



**TJR**<sup>®</sup>  
Rotary Table

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Rotary Table

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2023-03 The 12<sup>th</sup> version TJR Precision Technology Co., Ltd.  
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TJR APP



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**TJR**

Exquisite Products of Taiwan.  
Extreme Ingenuity



Driven by  
**Roller Gear Cam**



Driven by  
**Alloy Steel Worm Gear**



Driven by  
**D.D. Motor**



**TJR Precision Technology**  
[www.tjr.com.tw](http://www.tjr.com.tw) The 12<sup>th</sup> Edition

## No More wear and tear



Driven by  
**Roller Gear Cam**

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



Dual lead  
Alloy steel worm shaft

Driven by  
**Alloy Steel Worm Gear**



Bearing determines rigidity  
Radial & Axial bearing



Driven by  
**Direct Drive Motor**



**FANUC-made Torque Motor**  
Perfect Match with Fanuc Control

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

### 4 Transmission Mechanisms

**A**



Driven by **alloy steel** worm gear



Strength:

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

**B**



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



Strength:

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

**C-1**

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

**C-2**

Driven by direct drive motor  
(speed: 200 rpm)

**D**



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



Strength: **a mill / turn component**

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



Strength:

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

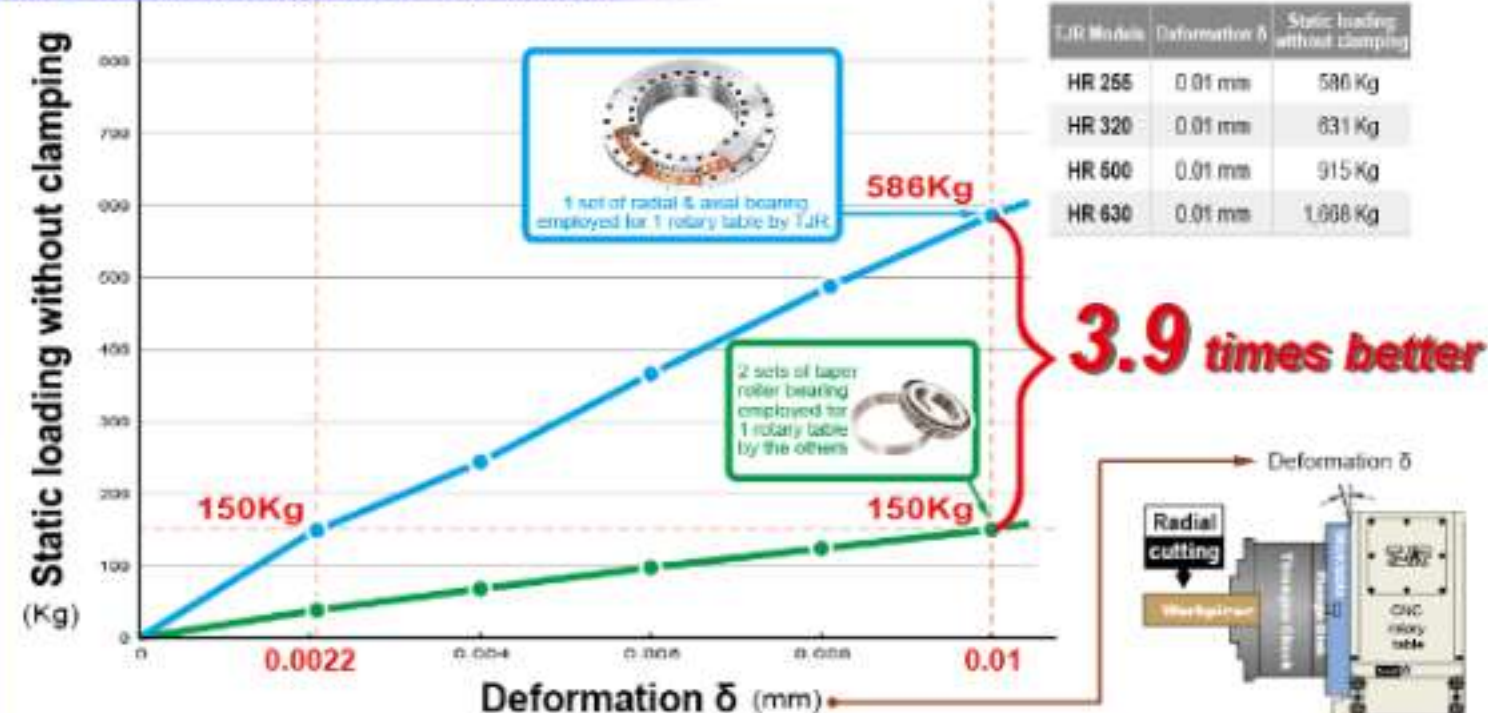


Strength:

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

## Rigidity comparison between radial & axial bearing and taper roller bearing

Take Ø255mm Rotary Table as an example



Large diameter

Devised by German

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

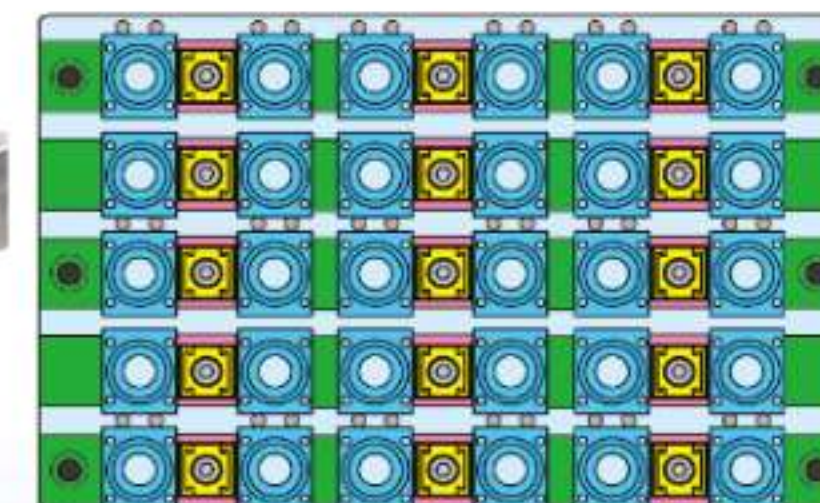


TYPE-A

TYPE-B

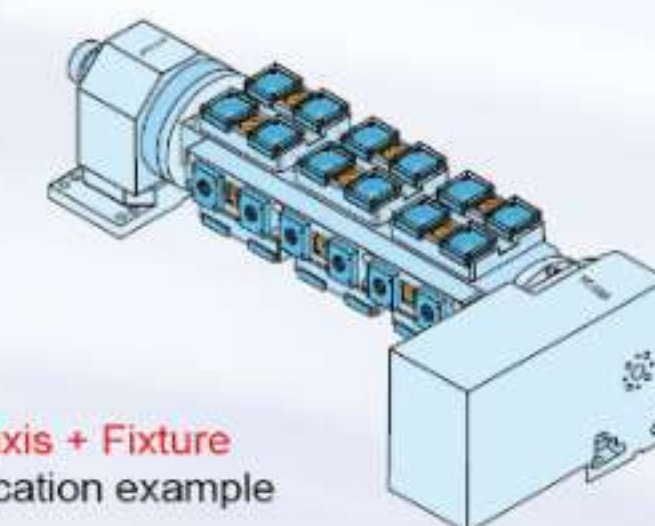
TYPE-C

## Little King Kong Vise

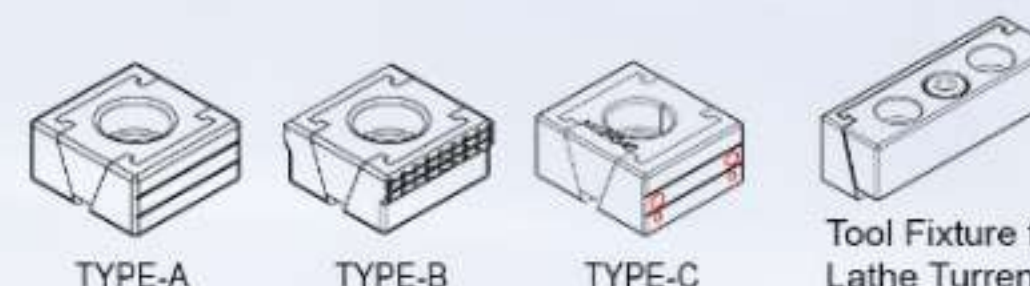


► Little King Kong Vise  
An example of fixing round work-piece.

- 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



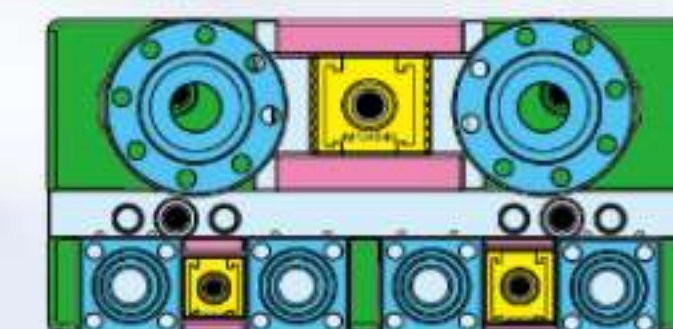
TYPE-A

TYPE-B

TYPE-C



Tool Fixture for Lathe Turret



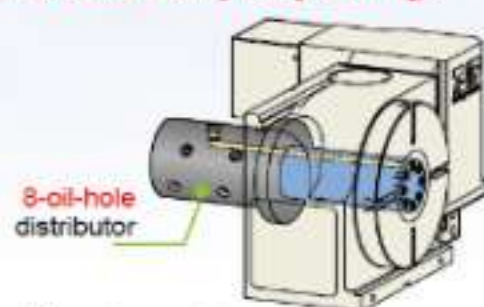
► Zero point clamping system is available.  
High-precision exchange of clamping devices, fixtures and work-pieces within seconds.



Japan-made high-tensile-brass worm gear

Wear life is 2.6 times longer than aluminum bronze PBC3.

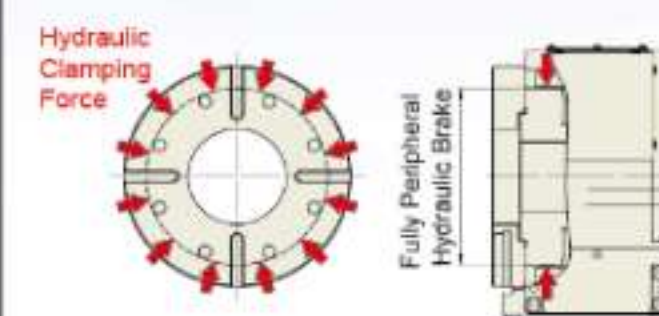
can sustain outer circle periphery of table, and accordingly deliver high rigidity and optimize axial heavy-duty cutting.



