



OPERATING

MANUAL

CNC ROTARY & TILTING

TABLE

MODEL:

DMTRT-220L

YUASA INTERNATIONAL

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Product Features

The rotary table in which installed inside NC controller allows it-self for setting accurate and for constantly stabilizing the working process. Work can as well processing through the centre hole and provide more

demands for market toward greater use.

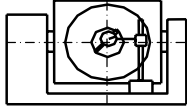
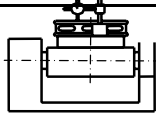
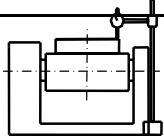
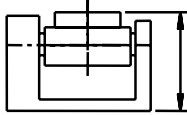
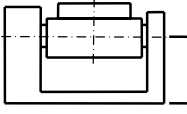
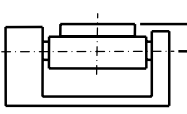
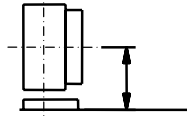
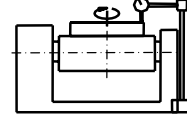
★ Features :

1. Use a section worm is relatively provides 5 times greater contact surface than single worm and worm gear. Moreover, proves superior rigidity and accuracy.
2. According to section worm' s fine features, it has transformed the way of back lash adjustment into the way by mechanical device. The device which design for adjusting back lash of worm gear is quite simple as it is easy to adjust and easy to achieve zero adjustment under selective terms.
3. Rotary has dimensions of large-scale, so the applying range can be more extensively.
4. According to NC controller' s fine features that our rotary can driving and cutting continuously. Moreover, it can use more efficacious.
5. Based on our rotary' s type, it can use two spindle NC controllers for diversity operating.
6. Our rotary can be made ideal for operating with NC controller of working table. Moreover, it can work with five axes driving simultaneously.
7. The min. indexing degree 0.001°

(1) Specification:

DMTRT-220L

NO.	Item	Unit	Standard		Note
1.	Table Top Diameter	mm	Ø220		
2.	Overall Height in Horizontal	mm	235		
3.	Center Height in Vertical	mm	390		
4.	Overall Height in Vertical	mm	335		
5.	Overall Length	mm	631		
6.	Thru Hole Diameter	mm	Ø64		
7.	Spindle Hole Diameter	mm	Ø42H7		
8.	Width of T-slot	mm	12H7		
9.	Width of Guide Slot	mm	18h7		
			Rotary Axis	Tilting Axis	
10.		FANUC	α 2i	α 4i	
11.	SERVO MOTOR	SANYO	P50B0807 5	P50B080 10	
12.	Reduction Ratio		1:90	1:120	
13.	Max. Speed of Table Top	r.p.m.	22.2	16.7	2000r.p.m
14.	Indexing Resolution	angle	0.001	0.001	
15.	Available Angle Range of Tilt Axis	angle	-20° ~+110°		
17.	Endurable cutting force	kg-m	70		
18.	Rotary Axis	Indexing Accuracy	sec	20	
		Repeatability	sec	±2	
		Brake Torque	kg-m	30	Air 6kg/cm ²
19.	Tilt Axis	Indexing Accuracy	sec	60	

NO.	testing subject	Tolerance	Method
1.	Concentricity of main shaft center hole	0.01	
2.	Flatness of Table Top	0.02	
3.	Parallelism Between Table Top and base	0.015	
4.	Height from Table Bottom to Table Top	335	
5.	Height from Table Bottom to Center of Tilting Axis (In Horizontal)	235	
6.	Distance Between The Center of Tilting Axis and Table Top	100	
7.	Height from Table Bottom to Center of Rotary Axis (in Vertical)	132	
8.	Offset of tilting axis center to mail axis center (Item 7- Item 5 = Item 8)	±0.03	
9.	Table Top Eccentric	0.015	
10.	Indexing Accuracy	Rotary Axis-20 sec.	tested by Optical Device
		Tilting Axis-45 sec.	
11.	Repeatability	Rotary Axis ±2sec.	tested by Optical Device
		Tilting Axis ±3sec.	

(2) CNC ROTARY TABLE ACCURACY INSPECTION

(3) PREPARATION BEFORE OPERATING

(Open the crates and assemble all apparatus)

1. Open the crates, handle the device and resemble all unit parts into processing machinery, except spare parts.

(1) Please check the followings when you open the crate :

- a. Check the NC Rotary Table and all accessories if they conform to the purchase list.
- b. Check the operating manual and inspection sheet. (Please Keep them as future reference)
- c. Wiping off the antirust oil and clean the rotary; do not apply corrosive cleaner or gasoline to NC rotary table. Check the item if there is any scrape or dent during handling. Grind the scrape or dent with oilstone.
- d. During handling and reassembling, please ensure the lift-up procedure; for instance, use hoisting rings as assistant, and poise the rotary with lightly push. Pull out the anchor bolts inside the crate before taking out the rotary table. Please confirm the location of anchor bolt with showed diagram or with the exposition.

(2) While reassembling, except the spare parts, please referring the

following procedures:

- a. Clean the NC rotary' s interface, the interface should be free of anti-rust oil or oil stain. Recheck the interface and make sure the interface free of scraps and dents; free of iron fillings of inner joint hole.

- b. While install NC Rotary Table into processing machine, make sure the locating key of processing machine infix with NC rotary table.
2. Before start operating NC rotary and CNC processing machine, make sure the accessories, such as clamping dogs, clamping fixtures or jigs are stable installed on the machine.

3-1 Lubricant

- (1) The oil should have the characteristics of forming a high-strength membrane, of great anti-rust and of anti-oxygenized...etc. Moreover, the lever of viscosity should conform to ISO-VG 100 to 150. Apply this oil at worm shaft, ward gear and parts. Supply quality lubricant on parts can retain good conditions for operating and life of use.

