2.5	0.098	3	0.630-9.173	0.630-9.173	7194	2,500	59.5

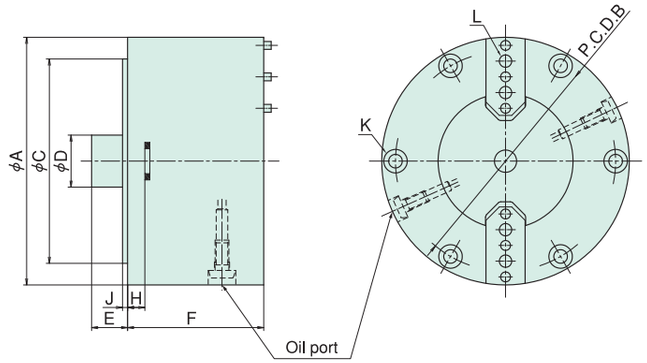
※Gripping force is the value when it's measured under the pressure of 101.5psi

Q signify quick change type

BTO

2-2 2 Jaw Rotary Air Chuck

Model No./Dim./Spec



Dimension

inch

Model No.		Dimension									
		A	B	C	D	E	F	H	J	K	L
④	100-2-2.5	3.937	3.5	3.25	0.827	0.571	2.165	0.276	0.079	6-M5	6-M5
⑥	150-2-2.5	5.906	5.344	4.921	0.984	0.571	2.165	0.276	0.079	6-M6	8-M5

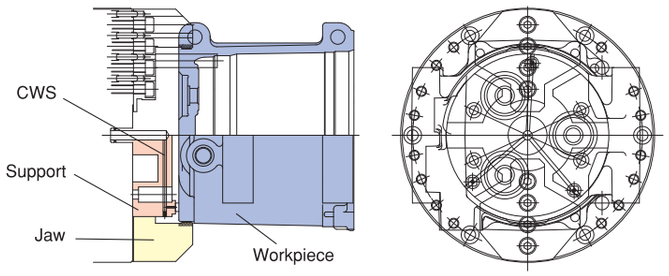
Specifications

Model No.		Stroke (inch)	Nbr.of Jaw	Chucking Cap.		※ Gripping Force (Lbf)	Max.rpm (Nominal)	Wgt. lb
				O.D (inch)	I.D (inch)			
④	100-2-2.5	0.098	2	0.118-3.543	0.236-3.543	1664	4,500	6.0
⑥	150-2-2.5	0.098	2	0.118-5.315	0.394-5.315	2316	4,000	14.8

※Gripping force is the value when it's measured under the pressure of 101.5psi

Application Example

Housing for automobile

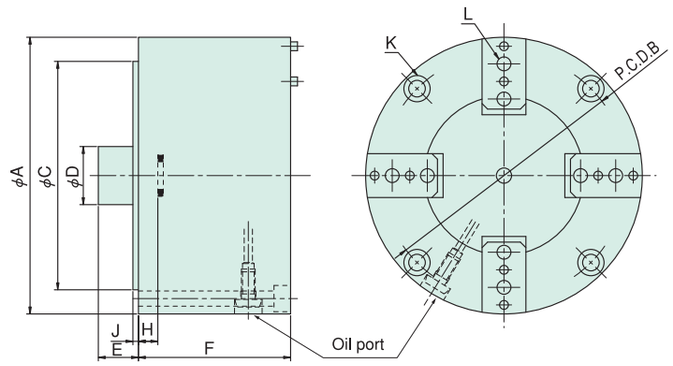


150-2-2.5

2-3 4 Jaw Rotary Air Chuck

Model No./Dim./Spec

Suitable for not round workpiece



Dimension

inch

Model No.		Dimension									
		A	B	C	D	E	F	H	J	K	L
④	100-4-2.5	3.937	3.5	3.250	0.827	0.571	2.165	0.276	0.079	4-M5	8-M5
⑤	125-4-5	4.921	4.5	4.0	0.984	0.571	2.815	0.276	0.079	4-M5	8-M5
⑥	150-4-5	5.906	5.344	4.921	0.984	0.571	2.815	0.276	0.079	4-M6	12-M5

Specifications

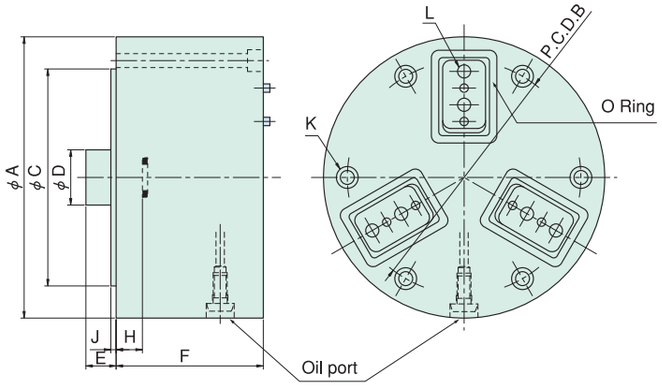
Model No.		Stroke (inch)	Nbr.of Jaw	Chucking Cap.		※ Gripping Force (Lbf)	Max.rpm (Nominal)	Wgt. lb
				O.D (inch)	I.D (inch)			
④	100-4-2.5	0.098	4	0.118-3.740	0.236-3.898	1484	4,500	6.0
⑤	125-4-5	0.197	4	0.118-4.724	0.236-4.882	2181	4,000	12.1
⑥	150-4-5	0.197	4	0.118-5.315	0.394-5.315	2181	4,000	17.9

※Gripping force is the value when it's measured under the pressure of 101.5psi

Application Example

2-4 Sealed Rotary Air Chuck Model No./Dim./Spec

Chuck is sealed to stop cutting chips and sludge penetrate inside.



Dimension

inch

Model No.		Dimension									
		A	B	C	D	E	F	H	J	K	L
③	87-3-2.5G	3.425	2.756	2.362	0.827	0.453	2.264	0.394	0.079	6-M5	3-M5
④	107-3-2.5G	4.213	3.5	3.250	0.827	0.453	2.205	0.394	0.079	6-M5	6-M5
⑥	157-3-2.5GT	6.181	5.344	4.921	0.827	0.413	2.205	0.394	0.079	6-M6	9-M5
⑧	214-3-2.5G	8.425	7.205	6.598	—	—	3.150	0.650	0.276	6-M10	6-3/8-24UNF
⑩	265-3-2.5G	10.433	9.201	8.496	—	—	3.150	0.650	0.276	6-M10	6-3/8-24UNF

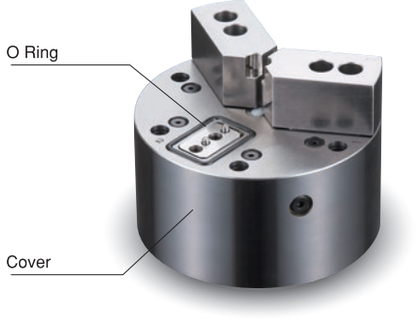
Specifications

Model No.		Stroke (inch)	Nbr.of Jaw	Chucking Cap.		※ Gripping Force (Lbf)	Max.rpm (Nominal)	Wgt. lb
				O.D (inch)	I.D (inch)			
③	87-3-2.5G	0.098	3	0.118-3.031	0.236-3.031	944	6,000	4.9
④	107-3-2.5G	0.098	3	0.118-3.819	0.236-3.819	1664	4,500	7.3
⑥	157-3-2.5GT	0.098	3	0.118-5.591	0.394-5.591	2316	4,000	16.5
⑧	214-3-2.5G	0.098	3	0.630-7.638	0.630-7.638	7194	3,000	44.1
⑩	265-3-2.5G	0.098	3	0.630-9.646	0.630-9.646	7194	2,500	69.4

※Gripping force is the value when it's measured under the pressure of 101.5psi

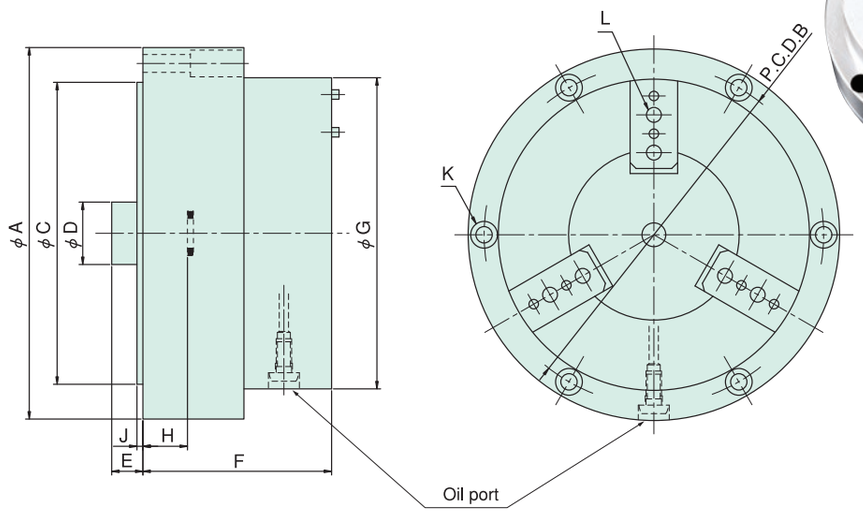
Originally, this chuck was developed for grinding application.
It's now being used not only for grinding but also for regular turning application.

Prevent the machined powder and cutting chips from penetrating inside the chuck.



2-5 High Speed Rotary Air Chuck Model No./Dim./Spec

High Speed Type. Up to about 6,000rpm operation will be possible.



Dimension

inch

Model No.	Dimension										
	A	B	C	D	E	F	G	H	J	K	L
105/125-3-2.5	4.921	4.5	4.0	0.827	0.413	2.5	4.122	0.591	0.079	6-M5	6-M5

Specifications

Model No.	Stroke (inch)	Nbr.of Jaw	Chucking Cap.		※ Gripping Force (Lbf)	Max.rpm (Nominal)	Wgt. lb
			O.D (inch)	I.D (inch)			
105/125-3-2.5	0.098	3	0.118-3.543	0.236-3.543	2181	5,500	8.8

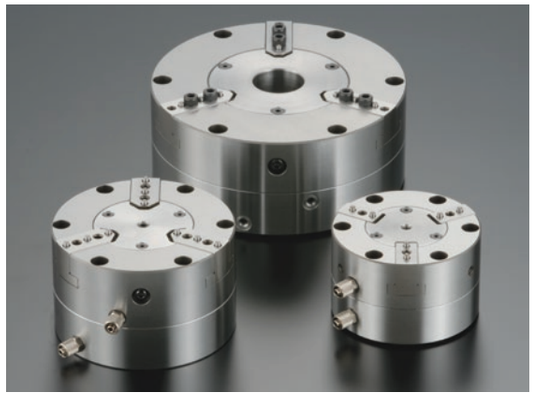
※Gripping force is the value when it's measured under the pressure of 101.5psi

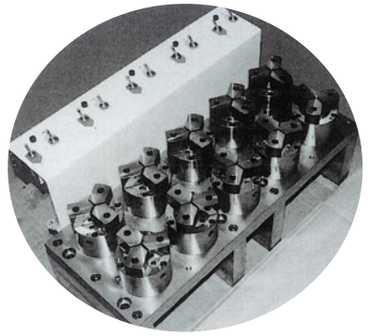
Max. rpm is a criterion, and depends on the cutting conditions, mass of workpiece and machined jaw.

