

TJR®
Rotary Table

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2023-09 The 12th version TJR Precision Technology Co., Ltd.
owns the related right of modification.



TJR APP



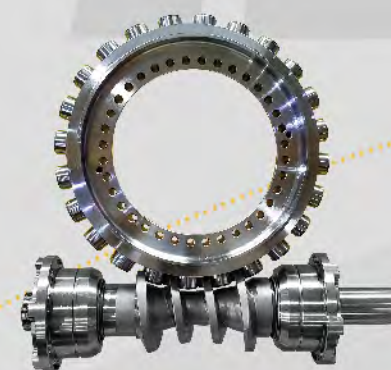
We Chat



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TJR®
Rotary Table

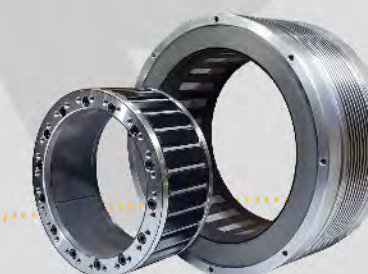
Exquisite Products of Taiwan,
Extreme Ingenuity



Driven by
Roller Gear Cam



Driven by
Alloy Steel Worm Gear

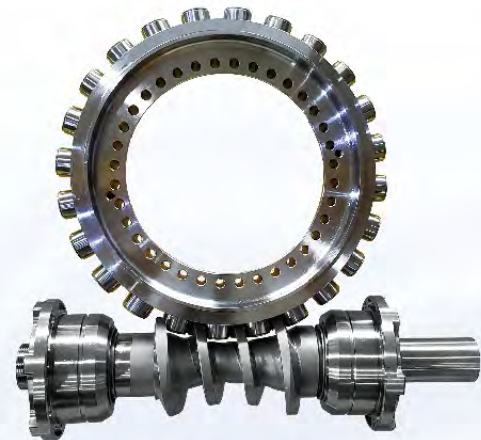


Driven by
D.D. Motor



TJR Precision Technology
www.tjr.com.tw The 12th Edition

No More wear and tear



Driven by
Roller Gear Cam

**Alloy steel
ion nitrided worm gear**
(1) Anti-wearing
(2) High torque
(3) Auto self-locking



Dual lead
Alloy steel worm shaft

Driven by
Alloy Steel Worm Gear

Bearing determines rigidity

Radial & Axial bearing



Driven by
Direct Drive Motor



FANUC-made Torque Motor
Perfect Match with Fanuc Control

There are **four common transmission mechanisms** of rotary table as bellow:
You can find **all types** of mechanism in **TJR**.

4 Transmission Mechanisms

A



Driven by **alloy steel** worm gear



Strength:

- ① Much more **anti-wear** than **bronze** worm gear
- ② **High torque**
- ③ Because the tilting axis needs to bear heavy load, alloy steel worm gear can significantly enhance wear resistance.

B



Driven by **roller gear cam**
(speed: 80 rpm)



Strength:

- ① Almost no backlash during the clockwise / anti-clockwise rotation
- ② **Almost no abrasion** for the transmission mechanism
- ③ High speed

C-1

Driven by **super high speed**
direct drive motor
(super high speed: 2000 rpm)

C-2

Driven by direct drive motor
(speed: 200 rpm)



Strength: **a mill / turn component**

- ① If the moving column vertical machining center or drilling & tapping center is equipped with our table, it can make the machine work as a **horizontal** or **vertical lathe** concurrently.
- ② The super high speed of rotary axis: 2000 rpm.
- ③ Truly **zero backlash** during the clockwise / anti-clockwise rotation.
- ④ Truly **zero wear** for the transmission mechanism.
- ⑤ Long-lasting high precision
(The actual precision depends on the selected angle encoder)



Strength:

- ① Truly **zero backlash** during the clockwise / anti-clockwise rotation.
- ② Truly **zero wear** for the transmission mechanism. (**No abrasion at all**)
- ③ High speed: 200 rpm
- ④ Long-lasting high precision
(The actual precision depends on the selected angle encoder)

D



Driven by **Japan-made**
worm & worm gear

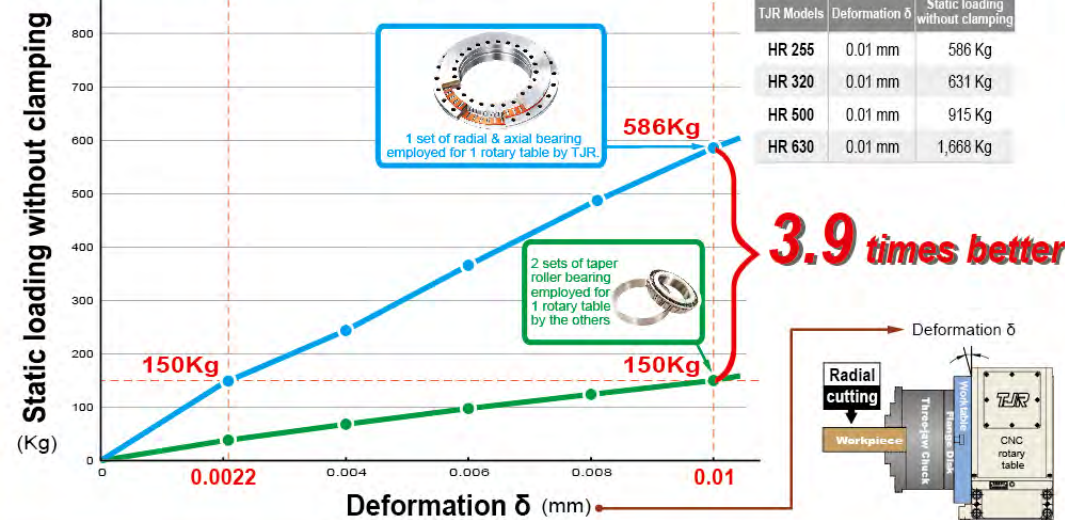


Strength:

- ① The major and cost-effective solution
- ② Easy to adjust backlash after some abrasions

Rigidity comparison between radial & axial bearing and taper roller bearing

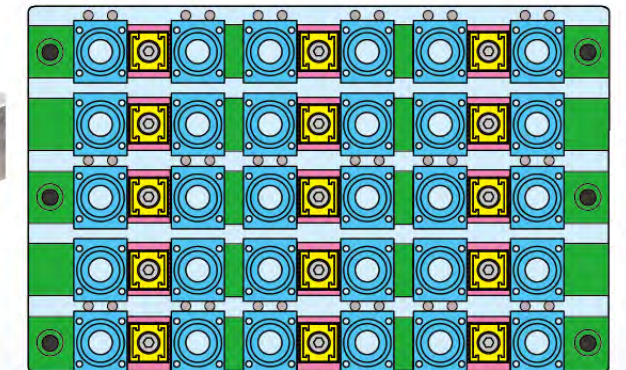
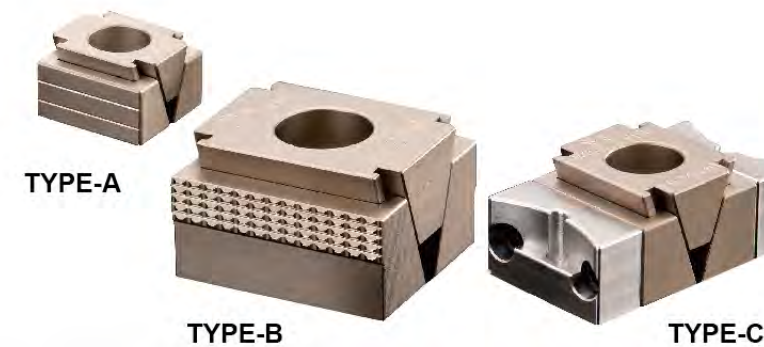
Take Ø255mm Rotary Table as an example



Large diameter

Devised by German

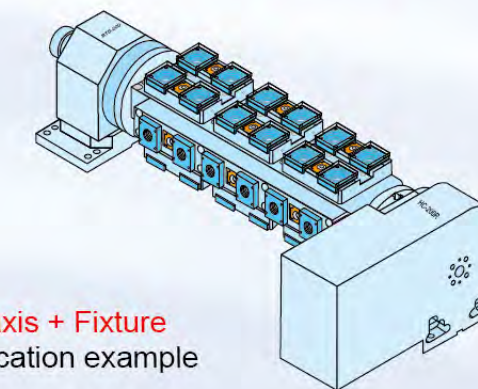
Specialized for Rotary Table, the Radial & Axial bearing can fully support heavy-duty cutting in both radial and axial directions.



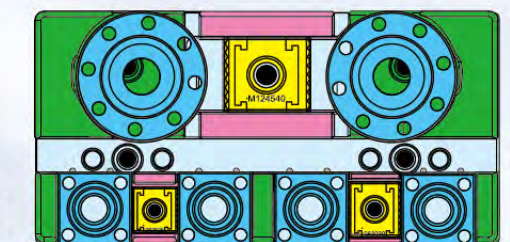
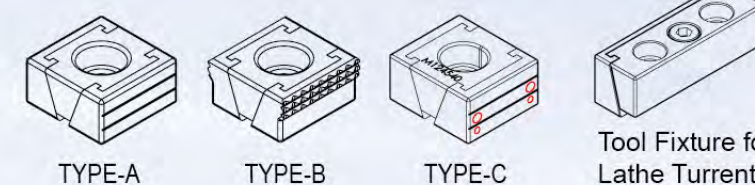
Little King Kong Vise

► Little King Kong Vise
An example of fixing round work-piece.

- Blue: Work-piece
- Yellow: Little King Kong Vise
- Green: Work-holding fixture
- Pink: Vise directional fixture



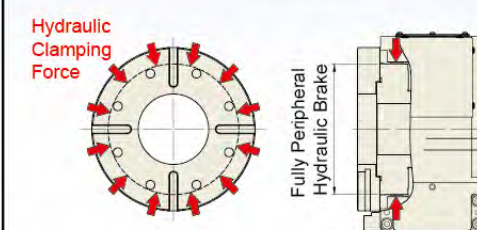
► The 4th axis + Fixture
An application example



► Zero point clamping system is available.
High-precision exchange of clamping devices, fixtures and work-pieces within seconds.

High performance braking system

TJR	Others
Drum brake	Disc brake
1) Clamping range is bigger	1) Clamping range is smaller
2) Drum brake mechanism is tightly placed on the worktable and thus provides high rigidity	2) Disc brake mechanism is far from the worktable; therefore, it causes run-out of table and low rigidity
So it is suitable for heavy duty cutting	Available for light cutting only



Drawing of drum clamping mechanism

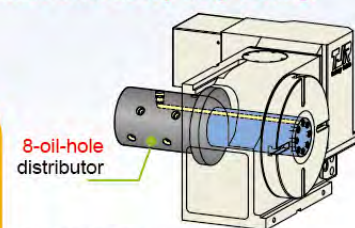


Japan-made high-tensile-brass worm gear

Wear life is 2.6 times longer than aluminum bronze PBC3.

Example of High-Tensile-Brass worm gear model name

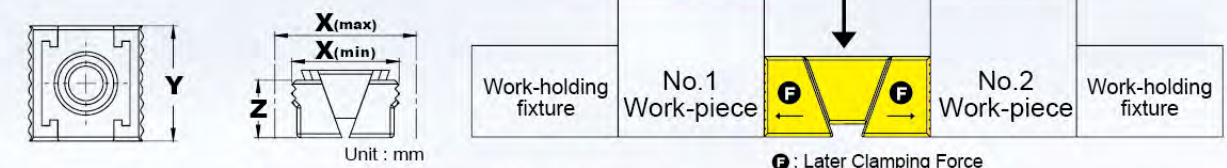
- AR-170-J
- HR-255-J
- FHR-320-J
- FHR-400CF-J



HR series employs the large-through-hole design, as it sizes up to over Ø255mm. The through hole diameter can be adjusted by using the mandrel sleeve. But, it is no way to be enlarged with small-through-hole design.

Little King Kong Vise

Use torque wrench to ensure the clamping torque.

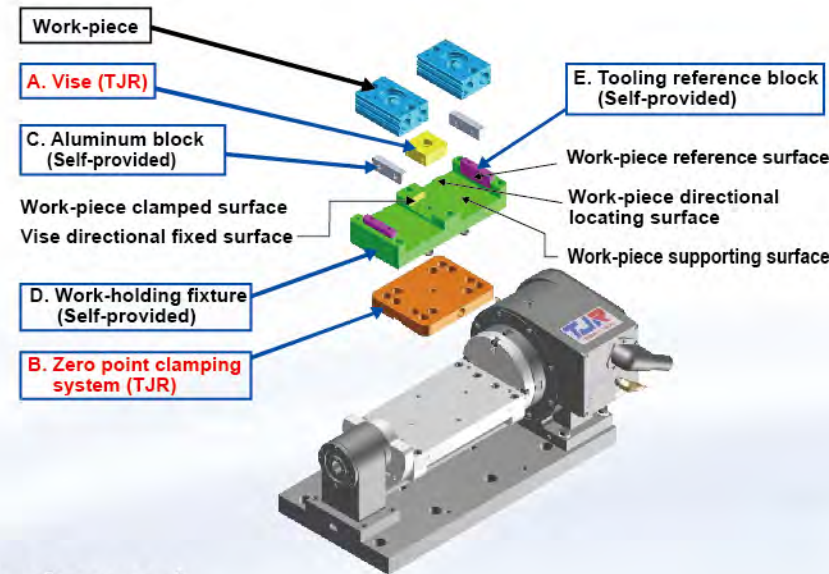


F: Later Clamping Force

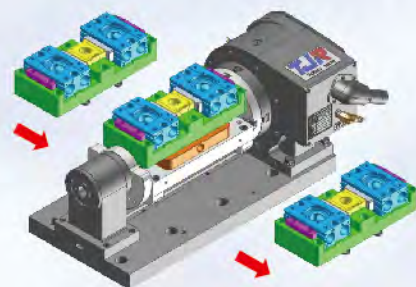
Vise specification	Model	Vise dimension					Suitable Screw	Clamping Force (KN)	Surface Hardness (HRC)
		X (mm)			Y (mm)	Z (mm)			
		Min.	Rated	Max.					
	M062525	23	25	26	25	12	M6*16	18	48-52
	M083030	27	30	31	30	15	M8*20	25	48-52
	M104040	36	40	42	40	20	M10*25	45	48-52
	M124540	40	45	47	40	22	M12*30	65	48-52
	M166060	54	60	63	60	29	M16*40	110	48-52

Zero point clamping system is the modern alternative to the conventional T-slot table: Drastically reduces the setup times and increases your machine capacity.

Make your own work-holding fixture by easily employing **TJR Vise** and **TJR zero point clamping system** on the fixture plate of 4th axis or the faceplate of 4th & 5th axes. Holes on the zero point clamping system are used as sockets for clamping studs.



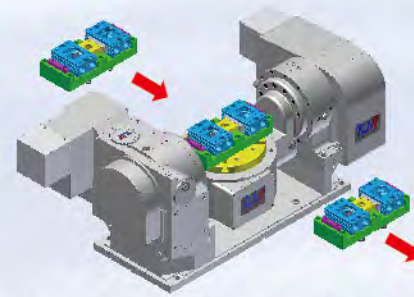
Work-holding fixture can be changed quickly and accurately (across all machines).



The illustration of the application for the 4th axis + connection plate



The zero point clamping system on the connection plate

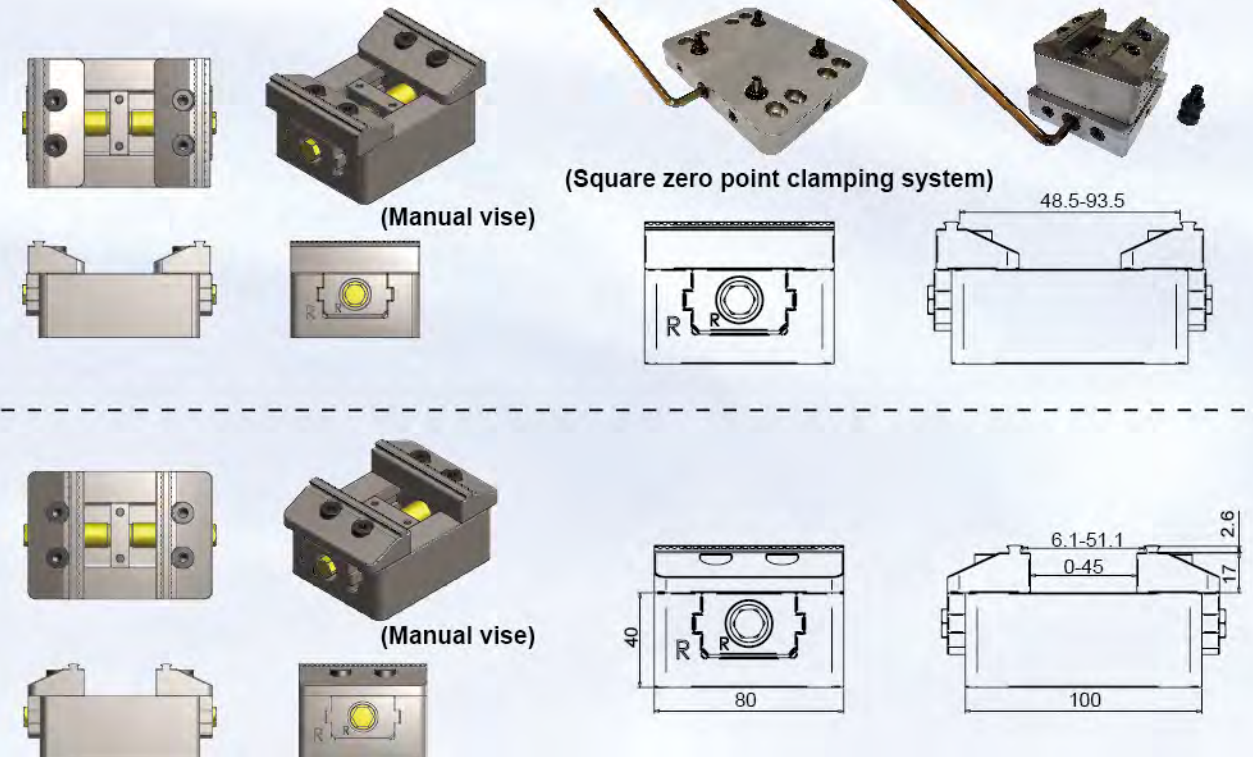
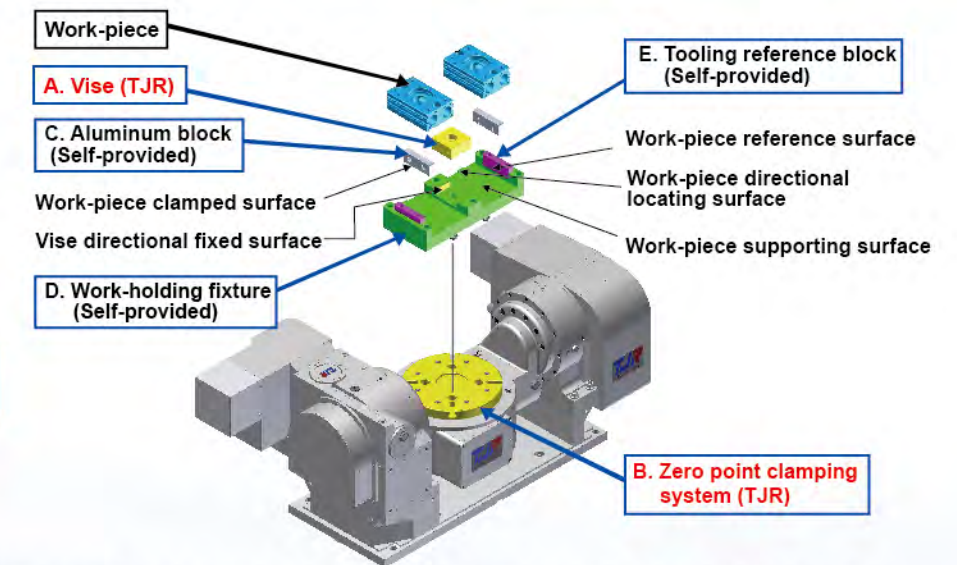


The illustration of the application for the zero point clamping system on the faceplate of the 4th & 5th axes

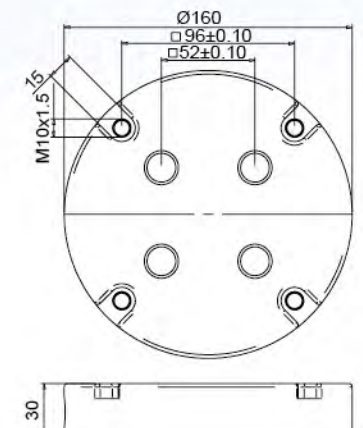
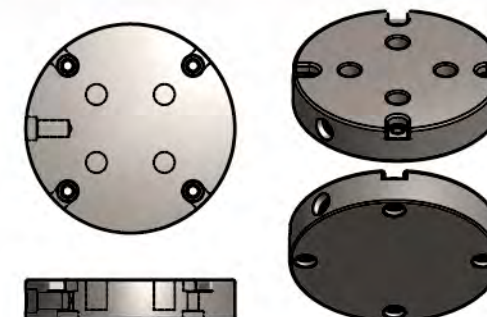


A built-in zero point clamping system on the faceplate of tilting rotary table.

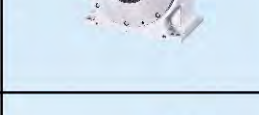
Patented products, imitation is prohibited



The faceplate of rotary table is concurrently the **zero point clamping system**.
(Patented products, imitation is prohibited)



Description	Model code	Page
	Features of TJR rotary tables	1~3
	Little King Kong Vise	4
	Zero point clamping system	5~6
	Page index	7~8
Instruction	How to choose a suitable TJR rotary table	9~10
CNC Rotary Tables Min indexing angle – 0.001° Driven by worm & worm gear	 AR series: Pneumatic brake(right side motor) AR-125R 、 AR-170R AR-210R 、 AR-250R 、 AR-255H	11~12
	 AR series: Pneumatic brake(left side motor) AR-125L 、 AR-170L AR-210L 、 AR-250L	13~14
	 AR series: Pneumatic brake(back side motor) AR-125B 、 AR-170B AR-210B 、 AR-250B	15~16
	 HR series: Hydraulic brake HR-255 、 HR-320 、 HR-400 、 AR-210H HR-500 、 HR-630 、 HR-800 HR-320B 、 HR-320B-2W 、 HR-400B	17~19 21~22
Manual Tilting Rotary Tables (CNC Rotary axis)	MTHR series: Maual Tilt axis CNC Rotary axis MTHR-255	20
CNC Multi spindle Rotary Tables Min indexing angle – 0.001°	AR multi spindle series:Pneumatic brake (2W : 2-wheel coupled) AR-125-2W/170-2W/210-2W (3W : 3-wheel coupled) AR-125-3W/170-3W/210-3W (4W : 4-wheel coupled) AR-125-4W	23~24
CNC Index Tables Min. indexing angle – 1° or 5°	HI series: Hirth coupling hydraulic brake Fixed angle (1° or 5°) HI-255 、 HI-320 、 HI-400 、 HI-500	25~26
CNC Indexing tables (Horizontal only) Min indexing angle - 1°or 5°	HHI series: Hirth coupling hydraulic brake(1° or 5°) HHI-320/400/500/630/800/1000 HHR series: Hydraulic brake(0.001°) HHR-400/500	27~28
Non-CNC Hydraulic index tables with hirth coupling	HC series: Hirth coupling hydraulic brake Fixed angle / Equal-parts HC-255A 、 HC-320A 、 HHC-500 (Index numbers: 2, 4, 8, 12, 24 indexes)	29
Flat type APC for 3-axis-moving-column vertical machining center	CHC series: Flat type auto pallet changer (180° to and fro) CHC-700 x 910 、 CHC-700 x 1090	30
CNC Tilting Rotary Tables Min. indexing angle –0.001° Driven by worm & worm gear	 FAR series: Pneumatic brake FAR-125/125B 、 FAR-170/170A/170B	31~32
	 FAR series: Pneumatic brake FAR-210/210B	33~34
	 FHR series:Hydraulic brake FHR-255C/255CL 、 FHR-320/320C FHR-400CF/400C-540-HR400B FHR-401C-700(800)-HR400B FHR-500C/650C	35~40
	 FAR series: Pneumatic brake FAR-100SN/FAR-160SN FHR series: Hydraulic brake FHR-400S FHR-650S-525/650S-550	40 41~42
Roller Gear Cam Hook type APC for vertical machining center	CURC series: Hook type auto pallet changer (180° to and fro) CURC-500x700	43

Description	Model code	Page
Hook type APC for vertical machining center	 CTU series: Hook type auto pallet changer (180° to and fro) CTU-400 x 600 、 CTU-500 x 700	44
Tray type APC and dual pallets rotary table for horizontal machining center	 CHI series: Hirth coupling hydraulic brake CHI-400/500/630L (1° or 5°) CHR series: Hydraulic brake CHR-400/500/630L (0.001°) CTH series: Tray type auto pallet changer CTH-400/500/630 (180° to and fro)	45~50
CNC Rotary Tables Min indexing angle – 0.001° Driven by Roller Gear Cam	4th axis  RC series : Pneumatic brake/Hydraulic brake RC-170R/210R/255R(N) RC-320R(N)/320L	51~52
	4th & 5th axes  FAR series : Pneumatic brake/Hydraulic brake FAR-160SN-RC255 、 FAR-160-RC255 、 FAR-170A-RC210 、 FAR-170-RC210 、 FAR-210-RC210 FAR-170-2W-RC255 、 FAR-210-2W-RC255	53~54 57~58
	 FHR series : Hydraulic brake FHR-255C-RC255 、 FHR-255CL-RC255 FHR-320-RC320 、 FHR-320C-RC320 FRC series : Hydraulic brake FRC-320CF-RC320 、 FRC-255CL-RC320	55~56
	 FHR series : Hydraulic brake FHR-400CF-RC400F FHR-350F-2W-RC320-2A HRC/HHRs series : Hydraulic brake HRC-400SP	57~58
CNC Rotary Tables Min indexing angle – 0.001° Driven by Direct Drive Motor	4th axis  AD series : Pneumatic brake AD-170 、 AD-210 、 AD-260iB AD-250HS	59~60 63~64
	 HAD series : Pneumatic brake HAD170/210F/250F	59~60
	4th & 5th axes  FAD series : Pneumatic brake FAD-170F-RC210 FAD-210F-RC210 FAD-300F-HS/400HS-AD500i-420 FAD-500FHS-AD500i-480	61~62 63~64
	 FHD series : Hydraulic brake / Two D.D. Motors FHD-650-ID650 iHHD series : Hydraulic Brake iHHD-650	61~62
Support table	 RTA series:Pneumatic brake RTA-125/170/210 RTH series:Hydraulic brake RTH-255/320/400A RT series: Support table without brake RT-135 / RT-170F	65 60/66
Manual tailstock	 TJ series: Fixed Taper TJ-125~400 TTJ series: Replaceable Taper TTJ-125~400	66
Manual tailstock with Pneumatic / Hydraulic Switching valve	 ATJ / ATTJ series: With pneumatic switching valve HTJ / HTTJ series: With hydraulic switching valve	
Rotary table accessories / Accuracy Inspection report: Geometry precision test/ indexing precision test		67~73
Global Sales		74

Instruction

How to choose a suitable TJR rotary table

1 Workpiece material :

- A : For materials like aluminum and copper, it is OK to select AR series (Pneumatic brake)
- B : For materials like cast iron and steel, it is OK to select HR series (Hydraulic brake) or HI series (Hirth coupling Hydraulic brake)

2 Workpiece accuracy requirement :

- A : For accuracy within 20 sec, select AR series (as rotary table for any angle)
- B : For accuracy within 15 sec, select HR series (as rotary table for any angle)
- C : For accuracy within 10 sec, the retrofitting of angle encoder can be considered; but the angle encoder costs more. If the processing only occurs at fixed angles, HI series (± 5 sec can be achieved) can be considered; however, the HI series cannot be used for continuous cutting, as it only works at **fixed angles** of multiple of 1° or 5° (see page 25)

3 Workpiece shape and size :

- A : If it is in the shape of round bar, please purchase the 3-jaw chuck and the center tailstock additionally. (as Dia. ① to the right) When choosing the 3-jaw chuck, note that its outer diameter should not exceed the table diameter. Please see page 68 for the grip range of the chuck.
- B : If of odd shapes and more than two workpieces are processed at once (see page 67), then purchase support table additionally. (as Dia. ② to the right) [For L-block, base plate and middle plate (connection plates), please have them manufactured by fixture suppliers].

✗ When using middle plate, please note to limit its width to the max. table diameter.

4 Max. load :

Verify if the rotary table can withstand the load of workpiece and then add up the weights of predetermined rotary table, tailstock, L-block, middle plate, base plate, workpiece and fixture to see if the total load which the machine can withstand is exceeded. If overweighed, check the material of workpiece first. If the material is aluminum alloy or other light material but you are forced to select a larger rotary table due to its too long details in shapes which require over-large radius of rotation, please feel reassured to select the rotary table of a next smaller size. Fit raiser blocks to lift the workpiece so as to accommodate the radius of rotation whereby to reduce the total weight and the cost.

5 Y axis interference :

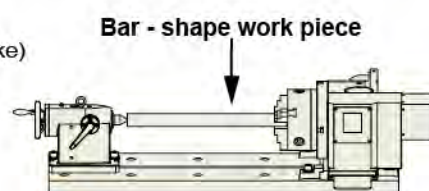
First, verify whether the selected rotary table interferes when it is placed on the work table of the machining center. With the Y axis of the vertical machining center moved to the origin, please measure

- A : the distance between central groove of the worktable and the sheet metal of the machine's slide door [Ex: assuming 450mm remains]
- B : the distance between the centerline of rotary table and the end of motor cover (excluding the wiring box) [Ex: 420mm in HR255-R as Dia ③ to the right]

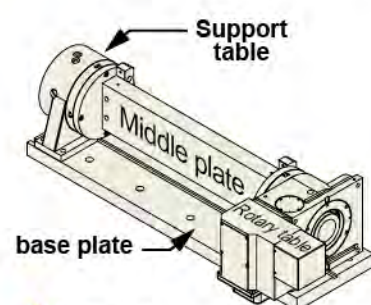
If the "B" distance is less than the "A" distance, it is certain that the rotary table will not collide with the sheet metal of the slide door. [Ex: 420mm < 450mm; thus it's ok to select HR255-R] If not, please change to sheet metal cover reduction version of TJR rotary table. [Ex: only 346mm in HR255-N as Dia ③-1 to the right]

6 Verify the available room for placing the workpiece :

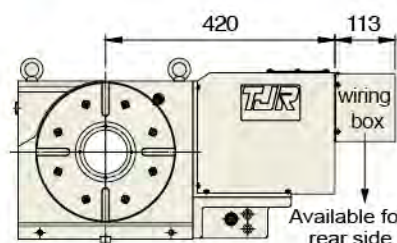
Please measure the length of working table of the machine to verify that it is not 200 mm smaller than base plate. It is the **maximal allowed protrusion** for the base plate of all models to stand out by **100mm** on each side of the working table. For example: Assuming the length of working table of the machine is 950mm. (as Dia. ④ to the right) If HR255-N rotary table, RTH-255 support table, and middle plate are selected, then it is determined that 700 mm in "E" middle plate is available for workpiece. (see data sheet on page 67) By the same principle, it's 1148mm in "B" base plate. In this case, it's acceptable since it is only 198 mm larger than machine's working-table. As for the space "E", thickness "J" and width "H", they are advised not to exceed the set values in our specification (as data sheet on page 67).



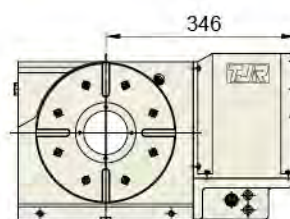
▲ Drawing ①



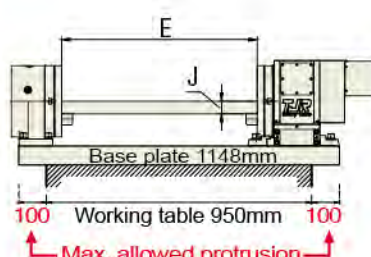
▲ Drawing ②



▲ Drawing ③ : HR-255R



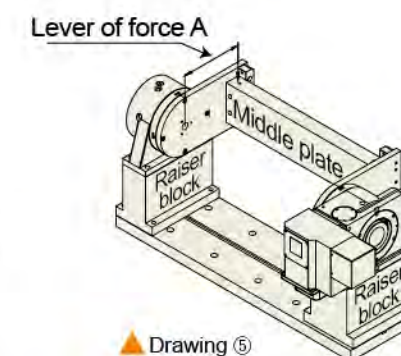
▲ Drawing ③-1 : HR-255N



▲ Drawing ④ : base is bigger than working table

7 Important notices :

When purchasing rotary table, support table, and **cradle-type fixture** (as Dia. ⑤ to the right), it is necessary to advise us if the arm (A) has overtaken the table radius and caused off-center process. Otherwise, the worm wheel will be worn out quickly. (The longer the arm (A) is, the more it's against common sense and normal practice) We shall not be responsible if you fail to advise so.



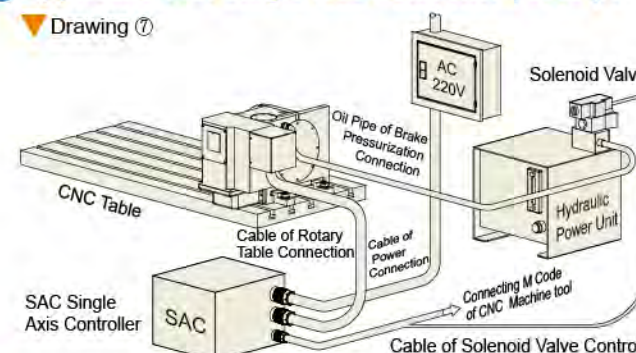
▲ Drawing ⑤

8 "Reserved interface for the forth axis" :

The so-called "reserved interface for the forth axis" refers to all the small hardware or PLC software necessarily reserved for the fourth axis on the machine as well as refers to five main components including ① rotary table ② 4th axis motor ③ shielded power & feedback cables ④ unshielded power & feedback cables, and ⑤ 4th axis amplifier. (as below Dia. ⑥ shows)

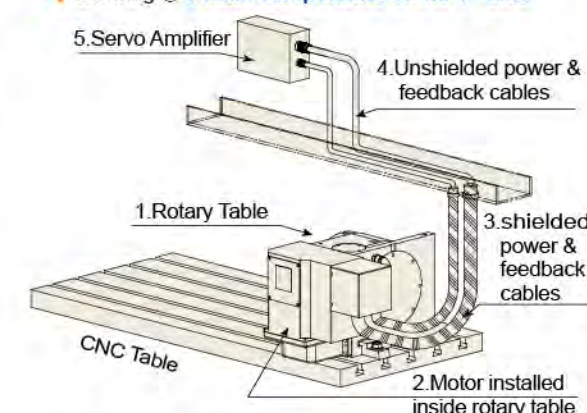
- (A) If the machine comes with those reserved interfaces for the fourth axis, there is no problem at all to retrofit the fourth axis of the same system for **four-axes simultaneous contouring**.
- (B) If the machine does not come with those reserved interfaces for the fourth axis, the **single-axis controller (SAC)** we provide (as below Dia. ⑦ shows) can be used to retrofit the fourth axis. However, such single-axis controller does not interlock with any of X, Y and Z axes in the machine. In other words, the other three axes can not be moved unless the fourth-axis motion is complete.

9 Application for single axis controller (SAC) :



★ With a reserved M Code in the machine center, TJR SAC single axis controller or AIC hydraulic controller can be easily installed, **no matter which brand** of control system is used.

