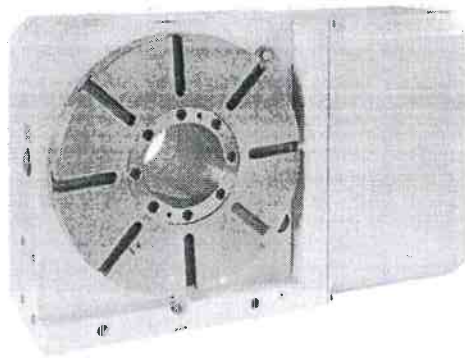


Goldensun Cosmos Machinery Pvt. Ltd.

Instruction Manual

CNC Rotary Table

Model: CNC-200R



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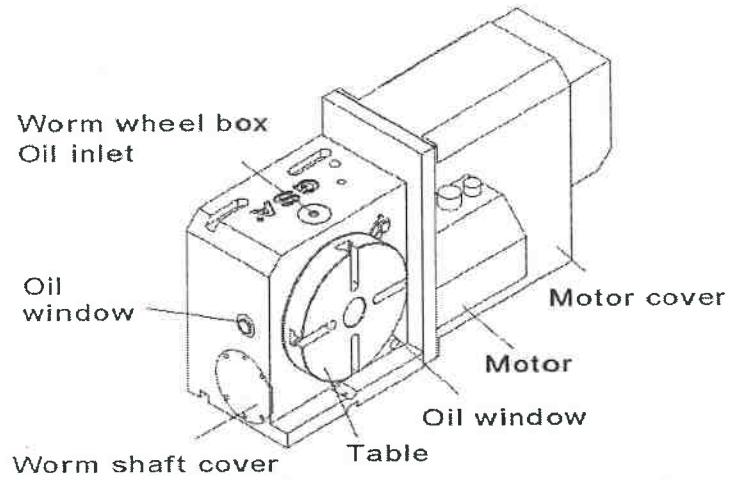
TECHNICAL DATA

Specification

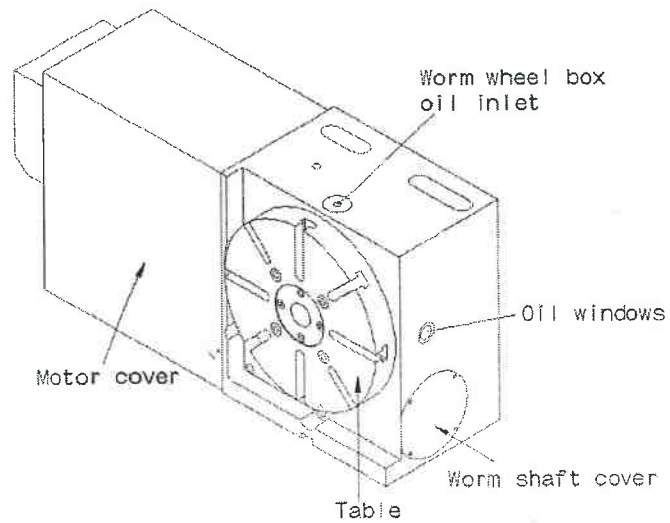
ITEM /MODEL		CNC-200R/CNC-200L	
Table dia.	(mm)	200	
Center height in vertical	(mm)	160	
Table height in horizontal	(mm)	165	
Over all height in vertical without motor cover	(mm)	265	
Thru-hole dia.	(mm)	35 ^{H7}	
Width of T-slot	(mm)	12 ^{H7}	
Width of guide block	(mm)	18 ^{h7}	
Servo motor type	FANUC	α 4i	
Gear ratio		1:90	
Max.R.P.M.	R.P.M	22.2(motor 2000 R.P.M)	
Min indexing unit degree	(degree)	0.001	
Indexing accuracy class	(Sec.)	20"	
Repeatability	(Sec.)	Unidirectional	4"
		Bidirectional	8"
Clamp force (pneumatic 5kg/cm ²)	(kg · m)	19	
Clamp force (hydraulic 20kg/cm ²)	(kg · m)	60	
Max. load (horizontal)	(kg)	250	
Max. load (vertical)	(kg)	125	

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2.1.1. Outside Feature of Rotary Table CNC-200R



CNC-200L



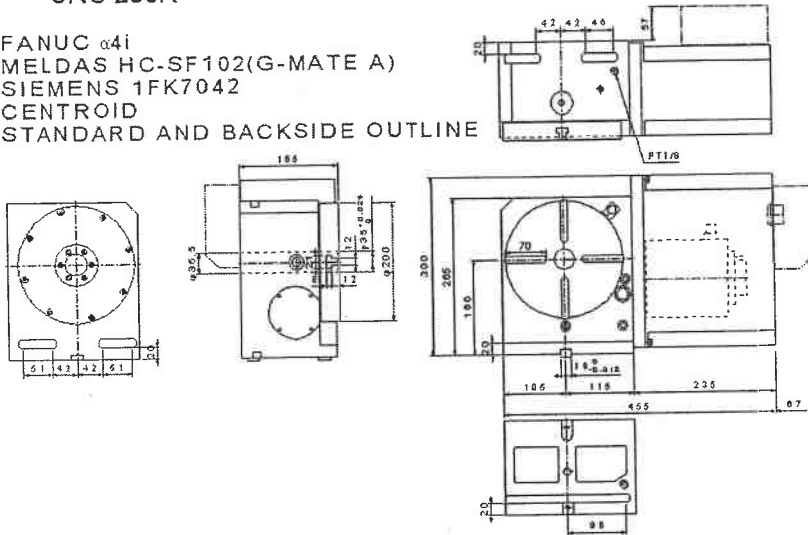
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2.2. Outside dimension

