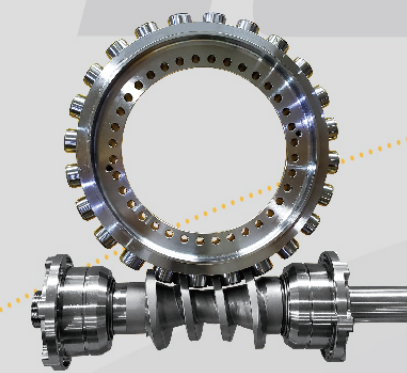


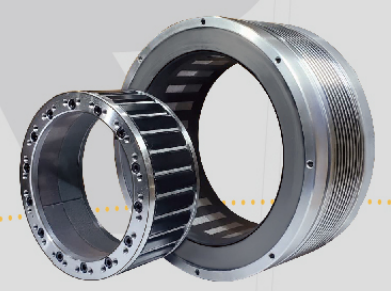
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Driven by  
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Driven by  
**Alloy Steel Worm Gear**



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**TJR**<sup>®</sup>  
Rotary Table

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TJR APP



We Chat

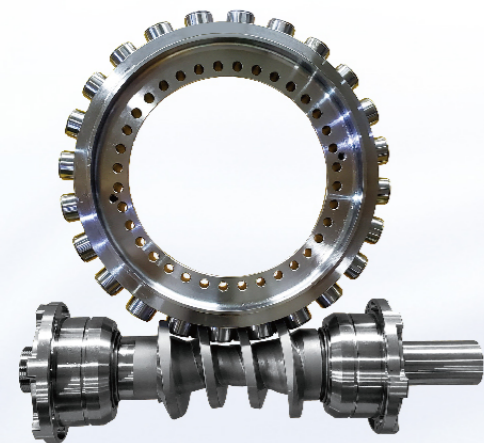


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**No More wear and tear**



Driven by  
**Roller Gear Cam**

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

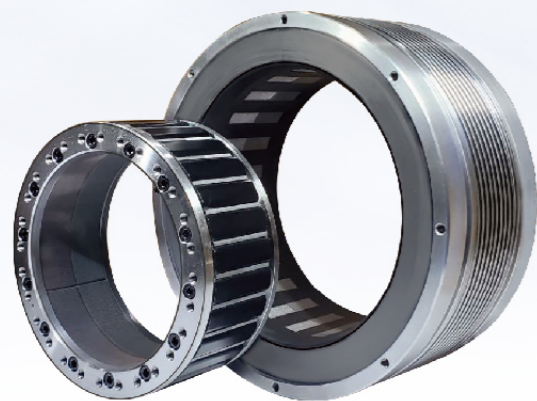


Dual lead  
Alloy steel worm shaft

Driven by  
**Alloy Steel Worm Gear**



Bearing determines rigidity  
**Radial & Axial bearing**



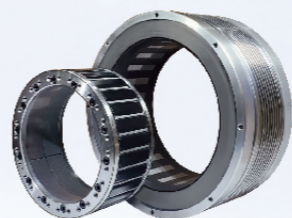
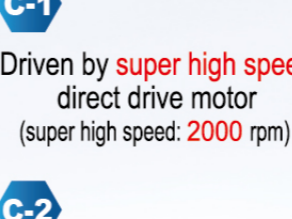



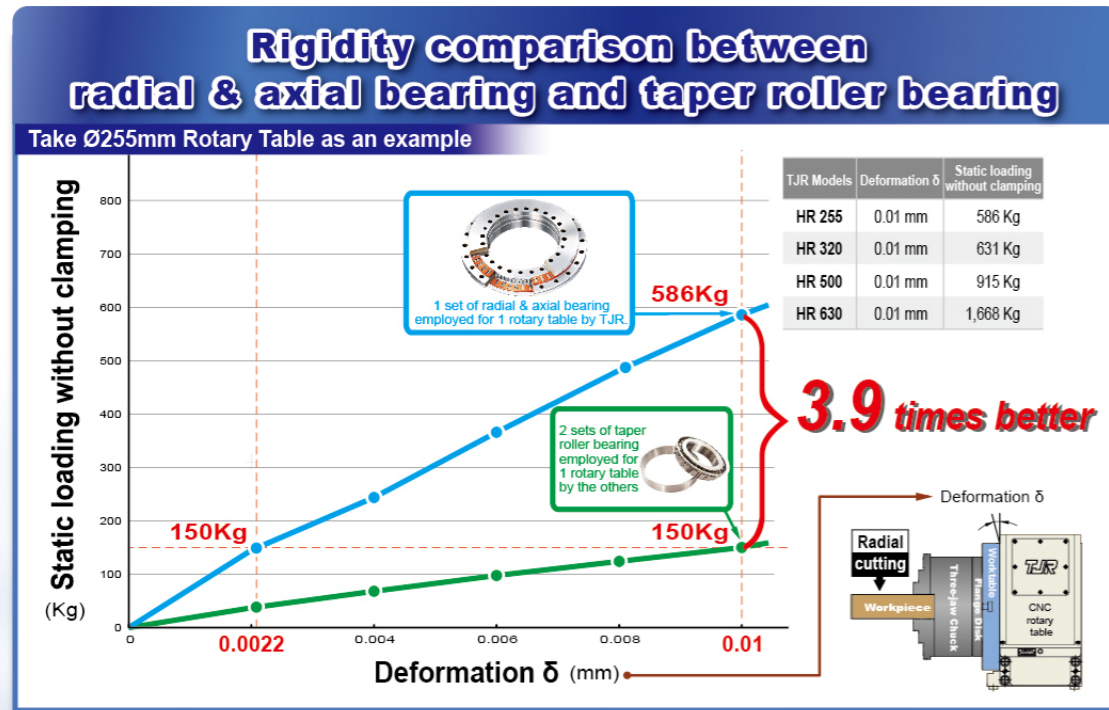
Driven by  
**Direct Drive Motor**



**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**.

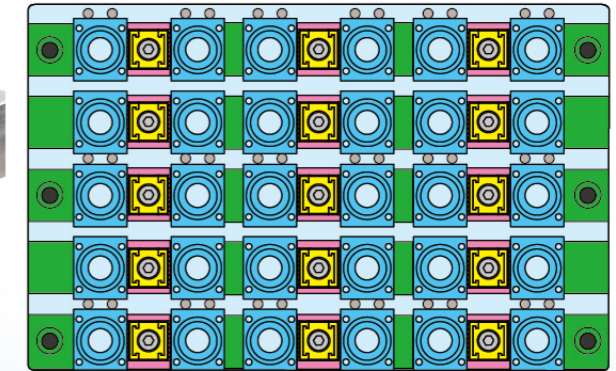
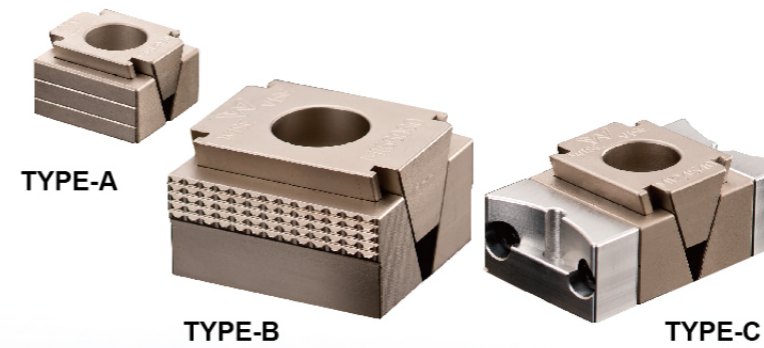
4 Transmission Mechanisms	
<p><b>A</b></p>  <p>Driven by <b>alloy steel</b> worm gear</p>	<p>Strength:</p> <ul style="list-style-type: none"> <li>① Much more <b>anti-wear</b> than bronze worm gear</li> <li>② <b>High torque</b></li> <li>③ Because the tilting axis needs to bear heavy load, alloy steel worm gear can significantly enhance wear resistance.</li> </ul>
<p><b>B</b></p>  <p>Driven by <b>roller gear cam</b> (speed: 80 rpm)</p>	<p>Strength:</p> <ul style="list-style-type: none"> <li>① Almost no backlash during the clockwise / anti-clockwise rotation</li> <li>② <b>Almost no abrasion</b> for the transmission mechanism</li> <li>③ High speed</li> </ul>
<p><b>C-1</b></p>  <p>Driven by <b>super high speed direct drive motor</b> (super high speed: 2000 rpm)</p>	<p>Strength: <b>a mill / turn component</b></p> <ul style="list-style-type: none"> <li>① If the moving column vertical machining center or drilling &amp; tapping center is equipped with our table, it can make the machine work as a <b>horizontal</b> or <b>vertical lathe</b> concurrently.</li> <li>② The super high speed of rotary axis: 2000 rpm.</li> <li>③ Truly <b>zero backlash</b> during the clockwise / anti-clockwise rotation.</li> <li>④ Truly <b>zero wear</b> for the transmission mechanism.</li> <li>⑤ Long-lasting high precision (The actual precision depends on the selected angle encoder)</li> </ul>
<p><b>C-2</b></p>  <p>Driven by <b>direct drive motor</b> (speed: 200 rpm)</p>	<p>Strength:</p> <ul style="list-style-type: none"> <li>① Truly <b>zero backlash</b> during the clockwise / anti-clockwise rotation.</li> <li>② Truly <b>zero wear</b> for the transmission mechanism. (<b>No abrasion at all</b>)</li> <li>③ High speed: 200 rpm</li> <li>④ Long-lasting high precision (The actual precision depends on the selected angle encoder)</li> </ul>
<p><b>D</b></p>  <p>Driven by <b>Japan-made worm &amp; worm gear</b></p>	<p>Strength:</p> <ul style="list-style-type: none"> <li>① The major and cost-effective solution</li> <li>② Easy to adjust backlash after some abrasions</li> </ul>



Large diameter

**Devised by German**

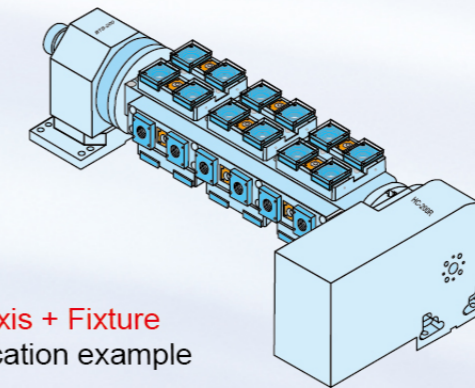
Specialized for Rotary Table, the Radial & Axial bearing can fully support heavy-duty cutting in both radial and axial directions.



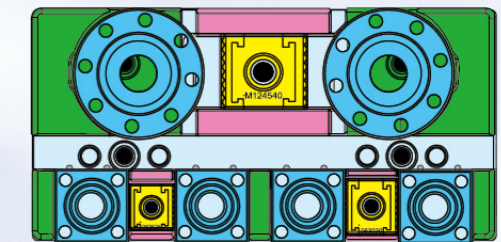
## Little King Kong Vise

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

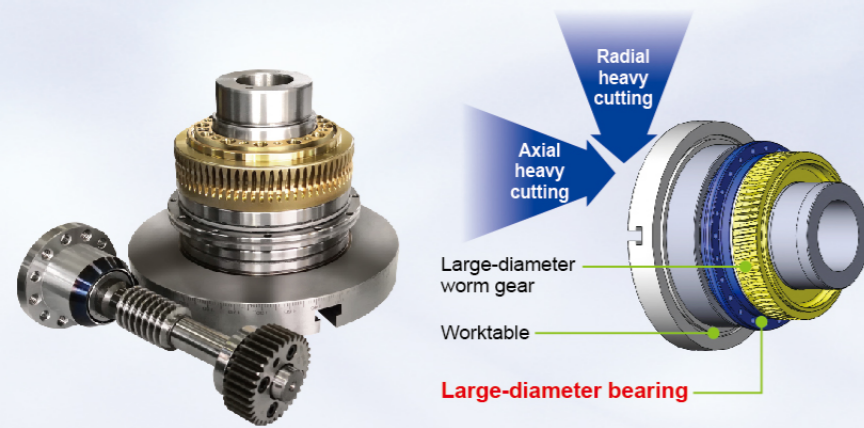
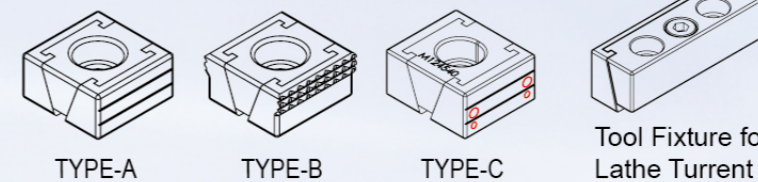
- Blue: Work-piece
- Yellow: Little King Kong Vise
- Green: Work-holding fixture
- Pink: Vise directional fixture



▶ The 4<sup>th</sup> axis + Fixture  
An application example



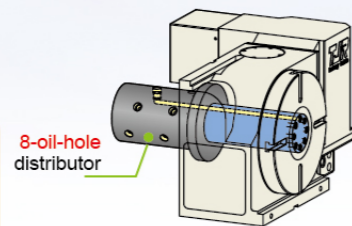
▶ Zero point clamping system is available.  
High-precision exchange of clamping devices, fixtures and work-pieces within seconds.



**Japan-made high-tensile-brass worm gear**

Wear life is 2.6 times longer than aluminum bronze PBC3.

can sustain outer circle periphery of table, and accordingly deliver high rigidity and optimize axial heavy-duty cutting.



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.

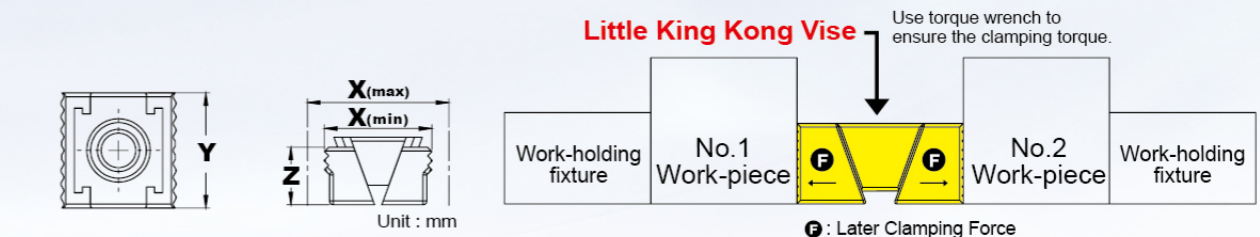
### High performance braking system

<b>Drum brake</b>	<b>Others Disc brake</b>
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**

Example of High-Tensile-Brass worm gear model name

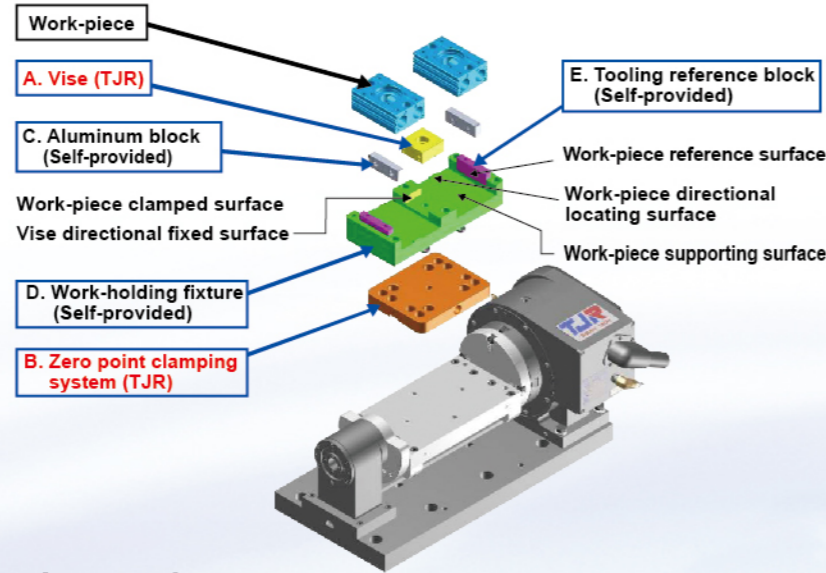
- AR-170-J
- HR-255-J
- FHR-320-J
- FHR-400CF-J



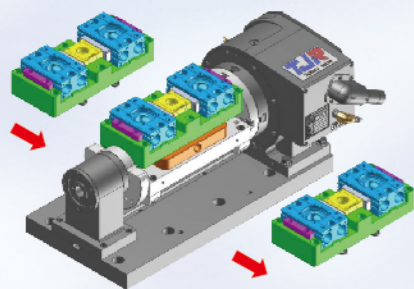
Vise specification	Model	Vise dimension				Suitable Screw	Clamping Force (KN)	Surface Hardness (HRC)	
		X (mm)			Z (mm)				
		Min.	Rated	Max.					
	M062525	23	25	26	25	12	M6*16	18	48-52
	M083030	27	30	31	30	15	M8*20	25	48-52
	M104040	36	40	42	40	20	M10*25	45	48-52
	M124540	40	45	47	40	22	M12*30	65	48-52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

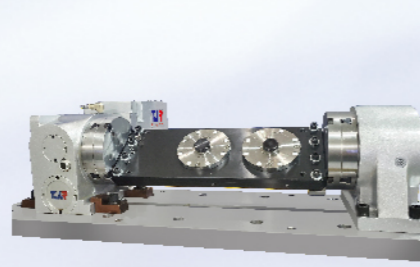
Make your own work-holding fixture by easily employing **TJR Vise** and **TJR zero point clamping system** on the fixture plate of 4<sup>th</sup> axis or the faceplate of 4<sup>th</sup> & 5<sup>th</sup> axes. Holes on the zero point clamping system are used as sockets for clamping studs.



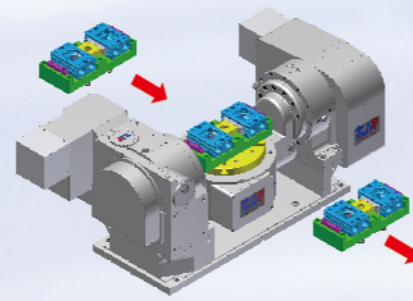
Work-holding fixture can be changed quickly and accurately (across all machines).



The illustration of the application for the 4<sup>th</sup> axis + connection plate



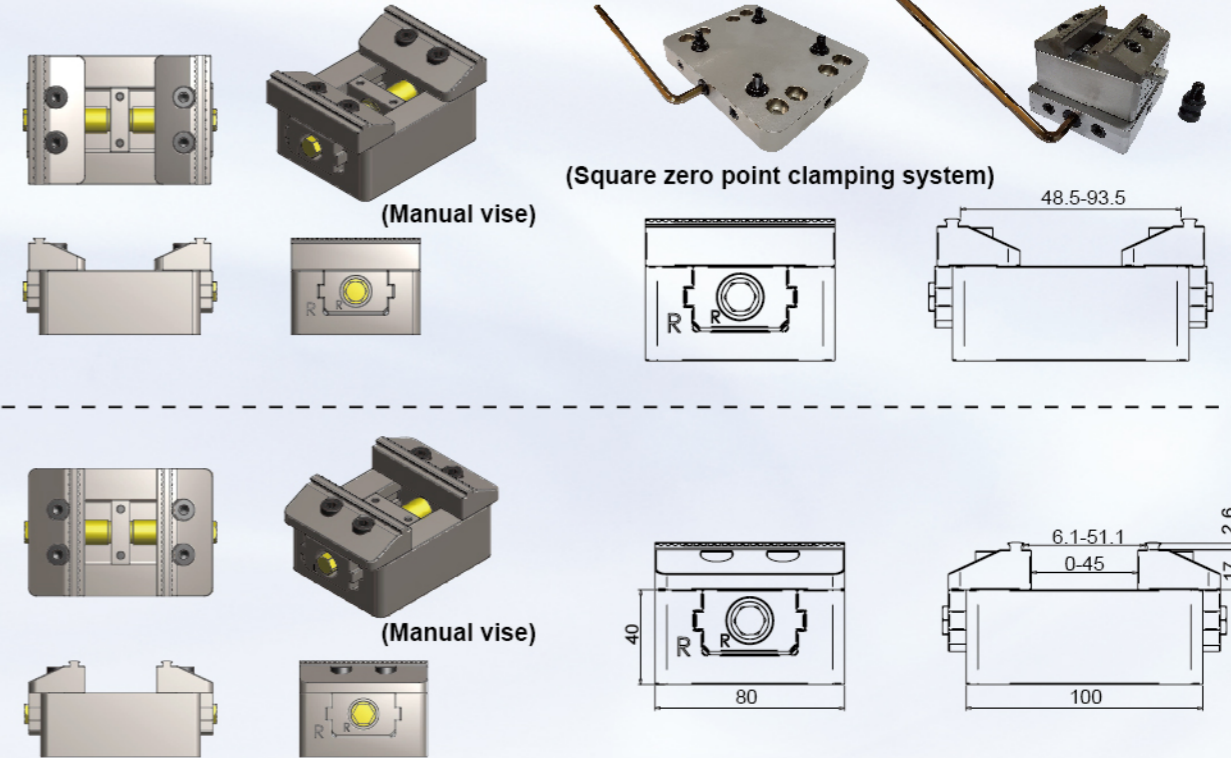
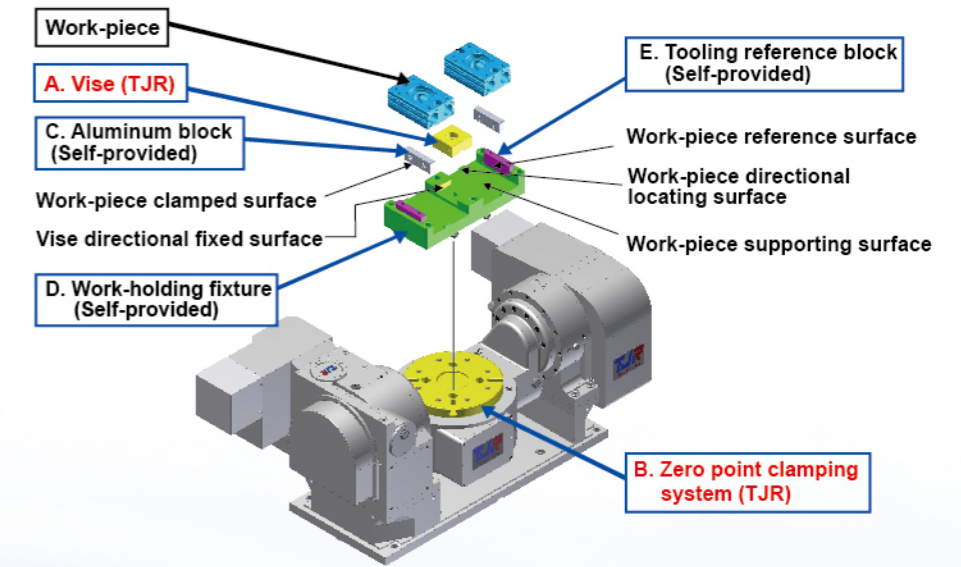
The zero point clamping system on the connection plate



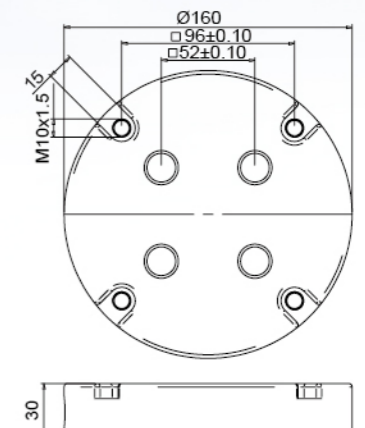
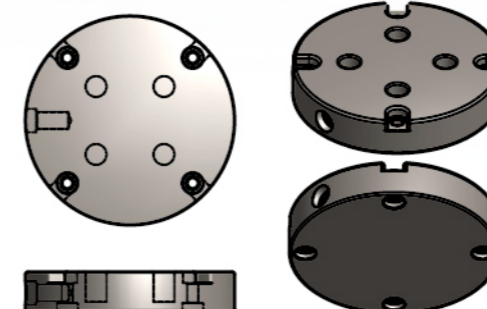
The illustration of the application for the zero point clamping system on the faceplate of the 4<sup>th</sup> & 5<sup>th</sup> axes

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
<b>Features of TJR rotary tables</b>		
		1~3
<b>Little King Kong Vise</b>		
		4
<b>Zero point clamping system</b>		
		5~6
<b>Page index</b>		
		7~8
<b>Instruction</b>	<b>How to choose a suitable TJR rotary table</b>	9~10
<b>CNC Rotary Tables</b> 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
<b>Manual Tilting Rotary Tables (CNC Rotary axis)</b>	MTHR series: Maual Tilt axis CNC Rotary axis MTHR-255	20
<b>CNC Multi spindle Rotary Tables</b> 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
<b>CNC Index Tables</b> 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
<b>CNC Indexing tables (Horizontal only)</b> 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
<b>Non-CNC Hydraulic index tables with hirth coupling</b>	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
<b>Flat type APC for 3-axis-moving-column vertical machining center</b>	CHC series: Flat type auto pallet changer (180° to and fro) CHC-700 x 910 、 CHC-700 x 1090	30
<b>CNC Tilting Rotary Tables</b> 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	40
	FHR series: Hydraulic brake FHR-400S FHR-650S-525/650S-550	41~42
<b>Roller Gear Cam Hook type APC for vertical machining center</b>	CURC series: Hook type auto pallet changer (180° to and fro) CURC-500x700	43

Description	Model code	Page
<b>Hook type APC for vertical machining center</b>	CTU series: Hook type auto pallet changer (180° to and fro) CTU-400 x 600 、 CTU-500 x 700	44
<b>Tray type APC and dual pallets rotary table for horizontal machining center</b>	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
<b>CNC Rotary Tables</b> Min indexing angle – 0.001° Driven by Roller Gear Cam	RC series : Pneumatic brake/Hydraulic brake RC-170R/210R/255R(N) RC-320R(N)/320L	51~52
	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
<b>CNC Rotary Tables</b> Min indexing angle – 0.001° Driven by Direct Drive Motor	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
<b>CNC Rotary Tables</b> Min indexing angle – 0.001° Driven by Direct Drive Motor	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
<b>Support table</b>	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
<b>Manual tailstock</b>	TJ series: Fixed Taper TJ-125~400 TTJ series: Replaceable Taper TTJ-125~400	66
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<b>Rotary table accessories / Accuracy Inspection report: Geometry precision test/ indexing precision test</b>		67~73
<b>Global Sales</b>		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 ( $\pm 5$  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  $1^\circ$  or  $5^\circ$  (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 :

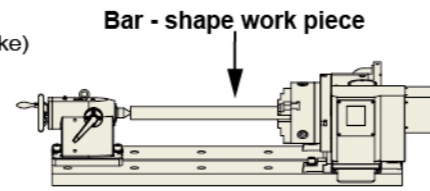
First, verify whether the selected rotary table interferes when it is placed on the work table of the machining center. With the Y axis of the vertical machining center moved to the origin, please measure

- 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]

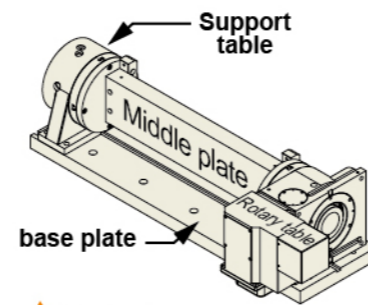
If the "B" distance is less than the "A" distance, it is certain that the rotary table will not collide with the sheet metal of the slide door. [Ex: 420mm < 450mm; thus it's ok to select HR255-R] If not, please change to sheet metal cover reduction version of TJR rotary table. [Ex: only 346mm in HR255-N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

### 6 Verify the available room for placing the workpiece :

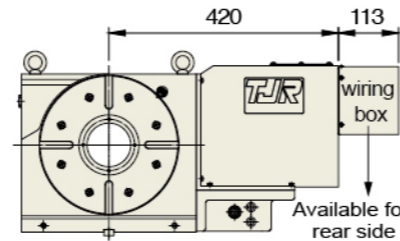
Please measure the length of working table of the machine to verify that it is not 200 mm smaller than base plate. It is the **maximal allowed protrusion** for the base plate of all models to stand out by **100mm** on each side of the working table. For example: Assuming the length of working table of 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).



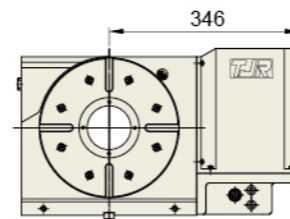
▲ Drawing ①



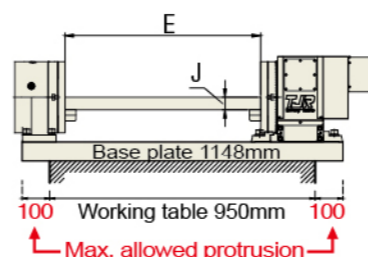
▲ Drawing ②



▲ Drawing ③ : HR-255R



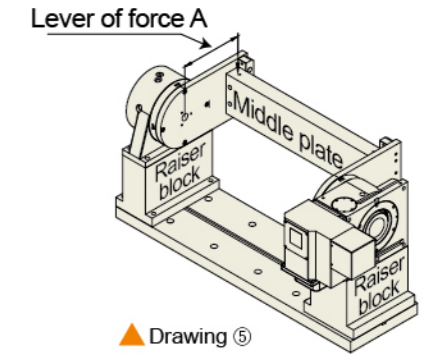
▲ Drawing ③-1 : HR-255N



▲ 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.



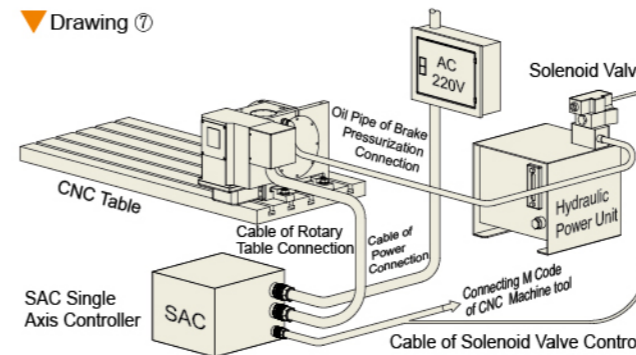
▲ Drawing ⑤

### 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 4<sup>th</sup> axis motor ③ shielded power & feedback cables ④ unshielded power & feedback cables, and ⑤ 4<sup>th</sup> 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.

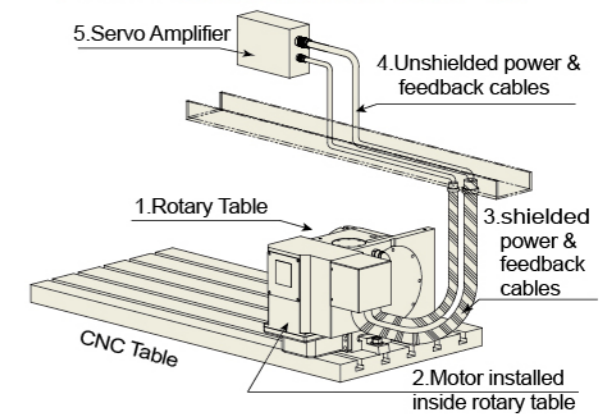
### 9 Application for single axis controller ( SAC ) :



▼ Drawing ⑦

★ 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.

