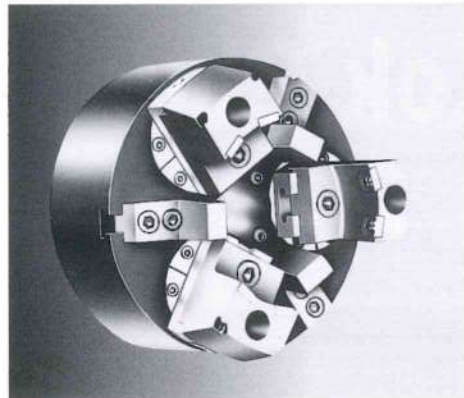


SWING TYPE [Pull-Back Action]

UBL Universal Ball-Lok Chuck

Wide-range clamp enables unprecedented machining.

The UBL [Universal Ball-Lok Chuck] is the jaw swing-type power chuck offering excellent clamping force, rigidity, and durability. Especially, they are designed for not only efficient chucking of cast and forged materials with draft, but also tight holding of overhang work-pieces. Also, they greatly improve roundness of thin-walled unfinished work-pieces while accepting complex-shaped work-pieces.

Three types are available. ① Centralizing type (Centripetal type... General clamping point reference), ② Compensating type (Center offset type...boss hole / both center basis), and ③ ON-OFF type (Switchover type). In addition, each type has three-jaw and two-jaw applications. Moreover, the long stroke type, the large diameter through-hole type, special jaw actuator (base jaw), and newly also available 6 jaws (I.D. / O.D. compatible) as standard. According to the requirement of the customer, we design and manufacture the fitting portion for machine spindle, top-jaws, and stoppers, etc...



6JAW

Special



3JAW



2JAW

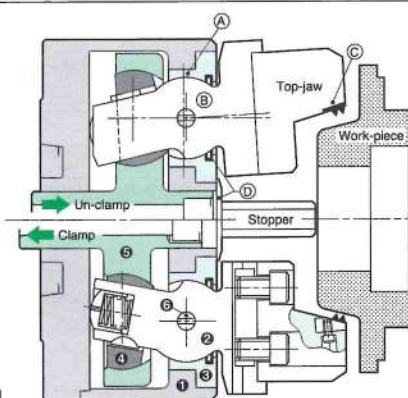
Incorporating our know-how of chucking design and engineering accumulated since 1969 and offering a wide variety, the UBL Chuck is highly evaluated as excellent power chucks enabling various customers to greatly increase productivity especially in automated production line.

Structure and Function

Advantages

- ① Land
..... This is a portion to "Pull-Back" the work-piece toward the stopper.
- ② Equalizing unit
..... This is a key device to the top-jaw swing motion.
- ③ Carbide insert
..... The carbide insert offer greatly improved service life and clamping torque, while providing excellent interchangeability.
- ④ Cover & Sealing
..... It is outstanding in the preserve-ability in the protection against dust and being waterproof. Especially, it is the optimal for the FA manufacture line.

- ① Body
- ② Jaw actuator
- ③ Front bearing race
- ④ Eccentric ball
- ⑤ Actuator
- ⑥ Equalizing mechanism



Advantages

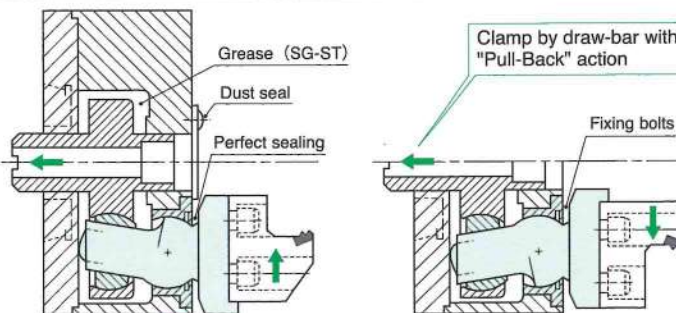
1 Both O.D. and I.D. clamping are available with the same chuck

O.D. and I.D clamping are both available by pulling the draw-bar.

Easy to change O.D. clamping from I.D. clamping.

How to change is just to unfasten the 4 pieces of fixing bolts of the bearing races and then rotate them 180 degree as combining with the jaw actuator without taking them off from the body and again fix the bolts.

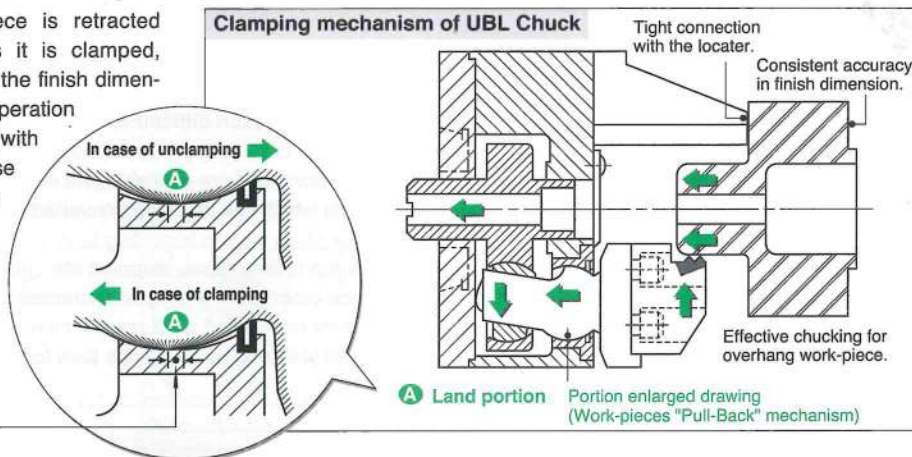
※ In this case, the special waterproof seal is not applied.