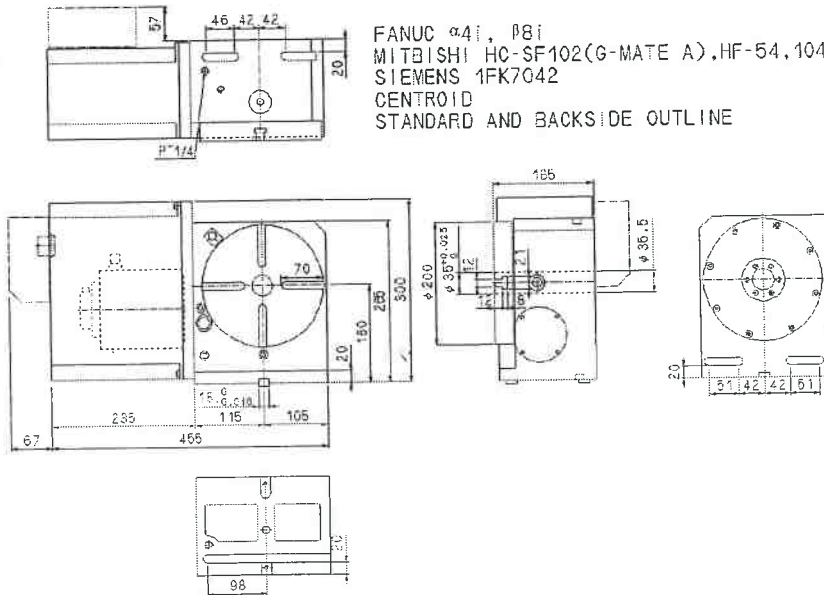
CNC-200R

FANUC α 4i
 MELDAS HC-SF102(G-MATE A)
 SIEMENS 1FK7042
 CENTROID
 STANDARD AND BACKSIDE OUTLINE



CNC-200L

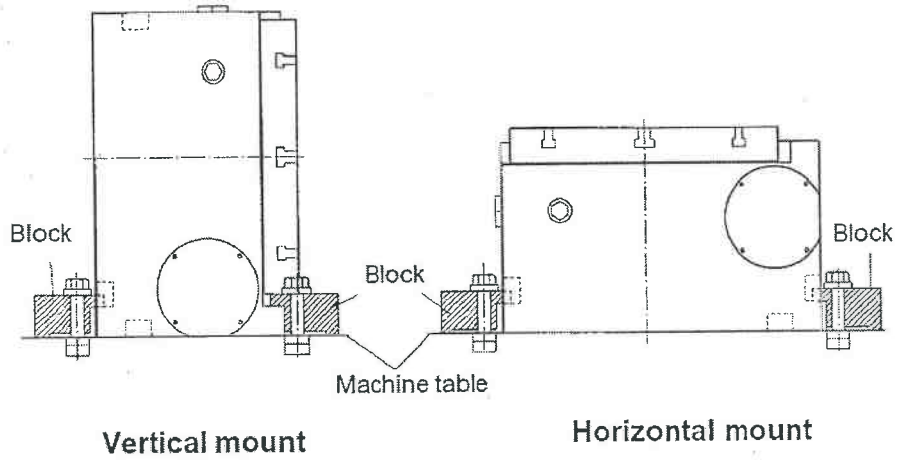
FANUC α 4i, β 8i
 MITSUBISHI HC-SF102(G-MATE A), HF-54, 104
 SIEMENS 1FK7042
 CENTROID
 STANDARD AND BACKSIDE OUTLINE



Note:: The above dimensions are indicative. The actual dimension may vary if the motor type is different

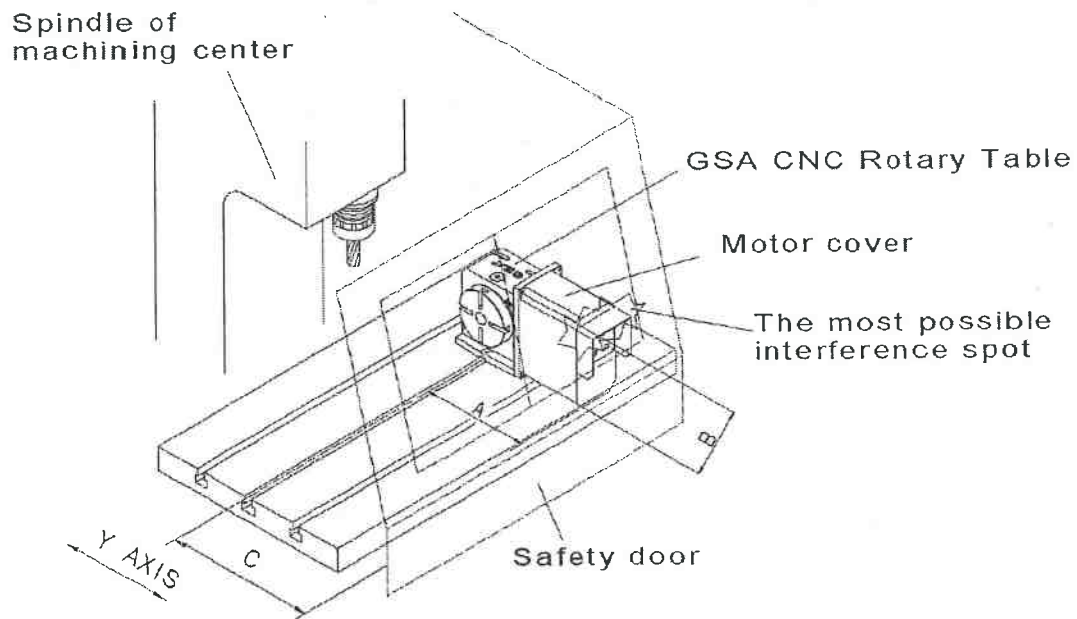
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3. INSTALLATION



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3.3. How to avoid the interference between Rotary table and M/C



- A → The width from center of guide-block CNC rotary table to the end of motor cover.
- B → Height of motor cover.
- C → M/C moving to end of the Y axis, the distance between locking center of CNC rotary table to the safety door.