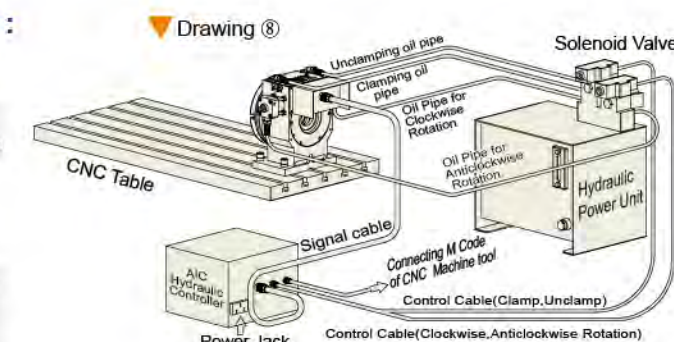
⑤ main components of the 4th axis



10 Application of AIC hydraulic controller :

It is not suitable for CNC rotary table, but for HC series hydraulic index table only (see page 29)

- Strength:** Indexing accuracy ± 5 seconds, Lower cost due to no numerical control system
- Weakness:** It is not available for simultaneous movement with the other 3 axes. Limited index numbers: 2, 4, 8, 12, 24 index numbers
- Note:** Please prepare specialized PLC for HC series by yourself, if you don't buy AIC hydraulic controller.



CNC Rotary Tables (Min indexing angle – 0.001°)

AR Series (Powerful Pneumatic Brake)- Right Side Motor

AR(s)-125R/170R/210R/250R/255H



▲ AR(s)-170R

▲ AR(s)-210R

▲ AR(s)-250R

▲ AR(s)-255HR



▲ AR(s)-125R Use radial & axial bearings

◀ Alloy steel worm gear (Optional)

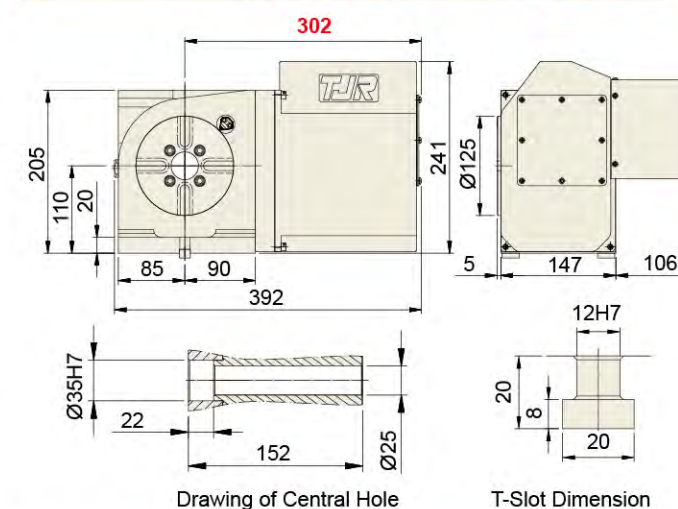
Hydraulic AR(s)-170HR/210HR/250HR are alternatives.

Item / Model	Unit	AR(s)-125R	AR(s)-170R	AR(s)-210R / AR(s)-250R	AR(s)-255HR
Table Diameter	mm	Ø 125	Ø 170	Ø 210 / Ø 250	Ø255
Inner Diameter of Mandrel Sleeve	mm	Ø 35H7 (Diameter of table central hole)	Ø 40H7	Ø 40H7	Ø80H7
Diameter of Center Through Hole	mm	Ø 25	Ø 40	Ø 40	Ø80
Center Height (Vertical)	mm	110	135	160	160
Table Height (Horizontal)	mm	152	152	152 / 160	200
Table T-slot Width	mm	12H7	12H7	12H7	12H7
Guide Block Width	mm	14h7	18h7	18h7	18h7
Min. Increment	deg.	0.001	0.001	0.001	0.001
Indexing Precision	sec.	40	20	20	15
Repeatability	sec.	6	6	6	6
Clamping System (Pneumatic)	kgf/cm ²	6	6	6	5
Clamping Torque	kgf-m	13	31	31	70
Servo Motor Model	FANUC	Taper shaft	ais4 / ßis4	aiF4 / aiF8 / ßis8	aiF4 / aiF8 / ßis8
	MITSUBISHI	Taper / Straight shaft	HG/HF-75 / 105	HG/HF-54 / 104	HG/HF-54 / 104
Speed Reduction Ratio	-	1 : 60	1 : 90	1 : 90	1 : 120
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)	r.p.m	83.3 *(33.3)	44.4 *(33.3)	44.4 *(33.3)	33.3 *(25)
Allowable Inertia Load Capacity (Horizontal)	kg.cm.sec ²	2	5.4	8.3 / 11.7	20.3
Allowable Workpiece Load	Vertical	kg	50	75	100
	with Support Table	kg	100	150	250
	Horizontal	kg	100	150	250
Allowable Thrust Load (with Rotary Table Clamping)	F	kgf	1000	1450	2000
	FxL	kgf-m	45	110	150
	FxL	kgf-m	13	31	70
Driving Torque	kgf-m	9 *(3.7)	18 *(14.6)	18 *(14.6)	55 *(19.6)
Net Weight (servo motor excluded)	kg	34	50	55 / 58	116

*() Alloy Steel worm & gear series

NEW Powerful Brake System

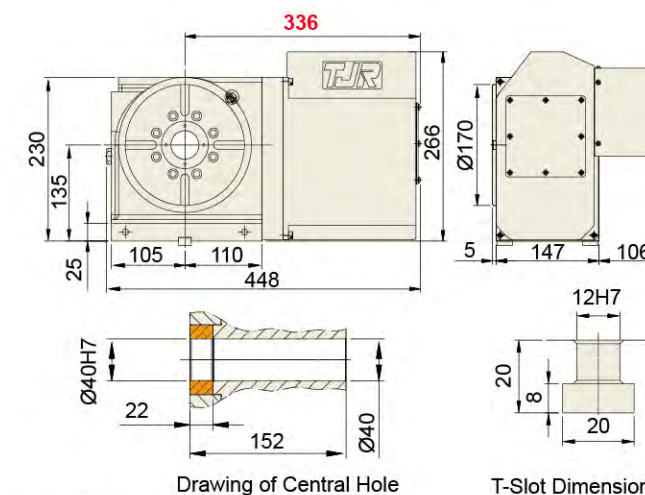
AR(s)-125R



NEW Powerful Brake System

AR(s)-170R

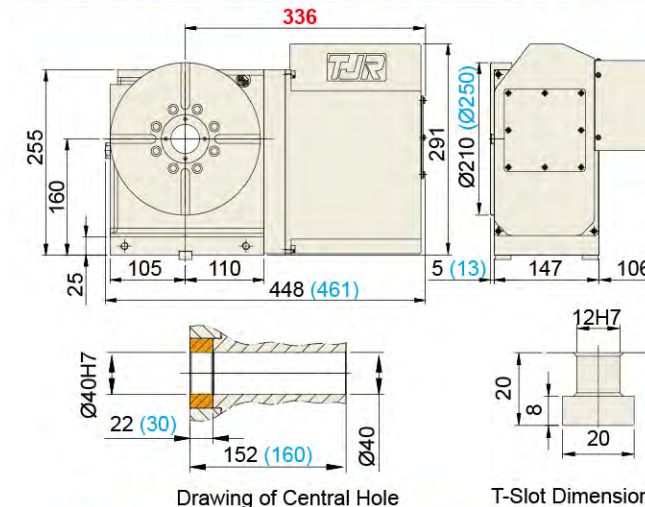
AR(s)-170HR
(Hydraulic Brake)



NEW Powerful Brake System

AR(s)-210R/250R

AR(s)-210HR/250HR
(Hydraulic Brake)



*() : the dimension of Model AR(s)-250R

ARs-210H-R-J-A

Diagram of Model Encoding Rules

- Special Version (A, B, C...) Specified by Customers
- J: Worm and Worm Gear
Made in Japan
(Recommend for any table which sizes up to over Ø255mm)
- T: Worm and Worm Gear
Made in Taiwan
- R: Right Side Motor
(for Both Vertical and Horizontal Applications)
- L: Left side motor, while applying to 4th axis. (for Both Vertical and Horizontal Applications)
- L: Extended type, while applying to 4th & 5th axis
- L: Integrated linear guideway bottom type, while applying to auto pallet changer.
- B: Back Side Motor
(Only for Vertical Application
;not able to equip with angle encoder)
- N: Right Side Motor with Sheet Metal Cover Reduction
(Only for Vertical Application)
- C: Dual-axis Cradle Type
- S: Dual-axis Single-arm Type
- A: 2nd generation
- H: Hydraulic Brake

Table Diameter

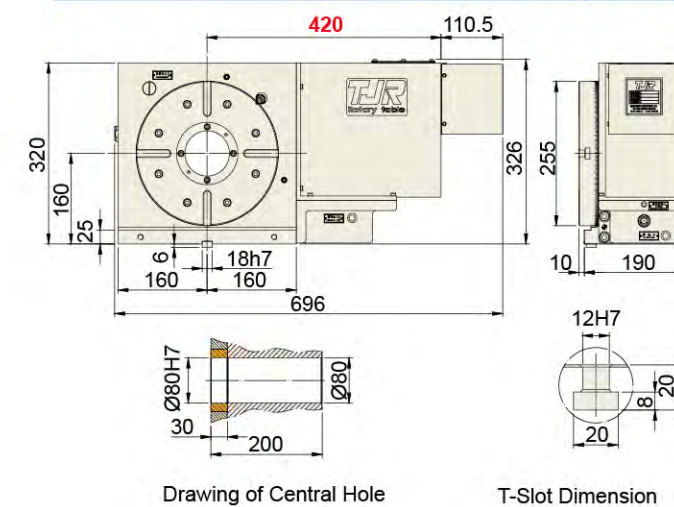
Alloy steel worm gear

Model code (refer to page 7 ~ 8)



NEW Powerful Brake System

AR(s)-255HR



CNC Rotary Tables
(Min indexing angle – 0.001°)

AR Series

(Powerful Pneumatic Brake)-
Left Side Motor

AR(s)-125L/170L/210L/250L



AR(s)-125L

FEATURE

Use radial & axial bearings



Alloy steel worm gear (Optional)



AR(s)-170L



AR(s)-210L



AR(s)-250L

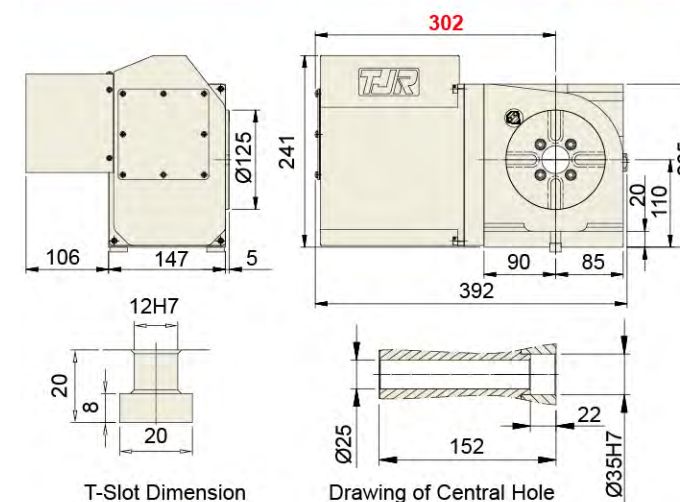
Hydraulic AR(s)-170HL/210HL/250HL are alternatives.

Item / Model	Unit	AR(s)-125L	AR(s)-170L	AR(s)-210L	AR(s)-250L
Table Diameter	mm	Ø 125	Ø 170	Ø 210	Ø 250
Inner Diameter of Mandrel Sleeve	mm	Ø 35H7 (Diameter of table central hole)	Ø 40H7	Ø 40H7	Ø 40H7
Diameter of Center Through Hole	mm	Ø 25	Ø 40	Ø 40	Ø 40
Center Height (Vertical)	mm	110	135	160	160
Table Height (Horizontal)	mm	152	152	152	160
Table T-slot Width	mm	12H7	12H7	12H7	12H7
Guide Block Width	mm	14h7	18h7	18h7	18h7
Min. Increment	deg.	0.001	0.001	0.001	0.001
Indexing Precision	sec.	40	20	20	20
Repeatability	sec.	6	6	6	6
Clamping System (Pneumatic)	kgf/cm ²	6	6	6	6
Clamping Torque	kgf·m	13	31	31	31
Servo Motor Model	FANUC	Taper shaft	aiS4 / βis4	aiF4 / aiF8 / βis8	aiF4 / aiF8 / βis8
	MITSUBISHI	Taper / Straight shaft	HG/HF-75 / 105	HG/HF-54 / 104	HG/HF-54 / 104
Speed Reduction Ratio	-	1 : 60	1 : 90	1 : 90	1 : 90
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)	r.p.m	83.3 *(33.3)	44.4 *(33.3)	44.4 *(33.3)	44.4 *(33.3)
Allowable Inertia Load Capacity (Horizontal)	kg.cm.sec ²	2	5.4	8.3	11.7
Allowable Workpiece Load	Vertical	kg	50	75	75
	with Support Table	kg	100	150	150
	Horizontal	kg	100	150	150
Allowable Thrust Load (with Rotary Table Clamping)	F	kgf	1000	1450	1450
	FxL	kgf·m	45	110	110
	FxL	kgf·m	13	31	31
Driving Torque	kgf·m	9 *(3.7)	29 *(14.6)	29 *(14.6)	29 *(14.6)
Net Weight (servo motor excluded)	kg	34	50	55	58

*() Alloy Steel worm & gear series

NEW Powerful Brake System

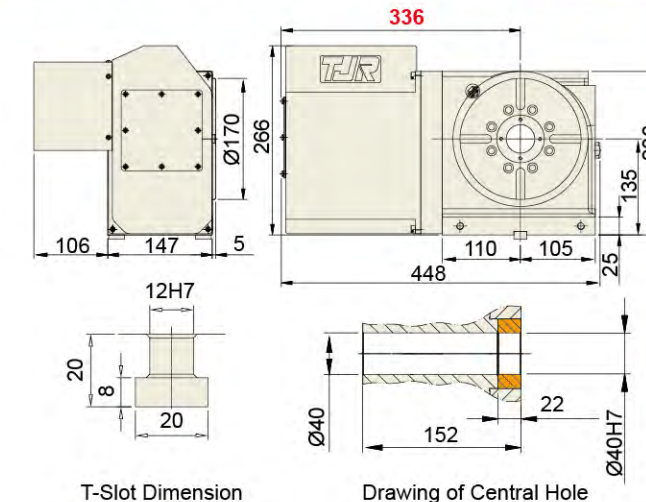
AR(s)-125L



NEW Powerful Brake System

AR(s)-170L

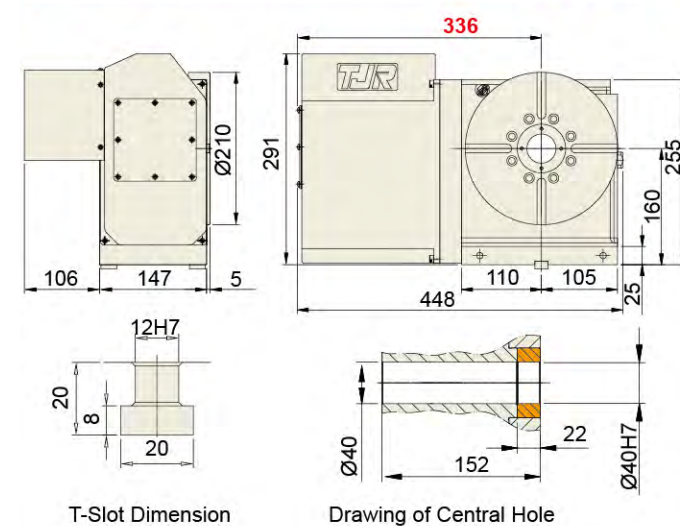
AR(s)-170HL
(Hydraulic Brake)



NEW Powerful Brake System

AR(s)-210L

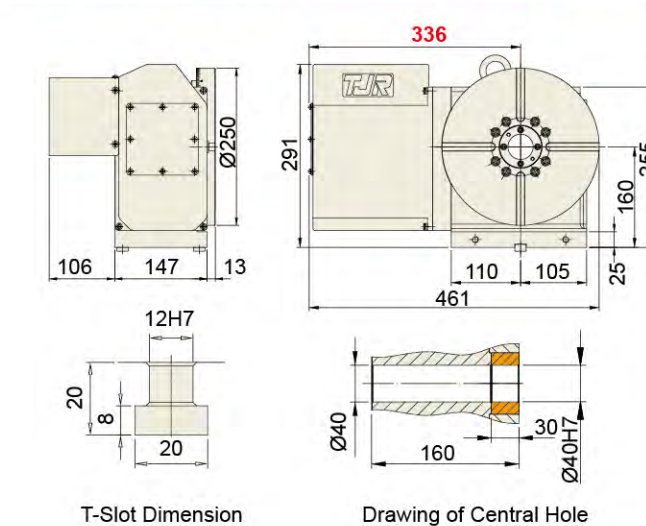
AR(s)-210HL
(Hydraulic Brake)



NEW Powerful Brake System

AR(s)-250L

AR(s)-250HL
(Hydraulic Brake)



※ While using AR series rotary table (pneumatic brake), please note the following matters :



Air pressure required



Solenoid valve (inside of rotary table)

scenario 1



Solenoid valve (inside of rotary table)

scenario 2



Simultaneously brake for rotary table and tailstock



Note:
Please mount cooling dryer or F.R.L unit to avoid any rustiness which seizes up the shaft of solenoid valve and damages the coils.

CNC Rotary Tables (Min indexing angle – 0.001°)

AR Series (Powerful Pneumatic Brake)- Back Side Motor

AR(s)-125B/170B/210B/250B



AR(s)-170B
(Back Side Motor)



AR(s)-210B
(Back Side Motor)

For tapping center
(short Y axis travel)

FEATURE



Use radial & axial bearings

Alloy steel worm gear (Optional)

Picture of Power
and Feedback
Cable Connectors

(Back Side Motor type
can not be equipped
with angle encoder)

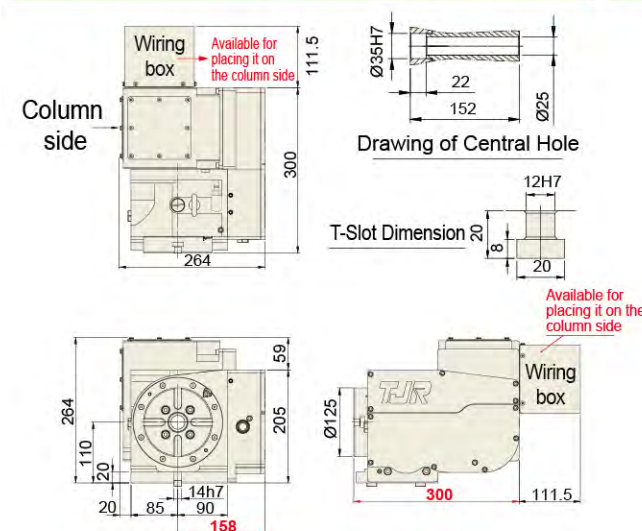
Hydraulic AR(s)-170HB/210HB/250HB are alternatives.

Item / Model		Unit	AR(s)-125B	AR(s)-170B	AR(s)-210B	AR(s)-250B
Table Diameter		mm	Ø 125	Ø 170	Ø 210	Ø 250
Inner Diameter of Mandrel Sleeve		mm	Ø 35H7 (Diameter of table central hole)	Ø 40H7	Ø 40H7	Ø 40H7
Diameter of Center Through Hole		mm	Ø 25	Ø 40	Ø 40	Ø 40
Center Height (Vertical)		mm	110	135	160	160
Table Height (Horizontal)		mm	-	-	-	-
Table T-slot Width		mm	12H7	12H7	12H7	12H7
Guide Block Width		mm	14h7	18h7	18h7	18h7
Min. Increment		deg.	0.001	0.001	0.001	0.001
Indexing Precision		sec.	40	20	20	20
Repeatability		sec.	6	6	6	6
Clamping System (Pneumatic)		kgf/cm ²	6	6	6	6
Clamping Torque		kgf·m	13	31	31	31
Servo Motor Model	FANUC	Taper shaft	αis4 / βis4	αiF4 / αiF8 / βis8	αiF4 / αiF8 / βis8	αiF4 / αiF8 / βis8
	MITSUBISHI	Taper / Straight shaft	HG/HF-75 / 105	HG/HF-54 / 104	HG/HF-54 / 104	HG/HF-54 / 104
Speed Reduction Ratio		-	1 : 60	1 : 90	1 : 90	1 : 90
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)		r.p.m	83.3 *(33.3)	44.4 *(33.3)	44.4 *(33.3)	44.4 *(33.3)
Allowable Inertia Load Capacity (Horizontal)		kg.cm.sec ²	2	2.7	4.1	5.9
Allowable Workpiece Load	Vertical	kg	50	75	75	75
	with Support Table	kg	100	150	150	150
	Horizontal	kg	-	-	-	-
Allowable Thrust Load (with Rotary Table Clamping)	F	kgf	1000	1450	1450	1450
	FxL	kgf·m	45	110	110	110
	FxL	kgf·m	13	31	31	31
Driving Torque		kgf·m	9 *(3.7)	18 *(14.6)	18 *(14.6)	18 *(14.6)
Net Weight (servo motor excluded)		kg	-	60	65	72

*() Alloy Steel worm & gear series

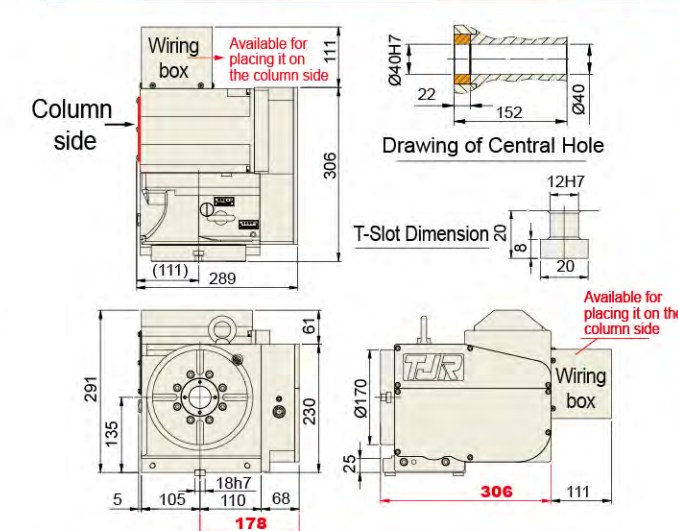
NEW Powerful Brake System

AR(s)-125B



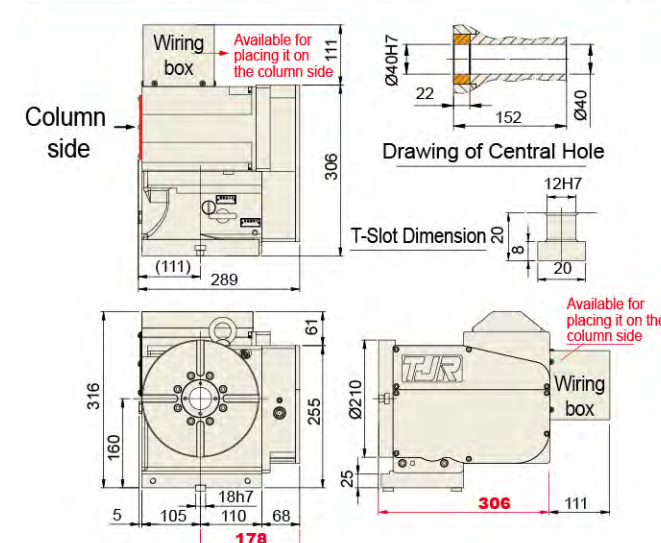
NEW Powerful Brake System

AR(s)-170B AR(s)-170HB (Hydraulic Brake)



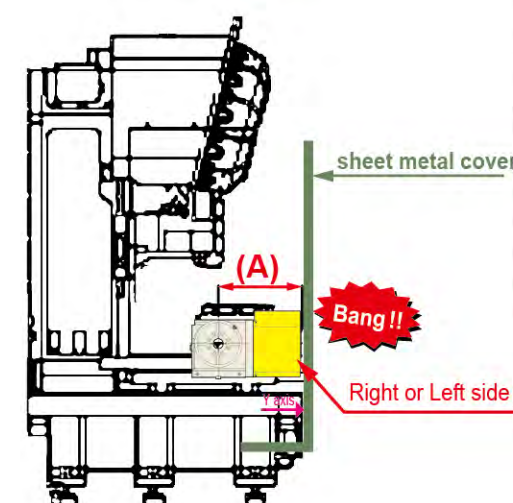
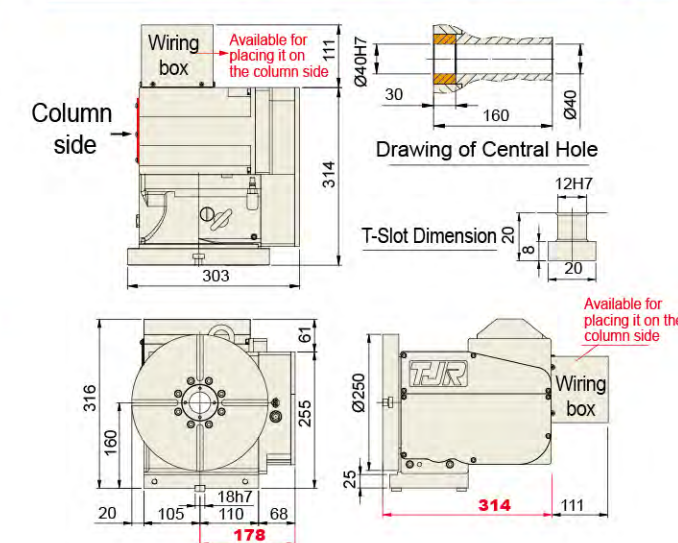
NEW Powerful Brake System

AR(s)-210B AR(s)-210HB (Hydraulic Brake)



NEW Powerful Brake System

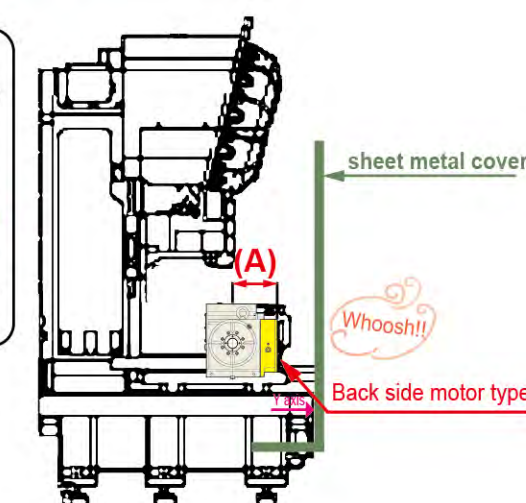
AR(s)-250B AR(s)-250HB (Hydraulic Brake)



If the rotary table interferes with sheet metal cover (as shown, the distance A protrudes beyond sheet motor cover), it's recommended to choose back side motor type for AR series or right side motor with sheet metal cover reduction type for HR & HI series. (as Dia. to the right)

Bang!!

Right or Left side motor type



Whoosh!!

Back side motor type

CNC Rotary Tables (Min indexing angle – 0.001°)

HR Series (Hydraulic Brake)

AR(s)-210H

HR(s)-255/320/400



Alloy steel worm gear ▲
(Optional) for AR(s)-210H
HR(s)-255

◀ **HR(s)-255N**
(Reduced Sheet Metal Cover for Vertical Application)

◀ **HR(s)-255R**
(Sheet Metal Cover for Both Vertical and Horizontal Applications)

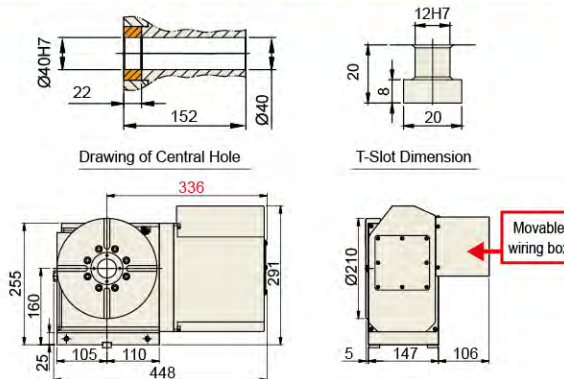
▲ **HR-320N**
(Reduced Sheet Metal Cover for Vertical Application)

- 1 Use **large-diameter** ▲
radial & axial bearings
- 2 Employ a **large-through-hole** **design** while the table diameter exceeds 250mm. This design delivers high rigidity and provides bigger space for work piece setup with fixtures.
(The hole diameter can be adjusted by adding a mandrel sleeve.)
- 3 **High rotation rate design** delivers high efficiency

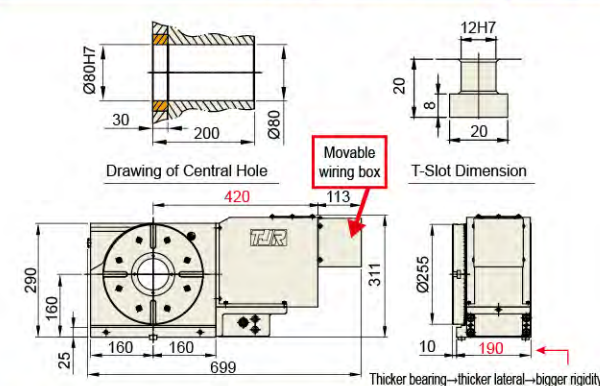
Item / Model		Unit	AR(s)-210H	HR(s)-255	HR-320	HR-400
Table Diameter		mm	Ø 210	Ø 255	Ø 320	Ø 400
Inner Diameter of Mandrel Sleeve		mm	Ø 40H7	Ø 80H7	Ø 120H7	Ø 120H7
Diameter of Center Through Hole		mm	Ø 40	Ø 80 Big Bore	Ø 120 Big Bore	Ø 120 or Ø 150
Center Height (Vertical)		mm	160	160	210	255
Table Height (Horizontal)		mm	152	200	235	250
Table T-slot Width		mm	12H7	12H7	14H7	14H7
Guide Block Width		mm	18h7	18h7	18h7	18h7
Min. Increment		deg.	0.001	0.001	0.001	0.001
Indexing Precision		sec.	20	15	15	15
Repeatability		sec.	6	6	6	6
Clamping System (Hydraulic)		kgf/cm ²	35	35	35	35
Clamping Torque		kgf-m	55	70	115	200
Servo Motor Model	FANUC	-	αiF4/αiF8/βis8[Taper shaft]	αiF8/βis8[Taper shaft]	αiF12/βis22[Straight shaft]	αiF12/βis22[Straight shaft]
	MITSUBISHI	Taper / Straight shaft	HG/HF-54/104	HG/HF-104/154	HG/HF-204	HG/HF-204
Speed Reduction Ratio		-	1 : 90	1 : 120	1 : 120	1 : 120
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)		r.p.m	44.4 *(33.3)	33.3 *(25)	25	25
Allowable Inertia Load Capacity (Horizontal)		kg.cm.sec ²	8.3	20.3	44.8	100
Allowable Workpiece Load	Vertical	kg	75	100	150	200
	with Support Table	kg	150	250	350	500
	Horizontal	kg	150	250	350	500
Allowable Thrust Load (with Rotary Table Clamping)	F	kgf	1450	2000	3000	4000
	FxL	kgf-m	110	150	300	400
	FxL	kgf-m	55	70	115	200
Driving Torque		kgf-m	18 *(14.6)	55 *(19.6)	80	170
Net Weight (servo motor excluded)		kg	55	109	204	286

*() Alloy Steel worm & gear series

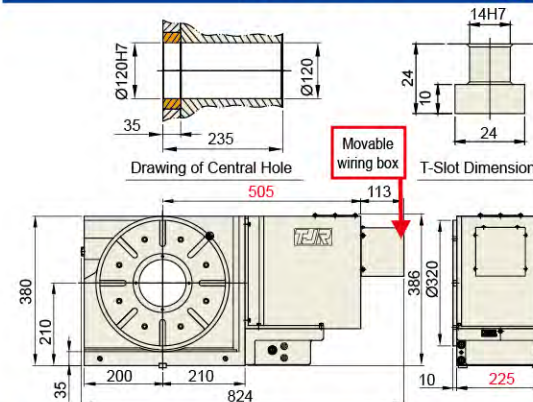
AR(s)-210H



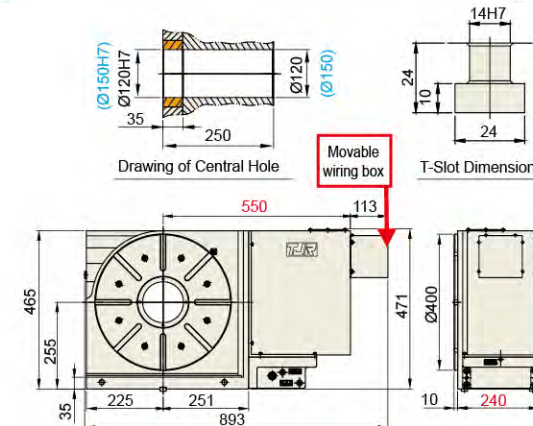
HR(s)-255R



HR-320R



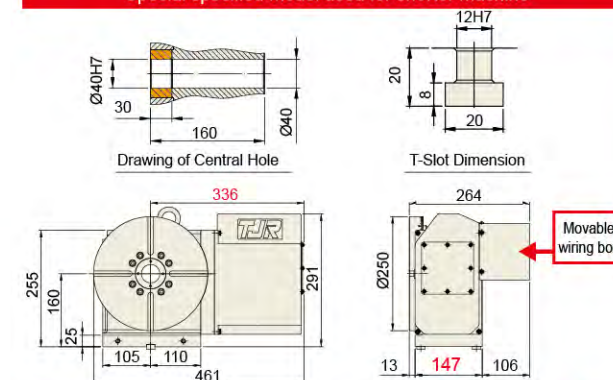
HR-400R



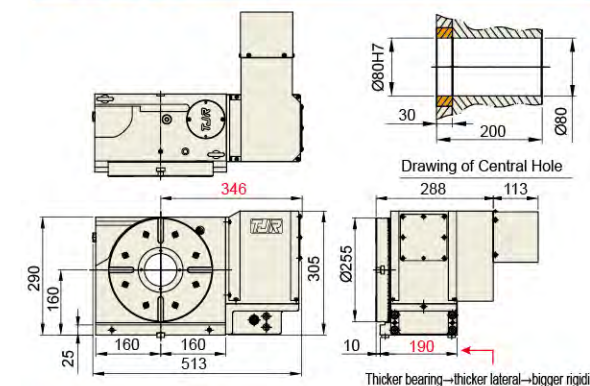
*() Ø150 central through hole is available.