2-6 Stationery Air Chuck

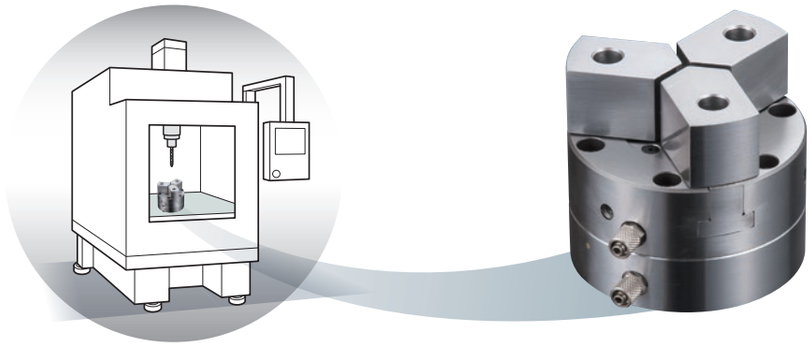
●For drilling, tapping

Model No./Dim./Spec





●Multi-Stationary Air Chucks on Fixture Plate



●Standard Type

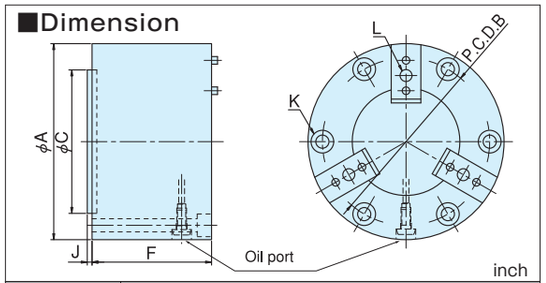
■Specifications

Model No.		Stroke (inch)	Nbr.of Jaw	Chucking Cap. O.D. (inch)	Chucking Cap. I.D. (inch)	※Gripping Force (Lbf)	Wgt. lb
⑵.⑸	6432S	0.079	3	0.118-2.126	0.236-2.126	337	2.0
③	332S	0.079	3	0.118-2.835	0.236-2.835	629	4.0
④	433S	0.118	3	0.118-3.543	0.236-3.543	1664	6.4
⑥	633S	0.118	3	0.118-5.315	0.394-5.315	2338	15.4

※Gripping force is the value when it's measured under the pressure of 101.5psi

BTO

■Dimension



inch

Model No.		Dimension A	B	C	F	J	K	L
⑵.⑸	6432S	2.520	2.047	1.181	1.654	C⊞0.079	3-M5	3-M5
③	332S	3.268	2.756	2.362	1.969	C⊞0.079	6-M5	3-M5
④	433S	3.937	3.5	2.362	2.441	C⊞0.087	6-M5	6-M5
⑥	633S	5.906	5.344	4.921	2.480	C⊞0.079	6-M6	12-M5

BTO

●Through-Hole Type

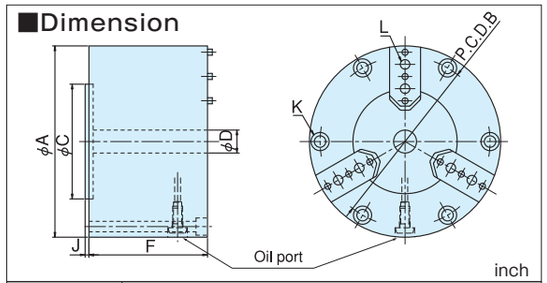
■Specifications

Model No.		Stroke (inch)	Nbr.of Jaw	Chucking Cap. O.D. (inch)	Chucking Cap. I.D. (inch)	※Gripping Force (Lbf)	Wgt. lb
④	433S/TH12	0.118	3	0.118-3.543	0.236-3.543	1664	6.4
⑥	633S/TH30	0.118	3	0.118-5.315	0.394-5.315	1484	15.7

※Gripping force is the value when it's measured under the pressure of 101.5psi

BTO

■Dimension



inch

Model No.		Dimension A	B	C	D	F	J	K	L
④	433S/TH12	3.937	3.5	2.362	0.472	2.441	C⊞0.087	6-M5	6-M5
⑥	633S/TH30	5.906	5.344	4.921	1.181	2.402	C⊞0.079	6-M6	9-M5

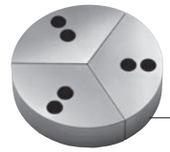
BTO

3 Jaw/Form Machining

Model No./Dim./Spec

Material is S45C. Other material is available on request.


Standard Jaw


Pie Jaw

●Type of Jaw

1 S 100 − 1 × 1

3 S 100 − 1

- Width
- Height
- Chuck Dia
- Material of Jaw
  - A=Aluminum
  - S=Steel
- Type of Jaw
  - 1=Std. 3Jaws
  - 3=Pie Jaw
  - 7=Half Moon
  - 14=4 Jaws

●Type

	Standard Jaw (W, H × W (inch))	Pie Jaw (H (inch))	Chucks To Be Used With
3″	1A83− 1×1	3A83−1	83−3−2.5
	1S83− 1×1	3S83−1	332S
	−1.5×1	−1.5	
4″	1A100− 1×1	3A100−1	100−3−2.5 (1.2)
	−1.5×1	−2	433S
	1S100− 1×0.75	3S100−1	433S/TH12
	− 1×1	−1.5	
	−1.5×1	−2	
	− 2×1		
	1S100−3−5− 1×1		100−3−5
	14S100− 1×1		100−4−2.5
5″	1A125− 1×1	3A125− 2	125−3−2.5
	1S125− 1×1	3S125− 1	
	− 2×1	− 1.5	
	14S125− 1×1		125−4−2.5
6″	1A150−1.5×1	3A150− 1.5	150−3−2.5
	1S150− 1×1	3S150− 1	633S
	−1.5×1	− 1.5	
	− 2×1	− 2	
	1S150−4−5− 1×1		150−4−5
	1S150−3−5− 1×1		150−3−5
8″	1S200− 2×2		200−3−2.5
10″	1S250− 2×2		250−3−2.5

3″	1S87− 1×1		87−3−2.5G
	−1.5×1		
4″	1S107− 1×1		107−3−2.5G
	−1.5×1		
6″	1S157−1.5×1		157−3−2.5GT
8″	1S214− 2×2		214−3−2.5G

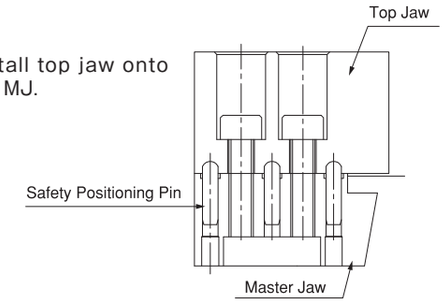
◎Other sizes than above are available on request. ◎Half Moon Type is available on request.

Machining of Jaw

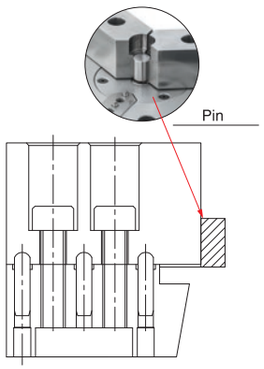
- Clean the mounting surface of both the top Jaws and Master Jaws.
- Set the air pressure to be used to machine the Jaw higher than that to be used for practical machining for production by 1.10231 to 2.20462 lbs.
- It is recommended to mark the S/No. of Chuck and/or the type of workpiece on the Work Jaws when they are removed from Chuck. That will ease the Work Jaws to be put back to the right Chuck when they have to be used for the same machining again. As done between the Master Jaws and Chuck Body, it is recommended to put the same Ref. No. on the Work Jaws as the No. marked on the Master Jaws. When once the Work Jaws have to be removed from Chuck, and when they have to be put back to Chuck again, this marking will help fitting both Jaws to the original setting.

O.D.Clamping

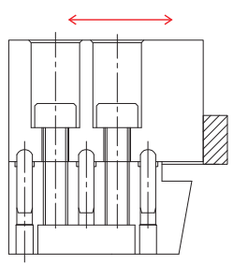
1 Install top jaw onto the MJ.



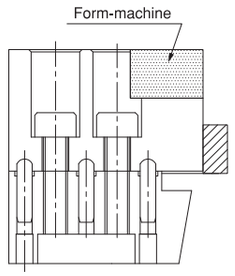
2 Open the jaw and machine where the pin for form-machining is to be placed. Put the pin to the pin as shown on the photo, and clamp it by closing the jaws.



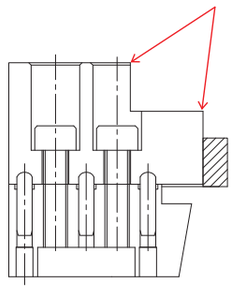
3 In order to make sure the seating and smooth movement of top Jaw, repeat open and close of jaw a few times not by rotating the chuck.



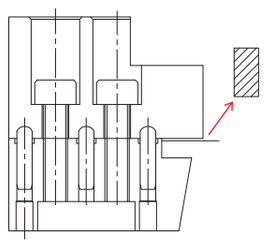
4 Close the top jaw with the pin, and form machine the jaw.



5 After machining, chamfer the corners to remove burr.

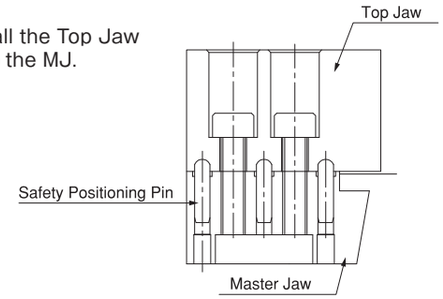


6 Open the top jaw and remove pin.
Clean the surface of chuck and top jaw.

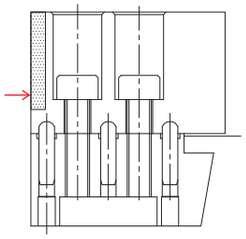


I.D.Clamping

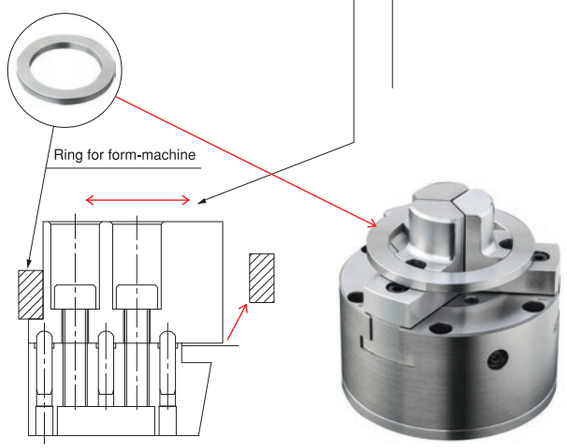
1 Install the Top Jaw onto the MJ.



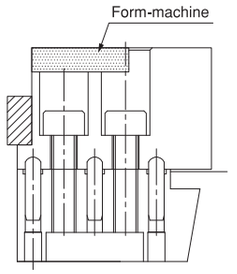
2 Close the top jaw and machine the OD of top jaw as much as needed to put the ring for form-machining over the top jaw.



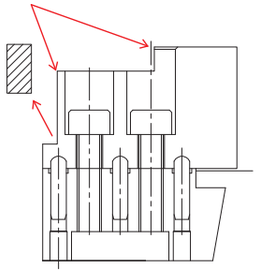
3 In order to make sure the seating and smooth movement of top jaw, repeat open and close of jaw a few times not by rotating the chuck. Remove the pin for form-machining, and put the ring for form-machining over the OD of jaw, and properly up to the end.



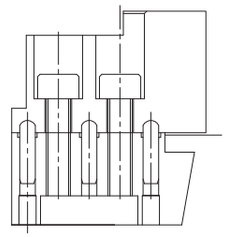
4 Open the top jaw to clamp the ring, and form-machine the jaw.