[Attention]

Please check the width of 'A' should be small than distance of 'C', and prevent the height of 'B' hit the safety door as well, before purchasing and installation.

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5. MAINTENANCE

5.1. Trouble shooting

(1) Check following items when motor fail to turn. If the problem can not be solved, contact with your local dealer or GSA for further help.

	Phenomenon	Possible reason	Checking	Solution	Reference
1	Table no rotating				
	<ul style="list-style-type: none"> ♦ Motor no rotation ♦ Motor rotate 	<ul style="list-style-type: none"> ♦ Motor fail, coolant soak cable or electrical short ♦ Gear loosen 	<ul style="list-style-type: none"> ♦ Cable connection ♦ Gear box 	<ul style="list-style-type: none"> ♦ Reassembling 	<ul style="list-style-type: none"> ♦ Electrical drawing ♦ Gear backlash adjustment
2	Rotation is not smooth or noise				
		<ul style="list-style-type: none"> ♦ Overload ♦ Fixture position incorrect ♦ Gear fail ♦ Motor parameter set ♦ Lubrication ♦ Worm shaft or driving gear ♦ Incorrect parameter 	<ul style="list-style-type: none"> ♦ Weight of fixture and work piece ♦ Motor loading ♦ Motor low speed ♦ Gear assembling ♦ Gear backlash ♦ Motor rotating conduction ♦ Lubricant level ♦ Pipe and brake switch 	<ul style="list-style-type: none"> ♦ Reduce loading ♦ Remount fixture ♦ Reassembling ♦ Replace oil ♦ Replace gear 	<ul style="list-style-type: none"> ♦ Load capacity and torque data ♦ Gear backlash adjustment ♦ Gear backlash adjustment ♦ Control system manual ♦ Maintenance & Lubrication
3	High current				
		<ul style="list-style-type: none"> ♦ Brake or release ♦ Overload ♦ Incorrect parameter ♦ Over filed oil 	<ul style="list-style-type: none"> ♦ Air pipe ♦ Solenoid fail ♦ Check solenoid function ♦ Weight of fixture and work piece ♦ Parameter setting 	<ul style="list-style-type: none"> ♦ Reduce loading ♦ Modify parameter ♦ Reduce oil 	<ul style="list-style-type: none"> ♦ Load capacity and torque data ♦ Parameter list ♦ Maintenance & Lubrication
4	Incorrect index position				
	<ul style="list-style-type: none"> ♦ Position inaccurate ♦ Min or damage of body 	<ul style="list-style-type: none"> ♦ Wore worm wheel ♦ Surface damaged by crash 	<ul style="list-style-type: none"> ♦ Worm gear backlash 	<ul style="list-style-type: none"> ♦ Adjust backlash ♦ Remove edge 	<ul style="list-style-type: none"> ♦ Worm gear backlash adjustment
5	Table shake				
	<ul style="list-style-type: none"> ♦ When clamp on cutting ♦ When helix cutting 	<ul style="list-style-type: none"> ♦ Out side force ♦ Brake loosen ♦ Low pressure ♦ Loosen worm gear backlash ♦ Loosen gear backlash ♦ Loosen worm gear bearing 	<ul style="list-style-type: none"> ♦ Cutting condition ♦ Clamp device & clamp sensor ♦ Backlash of worm gear ♦ Backlash of motor gear ♦ Worm gear nut 	<ul style="list-style-type: none"> ♦ Correct cutting condition ♦ Reduce cutting load ♦ Adjust pressure ♦ Adjust backlash ♦ Adjust backlash ♦ Tight worm gear nut 	<ul style="list-style-type: none"> ♦ CNC Rotary Table cutting speed chart ♦ Specification ♦ Worm gear backlash adjustment ♦ Gear backlash adjustment ♦ Worm gear backlash adjustment

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	Phenomenon	Possible reason	Checking	Solution	Reference
6	Brake function fail				
	<ul style="list-style-type: none"> ◆ Clamp fail ◆ No brake signal ◆ Signal delay 	<ul style="list-style-type: none"> ◆ Low pressure ◆ O-ring worn out ◆ Seal worn out ◆ Pressure switch ◆ Piston jammed ◆ Brake cable ◆ Delay time too long ◆ Pipe jammed ◆ Piston jammed ◆ Rust cylinder ◆ Air leak 	<ul style="list-style-type: none"> ◆ Air pressure regulator ◆ O-ring ◆ Piston seal ◆ Pressure function ◆ Pressure at 5 kg/cm² ◆ O-ring and seal ◆ Signal cable ◆ Parameter ◆ Pipe line ◆ Piston and cylinder ◆ Air filter and regulator ◆ Check pipe 	<ul style="list-style-type: none"> ◆ Replace O-ring ◆ Replace seal ◆ Replace pressure switch ◆ Adjust pressure ◆ Replace O-ring or seal ◆ Reconnection ◆ Reset parameter ◆ Clean pipe ◆ Clean piston and cylinder ◆ Refill oil ◆ Replace pipe or joint 	
7	Zero return				
	<ul style="list-style-type: none"> ◆ Table no rotation ◆ Non stop rotation ◆ Position error 	<ul style="list-style-type: none"> ◆ Signal fail ◆ Signal fail ◆ Limit switch fail ◆ Dog fail ◆ Signal fail ◆ Dog fail 	<ul style="list-style-type: none"> ◆ Signal cable ◆ Signal cable ◆ Limit switch ◆ Zero return dog ◆ Signal cable ◆ Zero return dog 	<ul style="list-style-type: none"> ◆ Reconnection ◆ Reconnection ◆ Replace limit switch ◆ Adjusting zero return dog ◆ Reconnection ◆ Adjusting zero return dog 	