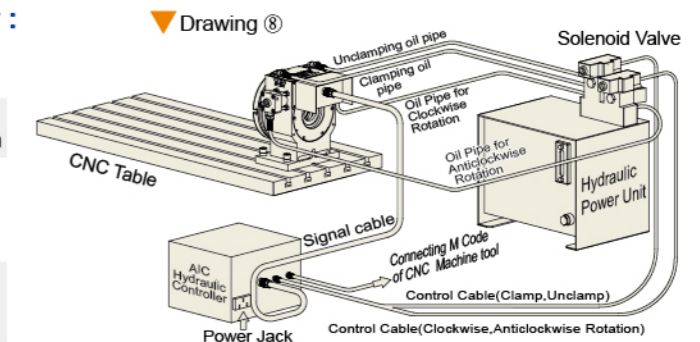
▼ Drawing ⑥ 5 main components of the 4<sup>th</sup> axis



### 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:	<ul style="list-style-type: none"> <li>• Indexing accuracy <math>\pm 5</math> seconds,</li> <li>• Lower cost due to no numerical control system</li> </ul>
Weakness:	<ul style="list-style-type: none"> <li>• It is not available for simultaneous movement with the other 3 axes.</li> <li>• Limited index numbers: 2, 4, 8, 12, 24 index numbers</li> </ul>
Note:	Please prepare specialized PLC for HC series by yourself, if you don't buy AIC hydraulic controller.

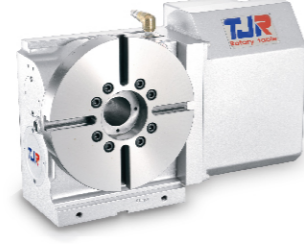


▼ Drawing ⑧

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)

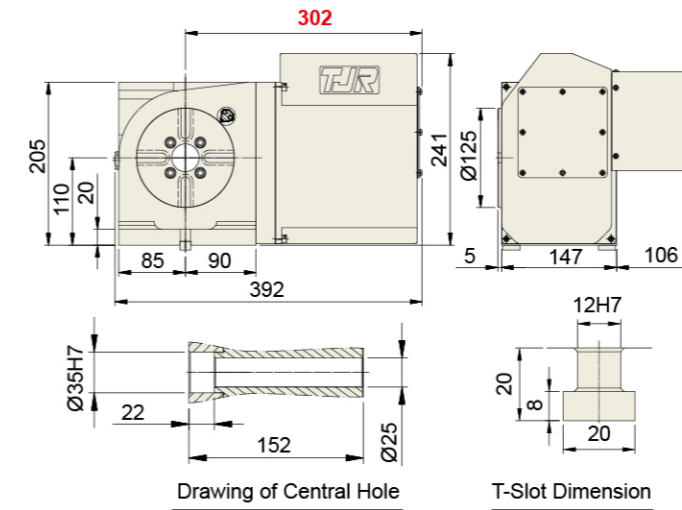
Hydraulic AR(s)-170HR/210HR/250HR are alternatives.

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 <sup>2</sup>	6	6	6	5	
Clamping Torque	kgf-m	13	31	31	70	
Servo Motor Model	FANUC	Taper shaft	αis4 / βis4	αiF4 / αiF8 / βis8	αiF4 / αiF8 / βis8	αiF8 / βis8
	MITSUBISHI	Taper / Straight shaft	HG/HF-75 / 105	HG/HF-54 / 104	HG/HF-54 / 104	HG/HF-104 / 154
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 <sup>2</sup>	2	5.4	8.3 / 11.7	20.3	
Allowable Workpiece Load	Vertical	kg	50	75	75	100
	with Support Table	kg	100	150	150	250
	Horizontal	kg	100	150	150	250
Allowable Thrust Load (with Rotary Table Clamping)	F	kgf	1000	1450	1450	2000
	FxL	kgf-m	45	110	110	150
	FxL	kgf-m	13	31	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

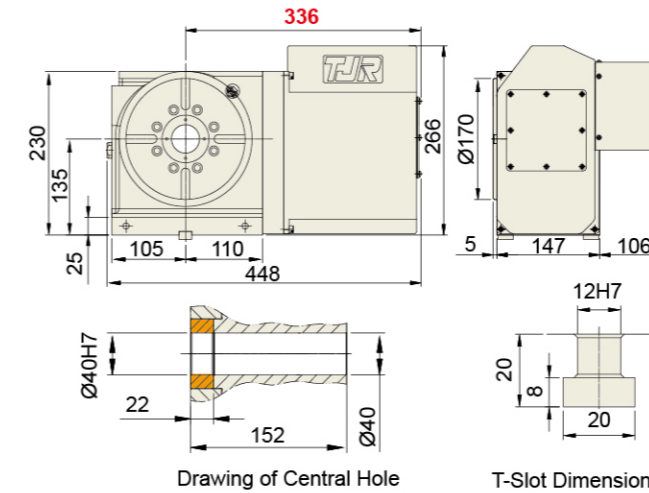
### AR(s)-125R



NEW Powerful Brake System

### AR(s)-170R

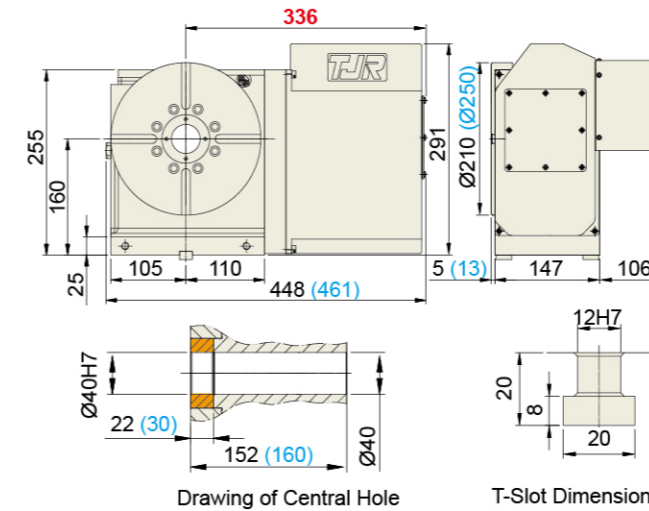
AR(s)-170HR  
(Hydraulic Brake)



NEW Powerful Brake System

### AR(s)-210R/250R

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



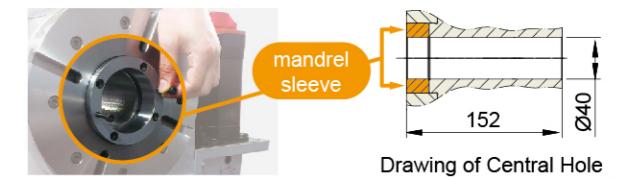
\*( ) : the dimension of Model AR(s)-250R

### ARs-210H-R-J-A

#### Diagram of Model Encoding Rules

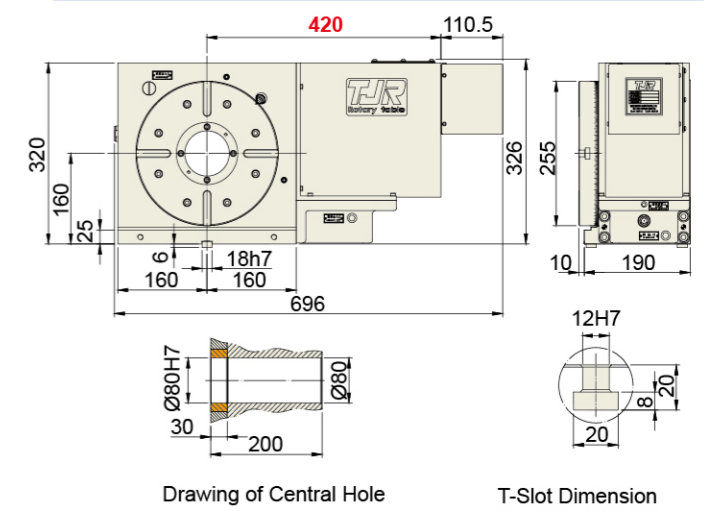
- Special Version (A, B, C...) Specified by Customers
- J: Worm and Worm Gear Made in Japan (Recommend for any table which sizes up to over Ø255mm)
- T: Worm and Worm Gear Made in Taiwan
- R: Right Side Motor (for Both Vertical and Horizontal Applications)
- L: Left side motor, while applying to 4<sup>th</sup> axis. (for Both Vertical and Horizontal Applications)
- L: Extended type, while applying to 4<sup>th</sup> & 5<sup>th</sup> 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: 2<sup>nd</sup> 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)-170L ▲



▲ AR(s)-125L

◀ Alloy steel worm gear (Optional)



AR(s)-210L ▲



AR(s)-250L ▲

**FEATURE**



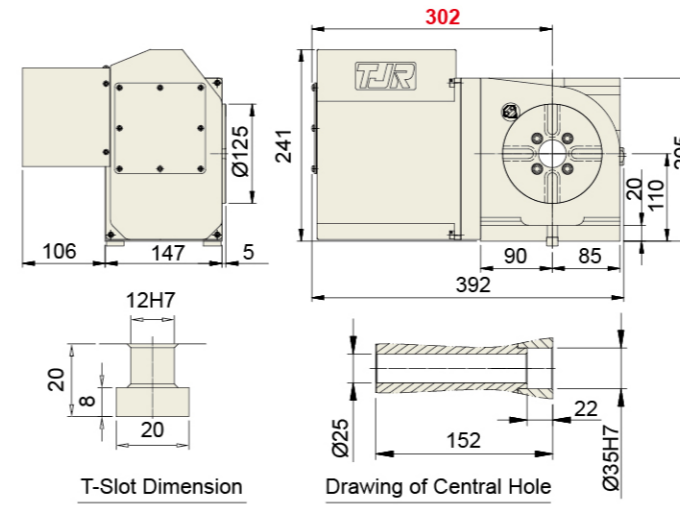
Use radial & axial bearings

Item / Model		Unit	AR(s)-125L	AR(s)-170L	AR(s)-210L	AR(s)-250L
Hydraulic AR(s)-170HL/210HL/250HL are alternatives.						
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 <sup>2</sup>	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 <sup>2</sup>	2	5.4	8.3	11.7
Allowable Workpiece Load	Vertical	kg	50	75	75	75
	with Support Table	kg	100	150	150	150
	Horizontal	kg	100	150	150	150
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)	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**

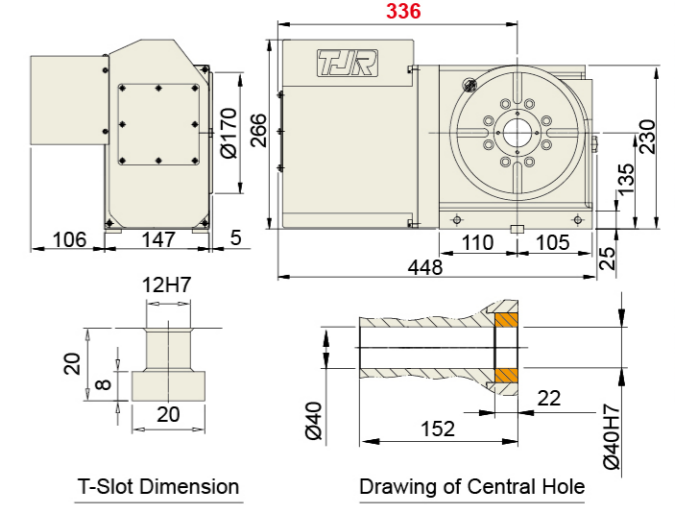
### AR(s)-125L



**NEW Powerful Brake System**

### AR(s)-170L

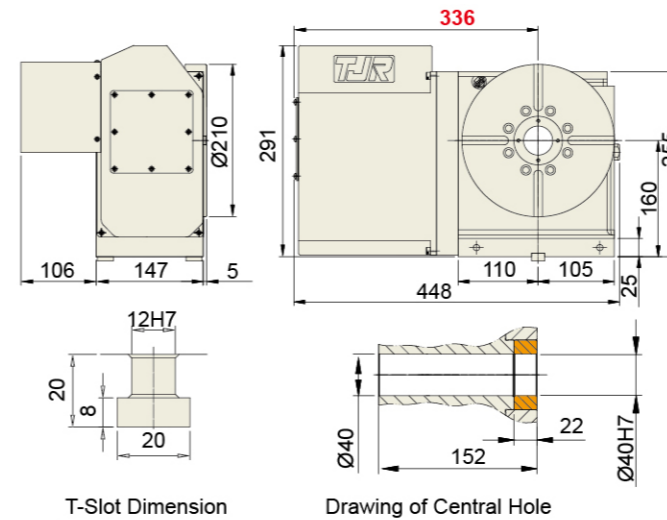
AR(s)-170HL  
(Hydraulic Brake)



**NEW Powerful Brake System**

### AR(s)-210L

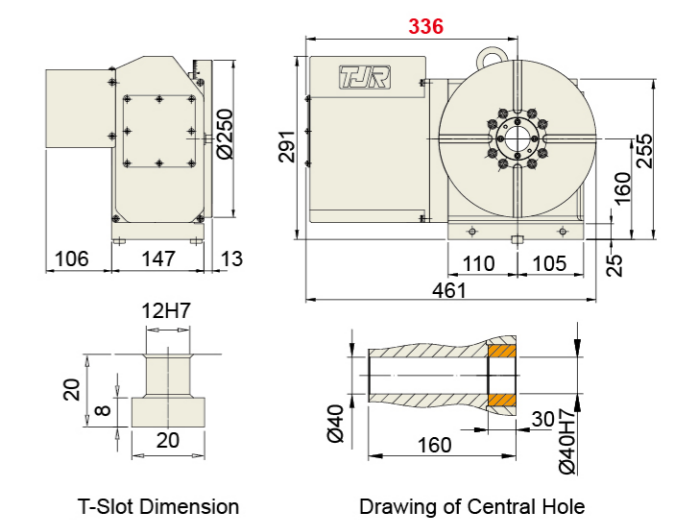
AR(s)-210HL  
(Hydraulic Brake)



**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



scenario 1  
Solenoid valve (inside of rotary table)

scenario 2  
Solenoid valve (inside of rotary table)

**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.

Simultaneously brake for rotary table and tailstock



CNC Rotary Tables  
(Min indexing angle – 0.001°)

## AR Series (Powerful Pneumatic Brake)- Back Side Motor AR(s)-125B/170B/210B/250B



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)

AR(s)-170B ▲  
(Back Side Motor)

▲ AR(s)-210B  
(Back Side Motor)

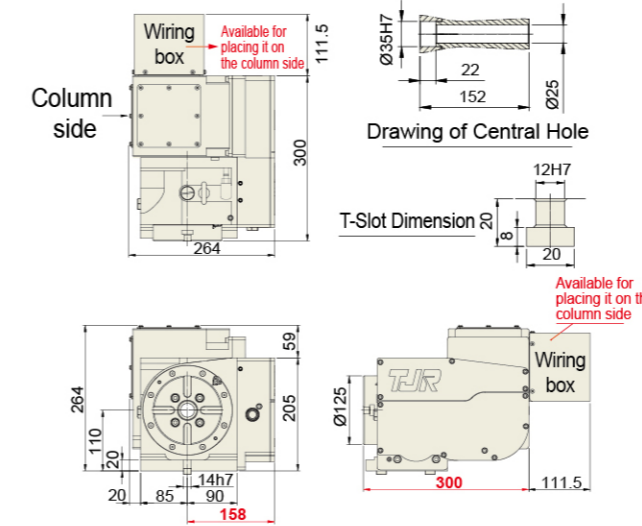
Hydraulic AR(s)-170HB/210HB/250HB are alternatives.

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 <sup>2</sup>	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 <sup>2</sup>	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
Driving Torque	FxL	kgf·m	13	31	31	31
		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

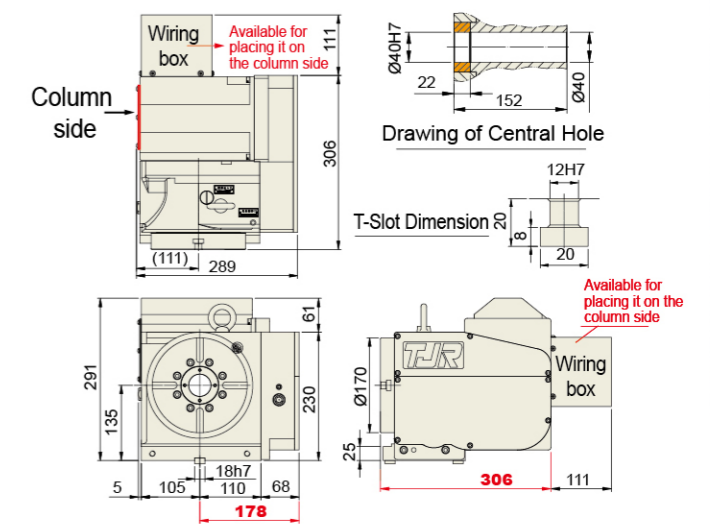
NEW Powerful Brake System

### AR(s)-125B



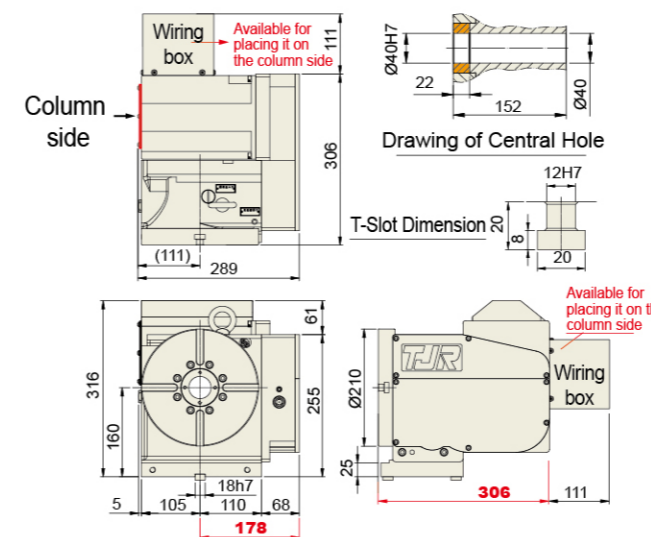
NEW Powerful Brake System

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



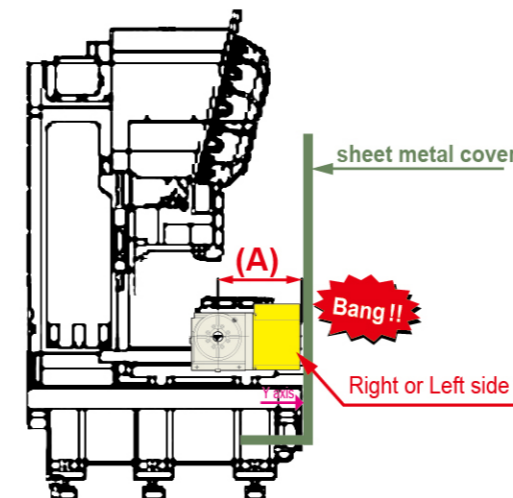
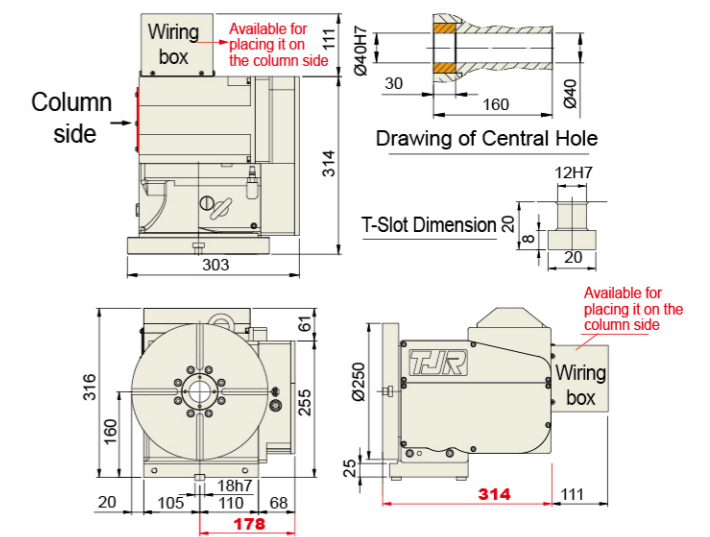
NEW Powerful Brake System

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

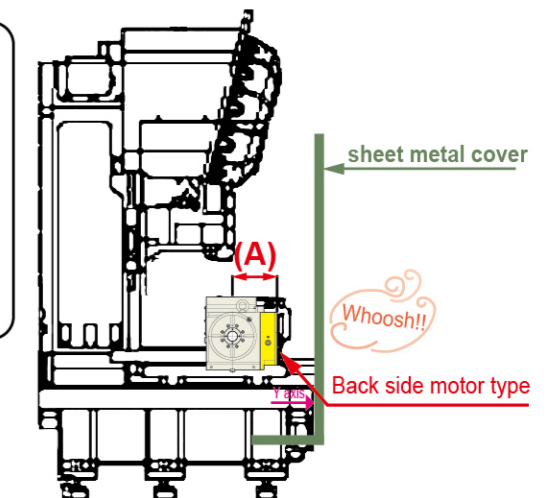


NEW Powerful Brake System

### 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)



## CNC Rotary Tables (Min indexing angle – 0.001°)

### HR Series (Hydraulic Brake)

#### AR(s)-210H HR(s)-255/320/400



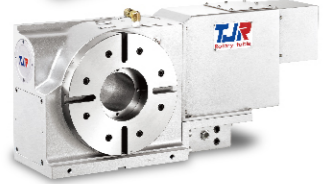
Alloy steel worm gear  
(Optional) for AR(s)-210H  
HR(s)-255

- 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

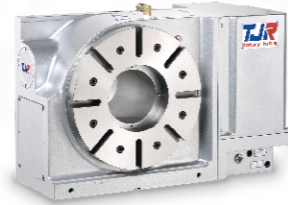
◀ **HR(s)-255N**  
(Reduced Sheet Metal Cover for Vertical Application)



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



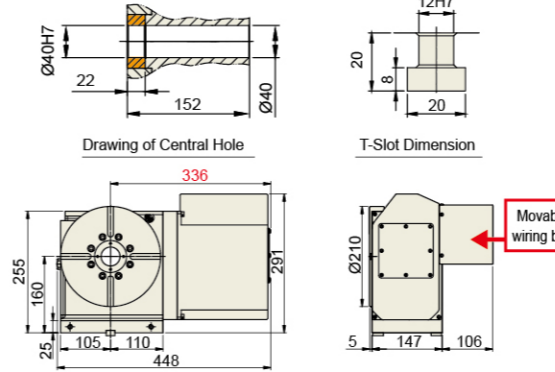
▲ **HR-320N**  
(Reduced Sheet Metal Cover for Vertical Application)



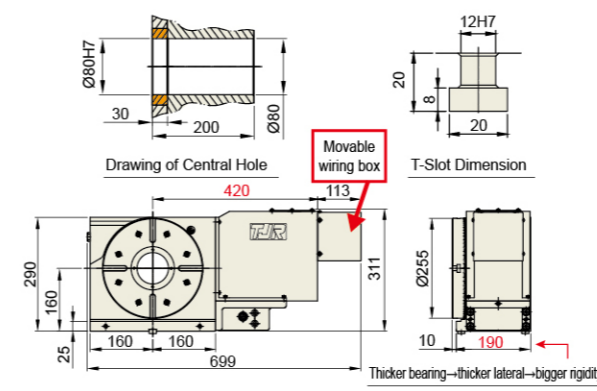
Item / Model	Unit	AR(s)-210H	HR(s)-255	HR-320	HR-400	
Table Diameter	mm	Ø 210	Ø 255	Ø 320	Ø 400	
Inner Diameter of Mandrel Sleeve	mm	Ø 40H7	Ø 80H7	Ø 120H7	Ø 120H7	
Diameter of Center Through Hole	mm	Ø 40	<b>Ø 80</b> Big Bore	<b>Ø 120</b> Big Bore	<b>Ø120 or Ø150</b>	
Center Height (Vertical)	mm	160	160	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 <sup>2</sup>	35	35	35	35	
Clamping Torque	kgf-m	55	70	115	200	
Servo Motor Model	FANUC	-	aiF4/aiF8/βis8[Taper shaft]	aiF8/βis8[Taper shaft]	aiF12/βis22[Straight shaft]	aiF12/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)	<b>33.3</b> *(25)	<b>25</b>	<b>25</b>	
Allowable Inertia Load Capacity (Horizontal)	kg.cm.sec <sup>2</sup>	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

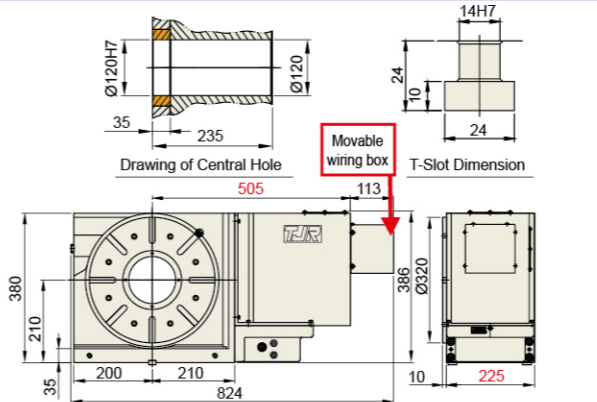
### AR(s)-210H



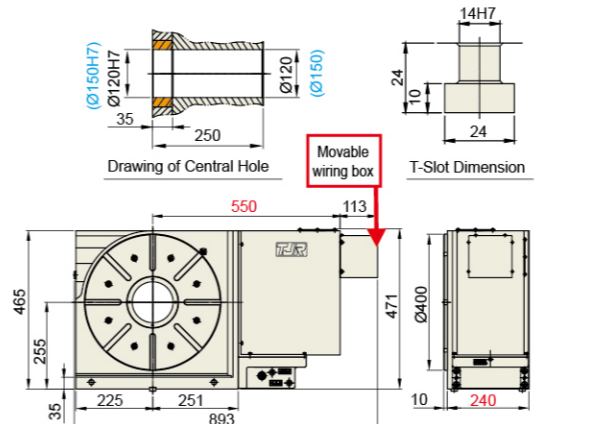
### HR(s)-255R



### HR-320R



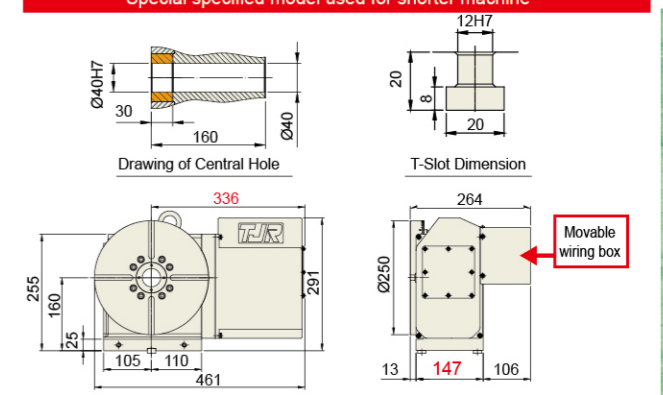
### HR-400R



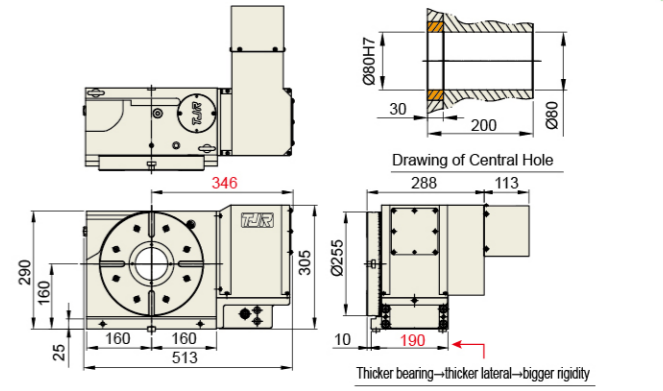
\*( ) Ø150 central through hole is available.

### AR(s)-250HR

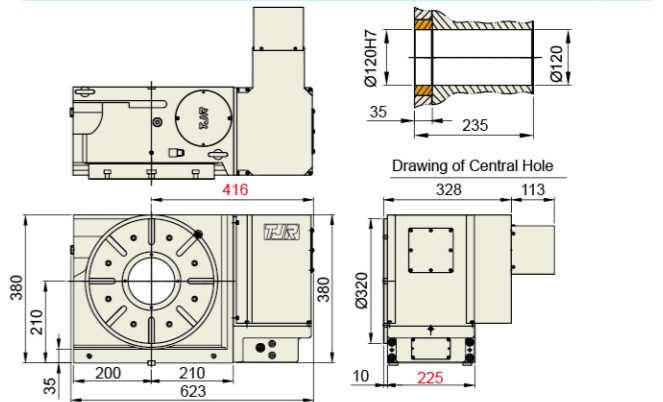
Special specified model used for shorter machine



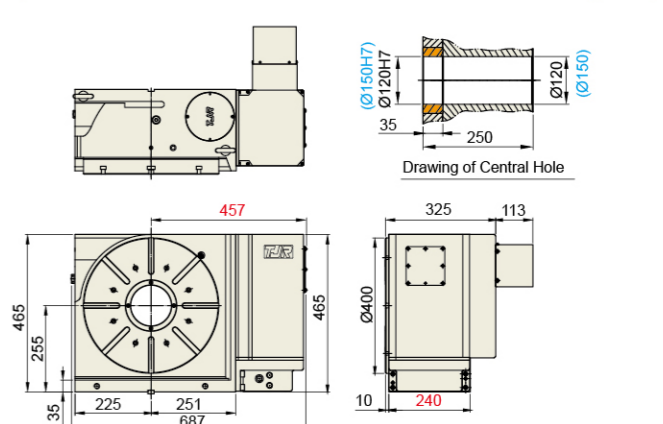
### HR(s)-255N (Sheet metal cover reduction)



### HR-320N (Sheet metal cover reduction)



### HR-400N (Sheet metal cover reduction)



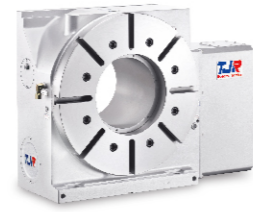
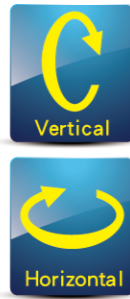
\*( ) Ø150 central through hole is available.