5 After machining, remove burr by chamfering, and remove the ring afterwards.



6 Clean the chuck surface and top jaw.

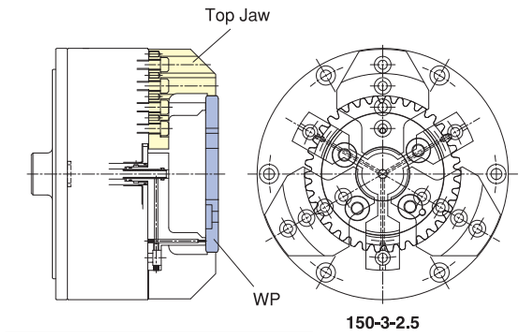


Note : Loading pin should not necessarily be the one from the pins supplied as standard. Any pin, as long as it is good for the purpose, can be used.

4 Application Examples

●Automobile Parts etc.

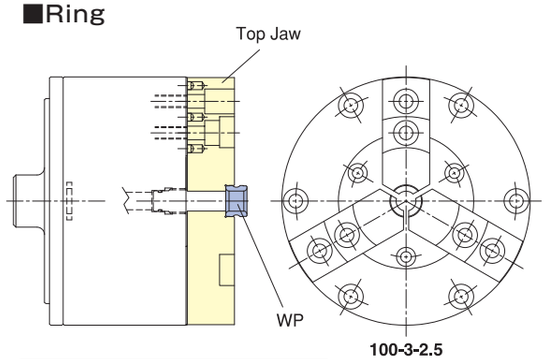
■Sprocket



150-3-2.5

Accuracy Req'ed		
Roundness	→	0.0004
Squareness/Flatness	→	0.0008

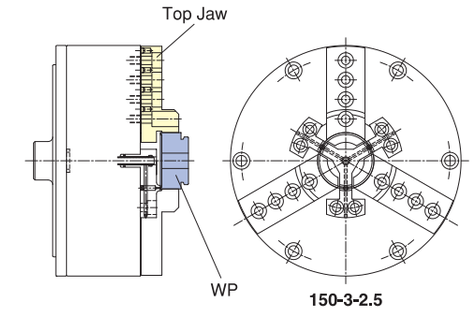
■Ring



100-3-2.5

Accuracy Req'ed		
Roundness	→	0.0001
Concentri-city/squareness	→	0.0020

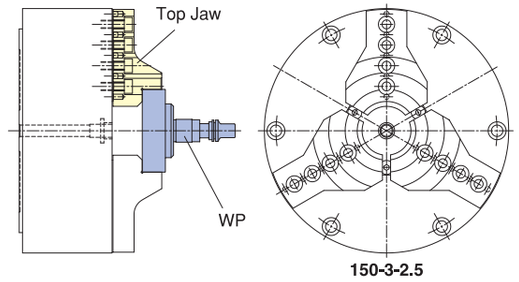
■Piston



150-3-2.5

Accuracy Req'ed		
Concentri-city	→	0.0001
Squareness/Parallelism	→	0.0020

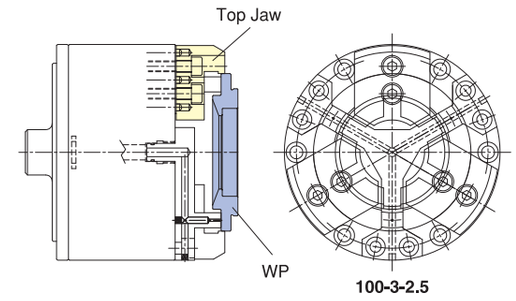
■Aluminum Piston



150-3-2.5

Accuracy Req'ed		
Roundness	→	0.0004
Concentri-city	→	0.0008

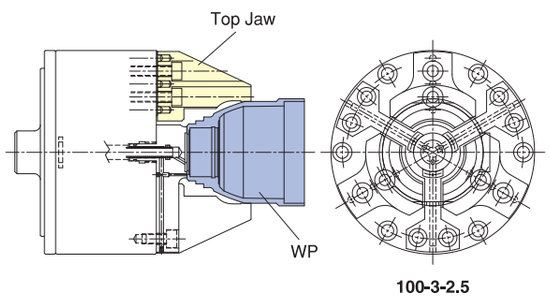
■Plate



100-3-2.5

Accuracy Req'ed		
Concentri-city	→	0.0004/0.0039
Squareness/runout	→	0.0020

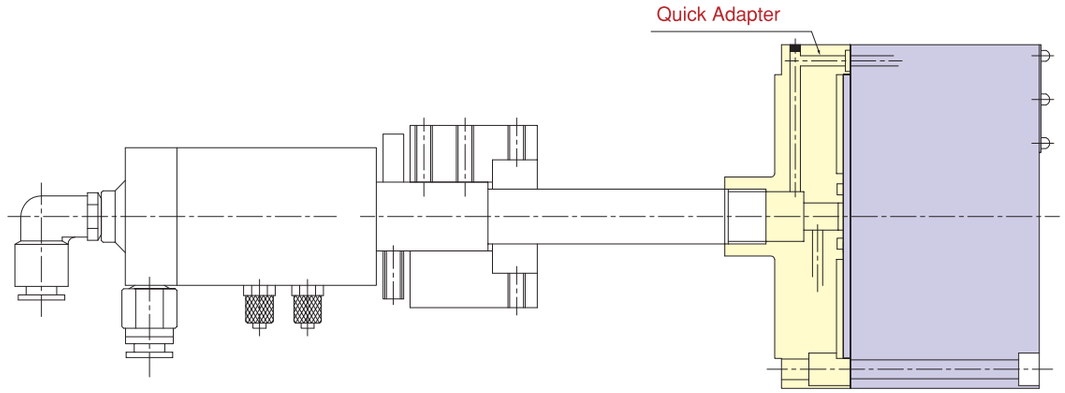
■Case



100-3-2.5

Accuracy Req'ed		
Concentri-city/Squareness	→	0.0020

5 Quick Change System



※Refer to page11-12 for Mechanism & Feature

※Quick change system is available for any std. rotary air chucks.

M1 Installation

●1. Installation of Chuck Adapter

(1) Clean the surface and pilot on both spindle nose and chuck adapter.

(2) Make sure the surface of both adapter and spindle nose is free from the damage like scratch and dent. If found, correct them by grinding stone or anything suitable. After correcting work, clean both surface again.

(3) Mount the chuck adapter onto the spindle nose. Make sure not to damage both during the operation.

(4) Tighten the bolts to secure the chuck adapter to the spindle nose temporarily, not to full extent, leaving a little allowance to make it movable by plastic hammer.

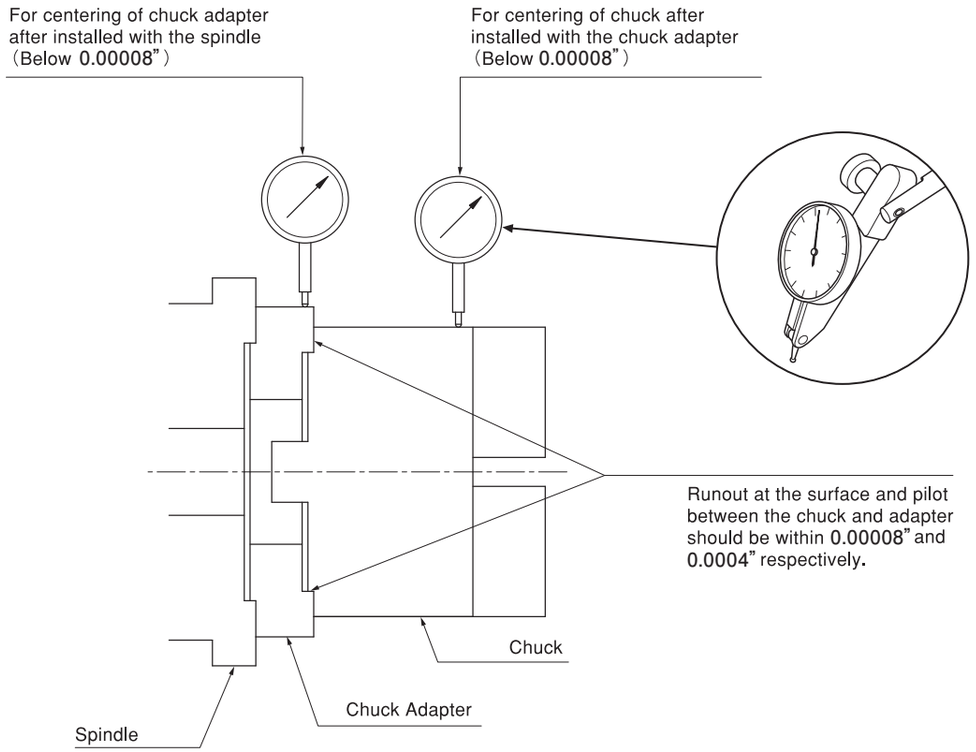
(5) Put the dial gauge on the front side of chuck adapter.

(6) Center the chuck adapter to within 0.00008" by knocking it with plastic hammer, all around where seem to be neccessary, like; Rotate the spindle by hand, hit the point where the runout was measured highest by plastic hammer. Repeat this operation until below 0.00008" of runout is obtained. If the adaper is hardly moved in other words, if the runout is hardly be improved by this operation, loosen bolts a little further and start the operation again.

(7) After centering is finished to within 0.00008", tighten the bolts now firmly with the spindle nose.

(8) Make sure again, if the runout is within 0.00008". If found not, repeat the procedure (6)-(7) until 0.00008" or below is obtained.

M1 Installation



●2. Installation of Chuck

(1) Clean both surface of pilot of chuck adapter and chuck.

(2) Make sure the surface and pilot are free from the damage such as scratch and dent. If found, correct them by grinding stone or whatever suitable to get the good flat surface. Surface and pilot have to be cleaned after correction work.

(3) Put the chuck onto the chuck adapter. Caution not to damage the mounting surface is required.

(4) Tighten the bolts to secure the chuck to the chuck adapter temporarily, not to full extent, leaving a little allowance for the adjustment of runout to be accomplished later, to the extent that it's movable when hitting lightly by plastic hammer.

(5) Put the dial gauge at the front side of chuck, as shown on the illustration below. As close to the front surface as possible, but away from some unevenness if there is at the surface area.

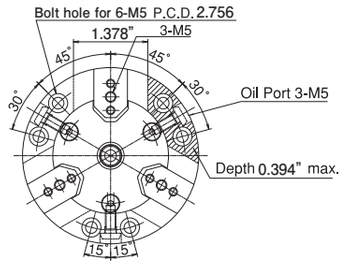
(6) Center the chuck to 0.00008" or below.
Procedure: Rotate the spindle (chuck) by hand and measure the runout around the chuck. Find out the point reads highest. Hit there lightly by plastic hammer. Rotate the spindle again to find out highest reading point again, and hit there lightly by plastic hammer. Repeat this procedure until 0.00008" or below runout is obtained. If the runout is hard to be improved, in other word, if it seems that the chuck is hardly moved by plastic hammer, then, loosen the bolts a little, and try above operation until within 0.00008" of runout is obtained.

(7) After finished centering to within 0.00008", tighten the bolts firmly, to the end.

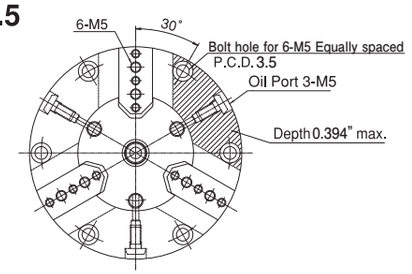
(8) Once again, make sure the runout is within 0.00008". If not, repeat the procedure (6)-(7) until 0.00008" or below is obtained.