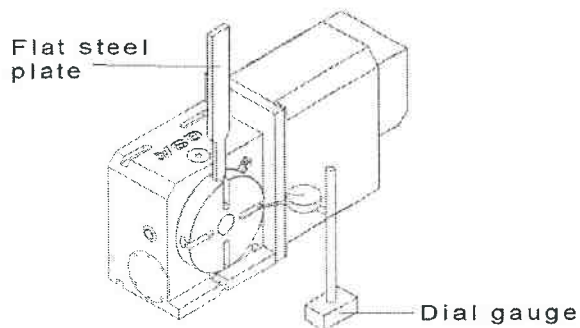
(2) There are some reasons that could hamper the machining. Please take percussion for following possible reasons to protect your machine and table.

Wrong method	Precaution
Rotary no firm fixed	Please, refer to installation chapter for fixing table on machine.
Cutting method	<ol style="list-style-type: none"> 1. Check and sharp cutting tools before use. 2. Avoid interference of tools and work piece. 3. Firm fix the work piece on table. 4. The tolerance between table and tailstock is less than 0.01 mm 5. Avoid cutting force greater than suggested value. 6. Return zero point before working. 7. Backlash parameter should be set at proper value.
Crashed	Crashed machine may cause parts damage, inaccurate index or noise curing index. We recommend you to send the table back to manufacturer for repairing if crashed

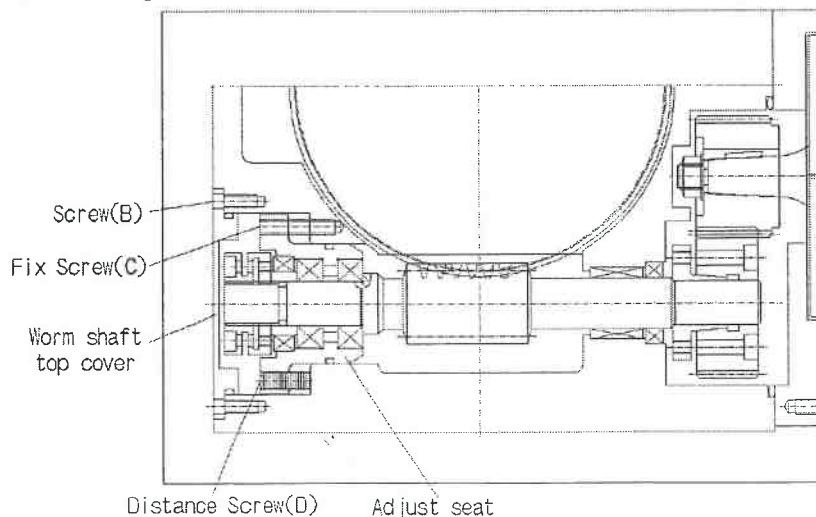
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5.2.Ensuring the backlash

1. Turn off power and cut of pneumatic supply.
2. The backlash can be measured with a deflection dial gauge by inserting a flat steel plate into a T-slot of the rotary table and shaking the periphery there of left and right through the plate with hand.
3. Measure the backlash again and make sure that it is between 0.01mm~0.02mm, the adjustment is required when a backlash of above 0.05mm is observed.
4. The measurement is to be done on eight spots of the table by rotating is every 45°.



5.2.1.Worm gear and worm wheel backlash adjustment

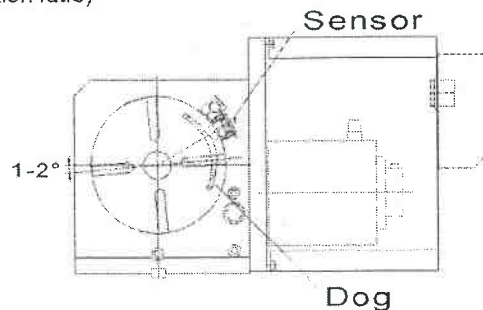


- A. Loosen the screws (B) then take out the worm shaft top cover.
- B. Loosen those four screws (D) evenly, adjust four fixed screws(C). Make worm shaft adjust seat lessens with tooth clearance.
- C. Execute 5.2Worm gear and worm wheel backlash adjustment, if tooth clearance not in 0.01mm~0.02mm, Try again step B.

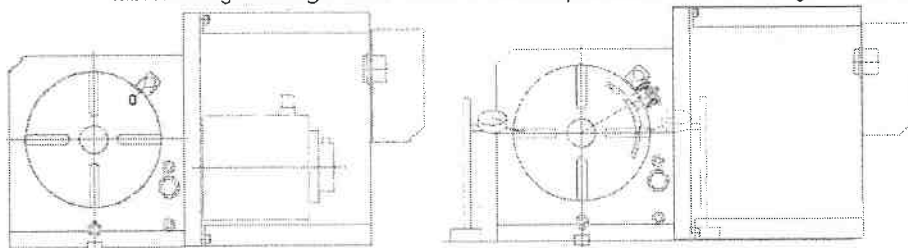
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5.3. Origin mechanism

- A. The sensor used for origin mechanism is disposed in Fig.
- B. Origin dog attached to the periphery of rotary table actuates this sensor to have it output the signs of retardation $1^{\circ} \sim 2^{\circ}$ before stop. (According to the difference in total retardation ratio)



- C. Measuring the difference in origin between dog position and absolute origin of rotary table. Using this angle error value to be compensation and resetting NC data.