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

| TJR                                                                                        | Others                                                                                                    |
|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <b>Drum brake</b>                                                                          | <b>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

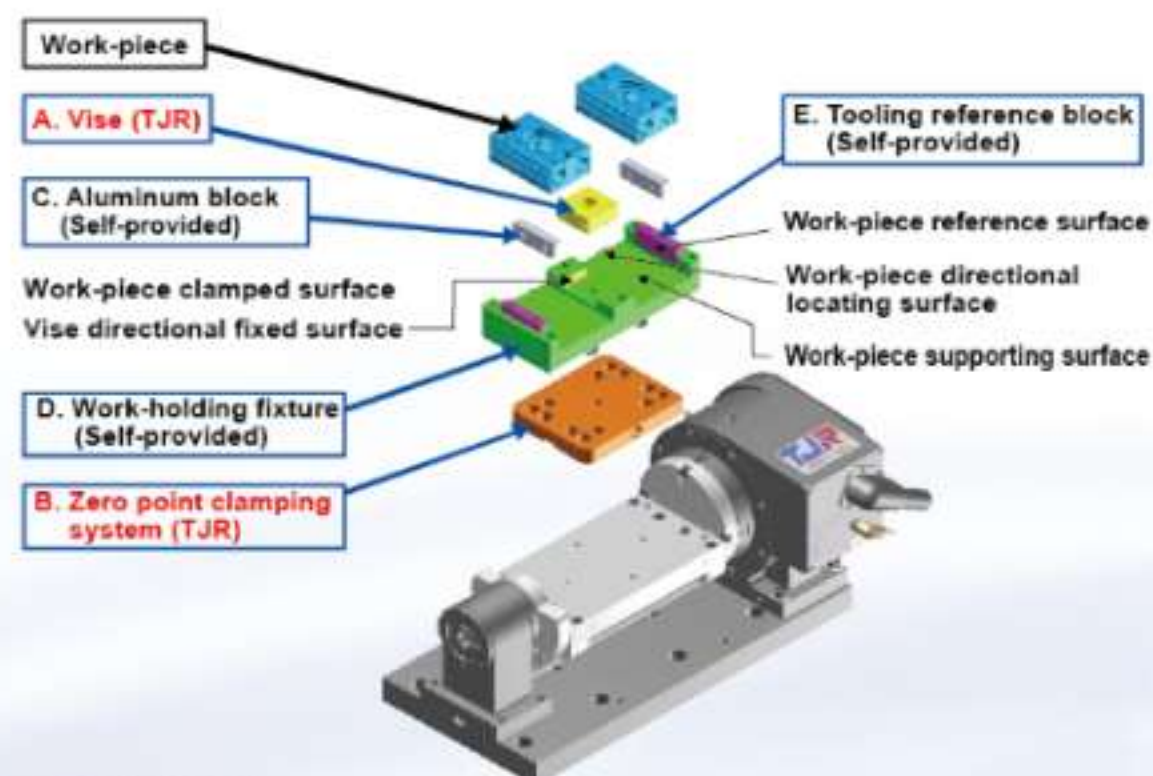
Example of High-Tensile-Brass worm gear model name

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

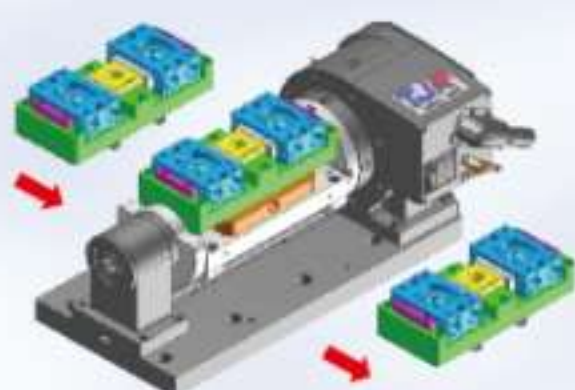
| Vise specification | Model   | Vise dimension |       |      |        |        | Suitable Screw | Clamping Force (KN) | Surface Hardness (HRC) |
|--------------------|---------|----------------|-------|------|--------|--------|----------------|---------------------|------------------------|
|     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

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

Make your own work-holding fixture by easily employing **TJR Vise** and **TJR zero point clamping system** on the fixture plate of 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.



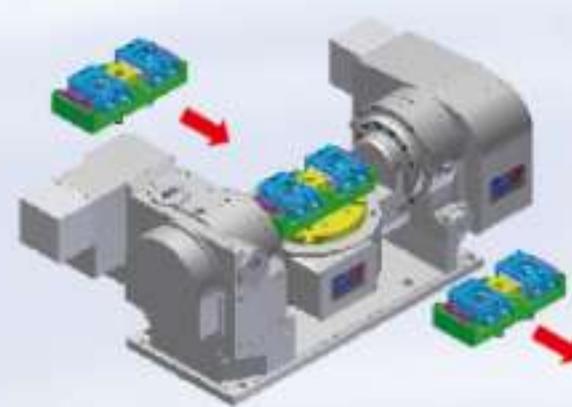
Work-holding fixture can be changed quickly and accurately (across all machines).



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



The zero point clamping system on the connection plate

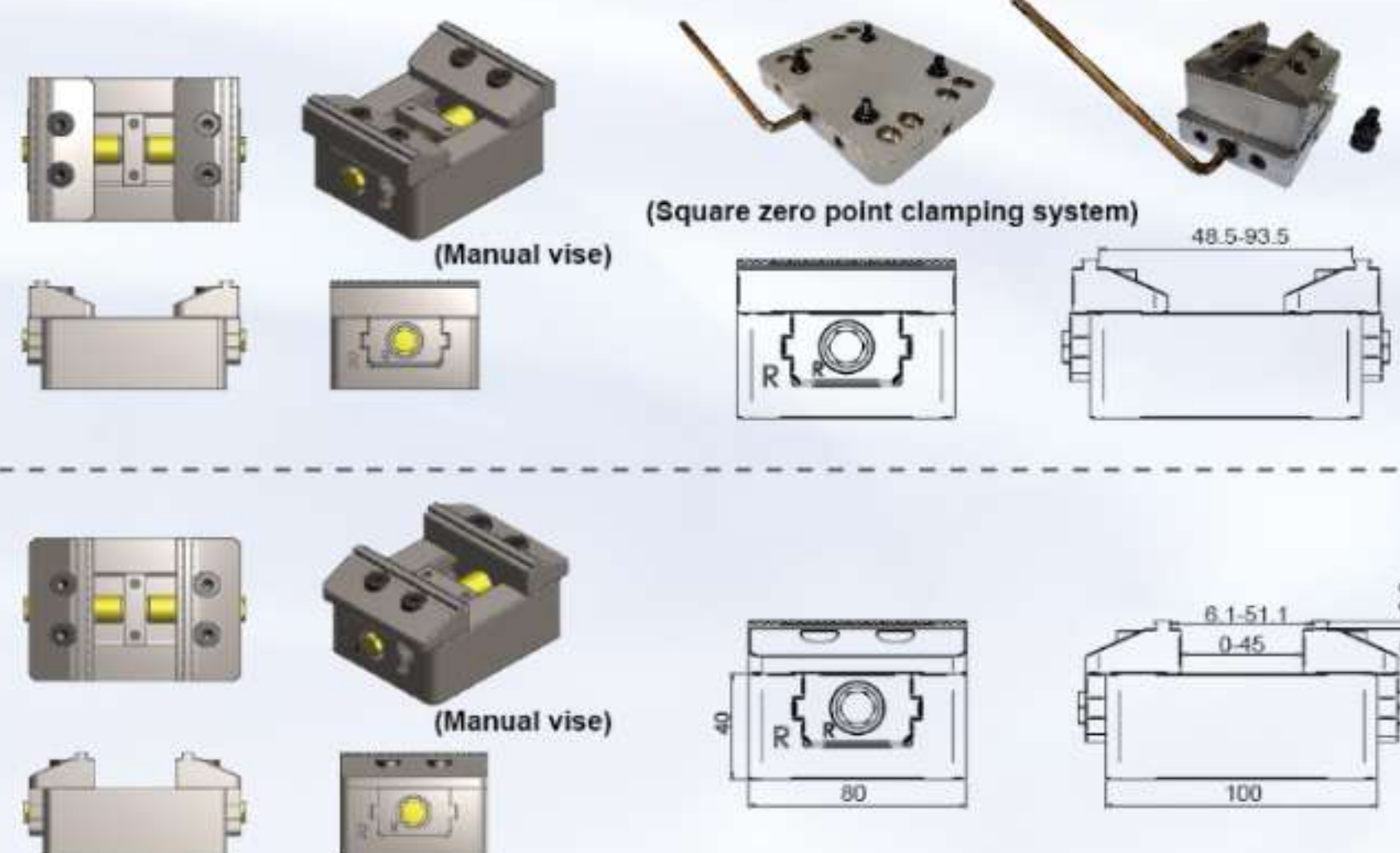
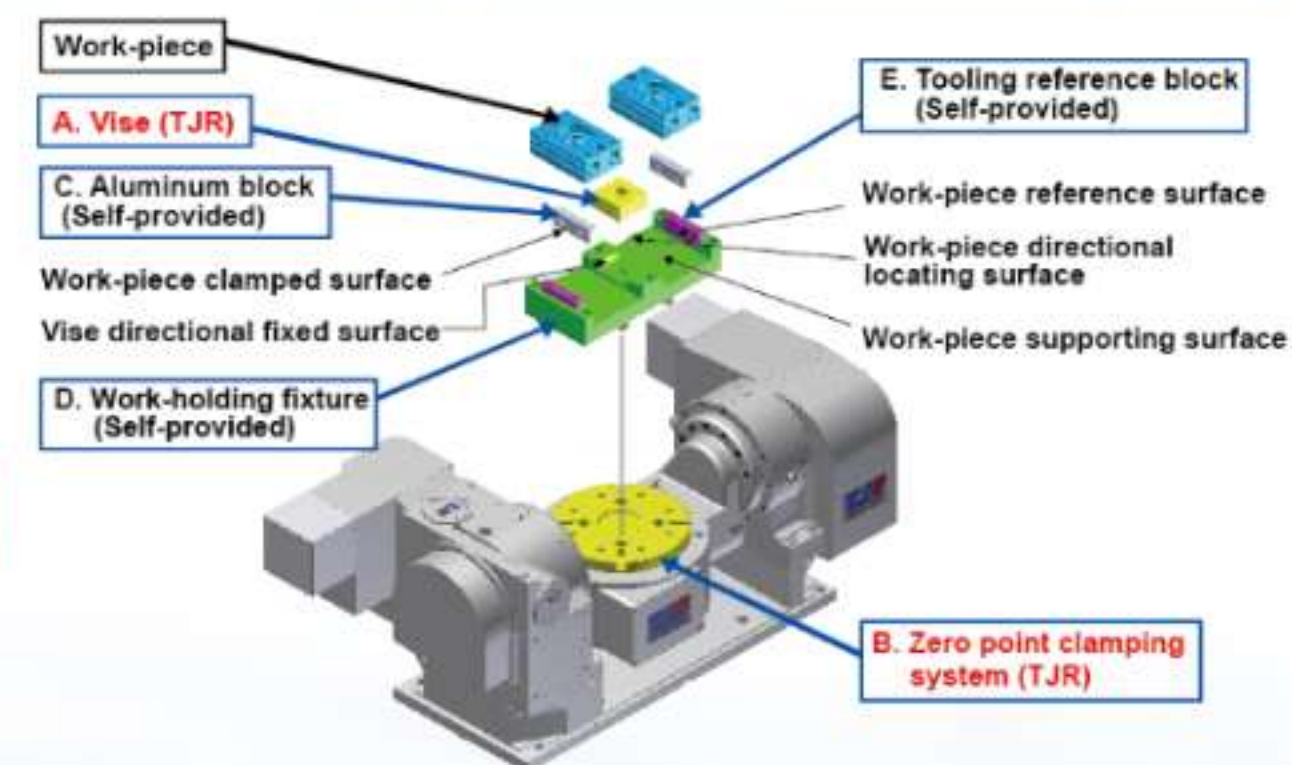


The illustration of the application for the zero point clamping system on the faceplate of the 4<sup>th</sup> & 5<sup>th</sup> axes

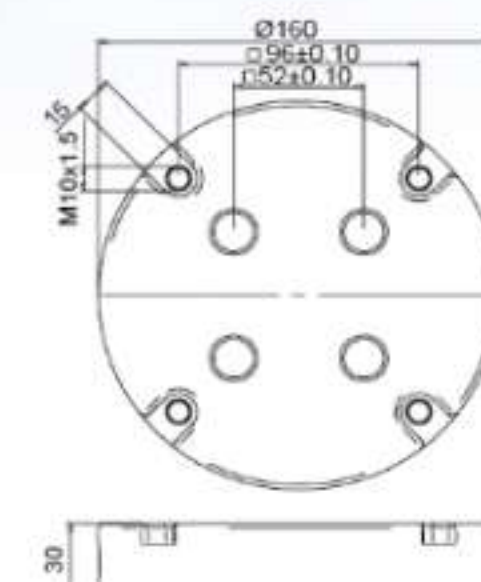
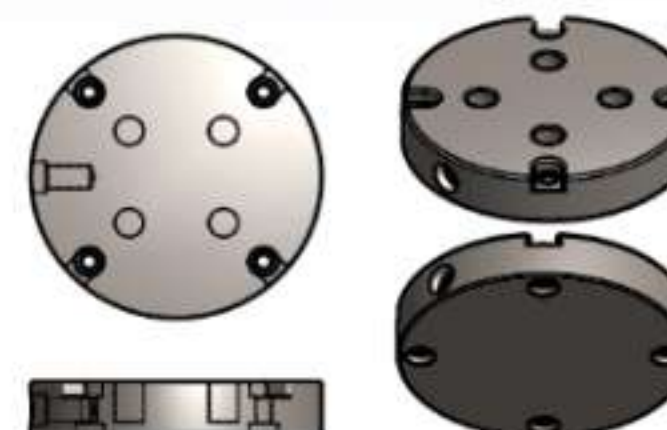


A built-in zero point clamping system on the faceplate of tilting rotary table.