M2 Possible Additional Machining Area & Depth

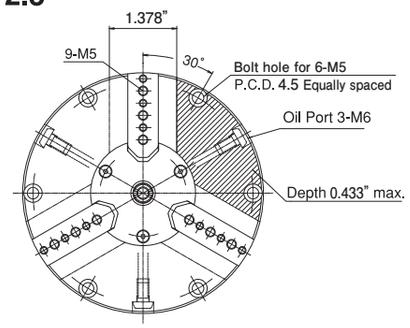
83-3-2.5



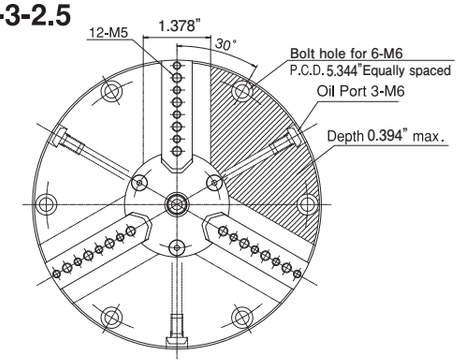
100-3-2.5



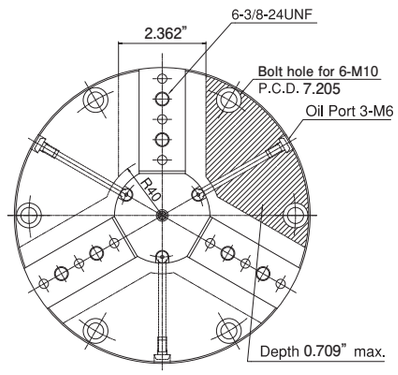
125-3-2.5



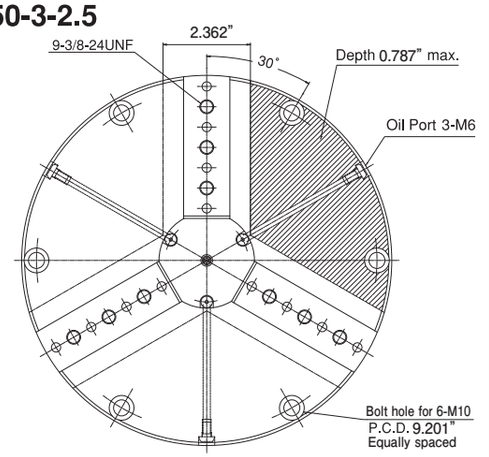
150-3-2.5



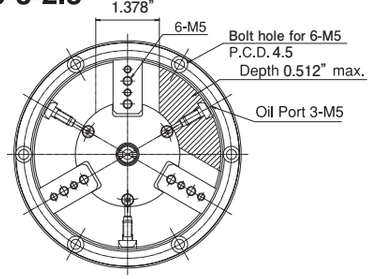
200-3-2.5



250-3-2.5



105/125-3-2.5



M3 Test Running

M-3

●Be sure that the Chuck is lubricated. (Refer to page 45)
Supply Turbine oil first grade ISO VG32 (Recommended oil) to lubricator through oil port located above lubricator, to the upper limit indicated on the pot. Pay attention not to have chips or dust get into the pot when filling.

●Turn the knob of lubricator to increase the pressure. Carry out inching (Repeat ON/OFF a few times quickly) when the needle of pressure gage reached 21.76 to 29.0psi, and then, make sure the Jaws open & close OK.

●Turn the needle of Lubricator to adjust the drip rate of oil. In general, suitable dripping rate of lubrication oil is one (1) drip per 2 to 3 times of Chuck open & close.

●Turn the pressure adjustment handle to increase the pressure up to 87.02psi, and check air leak or any malfunction. There will be some air leak with Journal of ASA, but it will not be a problem usually.

●Start rotating spindle at 100-200 rpm, and increase the rpm gradually, and see there is no vibration with Chuck or ASA Journal. If there is a vibration with the journal, check the runout of journal by refering to pages 51-54. If not centered within the designated value, retry centering, or call us or local representative.

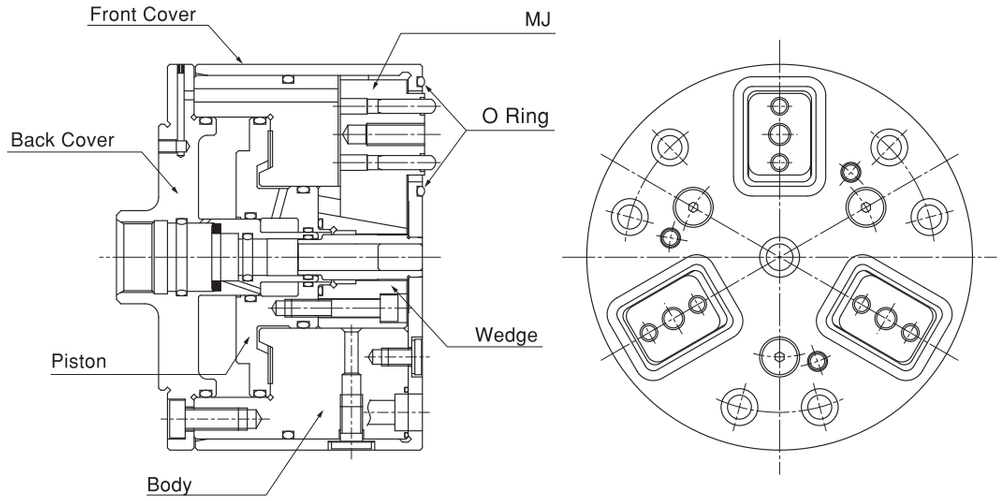
M4 Overhaul

M-4

Due to the nature of the structure, it is inevitable for chips and sludge from penetrating inside the Slide Jaw Type Air Chucks, and from reaching to the slide ways among MJ. body and wedge. Not much chip or sludge are expected getting inside, however, it keeps going a little by little all the time. Eventually, the jaw get stuck the jamming is caused, and the jaw get stuck. In order to avoid this, it is imperative to lubricate the chuck once every day to get the old oil mixed with chips and sludge out, and fill all the slide ways with new oil. In this way, the life, accuracy life of chuck will be extended.

However, even if the lubrication is done penodically, some small amount of chips or sludge will still remain inside. They will be accumulated and get stiff, and cause jamming eventually. In such case, Overhaul is done to clean inside and to get the smooth movement of jaw back. Disassemble the chuck, clean each component and inside, remove the jamming for example by sand paper lapping, change O rings, and reassemble. Check to see if the jaws move smooth. These are the procedure for overhaul. This operation is normally suggested to do like half a year, or once a year min. Original smooth movement will be back, however, not the repeatability. Longer the chuck is used, bigger the clearance amount the body, MJ and wedge due to the nature with the slide jaw type air chucks. As the bottom line, the frequent lubrication and periodical overhaul will be the keys for longer life.

●Overhaul illustration



●Overhaul Procedure Example

Example:87-3-2.5G(Shield Chuck)

1.Removal of Front Cover

After dis-mounting Jaws, remove round screw(3 pcs) flat screw and 3 pcs of oil nipples, then, the cover can be dis-mounted. When it's hard to be dis-mounted because of the use of O Ring, insert a round rod through the center of Chuck, and push the cover moderately. If once O Ring located along outside of chuck come off, the cover can be removed smoothly.

2.Removal of Back Cover

Back Cover is ground together with Chuck body. So, before removing, put the check mark at the back side of jaw No.1, and at any other place than the mounting surface or at any critical part of precision so that the Back Cover can be put back to the original position after finished overhaul. Remove the bolts to release Back Cover from Chuck Body. Normally, it's hard to separate Back Cover from Chuck Body by hands. The easy way to do this is to install ASA with Chuck, and send air of approx. 14.5psi, then, Back Cover will come off. If not, repeat once or twice Chuck open/close by change valve, then, Back Cover and Chuck Body is separated. If still not, increase air pressure a little by little. (Do not use too high air pressure which might cause accident)

3.Dismount of Master Jaws

After removed the Back Cover, dismount the Wedge and Piston which are all tightened together by 3 bolts as one (1)unit, from Chuck Body. Then, remove the Master Jaws. Disassemble above Wedge and Piston. When doing above operation, pay enough attention not to give any scars or scratches to each component.

M4 Overhaul

4.After Dis-assembly

1) Check sliding surface with T-slot of Master Jaws. If there is any mark of jamming or scratches, repair it. If T-slotted part and Wedge shaped T-slot are heavily worn out, then, the chuck will not be repaired and adjusted to the origianl accuracy.
2) Check the sliding surface of Body and Wedge. If there is any mark of jamming or scratches, repair it. If damaged or heavily worn out, correction will be impossible. (If these need to be repaired, then these parts have to be newly made.) In order to correct the mark of jamming or scratches, it is generally recommended to use a sand paper of higher grade than#10000, or, a ultra-fine diamond file. If the mark of jamming or scratches is very deep, the clearance between the Wedge and Body would be bigger after correction. In this case, the origial accuracy will be very hard to be obtained after correction.
4) Check inside all around.
In the long run of use, O Ring and Seal will be inevitable from de-terioration or scratch. Even though the inside is filmed with oil, because of the fluctuation of temparature, and from the air, there is always a chance to get inside moistened. There once was a problem with oil itself. Make sure if there is no rust or corrosion.

5.Cleaning

Clean every component properly.
Chips, grease and oil have to be cleaned out. Clean carefully even narrow part and gap, T-slot sliding part, air port and oil port are all not easy to be cleaned. Use air to clean these parts.

6.Re-Assembly

Re-assembly the chuck by the reverse procedure to the dis-assembly.

Note : Manufacturer will not be responsible about the result of overhaul done by customer.

M5 Lubrication(For Slide ways) M-5

Observation of periodical lubrication is imperative to maintain the accuracy and life. For all the air chucks, except sealed type, there's always the chance for chips, coolant and sludge penetrate inside of chuck. It is, therefore, necessary to keep ejecting those out of chuck by injecting new lubricating oil periodically, to maintain the smooth lubrication, and naturally for long life. It is recommended to observe the followings;

1.Do lubrication at three oil ports supplied with chuck.
2.Remove the plug from ports, and clean all three ports by air blow or cloth. In case of using hex wrench, pay attention not to damage the hex port of chuck side.
3.Do open/close of jaws 5-6 cycles while doing injection so that the lubrication oil can be delivered to all slide ways. (During this operation, there will be a chance for the oil splash out of the port. So, it is recommended to waste cloth at the port area to avoid that.) Not to have oil leak at the port area, before it goes into the chuck. Put the injector nozzle firmly to the port.
4.Injection of lubrication oil to the ports should be continued until the oil will came out of the clearance between the master jaws and chuck body, and to other ports other than the one being used for injection, and eventually up until the clean lubrication oil can be seen after the initial old dirty oil. (Open/close operation of jaws mentioned above 3 will actually have to be repeated until the clear oil will come out of the chuck.)
5.Recommended lubrication oil: Shell Tona S3M68 or equivalent to either of them.
6.Frequency of lubrication: Min. once a day (More than once a day lubrication is recommended for long life.) In case of dry cutting, as frequent as possible, more than once a day, lubrication is requested.

M6 Caution M-6

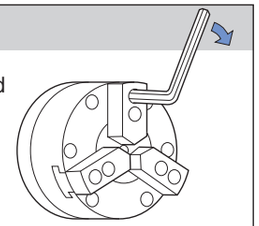
❶ Power

Turn off power while changing chuck or ASA, or while doing inspection.

OFF

❷ Bolt

Tighten all bolts firmly and evenly.



❸ Lubrication

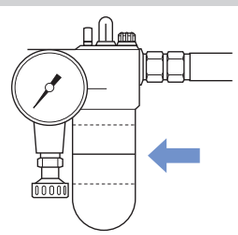
Supply lubrication oil through oil port periodically. Refer to page 45.