1. Setting origin adjustment several times in slow clockwise rotation to match scale 0 of rotary table with datum scale.
2. Find out the angle error value in order to change compensation value.

Angle error value = $(360^{\circ} - \text{from work origin to moving angle})$

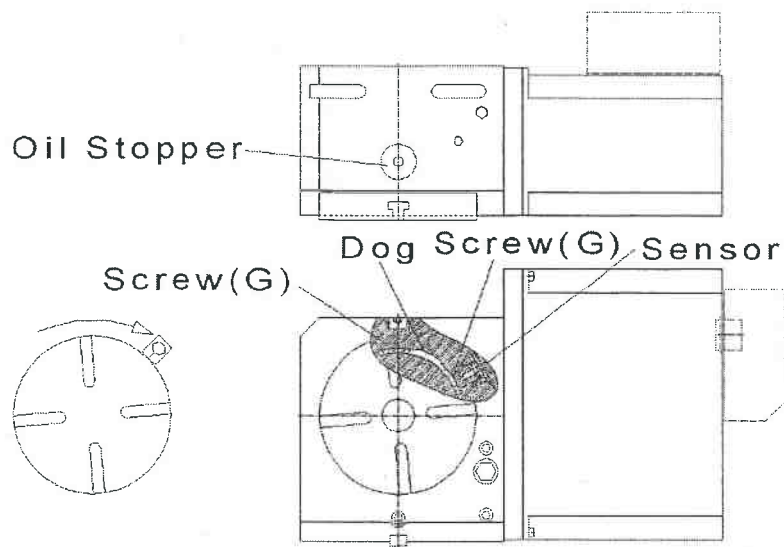
Compensation value (Unit: PULSE) =

$$\frac{\text{Angle error value}}{360 \times \text{total retardation ratio}} \times \text{PULSE value (one rotation of Motor)}$$

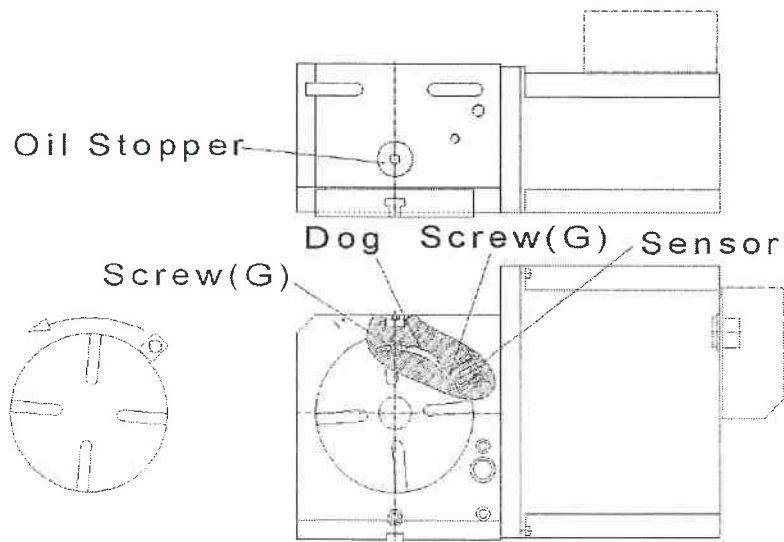
3. Input the compensation value to be origin mechanism.
4. Process step 1 again and set origin adjustment in slow clockwise rotation.
5. Check the horizontal in T-slot of the rotary table by dial gauge and then modify compensation value again.
- 6 Please operate step 3~ step 5 again and make sure the compensation value in the horizontal T-slot of the rotary table which is moving angle of origin dog until it can be measured origin by dial gauge.

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- D. The adjustment of dog position is to bring the dog under jog mode to the position of oil inlet, where the adjustment can be done easily.