-----Suggestion lubricant-----

JoMo - LATHUS 100(or 150)

Mobil- Gear 629

Shell- Omela Oil 100 (or 150)

Esso - Spartan 100 (or 150)

- (1) Maintaining the cleanliness and cleaning up the foreign material of oil when infusing, otherwise the foreign material will had damaged the worm shaft and worm gear, as well as damage the bearing or sort of mechanical system in short time.
- (2) Infuse the oil gradually and check the volume with oil gauge. After that make sure the volume is sufficient, put the machine into running for 30 minutes. Stop the running after 30 minutes and Recheck the volume by oil gauge if the oil is still sufficient.

(3) Replace the oil every six months. Drain the waste oil out before replacing new one.

3-2 Clamping of Oil pressure pump.

(1) Connecting the hydraulic hose into the hydraulic access and supply oil pressure. (the standard volume is 20kg/ cm²)

※Note: Use quality hose to sustain oil pressure.

(2) Ascertain the signal read from the pressure-switch to ensure the clamping power is adequate.

(3) The clamping power should not power intensity must not subdue so fast to effect the clamping power.

(4) TRIAL RUNNING

Before operating the table, please refer following steps:

1. Before starting the motor, please check the following items:

(1) Assure the trial running is on non-loading condition without mount any work-pieces, jigs, fixtures, and other accessories on the table.

(2) Confirm the program and NC controller has provided the correct signal.

(3) Repeating the operation clamping system to confirm the consistency between the clamping system and the signal. The clamping system should on loosen status under running of servo motor to void man-operated mistake.

※Notice : While the servo motor running under clamping status; the NC rotary operating still, depends on the theorem of reduction ratio. It might result in damage of worm shaft and worm gear ,more over, might cause the jammed inside. The operator should pay extreme attention to the clamping system.

2.RUNNING TRIAL

(1)While running escalates the speed to normal speed, with single direction of clockwise or anti-clockwise, then speed up the running after normal speed.

(2)Make the table running for 20 to 30 minutes after your setting up the machine.

3.Setting the distance of Zero-Return for grind shaft

The signal of Zero-Return coming from N/C

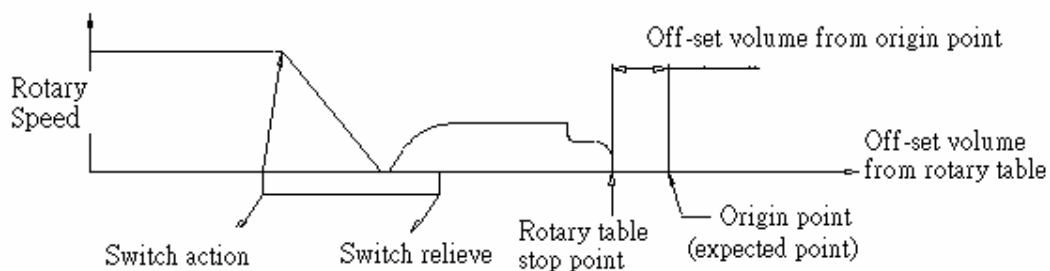
(1)When table return to the initial position (origin point), usually turn with clockwise direction (watch from the table side), followings are steps:

- a. Speed up the running when the table starting running.
- b. When it hits the dog, micro switch activates and slows down the speed to reach the level in capable of sudden stop.
- c. After slowing down the speed, the Motor Detector will remit the signal to make the table stop immediately at the initial Position.
(Origin Position)

(2) The position of Zero-Return usually is set at the T-Slot of the table in which parallels to the undercut at the base of the NC Rotary Table.

(3) Repeat the Zero-Return several times and check if the table stopped at the right position as programmed.

※ Notice : The position of Zero-Return usually is usually set at the T-Slot of the table in which parallels to undercut at the base of the NC Rotary Table. If there is any distinct, adjust the distinct by computer parameter to make the Zero-Return until it parallel to the undercut (Within 0.02mm). The parameter usually is positive numbers, not negative numbers. If the parameter needs negative numbers, it means the dog needs to be unjustified to a suitable position, then plus the positive numbers to parameter.



Reset statement of Origin point.

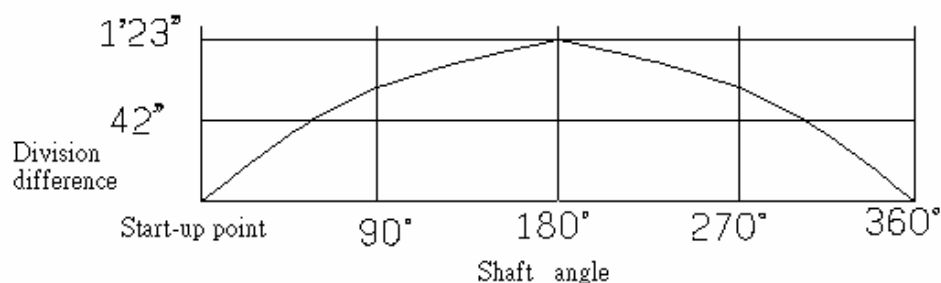
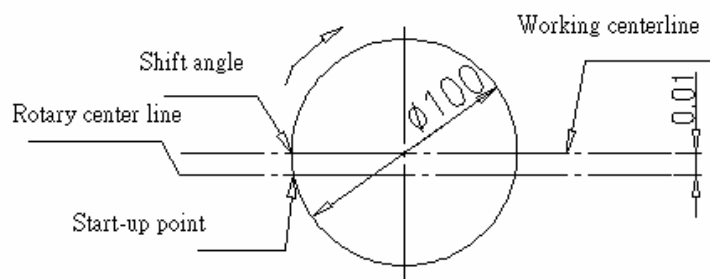
(5) Work-Pieces Mounted.

While mounts work pieces on the rotary table, ensure the following procedures to void any accident and any damage caused from cutters or from devices.