2 "PULL-BACK" function for machining and consistent accuracy

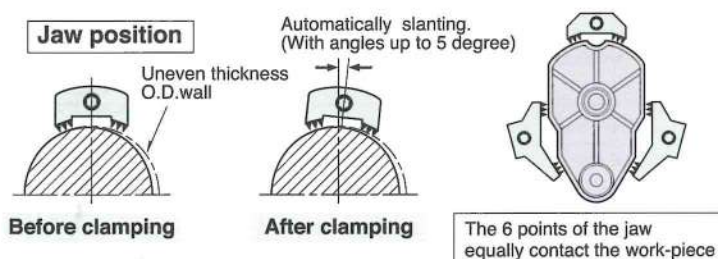
With this function, the work-piece is retracted toward the stopper as soon as it is clamped, resulting in consistent accuracy of the finish dimensions in the axial direction. The operation of the correlation between Jaw (with carbide insert) and stopper increase the clamping stability and it allows to do heavy-duty cutting of overhang work-pieces.

Cylindrical portion is provided at center position (inside dia.) of front bearing race enabling jaws to "Pull-Back" work-pieces.



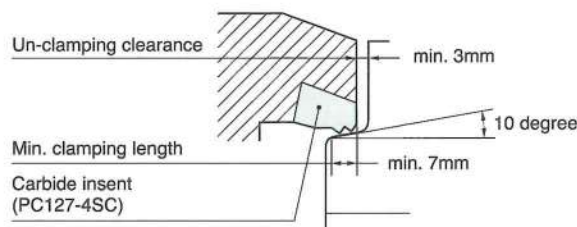
3 Equalizing function of jaws

By incorporating equalizing mechanism in body, the UBL Chuck can clamp uneven thickness O.D. of work-pieces and / or uneven shaped work-pieces. Top jaws rotate till 2 portions of each of them contact to workpiece and it enables to increase stability of clamping securely. Especially, when OP-1 of thin ring shape work-pieces, the roundness increases more by making 6 points of the work-piece contact to jaws equally.



4 Efficient chucking for heavy-duty cutting of tapered work-piece with minimum holding area

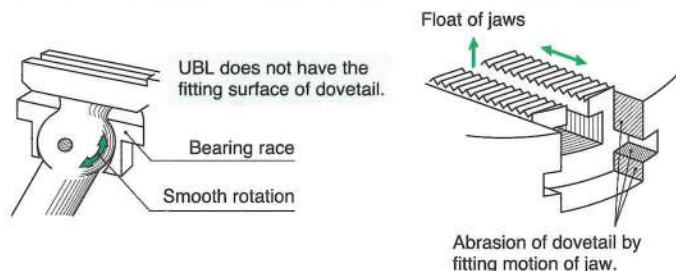
The UBL Chuck is designed to clamp work-pieces having 10 degree slant surfaces without difficulty even with very small holding area and can respond to heavy-duty cutting processes. Therefore, efficient chucking design is possible to reduce the number of machining processes and to expect remarkable productivity.



5 Equalizing motion for long life clamping

The life of standard power chucks is much influenced, because the dovetail (jaw guiding groove) abrasion makes the float of jaw bigger. The materials of UBL parts are selected under the consideration of high durability and therefore, UBL Chucks are being used for long time with no necessity of maintenance.

※ UBL Chucks rotating by equalizing motion is designed to make cutting chip difficult to enter.



6 Parts inside UBL Chucks for interchangeability (Refer to 10 page)

Component parts of UBL Chucks (other than Special Design Chucks) which are machined precisely are interchangeable. These parts are in stock and are promptly delivered to meet the planning for our customers' productions.

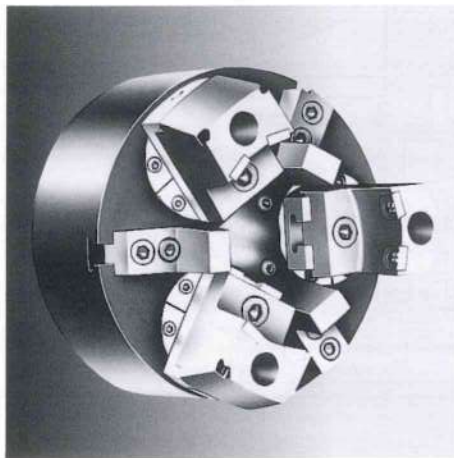
Attention Quality of UBL parts such as materials heat treatments, dimensions, accuracy, etc... is not commonly specified with other companies than FORKARDT UBL.

7 Arm seal and special waterproof sealing for dust free, waterproof operation

Not only arm seal, TEIKOKU also strengthened special waterproof seal, which resolved the problem of the penetration of cutting dust or coolant water into inside of chucks, as well as reduced the necessity of overhaul because of worn-out, seizure or abrasion. And it makes easier to deal with cutting dust even in vertical lathes.

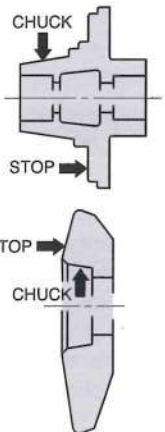
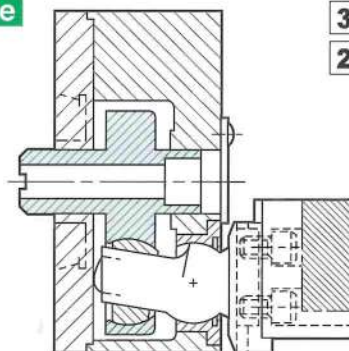
SWING TYPE [Pull-Back Action]

UBL Centralizing type Chuck



The UBL Centralizing type Chuck employs a common clamping method, using the clamping part as a concentricity reference and the stop face as an end face reference. They are capable of clamping such difficult-to-clamp work-pieces as tapered (20 degree max.) surfaces of casting or forging products, holding them tightly even under heavy cuttings, 2 jaws type and 3 jaws type are available and every UBL Chucks can correspond to both I.D. or O.D. clamping which can be easily converted from each other (see page 3.) We are liable to design and produce chucks according to your request such as troublesome body modification and every top tooling (jaws, stoppers etc...). UBL Chucks include a wide design variety, such as carbide insert jaws and special shaped jaws for material operation (see page 9), wide type jaws for thin-walled work-pieces, high-tension aluminum jaws for high-speed rotation, combination jaws and quick change jaws for small-lot production (see page 9.)