Driven by Worm & Worm Gear

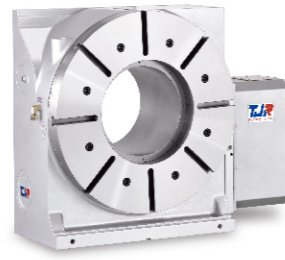
Driven by Worm & Worm Gear

## CNC Rotary Tables (Min indexing angle – 0.001°)

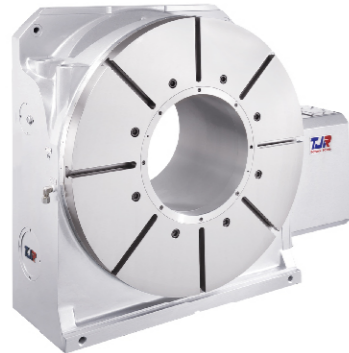
### HR Series (Hydraulic Brake) HR-500R/630R/800R



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



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

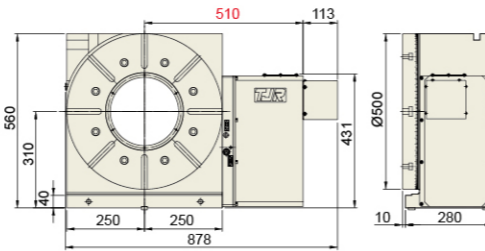
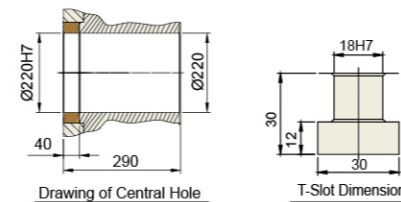


▲ **HR-800** (for Both Vertical and Horizontal Applications)

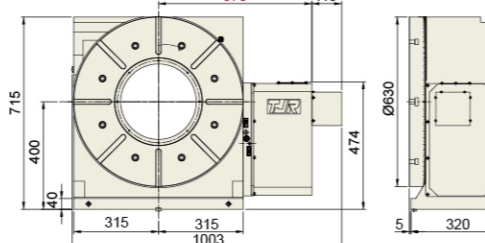
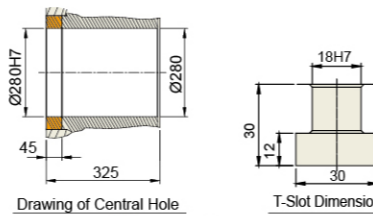


- 1 Use **large-diameter** ▲ radial & axial bearings
- 2 Employ a **large-through-hole design** while the table diameter exceeds 250mm. This design delivers high rigidity and provides bigger space for work piece setup with fixtures. (The hole diameter can be adjusted by adding a mandrel sleeve.)

### HR-500R



### HR-630R



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

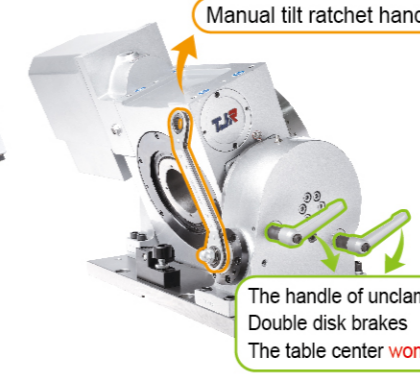
### MTHR Manual Tilt Series (Manual tilt axis ; CNC rotary axis - 0.001°)



#### MTHR(s)-255



▲ **MTHR(s)-255**



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

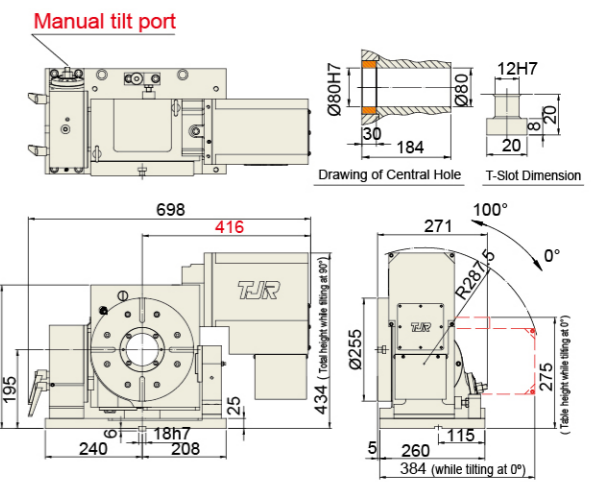
- 1 Use **large-diameter** ▲ radial & axial bearings
- 2 **Fully sealed** tilt axis
- 3 **Powerful manual double disk brakes** for tilt axis
- 4 **Highly rigid structure** of manual tilt axis



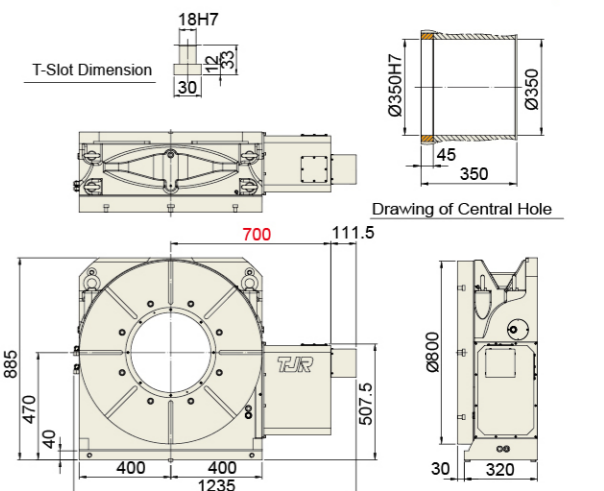
▲ **Alloy steel worm gear (Optional)**

### 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 <sup>2</sup>	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 <sup>2</sup>	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	



### HR-800R



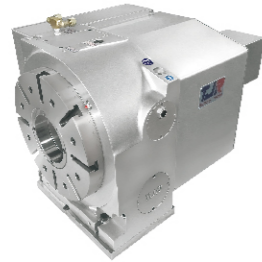
Item / Model	Unit	HR-500R	HR-630R	HR-800R
Table Diameter	mm	Ø 500	Ø 630	Ø 800
Inner Diameter of Mandrel Sleeve	mm	Ø 220H7	Ø 280H7	Ø 350H7
Diameter of Center Through Hole	mm	Ø220 Big Bore	Ø280 Big Bore	Ø350 Big Bore
Center Height (Vertical)	mm	310	400	470
Table Height (Horizontal)	mm	290	325	350
Table 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 <sup>2</sup>	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 <sup>2</sup>	187.5	396.9	1200
Allowable Workpiece Load	Vertical	kg	250	400
	with Support Table	kg	600	800
Allowable Thrust Load (with Rotary Table Clamping)	Horizontal	kg	600	800
	F	kgf	4000	5000
Driving Torque	FxL	kgf-m	500	850
	FxL	kgf-m	370	800
Net Weight (servo motor excluded)	kg	405	692	991

\*( ) Alloy Steel worm & gear series

CNC Rotary Tables  
(Min indexing angle – 0.001°)

## HR Series (Hydraulic Brake - Back Side Motor)

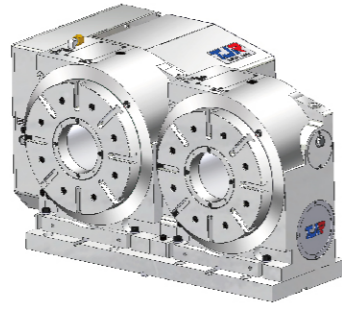
HR-320B/320B-2W/400B



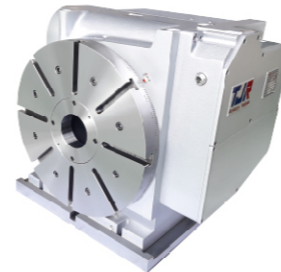
▲ HR-320B (Back Side Motor)



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	<b>Big Bore Ø120x217 Deep</b>	<b>Big Bore Ø120x217 Deep</b>	<b>Big Bore Ø120x220 Deep</b>
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 <sup>2</sup>	35	35	35
Clamping Torque	kgf·m	115	115	200
Servo Motor Model	FANUC	Straight Shaft without Key	αiF12 / βis22	αiF12 / βis22
	MITSUBISHI	Straight Shaft without Key	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	<b>25</b>	<b>25</b>	25
Allowable Inertia Load Capacity (Horizontal)	kg.cm.sec <sup>2</sup>	-	-	-
Allowable Workpiece Load	Vertical	kg	150	200
	with Support Table	kg	350	500
	Horizontal	kg	-	-
Allowable Thrust Load (with Rotary Table Clamping)	F	kgf	3000	4000
	FxL	kgf·m	300	400
	FxL	kgf·m	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



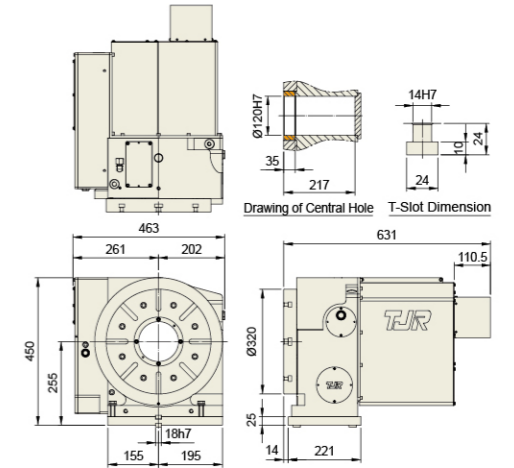
Use radial & axial bearings



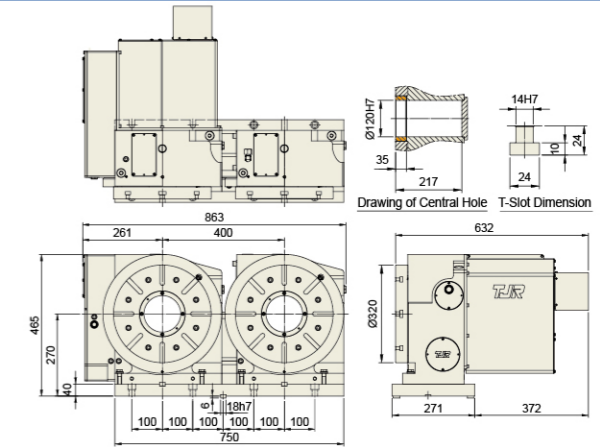
▶ iHHR-400

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 <sup>2</sup>	35
Clamping Torque	kgf·m	200
Servo Motor Model	FANUC	Straight shaft
	MITSUBISHI	Straight shaft
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 <sup>2</sup>	100
Allowable Workpiece Load	Vertical	kg
	with Support Table	kg
	Horizontal	kg
Allowable Load (with Rotary Table Clamping)	F	kgf
	FxL	kgf·m
	FxL	kgf·m
Driving Torque	kgf·m	170
Net Weight (servo motor excluded)	kg	-

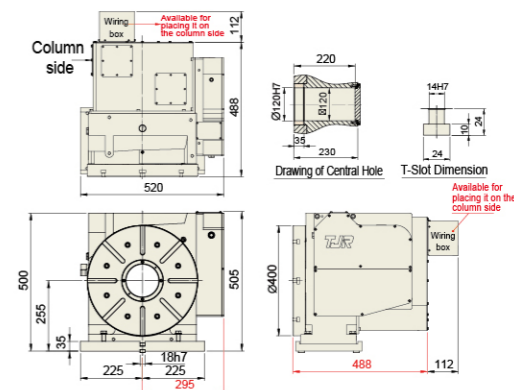
### HR-320B (Back Side Motor)



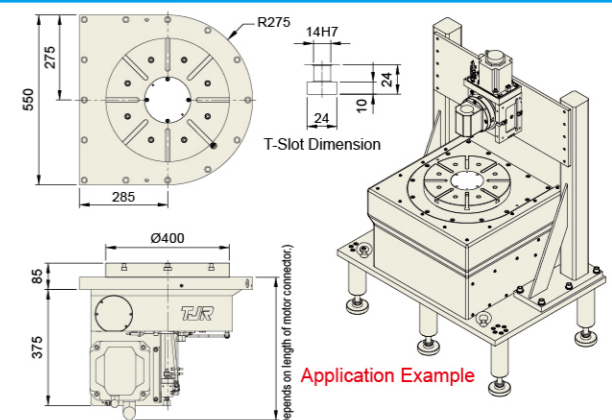
### HR-320B-2W (Back side motor / 2-wheel coupled)



### HR-400B (Back side motor)



### iHHR-400 (Embedded type)



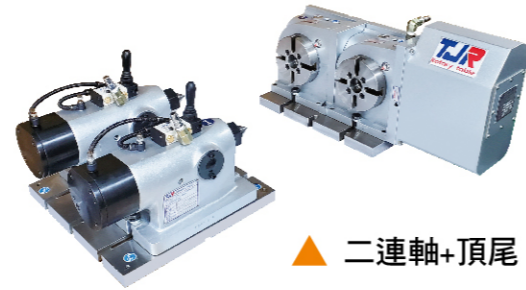
## CNC Multi Spindle Rotary Tables (Min indexing angle – 0.001°)



**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

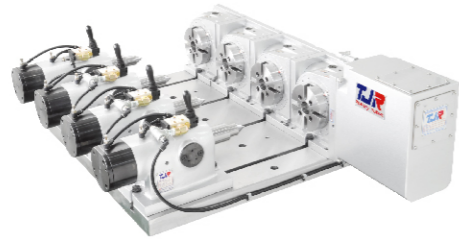
**AR multi spindle 4W Series**  
(4-wheel coupled, **Powerful Pneumatic Brake**)  
AR(s)-125-4W



▲ 二連軸+頂尾



▲ Alloy steel worm gear  
(Optional)



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



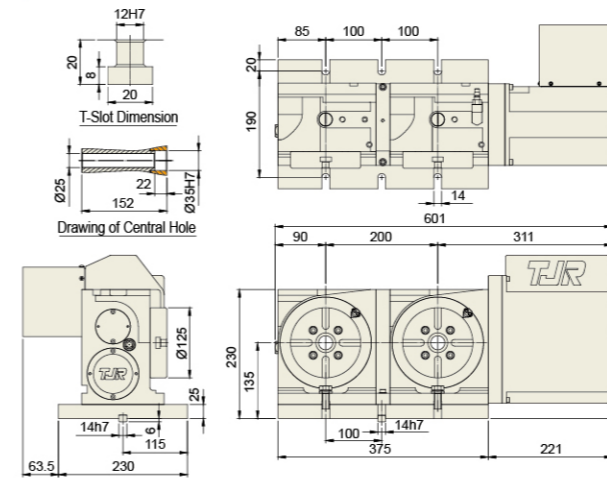
▲ AR(s)-170-2W  
(Horizontal application)  
(Pneumatic chuck is optional)

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 <sup>2</sup>	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 <sup>2</sup>	-	5.4	8.3
Allowable Workpiece Load	Vertical	kg	50	75
	with Support Table	kg	100	150
Allowable Load (with Rotary Table Clamping)	F	kgf	1000	1450
	FxL	kgf-m	45	110
	FxL	kgf-m	13	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

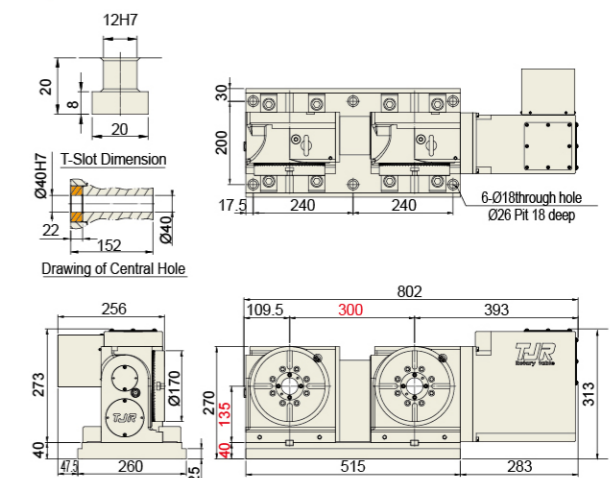
## NEW Powerful Brake System

### AR(s)-125-2W



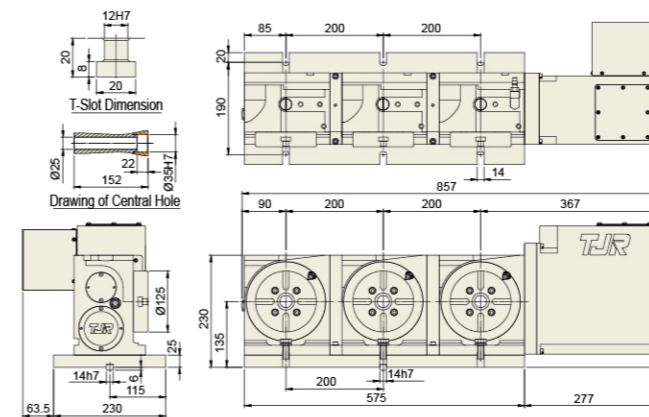
## NEW Powerful Brake System

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



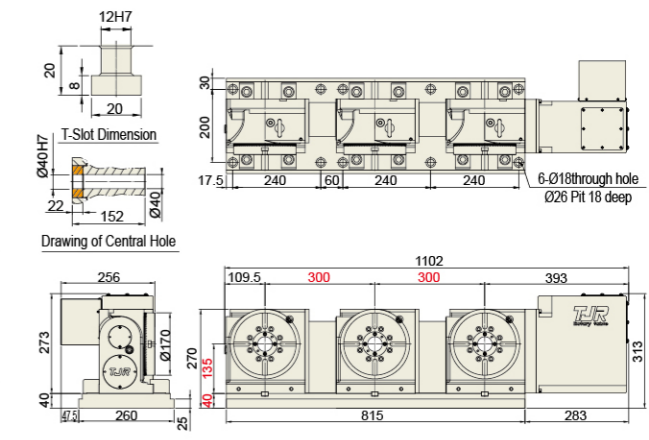
## NEW Powerful Brake System

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



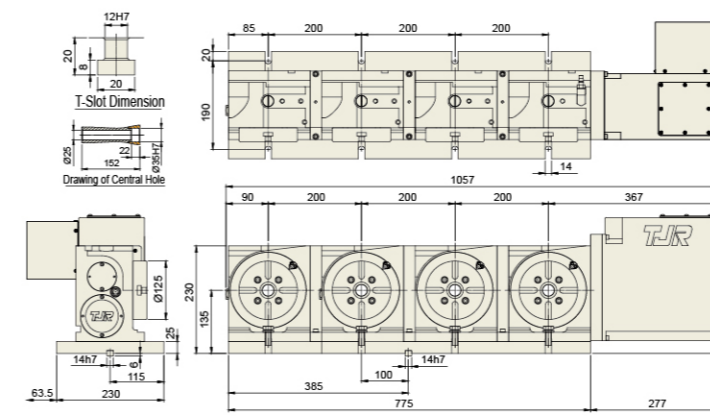
## NEW Powerful Brake System

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



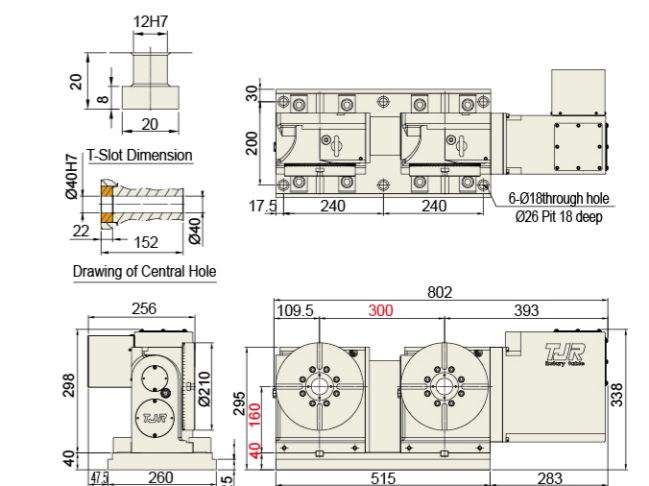
## NEW Powerful Brake System

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



## NEW Powerful Brake System

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



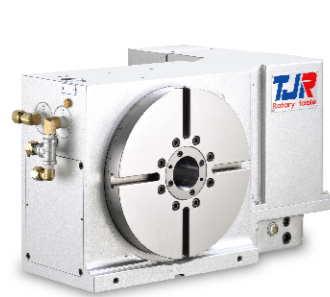
Driven by Worm & Worm Gear

Driven by Worm & Worm Gear

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

## HI Series (Hirth coupling hydraulic brake)

HI-255/320/400/500



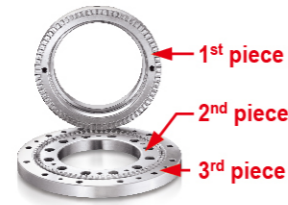
▲ HI-255N



▲ HI-320N



▲ HI-500

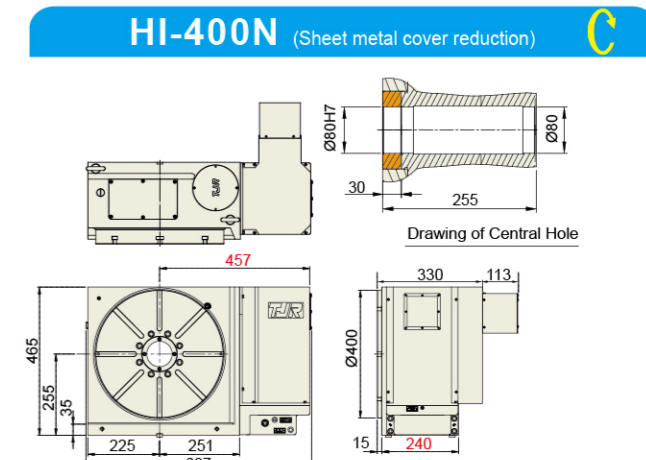
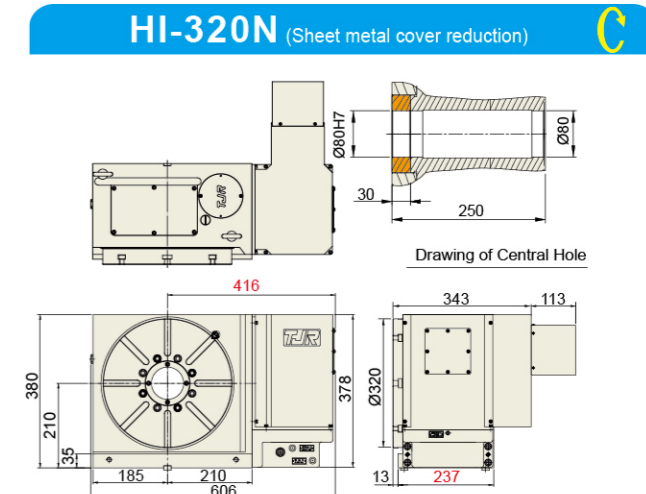
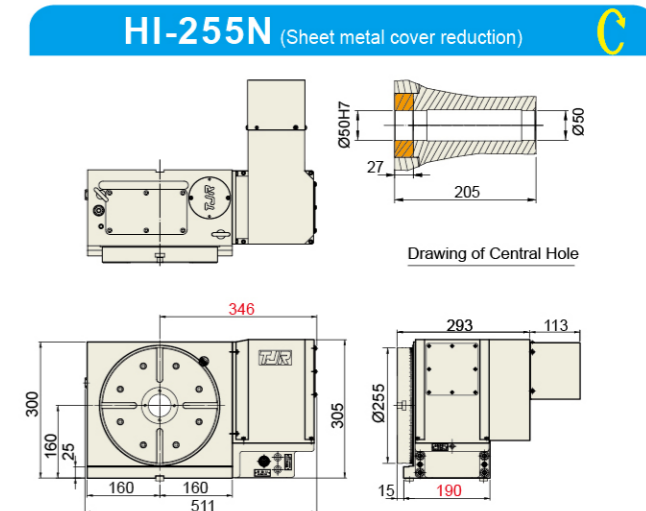
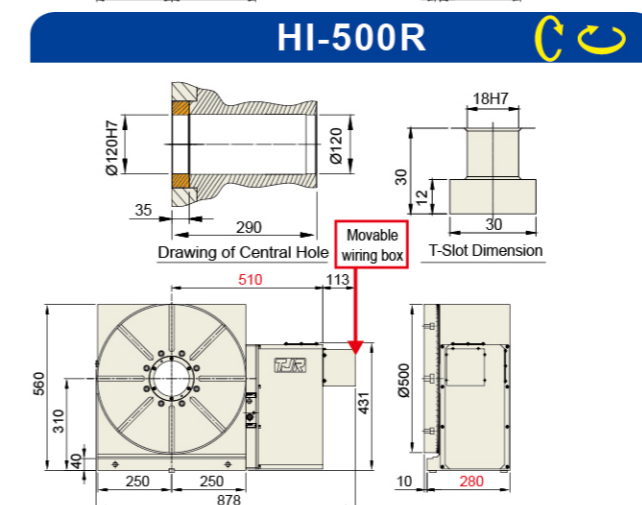
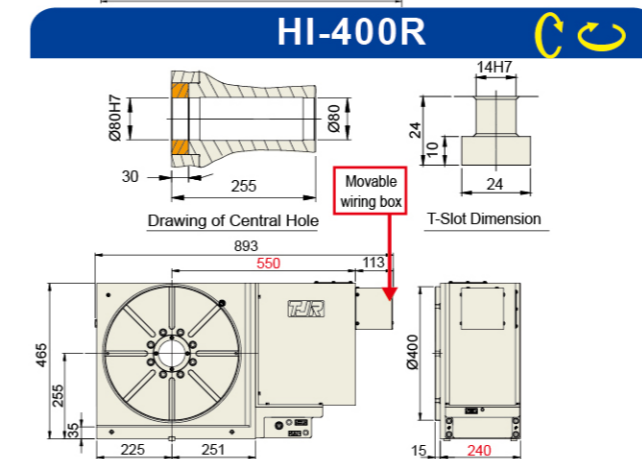
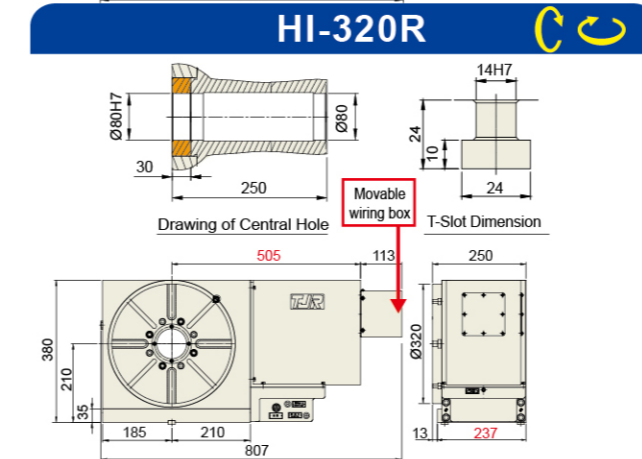
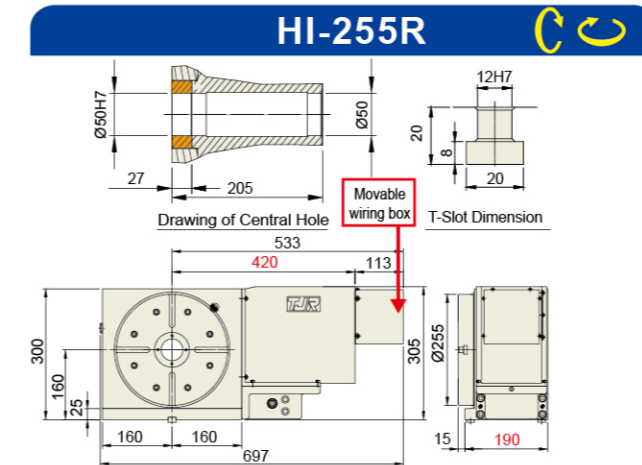


HI Series :  
Use **three-piece** clutch plate

Function:

- ① Accuracy:  $\pm 5$  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.	$\pm 5$	$\pm 5$	$\pm 5$	$\pm 5$	
Repeatability	sec.	$\pm 1$	$\pm 1$	$\pm 1$	$\pm 1$	
Clamping System (Hydraulic)	kgf/cm <sup>2</sup>	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	<b>33.3</b>	<b>25</b>	<b>25</b>	<b>16.6</b>	
Allowable Inertia Load Capacity (Horizontal)	kg.cm.sec <sup>2</sup>	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
	F	kgf	1600	2000	3000	4000
Table Clamping)	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.

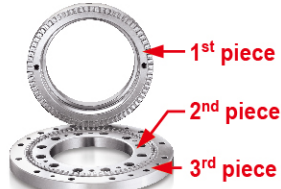
Driven by Worm & Worm Gear

CNC Indexing tables (Horizontal only)  
(Min indexing angle - 1° or 5°)



## HHI Series (Hirth coupling hydraulic brake)

For horizontal machining center  
or horizontal drilling & tapping center.



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

Function:

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



▲ HHI-800x800

High loading(HL)  
version is an alternative



▲ HHI-320x320F

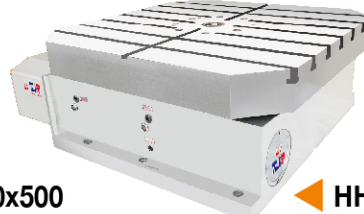
For small Horizontal drilling  
& tapping center.