❹ Shock

Refrain from hitting Chuck. Jaw and workpiece by hammer etc.

❺ Lubricator

Keep paying attention to the volume of lubrication oil in the lubricator so that it will always be over half of pot.



❻ S.R. Bushing

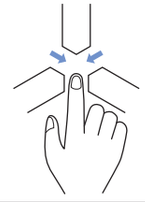
After centering is finished, tighten bolts evenly and firmly. Neglecting this will eventually cause jamming and damage to ASA assembly.

❼ Change Valve

Do not operate Valve(Manual or Solenoid) while spindle is rotating. Operate it only after spindle is stopped.

❽ Hand

Be careful with finger not to be caught by Jaws.



❾ Coolant

Max. pressure to be used to feed the coolant is 58.0psi. Any higher pressure may harm Journal of ASA.

❿ RPM Restin

Use of higher RPM than that specified in the catalog may have workpiece fly from Jaws because of the depressions of clamping force. Depending on the cutting conditions etc., even the RPM specified in the catalog may occasionally not be used. When high RPM is required to be used, contact manufacturer or local representative.

⓫ Spindle Start

For the safety, set system so that the spindle can not be started when the door is open.

⓬ Air Pressure

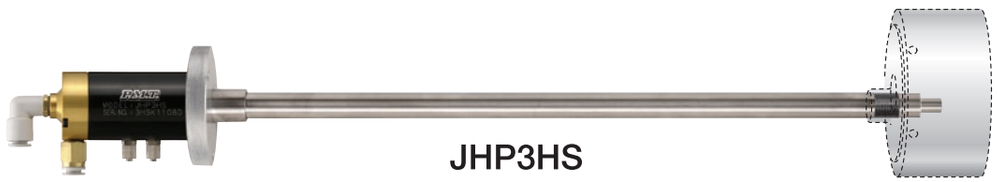
Max. air pressure:101.5psi

Use of any higher pressure than 101.5psi will shorten the life of air chuck.

ASA(Air Supply Apparatus)

ASA

Variety of products to meet the requirement for low speed to high speed,
for movable ASA, for high pressure coolant and etc. are available.
Special is available on request.



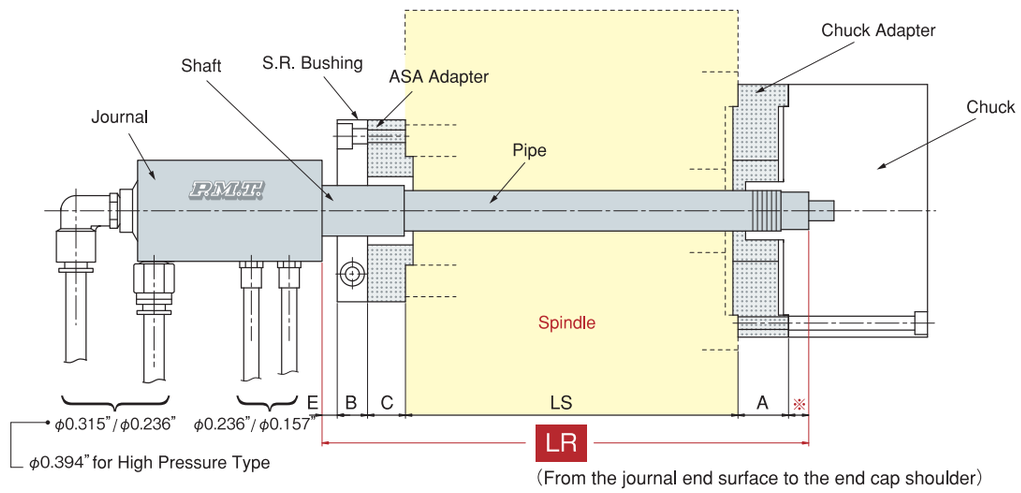
JHP3HS

Model & SER. No. here are helpful when the replacement is needed.

How to determine ASA length

Example····· JHP3-LR

LR=LS (Spindle Length) + ※ + A (Chuck Adapter) + C (ASA Adapter) + B (S.R. Bushing) + E (Max. 0.394")
※Dimension differs depending on the type of chuck.(Refer to the page of chuck.)



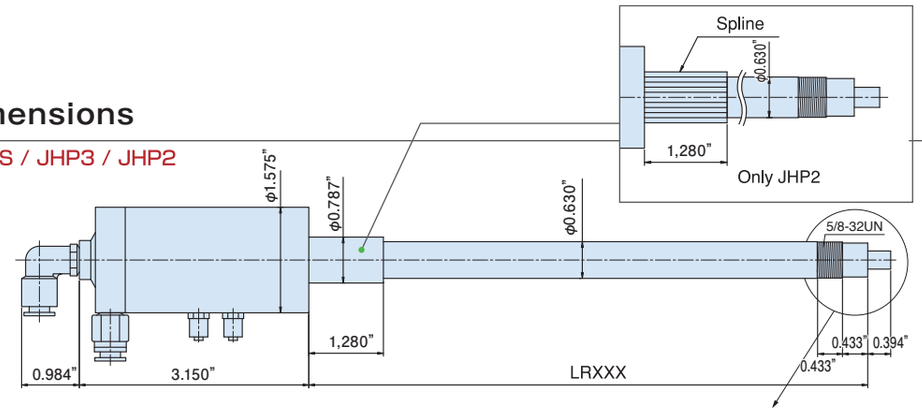
(From the journal end surface to the end cap shoulder)

ASA (Air Supply Apparatus)

Kinds of ASA & S.R. Bushing

●Dimensions

JHP3HS / JHP3 / JHP2



Dimensions and specification of end cap is same on all models.

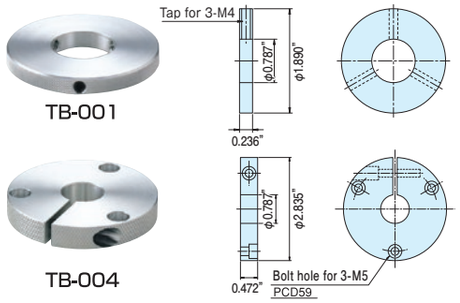
JHP3HS
For Diaphragm Chuck and Air Chuck.

JHP3
For Diaphragm Chuck and Air Chuck.

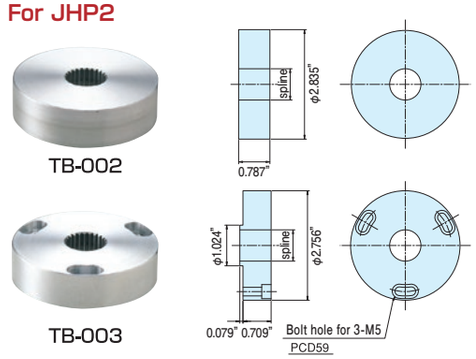
JHP2
For w/movable ASA Air Chuck.

●S.R.Bushing

For JHP3HS/JHP3 4L3,4L3AHPR,JHP3AHPR



For JHP2



●TB-001 : Mainly for JHP3HS. Fine centering is possible.
●TB-004 : With split & mainly for JHP3. Possible for JHP3HS. For tightening ASA and for securing with adapter

For TB-002, the location and size of mounting hole can be determined and made anywhere according to the customer's choice.

●Max. Air pressure & Coolant pressure

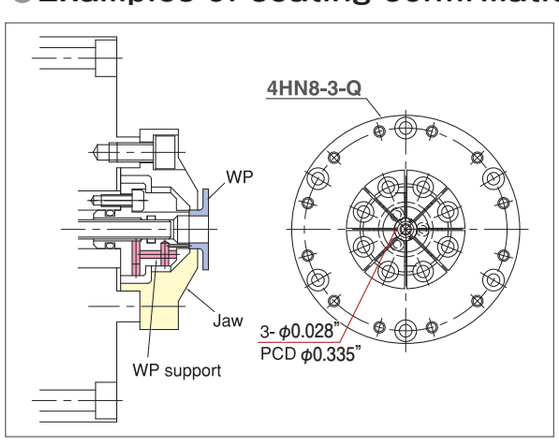
Model No.	Max. Speed	Max. Air/Coolant Press
4L3	8,000rpm	58psi
4L3AHPR	6,000rpm	145psi
JHP3HS	12,000rpm	58psi
JHP3	8,000rpm	58psi
JHP2	8,000rpm	58psi
JHP3AHPR	6,000rpm	145psi

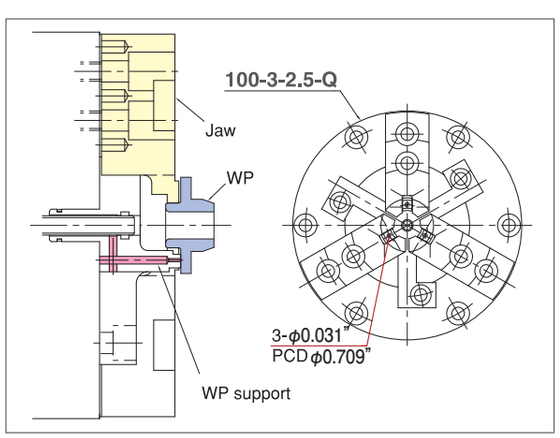
4 Layer ASA (For confirming workpiece seating)

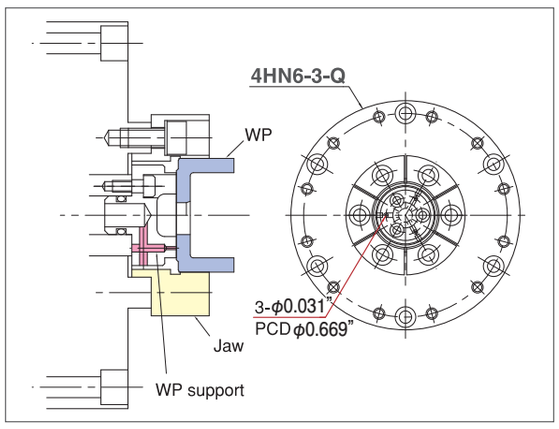
Not only opening & closing jaws, air blow and/or coolant feed through the center bore of chuck, checking and confirming workpiece seated properly or not, is possible.