AR(s)-250HR

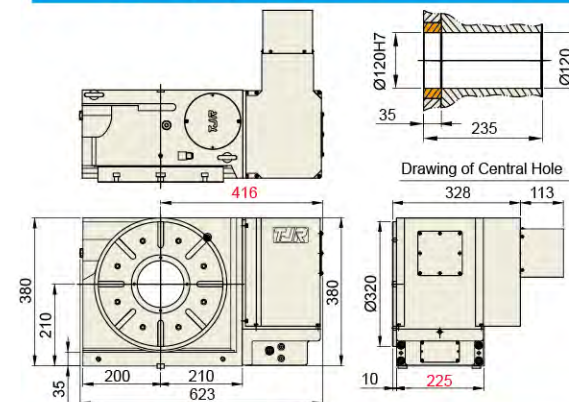
Special specified model used for shorter machine



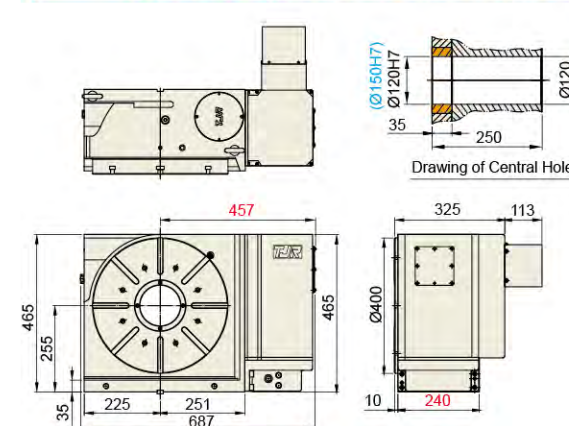
HR(s)-255N (Sheet metal cover reduction)



HR-320N (Sheet metal cover reduction)



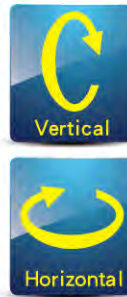
HR-400N (Sheet metal cover reduction)



*() Ø150 central through hole is available.

CNC Rotary Tables (Min indexing angle – 0.001°)

HR Series (Hydraulic Brake) HR-500R/630R/800R



▲ **HR-500R**
(for Both Vertical and Horizontal Applications)



▲ **HR-630R** (for Both Vertical and Horizontal Applications)

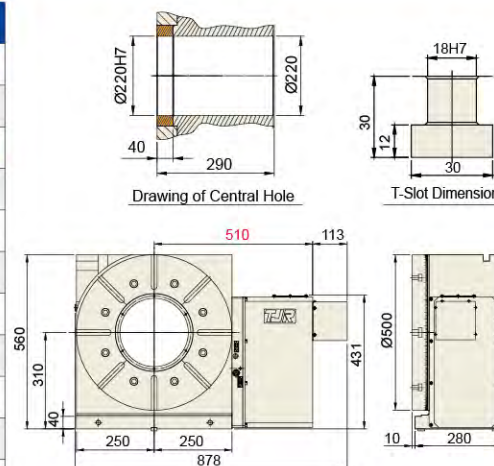
▲ **HR-800** (for Both Vertical and Horizontal Applications)

Item / Model	Unit	HR-500R	HR-630R	HR-800R
Table Diameter	mm	Ø 500	Ø 630	Ø 800
Inner Diameter of Mandrel Sleeve	mm	Ø 220H7	Ø 280H7	Ø 350H7
Diameter of Center Through Hole	mm	Ø 220 Big Bore	Ø 280 Big Bore	Ø 350 Big Bore
Center Height (Vertical)	mm	310	400	470
Table Height (Horizontal)	mm	290	325	350
Table T-slot Width	mm	18H7	18H7	18H7
Guide Block Width	mm	18h7	18h7	18h7
Min. Increment	deg.	0.001	0.001	0.001
Indexing Precision	sec.	15	15	15
Repeatability	sec.	6	6	6
Clamping System (Hydraulic)	kgf/cm ²	35	35	35
Clamping Torque	kgf-m	370	800	800
Servo Motor Model	FANUC	Straight Shaft without Key	αiF12 / βis22	αiF22
	MITSUBISHI	Straight Shaft without Key	HG/HF-204	HG/HF-354
Speed Reduction Ratio	-	1 : 180	1 : 180	1 : 180
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)	r.p.m	16.6	16.6	11.1
Allowable Inertia Load Capacity (Horizontal)	kg.cm.sec ²	187.5	396.9	1200
Allowable Workpiece Load	Vertical	kg	250	400
	with Support Table	kg	600	800
	Horizontal	kg	600	1500
Allowable Thrust Load (with Rotary Table Clamping)	F	kgf	4000	5000
	FxL	kgf-m	500	850
	FxL	kgf-m	370	800
Driving Torque	kgf-m	250	420	800
Net Weight (servo motor excluded)	kg	405	692	991

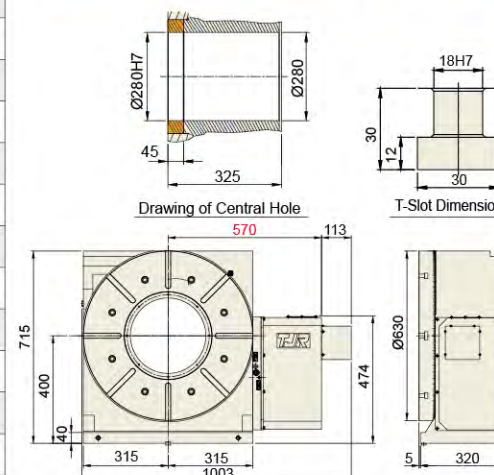


- 1 Use **large-diameter** radial & axial bearings
- 2 Employ a **large-through-hole design** while the table diameter exceeds 250mm. This design delivers high rigidity and provides bigger space for work piece setup with fixtures.
(The hole diameter can be adjusted by adding a mandrel sleeve.)

HR-500R



HR-630R



Manual Tilt rotary tables (Min indexing angle – 0.001°)

MTHR Manual Tilt Series (Manual tilt axis ; CNC rotary axis - 0.001°)

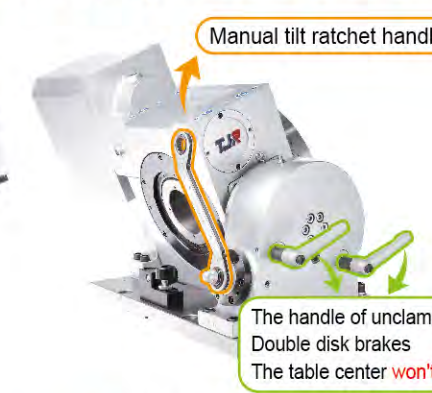


- 1 Use **large-diameter** radial & axial bearings
- 2 **Fully sealed** tilt axis
- 3 Powerful manual **double disk brakes** for tilt axis
- 4 Highly rigid structure of manual tilt axis

MTHR(s)-255



▲ **MTHR(s)-255**



▲ **MTHR(s)-255**
Rear view + Ratchet handle

The handle of unclamping / clamping tilt axis.
Double disk brakes
The table center **won't shift** while clamping the tilt axis.

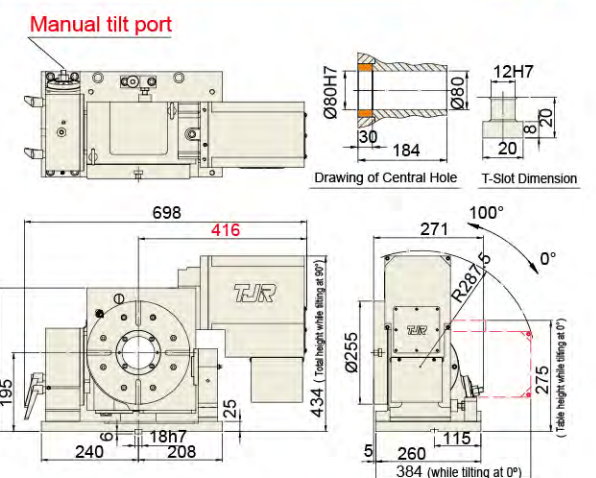


▲ Alloy steel worm gear (Optional)

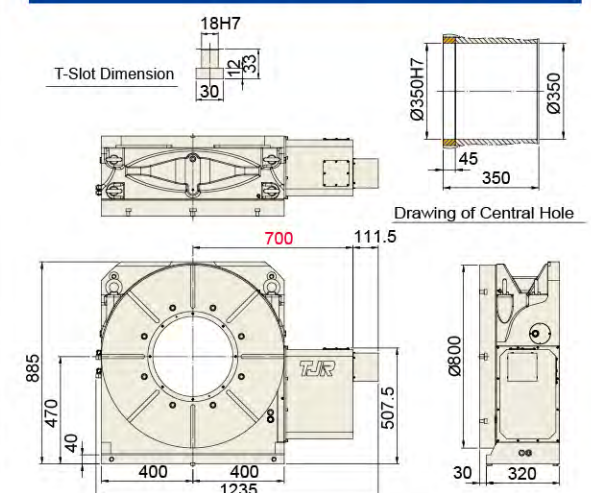
MTHR(s)-255 (Manual tilt)

Item / Model	Unit	MTHR(s)-255	
Table Diameter	mm	Ø255	
Inner Diameter of Mandrel Sleeve	mm	Ø80H7	
Diameter of Center Through Hole	mm	Ø80	
Table Height (Horizontal)	mm	275	
Table T-slot Width	mm	12H7	
Guide Block Width	mm	18h7	
Axis	-	Rotation	Tilt(0°~100°)
Min. Increment	deg.	0.001	-
Indexing Precision	sec.	15	-
Repeatability	sec.	6	-
Clamping System (Hydraulic)	kgf/cm ²	Hyd.35	Manual double disk brakes
Clamping Torque	kgf-m	70	-
Servo Motor Model	FANUC	Taper/Straight shaft	αiF8 / βis8 (Taper)
	MITSUBISHI	Straight shaft	HG/HF-104 / 154
Speed Reduction Ratio	-	1 : 120	1 : 40
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)	r.p.m	33.3 *(25)	-
Allowable Inertia Load Capacity (Horizontal)	kg.cm.sec ²	20.3	
Allowable Workpiece Load	0° Horizontal	kg	250
	0°~90° Tilt	kg	100
Allowable Load (with Rotary Table Clamping)	F	kgf	1600
	FxL	kgf-m	85
	FxL	kgf-m	70
Driving Torque	kgf-m	55 *(31)	
Net Weight (servo motor excluded)	kg	145	

*() Alloy Steel worm & gear series



HR-800R



CNC Rotary Tables (Min indexing angle – 0.001°)

HR Series (Hydraulic Brake - Back Side Motor)

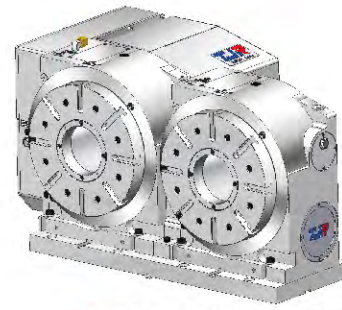
HR-320B/320B-2W/400B



▲ HR-320B (Back Side Motor)



Use radial & axial bearings



▲ HR-320B-2W (Back Side Motor / 2-wheel coupled)



▲ HR-400B
(Back Side Motor)

Item / Model		Unit	HR-320B	HR-320B-2W	HR-400B
Table Diameter		mm	Ø 320	Ø 320	Ø400
Inner Diameter of Mandrel Sleeve		mm	Ø 120H7	Ø 120H7	Ø120H7
Diameter of Center Hole x Depth		mm	Big Bore Ø120x217 Deep	Big Bore Ø120x217 Deep	Big Bore Ø120x220 Deep
Center Height (Vertical)		mm	255	270	255
Table Height (Horizontal)		mm	-	-	-
Minimum distance between table centers		mm	-	400	-
Table T-slot Width		mm	14H7	14H7	14H7
Guide Block Width		mm	18h7	18h7	18h7
Min. Increment		deg.	0.001	0.001	0.001
Indexing Precision		sec.	15	15	15
Repeatability		sec.	6	6	6
Clamping System (Hydraulic)		kgf/cm ²	35	35	35
Clamping Torque		kgf.m	115	115	200
Servo Motor Model	FANUC	Straight Shaft without Key	αiF12 / βis22	αiF12 / βis22	αiF12 / βis22
	MITSUBISHI	Straight Shaft without Key	HG/HF- 204	HG/HF- 204	HG/HF-204
Speed Reduction Ratio		-	1 : 150	1 : 150	1 : 120
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)		r.p.m	25	25	25
Allowable Inertia Load Capacity (Horizontal)		kg.cm.sec ²	-	-	-
Allowable Workpiece Load	Vertical	kg	150	150	200
	with Support Table	kg	350	350	500
	Horizontal	kg	-	-	-
Allowable Thrust Load (with Rotary Table Clamping)	F	kgf	3000	3000	4000
	FxL	kgf.m	300	300	400
	FxL	kgf.m	115	115	200
Driving Torque		kgf.m	80	80	170
Net Weight (servo motor excluded)		kg	-	-	281

CNC Rotary Tables (Min indexing angle – 0.001°)

HR Series (Embedded type)

iHHR-400



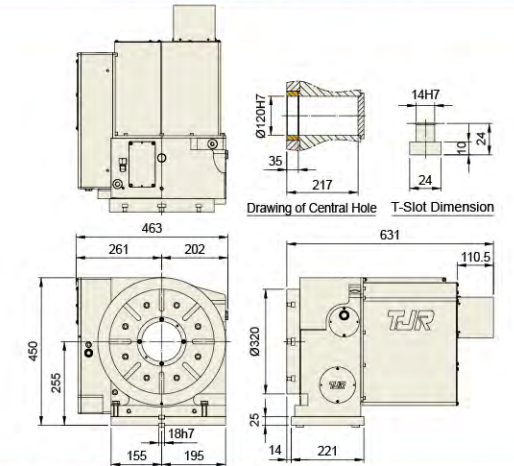
Use radial & axial bearings



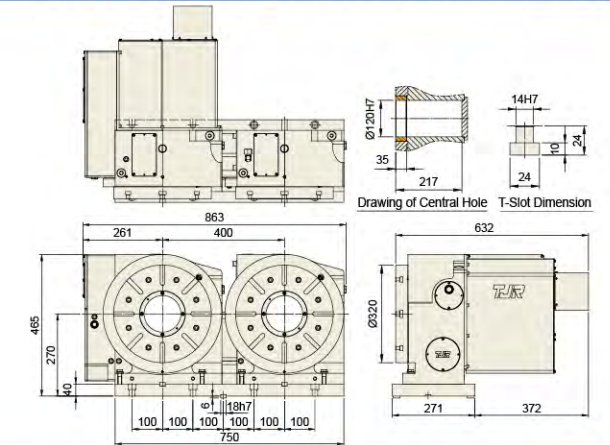
▶ iHHR-400

Item / Model		Unit	iHHR- 400
Table Diameter		mm	Ø 400
Inner Diameter of Mandrel Sleeve		mm	-
Diameter of Center Through Hole		mm	-
Center Height (Vertical)		mm	-
Table Height (Horizontal)		mm	-
Minimum distance between table centers		mm	-
Table T-slot Width		mm	14H7
Guide Block Width		mm	-
Min. Increment		deg.	0.001
Indexing Precision		sec.	15
Repeatability		sec.	4
Clamping System (Hydraulic)		kgf/cm ²	35
Clamping Torque		kgf.m	200
Servo Motor Model	FANUC	Straight shaft	αiF12 / βis22
	MITSUBISHI	Straight shaft	HF-204
Speed Reduction Ratio		-	1 : 150
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)		r.p.m	20
Allowable Inertia Load Capacity (Horizontal)		kg.cm.sec ²	100
Allowable Workpiece Load	Vertical	kg	-
	with Support Table	kg	-
	Horizontal	kg	500
Allowable Load (with Rotary Table Clamping)	F	kgf	4000
	FxL	kgf.m	400
	FxL	kgf.m	200
Driving Torque		kgf.m	170
Net Weight (servo motor excluded)		kg	-

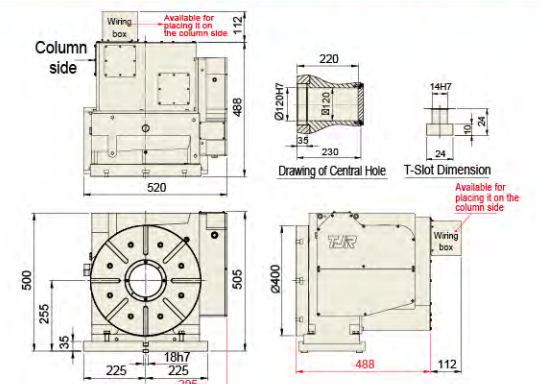
HR-320B (Back Side Motor)



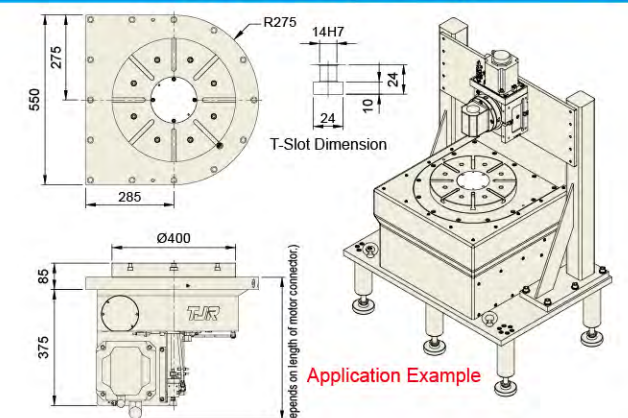
HR-320B-2W (Back side motor / 2-wheel coupled)



HR-400B (Back side motor)



iHHR-400 (Embedded type)



CNC Multi Spindle Rotary Tables (Min indexing angle – 0.001°)



AR multi spindle 2W Series
(2-wheel coupled, **Powerful Pneumatic Brake**)
AR(s)-125-2W/170-2W/210-2W

AR multi spindle 3W Series
(3-wheel coupled, **Powerful Pneumatic Brake**)
AR(s)-125-3W/170-3W/210-3W

AR multi spindle 4W Series
(4-wheel coupled, **Powerful Pneumatic Brake**)
AR(s)-125-4W



▲ Alloy steel worm gear
(Optional)



▲ AR(s)-125-4W
4 wheel coupled + manual
tailstock + big base plate



▲ 二連軸+頂尾



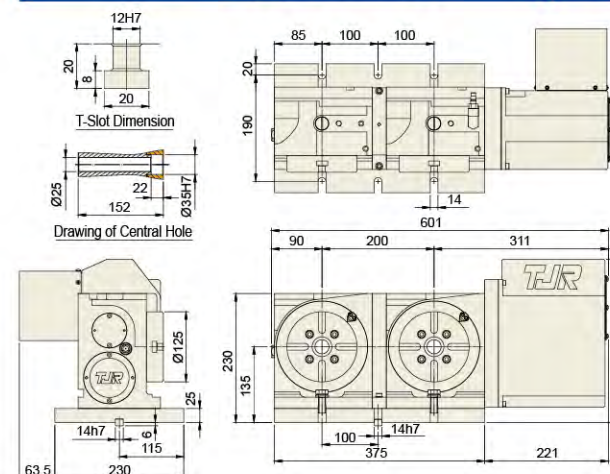
▲ AR(s)-170-2W
(Horizontal application)
(Pneumatic chuck is optional)

Item / Model		Unit	AR(s)-125-2W/3W/4W	AR(s)-170-2W/3W	AR(s)-210-2W/3W
Table Diameter		mm	Ø 125	Ø 170	Ø 210
Inner Diameter of Mandrel Sleeve		mm	Ø 35H7 (Diameter of table central hole)	Ø 40H7	Ø 40H7
Diameter of Center Through Hole		mm	Ø 25	Ø 40	Ø 40
Center Height(Vertical)		mm	135	175	200
Minimum distance between table centers		mm	200	300	300
Table T-slot Width		mm	12H7	12H7	12H7
Guide Block Width		mm	14h7	18h7	18h7
Min. Increment		deg.	0.001	0.001	0.001
Indexing Precision		sec.	60 [2w,3w] / 90 [4w]	40	40
Repeatability		sec.	6	6	6
Clamping System (Pneumatic)		kgf/cm ²	6	6	6
Clamping Torque		kgf·m	13	31	31
Servo Motor Model	FANUC	Taper Shaft with Key	[2w] αiF4 / βis8 [3w] αiF8 / βis8 [4w] αiF8 / βis12	αiF8 / βis12	αiF8 / βis12
	MITSUBISHI	Straight Shaft without Key	[2w] HG / HF-104 [3w] HG / HF-154 [4w] HG / HF-224	HG/HF-104/154	HG/HF-104/154
Speed Reduction Ratio		-	1 : 60	1 : 90	1 : 90
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)		r.p.m	83.3 *(33.3)	44.4 *(33.3)	44.4 *(33.3)
Allowable Inertia Load Capacity (Horizontal)		kg.cm.sec ²	-	5.4	8.3
Allowable Workpiece Load	Vertical	kg	50	75	75
	with Support Table	kg	100	150	150
Allowable Load (with Rotary Table Clamping)	F	kgf	1000	1450	1450
	FxL	kgf·m	45	110	110
	FxL	kgf·m	13	31	31
Driven Torque		kgf·m	9 *(3.7)	18 *(14.6)	18 *(14.6)
Net Weight (servo motor excluded)		kg	82 / 120 / -	- / -	- / 223

*() Alloy Steel worm & gear series

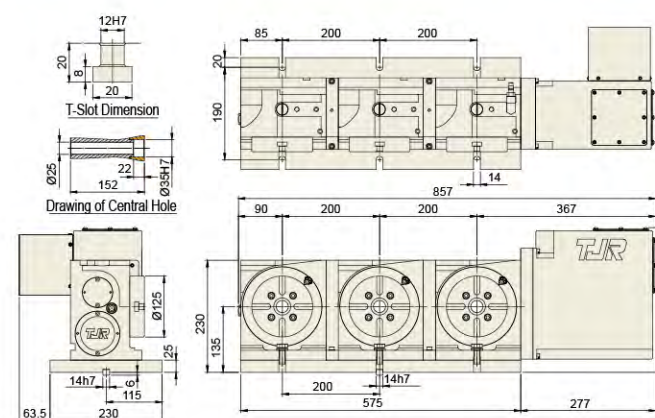
NEW Powerful Brake System

AR(s)-125-2W



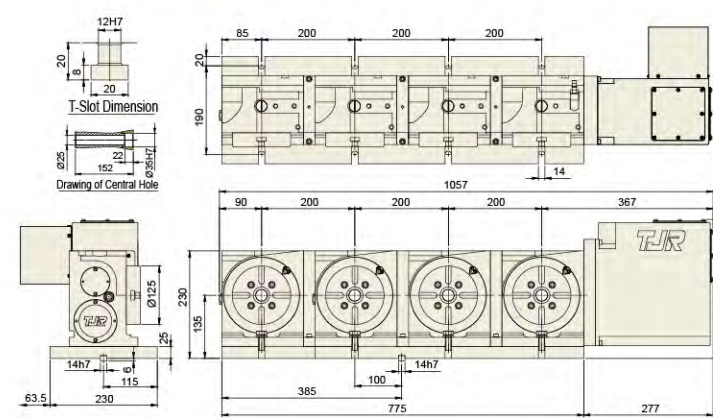
NEW Powerful Brake System

AR(s)-125-3W (Standard type)



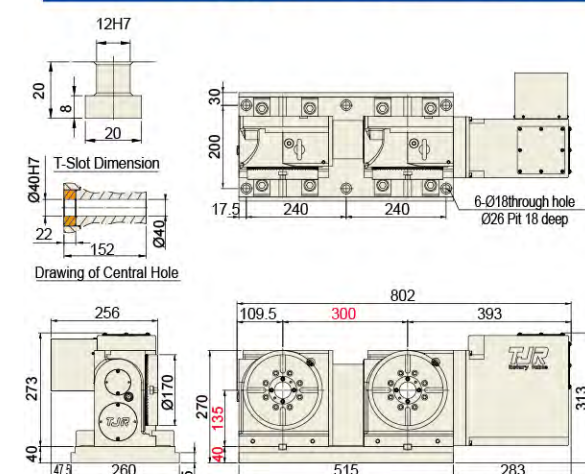
NEW Powerful Brake System

AR(s)-125-4W (Standard type)



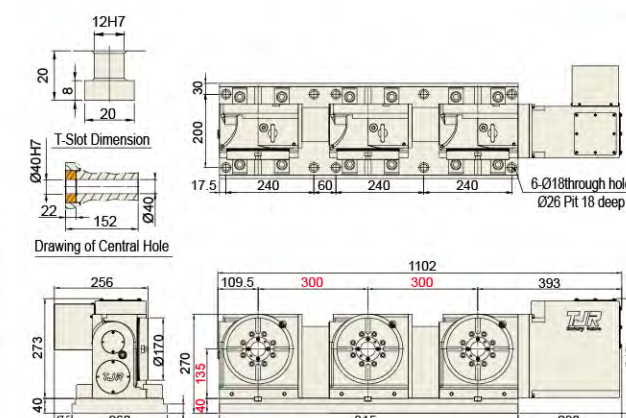
NEW Powerful Brake System

AR(s)-170-2W (Standard type)



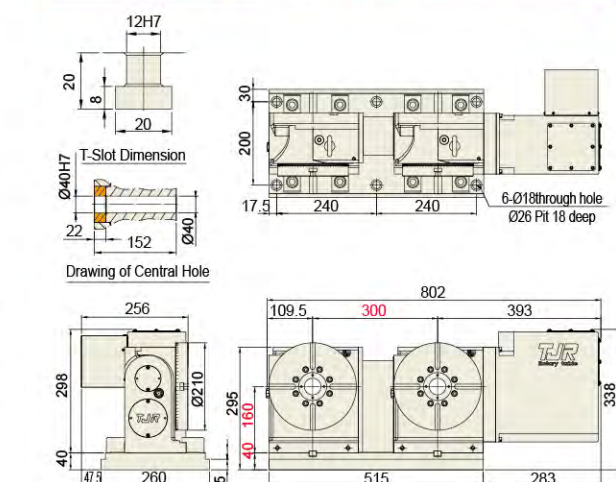
NEW Powerful Brake System

AR(s)-170-3W (Standard type)



NEW Powerful Brake System

AR(s)-210-2W (Standard type)



CNC Index Tables
Min. indexing angle – 1° or 5°

HI Series (Hirth coupling hydraulic brake)

HI-255/320/400/500



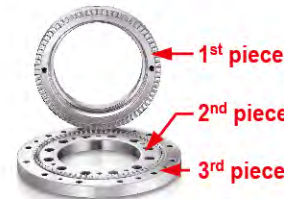
▲ HI-255N



▲ HI-320N



▲ HI-500

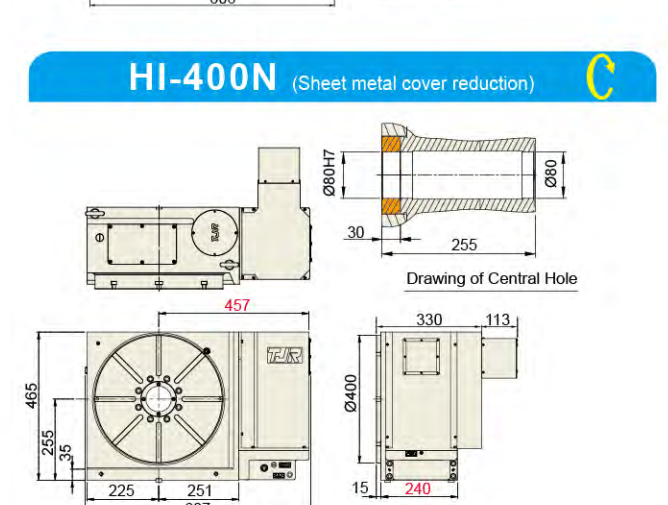
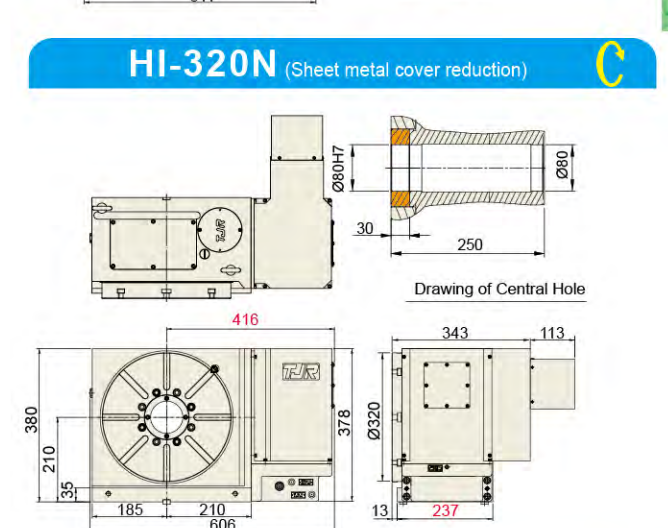
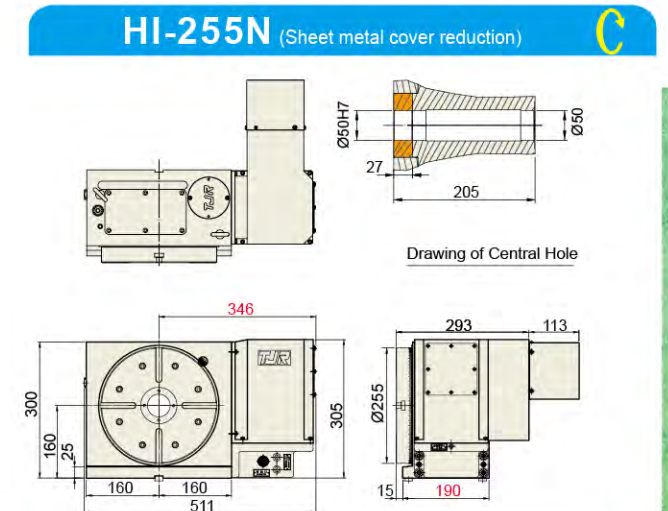
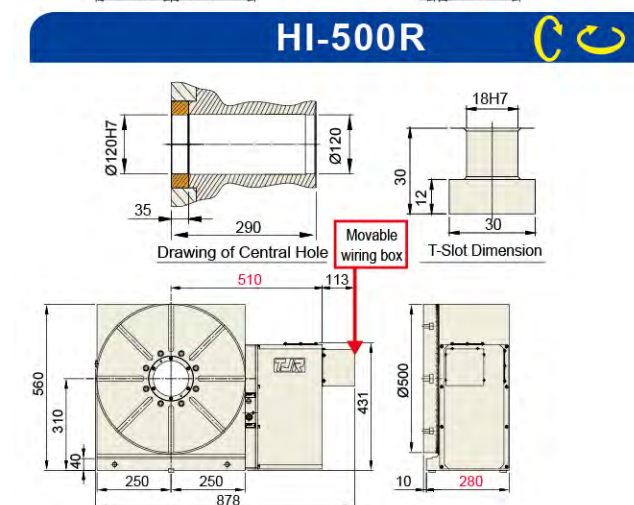
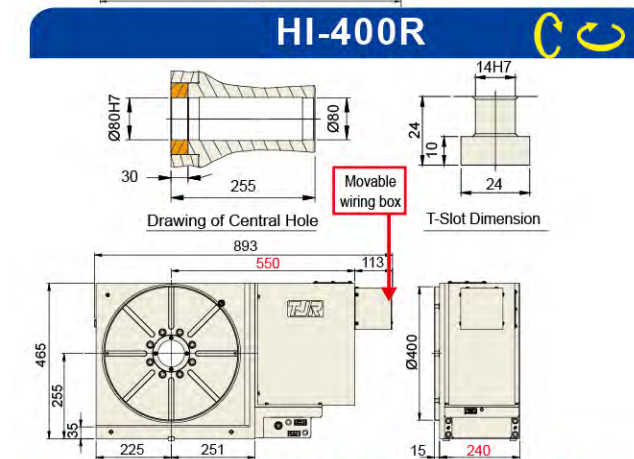
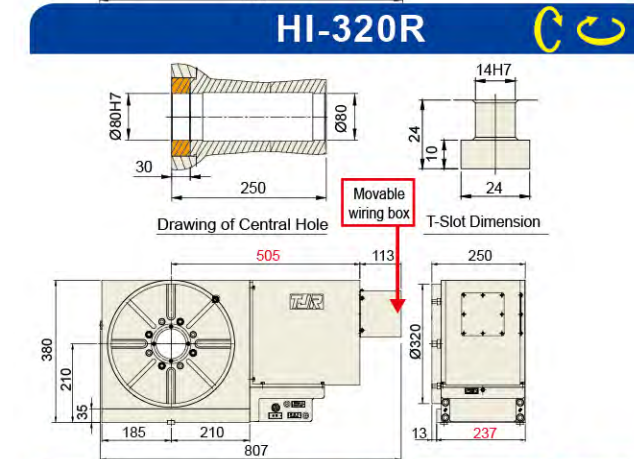
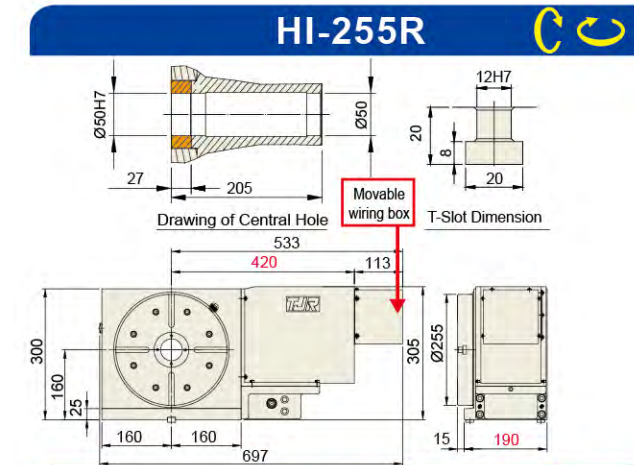


HI Series :
Use **three-piece** clutch plate

Function:

- ① Accuracy: ± 5 seconds
(Angle encoder accuracy)
- ② Rotate **without lifting the table** to prevent table from water and particles.

Item / Model		Unit	HI-255	HI-320	HI-400	HI-500
Table Diameter		mm	Ø 255	Ø 320	Ø 400	Ø 500
Inner Diameter of Mandrel Sleeve		mm	Ø 50H7	Ø 80H7	Ø 80H7	Ø 120H7
Diameter of Center Through Hole		mm	Ø 50	Ø 80	Ø 80	Ø 120
Center Height (Vertical)		mm	160	210	255	310
Table Height (Horizontal)		mm	205	250	255	290
Table T-slot Width		mm	12H7	14H7	14H7	18H7
Guide Block Width		mm	18h7	18h7	18h7	18h7
Min. Increment		deg.	1 or 5	1 or 5	1 or 5	1 or 5
Indexing Precision		sec.	± 5	± 5	± 5	± 5
Repeatability		sec.	± 1	± 1	± 1	± 1
Clamping System (Hydraulic)		kgf/cm ²	35	35	35	35
Clamping Torque		kgf·m	300	400	500	1000
Servo Motor Model	FANUC	-	βis8 (Taper shaft)	βis22 (Straight shaft)	βis22 (Straight shaft)	βis22 (Straight shaft)
	MITSUBISHI	Taper shaft	HG/HF-104 / 154	HG/HF-204	HG/HF-204	HG/HF-204
Speed Reduction Ratio		-	1 : 120	1 : 120	1 : 120	1 : 180
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)		r.p.m	33.3	25	25	16.6
Allowable Inertia Load Capacity (Horizontal)		kg.cm.sec ²	24.8	44.8	100	187.5
Allowable Workpiece Load	Vertical	kg	125	175	250	400
	with Support Table	kg	300	400	500	600
Allowable Thrust Load (with Rotary Table Clamping)	Horizontal	kg	300	350	500	600
	FxL	kgf	1600	2000	3000	4000
	FxL	kgf·m	175	250	300	600
	FxL	kgf·m	300	400	500	1000
Net Weight (servo motor excluded)		kg	120	210	320	410



▲ RTH-255

Hydraulic Brake Support Table (with Delay Valve)
When HI series is chosen, the corresponding support table should have a delay valve.

Non-CNC Hydraulic index table

HC Series (Hirth coupling hydraulic brake)

HC-255A/320A (Equal Parts)



Refer to page 10 for HC series application.