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><br>Min indexing angle – 0.001°<br><b>Driven by worm &amp; worm gear</b>         |  AR series: Pneumatic brake( right side motor )<br>AR-125R 、AR-170R<br>AR-210R 、AR-250R 、AR-255H                                        | 11~12          |
|                                                                                                          |  AR series: Pneumatic brake( left side motor )<br>AR-125L 、AR-170L<br>AR-210L 、AR-250L                                                  | 13~14          |
|                                                                                                          |  AR series: Pneumatic brake( back side motor )<br>AR-125B 、AR-170B<br>AR-210B 、AR-250B                                                  | 15~16          |
|                                                                                                          |  HR series: Hydraulic brake<br>HR-255 、HR-320 、HR-400 、AR-210H<br>HR-500 、HR-630 、HR-800<br>HR-320B 、HR-320B-2W 、HR-400B                | 17~19<br>21~22 |
| <b>Manual Tilting Rotary Tables (CNC Rotary axis)</b>                                                    | MTHR series: Maual Tilt axis<br>CNC Rotary axis<br>MTHR-255                                                                                                                                                              | 20             |
| <b>CNC Multi spindle Rotary Tables</b><br>Min indexing angle – 0.001°                                    | AR multi spindle series:Pneumatic brake<br>(2W : 2-wheel coupled) AR-125-2W/170-2W/210-2W<br>(3W : 3-wheel coupled) AR-125-3W/170-3W/210-3W<br>(4W : 4-wheel coupled) AR-125-4W                                          | 23~24          |
| <b>CNC Index Tables</b><br>Min. indexing angle – 1° or 5°                                                | HI series: Hirth coupling hydraulic brake<br>Fixed angle (1° or 5°)<br>HI-255 、HI-320 、HI-400 、HI-500                                                                                                                    | 25~26          |
| <b>CNC Indexing tables (Horizontal only)</b><br>Min indexing angle - 1° or 5°                            | HHI series: Hirth coupling hydraulic brake(1° or 5°)<br>HHI-320/400/500/630/800/1000<br>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<br>Fixed angle / Equal-parts<br>HC-255A 、HC-320A 、HHC-500<br>(Index numbers: 2, 4, 6, 12, 24 indexes)                                                                          | 29             |
| <b>Flat type APC for 3-axis-moving-column vertical machining center</b>                                  | CHC series: Flat type auto pallet changer<br>(180° to and fro)<br>CHC-700 x 910 、CHC-700 x 1090                                                                                                                          | 30             |
| <b>CNC Tilting Rotary Tables</b><br>Min. indexing angle –0.001°<br><b>Driven by worm &amp; worm gear</b> |  FAR series: Pneumatic brake<br>FAR-125/125B 、FAR-170/170A/170B                                                                       | 31~32          |
|                                                                                                          |  FAR series: Pneumatic brake<br>FAR-210/210B                                                                                          | 33~34          |
|                                                                                                          |  FHR series:Hydraulic brake<br>FHR-255C/255CL 、FHR-320/320C<br>FHR-400CF/400C-540-HR400B<br>FHR-401C-700(800)-HR400B<br>FHR-500C/650C | 35~40          |
|                                                                                                          |  FAR series: Pneumatic brake FAR-100SN/FAR-160SN<br>FHR series: Hydraulic brake<br>FHR-400S<br>FHR-650S-525/650S-550                  | 40<br>41~42    |
| <b>Roller Gear Cam Hook type APC for vertical machining center</b>                                       | CURC series: Hook type auto pallet changer<br>(180° to and fro)<br>CURC-500x700                                                                                                                                          | 43             |

| Description                                                                                                    | Model code                                                                                                                                                                                                                                                                                            | Page           |
|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Hook type APC for vertical machining center</b>                                                             |  CTU series: Hook type auto pallet changer<br>(180° to and fro)<br>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°)<br>CHR series: Hydraulic brake CHR-400/500/630L (0.001°)<br>CTH series: Tray type auto pallet changer<br>CTH-400/500/630 (180° to and fro) | 45~50          |
| <b>CNC Rotary Tables</b><br>Min indexing angle – 0.001°<br><b>Driven by Roller Gear Cam</b>                    |  RC series : Pneumatic brake/Hydraulic brake<br>RC-170R/210R/255R(N)<br>RC-320R(N)/320L                                                                                                                            | 51~52          |
|                                                                                                                |  FAR series : Pneumatic brake/Hydraulic brake<br>FAR-160SN-RC255 、FAR-160-RC255 、<br>FAR-170A-RC210 、FAR-170-RC210 、FAR-210-RC210<br>FAR-170-2W-RC255 、FAR-210-2W-RC255                                            | 53~54<br>57~58 |
|                                                                                                                |  FHR series : Hydraulic brake<br>FHR-255C-RC255 、FHR-255CL-RC255<br>FHR-320-RC320 、FHR-320C-RC320<br>FRC series : Hydraulic brake<br>FRC-320CF-RC320 、FRC-255CL-RC320                                              | 55~56          |
|                                                                                                                |  FHR series : Hydraulic brake FHR-400CF-RC400F<br>FHR-350F-2W-RC320-2A<br>HRC/HHRs series : Hydraulic brake<br>HRC-400SP                                                                                          | 57~58          |
| <b>CNC Rotary Tables</b><br>Min indexing angle – 0.001°<br><b>Driven by Direct Drive Motor</b>                 |  AD series :<br>Pneumatic brake<br>AD-170 、AD-210 、AD-260iB<br>AD-250HS                                                                                                                                          | 59~60<br>63~64 |
|                                                                                                                |  HAD series :<br>Pneumatic brake<br>HAD170/210F/250F                                                                                                                                                             | 59~60          |
|                                                                                                                |  FAD series :<br>Pneumatic brake<br>FAD-170F-RC210<br>FAD-210F-RC210<br>FAD-300F-HS/400HS-AD500i-420<br>FAD-500FHS-AD500i-480                                                                                    | 61~62<br>63~64 |
|                                                                                                                |  FHD series : Hydraulic brake / Two D.D. Motors FHD-650-iD650<br>iHHD series : Hydraulic Brake iHHD-650                                                                                                          | 61~62          |
| <b>Support table</b>                                                                                           |  RTA series:Pneumatic brake RTA-125/170/210<br>RTH series:Hydraulic brake RTH-255/320/400A<br>RT series: Support table without brake RT-135 / RT-170F                                                            | 65<br>60/66    |
| <b>Manual tailstock</b>                                                                                        |  TJ series: Fixed Taper TJ-125~400<br>TTJ series: Replaceable Taper TTJ-125~400                                                                                                                                  | 66             |
| <b>Manual tailstock with Pneumatic / Hydraulic Switching valve</b>                                             |  ATJ / ATTJ series: With pneumatic switching valve<br>HTJ / HTTJ series: With hydraulic switching valve                                                                                                          |                |
| <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

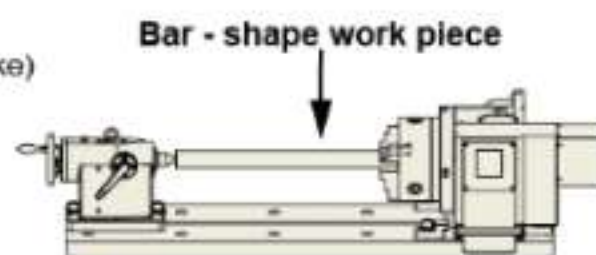
A : the distance between central groove of the worktable and the sheet metal of the machine's slide door [Ex: assuming 450mm remains]

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]

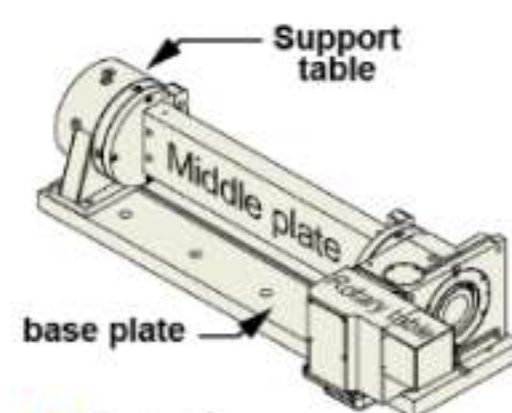
If the "B" distance is less than the "A" distance, it is certain that the rotary table will not collide with the sheet metal of the slide door. [Ex: 420mm < 450mm; thus it's ok to select HR255-R] If not, please change to sheet metal cover reduction version of TJR rotary table. [Ex: only 346mm in HR255-N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

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

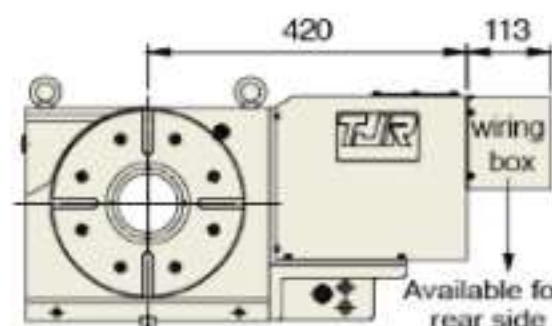
Please measure the length of working table of the machine to verify that it is not 200 mm smaller than base plate. It is the **maximal allowed protrusion** for the base plate of all models to stand out by 100mm on each side of the working table. For example: Assuming the length of working table of the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



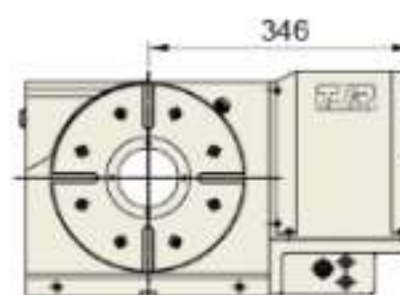
▲ Drawing ①



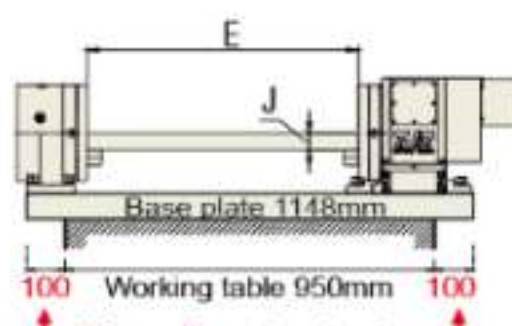
▲ Drawing ②



▲ Drawing ③ : HR-255R



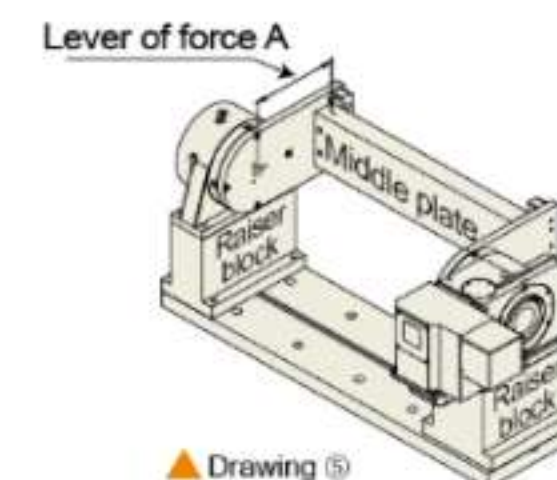
▲ Drawing ③-1 : HR-255N



▲ 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.