4L3

●Examples of seating confirmation

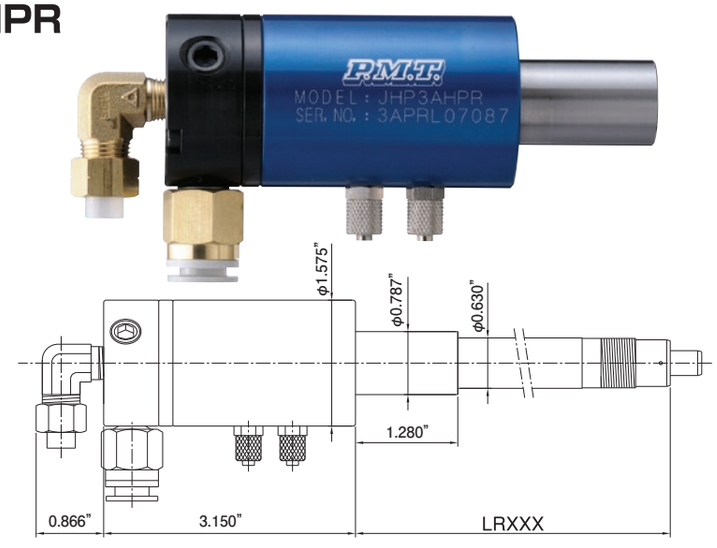






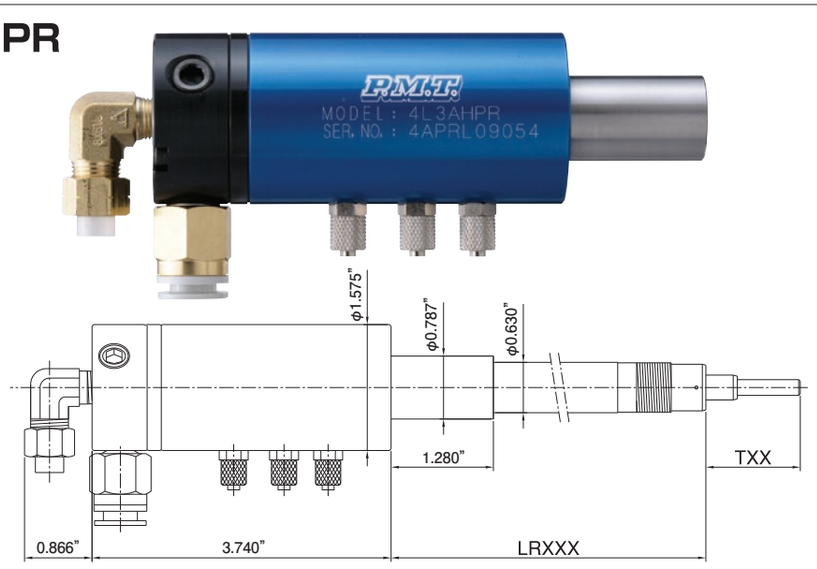
ASA for High Pressure Coolant

JHP3AHPR



JHP3 High pressure coolant type

4L3AHPR



4L3 High pressure coolant type

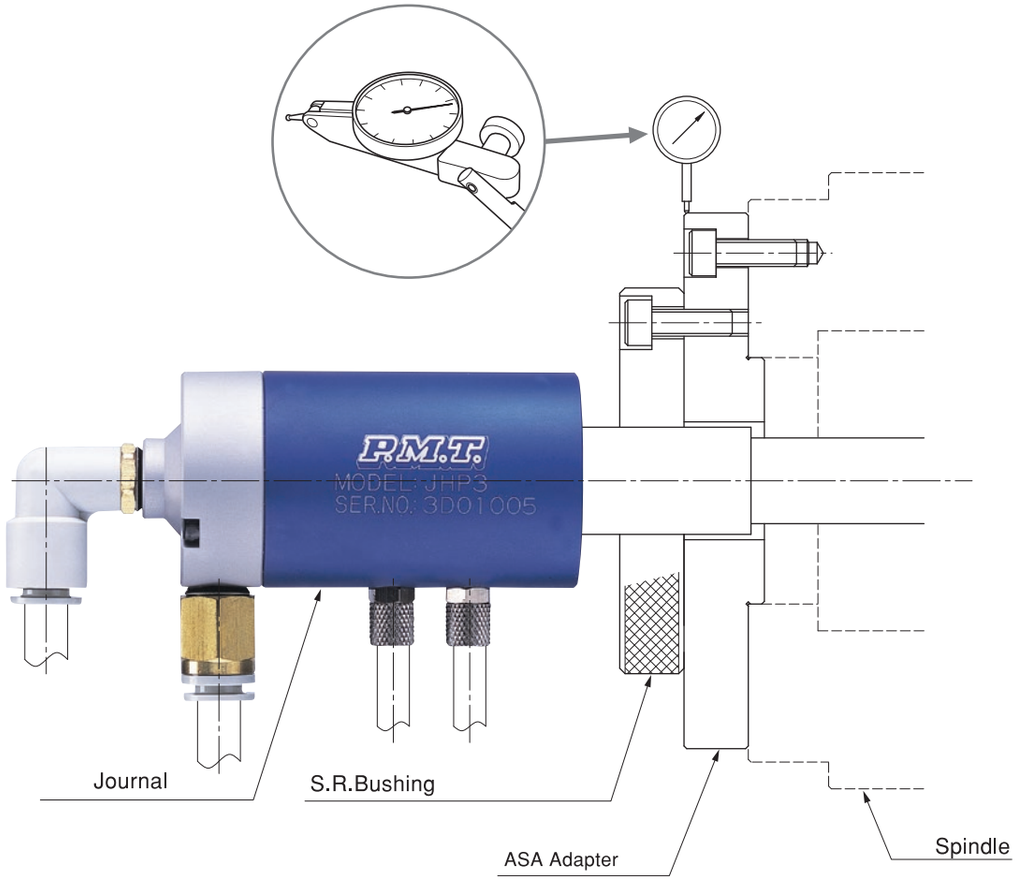
Model No.	Capability corresponding high pressure
JHP3AHPR	145psi
4L3AHPR	145psi

Increased capability to reduce the possibilty of penetration of coolant.
Can be used with CNC turning machines and grinding machines.

M1 Installation of ASA (Air Supply Apparatus)

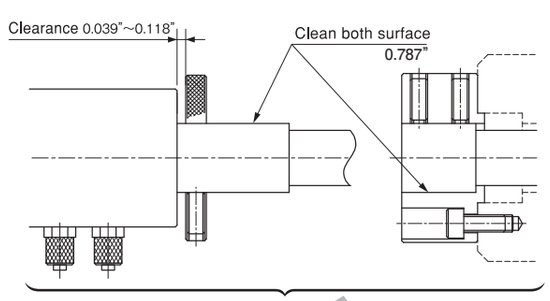
1.Installation of ASA Adapter

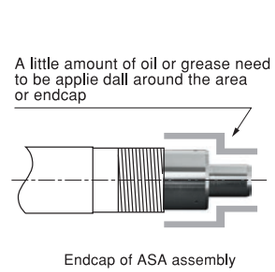
(1)Clean the pilot and mounting surface of ASA adapter and at the rear end of spindle where ASA adapter is installed.
(2)Make sure no damage, scratch, dent etc. on both surface before installation.
(3)Mount the S.R. Busing to the rear end of spindle.
(4)Secure the S.R. Bushing with the spindle by tightening bolts temporarily, not to full extent, to the extent that it could be movable when hitting by plastic hammer lightly. This is to leave an allowance for fine adjustment for centering.
(5)Set the dial gauge at rear side (journal side) of ASA Adapter.
(6)Center the ASA Adapter to below 0.00008". Plastic hammer is recommended to use for fine adjustment. How to center: Rotate the spindle by hand, and check the runout hit where showing highest point of measure lightly, and repeat this procedure until getting below 0.00008".
(7)Secure the ASA adapter firmly with the spindle by tightening the bolts to the full extent.
(8)Make sure again if below 0.00008" is still there. If not, repeat procedures (5) and (6) until getting below 0.00008".

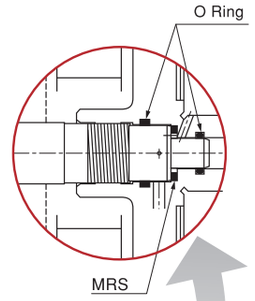


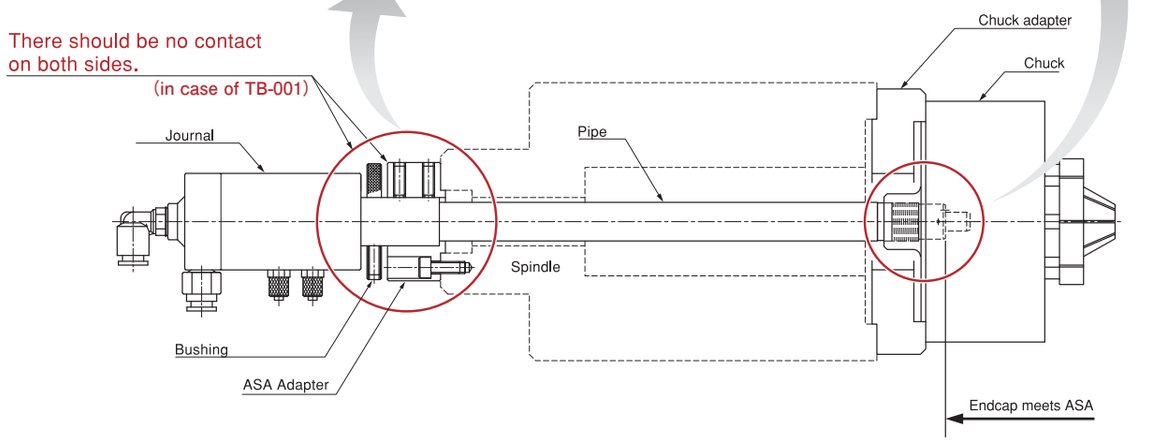
2.Installation of ASA Assembly

(1)Make sure the chuck is supplied with the spindle properly.
(2)Make sure the shaft of rotary journal is supplied with S.R. Bushing. Except TB-001, there's a front side and backside on the S.R. Bushing. Make sure it points the right direction.
There are counter-sunk bores with the Bushing, except TB-001.
These holes should point to the rotary journal when installed with the shaft. Position the S.R. Bushing firmly on the shaft leaving 0.039"-0.118" to the journal surface.
(3)Clean the inner bore of ASA adapter and the shaft of ASA Journal.
(4)Apply grease to the end cap, to the area where it meets O Ring and MRS (metal rubber seal) inside the pilot of chuck.
(5) Insert ASA Assembly through the ASA Adapter, and thence to the chuck or to the chuck adapter, until the contact between the end cap of pipe and the threads inside of pilot of chuck is made.
(6)Screw ASA further into the chuck until it contacts with MRS (metal rubber seal) by rotating the S.R. Bushing by hand, clockwise, A little further press just by a little more rotation of S.R. Busing would be enough. Do not use any tool for this operation. Too much tightening might cause the short life of MRS.
(7)For centering of ASA (Journal), refer to page 53,54





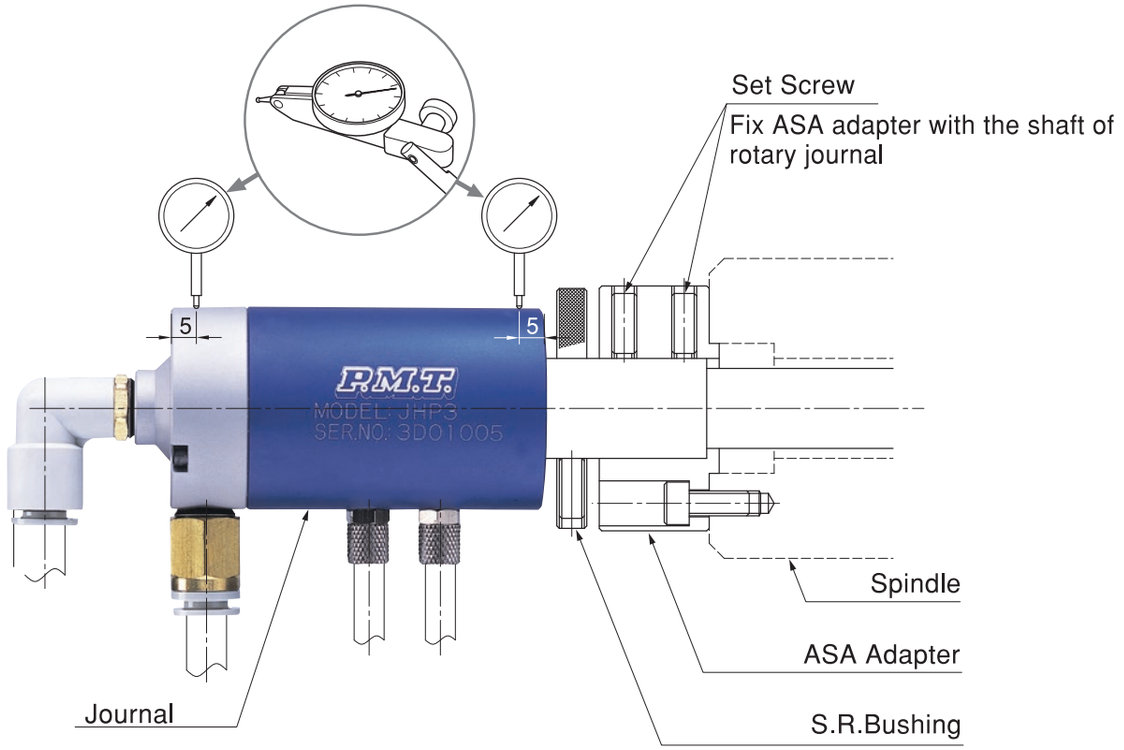




●3.Centering of Rotary Journal

When S.R. Bushing TB-001 is used;