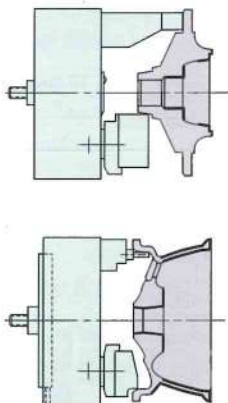
Structure



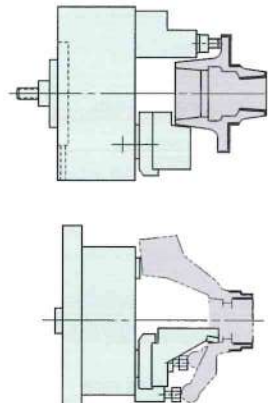
Practical examples

● **Vast variation** 5 inch size power chuck, big size dia. through hole power chuck, long stroke power chuck, combination chuck can be supplied.

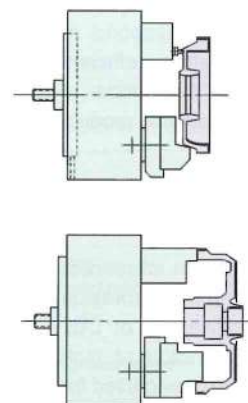
Overhung work-piece



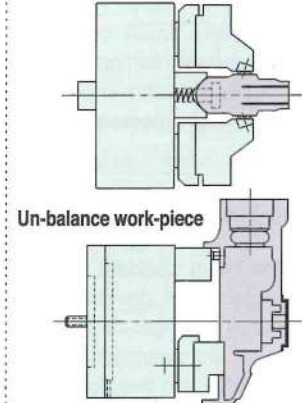
Tapered surface work-piece



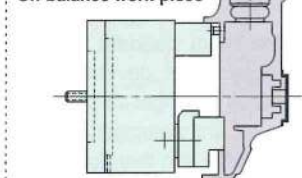
Thin-walled work-piece



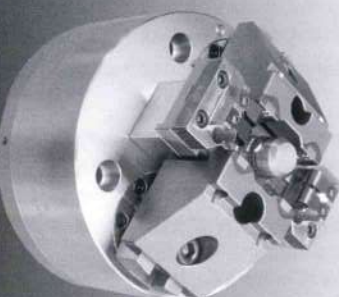
2JAW



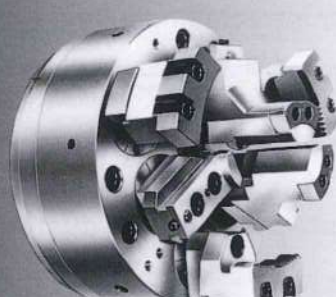
Un-balance work-piece



2JAW for machining Yoke



Special type 6JAW centralizing chuck



This UBL 6Jaw Ball-Lok Chuck is designed to enable easy conversion of UBL between O.D. clamping and I.D. clamping. Using quick change jaws at the inside and outside jaws will further reduce your loss time for jaw replacement. For easier maintenance, the smallest 10" model employs the same parts as UBL-6, except for the actuator.

Specification of standard type

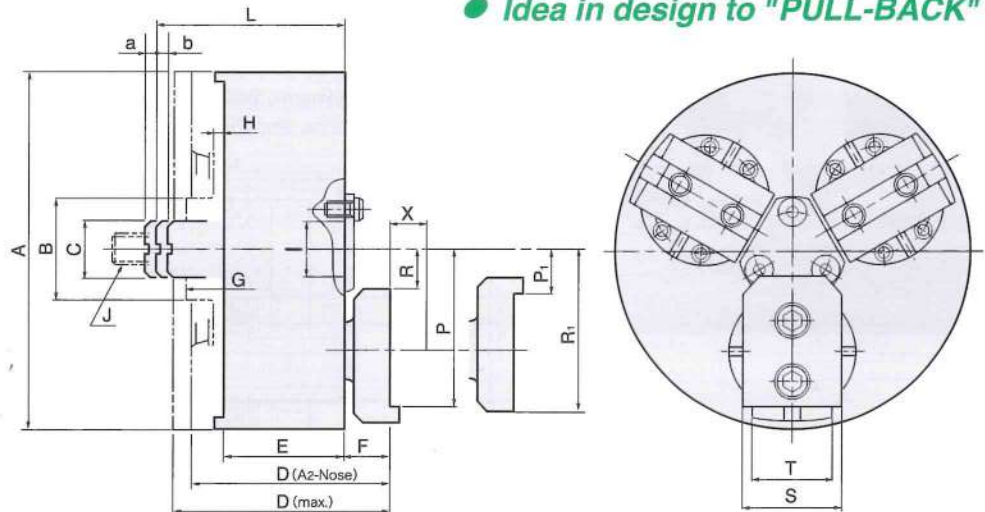
Centralizing type



O.D. Clamping



I.D. Clamping



● Idea in design to "PULL-BACK"

- Adapters to be fixed to the end of machine spindle and top tools such as jaws, stoppers are available.
- 5 inch size or long stroke type chucks are also standardized.