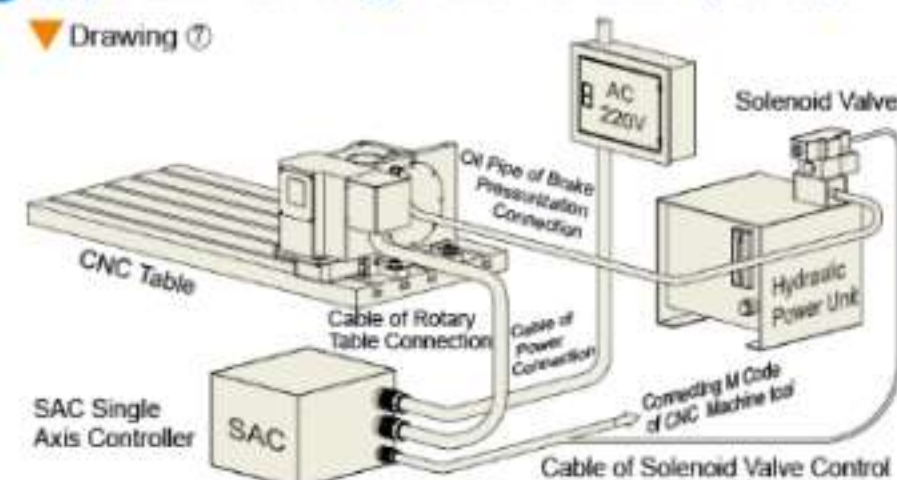
▲ Drawing ⑤

### 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)

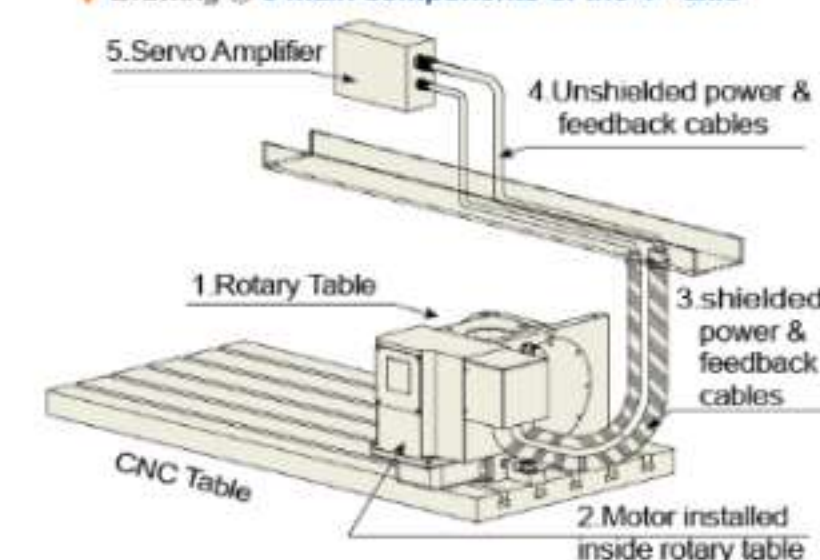
- (A) If the machine comes with those reserved interfaces for the fourth axis, there is no problem at all to retrofit the fourth axis of the same system for **four-axes simultaneous contouring**.  
(B) If the machine does not come with those reserved interfaces for the fourth axis, the **single-axis 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 ) :



★ 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.

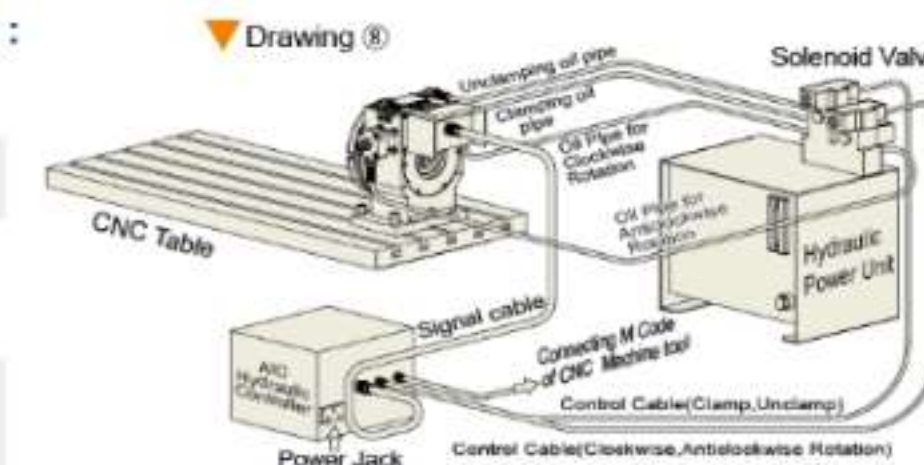
### ⑥ 5 main components of the 4<sup>th</sup> axis



### 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.                                                                                 |



## 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)

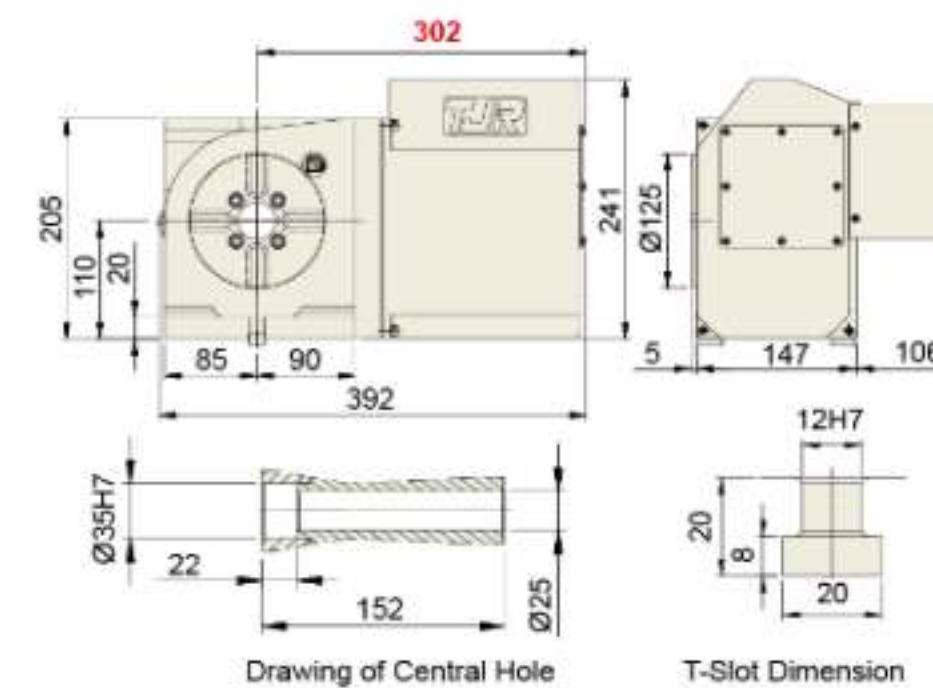
Hydraulic AR(s)-170HR/210HR/250HR are alternatives.

| 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<br>(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            | ais4 / Bis4                                | aiF4 / aiF8 / Bis8 | aiF4 / aiF8 / Bis8      | aiF8 / Bis8     |
|                                                            | 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

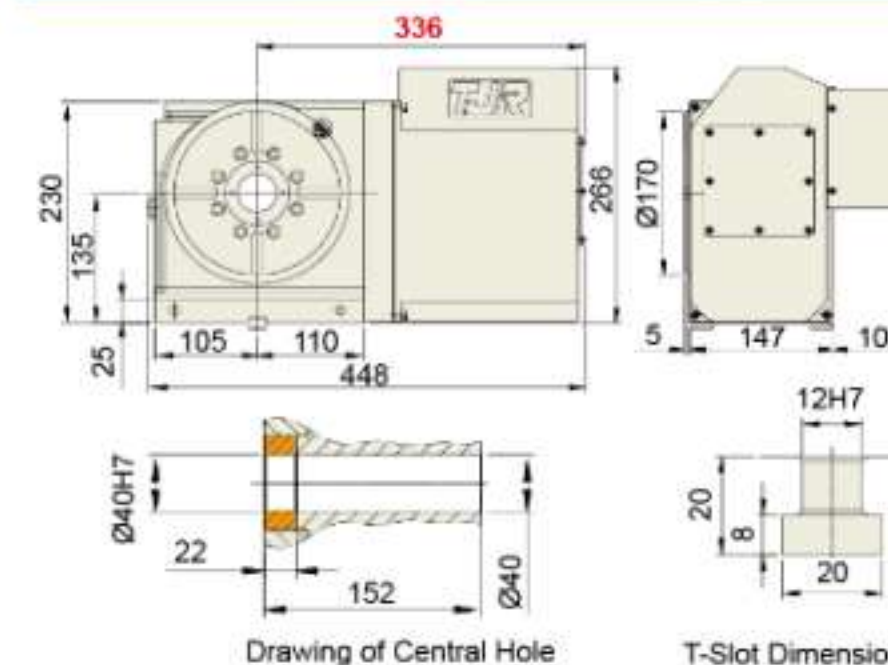
### AR(s)-125R



## NEW Powerful Brake System

### AR(s)-170R

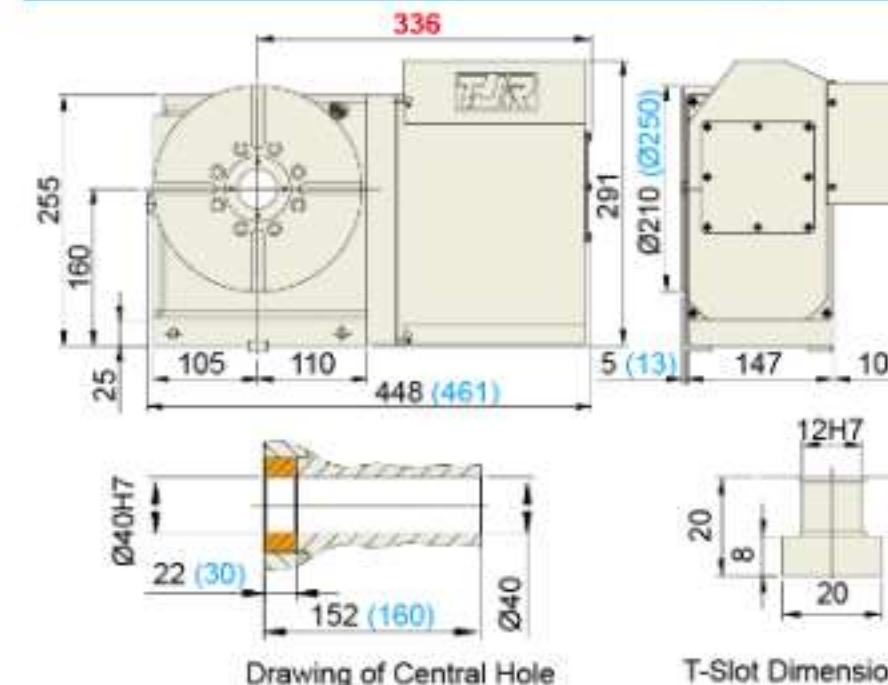
AR(s)-170HR  
(Hydraulic Brake)