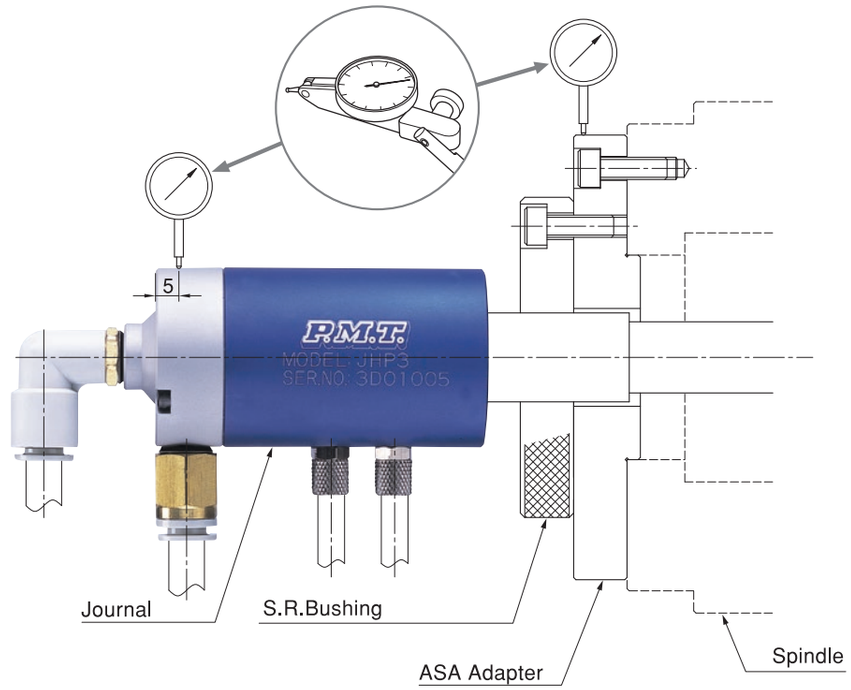
(1) Tighten all set screws lightly.
(2) Set the dial gauge at the front side of rotary journal.
(3) Rotate the spindle by hand, and stop the journal where showing the highest measurement. Loosen set screw of rear side of adapter (at near side to journal). and adjust the runout to below 0.0002". After this, tighten all the other set screws firmly.
(4) Set the dial gauge at the rear side of rotary journal.
(5) Rotate the spindle by hand, and stop the journal where showing highest measurement, tighten the set screw at 180 deg, opposite side of ASA adapter, at the front side(spindle side), and adjust the runout to within 0.0002". After this, tighten all the other set screws firmly.
(6) Set the dial gauge at the front side of rotary journal to make sure the runout is still within 0.0002". If found not, repeat the procedures (2) through (5)until 0.0002" is obtained.
(7) Make sure, after the runout of rotary journal is within 0.0002" at both front and rear side, make sure all the set screws are tightened firmly. Attention not to tighten the set screws too firmly is required to avoid deviation of runout. All set screws need to be tightened firmly, but not too excessively.



For the safety retaining bushing, TB-001 is, generally speaking, highly recommended for both AC and DC except the special TB-002 which is developed to be used with JHP-2. Easier centering and assurance of accuracy is the reason for that. TB-004 has been used, prior to TB-001, mainly for AC(Slide Jaw Type Air Chucks), and secondarily DC(Diaphragm Chucks) as well, as both types are mentioned in the catalog. We have still two types in the catalog, but, simply TB-001 is better as mentioned above. TB-004 is still available when it's necessary for no matter the reason is.

When S.R. Bushing TB-004 is used;

(1) Loosen set screw holding the shaft of rotary journal. Match the holes location between the S.R. Bushing and ASA Adapter, and put them together tightly.
(2) Tighten the bolt which is to shrink the slit, to fix the S.R. Bushing with the shaft of rotary journal.
(3) Tighten 3 bolts which are to secure S.R. Bushing with ASA adapter, temporarily to the extent that makes a little further move possible by plastic hammer when centering.
(4) Set the dial gauge at the rear side of rotary journal.
(5) Rotate the spindle by hand. If the runout measured is out of the value specitied below. check where at the lournal show highest measure, and hit there by plastic hammer for fine adjustment. Repeat this until the permissible runout is obtained.
For 6,000rpm or below→ Below 0.0004"
For over 6,000rpm → Below 0.0002"
(6) Tighten 3 bolts firmly.
(7) Again, make sure if the runout is still within 0.00008". If not, loosen the bolts and repeat procedures (3) to (6).



M2 Caution for Operation & Handling

Not because of production error, defectiveness and/or malfunction of ASA assembly itself, but because of the handling and/or wrong set-up etc., often the trouble is caused with ASA. Please pay enough attention to the followings;

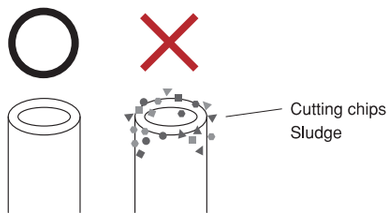
❶ Max. rotation speed and Air pressure

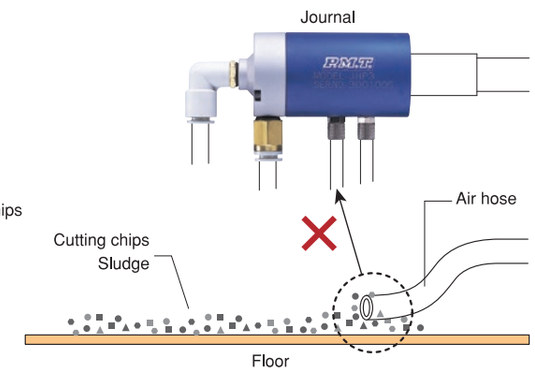
Model	Max. rpm	Coolant	CWS*	Jaw open/close
JHP2	8,000rpm	58psi	–	116psi
JHP3				
4L3			29psi	
JHP3HS	12,000rpm		–	
JHP3AHPR	6,000rpm	145psi		
4L3AHPR			29psi	

*CWS=Confirm Workpiece Seating

❷ Handling of Air Hose

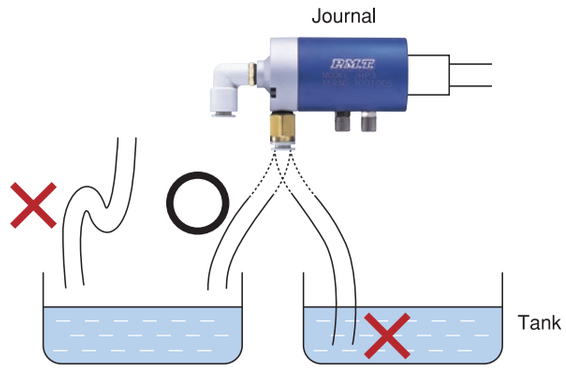
Inside of fitting and/or hoses have to be cleaned before installation to the journal. Otherwise, the foreign sub-stance may get inside, and thus, the jamming will have to be caused eventually. When installing the chuck and air supply apparatus to the machine, pay attention to the end of air hoses not to be touched to the floor to avoid it gets dirty with cutting chips, dirty oil and sludge. If the hoses are connected to the ports of Journal without cleaning the connecting part of hoses, the ASA will cause the trouble such as jamming of Journal.





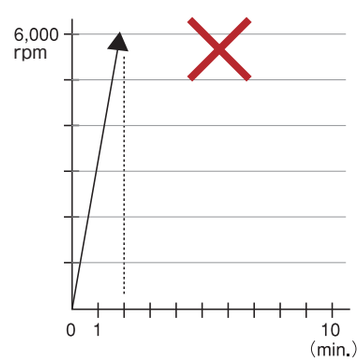
❸ Tubing for Drain

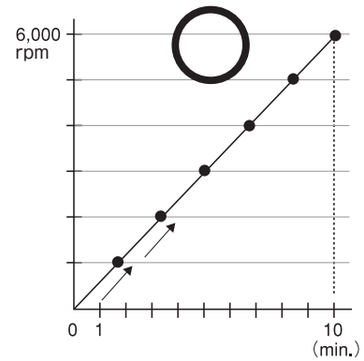
Arrange drain hose so that the coolant will return the tank. Do not put the hose into the coolant tank. Make sure there is no trap on drain hose.



❹ Warming Up

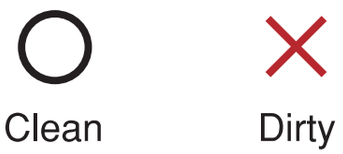
Before start machining, carry out warm-up running in a few steps, 1000, 2000, 3000....rpm, by spending over 10min. It might cause the jamming to run the ASA quickly at top speed.





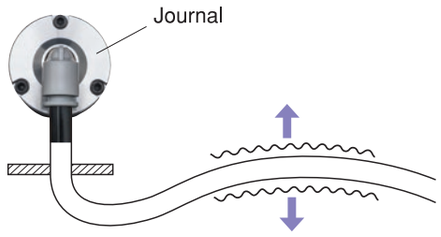
❺ Air and Oil

Use Air Filter which has over 0.0002" or better filtration capacity. Maintain the cutting oil as clean as possible all the time. Old filter, low cap of filtration for cutting chips, dirty oil may cause the jamming problem with ASA.



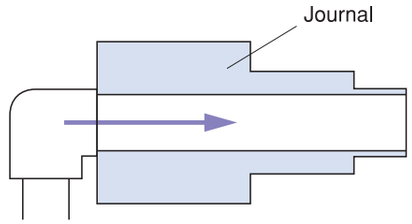
❻ Vibration of Hose

When there is a strong vibration with the coolant hose, supply some fixture, near by the journal, to prevent the vibration to be transferred to the journal.



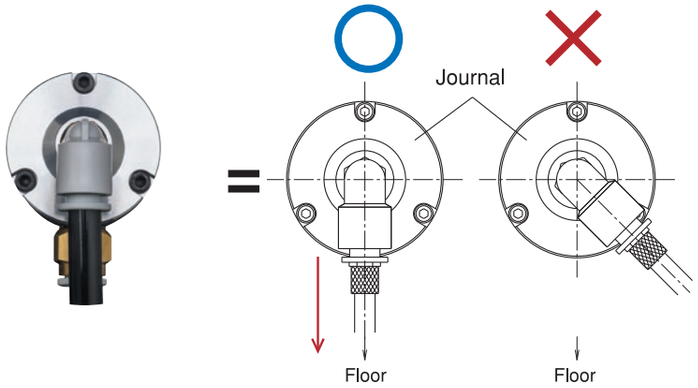
❼ Dry Cutting

If the dry-cut is done at high speed, thermal expansion is caused inside of journal, and may cause jamming between the shaft and housing. It is recommended to apply air blow through the journal, in case the coolant is not used, to reduce the heat generation inside journal.