1. Check the surface if there is any scratches or dents.
2. Avoided mounting the work pieces on the table with uneven surface or on a steep work, because it might strain the surface of the table and obstruct the stability of running.

※Notify : Furnish the Maximum measures of table supporters, if need be, filling the lashes between supporters and the surface of table.

3. If the work pieces are not mounted on the center position of the table surface, the mounting might an incorrect swiveling and make the table circumrotated. If the instability of work pieces and fixtures will cause an inaccurate indexing, i.e. the offset of positing during processing and inaccuracy division.



4. Location of work-pieces clamping would be limited, depends on the shape of the work-pieces and cutters. Making the work-pieces firmly on the top face of the table and keep the equal interval because the small table need more clamping to enhance work-pieces, tightly and fixed on the table.

(6) Back Lash Adjustment of Worm and Worm Gear.

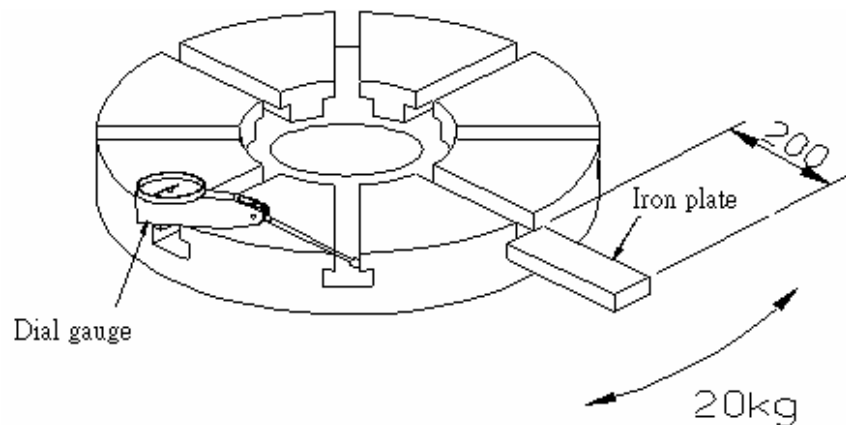
The section worm shaft is separated in the middle and clipped the worm gear from two orientations to establish a perfect gear clenching of every single tooth. The method of backlash adjustment is that rotating the worm shaft's left and right side to adjust the distance. Then, make the inner side and outer side teeth of worm gear closely and consequently could easily adjust the perfect backlash approximate 0.005~0.008mm. Too many backlashes will cause the indexing inaccuracy and ill effect of the finishing work pieces; Narrower or lesser back lash would caused the worm shaft too tighten to move due to the friction overheat. After testing the worm shaft for fuel factors, the suitable backlash must be around 0.008mm.

Notice: Sets the backlash smaller than 0.005mm; be sure to check the rotary table when turning the worm shaft by hand to experience if it runs smoothly.

The circumference of the table 0.01mm equal 0.008mm backlash of gear facing would be adjusted when table exported from factory. The table prohibit loosen or tighten after rotating a circle. A 0.008mm of backlash in width equals to a 0.01mm in length of a circumference of the gear face. Generally, the backlash has been justified before exit from factory. Followings are the procedures for adjusting:

1. Measuring of the backlash

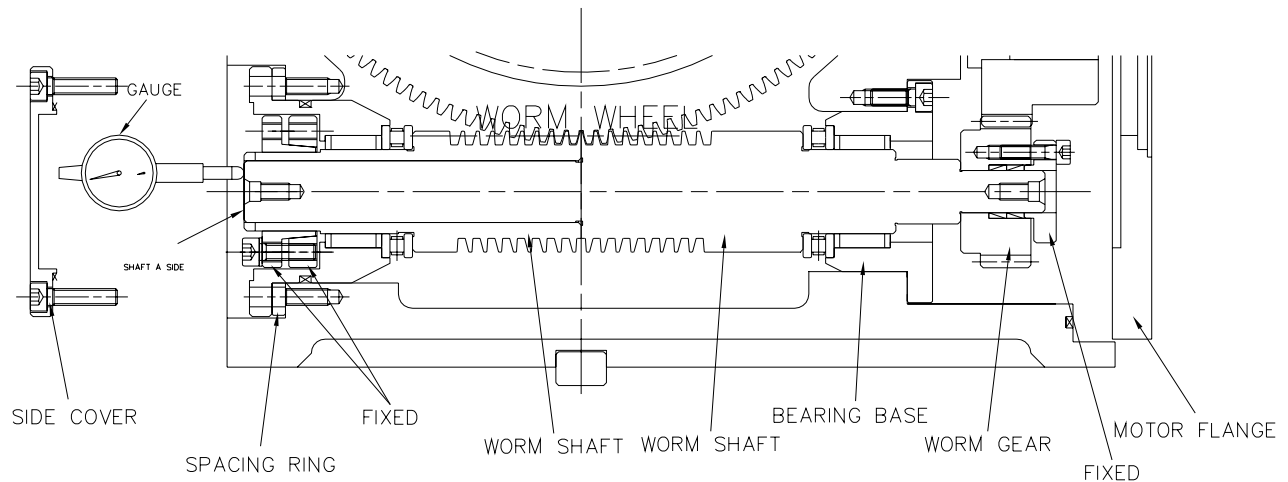
(1) Set the dial gauge nearby T-Slot, as figure showed:



(2) Insert the steel strip into the skirt of T-Slot, distance approximate 200mm, with hand force at 20kg. Sway the plate whether clockwise or anti-clockwise direction and use dial gauge read the interval value of gear lash. Release the force after hand force to recover a stable value. The recovered value doesn't represent the back lash value, moreover, the elastic deform of worm shaft and other parts. Use the same method to test in counterclockwise direction to get another stable value. Then add the obtained value from clockwise and counterclockwise direction. It means the backlash is the recover value after releasing the force by clockwise and counterclockwise. Do not forget to force both clockwise and counterclockwise directions.