## 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

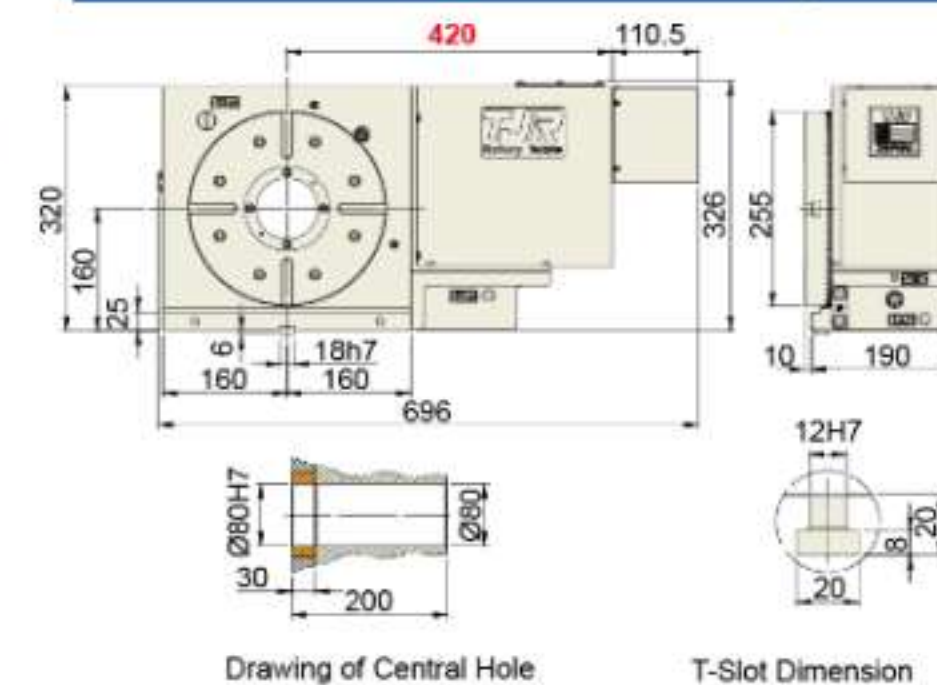
Alloy steel worm gear

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



Use radial & axial bearings



Alloy steel worm gear (Optional)



AR(s)-210L ▲



AR(s)-250L ▲

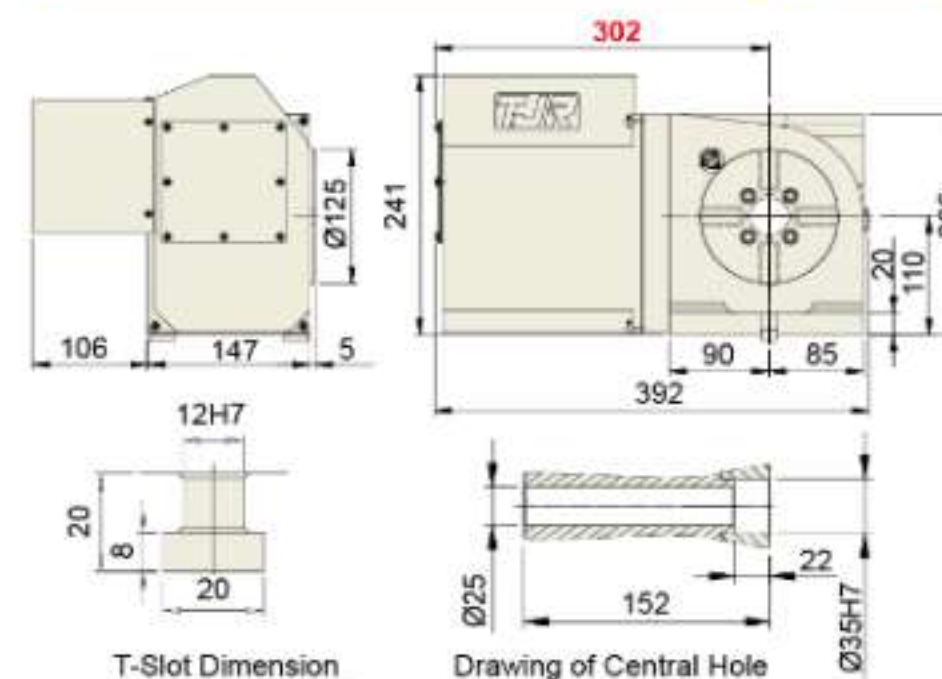
Hydraulic AR(s)-170HL/210HL/250HL are alternatives.

| Item / Model                                               | Unit                   | AR(s)-125L                                 | AR(s)-170L     | AR(s)-210L         | AR(s)-250L         |
|------------------------------------------------------------|------------------------|--------------------------------------------|----------------|--------------------|--------------------|
| Table Diameter                                             | mm                     | Ø 125                                      | Ø 170          | Ø 210              | Ø 250              |
| Inner Diameter of Mandrel Sleeve                           | mm                     | Ø 35H7<br>(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                                | ais4 / Bis4    | aiF4 / aiF8 / Bis8 | aiF4 / aiF8 / Bis8 |
|                                                            | MITSUBISHI             | Taper / Straight shaft                     | HG/HF-75 / 105 | HG/HF-54 / 104     | HG/HF-54 / 104     |
| Speed Reduction Ratio                                      | -                      | 1 : 60                                     | 1 : 90         | 1 : 90             | 1 : 90             |
| Max. Rotation Rate of Table (Calculate with Fanuc a 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                 |
|                                                            | with Support Table     | kg                                         | 100            | 150                | 150                |
|                                                            | Horizontal             | kg                                         | 100            | 150                | 150                |
| Allowable Thrust Load (with Rotary Table Clamping)         | F                      | kgf                                        | 1000           | 1450               | 1450               |
|                                                            | FxL                    | kgf·m                                      | 45             | 110                | 110                |
|                                                            | FxL                    | kgf·m                                      | 13             | 31                 | 31                 |
| Driving Torque                                             | kgf·m                  | 9 *(3.7)                                   | 29 *(14.6)     | 29 *(14.6)         | 29 *(14.6)         |
| Net Weight (servo motor excluded)                          | kg                     | 34                                         | 50             | 55                 | 58                 |

\*( ) Alloy Steel worm & gear series

NEW Powerful Brake System

### AR(s)-125L



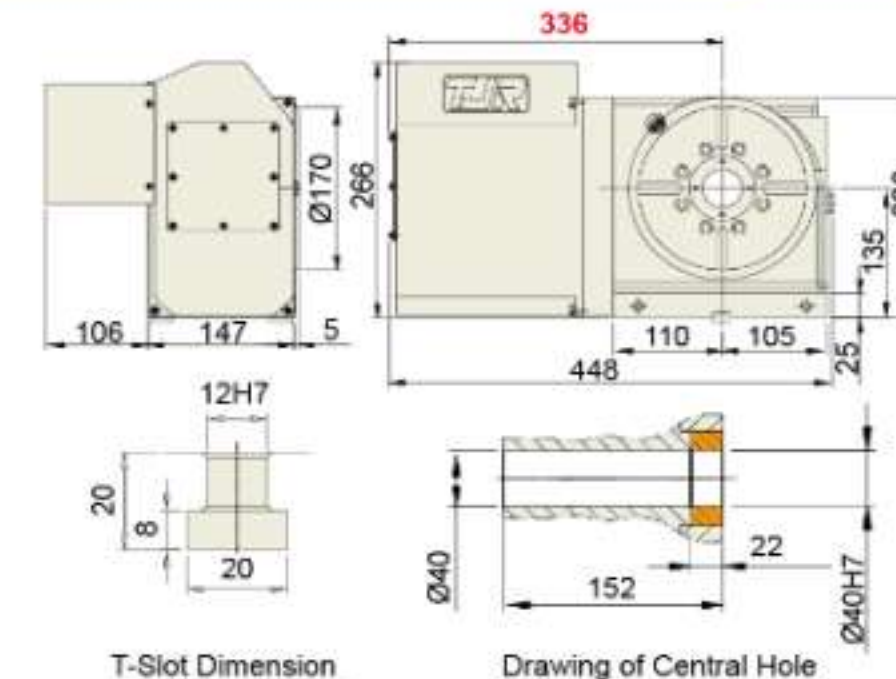
T-Slot Dimension

Drawing of Central Hole

NEW Powerful Brake System

### AR(s)-170L

AR(s)-170HL  
(Hydraulic Brake)



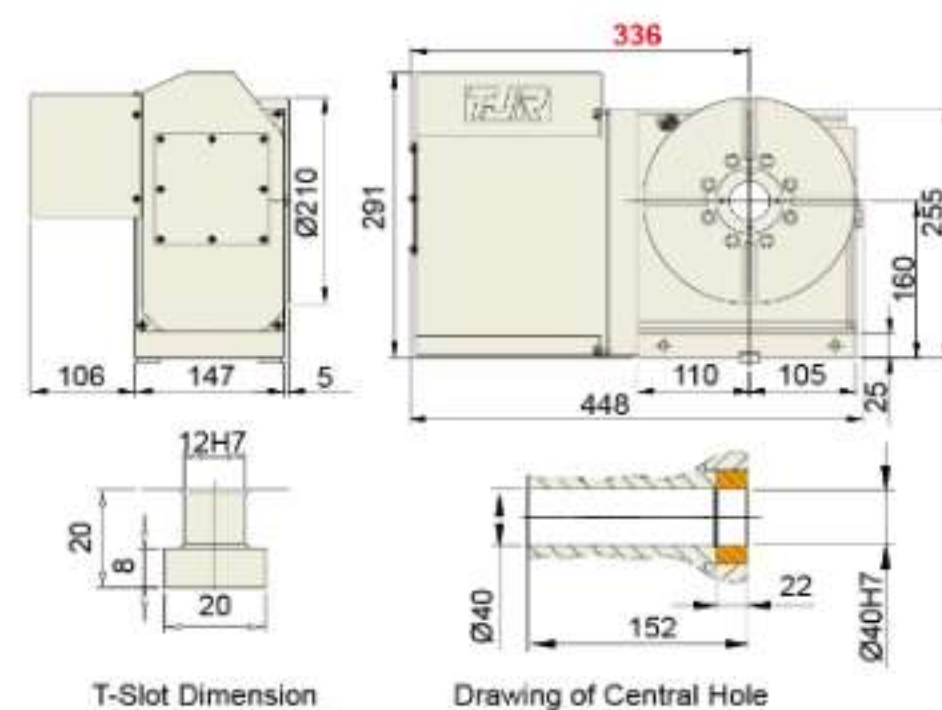
T-Slot Dimension

Drawing of Central Hole

NEW Powerful Brake System

### AR(s)-210L

AR(s)-210HL  
(Hydraulic Brake)