▲ HHR-400x400F



▲ HHI-500x500

High loading(HL)  
version is an alternative

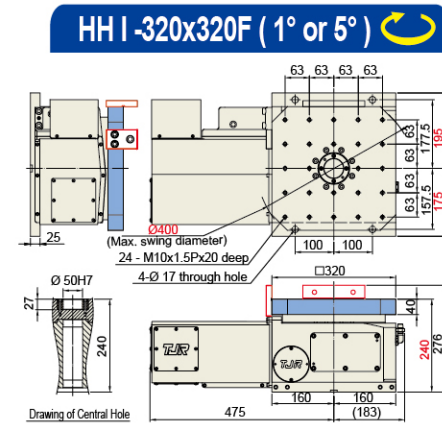


▲ HHI-630x630

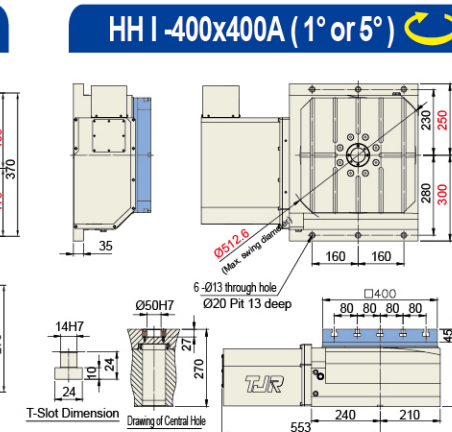


▲ HHI-1000x1000

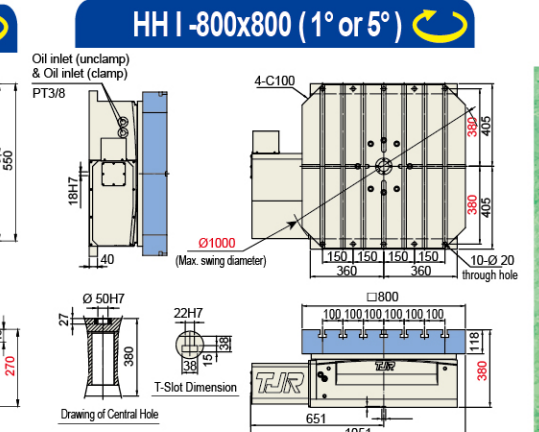
High loading(HL)  
version is an alternative



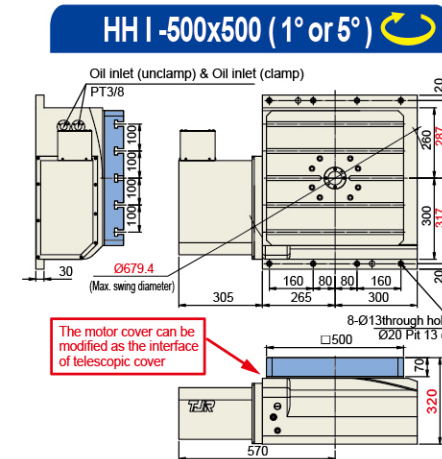
HHI-320x320F (1° or 5°)



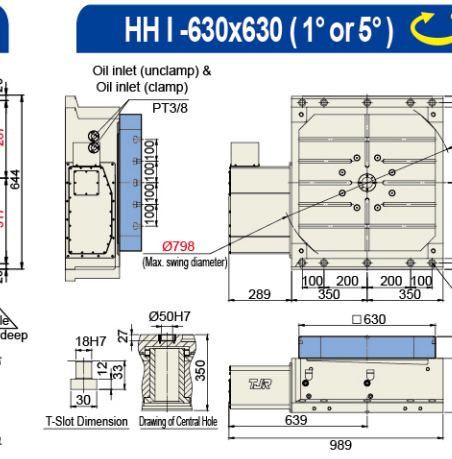
HHI-400x400A (1° or 5°)



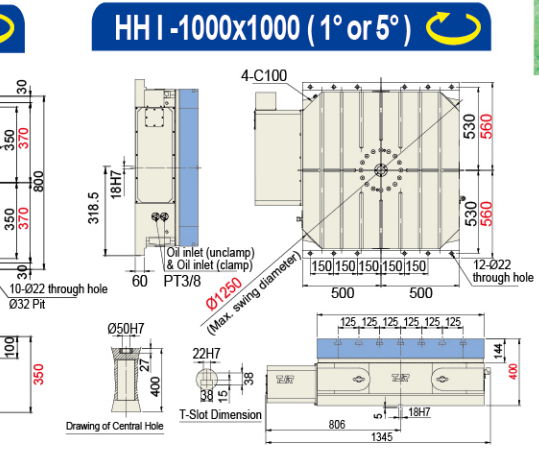
HHI-800x800 (1° or 5°)



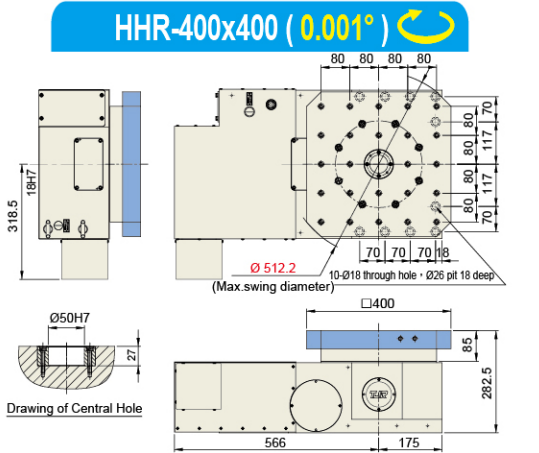
HHI-500x500 (1° or 5°)



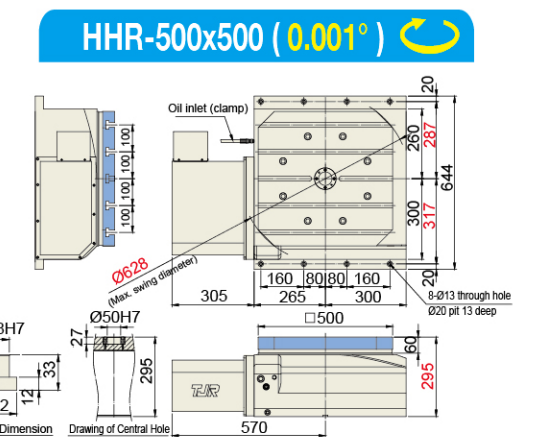
HHI-630x630 (1° or 5°)



HHI-1000x1000 (1° or 5°)



HHR-400x400 (0.001°)



HHR-500x500 (0.001°)

Item / Model	Unit	HHI-320x320F	HHI-400x400A	HHI-500x500	HHI-630x630	HHI-800x800	HHI-1000x1000	HHR-400x400	HHR-500x500	
Table size	mm	□ 320x320	□ 400x400	□ 500x500	□ 630x630	□ 800x800	□ 1000x1000	□ 400x400	□ 500x500	
Diameter of Table Central Hole	mm	∅ 50x27 deep	∅ 50x27 deep	∅ 50x27 deep	∅ 50H7x27 deep	∅ 50x27 deep	∅ 50x27 deep	∅ 50x27 deep	∅ 50x27 deep	
Table height	mm	240	270	320	350	380	400	282.5	295	
Table T-slot Width	mm	-	14H7	18H7	18H7	22H7	22H7	-	18H7	
Guide Block Width	mm	18h7	18h7	18h7	18h7	18h7	18h7	18h7	18h7	
Min. Increment	deg.	1 or 5	1 or 5	1 or 5	1 or 5	1 or 5	1 or 5	0.001	0.001	
Indexing Precision	sec.	±5	±5	±5	±5	±5	±5	20	15	
Repeatability	sec.	±1	±1	±1	±1	±1	±1	6	6	
Clamping System (Hydraulic)	kgf/cm <sup>2</sup>	35	35	35	35	35	35	45	35	
Clamping Torque	kgf-m	-	-	-	-	-	-	155	370	
Servo Motor Model	FANUC	Straight shaft	βis12	βis22	βis22	αiF12 / βis22	βis22	αiF22	αiF12i / βis22	αiF12i / βis22
	MITSUBISHI	without key	HF/HG-104/154	HF/HG-204	HF/HG-204	HF/HG-204	HF/HG-354	HF/HG-354	HF/HG-204	HF/HG-204
Speed Reduction Ratio	-	1:120	1:120	1:180	1:180	1:180	1:360	1:120	1:180	
Max. Rotation Rate of Table (Calculate with Fanuc a motor)	r.p.m	25	25	16.6	16.6	11.1	8.3	25	16.6	
Allowable Workpiece Load	Horizontal	kg	300	600	1200	1800	4000	5000	500	600
	F	kgf	1600	3000	4000	6000	9000	10000	2500	4000
Allowable Thrust Load (with Rotary Table Clamping)	FxL	kgf-m	175	300	600	650	1950	2200	300	500
	FxL	kgf-m	300	500	1000	1200	4000	4000	155	370
Net Weight (servo motor excluded)	kg	149	-	518	565	1053	1971	-	510	

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## Non-CNC Hydraulic index table

### HC Series (Hirth coupling hydraulic brake)

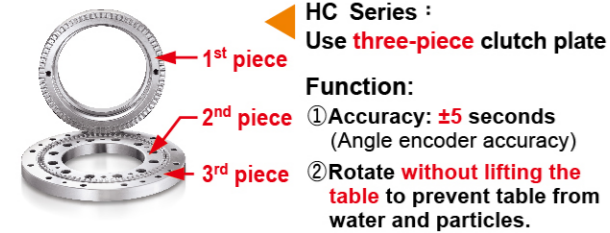
HC-255A/320A (Equal Parts)



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)

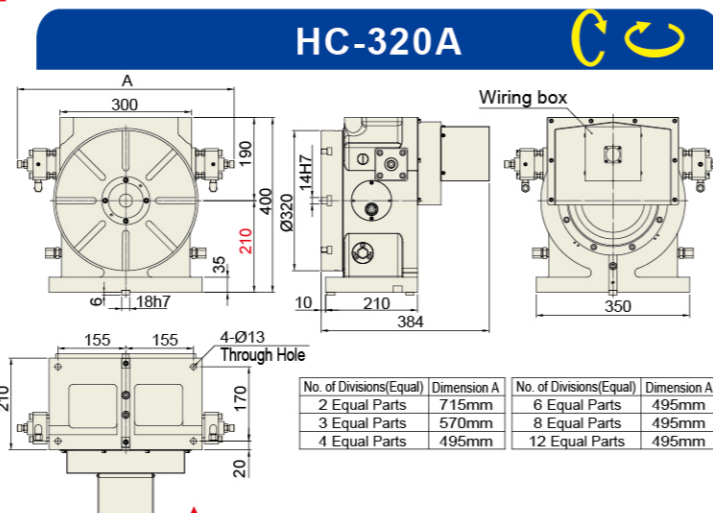
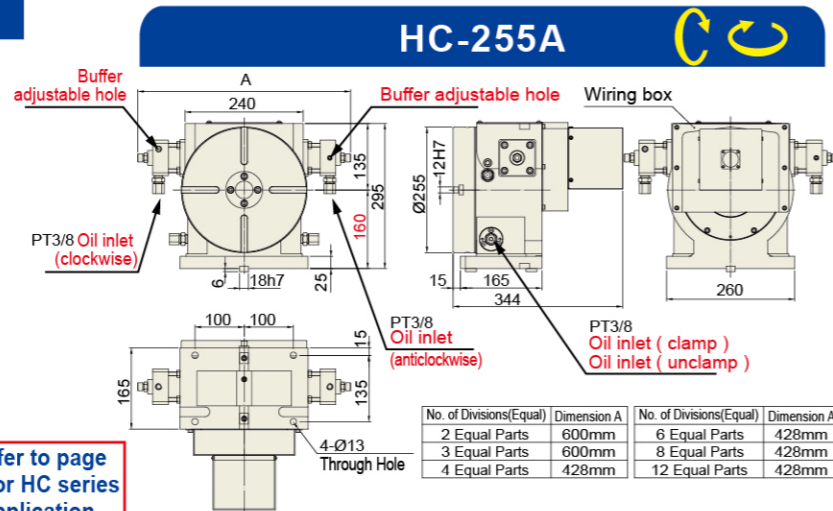


HC Series :  
Use **three-piece** clutch plate

- Function:**
- ① Accuracy:  $\pm 5$  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 <sup>2</sup>	35	35	35
Clamping Torque	kgf-m	154	280	995
Allowable Instant Inertia	kg.cm.sec <sup>2</sup>	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
Rotating Torque	FxL	kgf-m	154	227.5
		kgf-m	42	60
Rotary Table Total Weight	kg	65	98	214

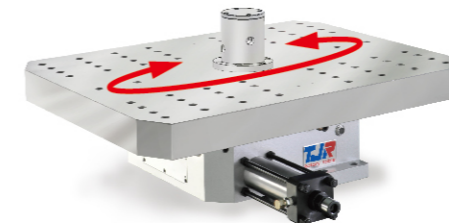
Refer to page 30 for the top, front and side views.

### CHC Series (Flat type auto pallet changer)

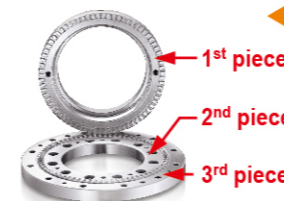
CHC-500(700x910)  
CHC-500(700x1090)



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:  $\pm 5$  seconds (Angle encoder accuracy)
  - ② Rotate **without lifting the table** to prevent table from water and particles.

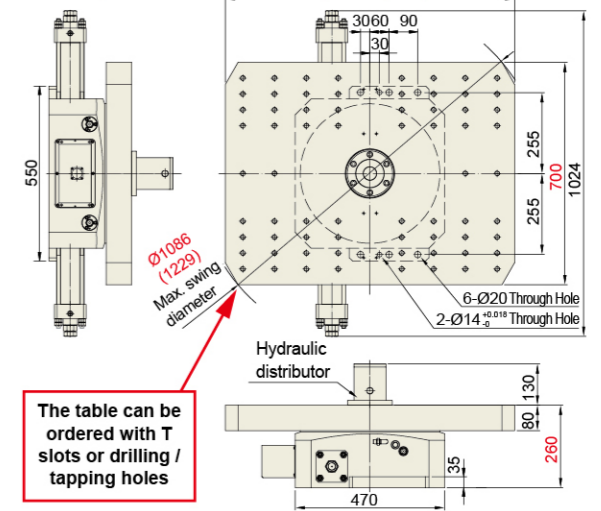


Pallet changing time is 4~5 seconds, which excludes PLC delayed time of machine

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 <sup>2</sup>	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

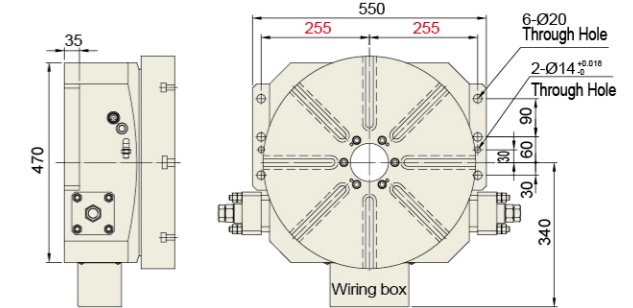
### CHC-700x910 (Pallet changer)

Table size can be customized 910(1090)

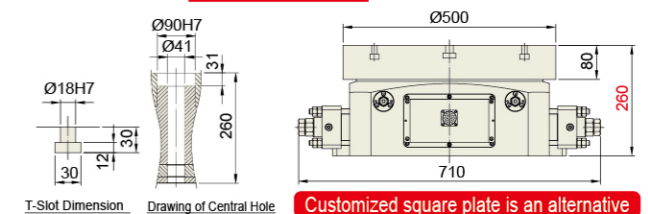


The table can be ordered with T slots or drilling / tapping holes

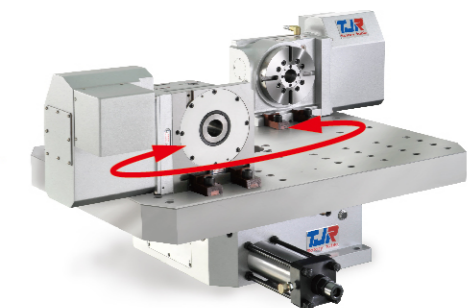
### HHC-500



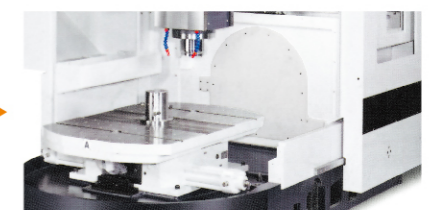
Refer to page 29 for the specification table.



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  $-0.001^\circ$

## 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)



▲ FAR(s)-170



▲ Workpiece sample –  
5 axis simultaneous  
contouring

**4**  
FEATURES



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

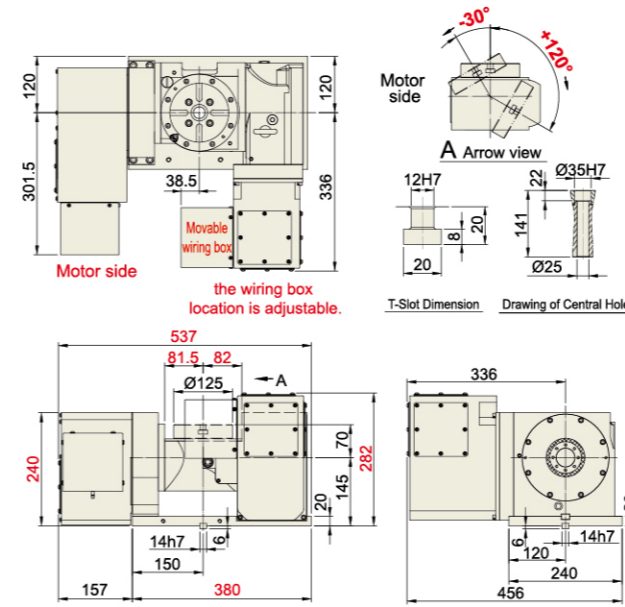
1 Both the tilting axis and rotary axis use radial & axial bearings.

2 Because the tilting axis normally needs to bear heavy load, Japanese-made worm and 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.)

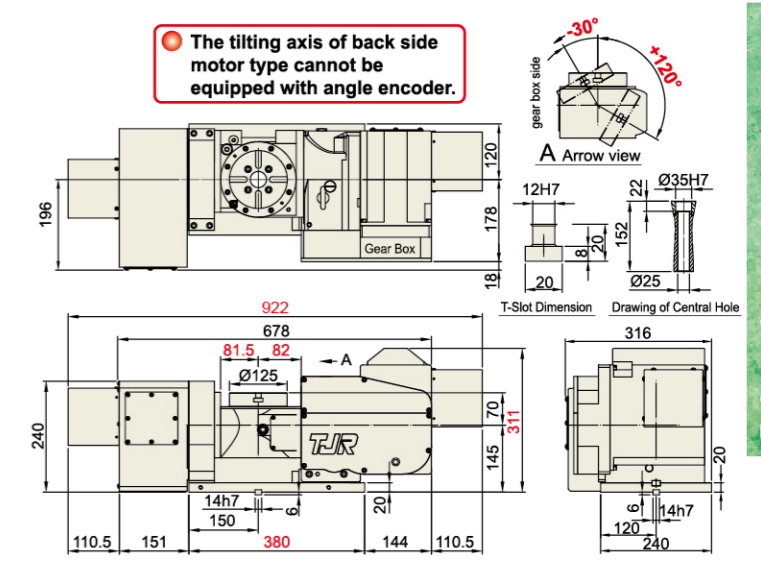
3 Anti-wear alloy steel worm gear is optional

4 A hydraulic brake for tilting axis is optional.

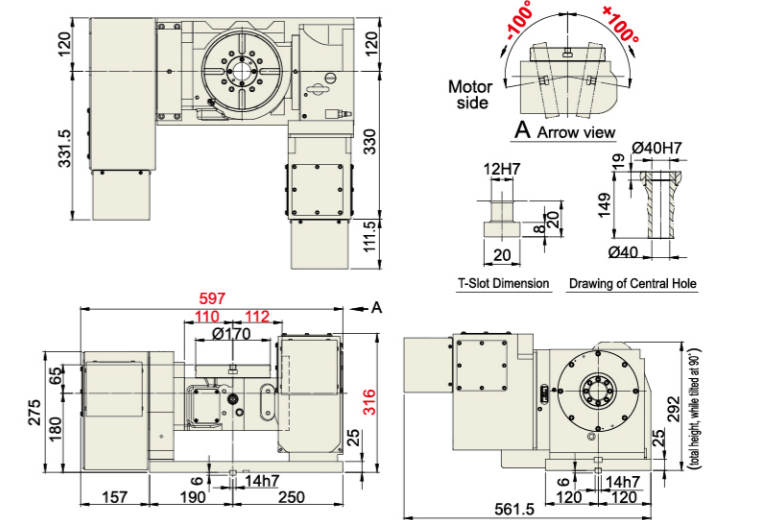
### FAR(s)-125(Standard type)



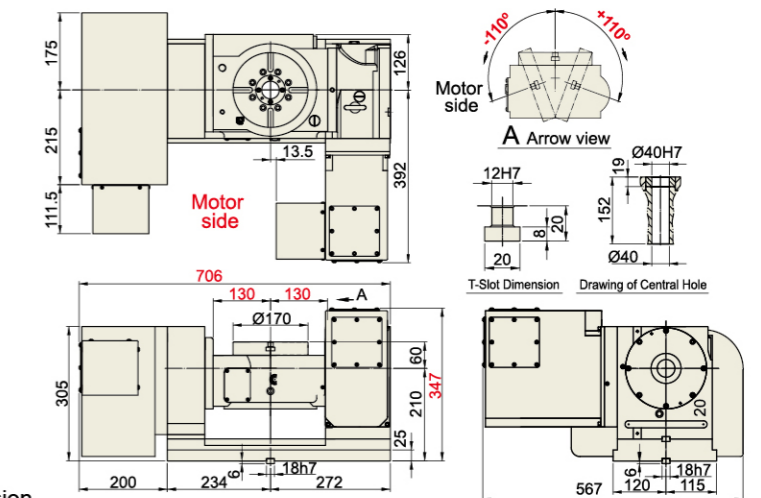
### FAR(s)-125B (Back side motor type)



### 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)	
		Rotation	Tilt $(-30^\circ \sim +120^\circ)$	Rotation	Tilt $\pm 100^\circ$	Rotation	Tilt $\pm 100^\circ$
Table Diameter	mm	$\varnothing 125$		$\varnothing 170$		$\varnothing 170$	
Inner Diameter of Mandrel Sleeve	mm	$\varnothing 35H7$ (Diameter of Table Central Hole)		$\varnothing 40H7$		$\varnothing 40H7$	
Diameter of Center Through Hole	mm	$\varnothing 25$		$\varnothing 40$		$\varnothing 40$	
Table Height (Horizontal)	mm	215		245		270	
Table T-slot Width	mm	12H7		12H7		12H7	
Guide Block Width	mm	14h7		18h7		18h7	
Axis	-	Rotation		Rotation		Rotation	
Min. Increment	deg.	0.001		0.001		0.001	
Indexing Precision (while tilt $0^\circ \sim +90^\circ$ )	sec.	40		20		20	
Repeatability	sec.	6		6		6	
Clamping System (Pneumatic)	kgf/cm <sup>2</sup>	6		6		6	
Clamping Torque	kgf-m	13		25		31	
Servo Motor Model	FANUC	Taper/Straight shaft	$\alpha$ is4 / $\beta$ is4	$\alpha$ iF4 / $\beta$ is8	$\alpha$ iS4 / $\beta$ is4	$\alpha$ iF4 / $\beta$ is8	$\alpha$ iF8 / $\alpha$ is12 / $\beta$ is12
	MITSUBISHI	Taper/Straight shaft	HG/HF-75 / 105	HG/HF-54 / 104	HG/HF-75 / 105	HG/HF-54 / 104	HG/HF-104
Speed Reduction Ratio	-	1 : 60		1 : 90		1 : 90	
Max. Rotation Rate of Table (Calculate with Fanuc or Motor)	r.p.m	44.4 *(33.3)		33.3 *(33.3)		33.3 *(33.3)	
Allowable Inertia Load Capacity (Horizontal)	kg.cm.sec <sup>2</sup>	0.97		2.2		2.7	
Allowable Workpiece Load	0° Horizontal	50		60		75	
	0°~90° Tilt	35		40		50	
Allowable Thrust Load (with Rotary Table Clamping)	F	400		600		750	
	FxL	31		31		31	
	FyL	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	

Hydraulic tilt axis FAR(s)-170H/170HA/170HB are alternatives.

\* ( ) 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  $-0.001^\circ$

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

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

**4**  
FEATURES



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

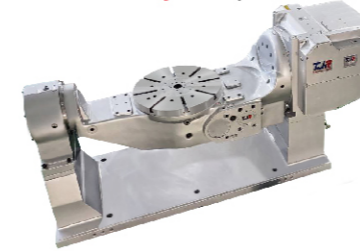
2 Because the tilting axis normally needs to bear heavy load, Japanese-made worm and worm gear are employed to improve wear resistance and precision of tilting axis. **standard component**



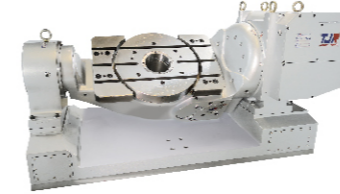
(It's wear life is 2.6 times longer than aluminum bronze PBC3.) (except for FHR-500C/630C)

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

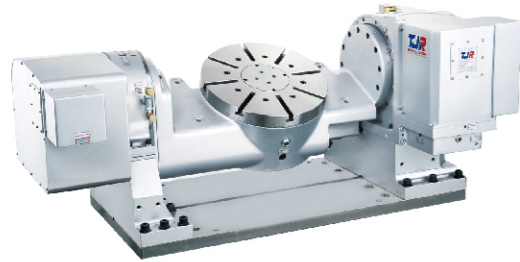
4 The tilting, supporting, and rotary axis are all equipped with the hydraulic-brake mechanisms. (Employing three independent hydraulic drum-brake systems)



▲ FHR-401C-820-HR400B (Single plate)



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



▲ FHR-400CF (Cradle type)



▲ FHR-400C-540-HR400B (Cradle type)

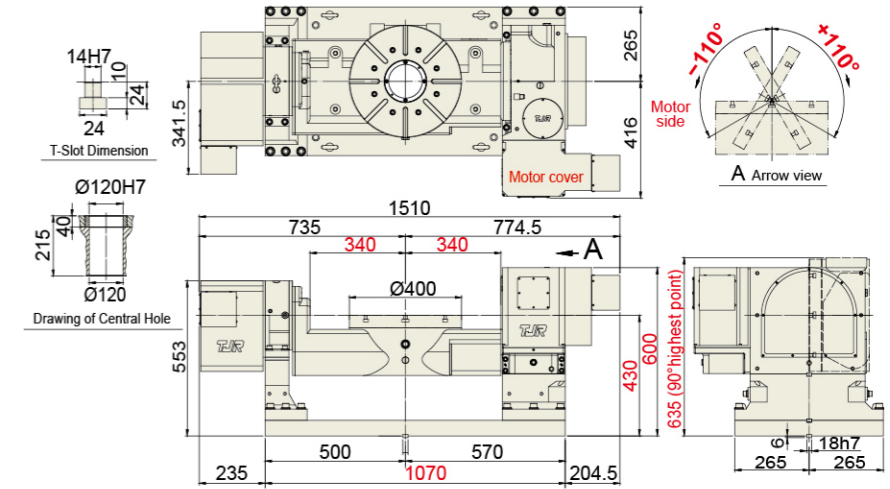
Item / Model	Unit	FHR-400CF (Cradle type)		FHR-400C-540-HR400B (Cradle type)		FHR-401C-820-HR400B (Cradle type)	
Table Diameter	mm	Ø 400		Ø 400		Ø 400	
Inner Diameter of Mandrel Sleeve	mm	Ø 120H7x40 deep		Ø 120H7x35 deep		Ø 120H7x35 deep	
Diameter of Center Through Hole	mm	Ø 120		Ø 120		Ø 105	
Table 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	$60^1$	15	$60^1$	15	$60^1$
Repeatability	sec.	6	8	6	8	6	8
Clamping System (Hydraulic)	kgf/cm <sup>2</sup>	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	aiF22 / Bis22(Straight)
	MITSUBISHI	Straight shaft without key	HG/HF-154	HG/HF-354	HF/HG-154	HF/HG-354	HF/HG-154
Speed Reduction Ratio	-	1 : 120	1 : 120	1 : 120	1 : 120	1 : 120	1 : 120
Max. Rotation Rate of Table (Calculate with Fanuc $\alpha$ Motor)	r.p.m	25	16.6	25	16.6	25	16.6
Allowable Inertia Load Capacity (Horizontal)	kg.cm.sec <sup>2</sup>	40		44		44	
Allowable Workpiece Load	$0^\circ$ Horizontal	kg		200		220	
	$0^\circ \sim 90^\circ$ Tilt	kg		100		120	
Allowable Thrust Load (with Rotary Table Clamping)	F	kgf		1800		1800	
	FxL	kgf-m		175		275	
	FxL	kgf-m		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.

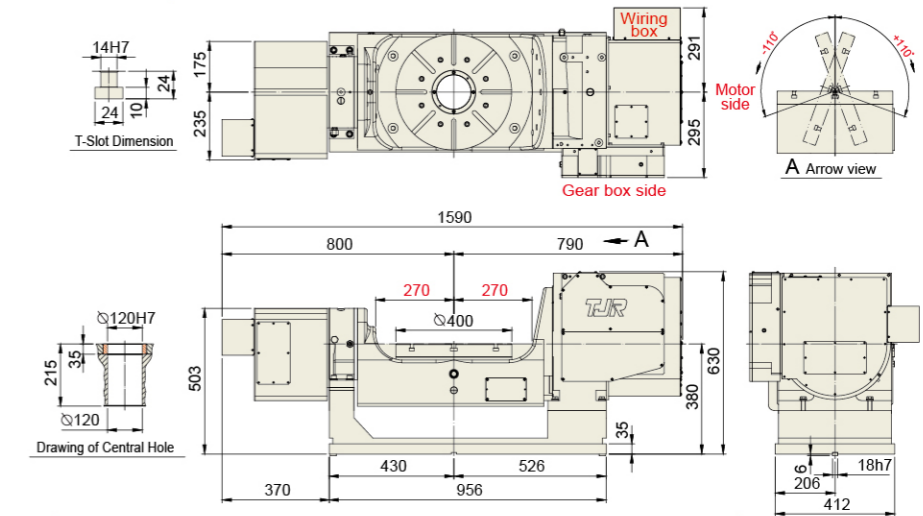
37 ★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.

### FHR-400CF (Cradle type)

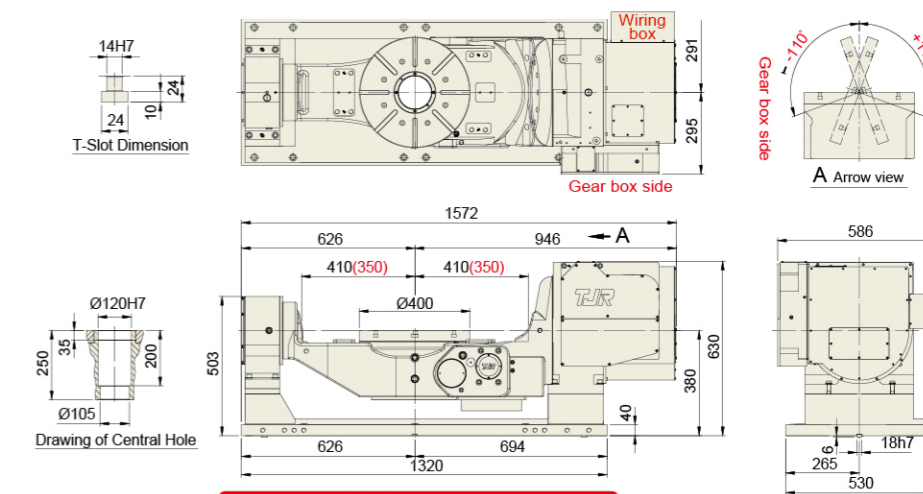
The model is recommended for workpiece made of light material such as aluminum or copper.