HC-255A

(for Both Vertical and Horizontal Applications) (A additional raiser must be employed whenever horizontal application is needed)



HC Series :
Use **three-piece** clutch plate

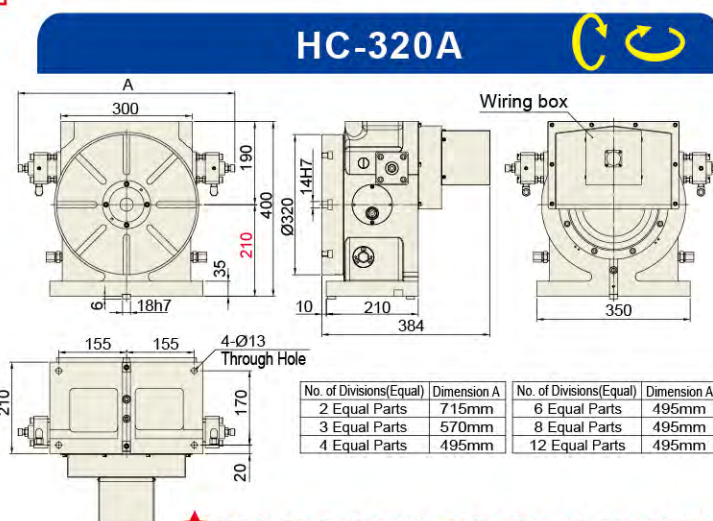
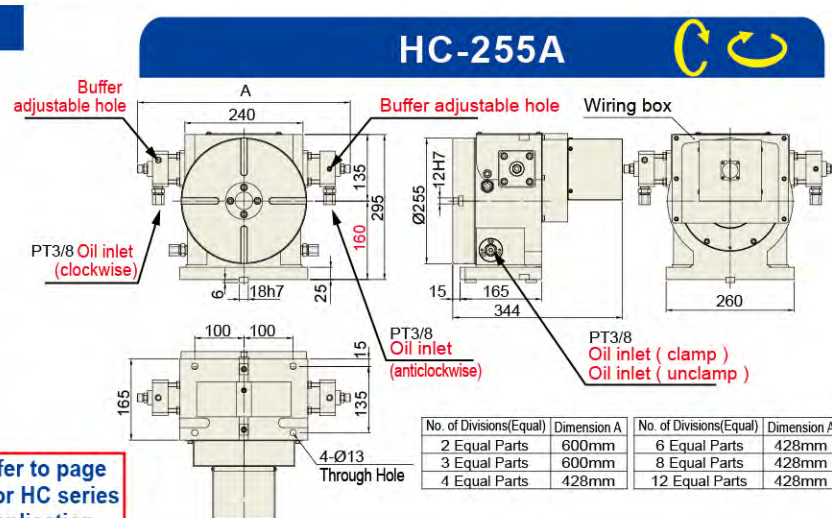
Function:

- ① Accuracy: ± 5 seconds (Angle encoder accuracy)
- ② Rotate **without lifting the table** to prevent table from water and particles.



Hydraulic Brake Support Table (with Delay Valve)

When HC series is chosen, the corresponding support table should have a delay valve.



★ If it is for horizontal application, please advise us when placing purchase order.

Item / Model	Unit	HC-255A	HC-320A	HHC-500
Table Diameter	mm	Ø 255	Ø 320	Ø 500
Inner Diameter of Mandrel Sleeve	mm	Ø 30H7 x 12deep	Ø 30H7 x 34deep	Ø 90H7 x 31deep
Diameter of Center Through Hole	mm	Ø 27	Ø 30	Ø 41
Center Height (Vertical)	mm	160	210	—
Table Height (Horizontal)	mm	180	220	260
Table T-slot Width	mm	12H7	14H7	18H7
Guide Block Width	mm	18h7	18h7	—
No. of Divisions (Equal)	deg.	2、3、4、6、8、12、24		
Indexing Precision	sec.	±5	±5	±5
Repeatability	sec.	±1	±1	±1
Clamping System (Hydraulic)	kgf/cm ²	35	35	35
Clamping Torque	kgf-m	154	280	995
Allowable Instant Inertia	kg.cm.sec ²	17.88	51.2	218
Allowable Workpiece Load	Vertical	kg	110	200
	Horizontal	kg	200	400
Allowable Thrust Load (with Rotary Table Clamping)	F	kgf	1300	1500
	FxL	kgf-m	94.5	136.5
	FxL	kgf-m	154	227.5
Rotating Torque	kgf-m	42	60	—
Rotary Table Total Weight	kg	65	98	214

Refer to page 30 for the top, front and side views

CHC Series (Flat type auto pallet changer)

CHC-500(700x910)
CHC-500(700x1090)



Hirth coupling hydraulic brake (180° to and fro)

For 3-axis-moving-column vertical machining center



CHC-700x910 (tray type APC) (optional hydraulic distributor)



HC Series :
Use **three-piece** clutch plate

Function:

- ① Accuracy: ± 5 seconds (Angle encoder accuracy)
- ② Rotate **without lifting the table** to prevent table from water and particles.

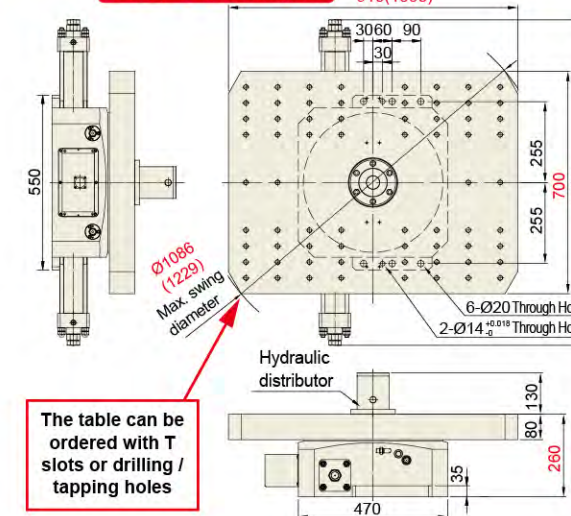


Pallet changing time is 4~5 seconds, which excludes PLC delayed time of machine

Item / Model	Unit	CHC-500(700x1090)
Table size	mm	□700 x 1090
Rotation method	—	Hydraulic gear
Rotation angle (Equal)	deg.	180° to and fro (2 equal)
Indexing Precision	sec.	±5
Repeatability	sec.	±1
Positioning method	—	3-piece clutch plate
Clamping System	kgf/cm ²	Hyd.35
Clamping force	kgf	4600
Allowable Workpiece Load	Horizontal	kg
Inspection accuracy		
Runout of table top during rotation	mm	0.02
Runout of table central hole	mm	0.01
Parallelism of table top to frame bottom	mm	0.02
Flatness of table top (Lower in the center)	mm	0.02
Total Weight	kg	525

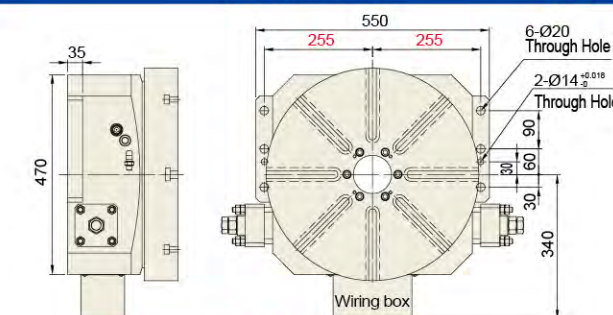
CHC-700x910 (Pallet changer)

Table size can be customized 910(1090)

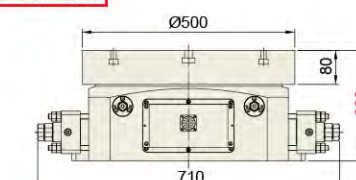
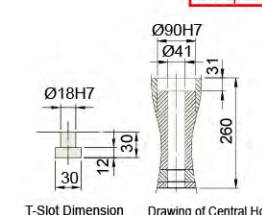


The table can be ordered with T slots or drilling / tapping holes

HHC-500



Refer to page 29 for the specification table.



Customized square plate is an alternative

Application diagram of auto pallet changer

(Available for 4-hole hydraulic distributor)



Application diagram: retrofits 3-axis-moving-column vertical machining center with CHC



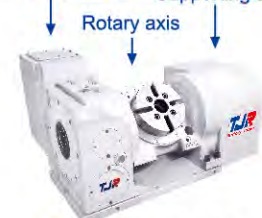
CNC Tilting Rotary Tables
Min. indexing angle -0.001°

FAR Series Dual-axis dual-arm type (Powerful Pneumatic Brake)

FAR(s)-125/125B/170A/170/170B



Tilting axis
Rotary axis
Supporting axis



▲ FAR(s)-125



▲ FAR(s)-170A(compact type)

Rotary axis Dual-lead
Alloy steel worm gear
(Optional)



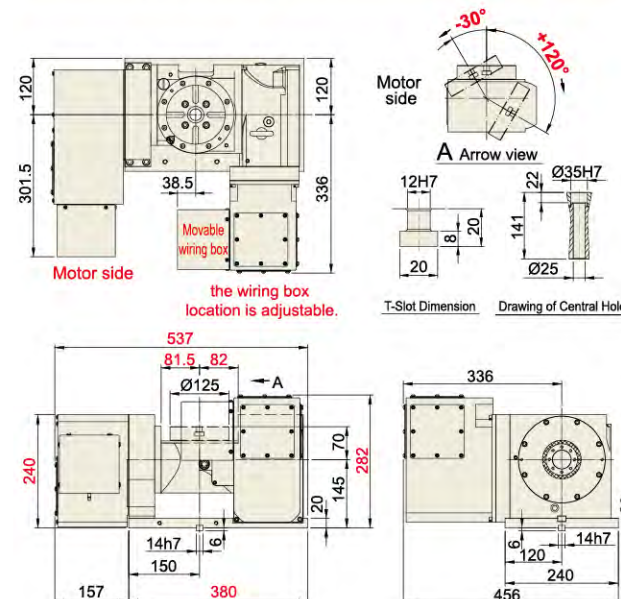
▲ FAR(s)-170



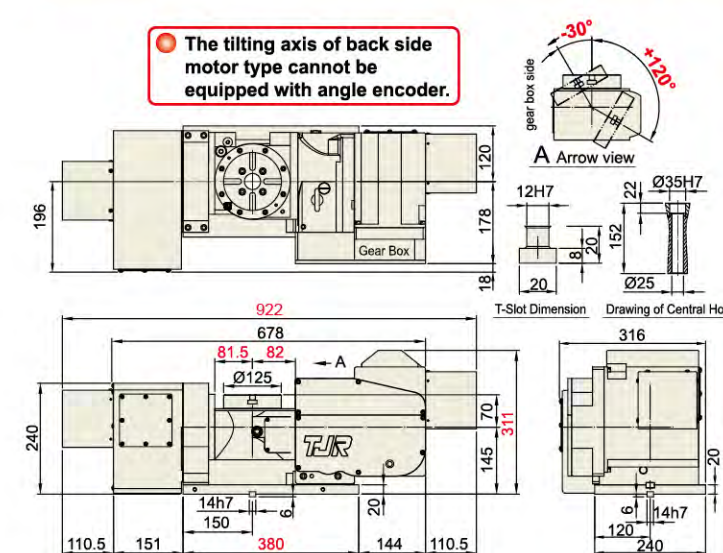
▲ Workpiece sample -
5 axis simultaneous
contouring

- Both the tilting axis and rotary axis use radial & axial bearings.
- Because the tilting axis normally needs to bear heavy load, Japanese-made worm and worm gear are employed to improve wear resistance and precision of tilting axis. **standard component** (It's wear life is 2.6 times longer than aluminum bronze PBC3.)
- Anti-wear alloy steel worm gear is optional
- A hydraulic brake for tilting axis is optional.

FAR(s)-125(Standard type)

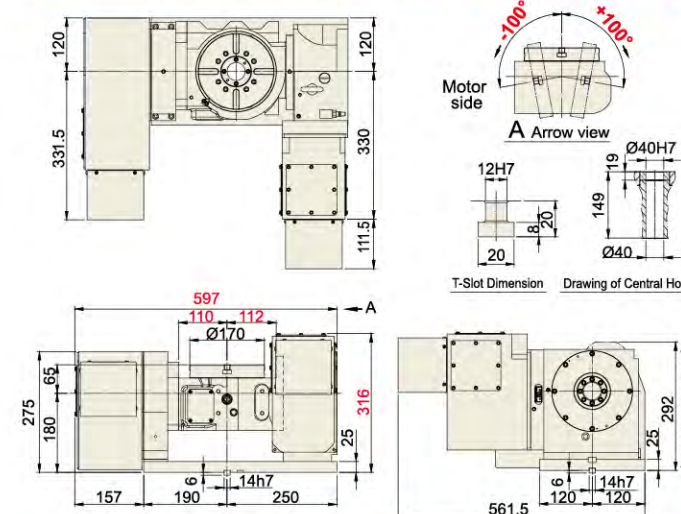


FAR(s)-125B (Back side motor type)



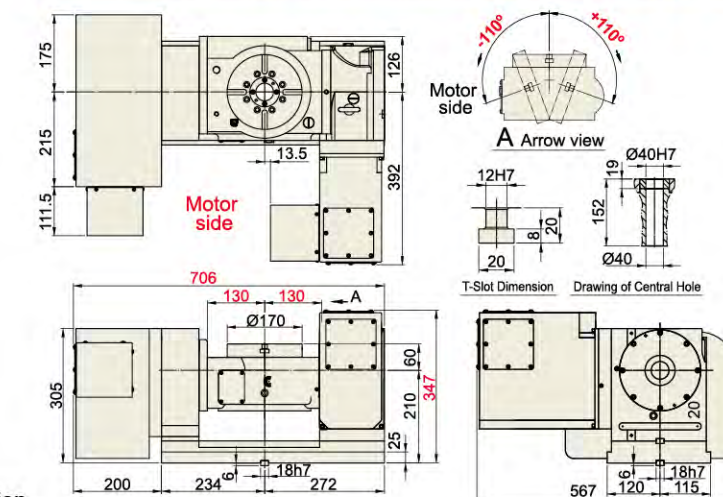
FAR(s)-170A

FAR(s)-170HA
(Compact type)



FAR(s)-170

FAR(s)-170HB
(Standard type)



Item / Model		Unit	FAR(s)-125/125B		FAR(s)-170A(Compact type)		FAR(s)-170(Standard type)/FAR(s)-170B(Back side motor type)	
Table Diameter		mm	Ø125		Ø170		Ø170	
Inner Diameter of Mandrel Sleeve		mm	Ø 35H7 (Diameter of Table Central Hole)		Ø40H7		Ø40H7	
Diameter of Center Through Hole		mm	Ø25		Ø40		Ø40	
Table Height (Horizontal)		mm	215		245		270	
Table T-slot Width		mm	12H7		12H7		12H7	
Guide Block Width		mm	14h7		18h7		18h7	
Axis		-	Rotation	Tilt $(-30^\circ \sim +120^\circ)$	Rotation	Tilt $\pm 100^\circ$	Rotation	Tilt $\pm 100^\circ$
Min. Increment		deg.	0.001	0.001	0.001	0.001	0.001	0.001
Indexing Precision (while tilt $0^\circ \sim +90^\circ$)		sec.	40	60^{*1}	20	60^{*1}	20	60^{*1}
Repeatability		sec.	6	8	6	8	6	8
Clamping System (Pneumatic)		kgf/cm ²	6	6	6	6	6	6
Clamping Torque		kgf-m	13	31	25	31	31	31
Servo Motor Model	FANUC	Taper/Straight shaft	αis4 / βis4	αiF4 / βis8	αiS4 / βis4	αiF4 / βis8	αiF4 / βis8	αiF8 / αis12 / βis12
	MITSUBISHI	Taper/Straight shaft	HG/HF-75 / 105	HG/HF-54 / 104	HG/HF-75 / 105	HG/HF-54 / 104	HG/HF-54 / 104	HG/HF-104
Speed Reduction Ratio		-	1 : 60	1 : 90	1 : 72	1:120 / SIEMENS 1:90	1 : 90	1 : 90
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)		r.p.m	44.4 *(33.3)	44.4 *(33.3)	33.3 *(33.3)	25 *(16.6)	33.3 *(33.3)	33.3 *(16.6)
Allowable Inertia Load Capacity (Horizontal)		kg.cm.sec ²	0.97		2.2		2.7	
Allowable Workpiece Load	0° Horizontal	kg	50		60		75	
	0°~90° Tilt	kg	35		40		50	
Allowable Thrust Load (with Rotary Table Clamping)	F	kgf	400		600		750	
	FxL	kgf-m	31		31		31	
	FxL	kgf-m	13		25		31	
Driving Torque (Rotary axis)		kgf-m	9 *(3.7)		18 *(14.6)		18 *(14.6)	
Net Weight (servo motor excluded)		kg	97 / -		125		153	

* () Alloy Steel worm & gear series

*1. Indexing precision can be better after installing an additional angle encoder. Please refer to the table on page 70 for more details.

★ Dual-lead alloy steel worm & gear for the rotary axis is optional.

★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.

CNC Tilting Rotary Tables
Min. indexing angle -0.001°

FAR Series

Dual-axis single-arm type
(Pneumatic Brake)

FAR(s)-160SN

Dual-axis dual-arm type
(Powerful Pneumatic Brake)

FAR(s)-210/210B/210L

4
FEATURES



Rotary axis Dual-lead
Alloy steel worm gear
(Optional)

1 Both the tilting axis and rotary axis use radial & axial bearings.

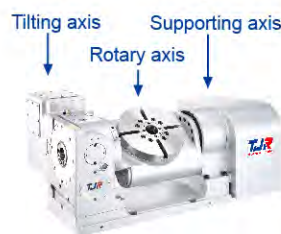
2 Because the tilting axis normally needs to bear heavy load, Japanese-made worm and gear are employed to improve wear resistance and precision of tilting axis. **standard component** (It's wear life is 2.6 times longer than aluminum bronze PBC3.)

3 Anti-wear alloy steel worm gear is optional

4 A hydraulic brake for tilting axis is optional.



▲ FAR(s)-160SN
(single-arm type)
Alloy steel worm gear
(Optional)



▲ FAR(s)-210 (Standard type)

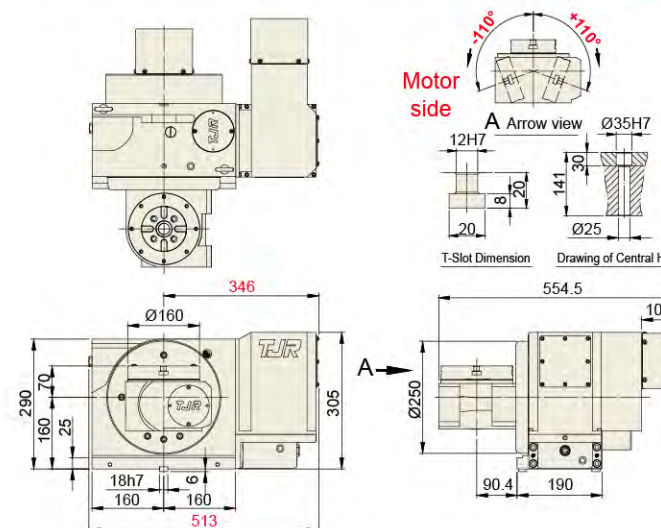


▲ FAR(s)-210B
(Back side motor type)

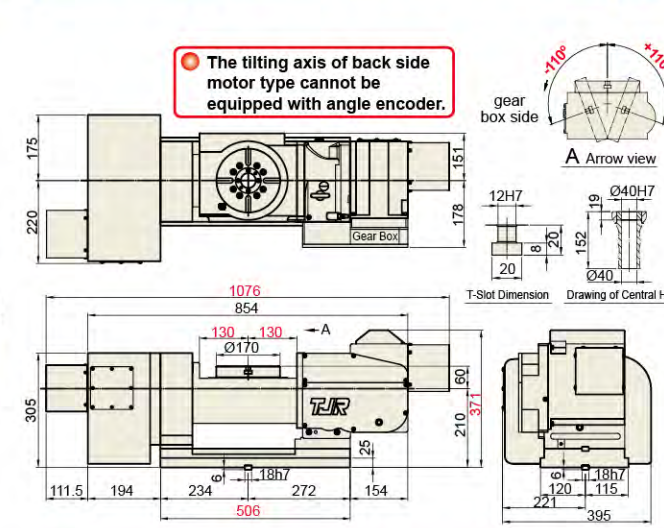


Installation of
5C Chuck

FAR(s)-160SN (Single-arm type)

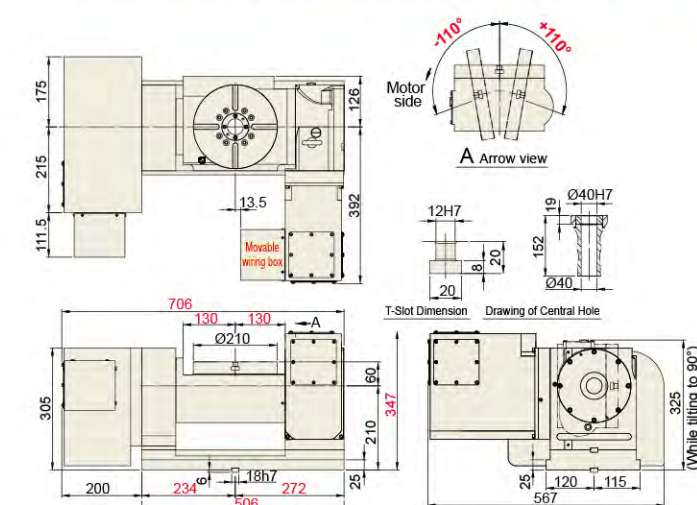


FAR(s)-170B FAR(s)-170HB (Back side motor type)

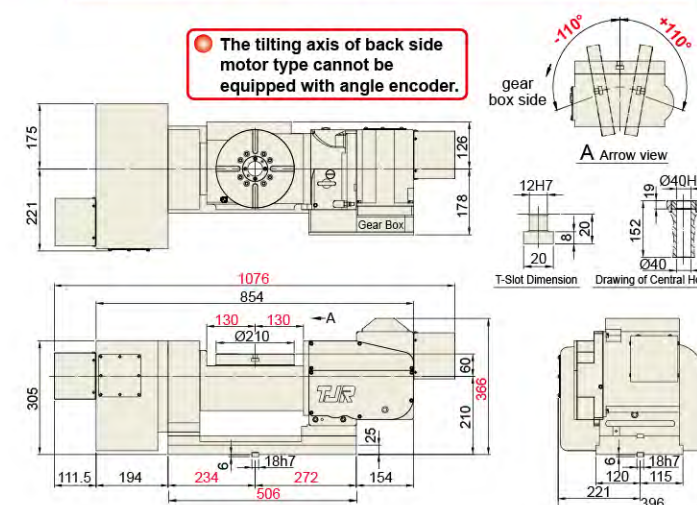


Remark: Please refer to Page 32 for the specification of FAR-170B

FAR(s)-210 FAR(s)-210H (Standard type)



FAR(s)-210B FAR(s)-210HB (Back side motor type)



Item / Model	Unit	FAR(s)-160SN(single-arm type)		FAR(s)-210 (Standard type)		FAR(s)-210B (Back side motor type)	
Table Diameter	mm	Ø160		Ø210		Ø210	
Inner Diameter of Mandrel Sleeve	mm	Ø35H7x30 deep (Diameter of Table Central Hole)		Ø40H7		Ø40H7	
Diameter of Center Through Hole	mm	Ø25		Ø40		Ø40	
Table Height (Horizontal)	mm	230		270		270	
Table T-slot Width	mm	12H7		12H7		12H7	
Guide Block Width	mm	18h7		18h7		18h7	
Axis	-	Rotation	Tilt $\pm 110^\circ$	Rotation	Tilt $\pm 100^\circ$	Rotation	Tilt $\pm 100^\circ$
Min. Increment	deg.	0.001	0.001	0.001	0.001	0.001	0.001
Indexing Precision (while tilt $0^\circ \sim +90^\circ$)	sec.	40	60	20	60^{+1}	20	60^{+1}
Repeatability	sec.	6	8	6	8	6	8
Clamping System (Pneumatic)	kgf/cm ²	Pne.5	35	6	6 / Hyd.35 (optional)	6	6 / Hyd.35 (optional)
Clamping Torque	kgf-m	13	70	31	31 / Hyd.55	31	31 / Hyd.55
Servo Motor Model	FANUC	Taper/Straight shaft	α is4 / β is4	α iF8 / β is8	α iF4 / β is8	α iF8 / α is12 / β is12	α iF4 / β is8
	MITSUBISHI	Taper/Straight shaft	HF-KP43JW04-S6 / HG-56	HF/HG-154	HG/HF-54/104	HG/HF-104	HG/HF-54/104
Speed Reduction Ratio	-	1 : 60	1 : 120	1 : 90	1 : 90	1 : 90	1 : 90
Max. Rotation Rate of Table (Calculate with Fanuc or Motor)	r.p.m	44.4 *(33.3)	16.6 *(11.1)	33.3 *(33.3)	33.3 *(16.6)	33.3 *(33.3)	33.3 *(16.6)
Allowable Inertia Load Capacity (Horizontal)	kg.cm.sec ²	0.8		4.13		4.13	
Allowable Workpiece Load	0° Horizontal	kg	25	75		75	
	0°~90° Tilt	kg	20	50		50	
Allowable Thrust	F	kgf	600	750		750	
Load (with Rotary Table Clamping)	FxL	kgf-m	25	Pne.31 / Hyd.55		Pne.31 / Hyd.55	
	FxL	kgf-m	13	31		31	
Driving Torque (Rotary axis)	kgf-m	9(3.7)		18 *(14.6)		18 *(14.6)	
Net Weight (servo motor excluded)	kg	116		160		163	

*() Alloy Steel worm & gear series

*1. Indexing precision can be better after installing an additional angle encoder. Please refer to the table on page 70 for more details.

★ The shown dimensional drawings of FAR-160SN are not suitable for Fanuc but most of servo control. Another dimensional drawing can be given when Fanuc motors are employed.

CNC Tilting Rotary Tables
Min. indexing angle -0.001°

FHR Series Dual-axis dual-arm type (Hydraulic Brake)

FHR-400CF
FHR-401C-700-HR400B



▲ FHR-400CF (Cradle type)

4
FEATURES



1 Both the tilting axis and rotary axis use large-diameter radial & axial bearings.



2 Because the tilting axis normally needs to bear heavy load, Japanese-made worm and worm gear are employed to improve wear resistance and precision of tilting axis. **standard component**
(It's wear life is 2.6 times longer than aluminum bronze PBC3.) (except for FHR-500C/630C)

3 Max. tilting angle: $\pm 110^{\circ}$



▲ FHR-400C-540-HR400B
(Cradle type)

4 The tilting, supporting, and rotary axis are all equipped with the hydraulic-brake mechanisms. (Employing three independent hydraulic drum-brake systems)



▲ FHR-401C-820-HR400B
(Single plate)



▲ FHR-401C-820-3-HR400B
(Three plates)

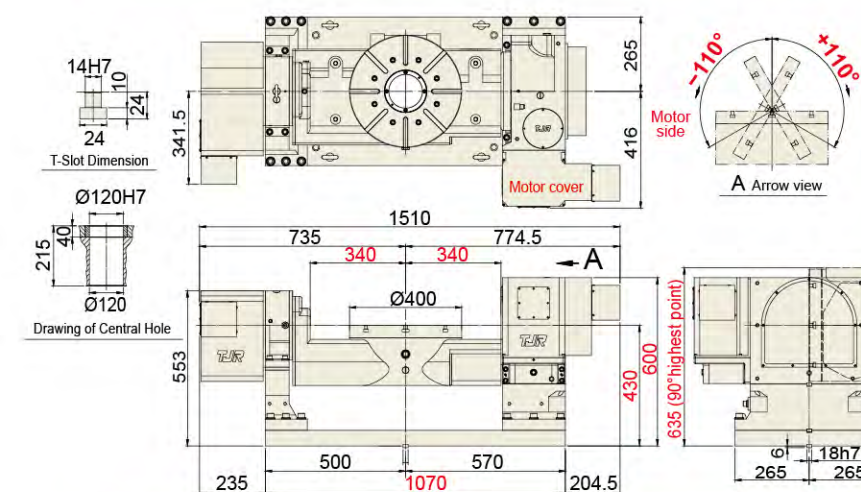
Item / Model		Unit	FHR-400CF (Cradle type)		FHR-400C-540-HR400B (Cradle type)		FHR-401C-820-HR400B (Cradle type)	
Table Diameter		mm	Ø 400		Ø 400		Ø 400	
Inner Diameter of Mandrel Sleeve		mm	Ø 120H7x40 deep		Ø 120H7x35 deep		Ø 120H7x35 deep	
Diameter of Center Through Hole		mm	Ø 120		Ø 120		Ø 105	
Table Height (Horizontal)		mm	430		380		410	
Table T-slot Width		mm	14H7		14H7		14H7	
Guide Block Width		mm	18h7		18h7		18h7	
Axis		-	Rotation	Tilt $\pm 110^{\circ}$	Rotation	Tilt $\pm 110^{\circ}$	Rotation	Tilt $\pm 110^{\circ}$
Min. Increment		deg.	0.001	0.001	0.001	0.001	0.001	0.001
Indexing Precision (while tilt $0^{\circ} \sim +90^{\circ}$)		sec.	15	$60^{\circ}1$	15	$60^{\circ}1$	15	$60^{\circ}1$
Repeatability		sec.	6	8	6	8	6	8
Clamping System (Hydraulic)		kgf/cm ²	35	35	35	35	35	35
Clamping Torque		kgf-m	115	175	115	275	115	275
Servo Motor Model	FANUC	Taper/Straight shaft	aiF8/ais12/Bis12(Straight)	aiF12/Bis22(Straight)	ais12	aiF22	aiF8/ais12/Bis12(Taper)	aiF22 / Bis22(Straight)
	MITSUBISHI	Straight shaft without key	HG/HF-154	HG/HF-354	HF/HG-154	HF/HG-354	HF/HG-154	HF/HG-354
Speed Reduction Ratio		-	1 : 120	1 : 120	1 : 120	1 : 120	1 : 120	1 : 120
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)		r.p.m	25	16.6	25	16.6	25	16.6
Allowable Inertia Load Capacity (Horizontal)		kg.cm.sec ²	40		44		44	
Allowable Workpiece Load	0° Horizontal	kg	200		220		220	
	$0^{\circ} \sim 90^{\circ}$ Tilt	kg	100		120		120	
Allowable Thrust Load (with Rotary Table Clamping)	F	kgf	1800		1800		1800	
	FxL	kgf-m	175		275		275	
	FxL	kgf-m	115		115		115	
Driving Torque(Rotary axis)		kgf-m	80		80		80	
Net Weight (servo motor excluded)		kg	818		702		958	

*1. Indexing precision can be better after installing an additional angle encoder.
Please refer to the table on page 70 for more details.

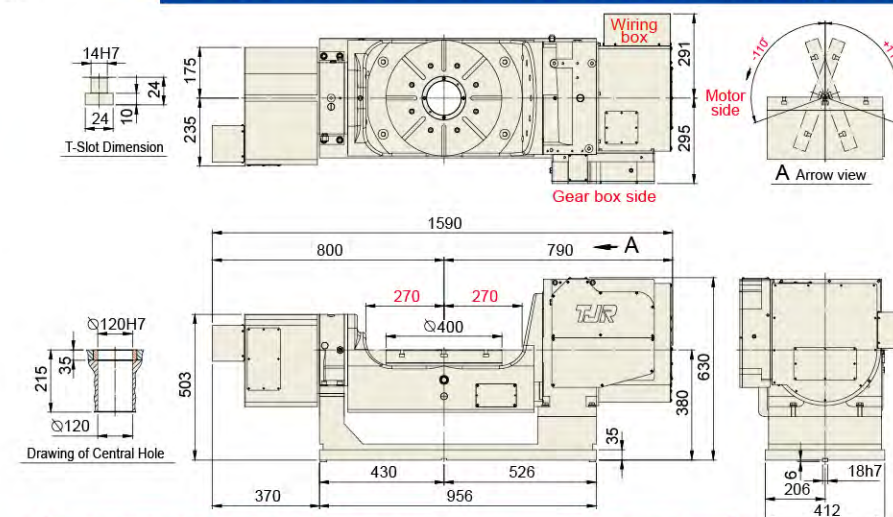
★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.

FHR-400CF (Cradle type)

The model is recommended for workpiece made of light material such as aluminum or copper.

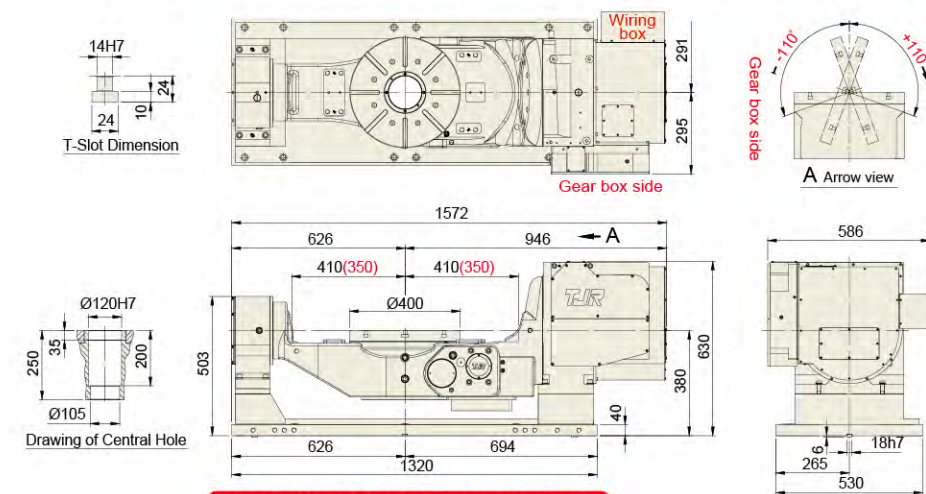


FHR-400C-540-HR400B (Cradle type)



A 6-port rotary joint and an angle encoder can be accommodated at the same time.

FHR-401C-820-HR400B (Cradle type)



6-port rotary joint can be accommodated.