※Notify: The value of backlash would be incorrect if any interval between worm shaft and bearing. Please take off the side-cover to check the worm shaft. And put the dial on the worm shaft (A)

as below layout to measure. If you find the play existence, adjust the thickness of the bearing, then clamping, and measure again.



✘After adjusting, please make sure again to check the play existence on (A)

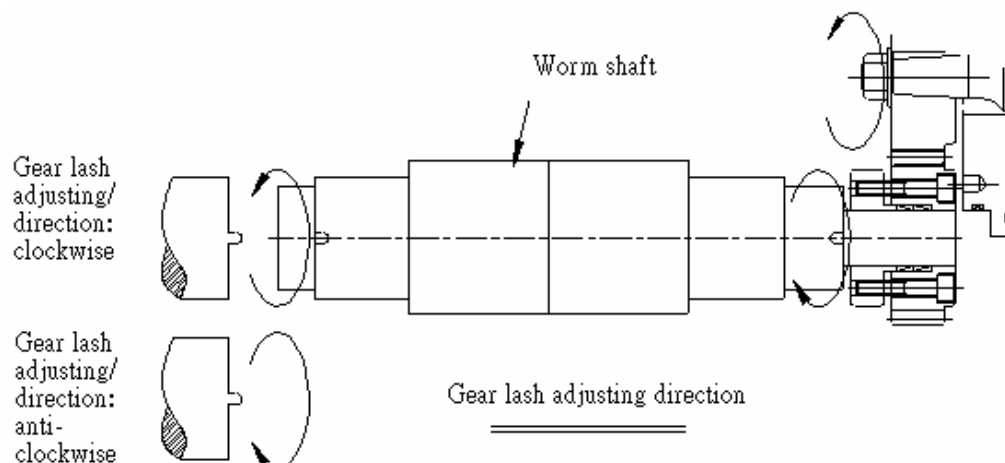
After adjusting the backlash, if the measured value is over 0.01mm, please re-adjust again.

2. The steps of adjusting the value of backlash:

(1) Drain the lubrication oil completely from the unit thru “ drain port”

(2) Dismantle all the screw from motor cover and switch covers, and adjust the worm shaft. Rotate the motor by regulating wheel in clockwise direction then stop and keep the holding situation. Then loosen the fixed screw of the shaft coupling. (Withdraw 2 pieces of screw bolts to loosen the shaft coupling.)

(3) The worm gear is composed by two sections and using the specialize

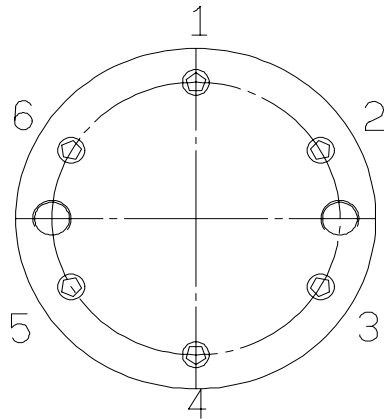


tool to adjust gradually, drawing showed below. Particularly, pay attention to the adjusting direction. Don't rotate the worm shaft before adjusting. It act would cause the serious damage if rotate the worm gear that isn't at right position or unclamping, moreover, damage the worm wheel.

After adjustment, screw the bolts of the washer, as drawing below, from no.1 to no.6, by clockwise direction. Please tighten slowly without contacting the bearing.

※ Notice: If you screwed too tight, the bolts would touch the bearing surface too much. The force would be 8.7ft/1bt.

(4)Resemble all parts conform to the adverse step. Wipe off the adhesive material and repaint new plaster.



(7) Constructions of Zero Set.

7-1 Zero set.

Slow down the speed of dog by reading the signal from approximating switch.

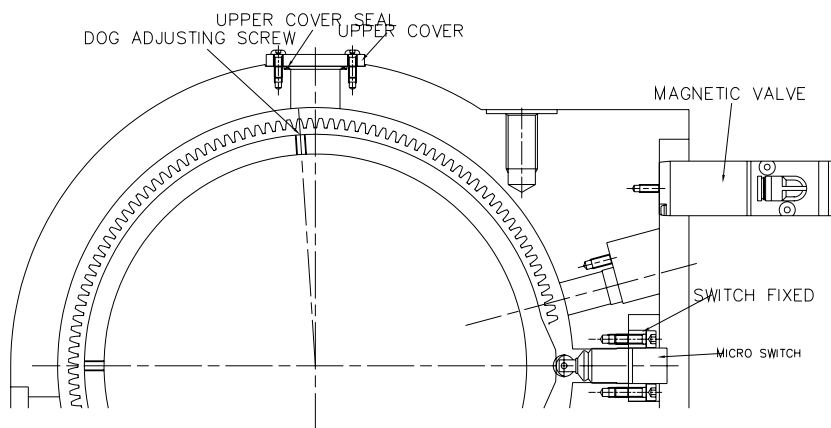
Adjust the height of proximating switch.

- (1) Standard path for rotating table back to initial position with clockwise direction.
- (2) Loosen the bolt and take out the mechanism.
- (3) Unclamp the bolt where near by proximating switch and adjust the position of proximating switch to near the dog around 1mm.
- (4) Re-screwed back the mechanism to machine.

※Notify : Generally, the proximating switch has already adjusted properly before exporting. Thus, the adjustment is no longer need, unless the switch needs to be replaced.

7-2. Adjusting the position of dog.

- (1) Loosen the screws of dogs and adjust the position by window system.
- (2) You can adjust the dog with entering into any point, i.e., adjusting easily.
- (3) Tight the fixed screw after adjusting.