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



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



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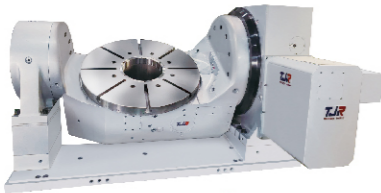
CNC Tilting Rotary Tables  
Min. indexing angle  $-0.001^\circ$

## 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

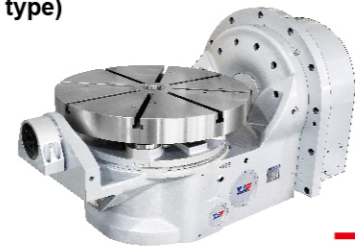


- Both the tilting axis and rotary axis use **large-diameter radial & axial bearings**.
- Because the **tilting axis** normally needs to bear heavy load, **Japanese-made** worm and worm gear are employed to improve wear resistance and precision of tilting axis. **standard component**  
(It's wear life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

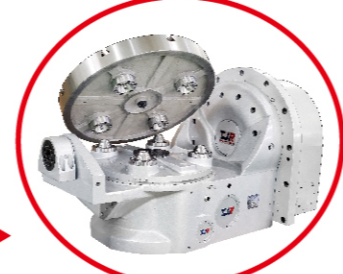


- The tilting, supporting, and rotary axis are all equipped with the hydraulic-brake mechanisms. (Employing **three independent hydraulic drum-brake systems**)

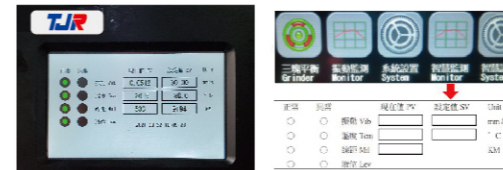
- Max. tilting angle:  $\pm 110^\circ$



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

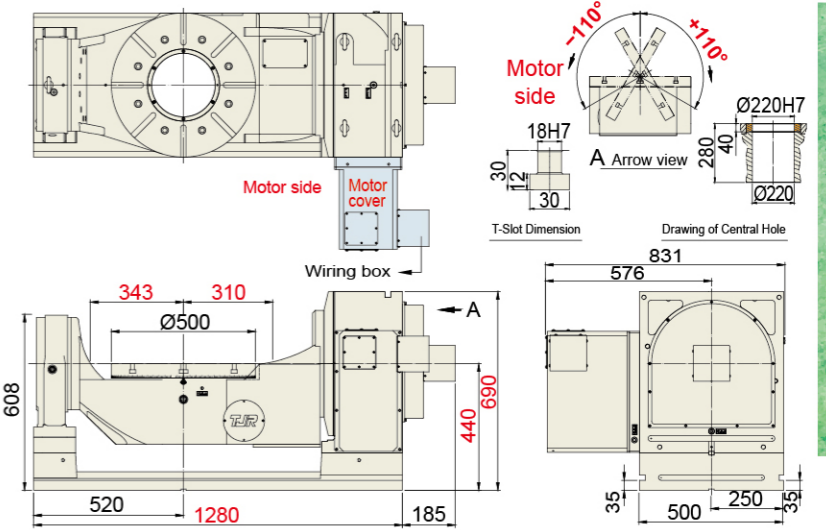


(pallet change type)

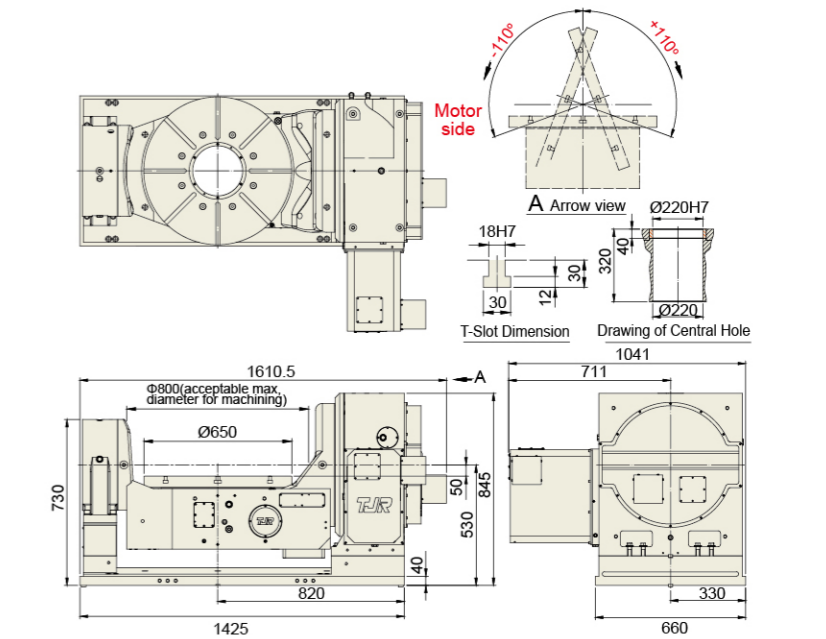


Artificial intelligence (AI) rotary table provides 4 foolproof functions to save your money and time.

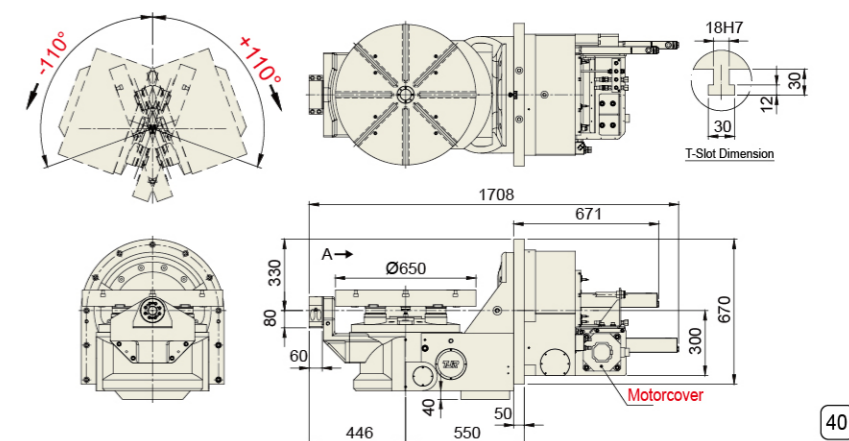
### FHR-500C (Dual-arm / Cradle type)



### 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	$60''^1$	15	$60''^1$	$15 \times 1$	$60''^1$	
Repeatability	sec.	6	8	6	8	6	8	
Clamping System (Hydraulic)	kg/cm <sup>2</sup>	35	35	35	35	35	35	
Clamping Torque	kgf-m	370	410	370	800	370	500	
Servo Motor Model	FANUC	Straight shaft	aiF12 / $\beta$ is22	aiF22 / $\beta$ is30	aiF12	aiF30	aiF12	aiF40
	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 $\alpha$ Motor)	r.p.m	25	11.1	25	11.1	25	13.3	
Allowable Inertia Load Capacity (Horizontal)	kg.cm.sec <sup>2</sup>	93.75		158.4		154.8		
Allowable Workpiece Load	$0^\circ$ Horizontal	kg		500		250		
	$0^\circ \sim 90^\circ$ Tilt	kg		300		400		
Allowable Thrust Load (with Rotary Table Clamping)	F	kgf		3000		3200		
	FxL	kgf-m		410		800		
Driving Torque (Rotary axis)	FxL	kgf-m		370		370		
	FxL	kgf-m		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.

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Driven by Worm & Worm Gear

CNC Tilting Rotary Tables  
Min. indexing angle  $-0.001^\circ$

## FHR Series Dual-axis single-arm type (Hydraulic Brake)

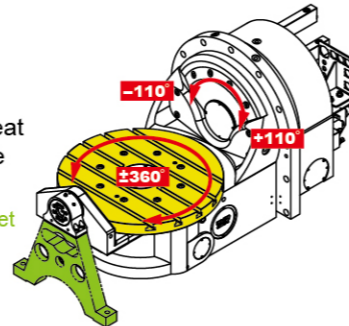
**FHR-400S**  
**FHR-650S-525**  
**FHR-650S-550**



▲ 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])



FHR-400S ▲

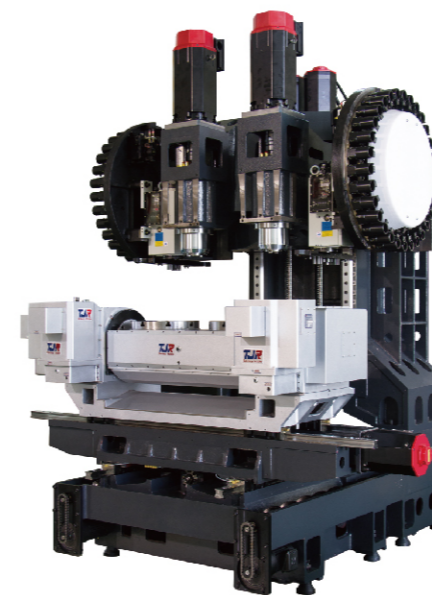
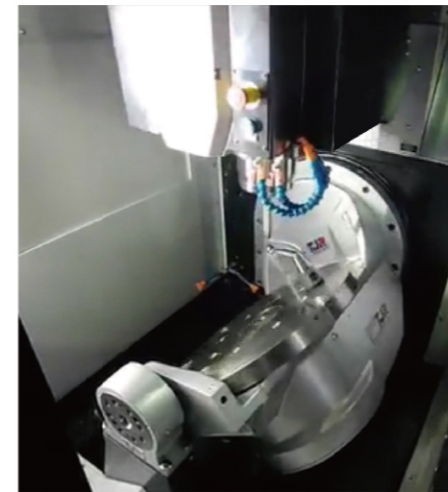
Item / Model	Unit	FHR-400S		FHR-650S-525 / 550		
Table Diameter	mm	Ø 400		Ø 650		
Inner Diameter of Mandrel Sleeve	mm	Ø 120H7x35 deep		-		
Diameter of Center Through Hole	mm	Ø 105		-		
Table Height (Horizontal)	mm	-		-		
Table T-slot Width	mm	14H7		18H7		
Guide Block Width	mm	-		-		
Axis	-	Rotation	Tilt $\pm 110^\circ$	Rotation	Tilt $\pm 110^\circ$	
Min. Increment	deg.	0.001	0.001	0.001	0.001	
Indexing Precision (while tilt $0^\circ \sim +90^\circ$ )	sec.	15	60	15	60 <sup>*1</sup>	
Repeatability	sec.	6	8	6	8	
Clamping System (Hydraulic)	kgf/cm <sup>2</sup>	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 $\alpha$ Motor)	r.p.m	25	13.3	25	13.3	
Allowable Inertia Load Capacity (Horizontal)	kg.cm.sec <sup>2</sup>	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		
	FyL	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.

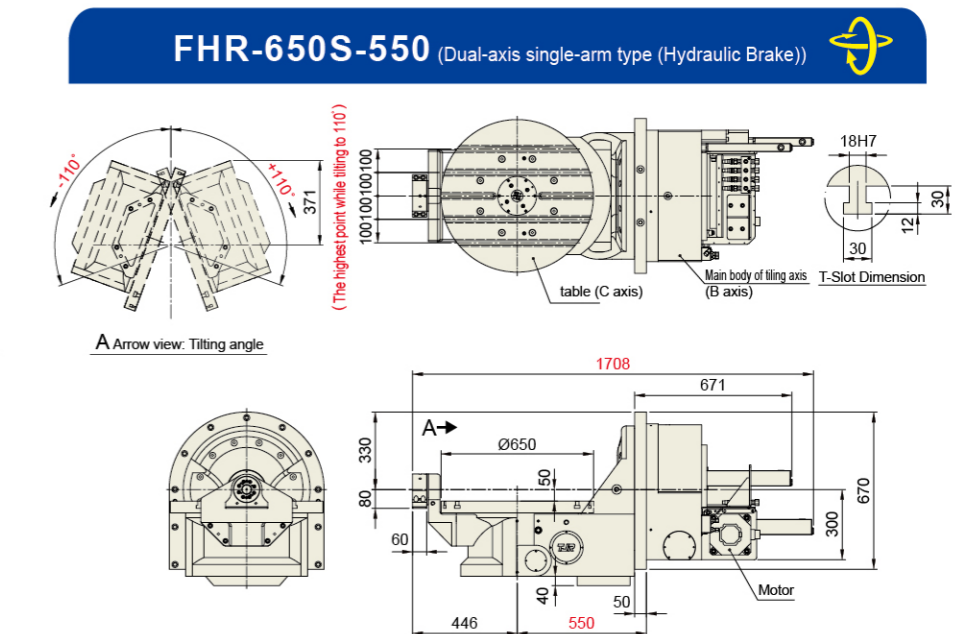
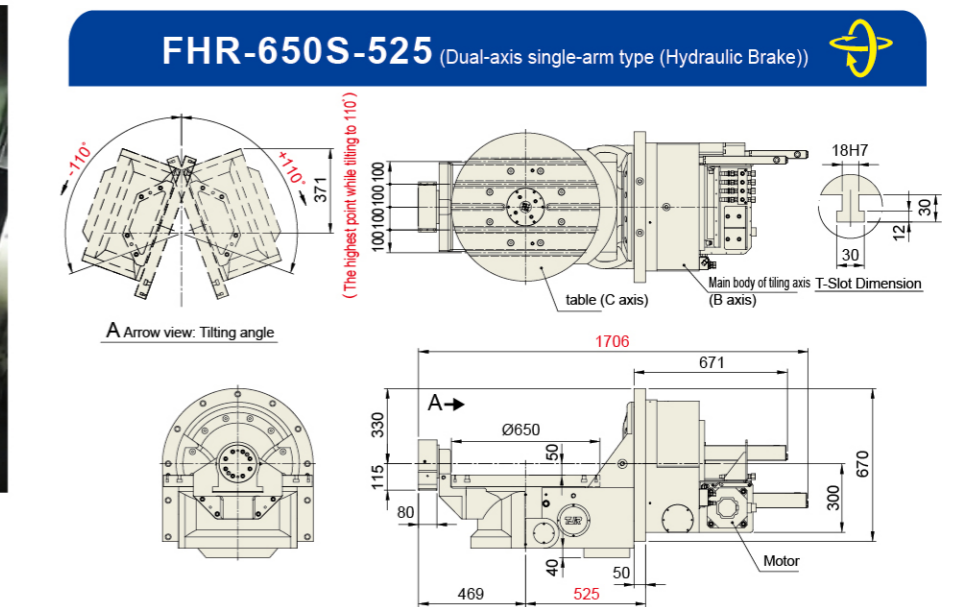
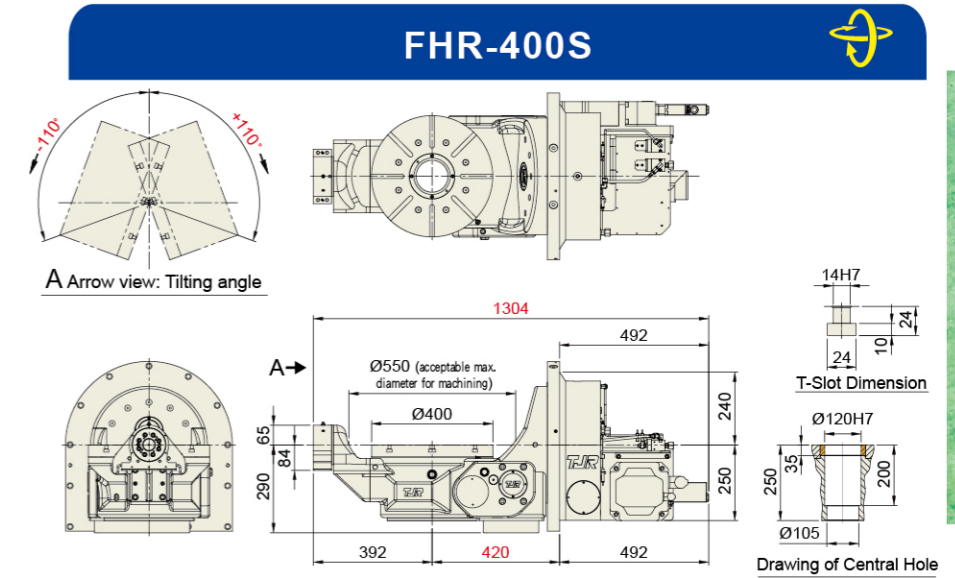
★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.



▲ FHR-650S-550



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



Driven by Worm & Worm Gear

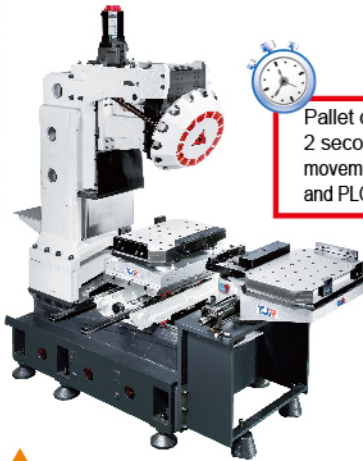
Driven by Worm & Worm Gear

## CURC series (Hook type CNC auto pallet changer)

### CURC-500x700

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

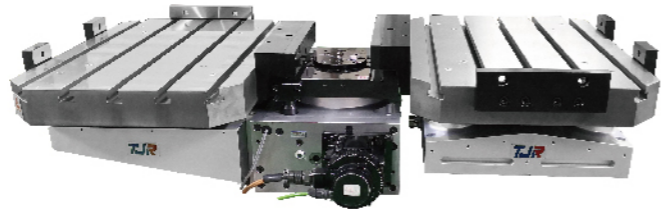
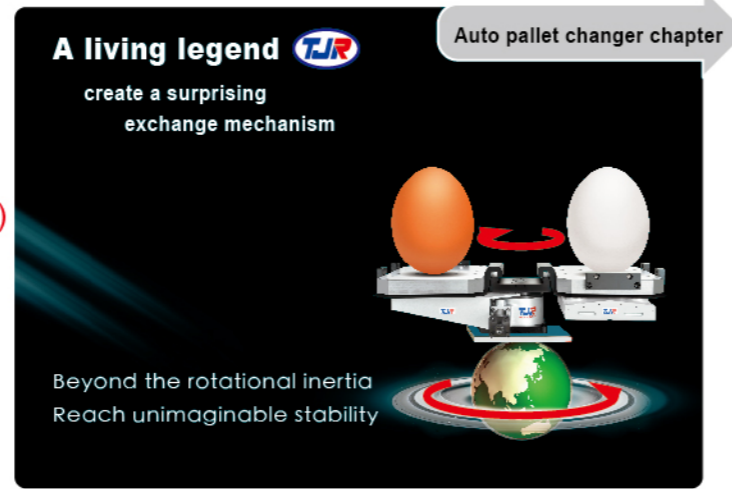
For C type vertical machining center or drilling & tapping center



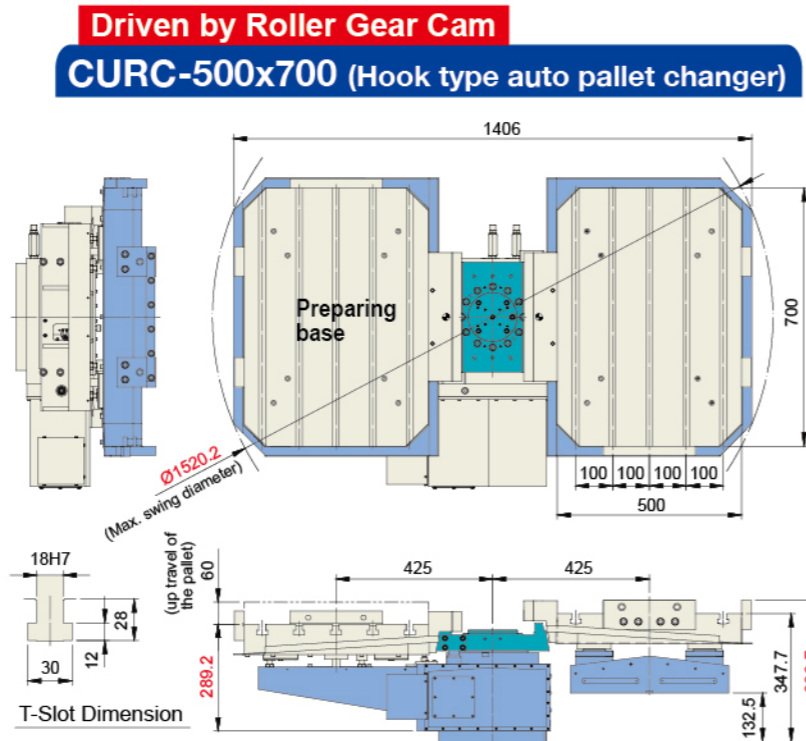
Pallet changing time is around 2 seconds, which excludes the movements of the plate rise & fall and PLC delayed time of machine.

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 <sup>2</sup>	35	
Positioning method	-	Cone positioning	
Clamping force(35kg/cm <sup>2</sup> )	kgf	960x4=3840	
Operating System (Up&Down&Rotate)	kgf/cm <sup>2</sup>	Hyd.35	
Lifting thrust force	kgf	2200	
Up and down travel of the pallet	mm	60	
Servo Motor Model	FANUC	βis12	
	DELTA	Straight shaft ECMA-E 1320GS	
	MITSUBISHI		
Speed Reduction Ratio	-	1 : 90	
Allowable Workpiece Load	Horizontal	kg	250x2=500
<b>Inspection accuracy</b>			
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	



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



## 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



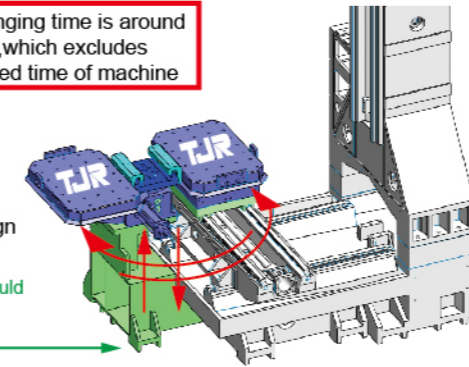
CTU-500x700 (hook type APC)



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

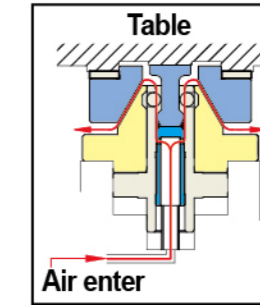
The location of CTU can vary, depending on the machine design & dimensions.

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 <sup>2</sup>	35	35
Positioning method	-	Cone positioning	Cone positioning
clamping force of positioning cones (35kg/cm <sup>2</sup> )	kgf	960x4=3840	960x4=3840
Operating System(Up & Down & Rotate)	kgf/cm <sup>2</sup>	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
<b>Inspection accuracy</b>			
Repeatability accuracy on positioning of the same pallet	mm	0.01	0.01
Max. positioning tolerance for 2 pallets	mm	0.02	0.02
Parallelism of pallet top and base bottom	mm	0.02	0.02

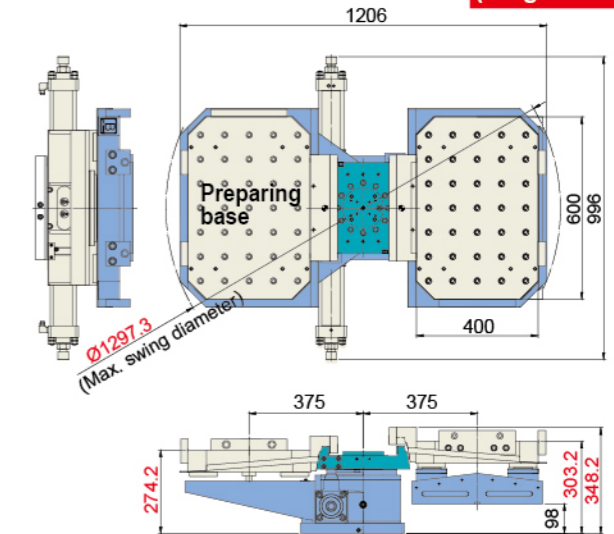


The function of cones :  
① Precise positioning  
② Air blast for chip removal  
③ Airtight testing

Cones:  
Powerful hydraulic clamping

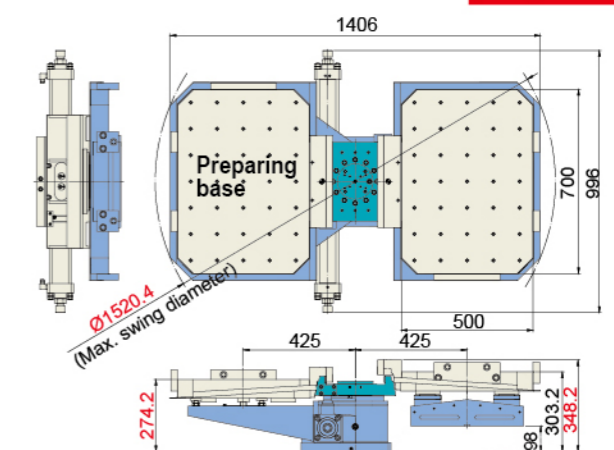
**CTU-400x600** (The type of hook plate fixed on the exchanging mechanism.)

(Weight : 530kg)



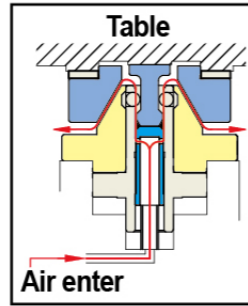
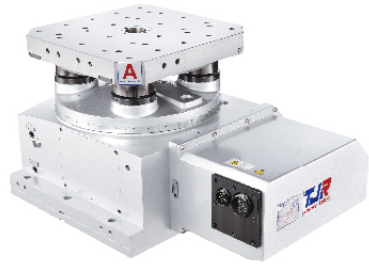
**CTU-500x700** (The type of hook plate fixed on the exchanging mechanism.)

(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)



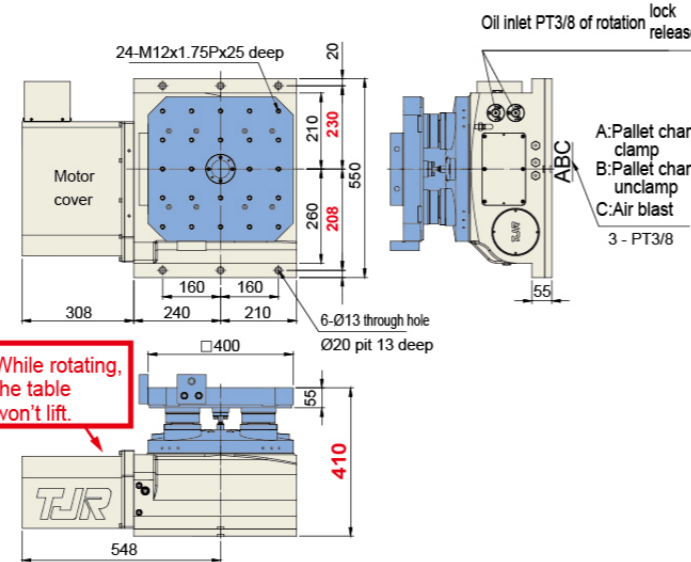
▲ CHI Series :  
 Use **three-piece** clutch plate

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



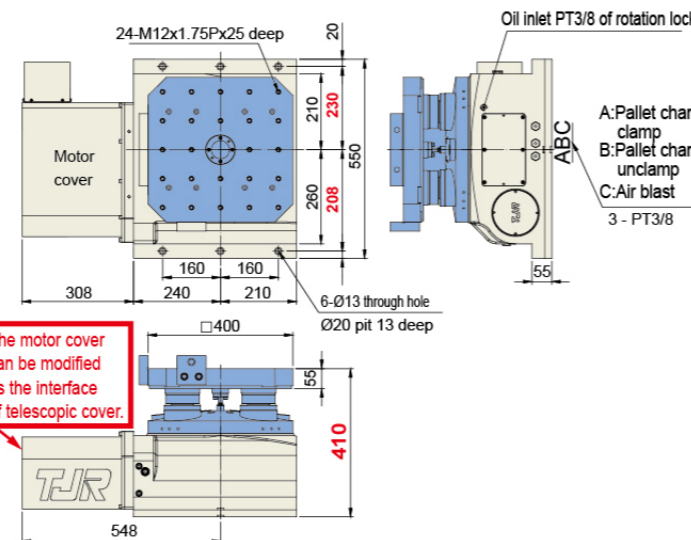
▲ CHR series :  
 Use **large-diameter radial & axial bearings**

### 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.

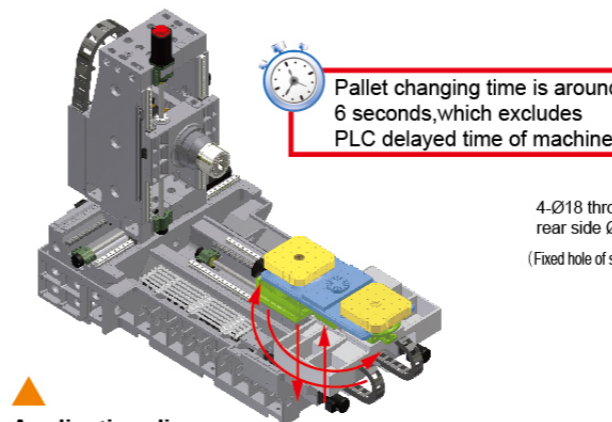
Item / Model	Unit	CHI-400	CHR-400
Table size	mm	□400x400	□400x400
Diameter of Table Central Hole	mm	Ø50x27 deep	Ø50x27 deep
Table height	mm	410	410
Table T-slot Width	mm	14H7	14H7
Guide Block Width	mm	18h7	18h7
Min. Increment	deg.	1 or 5	0.001
Indexing Precision	sec.	±5	15
Repeatability	sec.	±1	6
Clamping force of positioning cones	kgf	960x4=3840	960x4=3840
Clamping System (Hydraulic)	kgf/cm <sup>2</sup>	35	35
Clamping Torque	kgf·m	500	200
Servo Motor Model	FANUC / MITSUBISHI	aiF12 / βis22	aiF12 / βis22
Shaft	Straight shaft without key	aiF12 / βis22	aiF12 / βis22
Speed Reduction Ratio	-	1 : 120	1 : 120
Max. Rotation Rate of Table (Calculate with Fanuc α 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)

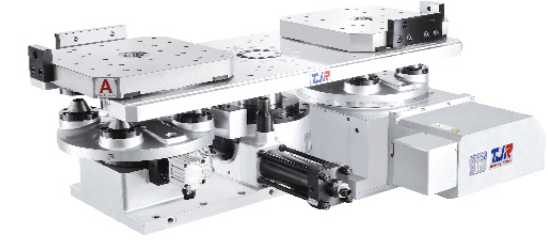


▲ CTH-400 (Tray type APC)



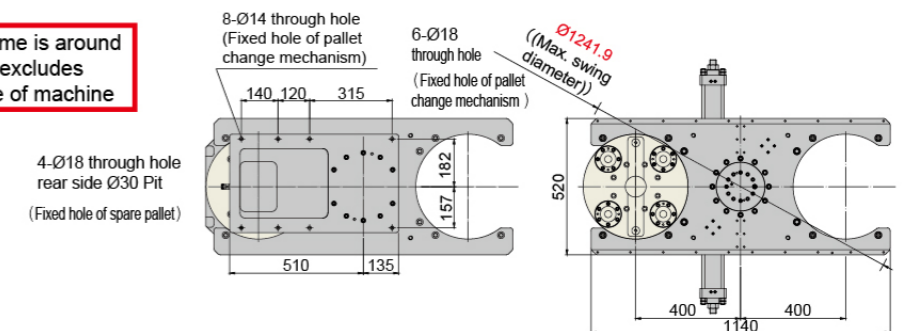
Application diagram:  
 retrofits horizontal machining center with CTH+ CHI