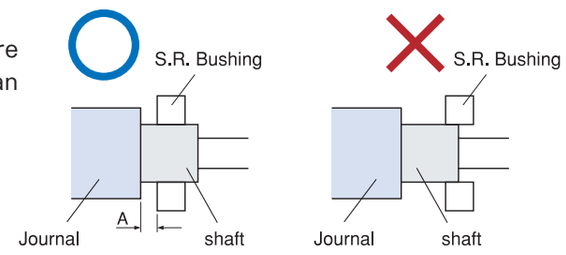
❽ Setting Direction of Journal

Set the Journal so that the fittings and hoses will point right at the floor.



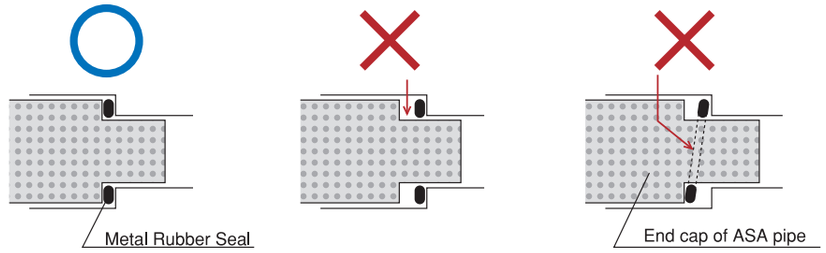
❾ Location of Bushing

When installed ASA with machine, make sure the SRB is holding the shaft with more than 90% of the holding surface.
(Clearance of A should be within 0.394")

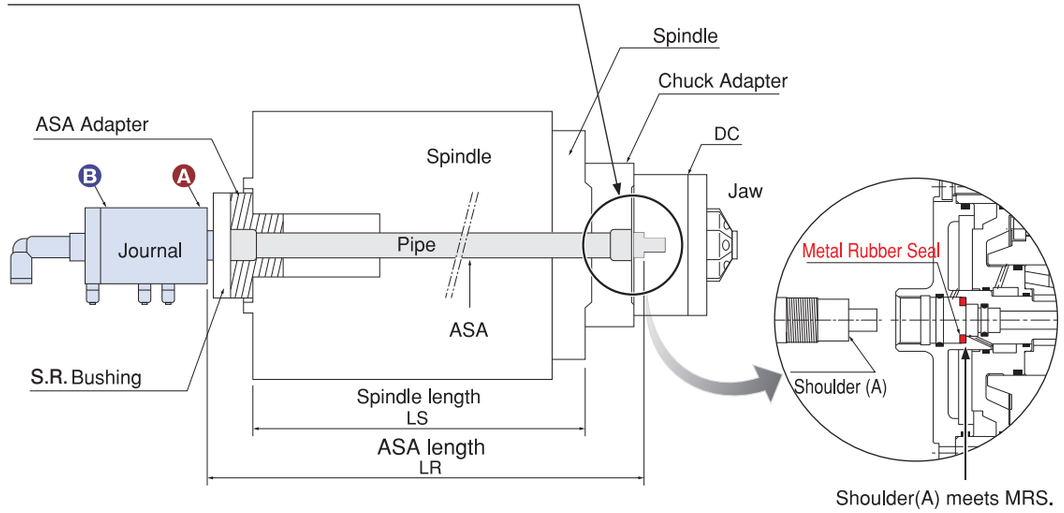


❿ Installation of ASA to chuck

When installing the ASA to the chuck, make sure the metal rubber seal is in place, and tighten the ASA until the edge of ASA will reach to it. If the ASA is not tightened firmly and properly, and/or if the metal rubber seal is not in the place properly, the air leakage will have to be caused, and the chuck will malfunction eventually.



Insert ASA until the shoulder (A) of end cap hit the metal rubber seal supplied at the rear side of DC. Screw tighten ASA just a little further to create firm contact with MRS (metal rubber seal), but not too excessively not to damage MRS.

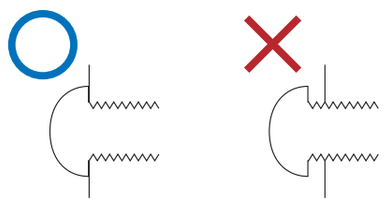


Centering when installing ASA to the machine

Make sure the runout at Ⓐ and Ⓑ must be within 0.0004"(0.0002" when the spindle speed is over 6,000rpm.)
Runout over these accuracies will affect the accuracy of turning and might cause the jamming at journal.

⓫ Tightening of Screw

After all the installation and adjustment related to the ASA adapter and Bushing, make sure all the screws are firmly tightened, not loose.

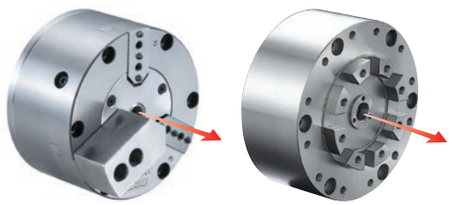


Trouble Shooting

Case1 Jaws don't move

【Slide Jaw Type Precision Air Chuck】

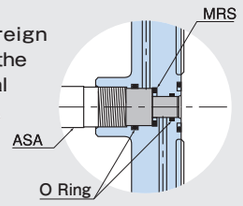
❶ If this phenomenon took place right after initial operation or rather in short period of use, air leakage might be the cause. Check the leak at the center bore of chuck.



Followings can be considered as the cause;

1, Damaged O Ring or MRS, or both together when installing ASA
Solution⇒**Change O ring and MRS for new ones**

2, Jamming resulted by foreign substance got in between the shaft and housing of journal
Solution⇒**Whole ASA assembly need to be replaced with new one**



❷ If this took place after certain long while of use, like after 1-2 or more years, jamming anywhere among MJ, Wedge and Body, is usually the cause of trouble.

In almost every cases, this jamming is resulted from the accumulation of chips and sludge, among MJ, Wedge and the Body, which have been progressed a little by little, farther and farther, along with months, years of use, inside the chuck. If this take place, the chuck have to be repaired. It normally takes 3 to 5 weeks.

【Diaphragm Type High Precision Air Chuck】

The followings can be considered as the cause.

❶ Air Leak	Please refer to aforementioned Case 1.
❷ Diaphragm Fatigue	Diaphragm material will normally last long. If DC in question has been in use long period, like for example a few years, this might be a cause.
❸ Breakage of Diaphragm	Breakage of diaphragm due to the collision caused by operational mistake, or whatever the reason, might be the cause. In this case, DC have to be repaired.

Trouble Shooting

Case2 Accuracy lost

【Slide Jaw Type Precision Air Chuck】

❶ In case over half a year have passed after started using

The followings can be considered as the cause when the accuracy which have been available since the beginning is lost:
(1)Jaw damaged and/or worn
(2)Jamming took place between the body, wedge and MJ
If (1) is the case, change the jaw for new one, form-machine it.
If (2) is the case, the chuck have to be repaired at our shop.
Note: In order to avoid jamming, as frequent lubrication as possible have to be done as explained in page 45. Enforcement of lubrication will extend the life, accuracy life of chuck.

❷ If it started within a few weeks of use

(1) Damaged Jaw, (2) Air Leak, (3) Inadequately Prepared Jaw, can be considered as the cause.
In case of (1), change jaw for new one, and form-machine it.
In case of (2), check the leak as explained at above Case 1 and consult us with the result.
In case of (3), if the jaw was prepared (form-machined) by the customer, please send the drawing of jaw arranged by the customer, together with the drawing of workpiece so that we will be able to talk with you for the solution.

【Diaphragm Type High Precision Air Chuck】

The followings can be considered as the cause.

❶ Jaw broke	Arrange new Jaw
❷ Diaphragm of DC broke or deteriorated	In case the cause is the breakage and/or fatigue of diaphragm matenal, the chuck have to be repaired. (Normally it takes 4 to 5 weeks.)
❸ Wear of clamp surface	Reform-machining is necessary. In case of OD clamp, for example, if the jaw was originally form-machined by opening it at 43.5psi air pressure, do the same now again by 29psi air pressure. The difference of Jaw stroke by two ditterent air pressure will be the rate of material to be removed by additional reform-machining.

Trouble Shooting

Case3 Rotary Journal locked (Jammed) during the operation

● Change ASA include Rotary Journal for new one.
Delivery of ASA is usually 3-4 days after receipt of order.

Case4 Jaw of DC break frequently

● The followings can be considered as the cause;
(1) Form-machining not done right and properly
(2) Not feasible machining conditions

In case of (1), If the jaw is prepared by the customer, please let us have the drawing made by customer, together with the drawing of WP for our evaluation and counter-idea to resolve the problem, and also with the following information;
1-Material and hardness of WP
2-Marterial of Jaw
3-Spindle RPM
4-Air pressure used to form-machine the jaw
5-Additional air pressure (if it's used.)
6-Cutting removal
7-Cutting Feed Rate

Remarks

For whatever caused trouble in terms of the accuracy or performance, please contact us with the following information;

1. Model No. of Chuck (or ASA)
2. S/No. of above
3. Period in use
4. Condition of machining:
   1) Material of WP 2) Cutting removal 3) Spindle RPM 4) Status of Implementation re Lubrication 5) Accuracies required on the drawing 6) Yes or No of Coolant usage 7) Operation hours per day, days per month and cycle time

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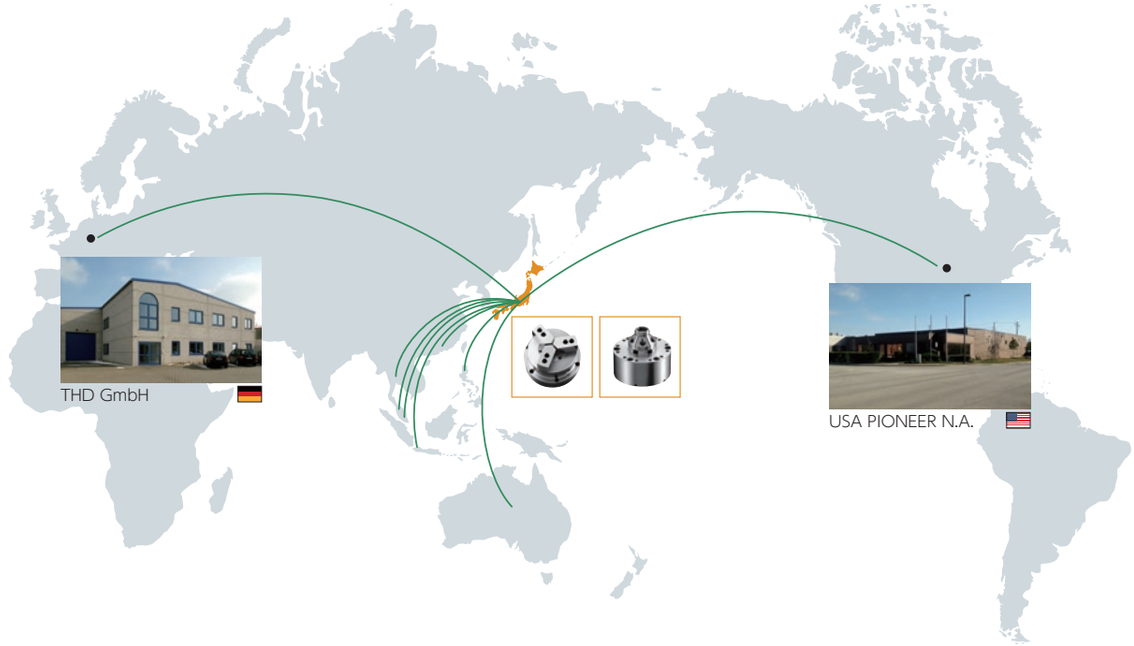

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