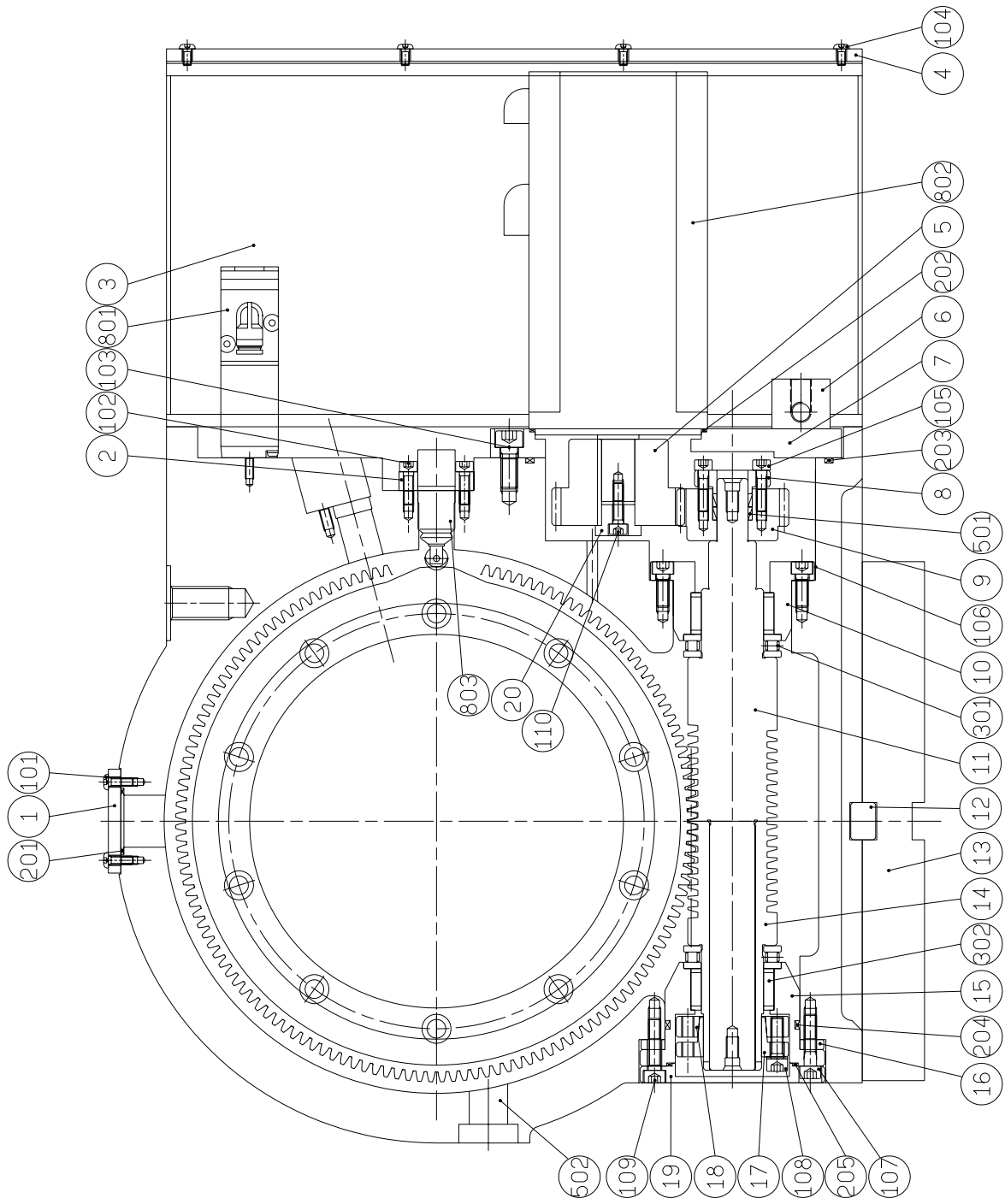
(8) Maintenance And Service

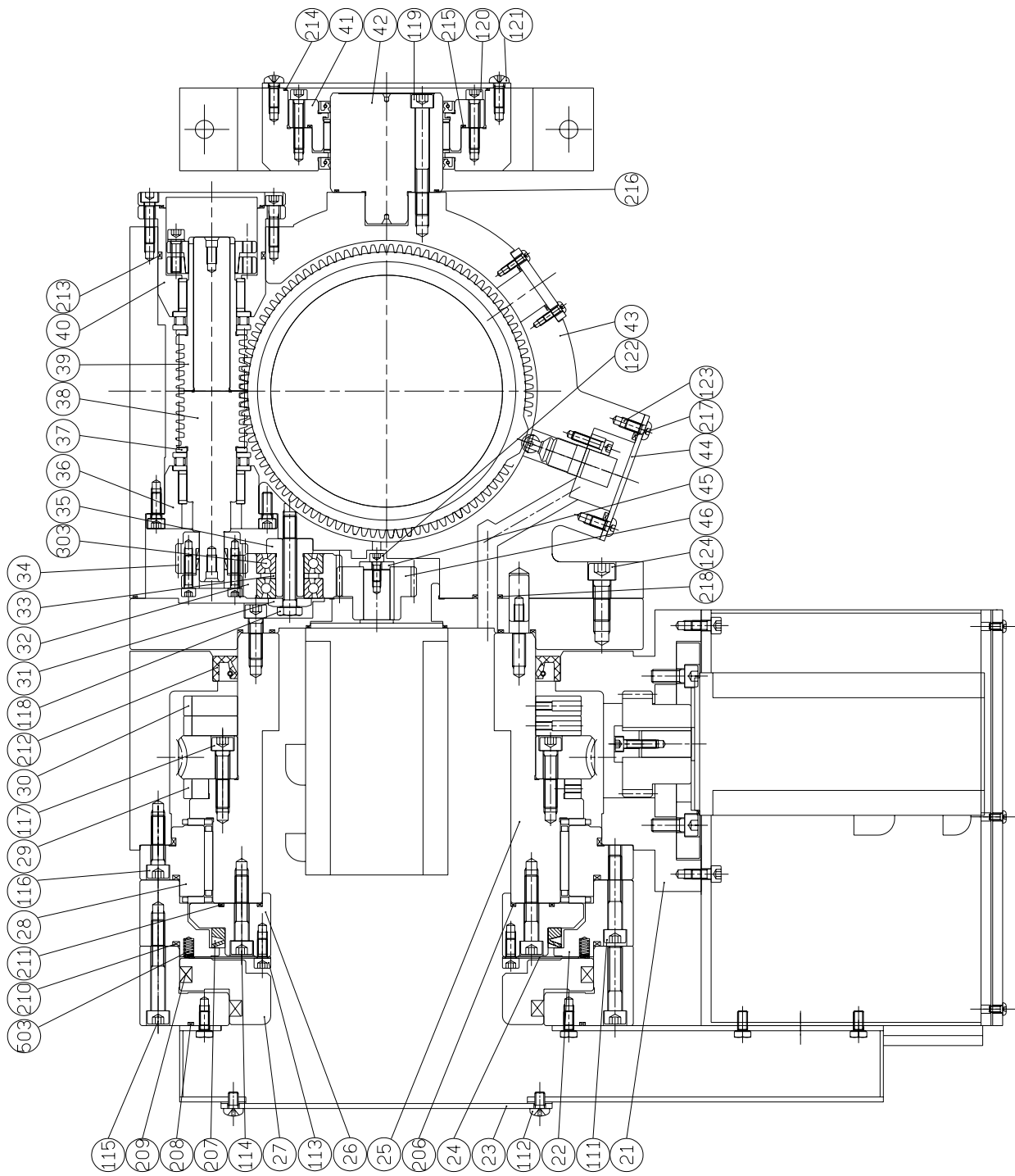
Check the following procedure daily before operating. :