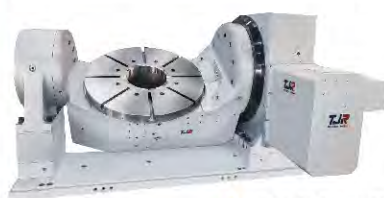
CNC Tilting Rotary Tables
Min. indexing angle -0.001°

FHR Series Dual-axis dual-arm type (Hydraulic Brake)

FHR-500C / FHR-650C



FHR-500C
(dual-arm, cradle type)



FHR-650C
(dual-arm, cradle type)

4
FEATURES



- Both the tilting axis and rotary axis use **large-diameter radial & axial bearings**.
- Because the **tilting axis** normally needs to bear heavy load, **Japanese-made** worm and worm gear are employed to improve wear resistance and precision of tilting axis. **standard component**
(It's wear life is **2.6** times longer than aluminum bronze PBC3.) (except for FHR-500C/630C)



- The tilting, supporting, and rotary axis are all equipped with the hydraulic-brake mechanisms. (Employing **three independent hydraulic drum-brake systems**)

- Max. tilting angle: $\pm 110^{\circ}$



FCHR-650S-550
(Single-arm, **pallet change type**)

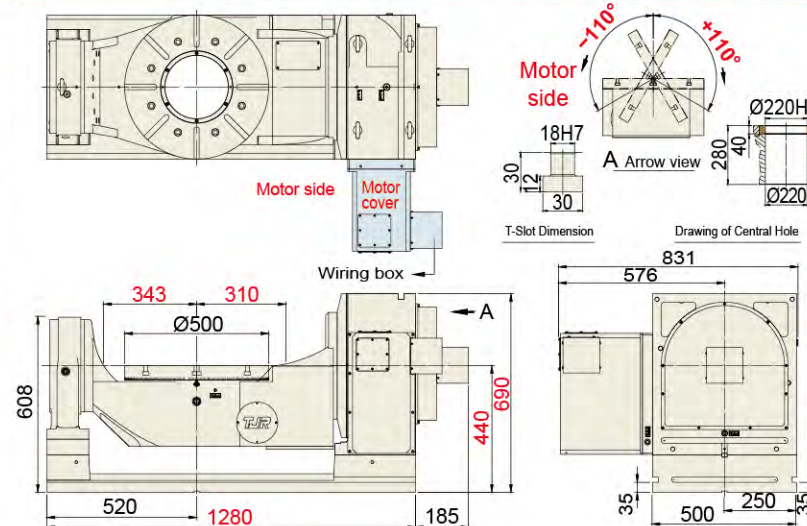


(pallet change type)

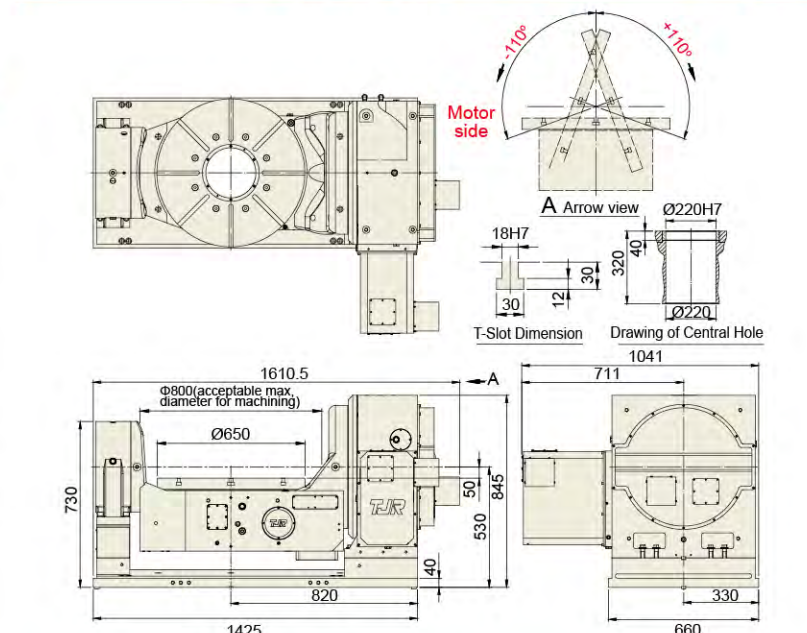


Artificial intelligence (AI) rotary table provides 4 foolproof functions to save your money and time.

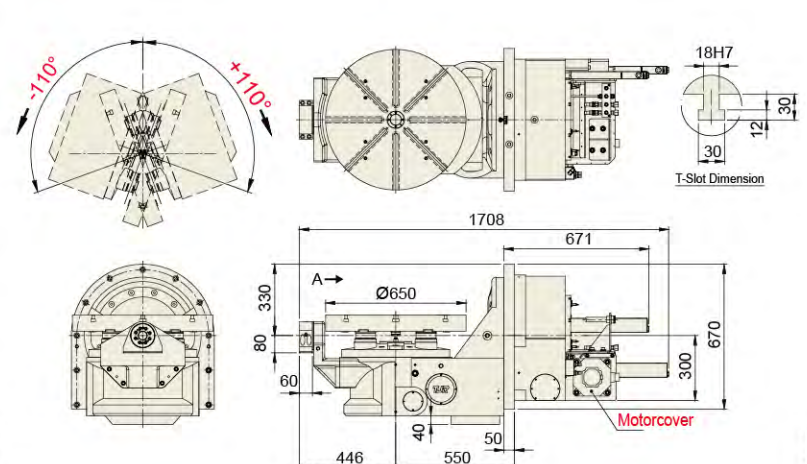
FHR-500C (Dual-arm / Cradle type)



FHR-650C (Dual-arm / Cradle type)



FCHR-650S-550 (pallet change type)



Item / Model		Unit	FHR-500C(dual-arm, cradle type)		FHR-650C(dual-arm, cradle type)		FCHR-650S-550(Single-arm, pallet change type)	
Table Diameter		mm	$\varnothing 500$		$\varnothing 650$		$\varnothing 650$	
Inner Diameter of Mandrel Sleeve		mm	$\varnothing 220H7$		$\varnothing 220H7$		$\varnothing 50H7 \times 27$ deep	
Diameter of Center Through Hole		mm	$\varnothing 220$		$\varnothing 220$		-	
Table Height (Horizontal)		mm	440		480		-	
Table T-slot Width		mm	18H7		18H7		18H7	
Guide Block Width		mm	18h7		18h7		-	
Axis		-	Rotation	Tilt $\pm 110^{\circ}$	Rotation	Tilt $\pm 110^{\circ}$	Rotation	Tilt $\pm 110^{\circ}$
Min. Increment		deg.	0.001	0.001	0.001	0.001	0.001	0.001
Indexing Precision (while tilt $0^{\circ} \sim +90^{\circ}$)		sec.	15	$60^{\circ}1$	15	$60^{\circ}1$	$15^{\circ}1$	$60^{\circ}1$
Repeatability		sec.	6	8	6	8	6	8
Clamping System (Hydraulic)		kgf/cm ²	35	35	35	35	35	35
Clamping Torque		kgf-m	370	410	370	800	370	500
Servo Motor Model	FANUC	Straight shaft	$\alpha i F12 / \beta i s22$	$\alpha i F22 / \beta i s30$	$\alpha i F12$	$\alpha i F30$	$\alpha i F12$	$\alpha i F40$
	MITSUBISHI	Straight shaft	HG/HF-204	HG/HF-354	HG/HF-204	HG/HF-703	HG/HF-204	HG/HF-703
Speed Reduction Ratio		-	1 : 120	1 : 180	1 : 120	1 : 180	1 : 120	1 : 150
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)		r.p.m	25	11.1	25	11.1	25	13.3
Allowable Inertia Load Capacity (Horizontal)		kg.cm.sec ²	93.75		158.4		154.8	
Allowable Workpiece Load	0° Horizontal	kg	500		500		250	
	$0^{\circ} \sim 90^{\circ}$ Tilt	kg	300		400		250	
Allowable Thrust Load (with Rotary Table Clamping)	F	kgf	3000		3200		-	
	FxL	kgf-m	410		800		500	
	FxL	kgf-m	370		370		370	
Driving Torque (Rotary axis)		kgf-m	250		250		250	
Net Weight (servo motor excluded)		kg	1091		1867		1434 (including 2 pallets)	

*1. Indexing precision can be better after installing an additional angle encoder. Please refer to the table on page 70 for more details.

★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.

★ Two pallets is the standard offer. If you need more pallets, please consult with TJR.

★ It excludes the pallet change mechanism which should be designed and manufactured by the machine tool manufacturers.

CNC Tilting Rotary Tables

FHR Series

Dual-axis single-arm type

(Hydraulic Brake)

FHR-400S

FHR-650S-525

FHR-650S-550



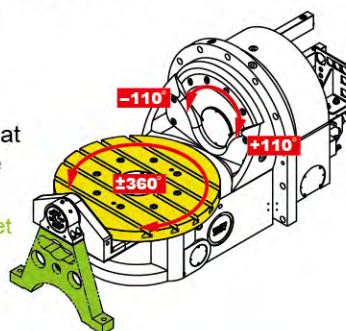
FHR-400S ▲



▲ **FHR-650S-525**

The illustration of additional supporting seat whose thickness can be tailor-made

The supporting seat bracket
(Made by the buyer
[machine tool builder])



Item / Model		Unit	FHR-400S		FHR-650S-525 / 550	
Table Diameter		mm	Ø 400		Ø 650	
Inner Diameter of Mandrel Sleeve		mm	Ø 120H7x35 deep		-	
Diameter of Center Through Hole		mm	Ø 105		-	
Table Height (Horizontal)		mm	-		-	
Table T-slot Width		mm	14H7		18H7	
Guide Block Width		mm	-		-	
Axis		-	Rotation	Tilt ±110°	Rotation	Tilt ±110°
Min. Increment		deg.	0.001	0.001	0.001	0.001
Indexing Precision (while tilt 0°~+90°)		sec.	15	60	15	60 ^{*1}
Repeatability		sec.	6	8	6	8
Clamping System (Hydraulic)		kgf/cm ²	35	35	35	35
Clamping Torque		kgf·m	115	200	370	500
Servo Motor Model	FANUC	-	ais12	aiF22 (Straight)	aiF12	aiF40 (Straight)
	MITSUBISHI	Straight shaft	HG/HF-154	HG/HF-354	HF-204	HF-703
Speed Reduction Ratio		-	1 : 120	1 : 150	1 : 120	1 : 150
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)		r.p.m	25	13.3	25	13.3
Allowable Inertia Load Capacity (Horizontal)		kg.cm.sec ²	44		158.4	
Allowable Workpiece Load	0°Horizontal 	kg	220		500	
	0°~90°Tilt 	kg	120		300	
Allowable Thrust Load (with Rotary Table Clamping)	F 	kgf	1800		-	
	FxL 	kgf·m	200		500	
	FxL 	kgf·m	115		370	
Driving Torque (Rotary axis)		kgf·m	80		250	
Net Weight (servo motor excluded)		kg	482		1120	

*1. Indexing precision can be better after installing an additional angle encoder.

Please refer to the table on page 70 for more details.

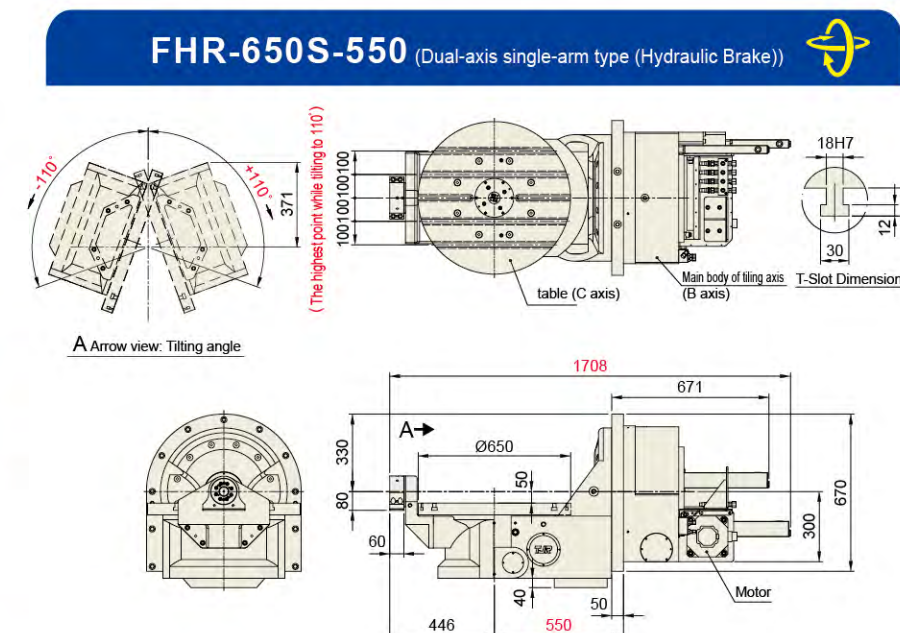
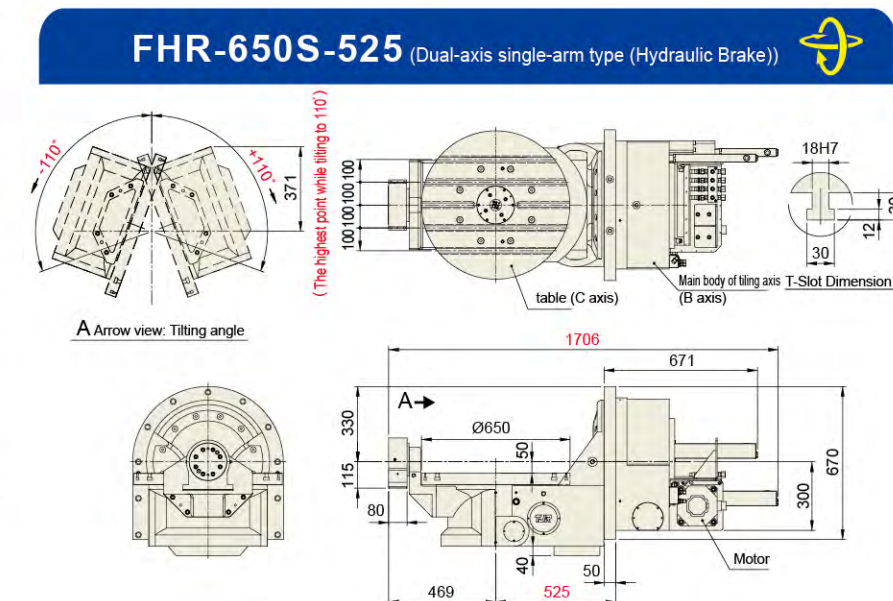
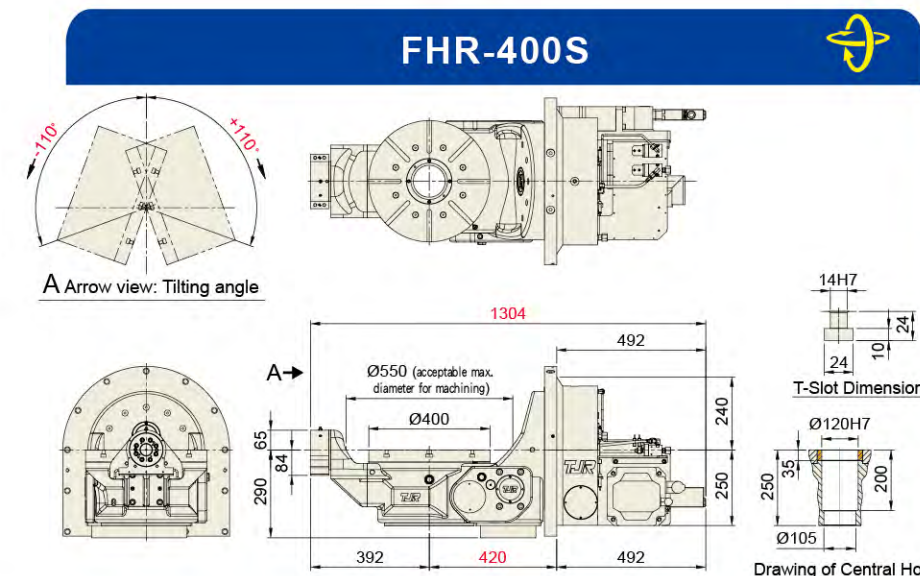
★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.



▲ FHR-650S-550



**Please see page 57 & 58
for FHR-350F-2W-RC320-2A**



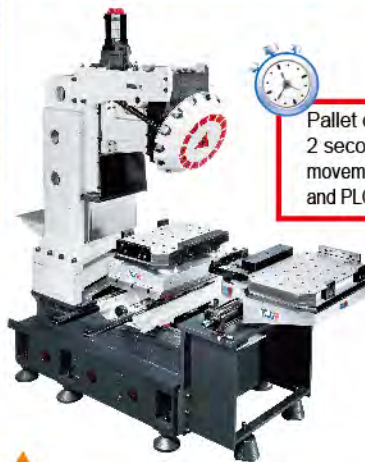
CURC series

(Hook type CNC auto pallet changer)

CURC-500x700

(Table size can be customized)(180° to and fro)

For C type vertical machining center or drilling & tapping center



Pallet changing time is around 2 seconds, which excludes the movements of the plate rise & fall and PLC delayed time of machine.

Application diagram:
retrofits vertical machining center with CURC-500x700

Item / Model	Unit	CURC-500x700
Lift-up mechanism	-	Hook type (U type)
Table size	mm	500 x 700
Rotation method	-	Servo motor
Rotation angle	deg.	180° to and fro
Clamping System (Hydraulic)	kgf/cm ²	35
Positioning method	-	Cone positioning
Clamping force(35kg/cm ²)	kgf	960x4=3840
Operating System (Up&Down&Rotate)	kgf/cm ²	Hyd.35
Lifting thrust force	kgf	2200
Up and down travel of the pallet	mm	60
Servo Motor Model	FANUC	βis12
	DELTA	ECMA-E 1320GS
	MITSUBISHI	HG-224
Speed Reduction Ratio	-	1 : 90
Allowable Workpiece Load	Horizontal	kg 250x2=500
Inspection accuracy		
Repeatability accuracy on positioning of the same pallet	mm	0.01
Max. positioning tolerance for 2 pallets	mm	0.02
Parallelism of pallet top and base bottom	mm	0.02
Net weight of saddle and one faceplate	kg	712

A living legend create a surprising exchange mechanism

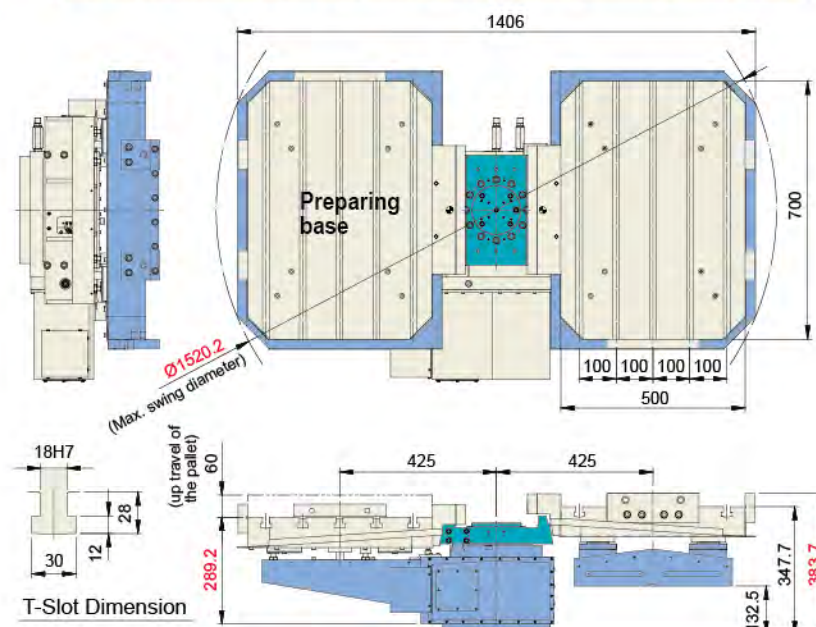
Auto pallet changer chapter

Beyond the rotational inertia
Reach unimaginable stability



CURC-500x700
(Hook type CNC auto pallet changer)
Driven by Roller Gear Cam

Driven by Roller Gear Cam
CURC-500x700 (Hook type auto pallet changer)



CTU series

(Hook type auto pallet changer)

CTU-400x600 / 500x700

(Table size can be customized)(180° to and fro)

For C type vertical machining center or drilling & tapping center

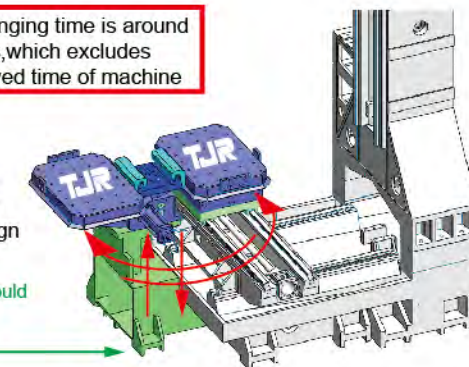


CTU-500x700 (hook type APC)

Pallet changing time is around 6 seconds, which excludes PLC delayed time of machine

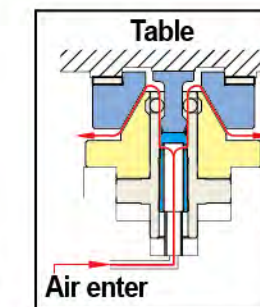
The location of CTU can vary, depending on the machine design & dimensions.

Green color section should be made by the buyer (machine tool builder)



Application diagram: retrofits vertical machining center with CTU

Item / Model	Unit	CTU-400x600	CTU-500x700
Lift-up mechanism	-	Hook type (U type)	Hook type (U type)
Table size	mm	□ 400 x 600	□ 500 x 700
Rotation method	-	Hydraulic hirth coupling	Hydraulic hirth coupling
Rotation angle	deg.	180° to and fro	180° to and fro
Clamping System (Hydraulic)	kgf/cm ²	35	35
Positioning method	-	Cone positioning	Cone positioning
clamping force of positioning cones (35kg/cm ²)	kgf	960x4=3840	960x4=3840
Operating System(Up & Down & Rotate)	kgf/cm ²	Hyd.45	Hyd.45
Lifting thrust force	kgf	2860	2860
Up and down travel of the pallet	mm	60	60
Allowable Workpiece Load	Horizontal	kg 250x2=500	250x2=500
Inspection accuracy			
Repeatability accuracy on positioning of the same pallet	mm	0.01	
Max. positioning tolerance for 2 pallets	mm	0.02	
Parallelism of pallet top and base bottom	mm	0.02	

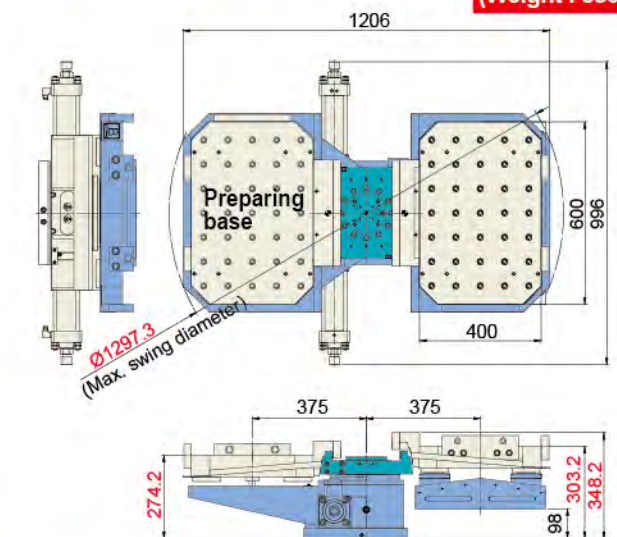


The function of cones :
① Precise positioning
② Air blast for chip removal
③ Airtight testing

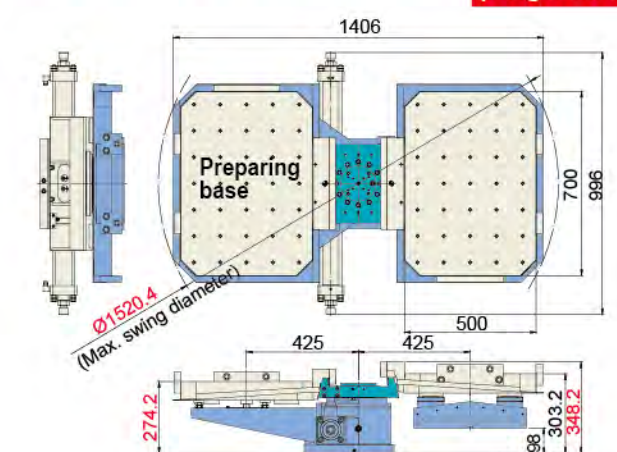


Cones:
Powerful hydraulic clamping

CTU-400x600 (The type of hook plate fixed on the exchanging mechanism.)
(Weight : 530kg)



CTU-500x700 (The type of hook plate fixed on the exchanging mechanism.)
(Weight : 603kg)

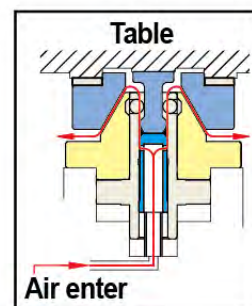


CHI/CHR Series

(Dual pallets rotary table)

CHI-400 (1° or 5°) Hirth coupling hydraulic brake

CHR-400 (0.001°) Hydraulic Brake
For horizontal machining center



The function of cones :
① Precise positioning
② Air blast for chip removal
③ Airtight testing



Cones:
Powerful hydraulic clamping

▲ CHI-400 (1°)- Dual pallets rotary table (Flat bottom type)



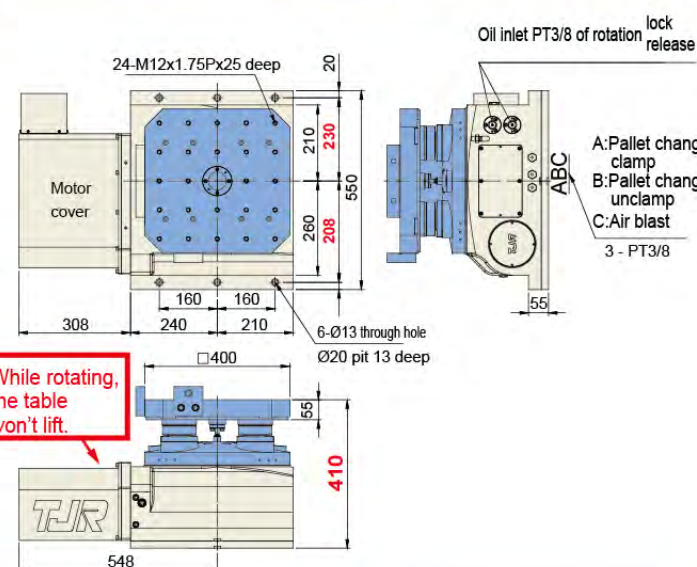
CHI Series :
Use **three-piece** clutch plate

Function: ① Accuracy: ± 5 seconds
② Rotate **without lifting the table** to prevent table from water and particles.



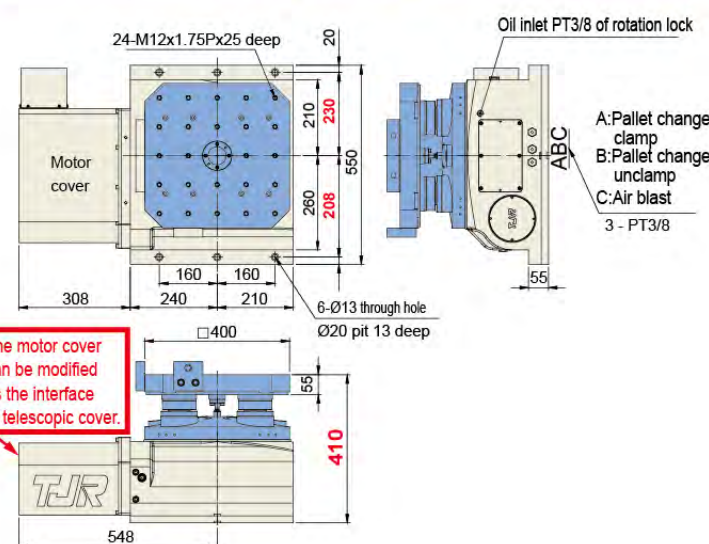
CHR series :
Use **large-diameter** radial & axial bearings

CHI-400 (1° or 5°) (Flat bottom type)



While rotating, the table won't lift.

CHR-400 (0.001°) (Flat bottom type)



The motor cover can be modified as the interface of telescopic cover.

Item / Model	Unit	CHI-400	CHR-400
Table size	mm	□400x400	□400x400
Diameter of Table Central Hole	mm	Ø50x27 deep	Ø50x27 deep
Table height	mm	410	410
Table T-slot Width	mm	14H7	14H7
Guide Block Width	mm	18h7	18h7
Min. Increment	deg.	1 or 5	0.001
Indexing Precision	sec.	± 5	15
Repeatability	sec.	± 1	6
Clamping force of positioning cones	kgf	960x4=3840	960x4=3840
Clamping System (Hydraulic)	kgf/cm ²	35	35
Clamping Torque	kgf-m	500	200
Servo Motor Model		FANUC Straight shaft without key	aiF12 / bis22 HG/HF-204
Speed Reduction Ratio	-	1 : 120	1 : 120
Max. Rotation Rate of Table (Calculate with Fanuc a Motor)	r.p.m	25	25
Allowable Workpiece Load	kg	400	400
Driving Torque	kgf-m	-	170
Net Weight (servo motor excluded)	kg	410	-

CTH Series

(Tray type auto pallet changer)

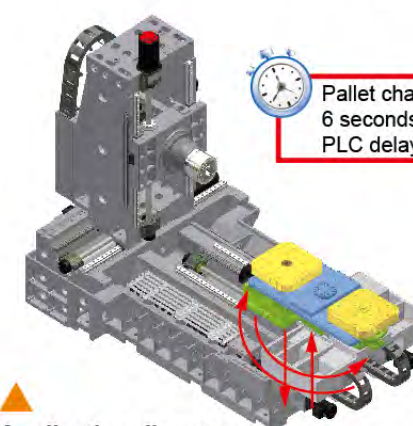
CTH-400 (Go with CHI/CHR series)

For horizontal machining center

(180° to and fro)



▲ CTH-400 (Tray type APC)



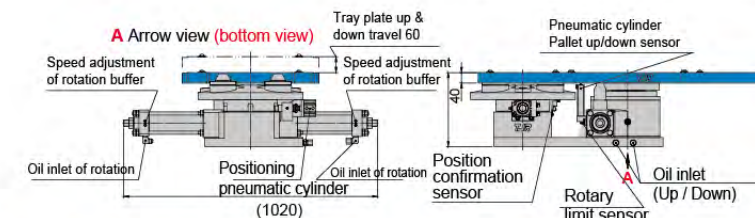
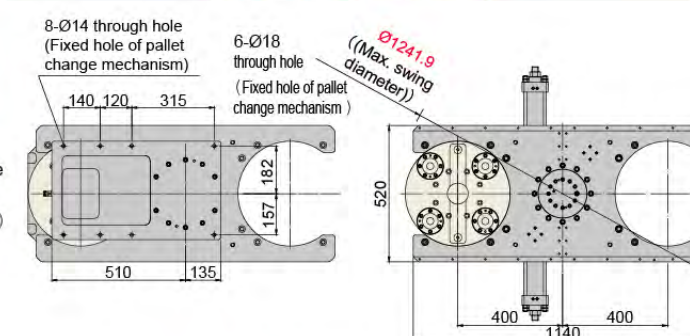
Application diagram:
retrofits horizontal machining center with CTH+ CHI

Pallet changing time is around 6 seconds, which excludes PLC delayed time of machine



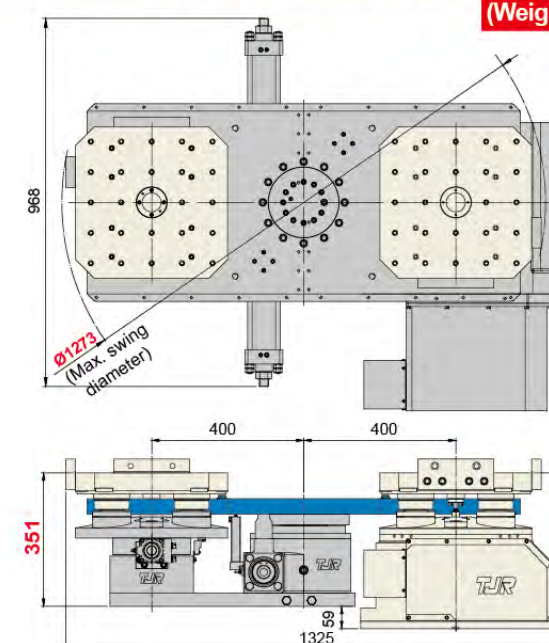
▲ CTH-400 + CHI-400 Tray type APC + Dual pallets rotary table (Flat bottom type)

CTH-400 (Pallet changer)



CTH-400 + CHI-400 (Flat bottom type)

(Weight : 335kg)



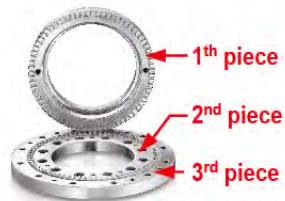
Item / Model	Unit	CTH-400
Lift-up mechanism	-	Tray type (H type)
Table size	mm	520 x 1140
Rotation method	-	Hydraulic hirth coupling
Rotation angle	deg.	180° to and fro
Clamping System (Hydraulic)	kgf/cm ²	35
Positioning method	-	Cone positioning
Clamping force (35kg/cm ²)	kgf	960x4=3840
Operating System (Up & Down & Rotate)	kgf/cm ²	Hyd.35
Lifting thrust force	kgf	2200
Up and down travel of the pallet	mm	60
Allowable Workpiece Load	kg	400x2=800
Inspection accuracy		
Repeatability accuracy on positioning of the same pallet	mm	0.01
Max. positioning tolerance for 2 pallets	mm	0.02
Parallelism of pallet top and base bottom	mm	0.02

CHI/CHR Series (Dual pallets rotary table)

CHI-500 (1° or 5°) Hirth coupling hydraulic brake
CHR-500 (0.001°) Hydraulic Brake
 For horizontal machining center



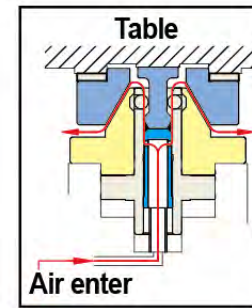
▲ **CHI-500 (1°)- Dual pallets rotary table**
 (Flat bottom type)



▲ **CHI Series :**
 Use **three-piece** clutch plate
 Function: ① Accuracy: ± 5 seconds
 ② Rotate **without lifting the table** to prevent table from water and particles.



▲ **CHR series :**
 Use **large-diameter** radial & axial bearings

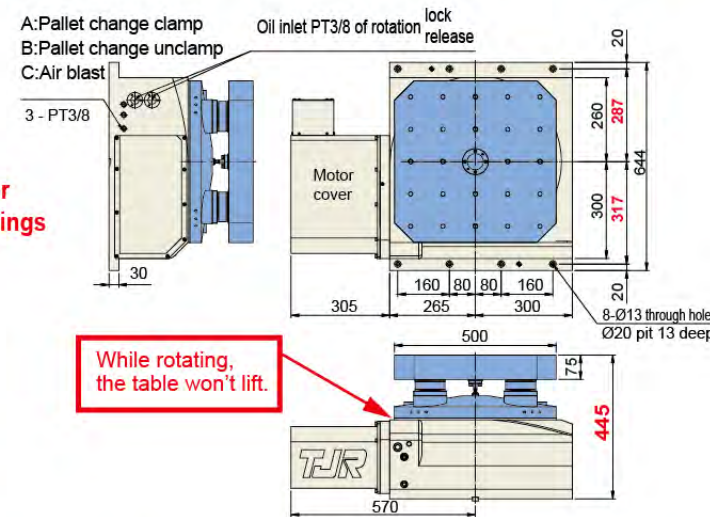


The function of cones :
 ① Precise positioning
 ② Air blast for chip removal
 ③ Airtight testing



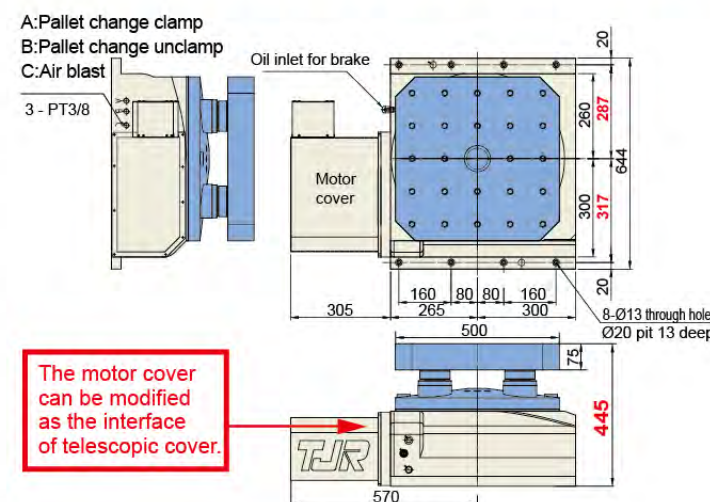
▲ **Cones:**
 Powerful hydraulic clamping

CHI-500 (1° or 5°) (Flat bottom type)



While rotating, the table won't lift.