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 <sup>2</sup>	35
Positioning method	-	Cone positioning
Clamping force (35kg/cm <sup>2</sup> )	kgf	960x4=3840
Operating System (Up & Down & Rotate)	kgf/cm <sup>2</sup>	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

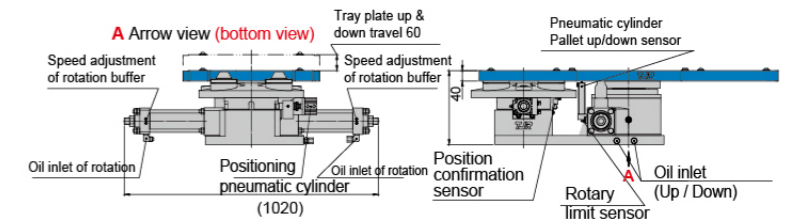


▲ CTH-400 + CHI-400  
 Tray type APC + Dual pallets rotary table  
 (Flat bottom type)

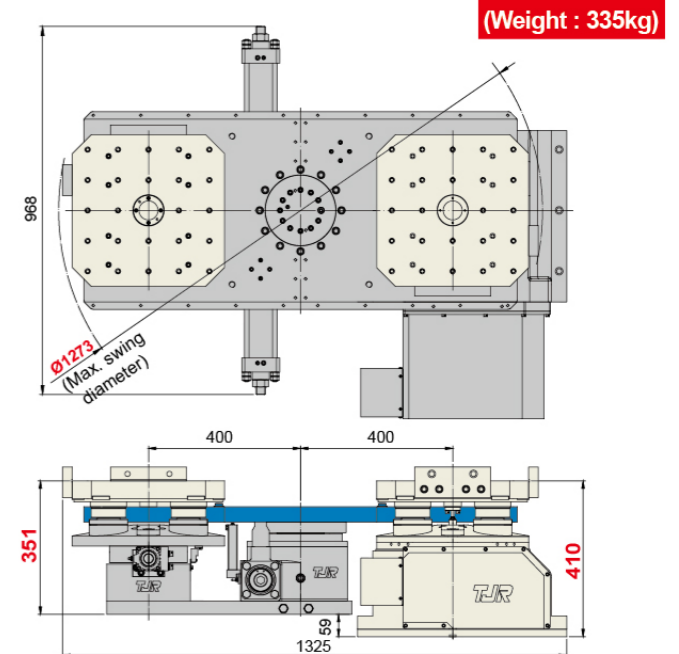
### CTH-400 (Pallet changer)



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



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





## 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



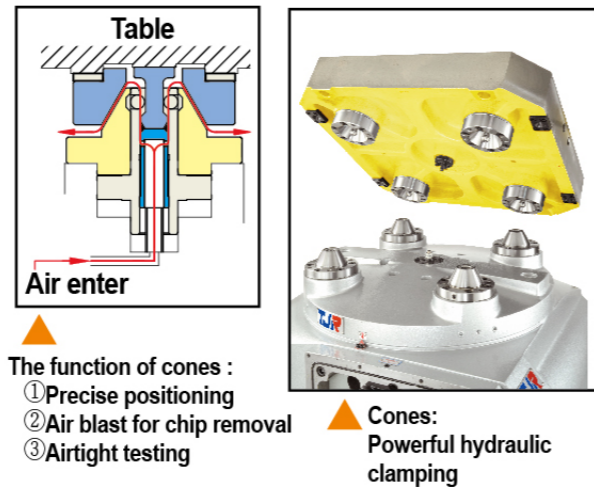
▲ **CHI-500 (1°)- Dual pallets rotary table**  
 (Flat bottom type)



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

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

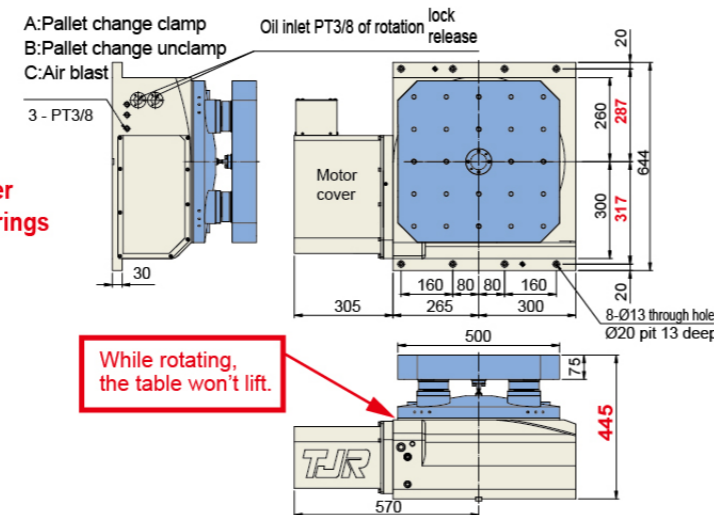
Item / Model	Unit	CHI-500	CHR-500
Table size	mm	□500x500	□500x500
Diameter of Table Central Hole	mm	Ø50x27 deep	Ø50x27 deep
Table height	mm	445	445
Table T-slot Width	mm	18H7	18H7
Guide Block Width	mm	18h7	18h7
Min. Increment	deg.	1 or 5	0.001
Indexing Precision	sec.	$\pm 5$	15
Repeatability	sec.	$\pm 1$	6
Clamping force of positioning cones (35kg/cm <sup>2</sup> )	kgf	960x4=3840	960x4=3840
Clamping System (Hydraulic)	kgf/cm <sup>2</sup>	35	35
Clamping Torque	kgf-m	1000	370
Servo Motor Model	FANUC MITSUBISHI	Straight shaft without key	$\beta$ is22 aiF12 / $\beta$ is22
Speed Reduction Ratio	-	1 : 180	1 : 180
Max. Rotation Rate of Table (Calculate with Fanuc $\alpha$ 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)	-



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

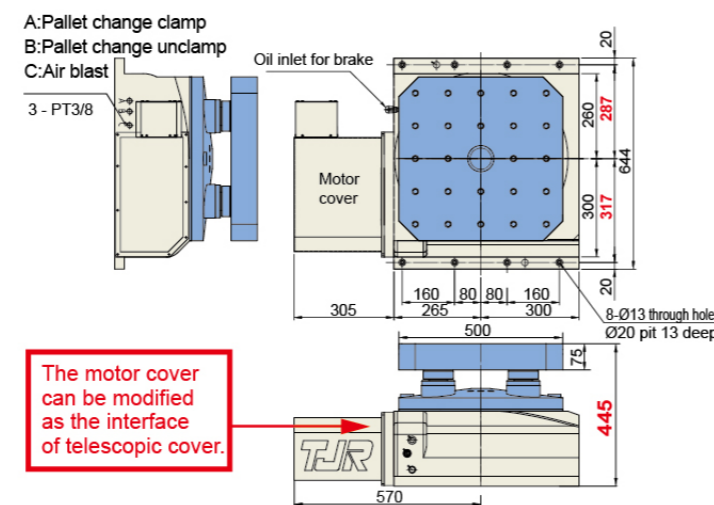
▲ **Cones:**  
 Powerful hydraulic clamping

### CHI-500 (1° or 5°) (Flat bottom type)



While rotating, the table won't lift.

### CHR-500 (0.001°) (Flat bottom type)



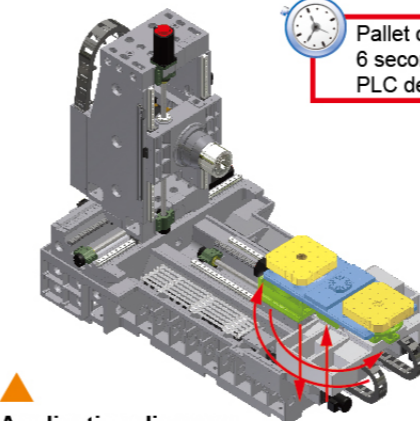
The motor cover can be modified as the interface of telescopic cover.

## 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

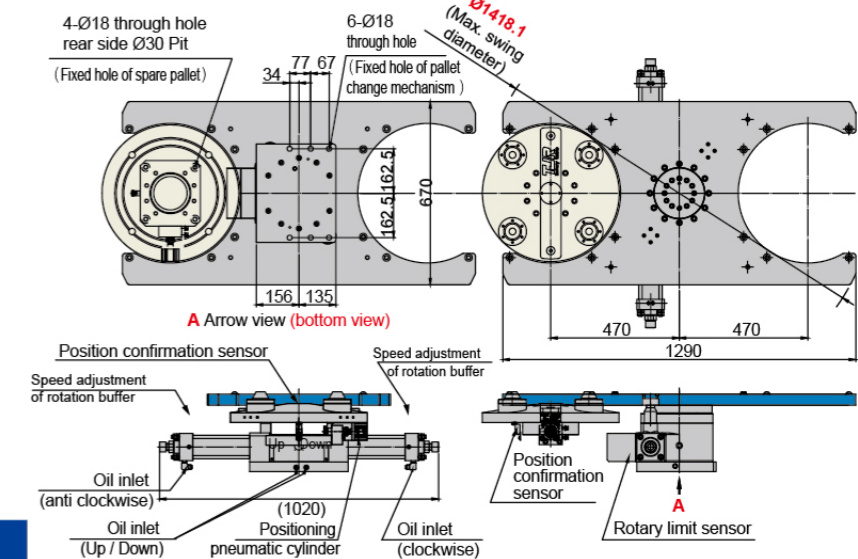
Item / Model	Unit	CTH-500
Lift-up mechanism	-	Tray type ( H type )
Table size	mm	670 x 1290
Rotation method	-	Hydraulic hirth coupling
Rotation angle	deg.	180° to and fro
Clamping System (Hydraulic)	kgf/cm <sup>2</sup>	35
Positioning method	-	Cone positioning
Clamping force (35kg/cm <sup>2</sup> )	kgf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



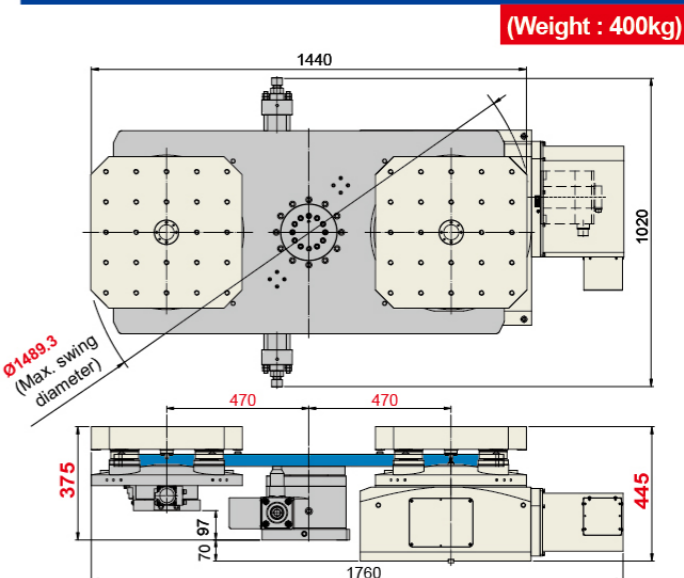
▲ **CTH-500 + CHI-500**  
 Tray type APC + Dual pallets rotary table  
 (Flat bottom type)

### CTH-500 (Pallet changer)

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



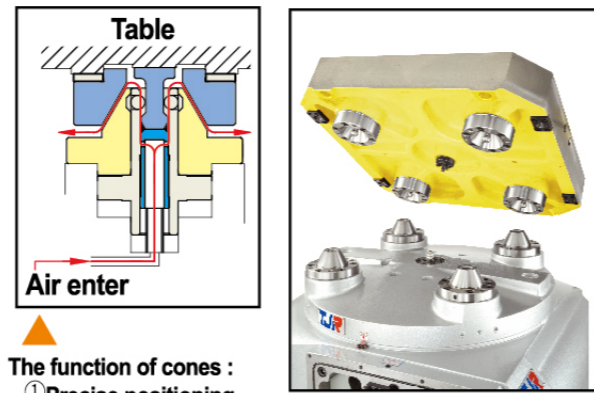
### CTH-500 + CHI-500 (Flat bottom type)



(Weight : 400kg)

## 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

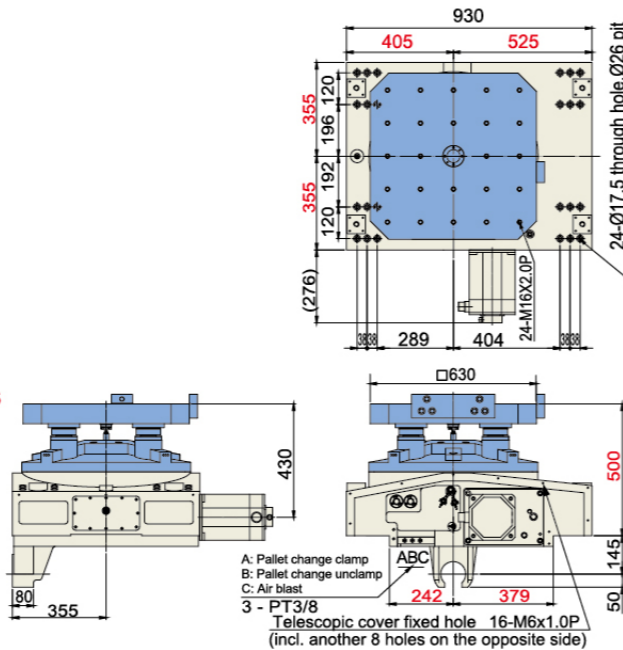
### ▲ CHI-630L (1°)- Dual pallets rotary table (Integrated ball-screw-interface type)



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

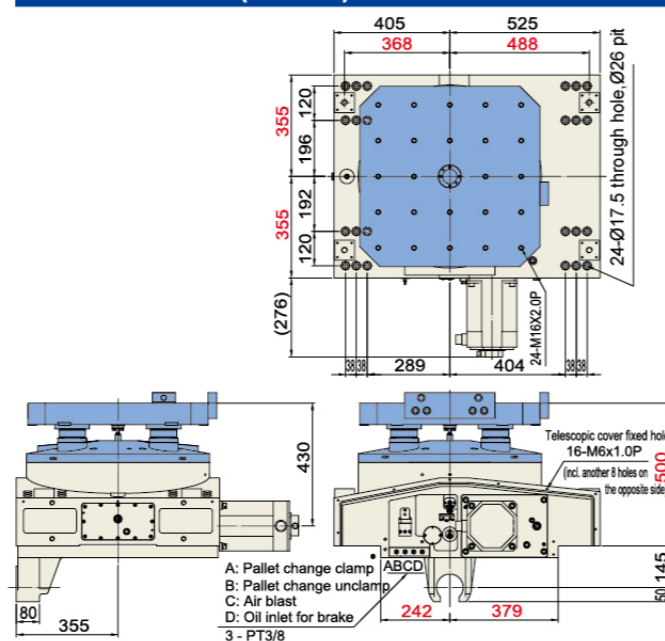
Function: ① Accuracy:  $\pm 5$  seconds  
 ② Rotate **without lifting the table** to prevent table from water and particles.

▲ 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	∅50x27 deep	∅50x27 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.	$\pm 5$	15
Repeatability	sec.	$\pm 1$	6
Clamping force of positioning cones (35kg/cm <sup>2</sup> )	kgf	940x4=3840	940x4=3840
Clamping System(Hydraulic)	kgf/cm <sup>2</sup>	35	35
Clamping Torque	kg-m	5000	800
Servo Motor Model		FANUC without key	∅iF22 / ∅is22
		MITSUBISHI	HG/HF-204
Speed Reduction Ratio	-	1 : 180	1 : 180
Max. Rotation Rate of Table (Calculate with Fanuc $\alpha$ 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	-

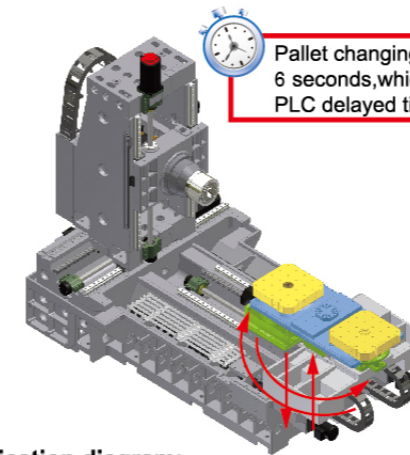


## CTH Series (Tray type auto pallet changer)

**CTH-630** (Go with CHI/CHR series)  
 For horizontal machining center  
 (180° to and fro)

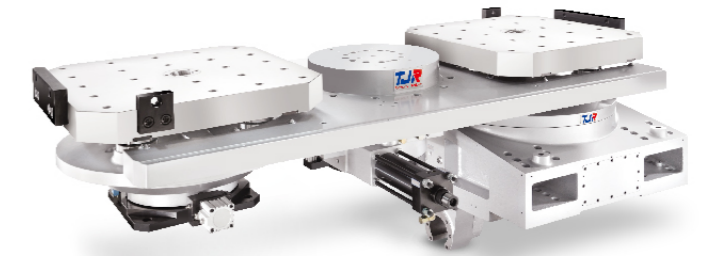


### ▲ CTH-630 (Tray type APC)

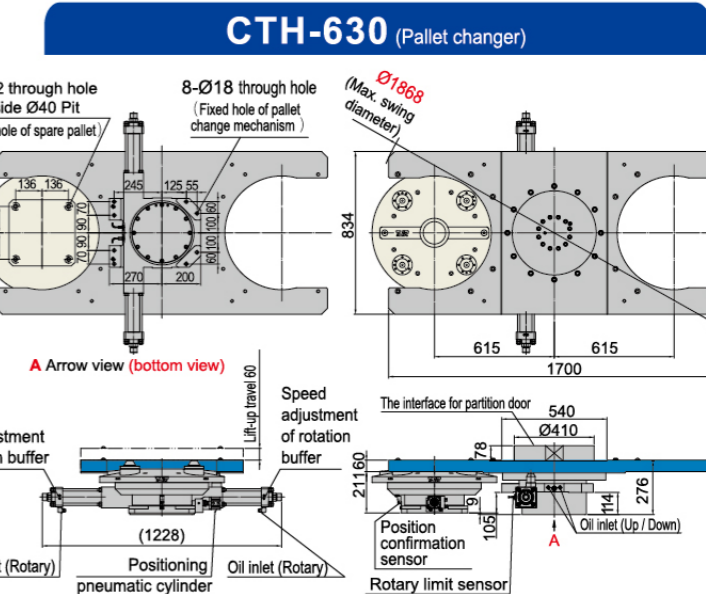


Application diagram:  
 retrofits horizontal machining center with CTH+ CHR

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 <sup>2</sup>	35
Positioning method	-	Cone positioning
Clamping force (35kg/cm <sup>2</sup> )	kgf	960x4=3840
Operating System(Up & Down & Rotate)	kgf/cm <sup>2</sup>	Hyd.45
Lifting thrust force	kg	3780
Up and down travel of the pallet	mm	60
Allowable Workpiece Load	kg	1000x2=2000
<b>Inspection accuracy</b>		
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

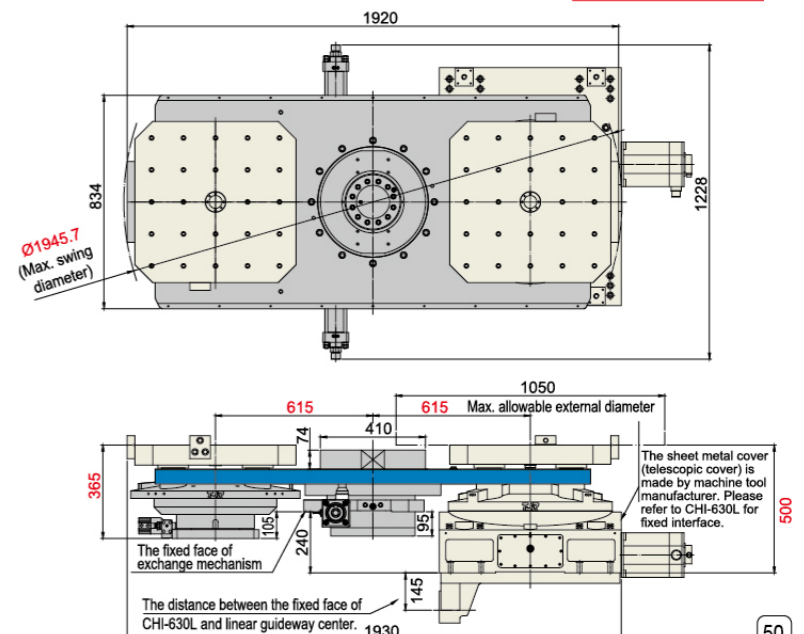


### ▲ CTH-630 + CHI-630L Tray type APC + Dual pallets rotary table (Integrated ball-screw-interface type)



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

(Weight : 600kg)



Driven by Worm & Worm Gear

## The 4<sup>th</sup> Axis Roller Gear Cam Series

- Pneumatic Brake / Hydraulic Brake



RC-170R



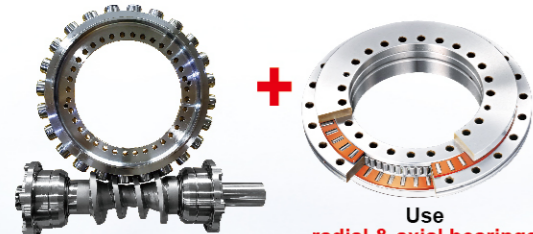
RC-255N



RC-320N



RC-400N

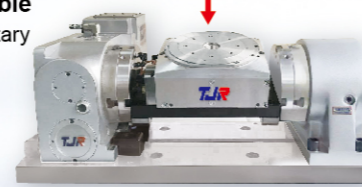


Use radial & axial bearings

90° indexer

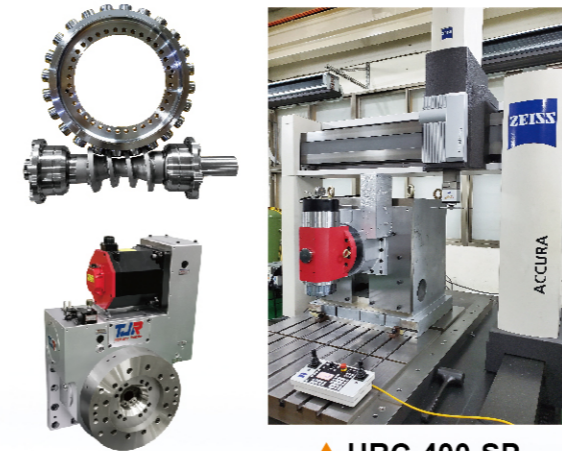
A simplified 4<sup>th</sup> & 5<sup>th</sup> axis rotary table  
Tilt axis: roller gear cam or DD motor rotary table  
Rotary axis: 90° indexer

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



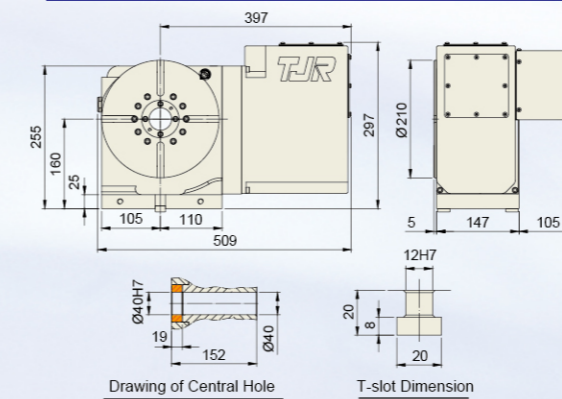
Driven by Roller Gear Cam  
(Speed : 80 rpm)

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 <sup>2</sup>	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)	αiF12 / βis22 (Straight)	
	MITSUBISHI Taper/Straight shaft	HG/HF-54 / 104	HG/HF-54 / 104	HG/HF-154	HG/HF-204	HG/HF-204 (Straight)	
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 <sup>2</sup>	5.4	8.3	20.3	44.8	100	
Allowable Workpiece Load (dynamic)	Vertical	kg	75	100	150	200	
	with Support Table	kg	150	150	250	350	500
Allowable Load (with clamping)	Horizontal	kg	150	250	350	500	
	F	kgf	1450	1450	2000	3000	4000
	FxL	kgf-m	110	110	150	300	400
Driving Torque	FxL	kgf-m	31	31 (Pne.) / 50 (Hyd.)	70	115	200
		kgf-m	37	37	55	107	140
Net Weight (Servo motor excluded)	kg	44	52	110	187	-	



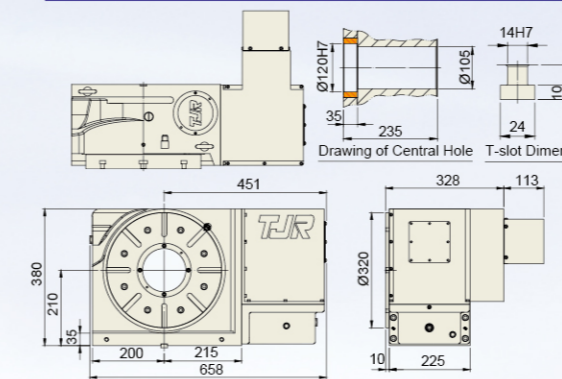
▲ HRC-400-SP

### RC-210R



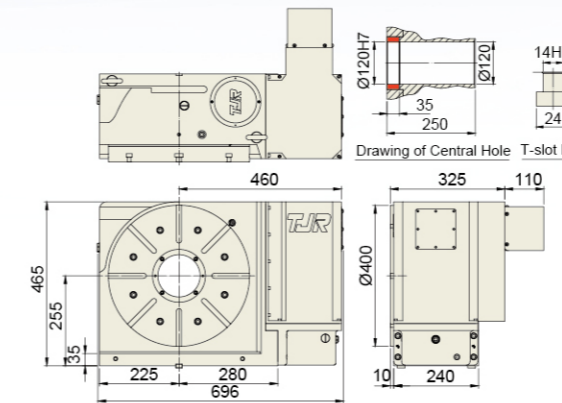
Drawing of Central Hole T-slot Dimension

### RC-320N (Sheet Metal Cover Reduction)



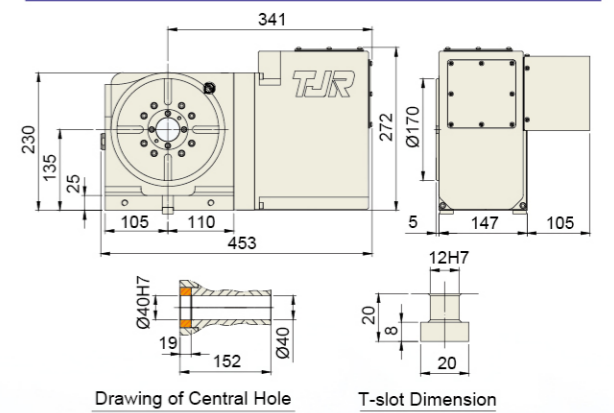
Drawing of Central Hole T-slot Dimension

### RC-400N



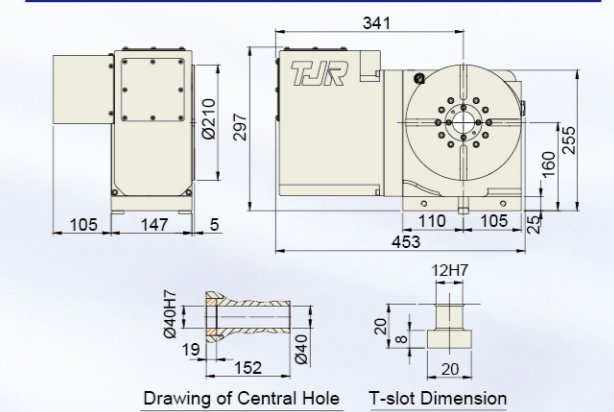
Drawing of Central Hole T-slot Dimension

### RC-170R



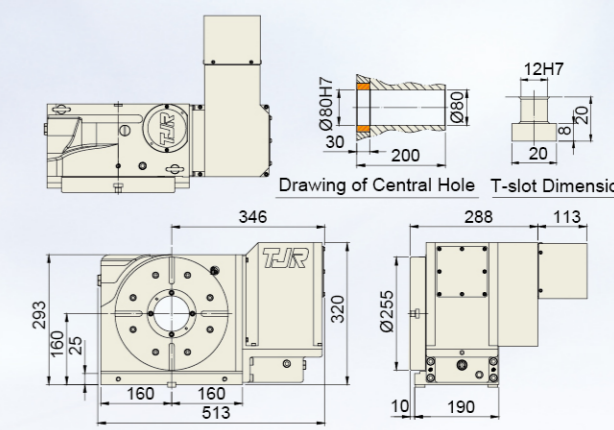
Drawing of Central Hole T-slot Dimension

### RC-210L (Left Side Motor Type)



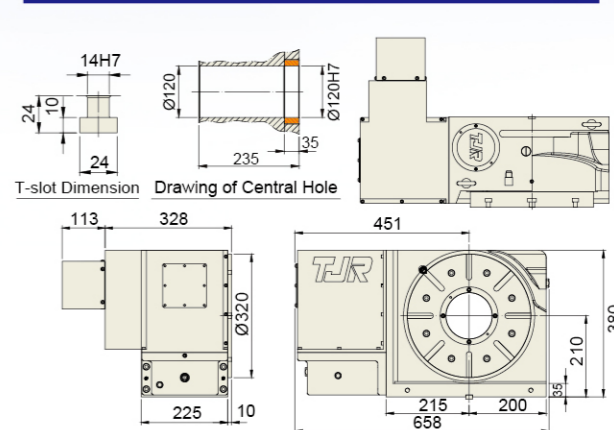
Drawing of Central Hole T-slot Dimension

### RC-255N (Sheet Metal Cover Reduction)



Drawing of Central Hole T-slot Dimension

### RC-320L (Left Side Motor Type)

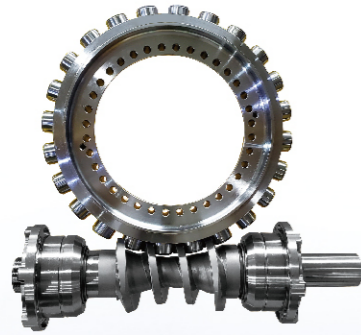


T-slot Dimension Drawing of Central Hole



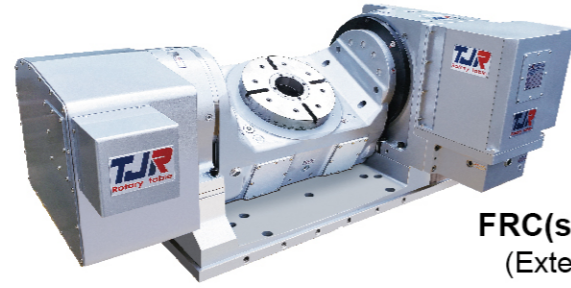
## The 4<sup>th</sup> & 5<sup>th</sup> Axis Roller Gear Cam Series