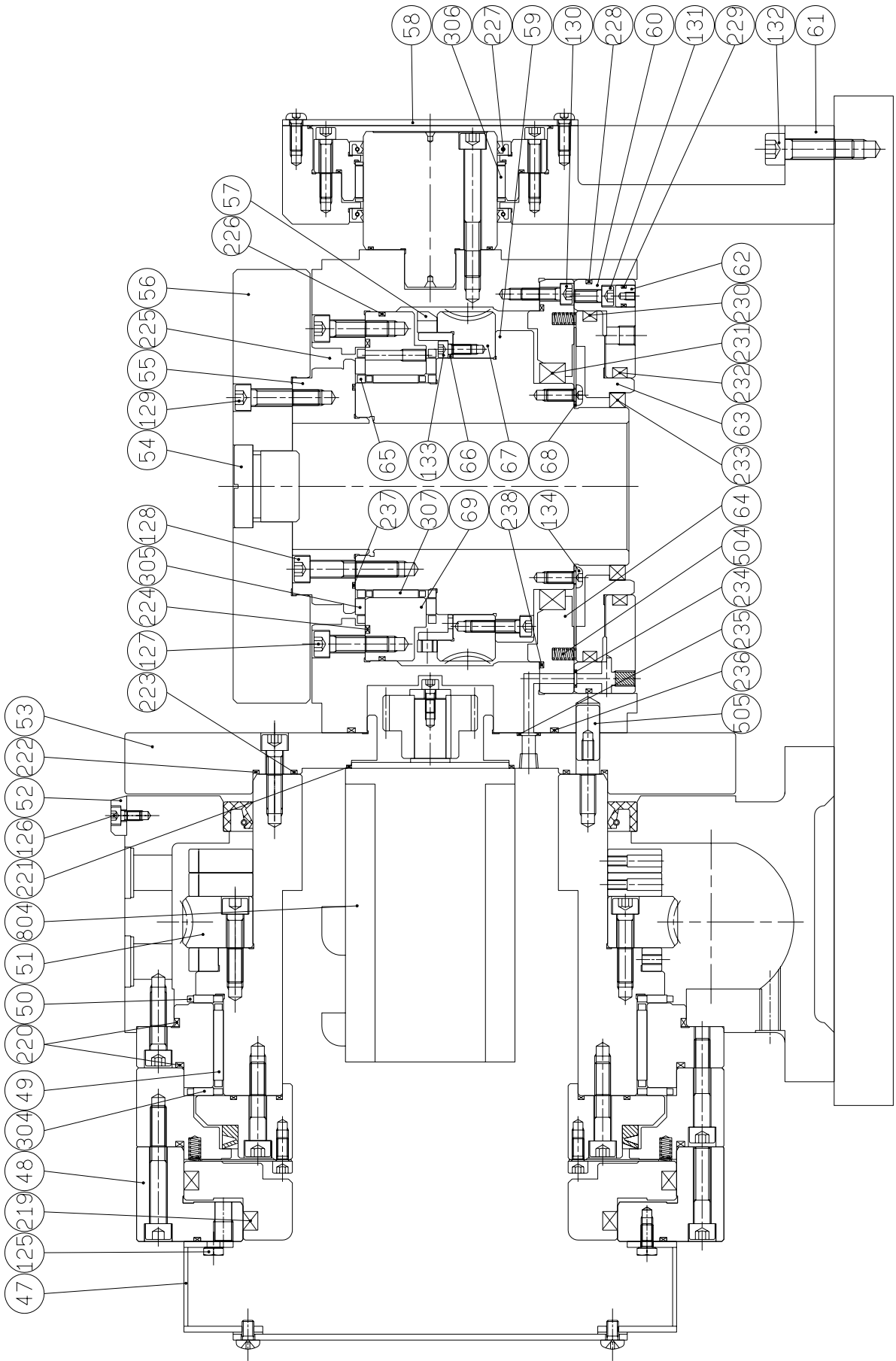
1. Checking the oil level if oil leakage.
2. Checking whether the rotary table is used within the capacities of load (work-pieces weight) and cutting force (drive torque) under standard circumstances.
3. Check the operation of clamping/unclamping.
4. Does the table function normally when rotating or tilting?
5. Listen and distinguish any strange noise from table rotation.