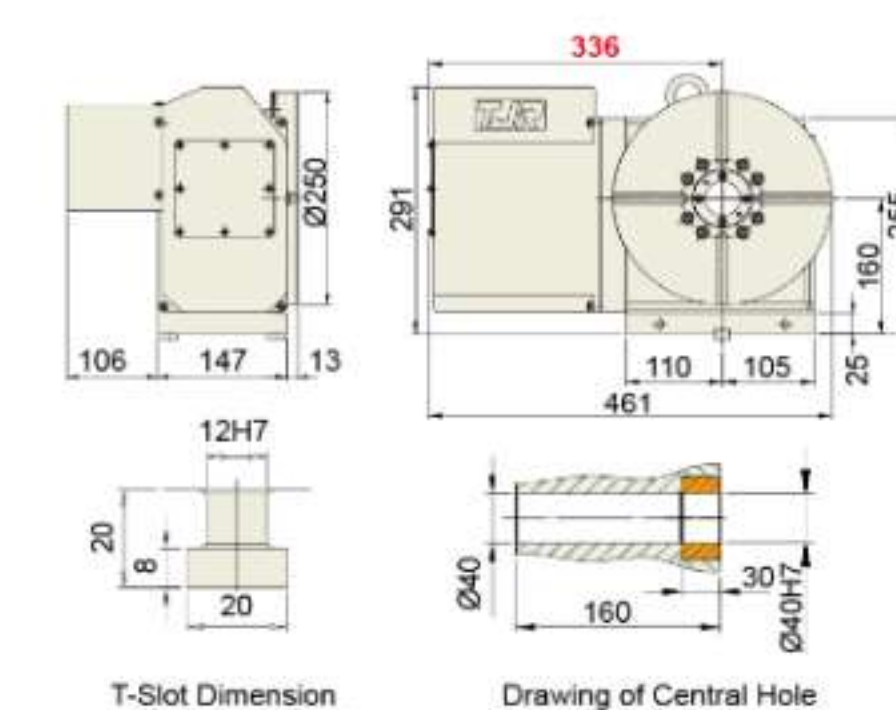
T-Slot Dimension

Drawing of Central Hole

NEW Powerful Brake System

### AR(s)-250L

AR(s)-250HL  
(Hydraulic Brake)



T-Slot Dimension

Drawing of Central Hole

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



Air pressure required



Solenoid valve (inside of rotary table)

scenario 1



Solenoid valve (inside of rotary table)

scenario 2



Simultaneously brake for rotary table and tailstock

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

CNC Rotary Tables  
(Min indexing angle – 0.001°)

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



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

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

For tapping center  
(short Y axis travel)

FEATURE

Use radial & axial bearings

Alloy steel worm gear (Optional)

Picture of Power  
and Feedback  
Cable Connectors

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

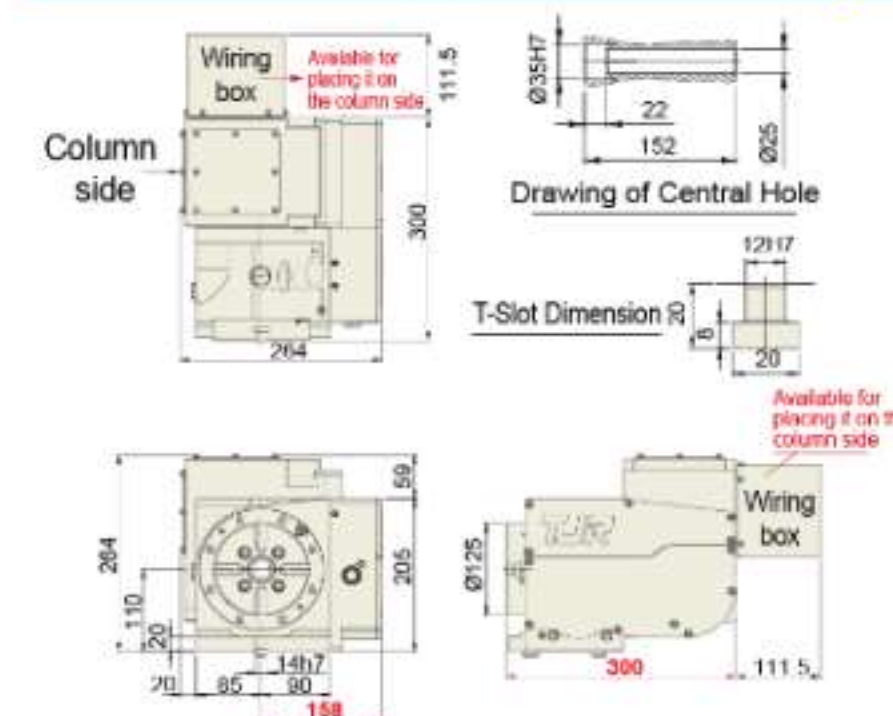
Hydraulic AR(s)-170HB/210HB/250HB are alternatives.

| Item / Model                                               | Unit                   | AR(s)-125B                                 | AR(s)-170B     | AR(s)-210B         | AR(s)-250B         |
|------------------------------------------------------------|------------------------|--------------------------------------------|----------------|--------------------|--------------------|
| Table Diameter                                             | mm                     | Ø 125                                      | Ø 170          | Ø 210              | Ø 250              |
| Inner Diameter of Mandrel Sleeve                           | mm                     | Ø 35H7<br>(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                                | ais4 / ßis4    | aiF4 / aiF8 / ßis8 | aiF4 / aiF8 / ßis8 |
|                                                            | MITSUBISHI             | Taper / Straight shaft                     | HG/HF-75 / 105 | HG/HF-54 / 104     | HG/HF-54 / 104     |
| Speed Reduction Ratio                                      | -                      | 1 : 60                                     | 1 : 90         | 1 : 90             | 1 : 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                 |
|                                                            | with Support Table     | kg                                         | 100            | 150                | 150                |
|                                                            | Horizontal             | kg                                         | -              | -                  | -                  |
| Allowable Thrust Load (with Rotary Table Clamping)         | F                      | kgf                                        | 1000           | 1450               | 1450               |
|                                                            | FxL                    | kgf-m                                      | 45             | 110                | 110                |
|                                                            | FxL                    | kgf-m                                      | 13             | 31                 | 31                 |
| Driving Torque                                             | kgf-m                  | 9 *(3.7)                                   | 18 *(14.6)     | 18 *(14.6)         | 18 *(14.6)         |
| Net Weight (servo motor excluded)                          | kg                     | -                                          | 60             | 65                 | 72                 |