- Hydraulic Brake

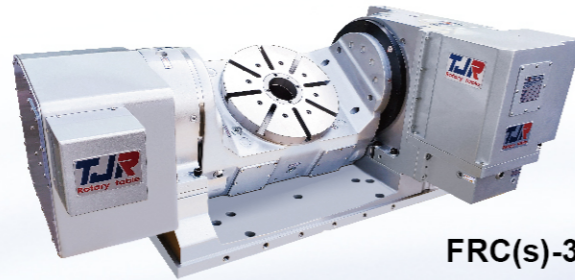


Driven by Roller Gear Cam  
(Speed : 80 rpm)

AC軸 雙滾子凸輪 傳動

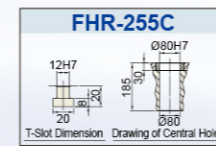
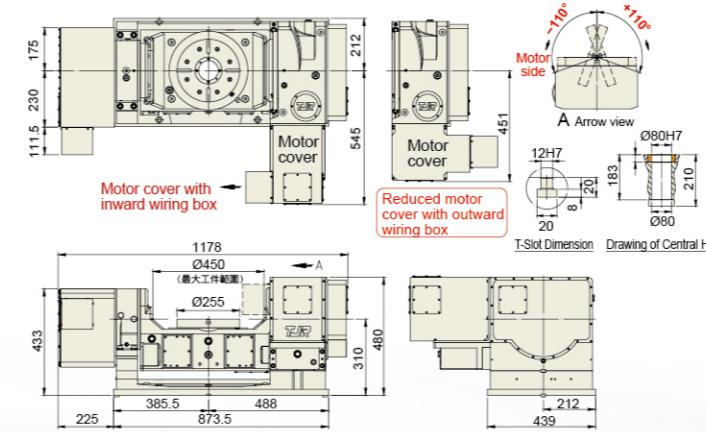


**FRC(s)-255CL-RC320**  
(Extended cradle type)



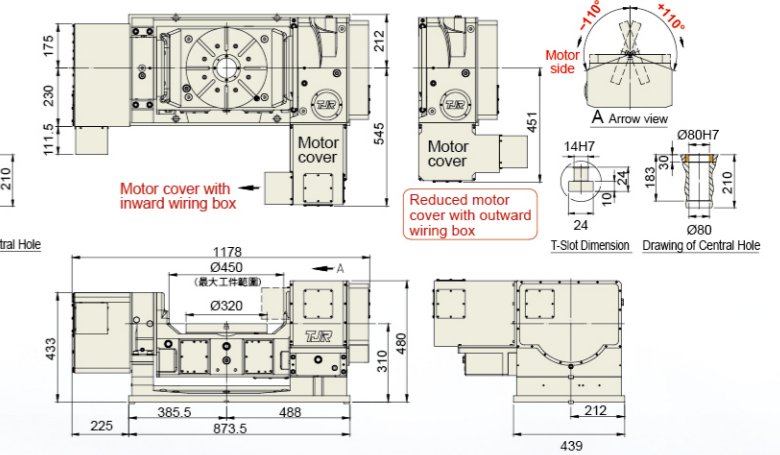
**FRC(s)-320CF-RC320**  
(Cradle type)

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



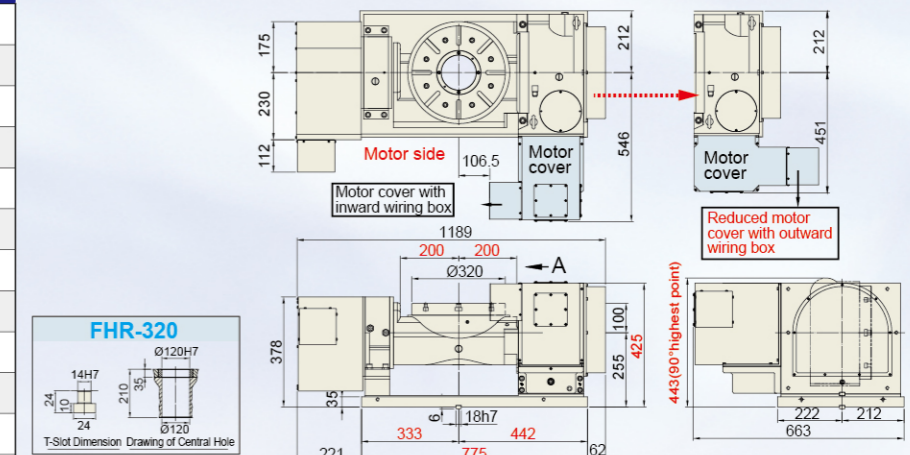
可裝6油孔分配器+光學尺

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



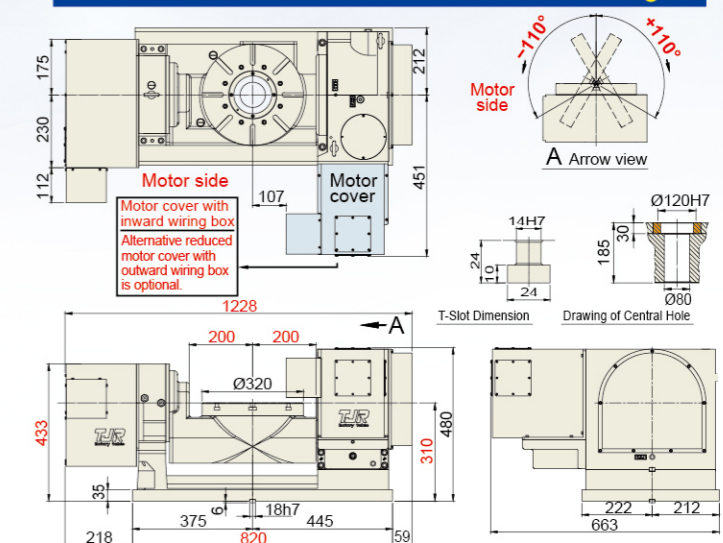
可裝6油孔分配器+光學尺

## FHR-320-RC320 (Standard type)



6-port rotary joint can be accommodated.

## FHR-320C-RC320 (Cradle type)



4-port rotary joint can be accommodated.

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 ±110°		Rotary axis	
Transmission Mechanism	-	Roller Gear Cam		Roller Gear Cam		Worm & Worm Gear	
Min. Increment	deg.	0.001		0.001		0.001	
Indexing Precision (while tilt 0°~+90°)	sec.	20		60		15	
Repeatability	sec.	6		8		6	
Clamping System (Hydraulic)	kgf/cm <sup>2</sup>	35		35		35	
Clamping Torque	kgf·m	70		175		115	
Servo Motor Model	FANUC Taper / Straight	aiF8 / ais12 / bis12	aiF12 / bis12	aiF8 / ais12 / bis12	aiF12 / bis22	aiF8 / ais12 / bis12	aiF12 / bis22
	MITSUBISHI Straight	HG/HF-154	HG/HF-154	HG/HF-154	HG/HF-154	HG/HF-104	HG/HF-204
Speed Reduction Ratio	-	1 : 60		1 : 120		1 : 120	
Max. Rotation Rate of Table (Calculate with FANUC α Motor)	r.p.m	50		25		25	
Allowable Inertia Load Capacity (Horizontal)	kg·cm·sec <sup>2</sup>	16.2		25.6		25.6	
Allowable Workpiece Load (dynamic)	0° Horizontal	kg		200		200	
	0~90° Tilt	kg		150		150	
Allowable Load (with clamping)	F	kgf		1600		1800	
	FxL	kgf·m		175		175	
	FxL	kgf·m		70		115	
Driving Torque	kgf·m	35		35		80	
Net Weight (servo motor excluded)	kg	580		585		-	

\*( ) Alloy Steel worm & gear series

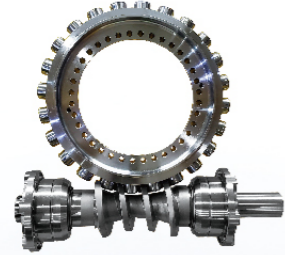
★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.

Driven by Roller Gear Cam

Driven by Roller Gear Cam

## The 4<sup>th</sup> & 5<sup>th</sup> Axis Roller Gear Cam Series

- Pneumatic Brake / Hydraulic Brake



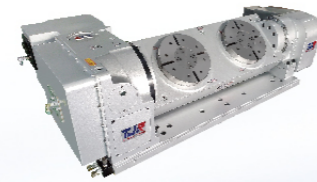
Driven by **Roller Gear Cam**  
(Speed : 80 rpm)



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



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



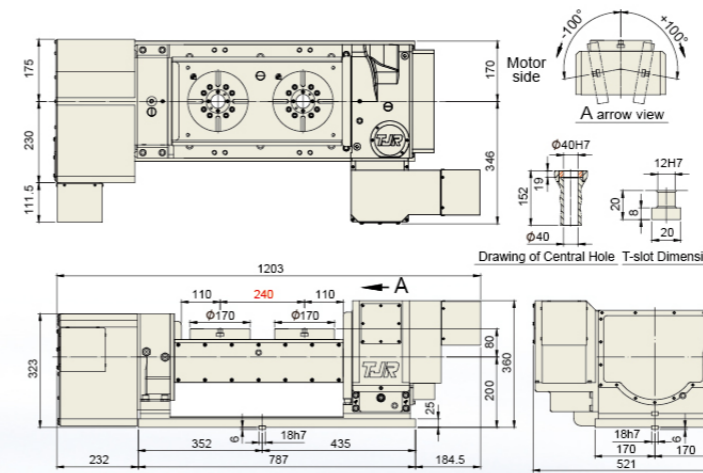
**FHR-255-2W-RC320**  
(2 wheel coupled)



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

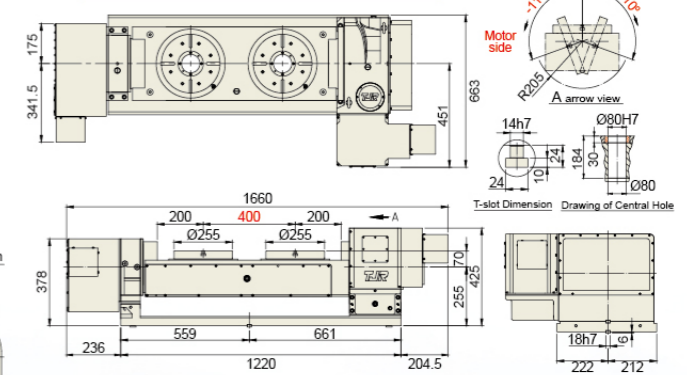
**FAR(s)-170-2W-RC255** (2 wheel coupled)

Tilt axis : Driven by Roller Gear Cam



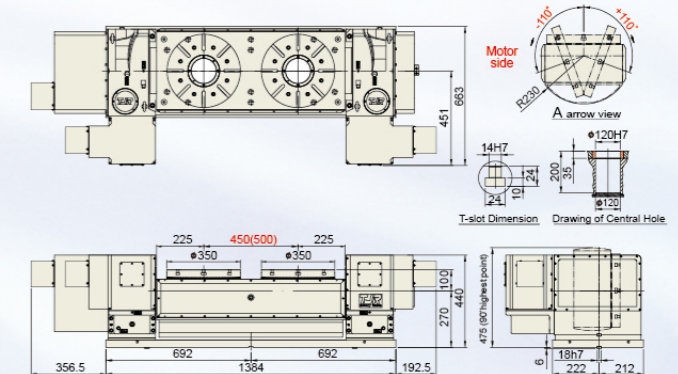
**FHR-255-2W-RC320** (2 wheel coupled)

4-port rotary joint can be accommodated.



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

Tilt axis : Driven by Roller Gear Cam



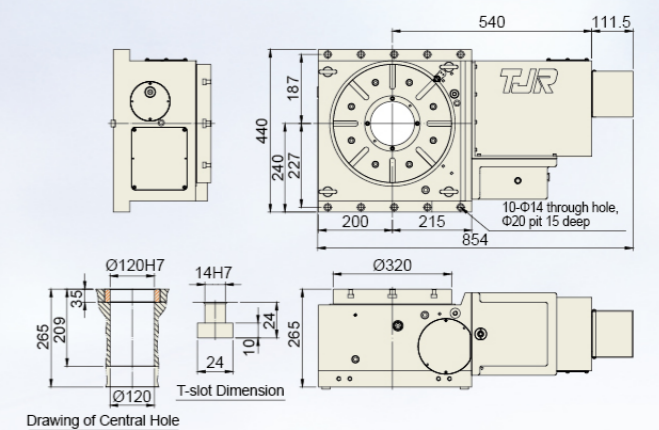
Item	Unit	FAR(s)-170-2W-RC255 / FAR(s)-210-2W-RC255	FHR-255-2W-RC320	FHR-350F-2W-RC320-2A	HRC-320	HRC-400SP			
Table Diameter	mm	Ø170 / Ø210	Ø255	Ø350	Ø320	Ø400			
Diameter of Table Central Hole	mm	Ø67	Ø110	Ø150	Ø150	Ø180			
Inner Diameter of Mandrel Sleeve	mm	Ø40H7	Ø80H7	Ø120H7	Ø120H7	-			
Diameter of Center Through Hole	mm	Ø40	Ø80	Ø120	Ø120 <b>Big Bore</b>	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 ±110°	Rotary axis	Tilt axis ±110°	-	-		
Transmission Mechanism	-	Worm Gear	Roller Gear Cam	Worm Gear	Roller Gear Cam	Roller Gear Cam	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	±10		
Repeatability	sec.	6	8	6	8	6	6		
Clamping System (Hydraulic)	kgf/cm <sup>2</sup>	Pne.6	35	35	35	35	45		
Clamping Torque	kgf·m	31	140	70	175	115	155		
Servo Motor Model	FANUC	Taper / Straight	aiF8 / βis12	ais12 / βis12	ais12 / βis12	ais12 / βis22	ais12 x2	aiF12 / βis22	aiF12 / βis22
	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	1FK7083 x2	-
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 <sup>2</sup>	2.7(Ø170) / 4.2(Ø210)		2.7 / 4.13		23 (per plate)		44.8 (Vertical)	
Allowable Workpiece Load (dynamic)	0° Horizontal	50 (per plate)		100 (per plate)		150 (per plate)		350	
	0°-90° Tilt	40 (per plate)		75 (per plate)		150 (per plate)		- Vertical 200	
Allowable Load (with clamping)	F	750		1000		1800		3000	
	FxL	140		175		230		300	
	FxL	31		70		115		115	
Driving Torque	kgf·m	18 *(14.6)		55		80		56 (dynamic)	
Net Weight (servo motor excluded)	kg	305 (Ø170) / 312 (Ø210)		740		1080		-	

\*( ) Alloy Steel worm & gear series

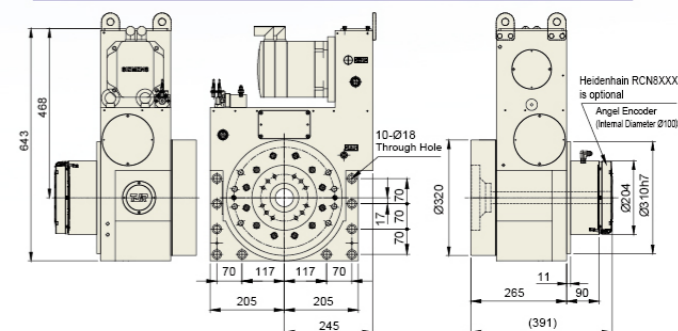
★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.

Driven by Roller Gear Cam

**HRC-320**



**HRC-400SP** (Swivel Spindle Head)



## The 4<sup>th</sup> Axis Direct Drive Motor Series

- Pneumatic Brake



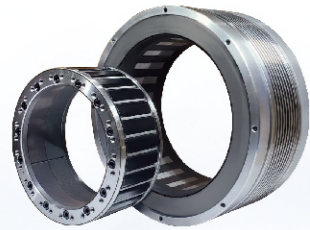
**AD-170**  
without faceplate



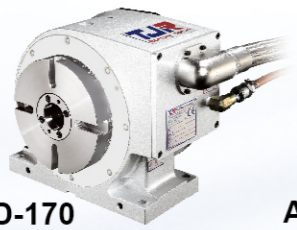
**AD-261iB-FA-CZ**  
FANUC DDM



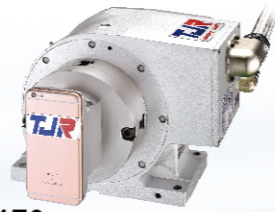
**AD-260iB**  
without faceplate  
(Standard with faceplate)



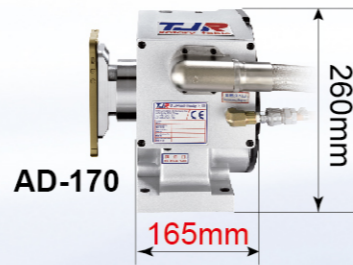
**D.D. Motor**  
(200 rpm)



**AD-170**  
with faceplate



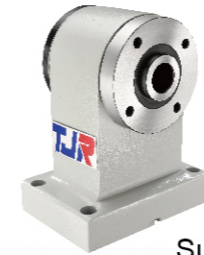
**AD-170**  
(Ex: Machining cell phone)



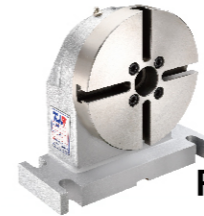
**AD-170**

165mm

260mm



**RT-135**



**RT-170F**

Support table without brake

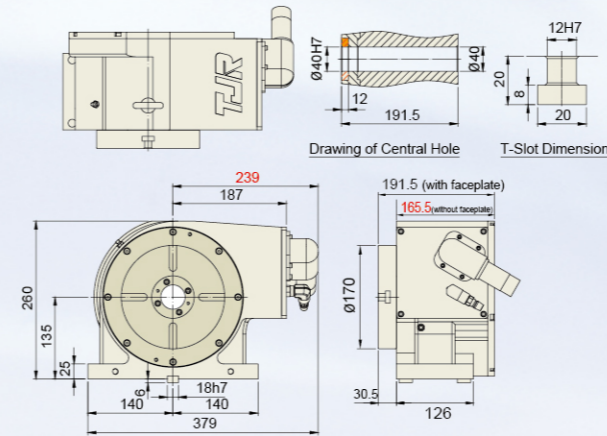


**AD-260iB** + support table + fixture plate

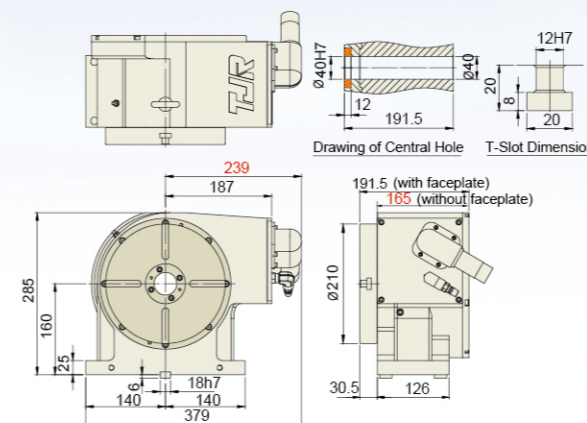
While using **DDM** rotary table, it's recommended to employ table **without faceplate** and simplified support table. Thus, it can increase the available loading capacity for fixtures and workpieces.

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 <sup>2</sup>	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 <sup>2</sup>	1.08	1.65	4.68	7.8	
Allowable Workpiece Load (dynamic)	Vertical	kg	30	30	60	100 (Rated Speed)
	with Support Table	kg	70	70	100	100 (Rated Speed)
Allowable Load (with clamping)	Horizontal	kg	-	-	-	-
	F	N	8000	8000	10000	10000
	FxL	Nm	105	105	231	231
	FxL	Nm	310	310	450	450
Net Weight (D.D motor included)	kg	55	61	84	90	
<b>Electrical Specification</b>						
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) 11.8 / 34.5 (Water Cooling)	9.3/56.6	
Power Rating	KW	0.75	0.75	0.75 / 1.9 (Water Cooling)	-	

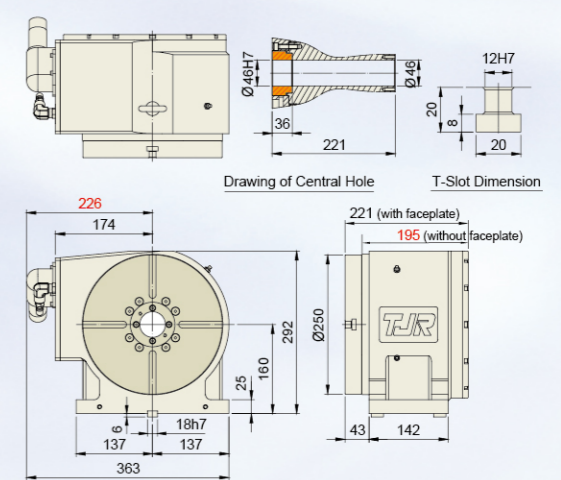
### AD-170 Direct Drive (200 rpm)



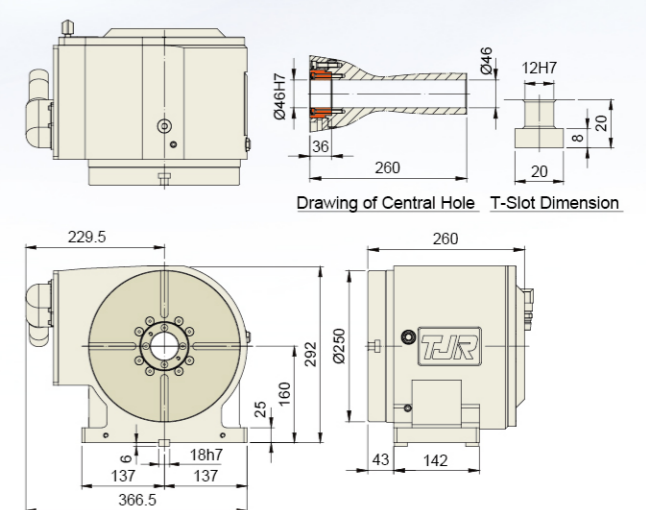
### AD-210 Direct Drive (200 rpm)



### AD-260iB Direct Drive (200 rpm)

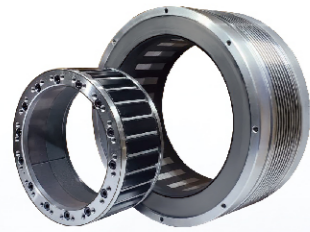


### AD-261iB-FA-CZ Direct Drive (300 rpm)



## The 4<sup>th</sup> & 5<sup>th</sup> Axis Direct Drive Motor Series The 4<sup>th</sup> Axis Direct Drive Motor Series

- Pneumatic Brake / Hydraulic Brake



D.D. Motor



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



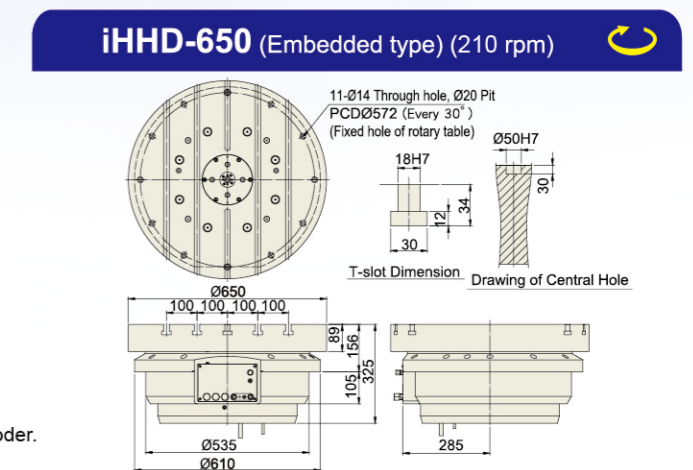
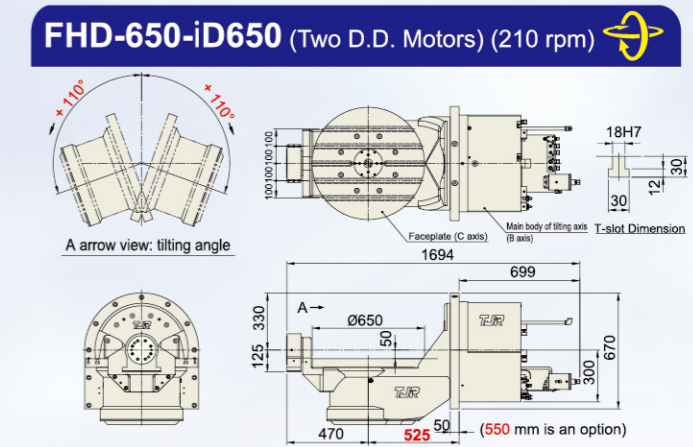
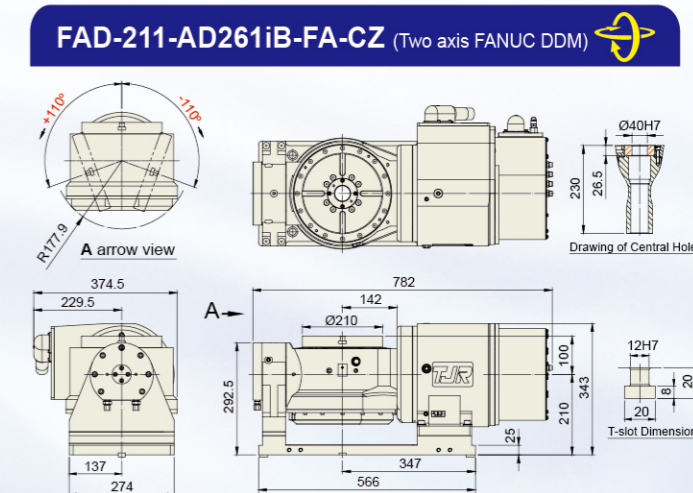
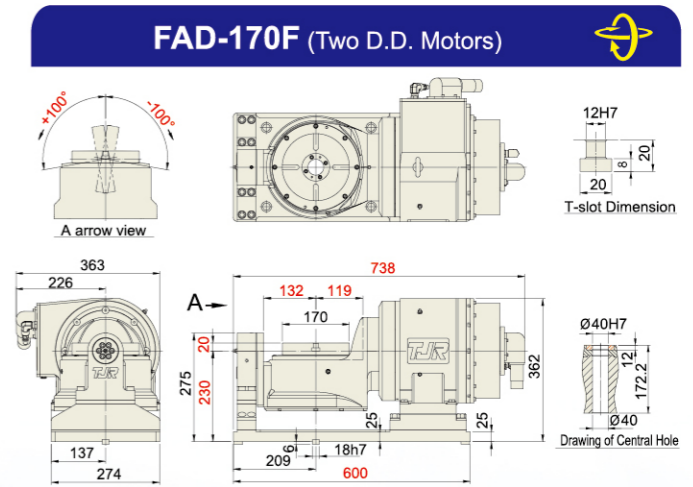
FAD-211-AD261iB-FA-CZ  
(Two D.D. Motors)  
(FANUC DDM)



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



iHHD-650



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 <sup>*1</sup>	30 <sup>*1</sup>	20 <sup>*1</sup>
Repeatability	sec.	4	4	4	4	4	4	4
Clamping System (Pneumatic)	kgf/cm <sup>2</sup>	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
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 <sup>2</sup>	1.08 (Ø170) / 1.65 (Ø210)		1.65		264		264
Allowable Workpiece Load	kg	50		50 (Rated Speed)		500		400
Allowable Load (with clamping)	N	4000		4000		25000		40000
	Nm	450		450		5000		5000
	Nm	310		310		3700		3700
Net Weight (D.D motor included)	kg	220 (Ø170) / 223 (Ø210)		237		1173		479
<b>Electrical Specification</b>								
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		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.