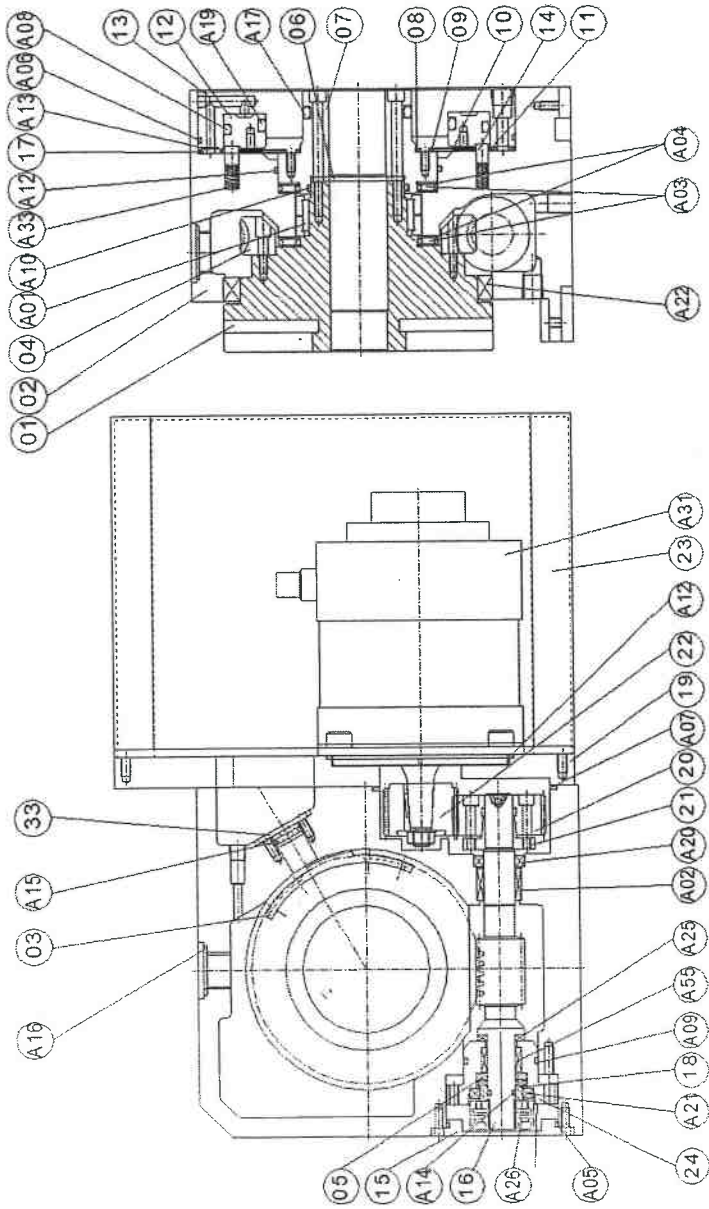
- E. Loosen the G-screw of dog. Move the dog to a proper position. The dog has circumferential slots for about ± 7.5 mm shifting.



- F. Note: Don't loosen the G-screw completely in order to prevent dropping into the interior of machine, when you loosen.

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5.4. System drawing
CNC-200R



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5.5.Part list

No.	Description	Q	Material	Drawing No.	Drawing No.	Remark
01	Spindle	1	SCM4	2100300030004	CNC200R-003-0-4	
02	Base	1	FC30	2100300020010	CNC200R-002-0-10	CNC-200R
02	Base	1	FC30	2104290010001	CNC200L-001-0-1	CNC-200L
03	Zero position block	1	S45C	2103440100000	CNC170R-010-0-0	
04	Worm wheel	1	ALBC3	2103440160000	CNC170R-016-0-0	CNC-200R
04	Worm wheel	1	ALBC3	2134190020000	CNCMT200RR-002-0-0	CNC-200L
05	Interval ring	1	S45C	2103440220001	CNC170R-022-0-1	
06	Compression ring Washer	1	SS41	2103440110001	CNC170R-011-0-1	
07	Compression ring	1	S45C	2103440030001	CNC170R-003-0-1	
08	Brake disk	2	SK7-M	2103440070000	CNC170R-007-0-0	
09	Interval washer	1	SS41	2103440060000	CNC170R-006-0-0	
10	Brake disk	2	SK7-M	2103440090000	CNC170R-009-0-0	
11	Interval washer	2	SS41	2103440080000	CNC170R-008-0-0	
12	Piston	1	FC30	2103440040000	CNC170R-004-0-0	Pneumatic
12	Piston	1	FC30	2103440040100	CNC170R-004-1-0	Hydraulic
13	Bottom cover	1	FC30	2103440200001	CNC170R-020-0-1	Pneumatic
13	Bottom cover	1	FC30	2103440200101	CNC170R-020-1-1	Hydraulic
14	Top pin	6	S45C	2103440140001	CNC170R-014-0-1	
15	Worm gear cover	1	SS41	2103440050000	CNC170R-005-0-0	
16	Worm shaft	1	SNM21	2103440150008	CNC170R-015-0-8	
17	washer	1	S45C	2103430180000	CNC250R-018-0-0	
18	Interval ring	1	S45C	2103440130001	CNC170R-013-0-1	
19	Motor fixed plate	1	FC30	2100300040006	CNC200R-004-0-6	α4i
19	Motor fixed plate	1	FC30	2104290020000	CNC200L-002-0-0	CNC-200L
20	Gear	1	SCM21	2103440180001	CNC170R-018-0-1	
21	Topper sleeve	1	S45C	2103440170001	CNC170R-017-0-1	
22	Gear	1	SCM21	2103430230000	CNC250R-023-0-0	
23	Motor cover	1	SS41	2103440210003	CNC170R-021-0-3	α4i
24	Adjust seat	1	S45C	2103440120001	CNC170R-012-0-1	
25	Connector plate	1	SS41	2100170382800	CNC150-038-28-0	17PIN

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No.	Description	Q	Material	Drawing No.	Drawing No.	Remark
26	Connector plate	1	SS41	2100170382900	CNC150-038-29-0	19PIN
27	Indicator	1	SS41	2100170290100	CNC150-029-1-0	
28	Screw	1	S45C	2100170300000	CNC150-030-0-0	
29	Block	2	S45C	2100170410102	CNC150-041-1-2	
30	Key	2	S45C	2100400480001	CNC251-048-0-1	
31	Cover	1	SS41	2100170360101	CNC150-036-1-1	
32	Oil stopper	1	S45C	2103340320001	CNC320R-032-0-1	
33	Plug	1	S45C	2103440230001	CNC170R-023-0-1	