\*( ) Alloy Steel worm & gear series

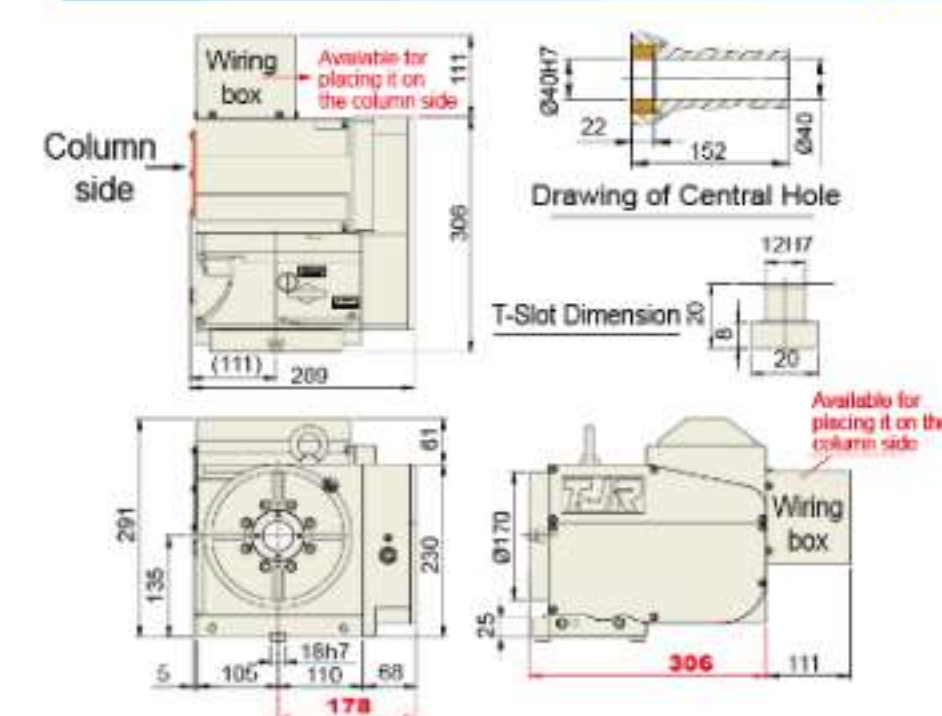
NEW Powerful Brake System

AR(s)-125B



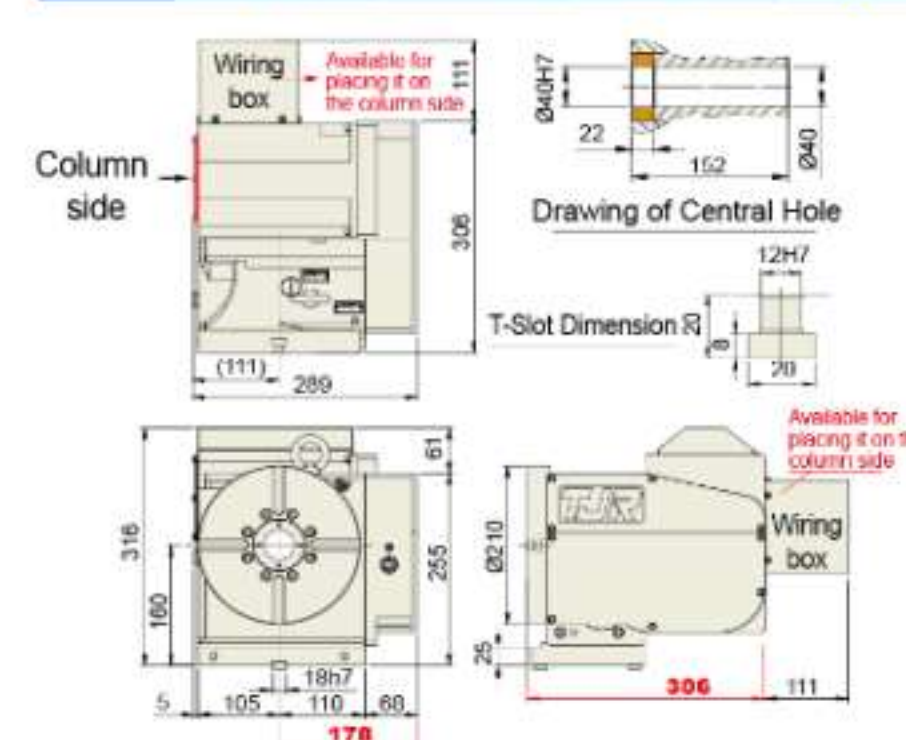
NEW Powerful Brake System

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



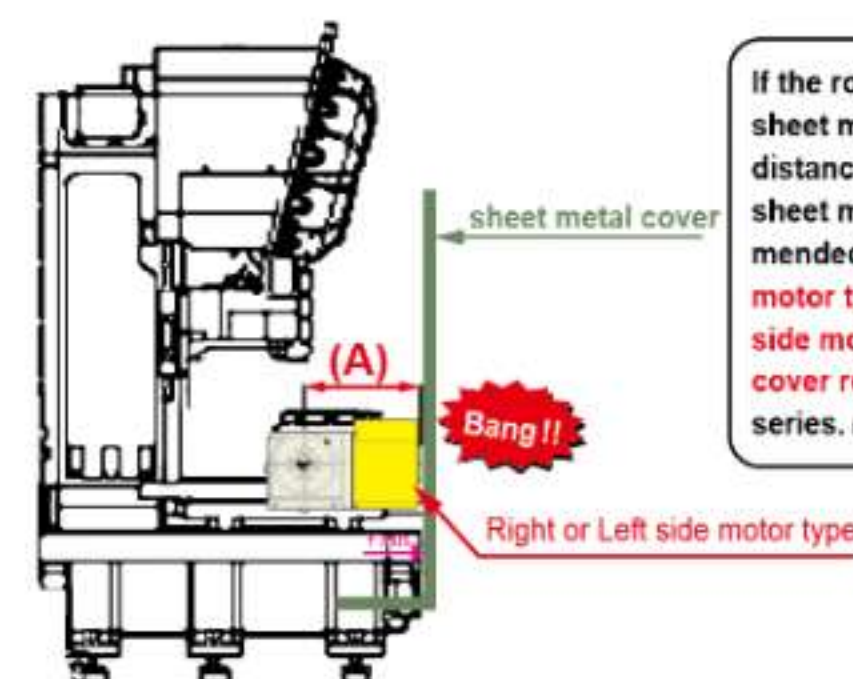
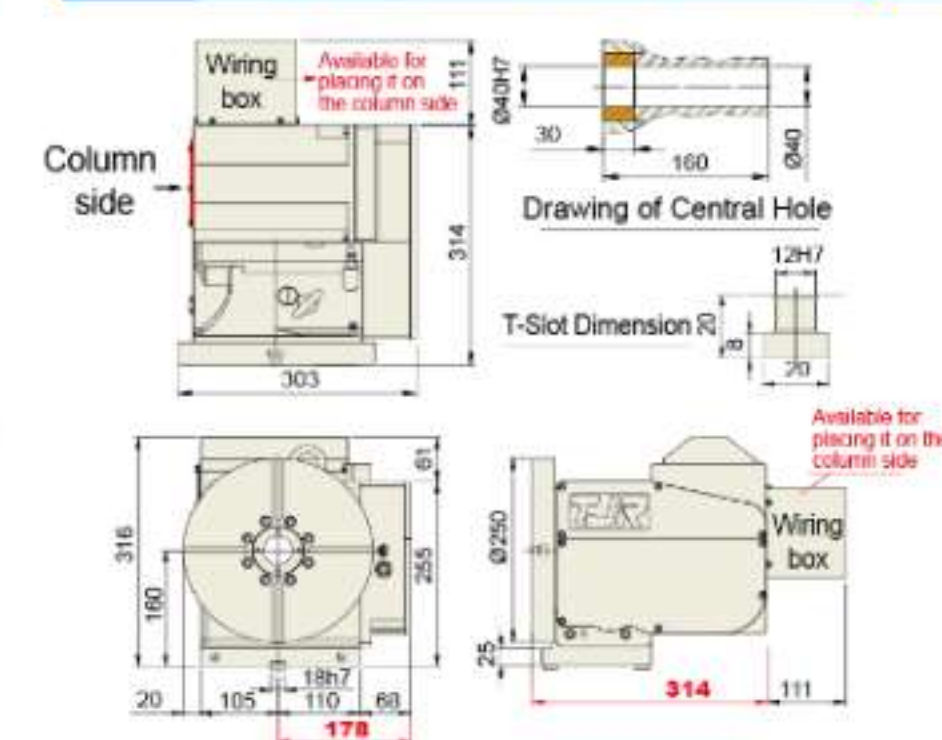
NEW Powerful Brake System

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

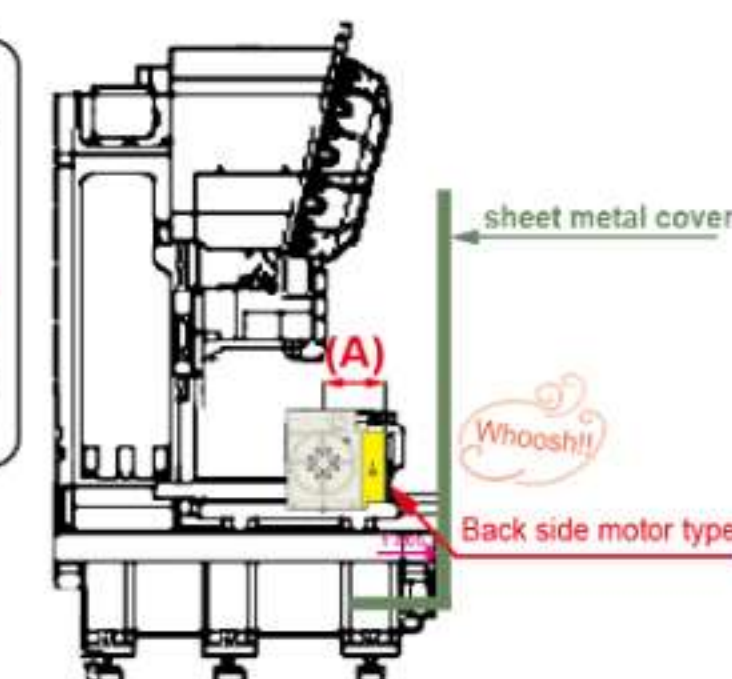


NEW Powerful Brake System

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 Dis. to the right)



CNC Rotary Tables  
(Min indexing angle – 0.001°)

## HR Series (Hydraulic Brake)

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



**3**  
FEATURES



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

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

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

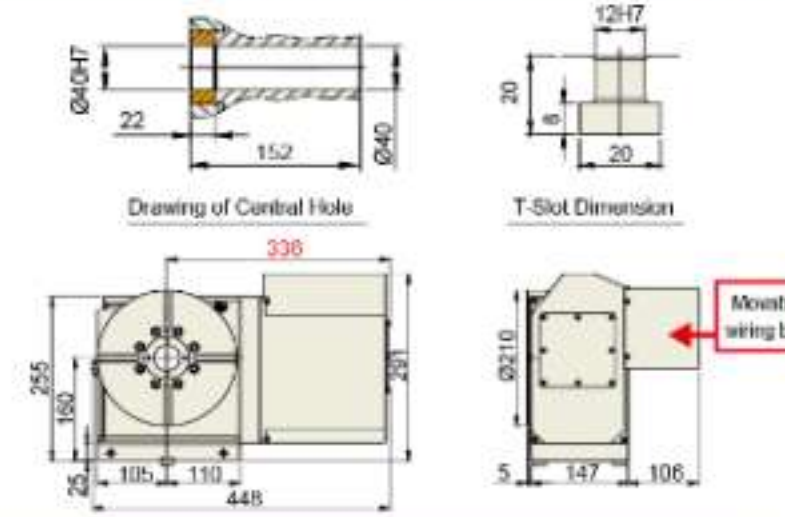
HR-320N  
(Reduced Sheet  
Metal Cover for  
Vertical Application)

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

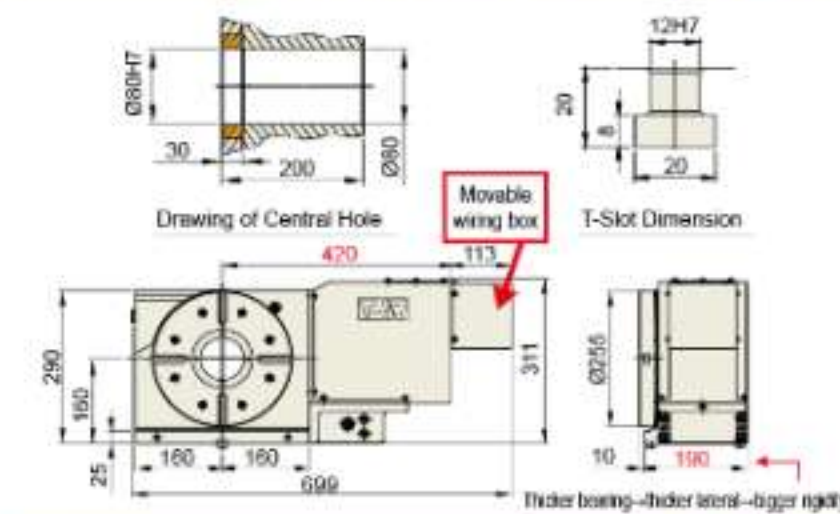
| Item / Model                                               |                    | Unit                   | AR(s)-210H                  | HR(s)-255              | HR-320                      | HR- 400                     |
|------------------------------------------------------------|--------------------|------------------------|-----------------------------|------------------------|-----------------------------|-----------------------------|
| Table Diameter                                             |                    | mm                     | Ø 210                       | Ø 255                  | Ø 320                       | Ø 400                       |
| Inner Diameter of Mandrel Sleeve                           |                    | mm                     | Ø 40H7                      | Ø 80H7                 | Ø 120H7                     | Ø 120H7                     |
| Diameter of Center Through Hole                            |                    | mm                     | Ø 40                        | Ø 80 Big Bore          | Ø 120 Big Bore              | Ø120 or Ø150                |
| 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              | -                      | αiF4/αiF8/βis8[Taper shaft] | αiF8/βis8[Taper shaft] | αiF12/βis22[Straight shaft] | αiF12/βis22[Straight shaft] |
|                                                            | MITSUBISHI         | Taper / Straight shaft | HG/HF-54/104                | HG/HF-104/154          | HG/HF-204                   | HG/HF-204                   |
| Speed Reduction Ratio                                      |                    | -                      | 1 : 90                      | 1 : 120                | 1 : 120                     | 1 : 120                     |
| Max. Rotation Rate of Table (Calculate with Fanuc α Motor) |                    | r.p.m                  | 44.4 *(33.3)                | 33.3 *(25)             | 25                          | 25                          |
| Allowable Inertia Load Capacity (Horizontal)               |                    | kg.cm.sec <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