If you found the unusual situation that not easily to resolve, please contact with your distributor or our company. We will give you the optimal serving.

(9)Part List







No	Serial No.	Description	Specification	Q' ty	Remark
1.	160401010	UPPER COVER	t=6mm	3	
2.	170401061	MICRO SWITCH BASE	KEY9×9×45L	4	
3.	122405010	MOTOR FLANGE	t=3mm	1	
4.	122405020	MOTOR COVER	t=3mm	1	
5.	122403040 170308040	SUPR GEAR	Ø64×41.5L Ø64×28L	1	P5 α 4i
6.	122404010	PNEUMATIC PLATE	64×28×24L	1	
7.	122403050 122403080	MOTOR FLANGE	t=14mm	1	P5 α 2i
8.	170403050	PRESSURING RING	Ø36.5×11.5L	2	
9.	170303020	WORM SHAFT GEAR	Ø54×25L	1	
10.	170403020	RIGHT BEARING BASE	Ø79×38L	2	
11.	122403010	WORM SHAFT (1)	Ø43×285L	1	
12.	110301020	GUIDE KEY	20×18×12L	2	
13.	122401060	BOTTOM PLATE	t=30mm	1	
14.	122403020	WORM SHAFT (2)	Ø43×120L	1	
15.	110303041	LEFT BEARING BASE	Ø88×50L	1	
16.	110303070	SPACING RING	Ø89×4.8L	2	
17.	110303050	FIXED (1)	Ø54×19L	2	
18.	110303060	FIXED (2)	Ø54×10L	2	
19.	110303080	SIDE COVER	Ø89×9.4L	2	
20.	170403080	FIXED RING	Ø22×11L	1	
21.	122401010	TILTING AXIS BODY		1	
22.	122402091	FIXED	Ø298×46.4L	1	
23.	122405040	REAR COVER	t=3mm	1	
24.	122402100	BRAKING PAD	Ø232×0.8L	1	
25.	122402020	SPINDLE	Ø238×159L	1	

26.	122402080	SPINDLE CONNECT BASE	Ø238×44.5L	1	
27.	122402110	BRAKING PISTON	Ø250×40L	1	
28.	122402071	BEARING RING	Ø298×43L	1	
29.	122402040	SENSOR RING-2	Ø210×12L	1	
30.	122402030	SENSOR RING-1	Ø210×12L	2	
31.	430300240	THICK WASHER	Ø26×5L	1	M8

No	Serial No.	Description	Specification	Q' ty	Remark
32.	110403070	IDLE WHEEL	Ø63×27L	1	
33.	122403060	IDLE PAD	Ø23×3.1L	1	
34.	170403040	WORM SHAFT	Ø43.5×25L	1	
35.	122403030	IDLE WHEEL	Ø28×36L	1	
36.	170403020	RIGHT BEARING BASE	Ø79×38L	1	
37.	170403030	PAD	Ø43×3L	2	
38.	110303020	WORM SHAFT (2)	Ø43×93L	1	
39.	110303010	WORM SHAFT (1)	Ø43×208L	1	
40.	170403010	LEFT BEARING BASE	Ø89×67L	1	
41.	122402060	SUPPORT RING	Ø89×67L	1	
42.	122402130	SUPPRT	Ø689×79L	1	
43.	122401020	ROTARY AXIS BODY		1	
44.	122401040	COVER	80×80×3L	1	
45.	170403080	FIXED RING	Ø22×11L	2	
46.	170403070 122403090	SPUR GEAR	Ø48×32L Ø48×30L	1	P5 α 2i
47.	122405030	REAR MOTOR COVER	t=3mm	1	

48.	122402120	BRAKING CYLINDER	Ø298×48L	1	
49.	110802041	BEARING KEEPER	Ø219.5×41.5L	1	
50.	110802091	BEARING KEEPER	Ø246.5×3L	1	
51.	122402050	WORM WHEEL	Ø251×26L	1	
52.	160401020	INDICATED PLATE	Ø20×8L	2	
53.	122402010	TILTING AXIS TABLE		1	
54.	160401040	TABLE FRONT COVER	Ø42×33L	1	
55.	170402040	SPINDLE FRONT COVER	Ø129×39L	1	
56.	160402010	TABLE		1	
57.	170402080	SENSOR RING	Ø168×10L	1	
58.	122401050	TAILSTOCK COVER	Ø150×5L	1	
59.	170402050	SPINDLE	Ø129×39L	1	
60.	170402130	BRAKING CYLINDER	Ø210×31L	1	
61.	122401030	TAILSTOCK BODY		1	
62.	110402150	PLUGGED	Ø11×10L	8	M6
63.	170402120	BRAKING PISTON	Ø178×29.5L	1	

No.	Serial No.	Description	Specification	Q' ty	Remark
64.	170402110	BRAKING CYLINDER COVER	Ø210×23.5L	1	
65.	120402040	KEEPER	Ø139×4L	2	
66.	170402070	SERNSOR FIXED	Ø156×17.5L	1	
67.	170402090	WORM WHEEL	Ø177.2×29.5L	1	
68.	170402140	BRAKING PAD	Ø161×0.8L	1	
69.	170402060	FIXED	Ø177×31L	1	
101.	B301-B4*15	HALF-ROUND SCREW	M4×15L	6	