CHR-500 (0.001°) (Flat bottom type)



The motor cover can be modified as the interface of telescopic cover.

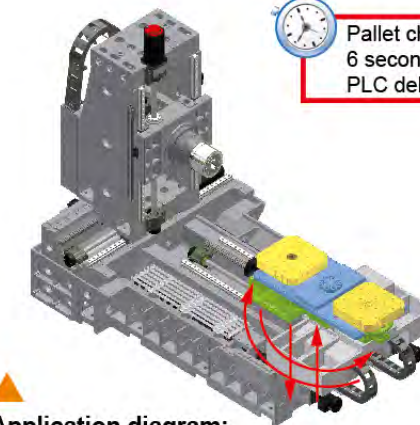
Item / Model	Unit	CHI-500	CHR-500
Table size	mm	□500x500	□500x500
Diameter of Table Central Hole	mm	Ø50x27 deep	Ø50x27 deep
Table height	mm	445	445
Table T-slot Width	mm	18H7	18H7
Guide Block Width	mm	18h7	18h7
Min. Increment	deg.	1 or 5	0.001
Indexing Precision	sec.	± 5	15
Repeatability	sec.	± 1	6
Clamping force of positioning cones (35kg/cm ²)	kgf	960x4=3840	960x4=3840
Clamping System (Hydraulic)	kgf/cm ²	35	35
Clamping Torque	kgf·m	1000	370
Servo Motor Model	FANUC MITSUBISHI	Straight shaft without key	βis22 αiF12 / βis22
Speed Reduction Ratio	-	1 : 180	1 : 180
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)	r.p.m	16.6	16.6
Allowable Workpiece Load	kg	600	600
Driving Torque	kgf·m	-	250
Net Weight (servo motor excluded)	kg	716 (including 2 pallets)	-

CTH Series (Tray type auto pallet changer)

CTH-500 (Go with CHI/CHR series)
 For horizontal machining center
 (180° to and fro)



▲ **CTH-500** (Tray type APC)



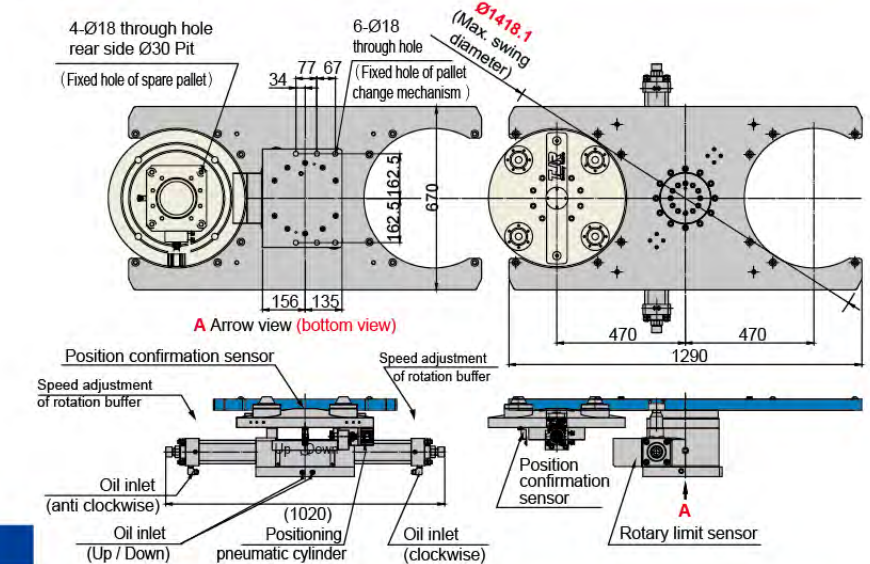
Application diagram:
 retrofits horizontal machining center with CTH+ CHI

Pallet changing time is around 6 seconds, which excludes PLC delayed time of machine



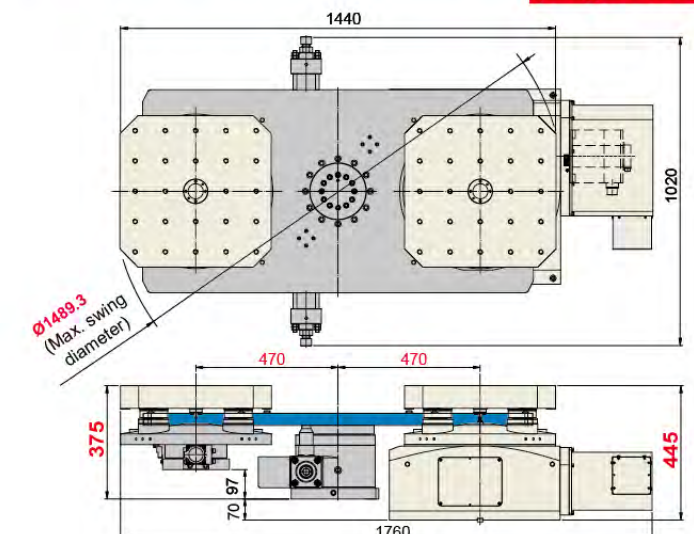
▲ **CTH-500 + CHI-500**
 Tray type APC + Dual pallets rotary table
 (Flat bottom type)

CTH-500 (Pallet changer)



CTH-500 + CHI-500 (Flat bottom type)

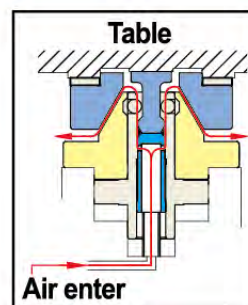
(Weight : 400kg)



Item / Model	Unit	CTH-500
Lift-up mechanism	-	Tray type (H type)
Table size	mm	670 x 1290
Rotation method	-	Hydraulic hirth coupling
Rotation angle	deg.	180° to and fro
Clamping System (Hydraulic)	kgf/cm ²	35
Positioning method	-	Cone positioning
Clamping force (35kg/cm ²)	kgf	960x4=3840
Operating System (Up & Down & Rotate)	kgf/cm ²	Hyd.45
Lifting thrust force	kg	2860
Up and down travel of the pallet	mm	60
Allowable Workpiece Load	kg	500x2=1000
Inspection accuracy		
Repeatability accuracy on positioning of the same pallet	mm	0.01
Max. positioning tolerance for 2 pallets	mm	0.02
Parallelism of pallet top and base bottom	mm	0.02

CHI/CHR Series (Dual pallets rotary table)

CHI-630L(1° or 5°) Hirth coupling hydraulic brake
CHR-630L(0.001°) Hydraulic Brake
 For horizontal machining center



The function of cones :
 ① Precise positioning
 ② Air blast for chip removal
 ③ Airtight testing



Cones:
 Powerful hydraulic clamping

CHI-630L (1° or 5°) Integrated ball-screw-interface type

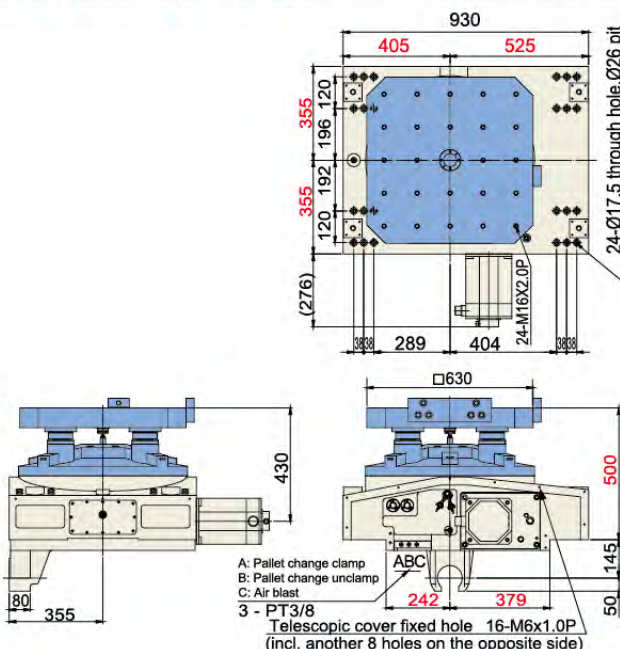
▲ **CHI-630L (1°)- Dual pallets rotary table**
 (Integrated ball-screw-interface type)



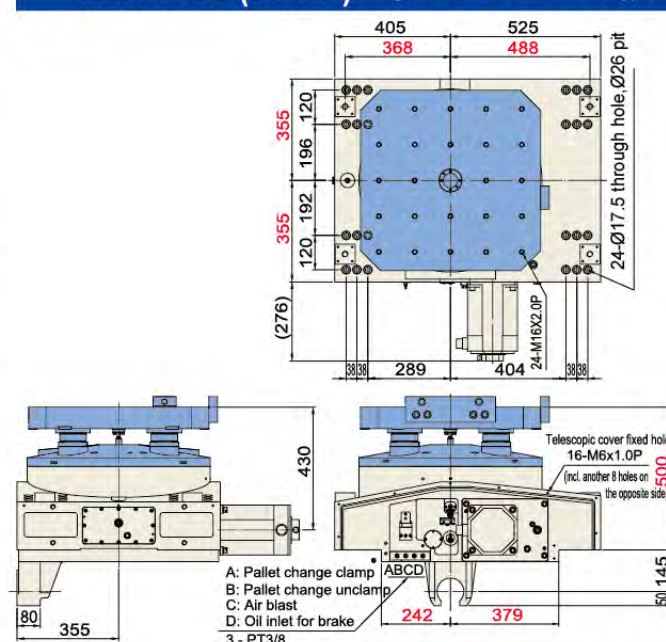
▲ **CHI Series :**
 Use **three-piece** clutch plate

Function: ① Accuracy: ± 5 seconds
 ② Rotate **without lifting the table** to prevent table from water and particles.

▲ **CHR series :**
 Use **large-diameter** radial & axial bearings



CHR-630L (0.001°) Integrated ball-screw-interface type



Item / Model	Unit	CHI-630L	CHR-630L
Table size	mm	□630x630	□630x630
Diameter of Table Central Hole	mm	Ø50x27 deep	Ø50x27 deep
Table height	mm	500	500
Table T-slot Width	mm	-	-
Guide Block Width	mm	-	-
Min. Increment	deg.	1 or 5	0.001
Indexing Precision	sec.	± 5	15
Repeatability	sec.	± 1	6
Clamping force of positioning cones (35kg/cm ²)	kgf	940x4=3840	940x4=3840
Clamping System (Hydraulic)	kgf/cm ²	35	35
Clamping Torque	kg-m	5000	800
Servo Motor Model			
FANUC	Straight shaft	βis22	αiF22 / βis22
MITSUBISHI	without key	HG/HF-204	HG/HF-204
Speed Reduction Ratio	-	1 : 180	1 : 180
Max. Rotation Rate of Table (Calculate with Fanuc α Motor)	r.p.m	16.6	16.6
Allowable Workpiece Load	kg	1200	1200
Driving Torque	kgf-m	-	420
Net Weight (servo motor excluded)	kg	1135	-

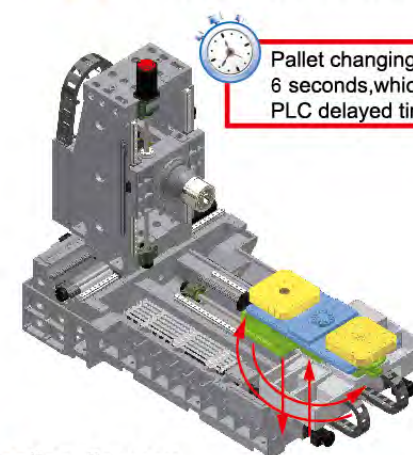
CTH Series (Tray type auto pallet changer)

CTH-630 (Go with CHI/CHR series)

For horizontal machining center
 (180° to and fro)



▲ **CTH-630 (Tray type APC)**



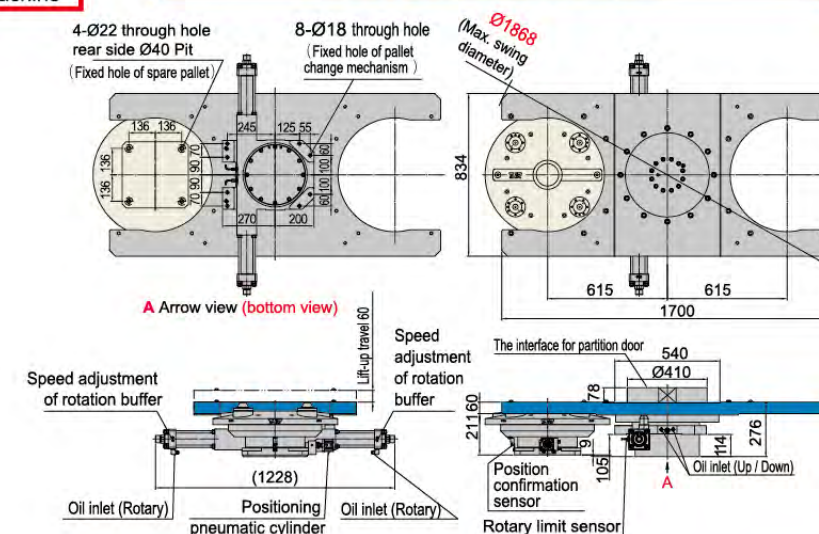
Application diagram:
 retrofits horizontal machining center with CTH+ CHR

Item / Model	Unit	CTH-630
Lift-up mechanism	-	Tray type (H type)
Table size	mm	834 x 1700
Rotation method	-	Hydraulic hirth coupling
Rotation angle	deg.	180° to and fro
Clamping System (Hydraulic)	kgf/cm ²	35
Positioning method	-	Cone positioning
Clamping force (35kg/cm ²)	kgf	960x4=3840
Operating System (Up & Down & Rotate)	kgf/cm ²	Hyd.45
Lifting thrust force	kg	3780
Up and down travel of the pallet	mm	60
Allowable Workpiece Load	kg	1000x2=2000
Inspection accuracy		
Repeatability accuracy on positioning of the same pallet	mm	0.01
Max. positioning tolerance for 2 pallets	mm	0.02
Parallelism of pallet top and base bottom	mm	0.02



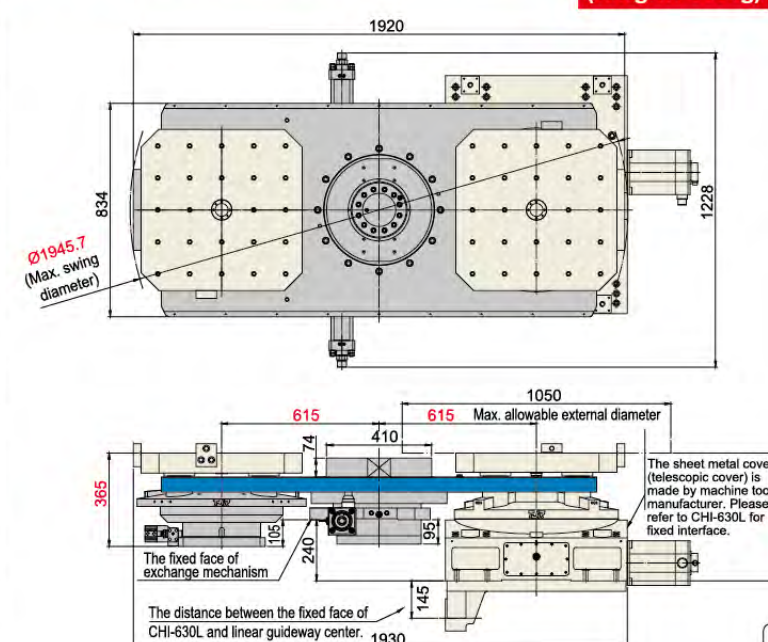
▲ **CTH-630 + CHI-630L**
 Tray type APC + Dual pallets rotary table
 (Integrated ball-screw-interface type)

CTH-630 (Pallet changer)



CTH-630 + CHI-630L Integrated ball-screw-interface type

(Weight : 600kg)



The 4th Axis Roller Gear Cam Series

- Pneumatic Brake / Hydraulic Brake



RC-170R



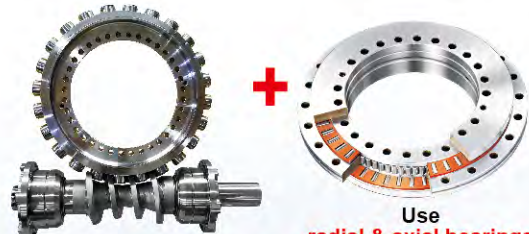
RC-255N



RC-320N



RC-400N



Use radial & axial bearings

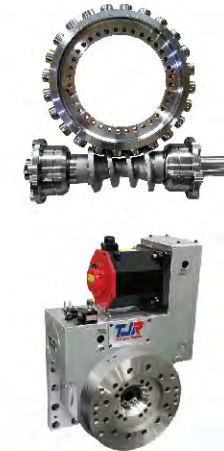
Driven by Roller Gear Cam
(Speed : 80 rpm)

A simplified 4th & 5th axis rotary table
Tilt axis: roller gear cam or DD motor rotary table
Rotary axis: 90° indexer

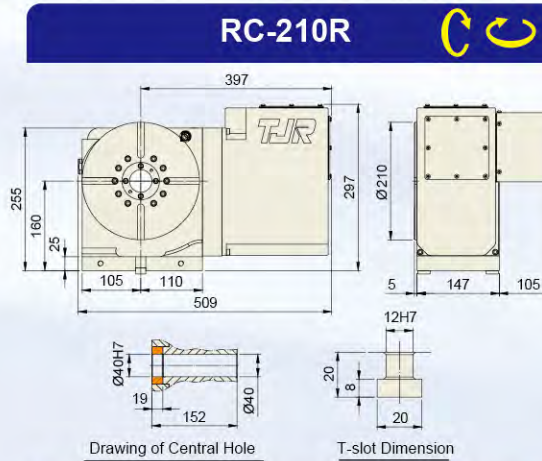
It can do five face machining without employing a standard 4th & 5th axis rotary table.



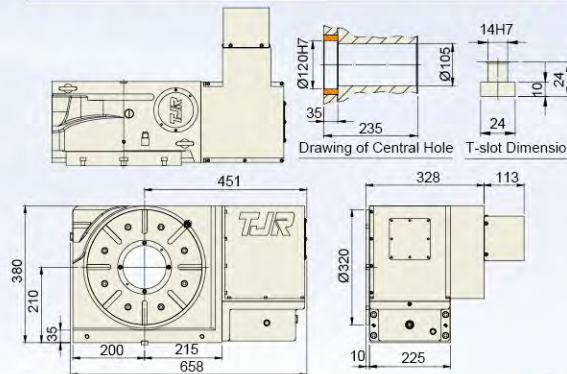
Item	Unit	RC-170R	RC-210R	RC-255R(N)	RC-320R(N) / 320L	RC-400
Table Diameter	mm	Ø170	Ø210	Ø255	Ø320	Ø400
Inner Diameter of Mandrel Sleeve	mm	Ø40H7	Ø40H7	Ø80H7	Ø120H7 x 35 deep	Ø120H7
Diameter of Center Through Hole	mm	Ø40	Ø40	Ø80 Big Bore	Ø105 Big Bore	Ø120 Big Bore
Center Height (Vertical)	mm	135	160	160	210	255
Table Height (Horizontal)	mm	152	152	200	235	250
Table T-slot Width	mm	12H7	12H7	12H7	14H7	14H7
Guide Block Width	mm	18h7	18h7	18h7	18h7	18h7
Min. Increment	deg.	0.001	0.001	0.001	0.001	0.001
Indexing Precision	sec.	30	30	20	20	20
Repeatability	sec.	8	8	6	6	6
Clamping System (Pneumatic / Hydraulic)	kgf/cm ²	Pne.6	Pne.6 / Hyd.35(Optional)	Hyd.35	Hyd.35	Hyd.35
Clamping Torque	kgf-m	31	31 (Pne.) / 50 (Hyd.)	70	115	200
Servo Motor Model	FANUC	Taper shaft	αiF8 / βis8	αiF8 / βis8	αiF8 / βis12 (Taper)	αiF12 / βis22 (Straight)
	MITSUBISHI	Taper/Straight shaft	HG/HF-54 / 104	HG/HF-54 / 104	HG/HF-154	HG/HF-204
Speed Reduction Ratio	-	1 : 36	1 : 36	1 : 60	1 : 90	1 : 90
Max. Rotation Rate of Table (Calculate with FANUC αMotor)	r.p.m	83.3	83.3	50	33.3	33.3
Allowable Inertia Load Capacity (Horizontal)	kg-cm-sec ²	5.4	8.3	20.3	44.8	100
Allowable Workpiece Load (dynamic)	Vertical	kg	75	75	100	200
	with Support Table	kg	150	150	250	500
	Horizontal	kg	150	150	250	500
Allowable Load (with clamping)	F	kgf	1450	1450	2000	4000
	FxL	kgf-m	110	110	150	300
	FxL	kgf-m	31	31 (Pne.) / 50 (Hyd.)	70	115
Driving Torque	kgf-m	37	37	55	107	140
Net Weight (Servo motor excluded)	kg	44	52	110	187	-



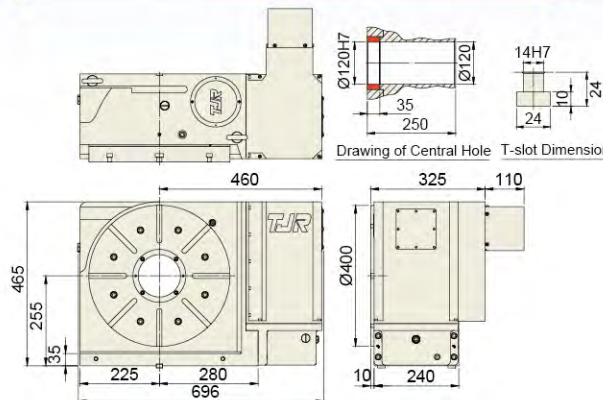
▲ HRC-400-SP



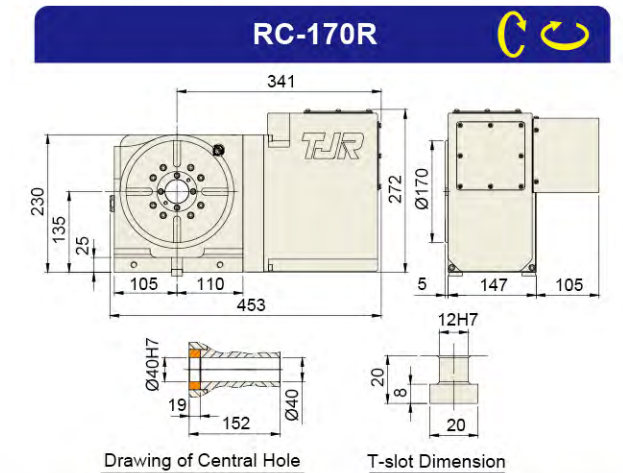
RC-210R



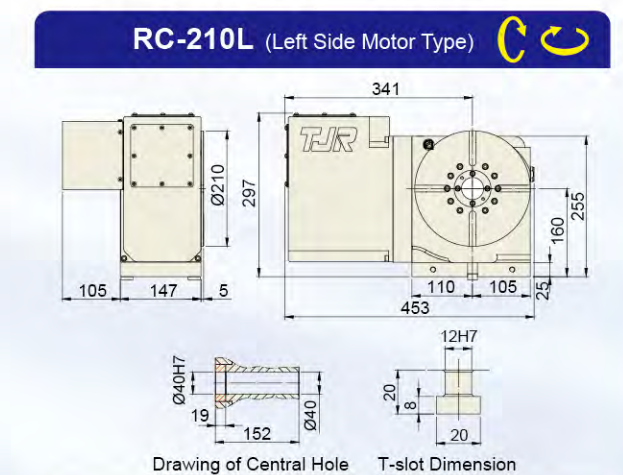
RC-320N



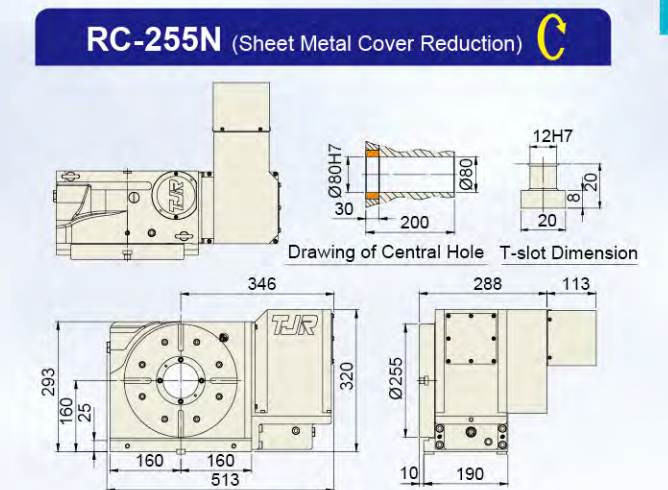
RC-400N



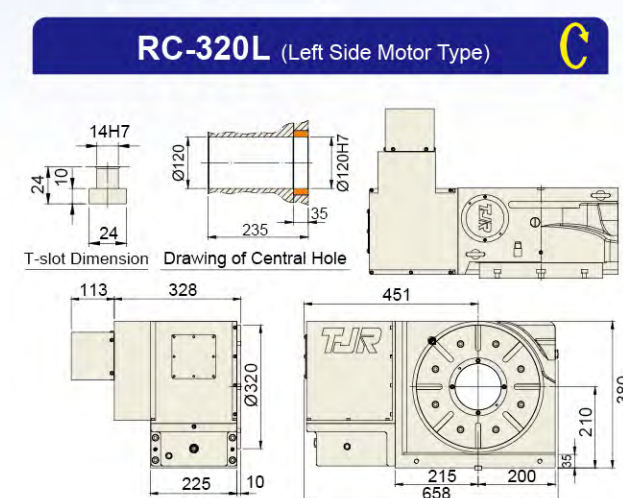
RC-170R



RC-210L (Left Side Motor Type)



RC-255N (Sheet Metal Cover Reduction)

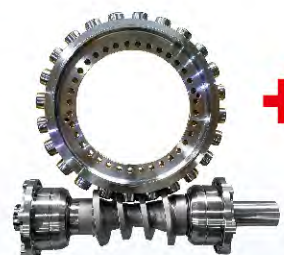


RC-320L (Left Side Motor Type)

Driven by Roller Gear Cam

The 4th & 5th Axis Roller Gear Cam Series

- Pneumatic Brake / Hydraulic Brake



Rotary axis Dual-lead Alloy steel worm gear (Optional)

Driven by Roller Gear Cam (Speed : 80 rpm)

FAR(s)-160SN-RC255
(Single-arm type)



FAR(s)-170A-RC210
(Compact type)



Tilt axis : Driven by Roller Gear Cam
Rotary axis : Driven by Alloy Steel Worm Gear (Optional)

FAR(s)-170-RC210
(Standard type)

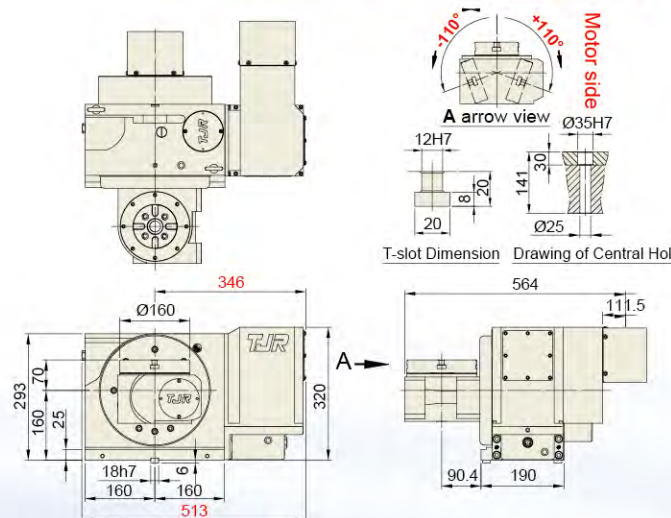


FAR(s)-210-RC210
(Standard type)



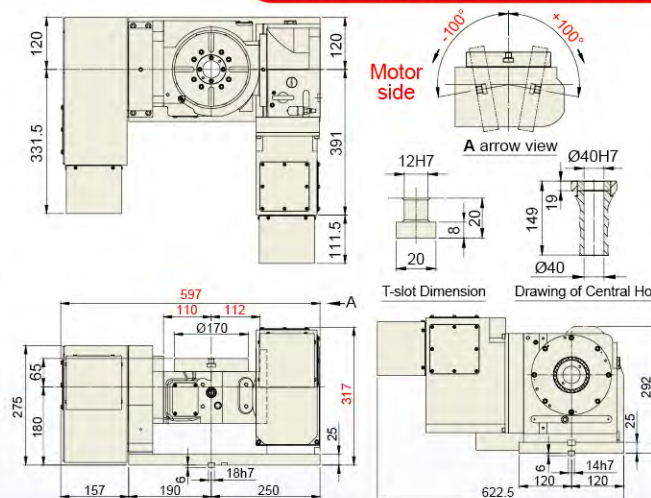
FAR(s)-160SN-RC255 (Single-arm type)

Tilt axis: Driven by Roller Gear Cam



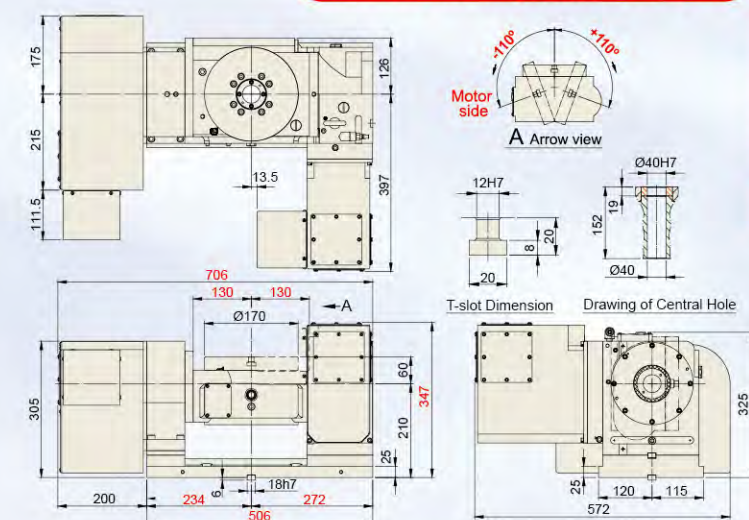
FAR(s)-170A-RC210(H) (Compact type)

Tilt axis: Driven by Roller Gear Cam



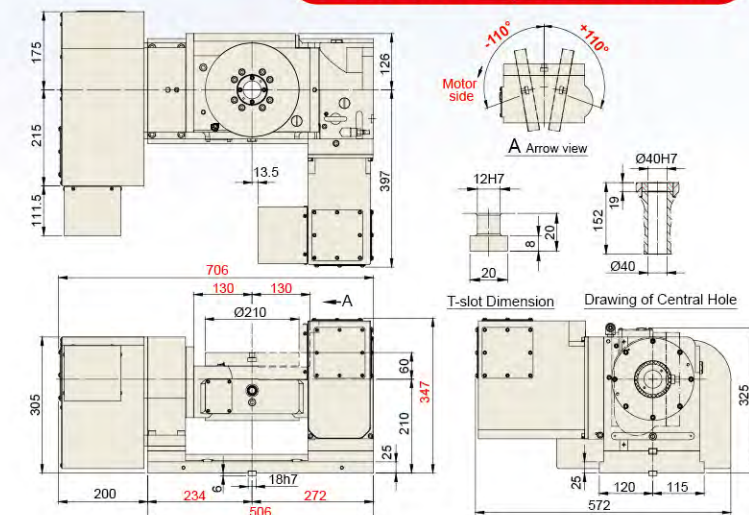
FAR(s)-170-RC210(H) (Standard type)

Tilt axis: Driven by Roller Gear Cam



FAR(s)-210-RC210(H) (Standard type)

Tilt axis: Driven by Roller Gear Cam



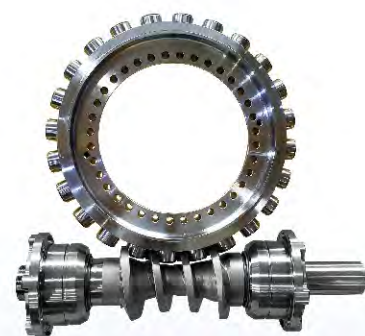
Item	Unit	FAR(s)-160SN-RC255		FAR(s)-170A-RC210(H)		FAR(s)-170-RC210(H) / FAR(s)-210-RC210(H)	
Table Diameter	mm	Ø160		Ø170		Ø170 / Ø210	
Inner Diameter of Mandrel Sleeve	mm	Ø35H7 x 30 deep (Diameter of Table Central Hole)		Ø40H7		Ø40H7	
Diameter of Center Through Hole	mm	Ø25		Ø40		Ø40	
Table Height (Horizontal)	mm	Single-arm type 230		245		270	
Table T-slot Width	mm	12H7		12H7		12H7	
Guide Block Width	mm	18h7		18h7		18h7	
Axis	-	Rotary axis	Tilt axis ±110°	Rotary axis	Tilt axis ±100°	Rotary axis	Tilt axis ±100°
Transmission Mechanism	-	Worm gear	Roller Gear Cam	Worm gear	Roller Gear Cam	Worm gear	Roller Gear Cam
Min. Increment	deg.	0.001	0.001	0.001	0.001	0.001	0.001
Indexing Precision (while tilt 0°~+90°)	sec.	40	60	40	60	20	60
Repeatability	sec.	6	8	6	8	6	8
Clamping System (Pneumatic)	kgf/cm ²	6	Hyd.35	6	Pne. 6 / Hyd.35	6	Pne. 6 / Hyd.35
Clamping Torque	kgf-m	13	70	25	31 (Pne.) / 50 (Hyd.)	31	31 (Pne.) / 50 (Hyd.)
Servo Motor Model	FANUC	Taper/Stralght	ais4 / βis4	ais12 / βis12	ais4 / βis4	ais12 / βis12	ais12 / βis12
	MITSUBISHI	Stralght	HF-KP43JW04-S6 / HG-56	HG/HF-154	HG/HF-75 / 105	HG/HF - 104	HG/HF-154
Speed Reduction Ratio	-	1 : 60	1 : 60	1 : 72	1 : 36	1 : 90	1 : 36
Max. Rotation Rate of Table (Calculate with FANUC a Motor)	r.p.m	33.3 *(33.3)	50	33.3 *(33.3)	50	33.3 *(33.3)	50
Allowable Inertia Load Capacity (Horizontal)	kg·cm·sec ²	0.8		2.2		2.7 (Ø170) / 4.13 (Ø210)	
Allowable Workpiece Load (dynamic)	0° Horizontal	kg	25	60	75		
	0 ~ 90° Tilt	kg	20	40	50		
Allowable Load (with clamping)	F	kg	600	600	750		
	FxL	kgf	70	31	31		
	FxL	kgf-m	13	31	31		
Driving Torque	kgf-m	9 *(3.7)		18 *(14.6)		18 *(14.6)	
Net Weight (servo motor excluded)	kg	126		-		163	170

*() Alloy Steel worm & gear series

★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.