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CNC-200R/CNC-200L

NO.	Description	Specification	Q	Use	Remark
A01	Needle bearing	RNA4911	1	01+02	
A02	Needle bearing	TAF202820	1	01+16	
A03	Thrust bearing	NTB75100	2	01+02,01+07	
A04	Thrust bearing washer	AS75100	4	01+02,01+07	
A05	O-ring	AS568-146	1	15	
A06	O-ring	AS568-169	1	13	
A07	O-ring	AS568-240	1	01	
A08	O-ring	AS568-362	1	12	
A09	O-ring	G40	1	24	
A10	O-ring	G60	1	07	
A11	O-ring	G65	1	07	
A12	O-ring	G100	1	01	
A13	O-ring	G110	1	19	
A14	O-ring	P12	1	16	
A15	O-ring	P7	2	01+13+17	
A16	O-ring	P14	1	01+33	
A17	O-ring	P28	1	01+32	
A18	O-ring	P80	1	12	Pneumatic
A19	O-ring	P115	1	12	Hydraulic
A20	Oil seal	TC20x32x7	1	01+16	
A21	Oil seal	TC27x40x6	1	18+24	
A22	Oil seal	TC150x170x15	1	01+02	
A23	Pin	φ6x25L	2	01+19	
A24	Topper pin	φ6x32L	4	02+04	
A25	Needle bearing	AZK17303.5	2	16+24	
A26	Bearing nut	YSK-M17xP1	1	16	
A27	Sensor	BES M08MG-UOC20B-BV03	1	33	
A28	Oil window	1/2	2	01	
A29	Solenoid	AC110V 4V110-06 1/8"	1	23	
A29	Solenoid	DC24V 4V110-06 1/8"	1	23	


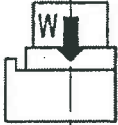
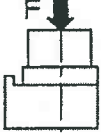
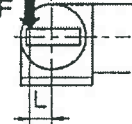
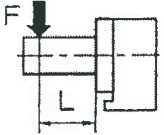
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NO.	Description	Specification	Q	Use	Remark
A30	Pressure switch	PSA-SD	1	23	Pneumatic
A30	Pressure switch	APSD-40-1	1	23	Hydraulic
A31	Motor	FANUC α4i	1	19	
A32	Hanger	M10	1	01	
A33	Compress spring	TB08-015	6	01+14	
A34	Stopper	PT1/4	16	01,13	
A35	Stopper	PT1/8	1	13	Hydraulic
A36	Stopper	PT1/16	1	13	
A37	Nut	M16	2	29	
A38	T-key	M16	2	29	
A39	T-key	M10	4	02	
A40	Screw	M16x45L	2	29	
A41	Screw	M5×12L (CAP)	8	07+08+09	
A42	Screw	M5x15L (CAP)	2	01+33	
A43	Screw	M5×25L (CAP)	12	02+04	
A44	Screw	M5×30L (CAP)	4	20+21	
A45	Screw	M6×16L (CAP)	4	19+23	
A46	Screw	M6×18L (CAP)	2	01+30	
A47	Screw	M6×30L (CAP)	12	01+13,01+24	
A48	Screw	M6×65L (CAP)	6	02+07	
A49	Screw	M8×30L (CAP)	6	01+19	
A50	Screw	M6×25L (SET)	4	01+24	
A51	Screw	M8×10L (SET)	1	16	
A52	Screw	M4×10L (BH)	2	02+03	
A53	Screw	M5×8L (BH)	8	23+31,23+26	
A54	Screw	M5×15L (BH)	4	01+15	
A55	Needle bearing	TAF172516	1	16+24	

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7.APPENDIX

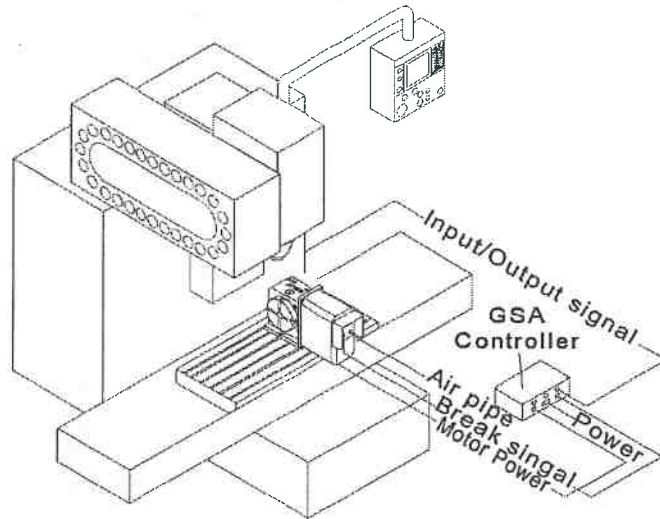
7.1. Load capacity and torque data

Item	Example	Allowable value
Max. Load	 <p>Vertical W</p>	$W = 125 \text{ kg}$
	 <p>Horizontal W</p>	$W = 250 \text{ kg}$
Max. Radial Load	 <p>F</p>	$F = 1100 \text{ kg}$
	 <p>F L</p>	$F \times L = 50 \text{ kg}\cdot\text{m}$
	 <p>F L</p>	$F \times L = 100 \text{ kg}\cdot\text{m}$

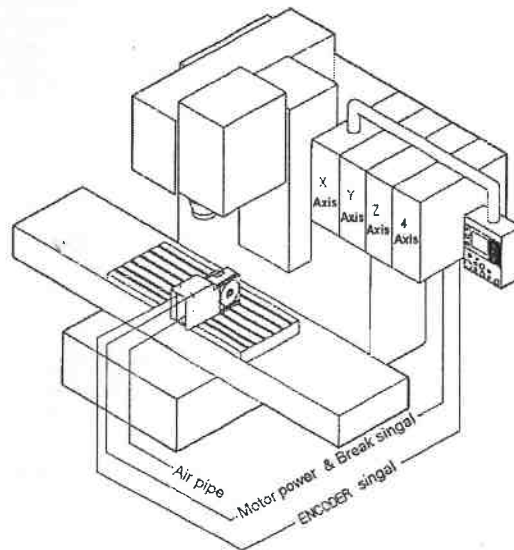
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7.4. Machine computer and rotary table control connection