102.	B301-A5*16	INNER HEXAGON SCREW	M5×16L	8	
103.	B301-A8*20	INNER HEXAGON SCREW	M8×20L	4	
104.	B301-B6*8	HALF-ROUND SCREW	M6×8L	10	
105.	B301-A5*20	INNER HEXAGON SCREW	M5×20L	6	
106.	B301-A6*15	INNER HEXAGON SCREW	M6×15L	6	
107.	B301-A6*25	INNER HEXAGON SCREW	M6×25L	6	
108.	B301-A6*20	INNER HEXAGON SCREW	M6×20L	6	
109.	B301-A6*25	INNER HEXAGON SCREW	M6×25L	3	
110.	B301-A5*20	INNER HEXAGON SCREW	M5×20L	1	
111.	B301-A8*45	INNER HEXAGON SCREW	M8×45L	12	
112.	B301-B6*10	HALF-ROUND SCREW	M6×10L	8	
113.	B301-A6*15	INNER HEXAGON SCREW	M6×15L	12	
114.	B301-A8*45	INNER HEXAGON SCREW	M8×45L	12	
115.	B301-A8*60	INNER HEXAGON SCREW	M8×60L	12	
116.	B301-A8*30	INNER HEXAGON SCREW	M8×30L	12	
117.	B301-A8*35	INNER HEXAGON SCREW	M8×35L	12	

118.	B301-F8*50	OUTER HEXAGON SCREW	M8×50L	1	
119.	B301-A8*65	INNER HEXAGON SCREW	M8×65L	4	
120.	B301-A6*30	INNER HEXAGON SCREW	M6×30L	6	
121.	B301-B6*15	HALF-ROUND SCREW	M6×15L	4	
122.	B301-A5*12	INNER HEXAGON SCREW	M5×12L	1	
123.	B301-B6*15	HALF-ROUND SCREW	M6×15L	4	
124.	B301-A10*30	INNER HEXAGON SCREW	M10×30L	4	
125.	B301-F6*12	OUTER HEXAGON SCREW	M6×12L	6	
126.	B301-A5*10	INNER HEXAGON SCREW	M5×10L	2	
127.	B301-A8*30	INNER HEXAGON SCREW	M8×30L	12	
No.	Serial No.	Description	Specification	Q' ty	Remark
128.	B301-A8*45	INNER HEXAGON SCREW	M8×45L	6	
129.	B301-A8*35	INNER HEXAGON SCREW	M8×35L	6	
130.	B301-A6*20	INNER HEXAGON SCREW	M6×20L	8	
131.	B301-A6*15	INNER HEXAGON SCREW	M6×15L	8	
132.	B301-A10*35	INNER HEXAGON SCREW	M10×35L	10	
201.	B2S26	O-RING	S26	3	

202.	B2S80 B2S115	O-RING	S80 S115	1	P5 α 2i
203.	B2S120	O-RING	S120	1	
204.	B2G60	O-RING	G60	1	
205.	B2S60	O-RING	S60	2	
206.	B2AS163	O-RING	AS163	1	
207.	B2V190A	V TYPE OIL SEAL	V190A	1	
208.	B2AS176	O-RING	AS176	1	
209.	B2P235	O-RING	P235	1	
210.	B2AS273	O-RING	AS273	1	
211.	B2AS170	O-RING	AS170	1	
212.	B2TC18021015	TC OIL SEAL	TC18021015	1	
213.	B2G60	O-RING	G60	1	
214.	B2S120	O-RING	S120	1	
215.	B2S90	O-RING	S90	1	
216.	B2S60	O-RING	S60	1	
217.	B2AS265	O-RING	G60	1	
218.	B2P12	O-RING	P12	1	
219.	B2P175	O-RING	P175	1	
220.	B2AS273	O-RING	AS273	2	
221.	B2S80	O-RING	S80	1	
222.	B2AS166	O-RING	AS166	1	
223.	B2AS160	O-RING	AS160	1	
224.	B2G140	O-RING	G140	1	
225.	B2TC12014012	TC OIL SEAL	TC12014012	1	
226.	B2AS166	O-RING	AS166	1	
227.	B2TC68827	TC OIL SEAL	TC68827	2	

No.	Serial No.	Description	Specification	Q' ty	Remark
228.	B2AS171	O-RING	AS171	1	
229.	B2P8	O-RING	P8	8	
230.	B2G170	O-RING	G170	1	
231.	B2TC10512513	TC OIL SEAL	TC10512513	1	
232.	B2P110	O-RING	P110	1	
233.	B2TC80958	TC OIL SEAL	TC80958	1	
234.	B2P6	O-RING	P6	1	
235.	B2P9	O-RING	P9	1	
236.	B2G95	O-RING	G95	1	
237.	B2S100	O-RING	S100	1	
238.	B2AS166	O-RING	AS166	1	
301.	B1-AZK30476 B1-GS3047	BEARING PAD	AZK30476 GS3047	4 8	
302.	B1-TAF304020	BEARING	TAF304020	4	
303.	B1-7203B	BEARING	7203B	2	
304.	B1004*10	ROLLER NEEDLE	Ø4×10L	120	
305.	B1005*8	ROLLER NEEDLE	Ø5×8L	80	
306.	B1-K687420	BEARING	K687420	1	
307.	B1-K10511330	BEARING	K10511330	1	
501.	B304-15*19	AGAINST RING	Ø15×Ø19×6.3L	2	
502.	B316-PF1/2"	OIL MIRROR	PF-1/2"	2	
503.	B309-6*22	SPRING	Ø6×22L	12	
504.	B309-6*22	SPRING	Ø6×22L	12	
505.	B313-12*28#	Pin	Ø12×28L	2	

801.	E800-100E1*24V	MAGNETIC VALVE	100E1-DC24V	1	
802.	SERVO MOTOR (TILTING AXIS)	SANYO FANUC	P50B08010 α 4i	1	OPTIONAL
803.	E100-D4E1E20N	MICRO SWITCH	D4E-1E20N	4	
804.	SERVO MOTOR (ROTARY AXIS)	SANYO FANUC	P50B08075 α 2i	1	OPTIONAL