The 4th & 5th Axis Roller Gear Cam Series

- Hydraulic Brake

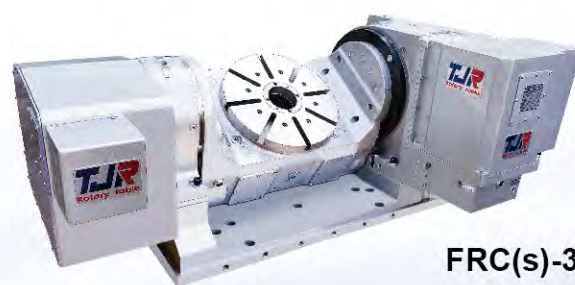


Driven by **Roller Gear Cam**
(Speed : 80 rpm)

AC軸 雙滾子凸輪 傳動



FRC(s)-255CL-RC320
(Extended cradle type)

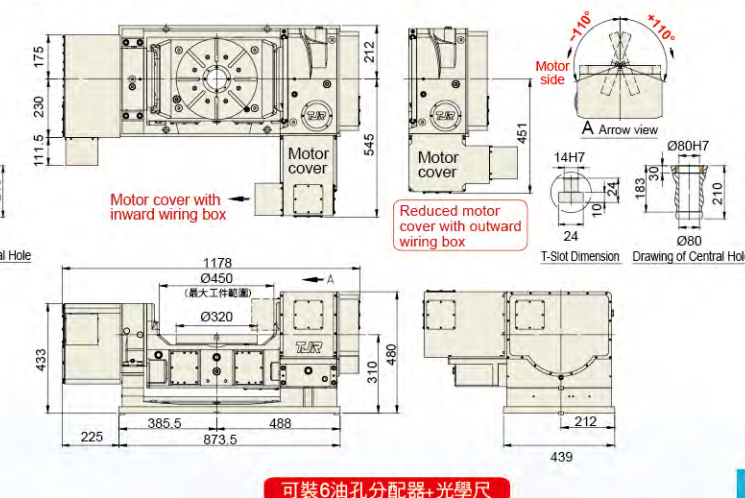


FRC(s)-320CF-RC320
(Cradle type)

FRC(s)-255CL-RC320 (Extended cradle type)



FRC(s)-320CF-RC320 (Cradle type)

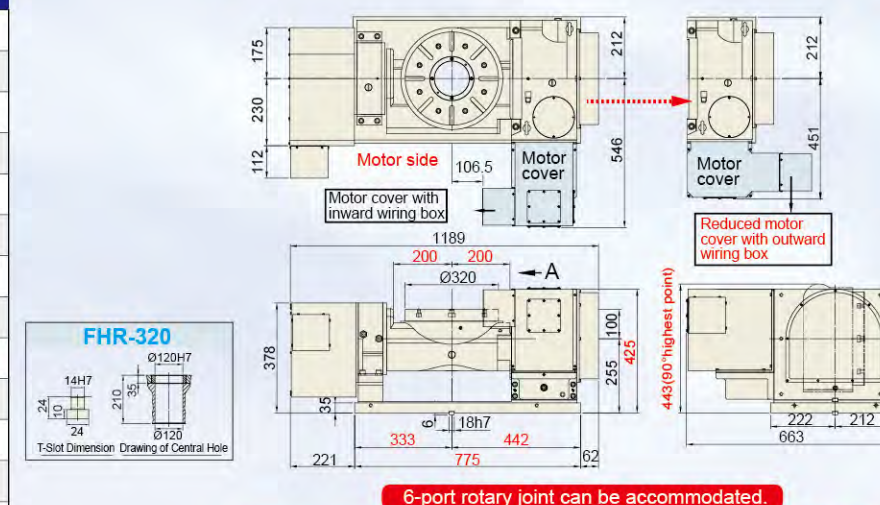


Item	Unit	FRC(s)-255CL-RC320 (Extended cradle type)		FRC(s)-320CF-RC320(Cradle type)		FHR-320-RC320 (Standard type)	
Table Diameter	mm	Ø255		Ø320		Ø320	
Diameter of Table Central Hole	mm	Ø110		Ø110		Ø150	
Inner Diameter of Mandrel Sleeve	mm	Ø80H7		Ø80H7		Ø120H7	
Diameter of Center Through Hole	mm	Ø80		Ø80		Ø120	
Table Height (Horizontal)	mm	310		310		355	
Table T-slot Width	mm	12H7		14H7		14H7	
Guide Block Width	mm	18h7		18h7		18h7	
Axis	-	Rotary axis	Tilt axis $\pm 110^\circ$	Rotary axis	Tilt axis $\pm 110^\circ$	Rotary axis	Tilt axis $\pm 110^\circ$
Transmission Mechanism	-	Roller Gear Cam		Roller Gear Cam		Worm & Worm Gear	Roller Gear Cam
Min. Increment	deg.	0.001	0.001	0.001	0.001	0.001	0.001
Indexing Precision (while tilt 0°~90°)	sec.	20	60	20	60	15	60
Repeatability	sec.	6	8	6	8	6	8
Clamping System (Hydraulic)	kgf/cm ²	35	35	35	35	35	35
Clamping Torque	kgf·m	70	175	70	175	115	175
Servo Motor Model	FANUC	Taper / Straight	αiF8 / αis12 / βis12	αiF12 / βis12	αiF8 / αis12 / βis12	αiF12 / βis22	αiF12 / βis22
	MITSUBISHI	Straight	HG/HF-154	HG/HF-154	HG/HF-154	HG/HF-154	HG/HF-154
Speed Reduction Ratio	-	1 : 60	1 : 120	1 : 60	1 : 120	1 : 120	1 : 90
Max. Rotation Rate of Table (Calculate with FANUC α Motor)	r.p.m	50	25	50	25	25	33.3
Allowable Inertia Load Capacity (Horizontal)	kg·cm·sec ²	16.2		25.6		25.6	
Allowable Workpiece Load (dynamic)	0° Horizontal	kg	200	200	200	200	200
	0~90° Tilt	kg	150	150	150	150	150
Allowable Load (with clamping)	F	kgf	1600	1600	1600	1800	1800
	FxL	kgf·m	175	175	175	175	175
	FxL	kgf·m	70	70	70	115	115
Driving Torque	kgf·m	35	35	35	35	80	80
Net Weight (servo motor excluded)	kg	580		585		-	

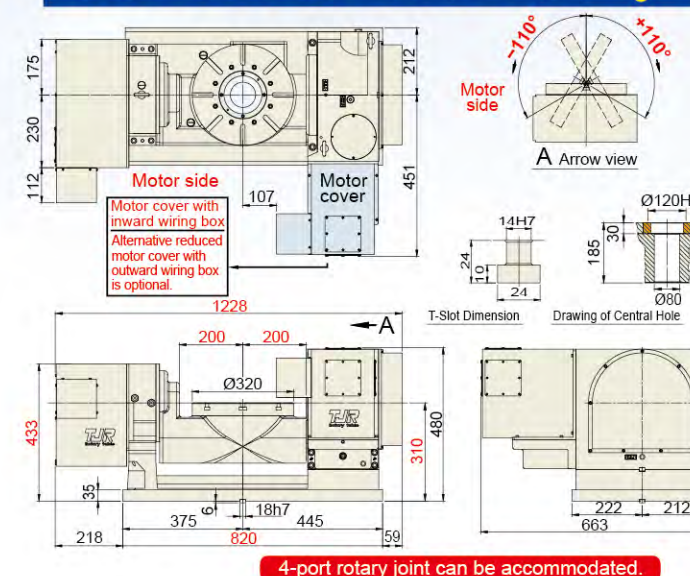
*() Alloy Steel worm & gear series

★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.

FHR-320-RC320 (Standard type)



FHR-320C-RC320 (Cradle type)



The 4th & 5th Axis Roller Gear Cam Series

- Pneumatic Brake / Hydraulic Brake



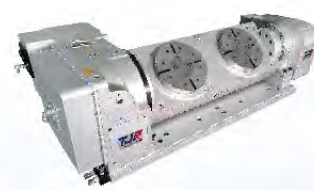
Driven by **Roller Gear Cam**
(Speed : 80 rpm)



FAR(s)-170-2W-RC255
(2 wheel coupled)



**Swivel Spindle Head
HRC-400SP**
(Roller Gear Cam)



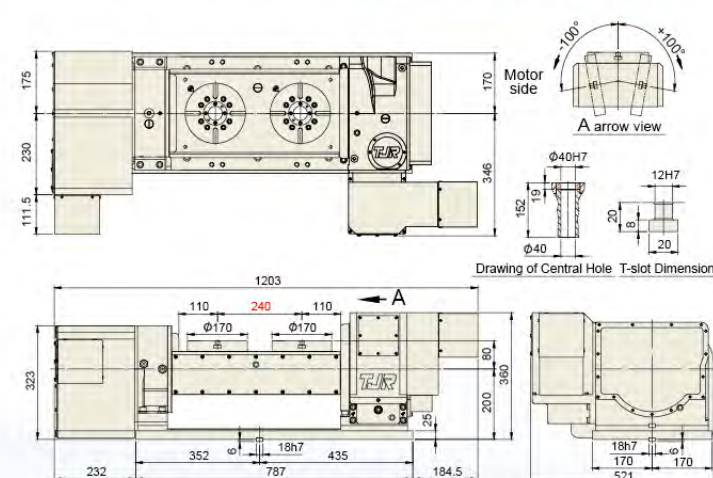
FHR-255-2W-RC320
(2 wheel coupled)



FHR-350F-2W-RC320-2A
(2 wheel coupled)

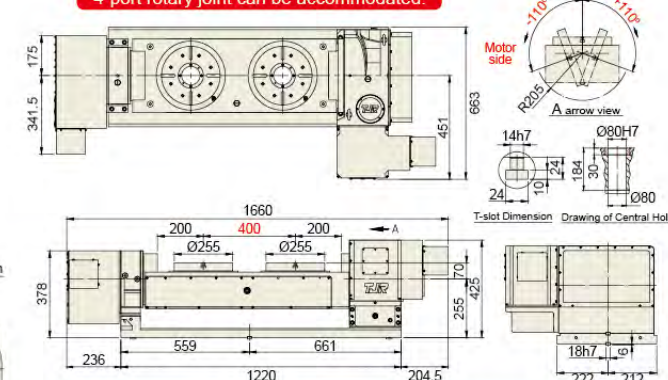
FAR(s)-170-2W-RC255 (2 wheel coupled)

Tilt axis : Driven by Roller Gear Cam



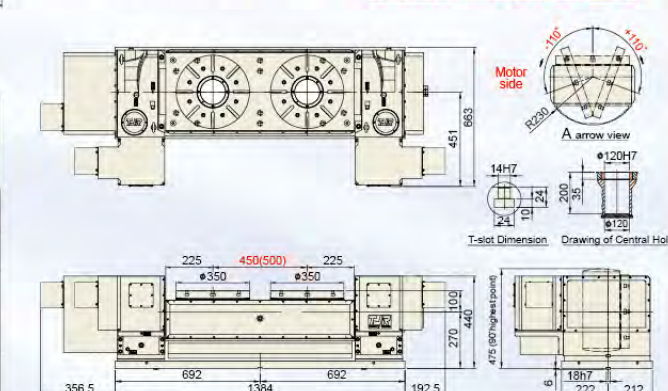
FHR-255-2W-RC320 (2 wheel coupled)

4-port rotary joint can be accommodated.

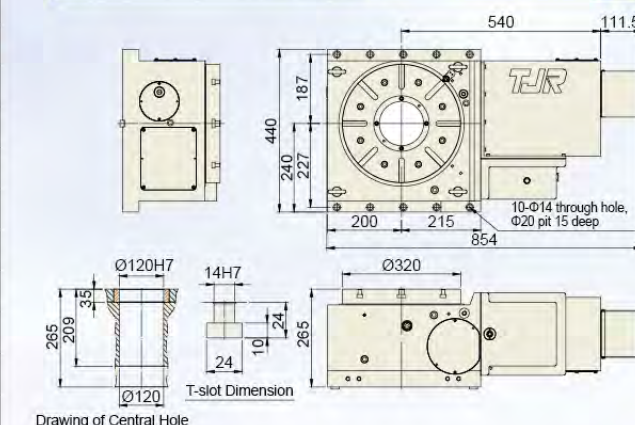


FHR-350F-2W-RC320-2A (2 wheel coupled)

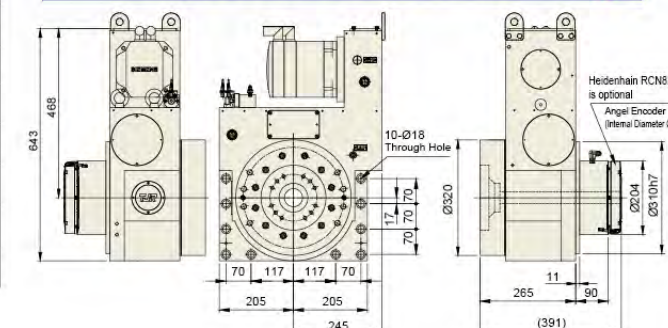
Tilt axis : Driven by Roller Gear Cam



HRC-320



HRC-400SP (Swivel Spindle Head)



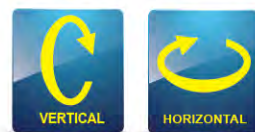
Item	Unit	FAR(s)-170-2W-RC255 / FAR(s)-210-2W-RC255		FHR-255-2W-RC320		FHR-350F-2W-RC320-2A		HRC-320	HRC-400SP
Table Diameter	mm	Ø170 / Ø210		Ø255		Ø350		Ø320	Ø400
Diameter of Table Central Hole	mm	Ø67		Ø110		Ø150		Ø150	Ø180
Inner Diameter of Mandrel Sleeve	mm	Ø40H7		Ø80H7		Ø120H7		Ø120H7	-
Diameter of Center Through Hole	mm	Ø40		Ø80		Ø120		Ø120 Big Bore	Ø34
Table Height (Horizontal)	mm	280		325		370		265	265
Table T-slot Width	mm	12H7		12H7		14H7		14H7	-
Guide Block Width	mm	18h7		18h7		18h7		18h7	-
Axis	-	Rotary axis	Tilt axis $\pm 110^\circ$	Rotary axis	Tilt axis $\pm 110^\circ$	Rotary axis	Tilt axis $\pm 110^\circ$	-	-
Transmission Mechanism	-	Worm Gear	Roller Gear Cam	Worm Gear	Roller Gear Cam	Worm Gear	Roller Gear Cam	Roller Gear Cam	Roller Gear Cam
Mln. Increment	deg.	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Indexing Precision (while tilt $0^\circ \sim 90^\circ$)	sec.	40	60	40	60	40	60	20	± 10
Repeatability	sec.	6	8	6	8	6	8	6	6
Clamping System (Hydraulic)	kgf/cm ²	Pne.6	35	35	35	35	35	35	45
Clamping Torque	kgf-m	31	140	70	175	115	230	115	155
Servo Motor Model	FANUC	Taper / Straight	aiF8 / β is12	ais12 / β is12	ais12 / β is12	ais12 / β is22	ais12 x2	aiF12 / β is22	aiF12 / β is22
	MITSUBISHI	Straight	HG/HF-154	HG/HF-154	HG/HF-154	HG/HF-204	HG/HF-154 x2	HG / HF-204	HG/HF-204
	SIEMENS	Straight	1FK7063	1FK7063	1FK7063	1FK7083	1FK7083 x2	-	1FK7083
Speed Reduction Ratio	-	1:90	1:60	1:150	1:90	1:120	1:90	1:90	1:90
Max. Rotation Rate of Table (Calculate with FANUC α Motor)	r.p.m	44.4 *(33.3)	33.3	16.6	16.6	25	16.6	33.3	33.3
Allowable Inertia Load Capacity (Horizontal)	kg-cm-sec ²	2.7(Ø170) / 4.2(Ø210)		2.7 / 4.13		23 (per plate)		44.8 (Vertical)	-
Allowable Workpiece Load (dynamic)	0° Horizontal	kg	50 (per plate)	100 (per plate)		150 (per plate)		350	-
	0°-90° Tilt	kg	40 (per plate)	75 (per plate)		150 (per plate)		-	Vertical $\hookrightarrow$ 200
Allowable Load (with clamping)	F	kg	750	1000		1800		3000	-
	FxL	kgf	140	175		230		300	400
	FxL	kgf-m	31	70		115		115	155
Driving Torque	kgf-m	18 *(14.6)		55		80		56 (dynamic)	75 (dynamic)
Net Weight (servo motor excluded)	kg	305 (Ø170) / 312 (Ø210)		740		1080		-	406

*() Alloy Steel worm & gear series

★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.

The 4th Axis Direct Drive Motor Series

- Pneumatic Brake



AD-170
without faceplate



AD-261iB-FA-CZ
FANUC DDM



AD-260iB
without faceplate
(Standard with faceplate)



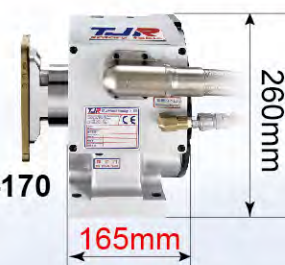
D.D. Motor
(200 rpm)



AD-170
with faceplate



AD-170
(Ex: Machining cell phone)

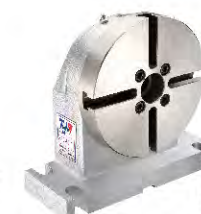


AD-170

Item	Unit	AD - 170	AD - 210	AD - 260iB	AD-261iB-FA-CZ
Table Diameter	mm	Ø170	Ø210	Ø250	Ø250
Inner Diameter of Mandrel Sleeve	mm	Ø40H7	Ø40H7	Ø46H7	Ø46H7
Diameter of Center Through Hole	mm	Ø40	Ø40	Ø46	Ø46
Center Height (Vertical)	mm	135	160	160	160
Table Height (Horizontal)	mm	-	-	-	-
Table T-slot Width	mm	12H7	12H7	12H7	12H7
Guide Block Width	mm	18h7	18h7	18h7	18h7
Cooling System	-	Free Cooling	Free Cooling	Free Cooling / Oil Cooling	Free Cooling / Oil Cooling
Min. Increment	deg.	0.001	0.001	0.001	0.001
Indexing Precision	sec.	20	20	20	20
Repeatability	sec.	4	4	4	4
Clamping System (Pneumatic)	kgf/cm ²	6	6	6	6
Clamping Torque	Nm	310	310	450 (Powerful)	450 (Powerful)
Servo Motor Model	-	DD Motor	DD Motor	DD Motor	FANUC DD Motor
Speed Reduction Ratio	-	Direct Drive	Direct Drive	Direct Drive	Direct Drive
Rated / Max. Speed	r.p.m.	150 / 200	150 / 200	150 / 200	200 / 300
Rated / Max. Cutting Torque	Nm	48 / 143	48 / 143	48 / 143	46(Oil Cooling 62) / 143
Allowable Inertia Load Capacity	kg·cm·sec ²	1.08	1.65	4.68	7.8
Allowable Workpiece Load (dynamic)	kg	30	30	60	100 (Rated Speed)
Allowable Load (with clamping)	kg	70	70	100	100 (Rated Speed)
Allowable Load (with clamping)	N	8000	8000	10000	10000
Allowable Load (with clamping)	Nm	105	105	231	231
Allowable Load (with clamping)	Nm	310	310	450	450
Net Weight (D.D motor included)	kg	55	61	84	90
Electrical Specification					
Encoder	-	Subject to demand and controller	Subject to demand and controller	Subject to demand and controller	Subject to demand and controller
Voltage (Back E.M.F)	Vrms/100rpm	67.2	67.2	67.2	-
Rotor Poles	-	44	44	44	28
Rated / Max. Current	Arms	4.4 / 13.2	4.4 / 13.2	4.4 / 13.2 (Free Cooling) 11.6 / 34.5 (Water Cooling)	9.3/56.6
Power Rating	KW	0.75	0.75	0.75 / 1.9 (Water Cooling)	-



RT-135



RT-170F

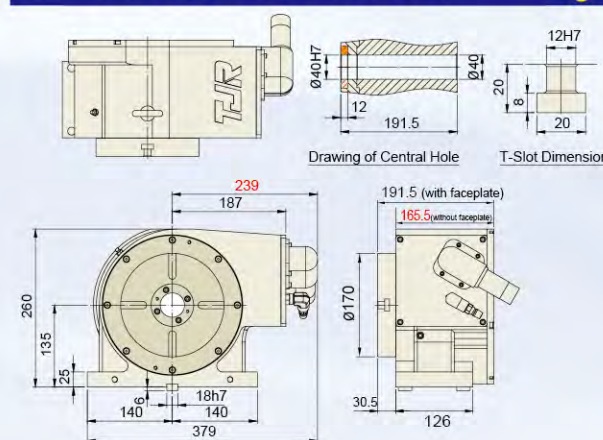
Support table without brake



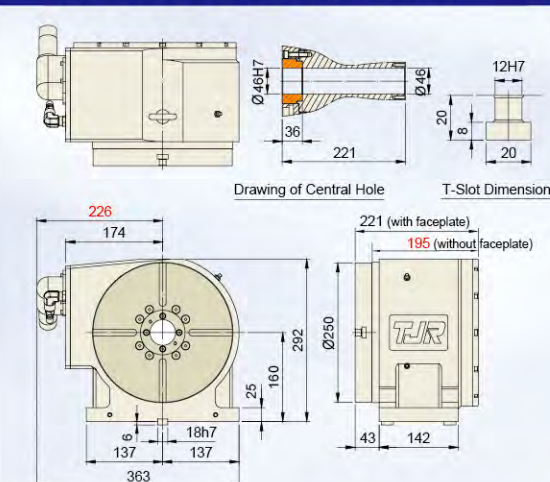
AD-260iB + support table + fixture plate

While using **DDM** rotary table, it's recommended to employ table **without faceplate** and simplified support table. Thus, it can increase the available loading capacity for fixtures and workpieces.

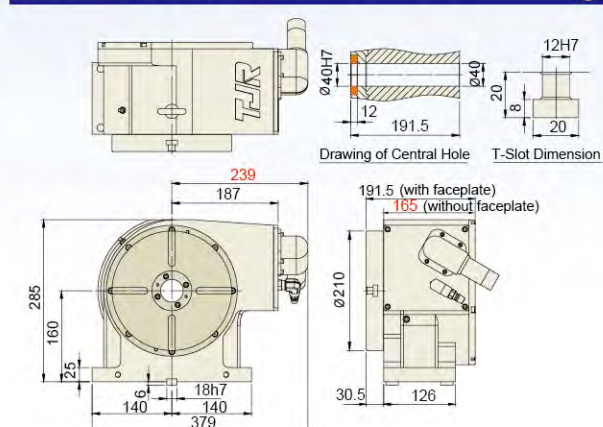
AD-170 Direct Drive (200 rpm)



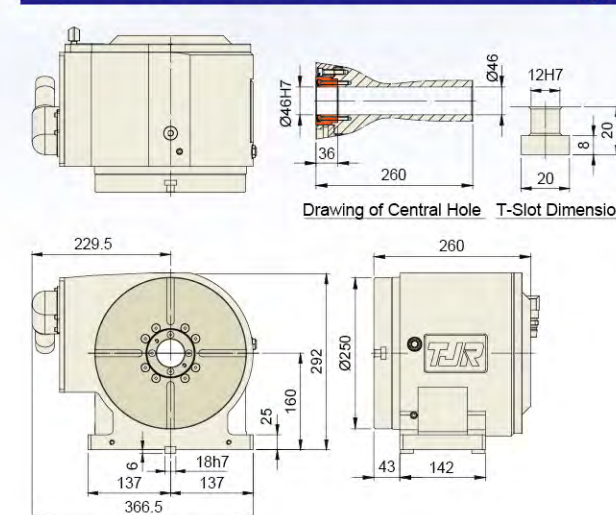
AD-260iB Direct Drive (200 rpm)



AD-210 Direct Drive (200 rpm)



AD-261iB-FA-CZ Direct Drive (300 rpm)



The 4th & 5th Axis Direct Drive Motor Series The 4th Axis Direct Drive Motor Series

- Pneumatic Brake / Hydraulic Brake



D.D. Motor



FAD-170F
(Two D.D. Motors)



FAD-211-AD261iB-FA-CZ
(Two D.D. Motors)
(FANUC DDM)

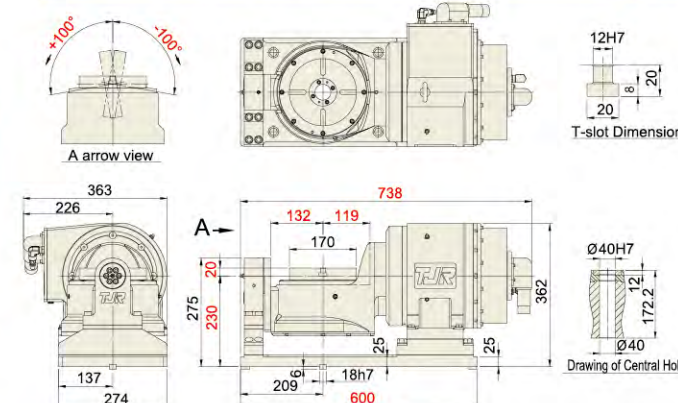


FHD-650-iD650
(Two D.D. Motors / Hydraulic Brake)

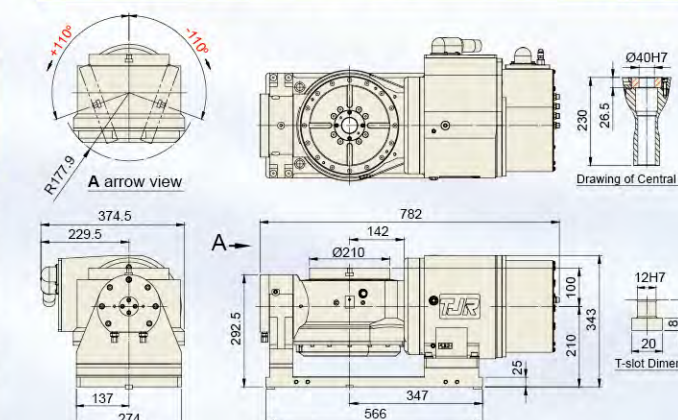


iHHD-650

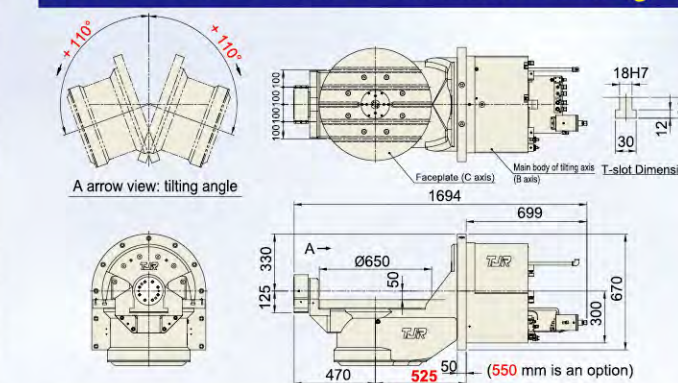
FAD-170F (Two D.D. Motors)



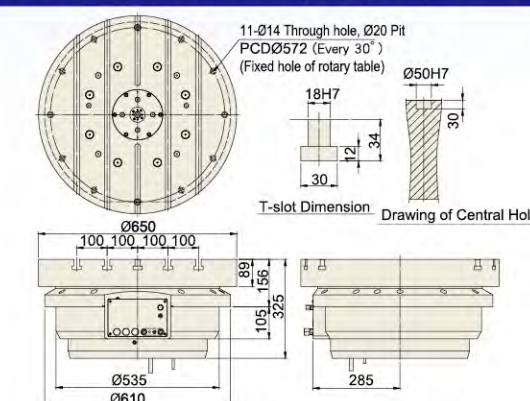
FAD-211-AD261iB-FA-CZ (Two axis FANUC DDM)



FHD-650-iD650 (Two D.D. Motors) (210 rpm)



iHHD-650 (Embedded type) (210 rpm)



Item		Unit	Two D.D. Motors : 300 rpm		Two axis FANUC DDM		Two D.D.Motors		Embedded type
			FAD-170F / FAD-210F		FAD-211-AD261iB-FA-CZ		FHD-650-iD650		iHHD-650
Table Diameter		mm	Ø170 / Ø210		Ø210		Ø650		Ø650
Inner Diameter of Mandrel Sleeve		mm	Ø40H7		Ø40H7		-		Ø50 x 30 deep (Diameter of table central hole)
Diameter of Center Through Hole		mm	Ø40		Ø40		-		-
Table Height (Horizontal)		mm	250		310		-		-
Table T-slot Width		mm	12H7		12H7		18H7		18H7
Guide Block Width		mm	18h7		18h7		-		-
Axis		-	Rotary axis	Tilt axis ±100°	Rotary axis	Tilt axis ±100°	Rotary axis	Tilt axis ±110°	-
Transmission Mechanism		-	DD Motor	DD Motor	DD Motor	DD Motor	DD Motor	DD Motor	DD Motor
Cooling System		-	Free Cooling	Free Cooling (Water Cooling)	Free Cooling	Free Cooling (Oil Cooling)	Water Cooling	Water Cooling	Water Cooling
Min. Increment		deg.	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Indexing Precision (while tilt 0°~+90°)		sec.	20	30	20	30	20 ^{*1}	30 ^{*1}	20 ^{*1}
Repeatability		sec.	4	4	4	4	4	4	4
Clamping System (Pneumatic)		kgf/cm ²	6	6	6	6	Hyd. 35	Hyd. 35	Hyd. 35
Clamping Torque		Nm	310	450 (Powerful)	310	450	3700	5000	3700
Servo Motor Model	FANUC MITSUBISHI	Taper shaft with key	DD Motor	DD Motor	FANUC DiS DD Motor	FANUC DiS DD Motor	DD Motor	DD Motor	DD Motor
Speed Reduction Ratio		-	Direct Drive	Direct Drive	Direct Drive	Direct Drive	Direct Drive	Direct Drive	Direct Drive
Rated / Max. Speed		r.p.m	200 / 300	50 / 150	200 / 300	150 / -	80 / 210	50 / 50	80 / 210
Rated / Max. Cutting Torque		Nm	29 / 143	48 (Water cooling 118) / 143	48 (Water cooling 80) / 200	57 (Oil cooling 80) / 300	554 / 741	1890 / 2478	554 / 741
Allowable Inertia Load Capacity (Horizontal)		kg·cm·sec ²	1.08 (Ø170) / 1.65 (Ø210)		1.65		264		264
Allowable	0° Horizontal 	kg	50		50 (Rated Speed)		500		400
Workpiece Load	0°~90° Tilt 	kg	30		30 (Rated Speed)		300		-
Allowable Load (with clamping)	F 	N	4000		4000		25000		40000
	FxL 	Nm	450		450		5000		5000
	FxL 	Nm	310		310		3700		3700
Net Weight (D.D motor included)		kg	220 (Ø170) / 223 (Ø210)		237		1173		479
Electrical Specification									
Encoder		-	Renishaw or Heidenhain		FANUC aiCZ		Heidenhain		Heidenhain
Voltage (Back E.M.F)		Vrms/100rpm	Rotary axis 38.8		-	-	125.6		125.6
Rotor Poles		-	44		Rotary axis : 28	Tilt axis : 28	66		66
Rated / Max. Current		Arms	4.25 / 12.75		10.2 / 28.3 (Rotary axis)	19.5 / 53.2 (Tilt axis)	29.8 / 75.7 (Water Cooling)		29.8 / 75.7 (Water Cooling)
Power Rating		kW	0.77	0.76	-	-	4.7	10.1	4.7

★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.

*1. Indexing precision can be better after installing an additional angle encoder. Please refer to the table on page 70 for more details.

The 4th & 5th Axis Direct Drive Motor Series The 4th Axis Direct Drive Motor Series

- Pneumatic Brake



D.D. Motor

AD-250HS

(super high speed: 2000 rpm)
Can work as a mill / turn component



FAD-300F-HS
Tilt axis : 50 rpm
Rotary axis : 2000 rpm



FAD-500FHS-AD500i-480

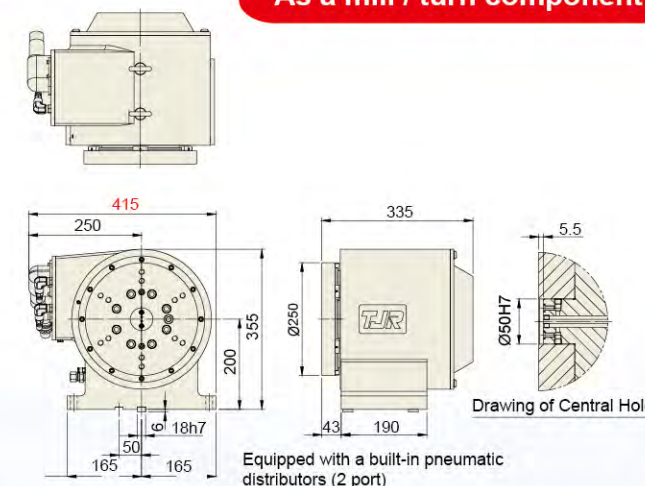


FAD-400HS-AD500i-420

(The faceplate can be customized.
Please refer to the below drawing for the standard faceplate.)