Standard dimensions

Model No.	A	B min.	C	D (1)		E	F	G min.	H min.	I
				Az-Nose	Max.					
UBL-6	162	41.1	30.16	96.8	104.6	59.2	19.3	19.8	4.8	30.170 ^{+0.005} ₀
UBL-8	200	45.0	31.75	113.6	126.3	70.0	23.3	21.5	6.0	31.760 ^{+0.003} _{-0.002}
UBL-10	254	58.0	41.27	141.2	148.0	86.6	29.1	26.0	7.0	41.285 ^{±0.0025}
UBL-12	300	58.0	41.27	141.2	148.0	86.6	29.1	26.0	7.0	41.285 ^{±0.0025}
UBL-15	381	83.0	57.16	152.4	174.0	96.1	32.4	36.6	7.0	57.160 ^{±0.005}
UBL-18	457	120.7	88.90	152.4	174.0	96.1	32.4	36.6	7.0	88.900 ^{+0.01} ₀
UBL-21	533	120.7	88.90	157.2	174.0	96.1	32.4	36.6	10.0	88.900 ^{+0.01} ₀

Model No.	J	L Clamp position	a	b	P	S	T	(2) R Standard	P ₁	R ₁	X Basic hight
			Stroke								
UBL-6	M16	95.8	5.1	6.2	73.15	50.0	38.1	17.3	22.2	78.0	24.9
UBL-8	M16	112.0	8.0	6.4	88.95	60.0	44.4	22.1	25.3	92.2	29.4
UBL-10	M18	131.5	8.0	9.5	112.70	70.0	57.1	30.0	30.1	112.7	36.5
UBL-12	M18	131.5	8.0	9.5	133.27	70.0	57.1	50.6	50.7	133.0	36.5
UBL-15	M24	155.4	10.3	12.0	171.45	76.2	66.6	65.8	69.8	176.0	41.9
UBL-18	M24	155.4	10.3	12.0	209.55	76.2	66.6	103.9	107.9	213.6	41.9
UBL-21	M24	155.4	10.3	12.0	247.65	76.2	66.6	142.0	146.0	252.0	41.9

Standard specifications

Model No.	Standard clamping force kN (kgf)		Cylinder critical force kN (kgf)	Jaw stroke (Dia.) mm	Standard clamping range mm		Basic rotation speed min ⁻¹	Chuck weight kg	Body GD ² N · m ² (kgf · m ²)	
					O.D.	I.D.				
UBL-6	64.7	(6,600)	21.6	(2,200)	7.9	12.7~120	70~152	3,000	18.0	1.47 (0.15)
UBL-8	85.3	(8,700)	28.4	(2,900)	9.5	16.0~152	76~203	2,800	27.0	4.70 (0.48)
UBL-10	105.8	(10,800)	35.3	(3,600)	12.7	50.0~203	85~235	2,500	45.0	12.05 (1.23)
UBL-12	105.8	(10,800)	35.3	(3,600)	12.7	63.0~241	127~305	2,000	67.5	23.72 (2.42)
UBL-15	161.7	(16,500)	53.9	(5,500)	15.8	76.0~317	165~381	1,600	84.5	83.20 (8.49)
UBL-18	161.7	(16,500)	53.9	(5,500)	15.8	89.0~394	241~457	1,200	120.0	148.67 (15.17)
UBL-21	161.7	(16,500)	53.9	(5,500)	15.8	162.0~470	317~533	900	180.0	245.00 (25.00)

(1) Fitting portion and bolt holes of adapters are to be machined, depending on the machine spindle.

(2) Dimension "R" can be enlarged by cutting of jaw actuator end.

* Dimensions are the same for both 3 jaws and 2 jaws applications. For 2 jaws types, UBL-6 to UBL-15 are readily available.

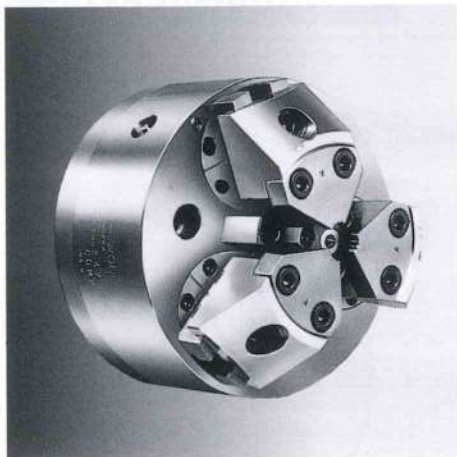
* In the 2 jaws application, standard clamping force and actuator's critical force tensile are 60%.

* Rotating speed and draw bar thrust are different, depending on the operation conditions.

These speed and propulsive force are shown by us.

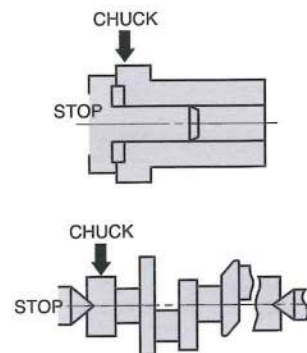
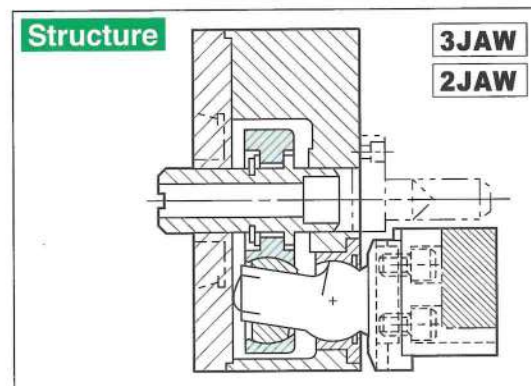
SWING TYPE [Pull-Back Action]

UBL Compensating type Chuck



The UBL Compensating type Chuck clamps with jaws spaced along the circumference of the work-pieces with equally distributed power at standard of between centers or the boss hole based.

We design many kinds of chucking types of both center or boss hole based. The UBL Compensating type Chuck is particularly excellent in terms of cost performance, corresponding to complex shape of the work-pieces, high-load operation, high-precision operation and maintainability. We are available to design custom-made special jaws, fixed center, standard pins, dynamic balancing and combination type according to operating accuracy, operating conditions, the shape of clamping portion or any other requirements.



Practical examples

Clamping of work-piece under standard of both center holes.

- Operating of general shaft work-piece of which O.D. is un-operated. There is another kind of chuck using spring center and end face based.

Clamping of casting surface under standard of holes. (Machining finished)

- It cannot afford to the cutting torque by only inside clamping at boss portion.

Combination Design
Tork-Lok Arbor (AC) and UBL Compensating type.