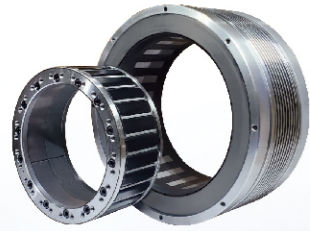
Driven by Direct Drive Motor

Driven by Direct Drive Motor



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

- Pneumatic Brake



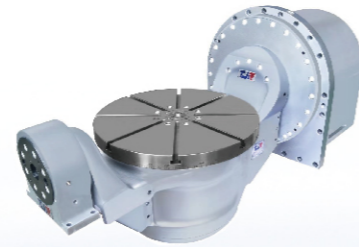
D.D. Motor

### 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

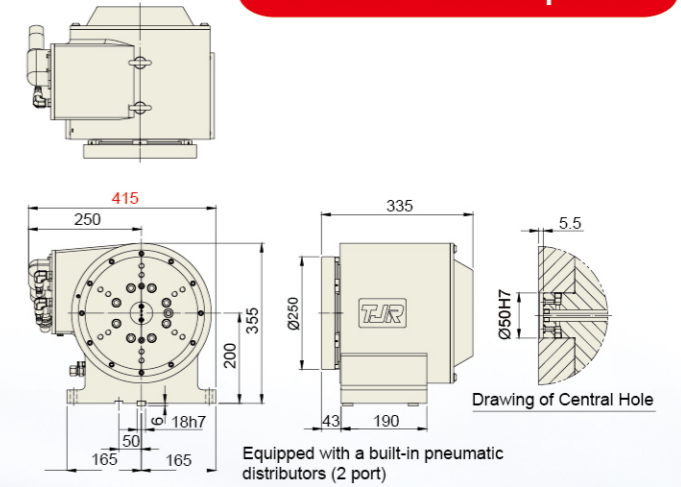


### FAD-400HS-AD500i-420

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

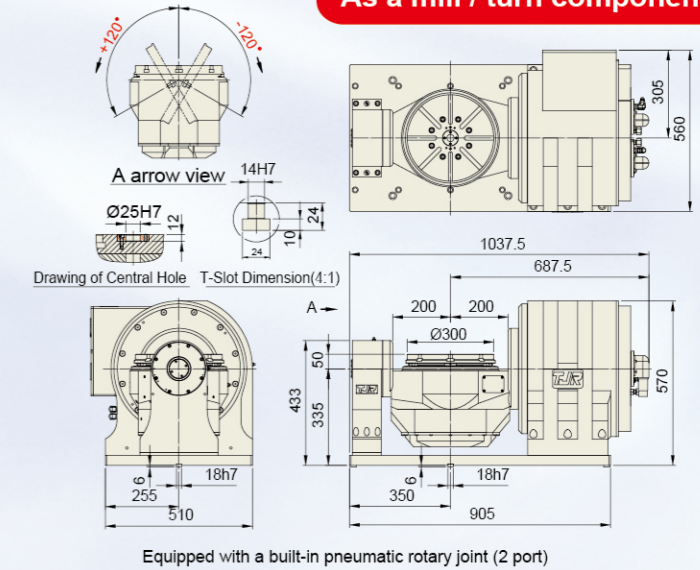
### AD-250HS (2000 rpm)

As a mill / turn component



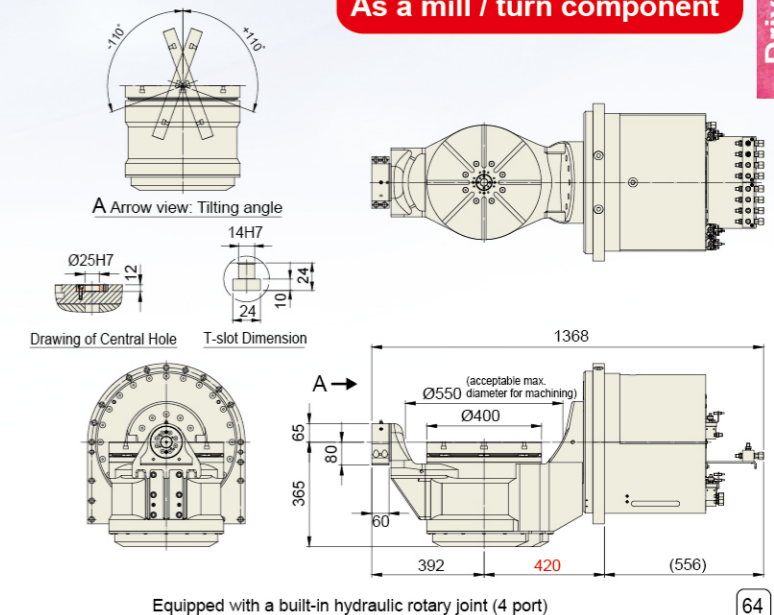
### FAD-300F-HS (2000 rpm)

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	FAD-400HS-AD500i-420	FAD-500FHS-AD500i-480		
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 <sup>2</sup>	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 <sup>2</sup>	3.1	-	-	40 (Ø400) / 62.5 (Ø500)		
Allowable Workpiece Load (dynamic)	kg	-	100 (Rated Speed)	100 (Rated Speed)	200 (balanced load)		
Allowable Load (with clamping)	0°Horizontal	kg	Vertical	50	100 (balanced load)		
	0°~90° Tilt	kg					
	F	N	10000	-	15000		
Net Weight (D.D motor included)	FxL	Nm	1150	730	2000		
	FxL	Nm	550	430	850		
<b>Electrical Specification</b>							
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

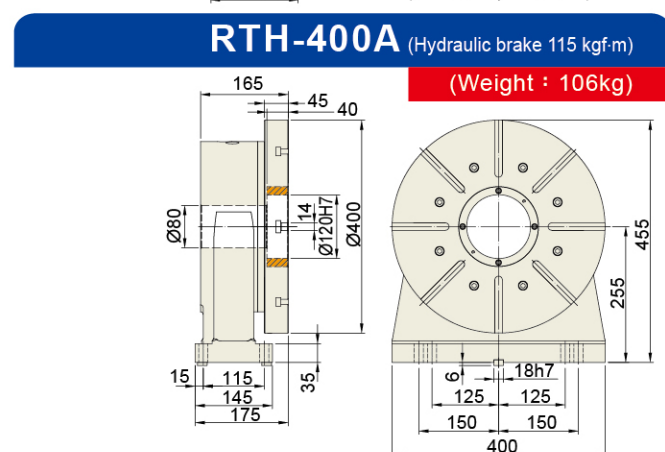
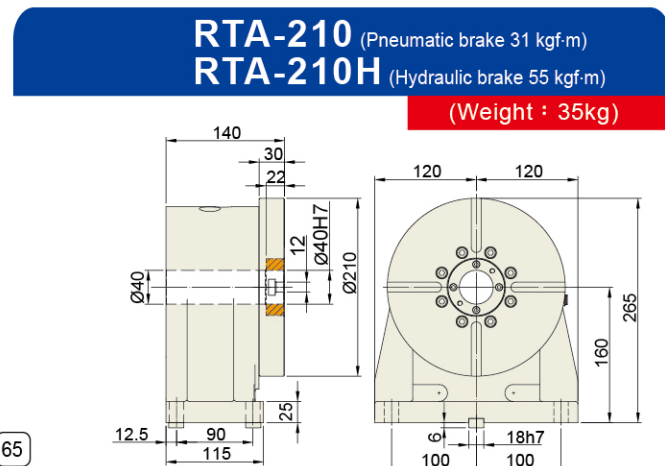
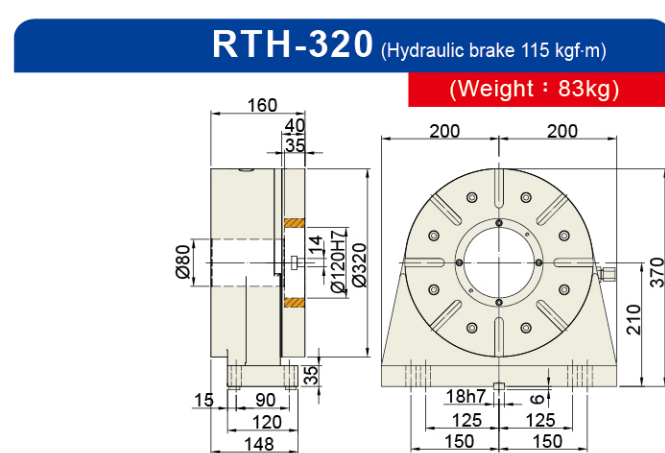
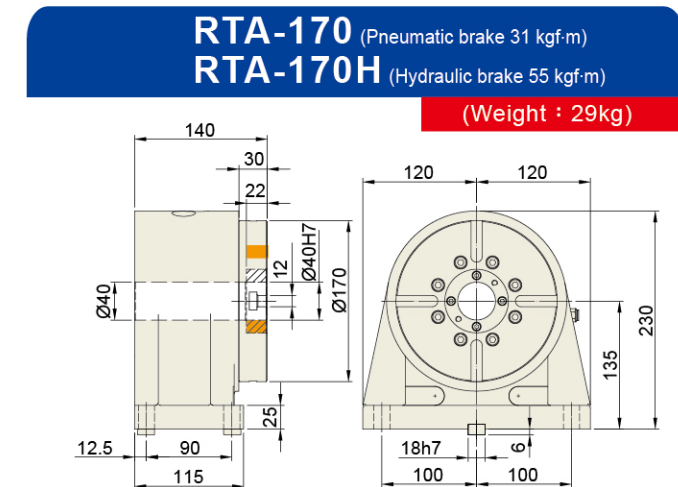
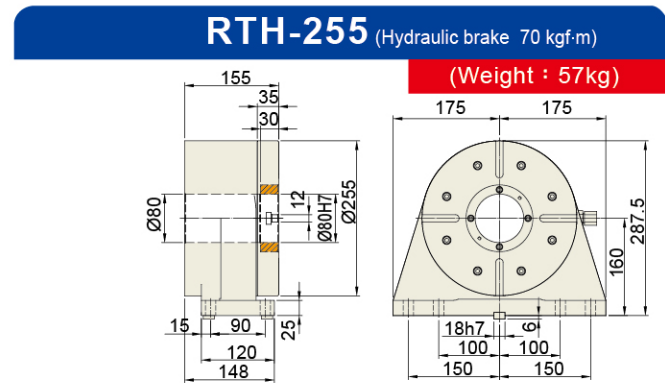
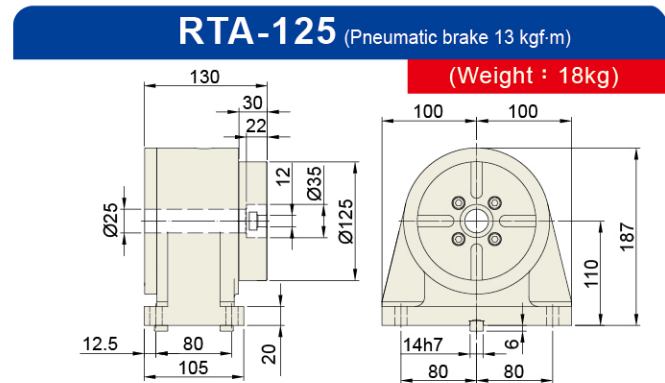
★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.

Driven by Direct Drive Motor

Driven by Direct Drive Motor

## Support Table

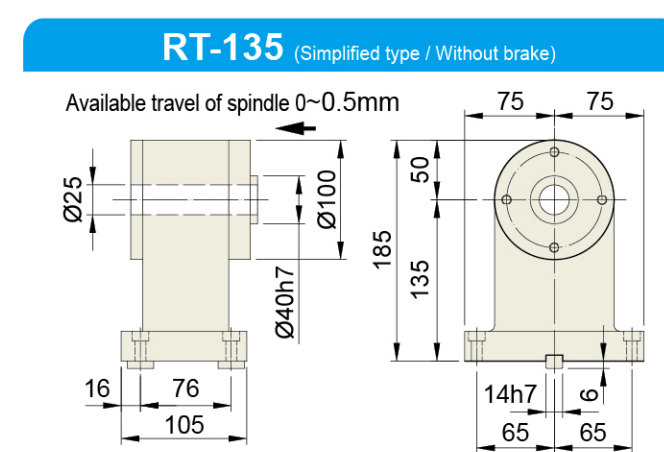
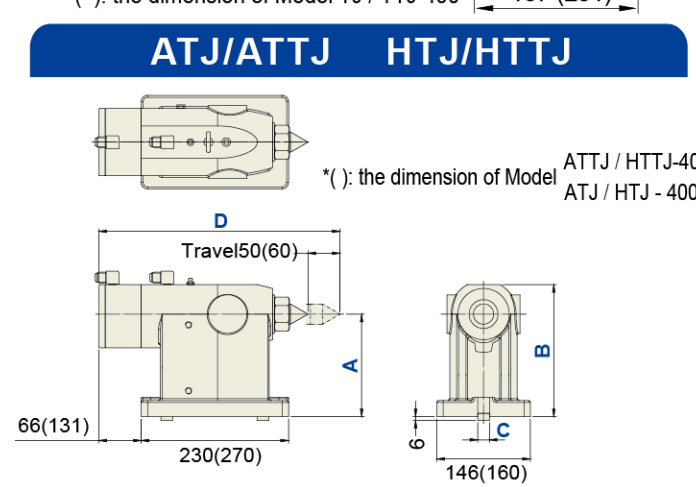
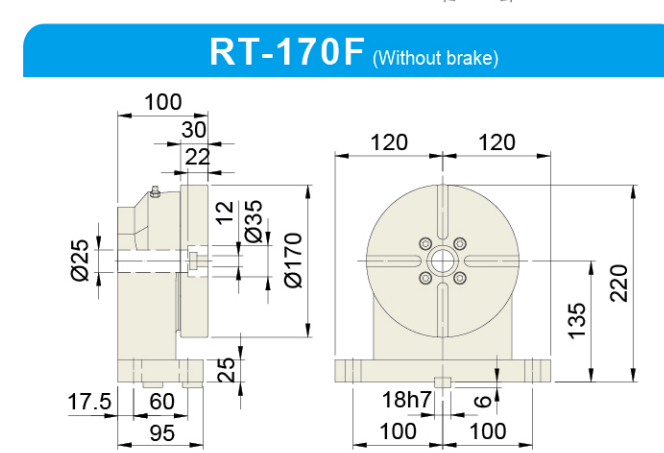
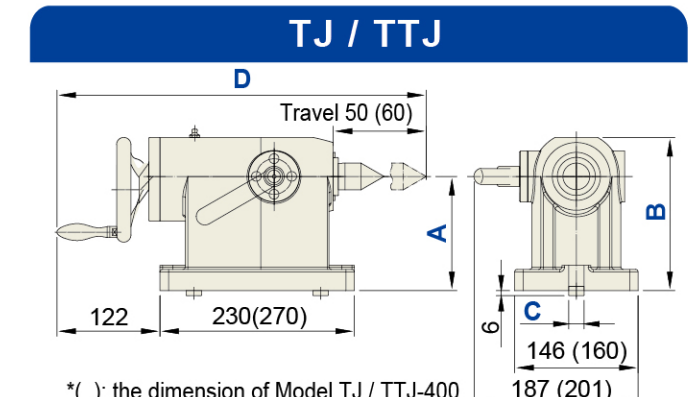
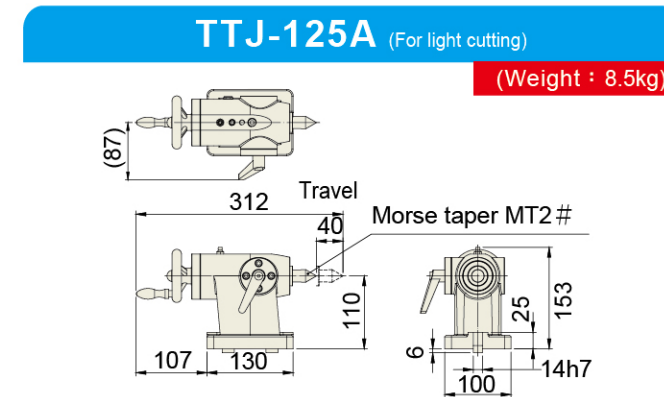
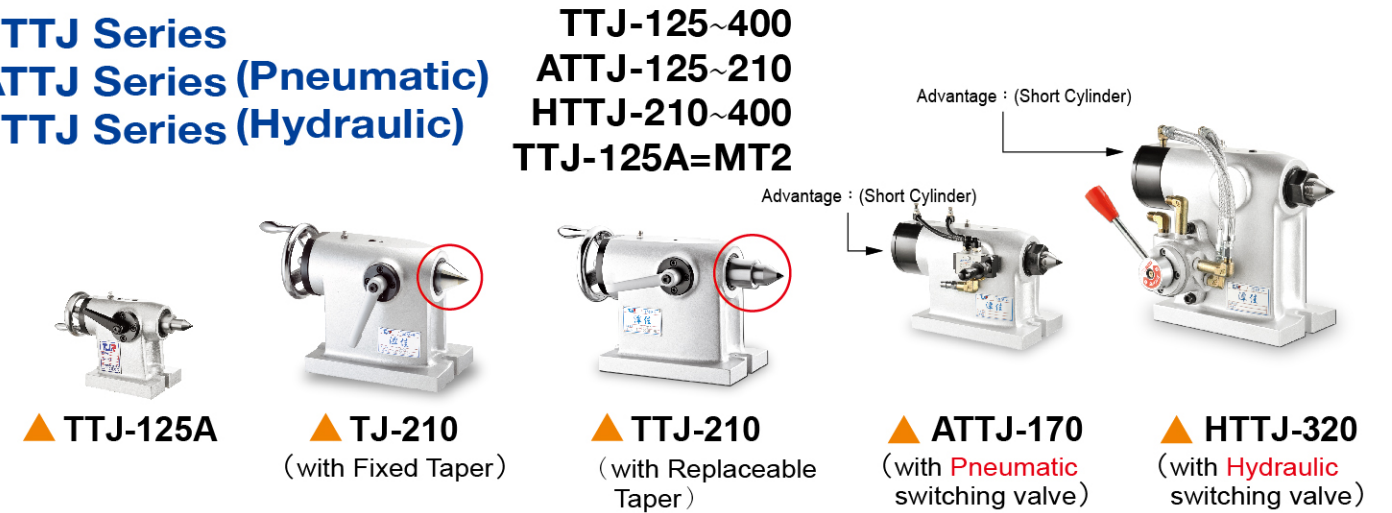
**RTA Series (Pneumatic Brake) RTA-125/170/210**  
**RTH Series (Hydraulic Brake) RTH-255/320/400A**



## Manual Tailstock

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

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



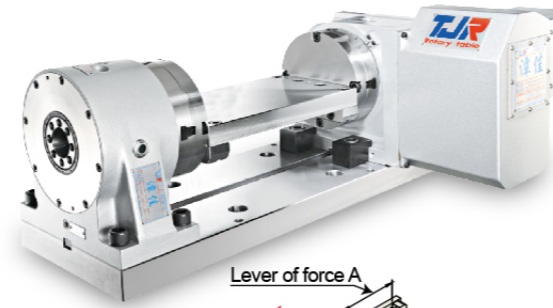
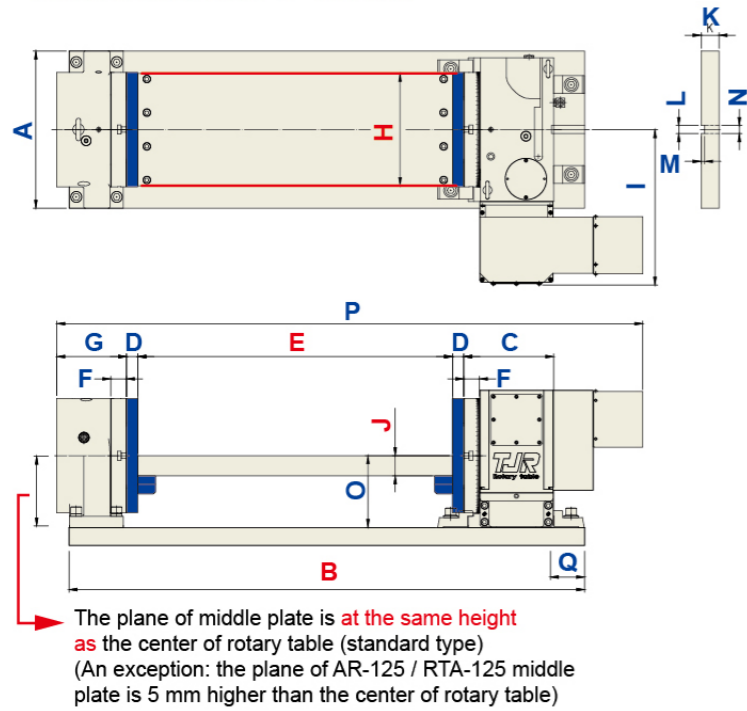
**Manual Tailstock Series** (Unit : mm)

Model	A	B	C	D	Weight Kg
TJ / TTJ-125	110	158	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	258	18	423/435.5	29
TJ / TTJ-400	255	310	18	487/503.5	48

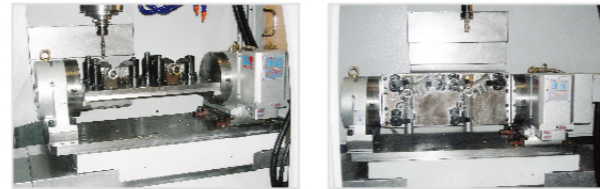
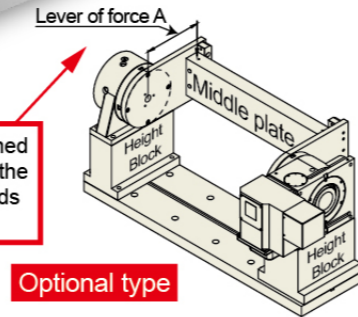
**Manual Tailstock Series with Pneumatic / Hydraulic switching valve** (Unit : mm)

Model	A	B	C	D	Weight Kg
ATJ / ATTJ-125	110	158	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	258	18	363/376	29
HTJ / HTTJ-400	255	310	18	496/495	50

## CNC Rotary Table + Support Table + Connection Plates



Please keep us informed before ordering while the lever of force A exceeds the table radius



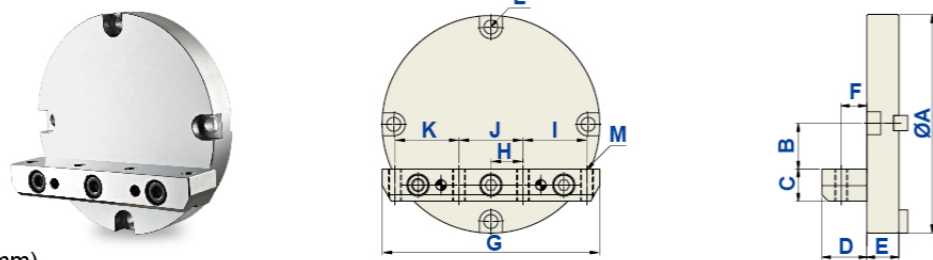
## Specification

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

- Installation of Manual Three-jaw Chuck
- Three-jaw Chuck
- Flange Disk
- AIC Hydraulic Controller
- Hydraulic cylinder
- Bar-shape work piece
- Single axis controller for Direct Drive Motor (DD SAC)
- Single axis controller (SAC) / Dual axis controller (DAC)

Diagram of Chuck Installation

## 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											
SK-12	Ø15-Ø300	Ø90-Ø290	96	Ø105	Ø105	Ø210											
SK-16	Ø30-Ø380	Ø110-Ø350	122	Ø160	Ø160	Ø210											28
SK-16	Ø30-Ø380	Ø110-Ø350	122	Ø160	Ø160	Ø270											28

Unit : mm

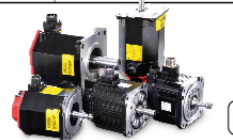
## Servo Motor Reference Table (Please use oil-proof motors)

The data in the CNC rotary table specification sheet are calculated based on FANUC aiF 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 aiF 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	aiF2 / 5000 aiS4 / 4000 βiS4 / 4000	aiF4 / 4000 aiS8 / 4000 βiS8 / 3000	aiF8 / 3000 aiS12 / 4000 βiS12 / 3000	aiF12 / 3000 aiS22 / 4000 βiS22 / 2000	aiF22 / 3000 aiS22 / 4000 aiS40 / 4000	aiF40 / 3000 aiS40 / 4000 aiS60 / 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

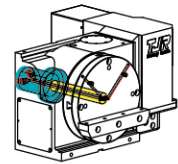
**Pneumatic / Hydraulic rotary joint :**  
(can be equipped with 2, 4, 6, 8 holes)



**2 holes :**  
1 input ; 1 output



**8 holes :**  
4 input ; 4 output



**Application diagram – rotary joint pneumatic / hydraulic distributor**

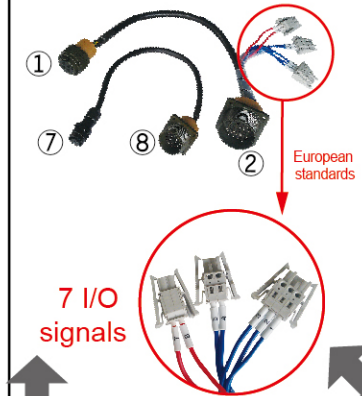
When mounting pneumatic/hydraulic fixtures, please use rotary joint and disk L-blocks equipped with air/oil holes so that the air/fluid can go through the center-through hole to avoid intertwining while the rotary table spins.



**Hydraulic Power Unit :**

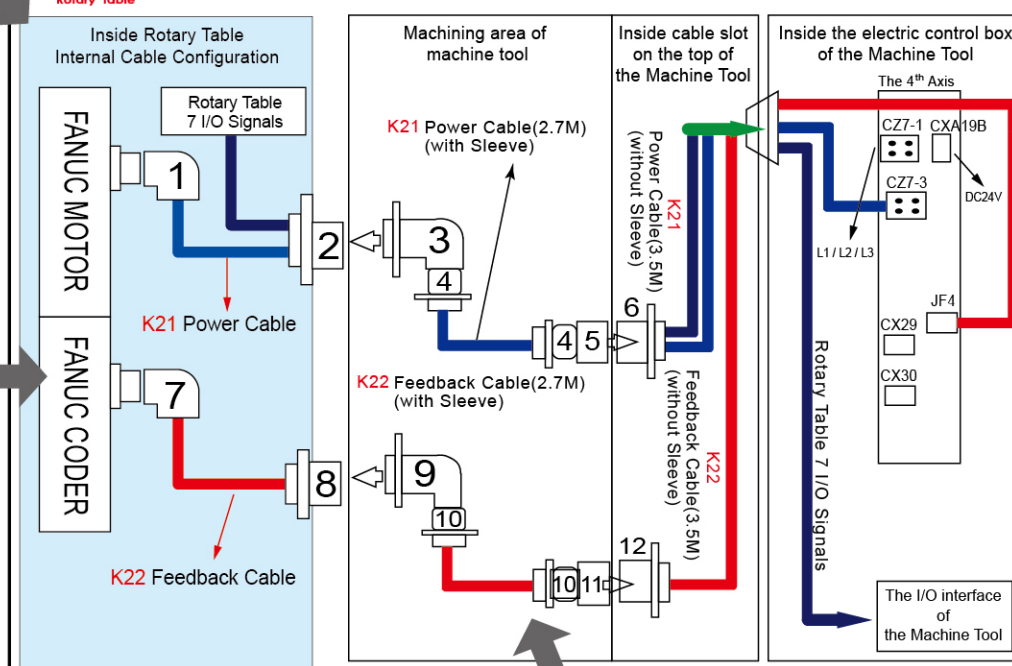
Timing for applications  
1. Use hydraulic brake rotary table + rotary tailstock  
2. Use hydraulic brake rotary table + rotary tailstock + hydraulic fixtures

**Internal Cable inside rotary table**

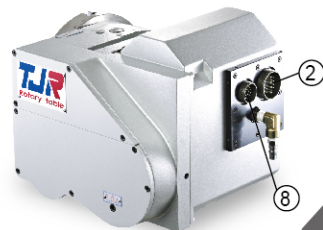


7 I/O signals

### TJR Power (& Signal) & Feedback Cable Diagram



**Cable assembly we provide (Standard)**



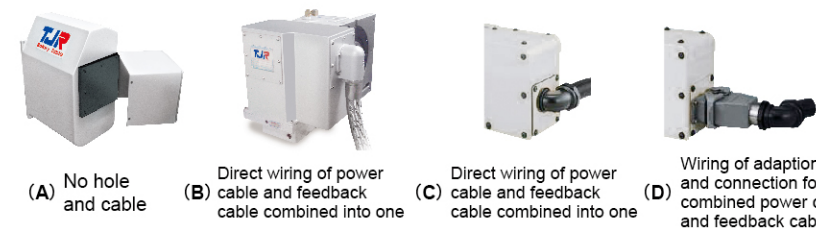
Separated wiring of adaption and connection for power cable and feedback cable respectively.

※ 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

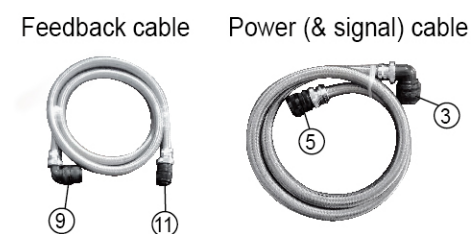
※ TJR can also provide ③ - ⑥ and ⑨ - ⑫ cables

**Cable assembly the customer provide (Optional)**



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.

**Cables located inside machining area of machine tool.**



Heidenhain model of angle encoder	Fargor model of angle encoder	Angle encoder accuracy	Take Heidenhain for example	
			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 don't need SMC-20			
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 don't need SMC-20			
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 don't need SMC-20			
RCN-8391F (FANUC)	H2-AF-29-D200i100-2	± 2"	Within 6"	-
RCN-8391M (MITSUBISHI)	H2-AM-29-D200i100-2			
RCN-8311 (SIEMENS)	H2-AS-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.

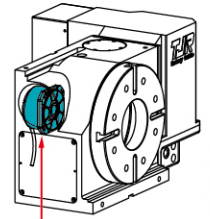


Diagram of angle encoder installation

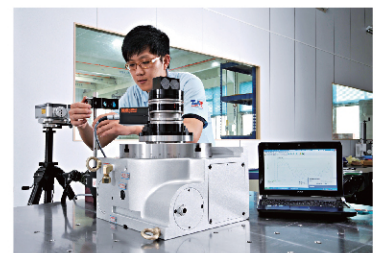


Angle encoder

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



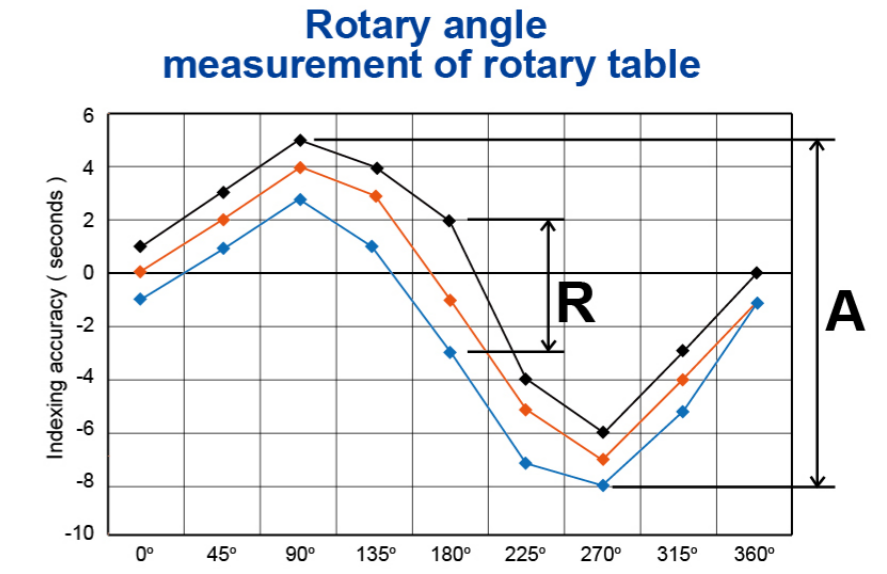
3D measuring equipment  
Geometry precision testing



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

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

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) Accumulative tolerance	Parallelism between rotary table and positioning block of bottom
	Total Length	Per 300mm	Total Length	Per 300mm	Total Length	Front	Total Length	Front	Total Length				
FAR-125	0.015	0.015	0.02	0.01	0.02	0.01	0.02	60"	40"	0.02			
FAR-170 / 210	0.015	0.015	0.02	0.01	0.02	0.01	0.02	60"	20"	0.02			
FHR-255	0.015	0.015	0.02	0.01	0.02	0.01	0.02	60"	15"	0.02			
FHR-320 / 400	0.015	0.015	0.02	0.01	0.02	0.01	0.02	60"	15"	0.02			
FHR-500	0.02	0.015	0.02	0.01	0.02	0.01	0.02	60"	15"	0.02			
FHR-630	0.02	0.015	0.02	0.01	0.02	0.01	0.02	60"	15"	0.02			
MTHR-255	0.02	0.02	0.02	0.01	0.02	0.01	0.02	-	15"	0.02			



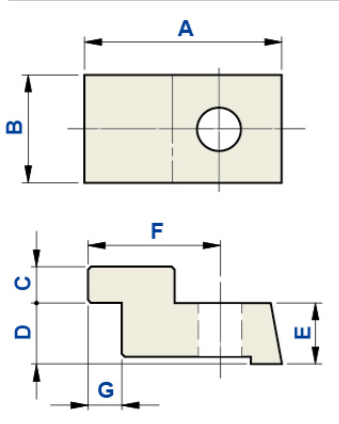
The measurement of ISO 230-2

- 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

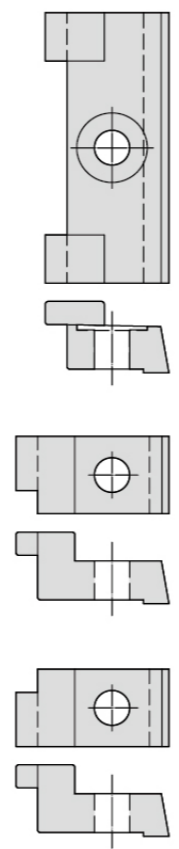
### Examples of special clamping device

Standard Clamping device



Model	Standard Clamping Device							
	A	B	C	D	E	F	G	H
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