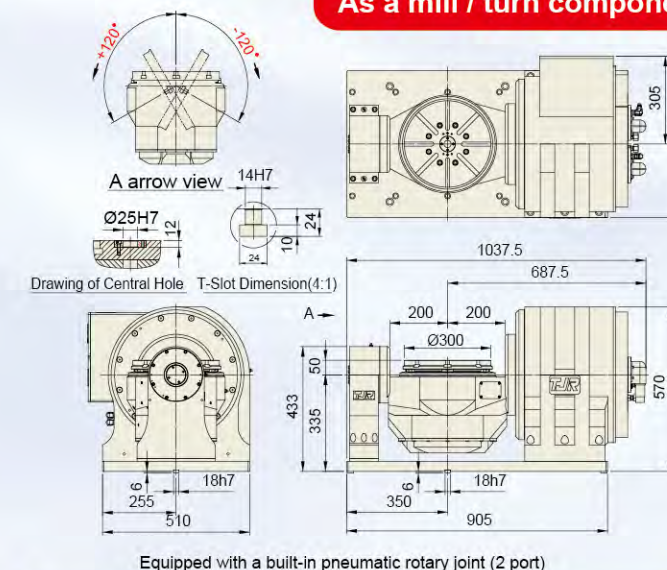
AD-250HS (2000 rpm)

As a mill / turn component



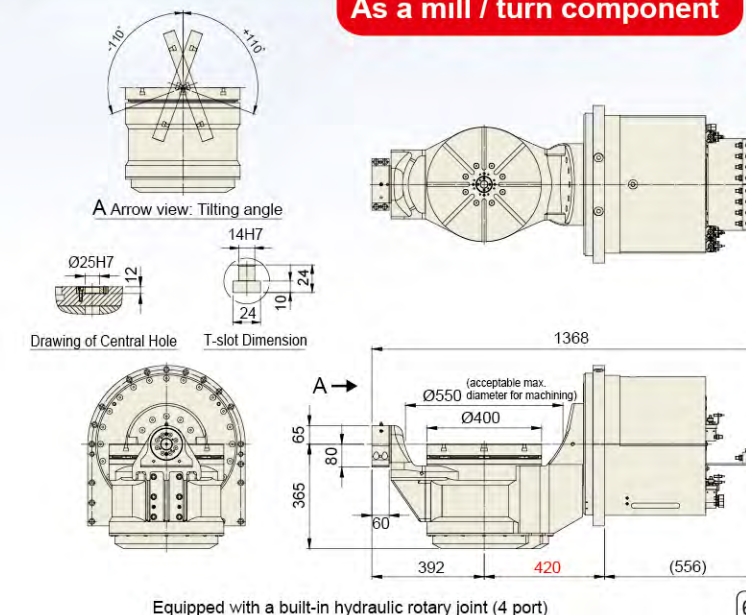
FAD-300F-HS (2000 rpm)

As a mill / turn component



FAD-400-HS (1200 rpm)

As a mill / turn component



Item	Unit	As a mill / turn component	Two D.D. Motors : 2000 rpm As a mill / turn component		FAD-400HS-AD500i-420 / FAD-500FHS-AD500i-480	
		AD - 250HS	FAD-300F-HS			
Table Diameter	mm	Ø250	Ø300		Ø400 / Ø500	
Inner Diameter of Mandrel Sleeve	mm	Ø50H7 x 5.5 deep (Diameter of table central hole)	Ø25H7 x 12 deep (Diameter of table central hole)		Ø25H7 x 12 deep (Diameter of table central hole)	
Diameter of Center Through Hole	mm	-	-		-	
Center Height (Vertical)	mm	200	-		-	
Table Height (Horizontal)	mm	335	385		-	
Table T-slot Width	mm	-	14H7		14H7	
Guide Block Width	mm	-	14h7		-	
Axis	-	-	Rotary axis	Tilt axis ±120°	Rotary axis	Tilt axis ±110°
Cooling System	-	Water Cooling	Water Cooling	Water Cooling	Water Cooling	Water Cooling
Transmission Mechanism	-	D.D. Motor	D.D. Motor	D.D. Motor	D.D. Motor	D.D. Motor
Min. Increment	deg.	0.001	0.001	0.001	0.001	0.001
Indexing Precision (while tilt 0°~+90°)	sec.	20	20	30	20	25
Repeatability	sec.	4	4	4	4	4
Clamping System (Pneumatic)	kgf/cm ²	6	6	6	6	6
Clamping Torque	Nm	450 (Powerful)	430	730	850	2000
Servo Motor Model	-	DD Motor	DD Motor	DD Motor	DD Motor	DD Motor
Speed Reduction Ratio	-	Direct Drive	Direct Drive	Direct Drive	Direct Drive	Direct Drive
Rated / Max. Speed	r.p.m	1100 / 2000	818 / 2000 (600VDC)	50 / 50	596 / 1200 (Ø400) or 596 / 800 (Ø500)	50 / 50
Rated / Max. Cutting Torque	Nm	113 / 169	113 / -	554 / 741	402 / -	1217 / 2120
Allowable Inertia Load Capacity (Horizontal)	kg·cm·sec ²	3.1	-		40 (Ø400) / 62.5 (Ø500)	
Allowable Workpiece	kg	-	100 (Rated Speed)		200 (balanced load)	
Load (dynamic)	kg	Vertical 50	100 (Rated Speed)		100 (balanced load)	
Allowable Load (with clamping)	F	10000	-		15000	
	FxL	1150	730		2000	
	FxL	550	430		850	
Net Weight (D.D motor included)	kg	158	730		- (Ø400) / 914 (Ø500)	
Electrical Specification						
Encoder	-	Subject to demand and controller	Renishaw or Heidenhain		Renishaw or Heidenhain	
Voltage (Back E.M.F)	Vrms/100rpm	33	Rotary axis : 33		Rotary axis : 45.55	
Rotor Poles	-	22	22		44	
Rated / Max. Current	Arms	26.5 / 50.2	26.5 / 50.2		Rotary axis : 66.9 / 151	
Power Rating	KW	9.9	9.9	4.7	25.6	6.5

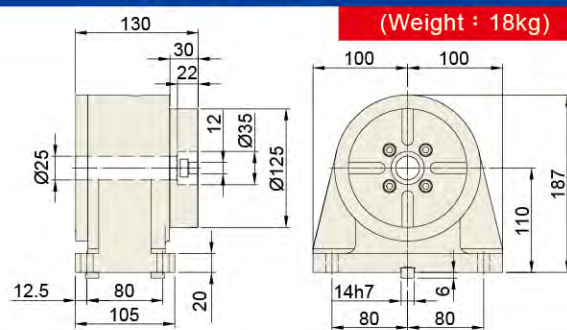
★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.

Support Table

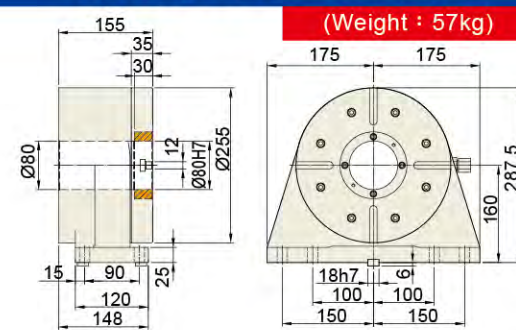
RTA Series (Pneumatic Brake) RTA-125/170/210
RTH Series (Hydraulic Brake) RTH-255/320/400A



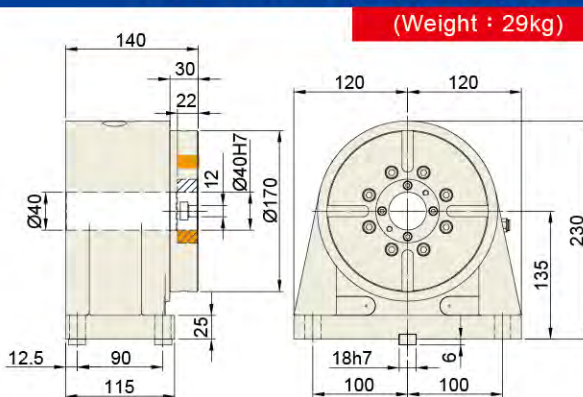
RTA-125 (Pneumatic brake 13 kgf-m)



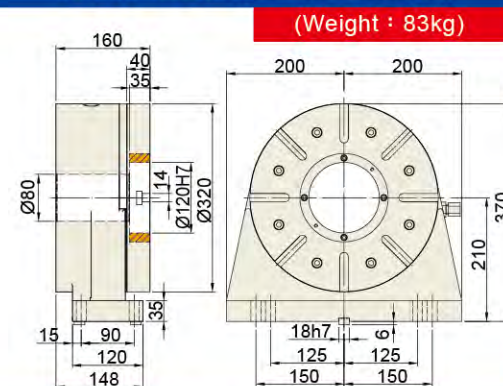
RTH-255 (Hydraulic brake 70 kgf-m)



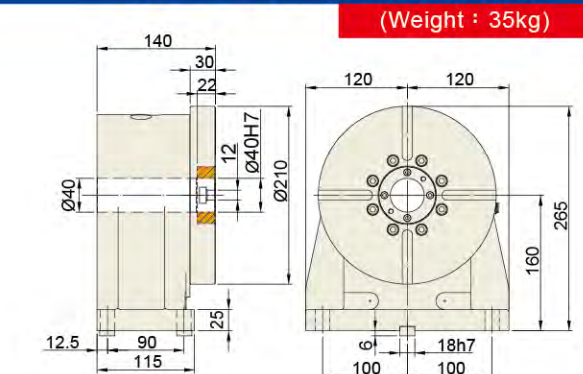
RTA-170 (Pneumatic brake 31 kgf-m)
RTA-170H (Hydraulic brake 55 kgf-m)



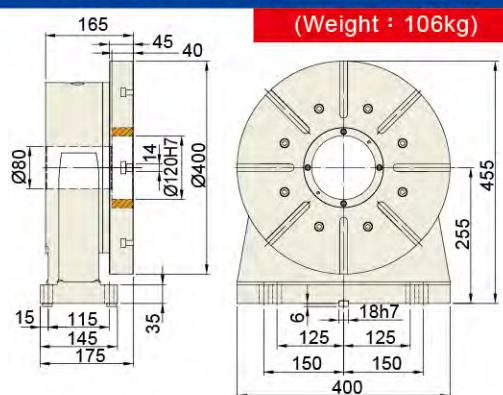
RTH-320 (Hydraulic brake 115 kgf-m)



RTA-210 (Pneumatic brake 31 kgf-m)
RTA-210H (Hydraulic brake 55 kgf-m)



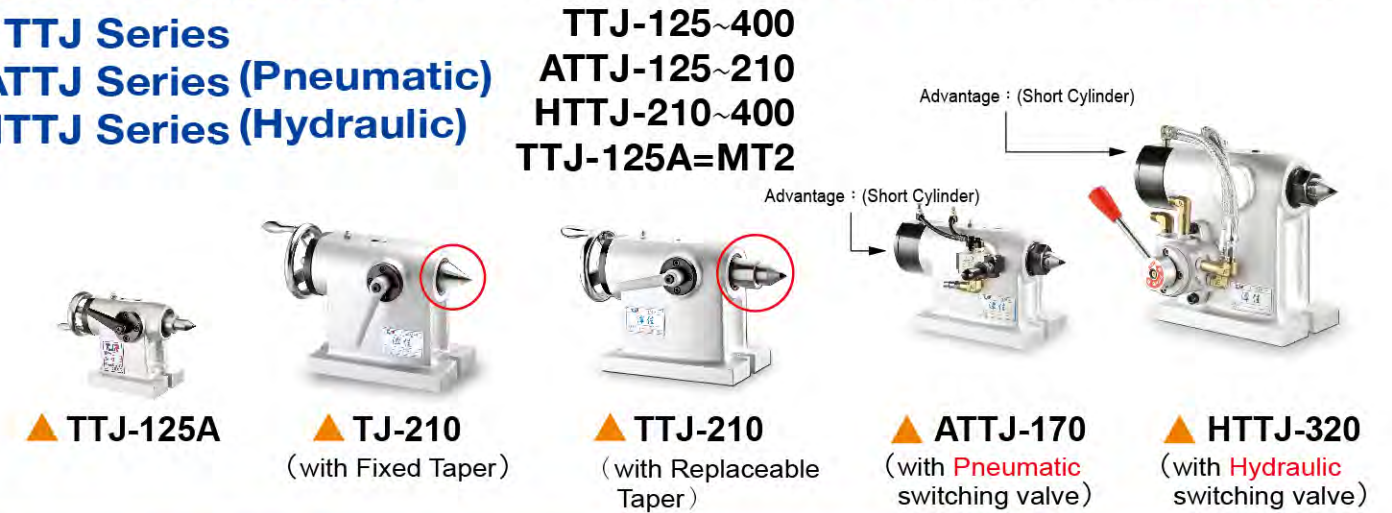
RTH-400A (Hydraulic brake 115 kgf-m)



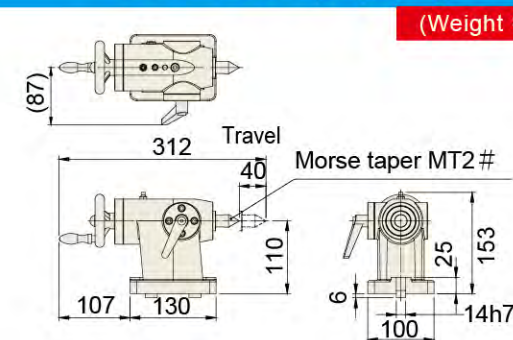
Manual Tailstock

TTJ Series
ATTJ Series (Pneumatic)
HTTJ Series (Hydraulic)

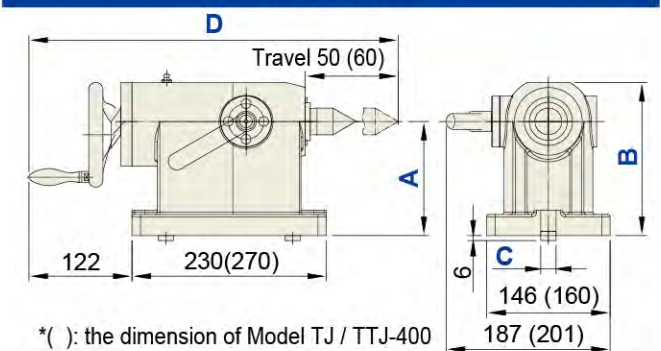
(For any model exceeding 170, **MT4[#]** is employed to provide **higher rigidity**)



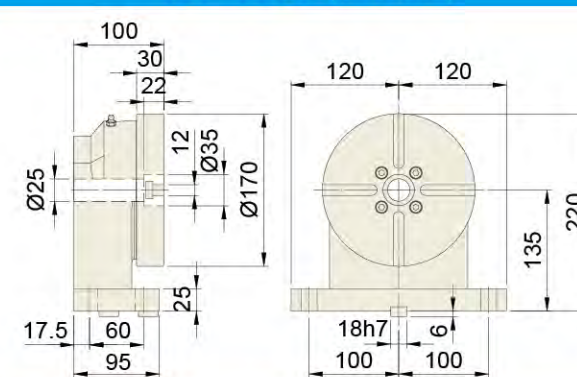
TTJ-125A (For light cutting)



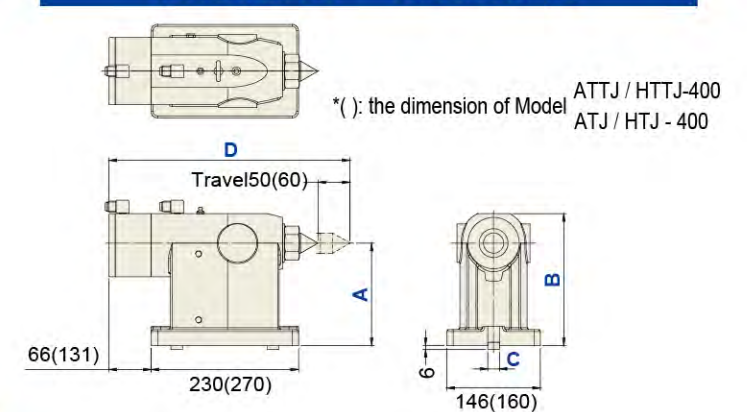
TJ / TTJ



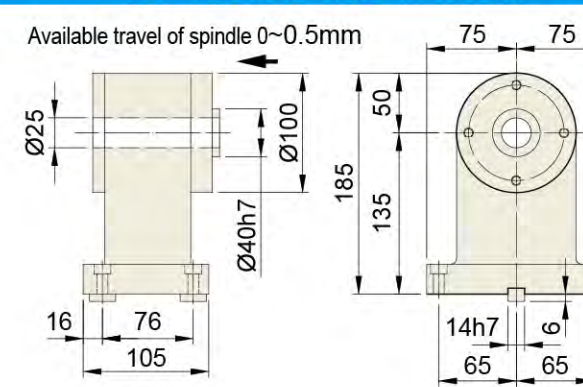
RT-170F (Without brake)



ATJ/ATTJ HTJ/HTTJ



RT-135 (Simplified type / Without brake)



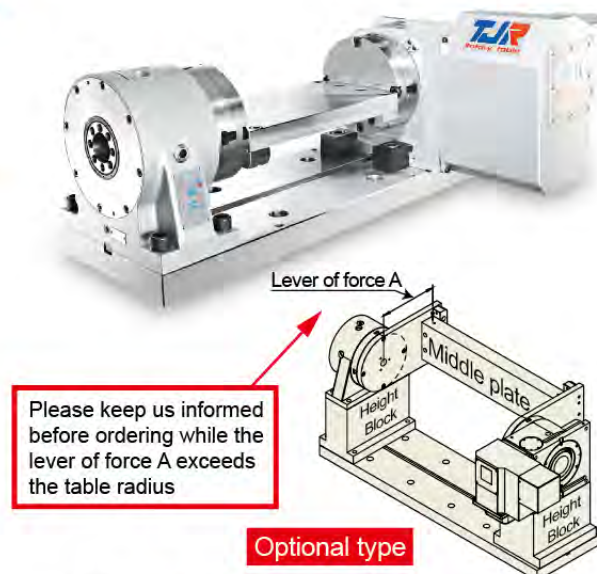
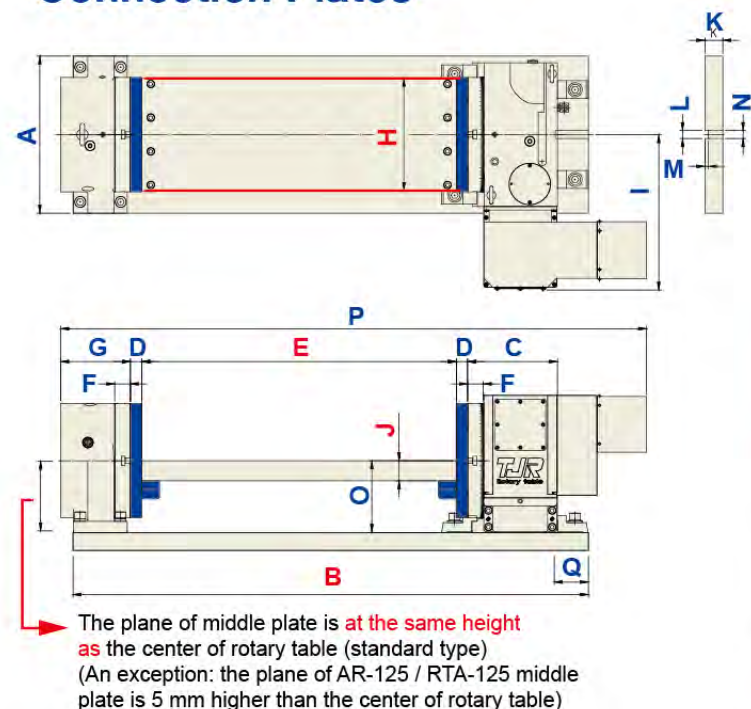
Manual Tailstock Series (Unit : mm)

Model	A	B	C	D	Weight Kg
TJ / TTJ-125	110	156	14	423/435.5	21.5
TJ / TTJ-170	135	181	18	423/435.5	23
TJ / TTJ-210	160	206	18	423/435.5	25
TJ / TTJ-255	160	206	18	423/435.5	25
TJ / TTJ-320	210	256	18	423/435.5	29
TJ / TTJ-400	255	310	18	487/503.5	48

Manual Tailstock Series with Pneumatic / Hydraulic switching valve (Unit : mm)

Model	A	B	C	D	Weight Kg
ATJ / ATTJ-125	110	156	14	363/376	21
ATJ / ATTJ-170	135	181	18	363/376	23
ATJ / ATTJ-210	160	206	18	363/376	25
HTJ / HTTJ-255	160	206	18	363/376	25
HTJ / HTTJ-320	210	256	18	363/376	29
HTJ / HTTJ-400	255	310	18	496/495	50

CNC Rotary Table + Support Table + Connection Plates



(Example of workpiece installation)

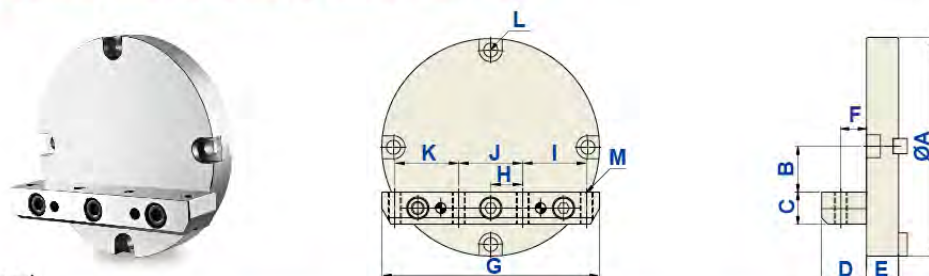
Specification

Model / Dimension	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
AR-125 / RTA-125	250	725	152	20	400	30	130	125	302	30	35	14	8	14	115	828	0
AR-170(H) / RTA-170(H)	300	911	152	25	500	30	140	170	336	35	40	18	8	18	135	947	69
AR-210(H) / RTA-210(H)	300	1011	152	25	600	30	140	200	336	40	40	18	8	18	160	1047	69
AR-250(H) / RTA-250(H)	300	1020	160	25	600	38	140	250	336	40	40	18	8	18	160	1055	69
HR-255N / RTH-255	350	1148	200	25	700	35	155	250	346	45	40	18	8	18	160	1305	69
HR-320N / RTH-320	400	1297	235	30	800	40	160	300	416	45	40	18	8	18	210	1460	69
HR-400N / RTH-400A	450	1455	250	30	900	45	175	400	457	45	40	18	8	18	255	1572	69

※ J is the thickness of the middle plate, recommended for manufacturing.
If the thickness is not enough, the middle plate will be easy to deform when twisted.

(Unit : mm)

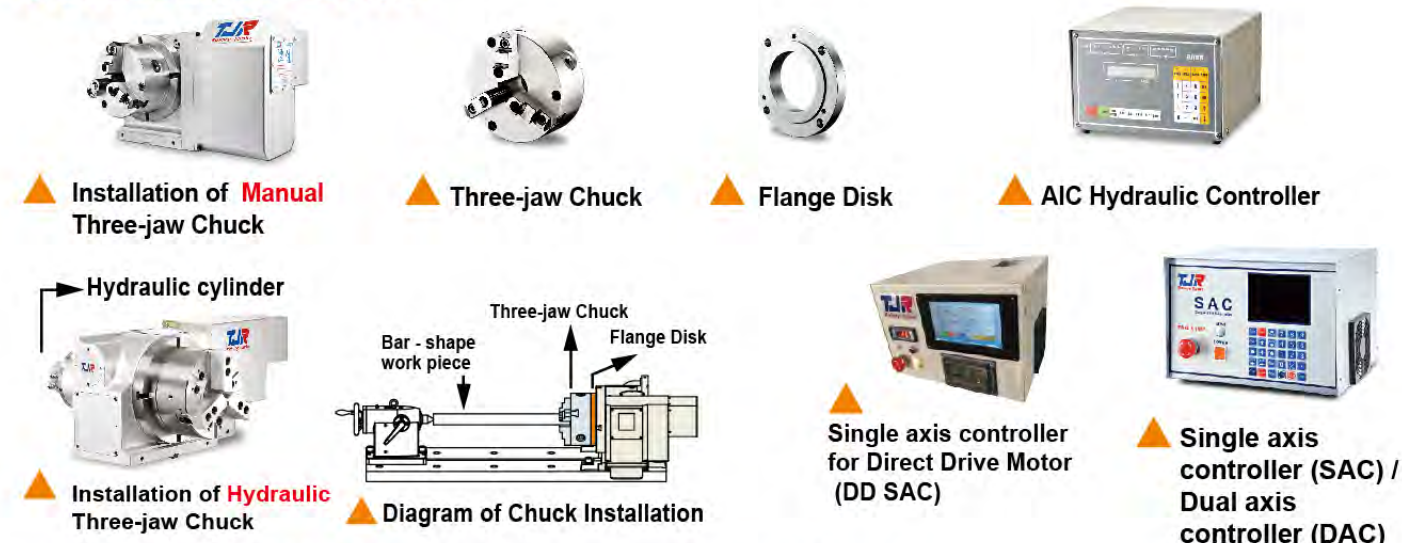
Disk L-block



Specification (Unit : mm)

Model / Dimension	ØA	B	C	D	E	F	G	H	I	J	K	L	M
AR-125	Ø125	25	25	25	20	12.5	120	27	25	54	25	M10	4-M8
AR-170(H)	Ø170	35	25	35	25	20	170	25	50	50	50	M10	4-M10
AR-210(H)	Ø210	40	35	40	25	20	200	27.5	55	55	55	M10	4-M10
HR-255	Ø250	45	40	40	25	20	250	37.5	75	75	75	M10	4-M10
HR-320	Ø320	45	45	45	30	22.5	300	42.5	85	85	85	M12	4-M12
HR-400	Ø400	45	45	45	30	22.5	400	75	80	150	80	M12	4-M12

Accessories Series



Specification Table of Manual Three-jaw Chuck

Model- Dimension	Gripping Range		Manual chuck thickness	Through hole of chuck	Max. available diameter of bar- shape workpiece which can go through hole of chuck.	Through hole of chuck adapter.	The thickness of chuck adapter					
	O.D. Range	I.D. Range					AR-125	AR-170/ 210/250(H)	RC-170/ 210/250	HR-255 HI-255	HR/Hi- 320-400	HR-500 HI-500
SK-4	Ø3-Ø95	Ø29-Ø84	59	Ø24	Ø24	Ø28	16					
SK-5	Ø3-Ø110	Ø33-Ø100	60	Ø32	Ø28	Ø28	16					
SK-6	Ø4-Ø160	Ø55-Ø150	67	Ø45	Ø30	Ø30		16	16			
SK-7	Ø8-Ø180	Ø62-Ø170	76.5	Ø58	Ø30	Ø30		16	16	20		
SK-8	Ø8-Ø190	Ø68-Ø180	76.5	Ø58	Ø30	Ø30		16	16	20	25	
SK-9	Ø11-Ø220	Ø70-Ø210	84	Ø70	Ø70	Ø70				20	25	
SK-10	Ø12-Ø260	Ø80-Ø250	89	Ø89	Ø70	Ø70				20	25	
SK-9	Ø11-Ø220	Ø70-Ø210	84	Ø70	Ø70	Ø110				20	25	
SK-10	Ø12-Ø260	Ø80-Ø250	89	Ø89	Ø89	Ø110				20	25	
SK-12	Ø15-Ø300	Ø90-Ø290	96	Ø105	Ø105	Ø110					25	
SK-12	Ø15-Ø300	Ø90-Ø290	96	Ø105	Ø105	Ø210					25	
SK-16	Ø30-Ø380	Ø110-Ø350	122	Ø160	Ø160	Ø210						28
SK-16	Ø30-Ø380	Ø110-Ø350	122	Ø160	Ø160	Ø270						28

Unit : mm

Servo Motor Reference Table (Please use oil-proof motors)

The data in the CNC rotary table specification sheet are calculated based on FANUC αiF servo motors. If other brands of servo motors are employed, please refer to the below list in order to select the suitable non-Fanuc servo motors whose sizes and features are similar to assigned Fanuc αiF ones. But, the below list is not suitable for the rotary axis of FAR-100/160SN and FAR-170A. Please consult with TJR to confirm the model of servo motor while placing order.

FANUC	αiF2 / 5000 αiS4 / 4000 βiS4 / 4000	αiF4 / 4000 αiS8 / 4000 βiS8 / 3000	αiF8 / 3000 αiS12 / 4000 βiS12 / 3000	αiF12 / 3000 αiS22 / 4000 βiS22 / 2000	αiF22 / 3000 αiS22 / 4000 αiS40 / 4000	αiF40 / 3000 αiS40 / 4000 αiS60 / 4000
MITSUBISHI	HF-75T / HG75T	HF-54T / HG104T	HG154S	HF-204S / HG204S	HF-354S / HG354S	HF-703S
YASKAWA	SGM7J-08A	SGM7G-09A	SGM7G-13A SGM7G-20A	SGM7G-30A	SGM7G-30A SGM7G-44A	SGM7G-44A
SIEMENS	1FK7042	1FK7060	1FK7063	1FK7083	1FK7101	1FK7103 / 1FK7105
HEIDENHAIN	QSY-96A	QSY-116C	QSY-116E QSY-130C	QSY-155B	QSY-155D	QSY-190D
SYNTEC	AM3-60	AM5-40	AM8-40 AM11-40	AM18-40	AM28-40	AM35-20(Ø35)

※ The servo motor models of the above list are actually categorized by motor sizes from the perspective of installation on the rotary tables. However, please do check the compatibility of servo motor based on the specification of NC control on the machining center.

※ Please employ higher torque motor while using connection plates and fixtures with support table.



Accessories Series

Air Hydraulic Booster Unit :
Timing for applications
1. Use hydraulic brake rotary table
2. Use hydraulic brake rotary table + manual tailstock

Pneumatic / Hydraulic rotary joint :
(can be equipped with 2, 4, 6, 8 holes)

2 holes :
1 input ; 1 output

8 holes :
4 input ; 4 output

Internal Cable inside rotary table

7 I/O signals

Cable assembly we provide (Standard)

Separated wiring of adaption and connection for power cable and feedback cable respectively.

※ As shown in the right diagram, internal cables include:
No. ① - ② power cable
No. ⑦ - ⑧ feedback cable
7 I/O signals for rotary table

※ TJR can also provide
③ - ⑥ and ⑨ - ⑫ cables

TJR Power (& Signal) & Feedback Cable Diagram

Cable assembly the customer provide (Optional)

(A) No hole and cable

(B) Direct wiring of power cable and feedback cable combined into one

(C) Direct wiring of power cable and feedback cable combined into one

(D) Wiring of adaption and connection for combined power cable and feedback cable

If you prefer any one of the above-mentioned types of cable assembly, we will provide only the rotary table [7 (air brake) / 5 (oil brake)] I/O signal connector. You need to prepare the rest.

Take Heidenhain for example

Heidenhain model of angle encoder	Fargor model of angle encoder	Angle encoder accuracy	Rotary table accuracy	
			C axis	A axis
ECN-2190F (FANUC)	H2AF-23-D87	± 10"	-	Within 30"
ECN-2190M (MITSUBISHI)	H2AM-23-D87			
ECN-2110 (SIEMENS)	H2AD-23-D87 H2AD-23-D87+EC-PA-DQ1 <i>don't need SMC-20</i>			
RCN-2391F (FANUC)	H2AF-26-D90	± 4"	Within 10"	Within 20"
RCN-2391M (MITSUBISHI)	H2AM-26-D90			
RCN-2311 (SIEMENS)	H2AS-26-D90 H2AD-26-D90+EC-PA-DQ1 <i>don't need SMC-20</i>			
RCN-2591F (FANUC)	H2AF-28-D90-2	± 2"	Within 8"	Within 15"
RCN-2591M (MITSUBISHI)	H2AM-28-D90-2			
RCN-2511 (SIEMENS)	H2AS-26-D90-2 H2AD-26-D90-2+EC-PA-DQ1 <i>don't need SMC-20</i>			
RCN-8391F (FANUC)	H2AF-29-D200i100-2	± 2"	Within 6"	-
RCN-8391M (MITSUBISHI)	H2AM-29-D200i100-2			
RCN-8311 (SIEMENS)	H2AS-29-D200i100-2			

※ Not any rotary table can be equipped with above-mentioned angle encoder. Please check the compatibility between rotary table and angle encoder with TJR after rotary table model is confirmed.

Diagram of angle encoder installation

Angle encoder

Accuracy comparison sheet while using angle encoder

1 Spindle bearings strength

TJR	Others	Others
Radial & axial preloading bearing	Taper roller bearing	Cross roller bearing
Large diameter	Small diameter	Small diameter
Suitable for heavy-duty cutting in the horizontal and vertical directions.	Only suitable for light cutting	Only suitable for light cutting

Laser measuring equipment [Indexing precision testing]

2 Advanced inspection facilities



3D measuring equipment
Geometry precision testing

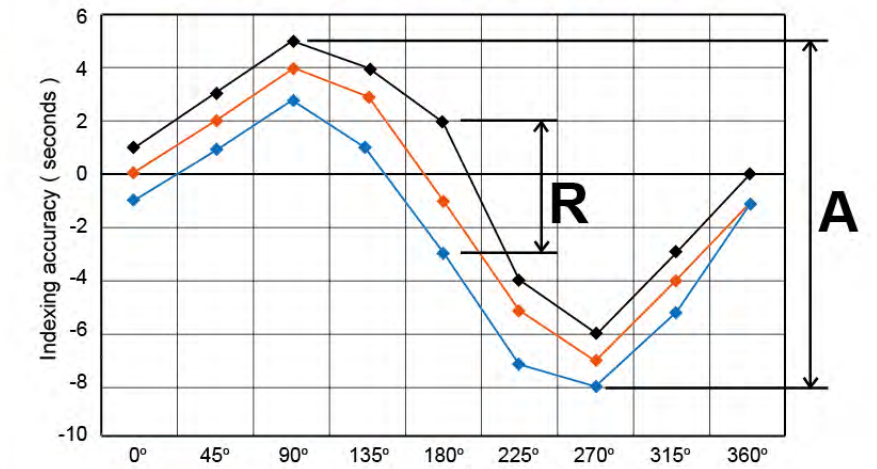


Geometry Precision Test Standard of Rotary Table (Unit : mm)

AR/HR (single axis)									
Inspection Items	Flatness of table top (Lower in the center)	Runout of table top during rotation	Parallelism of table top to frame bottom	Runout of table central hole	Perpendicularity of table top to frame bottom	Perpendicularity of table top to frame bottom guide blocks	Indexing Precision (Measured by optical instrument)	Parallelism of centerline between rotary table and tailstock frame bottom guide blocks	Height Difference between Center Line of Rotary Table and that of tailstock (tailstock center line should be higher)
	Total Length	Per 300mm	Total Length	Front	Total Length	Total Length	Accumulative tolerance	Per 300mm	
AR-125	0.01	0.015	0.02	0.01	0.01	0.02	40"	0.02	0.02
AR-170(H)/210(H)/250(H)	0.01	0.015	0.02	0.01	0.01	0.02	20"	0.02	0.02
AR-170(H)B/210(H)B/250(H)B	0.01	0.015	-	0.01	0.01	0.02	20"	0.02	0.02
HR-255/320/400	0.015	0.015	0.02	0.01	0.01	0.02	15"	0.02	0.02
HR-500	0.02	0.015	0.02	0.01	0.02	0.02	15"	0.02	0.02
HR-630 / HR-800	0.03	0.02	0.03	0.01	0.03	0.03	15"	0.02	0.02

FHR (dual axes)									
Inspection Items	Flatness of table top (Lower in the center)	Runout of table top during rotation	Parallelism of table top to frame bottom	Runout of table central hole	Parallelism between center line of tilting axis and bottom	Tilt axis - indexing precision (seconds)	Rotary axis - indexing precision (seconds)	Parallelism between rotary table and positioning block of bottom	
	Total Length	Per 300mm	Total Length	Front	Total Length		Accumulative tolerance		
FAR-125	0.015	0.015	0.02	0.01	0.02	60"	40"	0.02	
FAR-170 / 210	0.015	0.015	0.02	0.01	0.02	60"	20"	0.02	
FHR-255	0.015	0.015	0.02	0.01	0.02	60"	15"	0.02	
FHR-320 / 400	0.015	0.015	0.02	0.01	0.02	60"	15"	0.02	
FHR-500	0.02	0.015	0.02	0.01	0.02	60"	15"	0.02	
FHR-630	0.02	0.015	0.02	0.01	0.02	60"	15"	0.02	
MTHR-255	0.02	0.02	0.02	0.01	0.02	-	15"	0.02	

Rotary angle measurement of rotary table



The measurement of ISO 230-2

• Indexing Precision

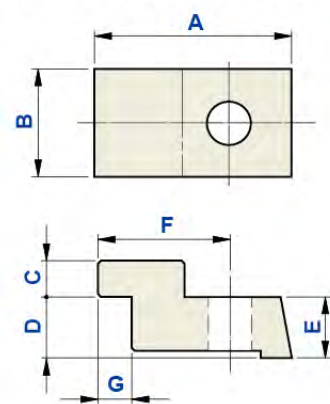
Rotate the axis in one direction and measure all the indexing values at equally divided and fixed angles (including at least 0°, 90°, 180°, 270°). Take the summary of the maximum positive difference and the maximum negative difference (absolute value) of all the measured values.

• Repeatability

Repeatedly rotate the axis in one direction and measure all the indexing values at equally divided and fixed angles (including at least 0°, 90°, 180°, 270°). Get the maximum differences of all measured indexing values at each fixed angle. Then, pick the biggest values from the measured maximum differences of all angles.

Specification – Clamping device

Standard Clamping device



Examples of special clamping device

Model	Standard Clamping Device						
	A	B	C	D	E	F	G
AR-125	63	35	12	20	20	43	11
AR-170(H)	78	40	12	25	22	49	11
AR-210(H)	78	40	12	25	22	49	11
AR-255H	78	40	12	25	22	49	11
HR-255	78	40	12	25	22	49	11
HR-320	78	40	15	35	25	49	11
HR-400	78	40	15	35	25	49	11
HR-500	63	60	18	40	58	33	18
HR-630	63	60	18	40	58	33	18
HI-255	78	40	12	25	22	49	11
HI-320	78	40	15	35	25	49	11
HI-500	63	60	18	40	58	33	18

※ When using clamping devices other than the above, please use suitable ones that are available in the market or order tailor-made ones from TJR.



Examples of applications: TJR can work with all brands of control systems and machines.



TJR Global Sales

Innovative Product

Integrity Business

Responsible Service



Appearance of Taiwan Plant

China Kunshan Plant



▲ EMO Hannover_Germany

▲ TIMTOS x TMTS_Taipei, Taiwan

▲ JIMTOF
Tokyo, Japan

▲ ITES_Shenzhen, China