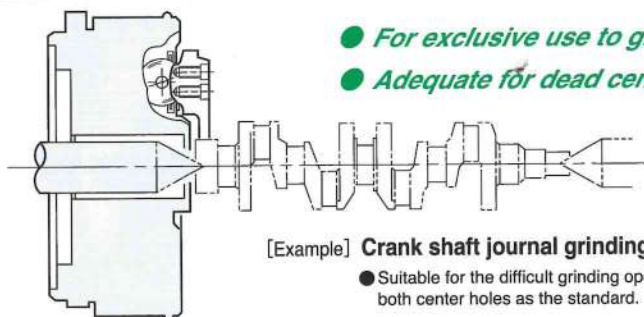
- Chuck clamp O.D. with centering by Collet due to high requirement concentricity between I.D. and O.D.

PIN-ARBOR CHUCK (OPA) and UBL compensating (Special type)

Work-piece name : Torque converter

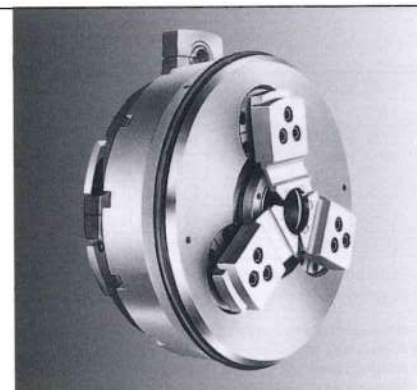
FBL Floating Ball-Lok Driver

- High accuracy Compensating Chuck



[Example] **Crank shaft journal grinding**

- Suitable for the difficult grinding operation in concentricity to both center holes as the standard.



Compensating type

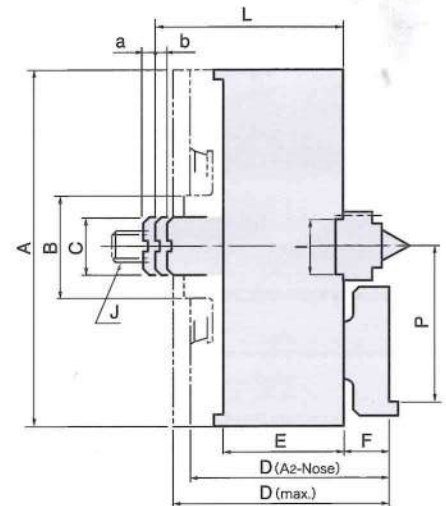
Specification of standard type

- Adapters to be fixed to the end of machine spindle and top tools such as jaws, fixed centers are available.
- The type of long stroke chuck is also standardized.

Standard dimensions

Model No.	A	B min.	C	D (1)		E	F
				Az-Nose	Max.		
UBL-6	162	41.1	30.16	96.8	104.6	59.2	19.3
UBL-8	200	45.0	31.75	113.6	126.3	70.0	23.3
UBL-10	254	58.0	41.27	141.2	148.0	86.6	29.1
UBL-12	300	58.0	41.27	141.2	148.0	86.6	29.1
UBL-15	381	83.0	57.16	152.2	174.0	96.1	32.4
UBL-18	457	120.7	88.90	152.4	174.0	96.1	32.4
UBL-21	533	120.7	88.90	157.2	174.0	96.1	32.4

Model No.	I	J	L Clamp position	a b Stroke		P
				a	b	
UBL-6	30.170 $^{+0.005}_0$	M16	95.8	5.1	6.2	73.15
UBL-8	31.760 $^{+0.003}_{-0.002}$	M16	112.0	8.0	6.4	88.95
UBL-10	41.285 $^{+0.0025}_0$	M18	131.5	8.0	9.5	112.70
UBL-12	41.285 $^{+0.0025}_0$	M18	131.5	8.0	9.5	133.27
UBL-15	57.160 $^{+0.005}_0$	M24	155.4	10.3	12.0	171.45
UBL-18	88.900 $^{+0.01}_0$	M24	155.4	10.3	12.0	209.55
UBL-21	88.900 $^{+0.01}_0$	M24	155.4	10.3	12.0	247.65



Standard specifications

Model No.	Standard clamping force kN (kgf)	Cylinder critical force kN (kgf)	Jaw stroke (Dia.) mm	Standard clamping range mm		Basic rotation speed min ⁻¹	Dia of jaw revise mm	Chuck weight kg	Body GD ² N · m ² (kgf · m ²)	
				O.D.	I.D.					
UBL-6	64.7 (6,600)	21.6 (2,200)	7.9	12.7~120	70~152	3,000	1.5	18.0	1.47 (0.15)	
UBL-8	85.3 (8,700)	28.4 (2,900)	9.5	16.0~152	76~203	2,800	2.0	27.0	4.70 (0.48)	
UBL-10	105.8 (10,800)	35.3 (3,600)	12.7	50.0~203	85~235	2,500	2.3	45.0	12.05 (1.23)	
UBL-12	105.8 (10,800)	35.3 (3,600)	12.7	63.0~241	127~305	2,000	2.3	67.5	23.72 (2.42)	
UBL-15	161.7 (16,500)	53.9 (5,500)	15.8	76.0~317	165~381	1,600	3.2	84.5	83.20 (8.49)	
UBL-18	161.7 (16,500)	53.9 (5,500)	15.8	89.0~394	241~457	1,200	3.2	120.0	148.67 (15.17)	
UBL-21	161.7 (16,500)	53.9 (5,500)	15.8	162.0~470	317~533	900	3.2	120.0	245.00 (25.00)	

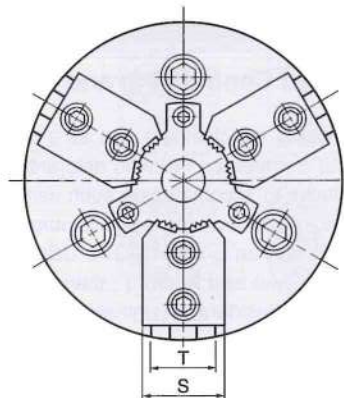
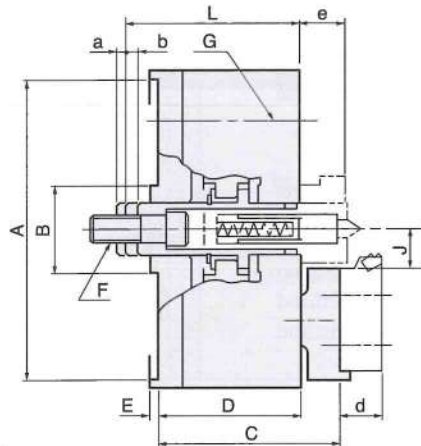
(1) Fitting portion and bolt holes of adapters are to be machined depending on the machine spindle.