7.4.1. Machine with 3 axes



7.4.2. Machine with 4 axes

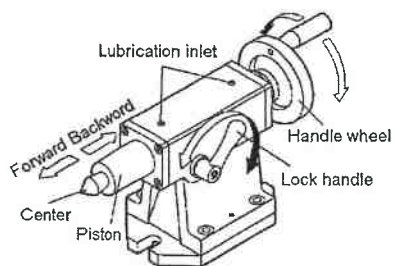


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7.5. How to use tailstock

7.5.1. Manual tailstock

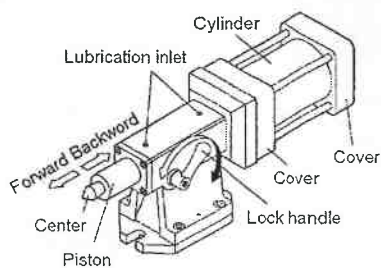
1. To lock piston : By turning locker handle CCW and release piston or CW to lock the piston.(7-1)
2. To move forward and backward : By turn handwheel CW to move piston forward and CCW for backward.
3. To remove the center : Move the piston backward to the end will release the center.



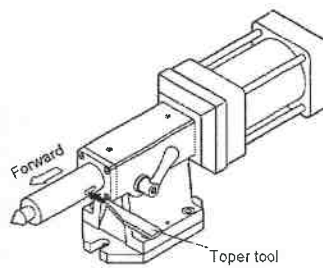
(7 - 1)

7.5.2. Power tailstock (pneumatic or hydraulic)

1. To lock piston : By turning locker handle CCW and release piston or CW to lock the piston.(7-2)
2. To move forward and backward : By acting the pneumatic (hydraulic) solenoid to move the piston forward or backward.(7-3)
3. To replace the center : Move the piston forward until the oval hole is complete out of body than stick in the taper tool to remove the center.



(7-2)



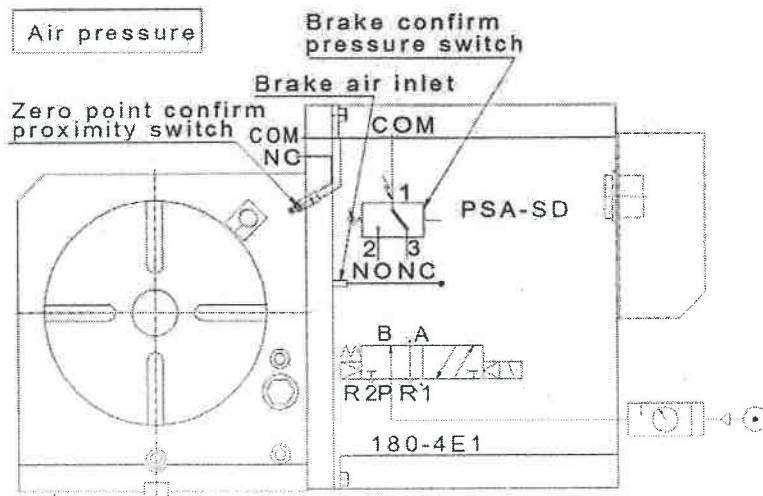
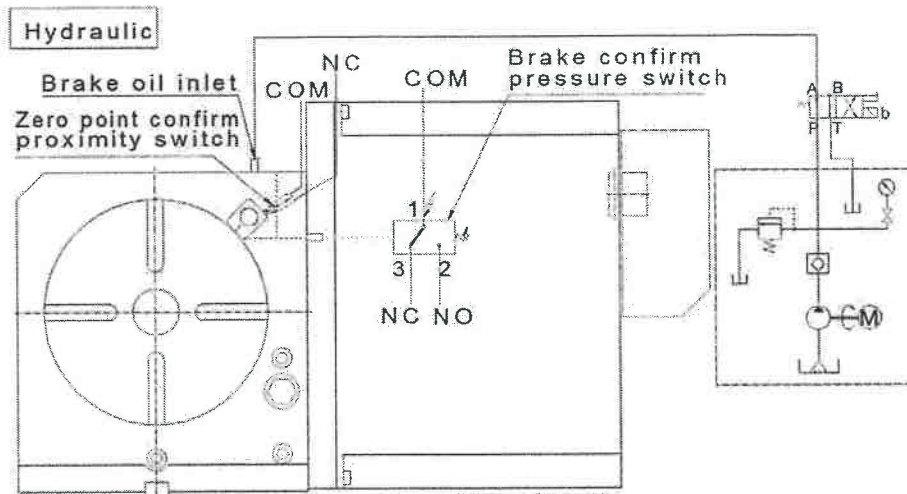
(7-3)

7.5.3. Maintenance:

It is recommended to grease from lubricant hole every six month for maintenance.

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7.6. Drawing of Oil pressure circuit



Attention item for install:

1. Confirm hydraulic solenoid circuit & voltage.
 2. Confirm unclamp & clamp signal.
 3. Solenoid link b point.
- (When switch on the magnet is unclamp item)

Movement order:

1. Unclamp signal(delay1~2 second).
2. Rotate angle.
3. Clamp signal(delay1~2 second).
4. Workpiece