* Dimensions are the same for both 3 jaws and 2 jaws applications. For 2 jaws types, UBL-6 to UBL-15 are readily available.

* In the 2 jaws application, standard clamping force and actuator's critical force tensile are 60%.

* Rotating speed and draw bar thrust are different, depending on the operation conditions. These speed and propulsive force are shown by us.

Specifications of spring-center

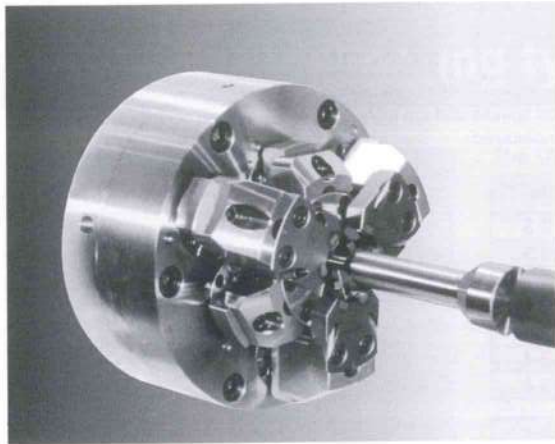


Standard dimensions

Model No.	A H7	B	C	D	E	F	G	L Clamp position	a b Stroke		J max.	S	T	d min.	e min.
									a	b					
UBL-6	140	40	97.3	78	5	M14 P2.0	3-M10 P.C.D.104.8	94.9	5.1	6.2	27.1	50	38.1	20	34
UBL-8	180	50	113.7	90	5	M14 P2.0	3-M12 P.C.D.133.4	109.7	5.3	9.0	34.9	60	44.4	20	38
UBL-10	190	58	139.2	110	5	M18 P2.5	3-M12 P.C.D.133.4	130.9	8.0	9.5	42.7	70	57.1	35	49
UBL-12	260	70	139.2	110	5	M18 P2.5	3-M16 P.C.D.171.4	130.9	8.0	9.5	56.2	70	57.1	35	49

Standard specifications

Model No.	Standard clamping force kN (kgf)	Cylinder critical force kN (kgf)	Jaw stroke (Dia.) mm	Standard clamping range mm		Basic rotation speed min ⁻¹	Dia of jaw revise mm	Chuck weight kg	Body GD ² N · m ² (kgf · m ²)	
				O.D.	I.D.					
UBL-6	64.7 (6,600)	21.6 (2,200)	7.9	12.7~120	70~152	3,000	1.5	18.0	1.47 (0.15)	
UBL-8	85.3 (8,700)	28.4 (2,900)	9.5	16.0~152	76~203	2,800	2.0	27.0	4.70 (0.48)	
UBL-10	105.8 (10,800)	35.3 (3,600)	12.7	50.0~203	85~235	2,500	2.3	45.0	12.05 (1.23)	
UBL-12	105.8 (10,800)	35.3 (3,600)	12.7	63.0~241	127~305	2,000	2.3	67.5	23.72 (2.42)	



Swing-type Combination Design Chuck

UBL 6JAW CENT & COMP

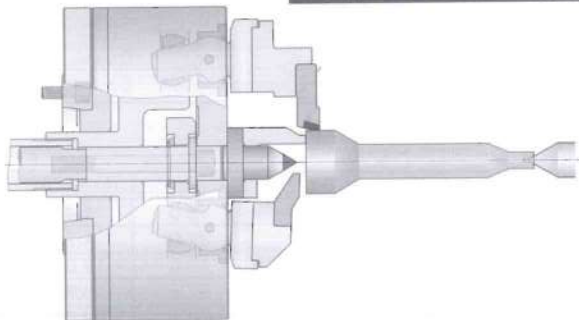
PAT.P

Only 1 unit of chuck can machine various shaft work-pieces without change-over in NC lathe.

The UBL 6JAW CENT & COMP Chuck is a swing type combination chuck which contains CENT Centralizing and COMP Compensating features in 1 unit of chuck.

※ Jaw-Escaping type Chuck & Face Driver is also available for machining of the whole circumstance of shaft work-pieces.

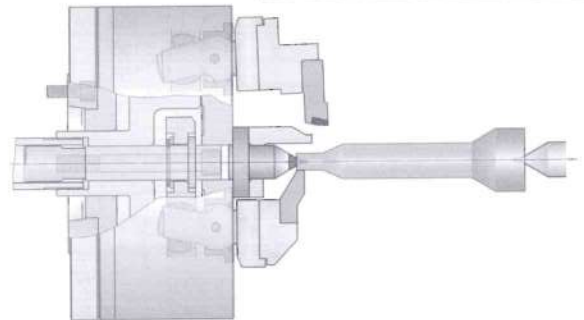
OP-1 Centralizing type



Set the height of the stopper so the shaft work-piece does not interfere to the jaw and the fixed center in next operation. And clamp with reference to the end face of the work-piece and the circumstance of big diameter by UBL 3JAW CENT [Centralizing].

The carbide inserts are attached on the top of the jawpieces to correspond to bigger cutting torque.

OP-2 Compensating type



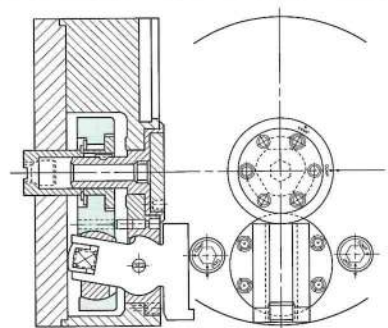
Reverse the shaft work-piece and do finish operation with clamping the small diameter (already finished portion in OP-1) by UBL 3JAW COMP [compensating] with reference to the both center by fixed center and tail center.

The jaw is hardened type not to scratch the finished surface.

UBL ON-OFF type

[Switchable between Centralizing and Compensating]

Generally, work-pieces using the clamping part as a reference and those using a both holes or both centers as a reference requires different chucks. The ON-OFF types are designed as ball-lok chucks to accommodate such varied needs, by enabling easy and quick switching between the "centralizing type / centripetal type" and the "compensating type / center offset type" with an L-wrench. The UBL ON-OFF types are standardized from 10" and 12" types [3-jaws and 2-jaws]; therefore, dimensions, specifications and major parts, are common in consideration of their interchangeability.



Quick (change) Jaw for UBL Chuck

Time saving to jaw changes has been realized

..... These jaws can be also used for presently using chucks.

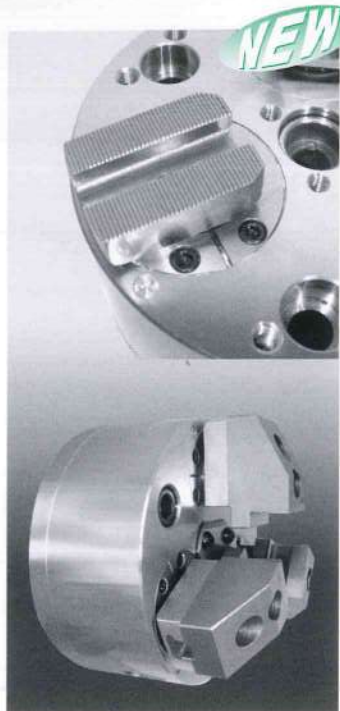
● Suitabilities to many kinds of work-pieces.

- Stable clamping can be obtained, as back face is supported by base jaws.
- No need of L-wrench, tools, etc...
- These jaws can be used for UBL Chucks which have already delivered.
- Exchange of jaws can be made within only 1 minute

Suitable for inner surface clamping



Examples : 6JAW inner clamping for special type [inner, outer, common types]

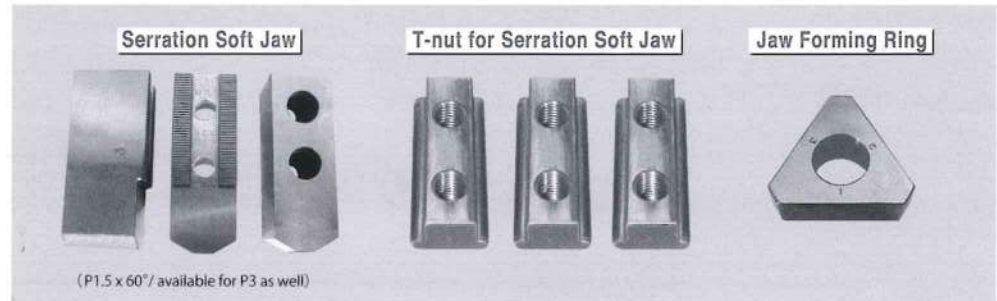


UBL Serration Jaw type

[Registered Design]

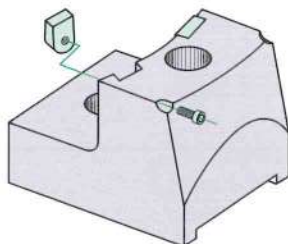
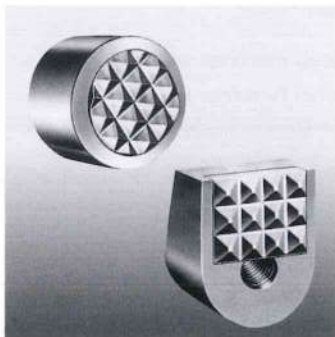
For many kinds of work-pieces and small lot production

- This Serration Jaw type installation way is the same as general power chucks.
- Able to form the jaws by using the Jaw Forming Ring.
- Able to change current UBL Chuck to be Serration Jaw type.
- Able to use commercial soft jaw* (*Need discussions to adjust the T-nut width.)



Attention:

1. Please make notch of jaw bottom corner portion when soft top jaw is made.
2. Please reduce cutting conditions when soft top jaw not only use clamp jaw but also use for stopper. Please prepare stopper (locator) separately if it cannot get parallelism accuracy for work-piece.
3. This UBL Serration model has repeatability accuracy within 0.03 T.I.R. so if need more high precision for your operation, recommend to use our Pin-Arbor series.



Fitting

It is possible to replace top jaw of the UBL Chuck, and therefore top soft jaws shall be shaved into suitable shape for particular work-pieces. Replaceable inserts shall be fitted to these top jaws to increase life of them and reduce their inventory. There are two available types of insert, (Angle-Lok style and Round style) both of them can be easily replaced.

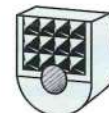
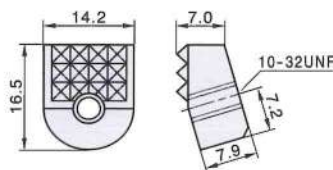
Carbide Insert for UBL Chuck

"High durability" "High clamping torque" "Easy exchange"

Variety of inserts

* Each carbide insert is chosen according to the requirements of a work-piece.

Angle-Lok style



PC127-10SC



PC127-4SC



PC130-4SC



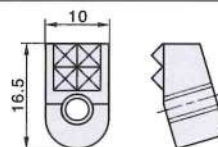
PC132-4SC



PC145-5SC



PC130-2SC



PC127-4SC-S



PC127-2SC-S

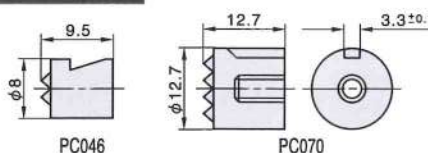


PC130-2SC-S



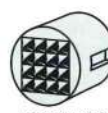
PC132-2SC-S

Round style

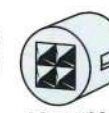


PC046

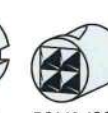
PC070



PC070-12SC



PC070-4SC



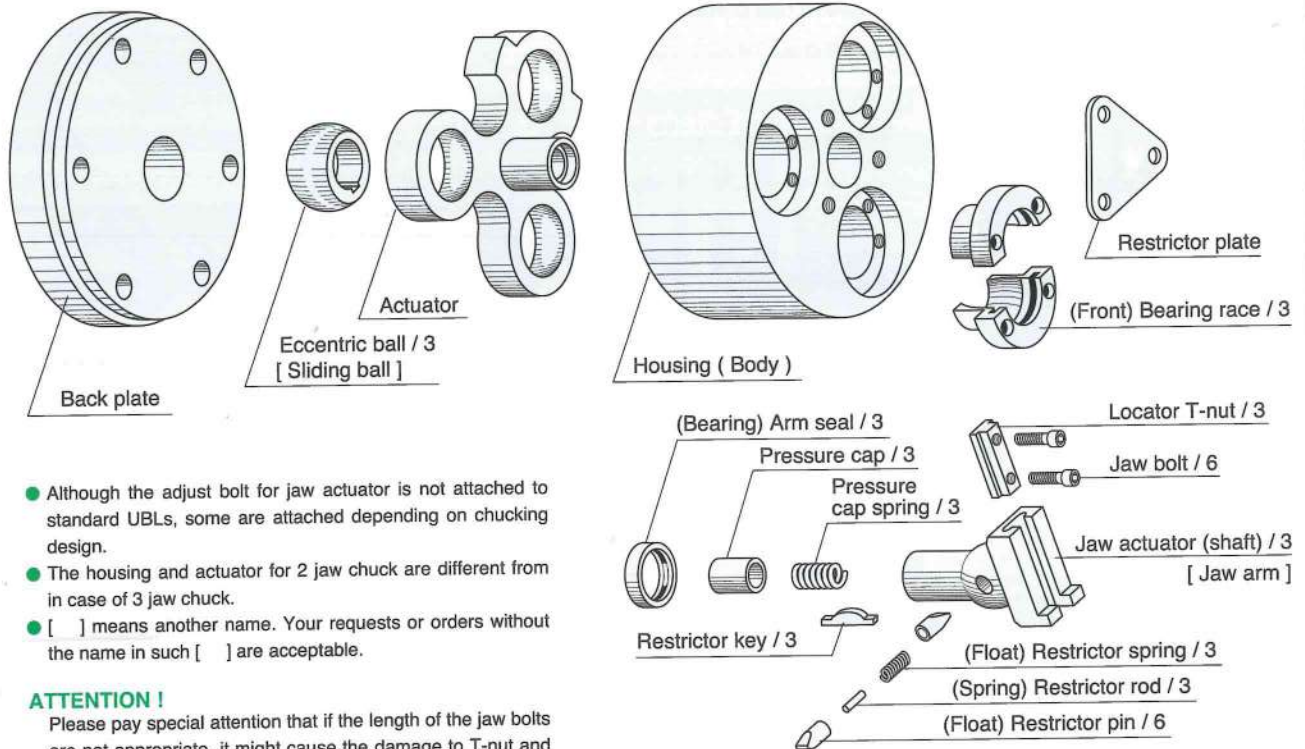
PC046-4SC



PC050-4SC
($\phi 5 \times 7$)

Component parts
ATTENTION

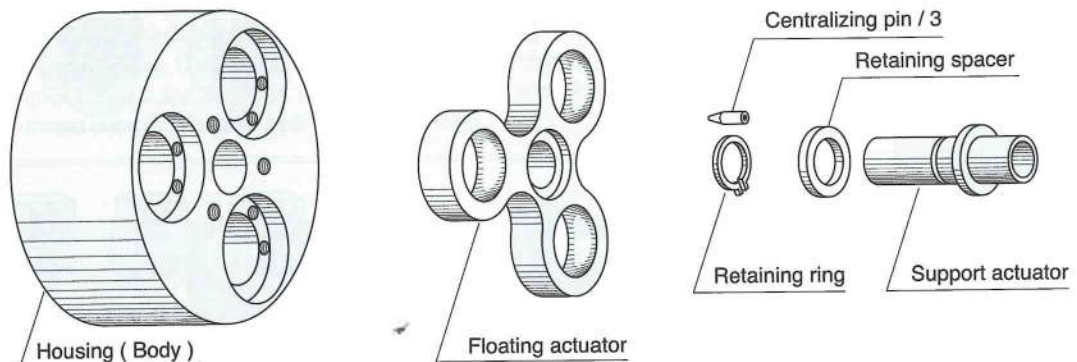
Please note that quality such as part material, heat treatment, dimensions and accuracy of UBL chuck is not standardized with any suppliers except FORKARDT.

Centralizing type
3JAW


- Although the adjust bolt for jaw actuator is not attached to standard UBLs, some are attached depending on chucking design.
- The housing and actuator for 2 jaw chuck are different from in case of 3 jaw chuck.
- [] means another name. Your requests or orders without the name in such [] are acceptable.

ATTENTION !

Please pay special attention that if the length of the jaw bolts are not appropriate, it might cause the damage to T-nut and the deformation of jaw actuator.

Compensating type
3JAW


- Only the parts of the Compensating type shown in this figure are different from those of the Centralizing type. Also, a different type of pressure cap spring is employed by the Compensating type. All the other parts are the same with the Centralizing type.
- As for the 2 jaw model, different types of housing and actuator are employed.