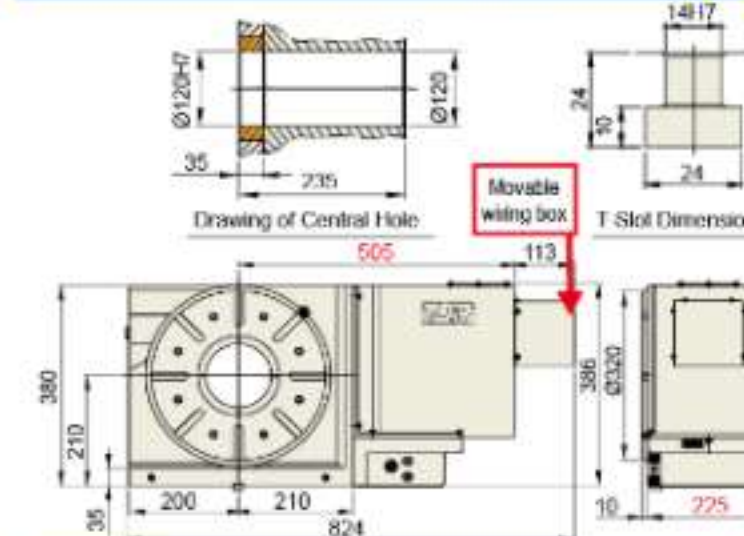
### AR(s)-210H



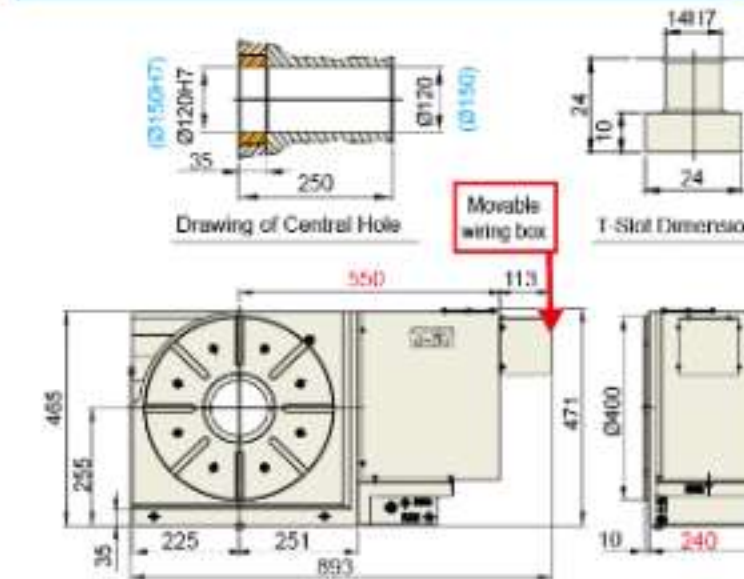
### HR(s)-255R



### HR-320R



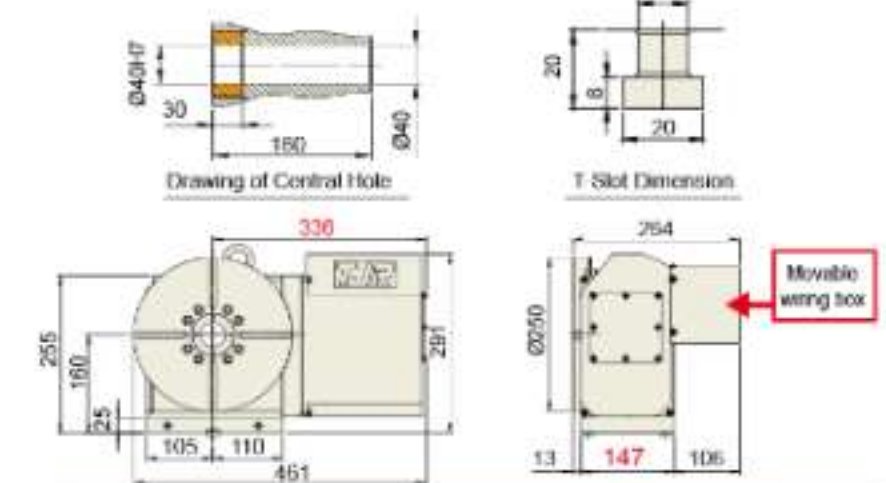
### HR-400R



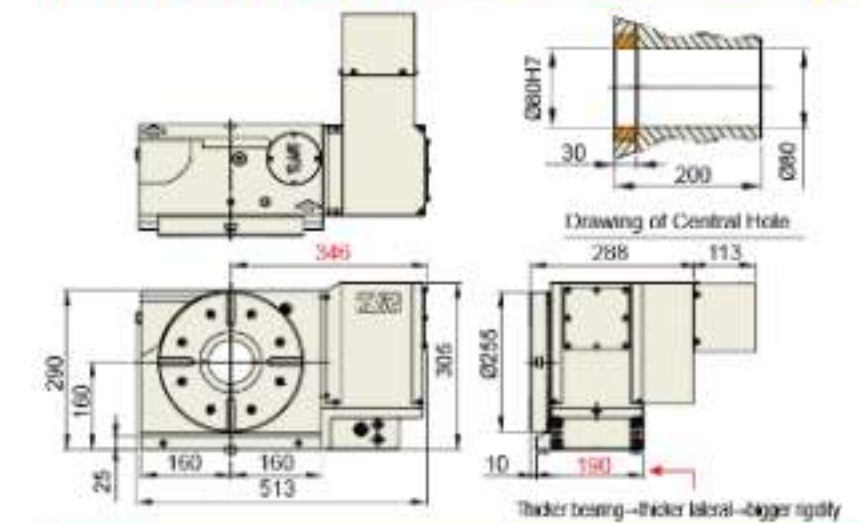
\*( ) Ø150 central through hole is available.

### AR(s)-250HR

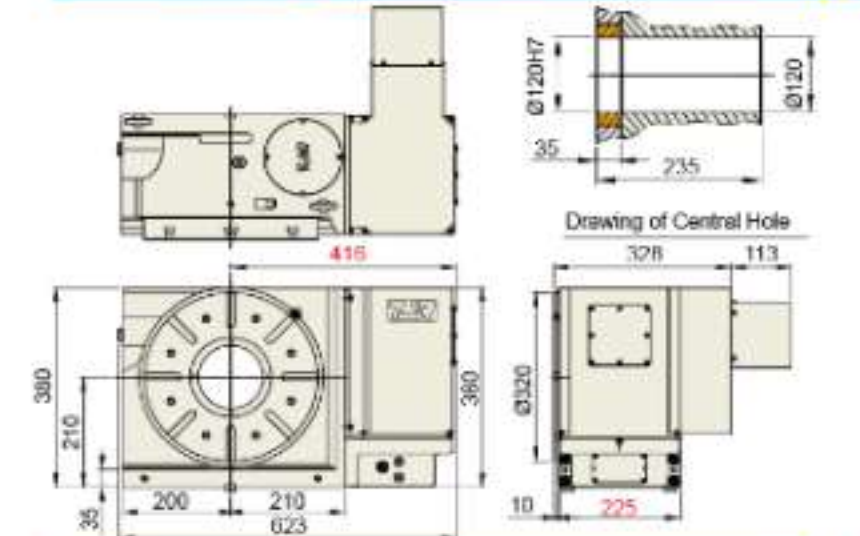
Special specified model used for shorter machine



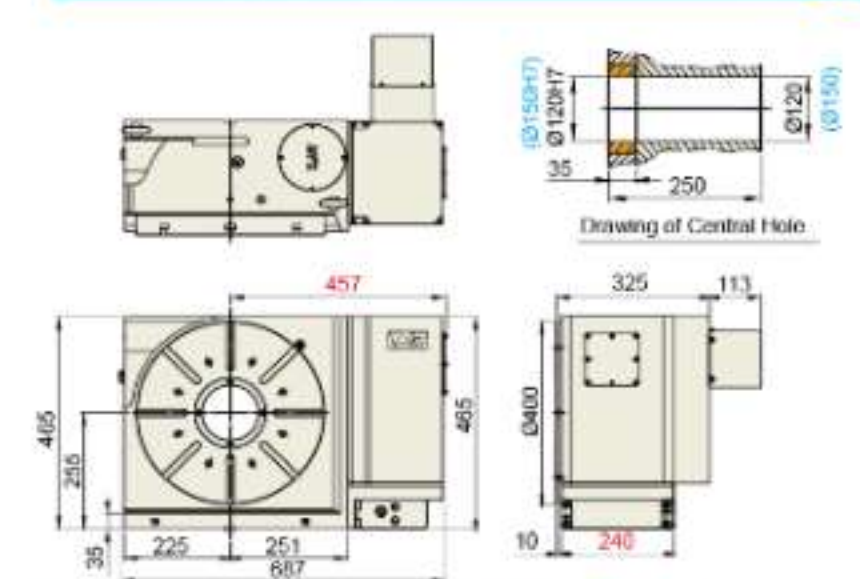
### HR(s)-255N (Sheet metal cover reduction)



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



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



\*( ) Ø150 central through hole is available.

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

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



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



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

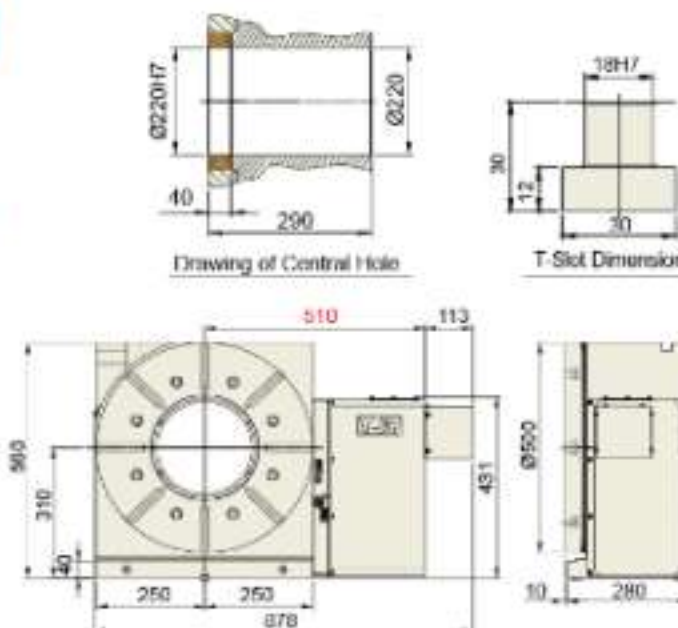
▲ HR-800 (for Both Vertical and Horizontal Applications)

| Item / Model                                               | Unit                   | HR-500R                       | HR-630R                       | HR-800R                       |
|------------------------------------------------------------|------------------------|-------------------------------|-------------------------------|-------------------------------|
| Table Diameter                                             | mm                     | Ø 500                         | Ø 630                         | Ø 800                         |
| Inner Diameter of Mandrel Sleeve                           | mm                     | Ø 220H7                       | Ø 280H7                       | Ø 350H7                       |
| Diameter of Center Through Hole                            | mm                     | Ø 220 <small>Big Hole</small> | Ø 280 <small>Big Hole</small> | Ø 350 <small>Big Hole</small> |
| 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                  | αiF12 / βis22                 | αiF12 / βis22                 | αiF22                         |
|                                                            | MITSUBISHI             | HG/HF-204                     | 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                           |
|                                                            | Horizontal             | kg                            | 600                           | 800                           |
| Allowable Thrust Load (with Rotary Table Clamping)         | F                      | kgf                           | 4000                          | 5000                          |
|                                                            | FxL                    | kgf-m                         | 500                           | 850                           |
|                                                            | FxL                    | kgf-m                         | 370                           | 800                           |
| Driving Torque                                             | kgf-m                  | 250                           | 420                           | 800                           |
| Net Weight (servo motor excluded)                          | kg                     | 405                           | 692                           | 991                           |

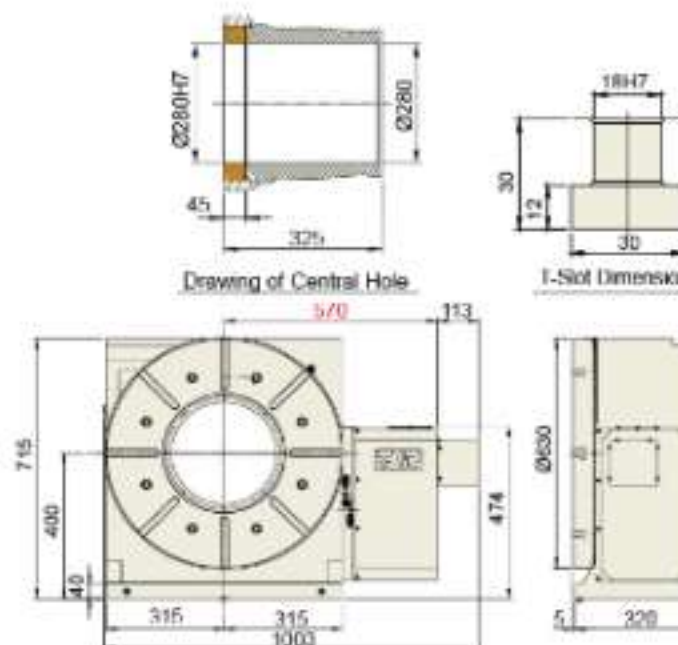


- 1 Use large-diameter radial & axial bearings
- 2 Employ a large-through-hole design while the table diameter exceeds 250mm. This design delivers high rigidity and provides bigger space for work piece setup with fixtures.  
(The hole diameter can be adjusted by adding a mandrel sleeve.)

### HR-500R



### HR-630R



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

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

#### 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

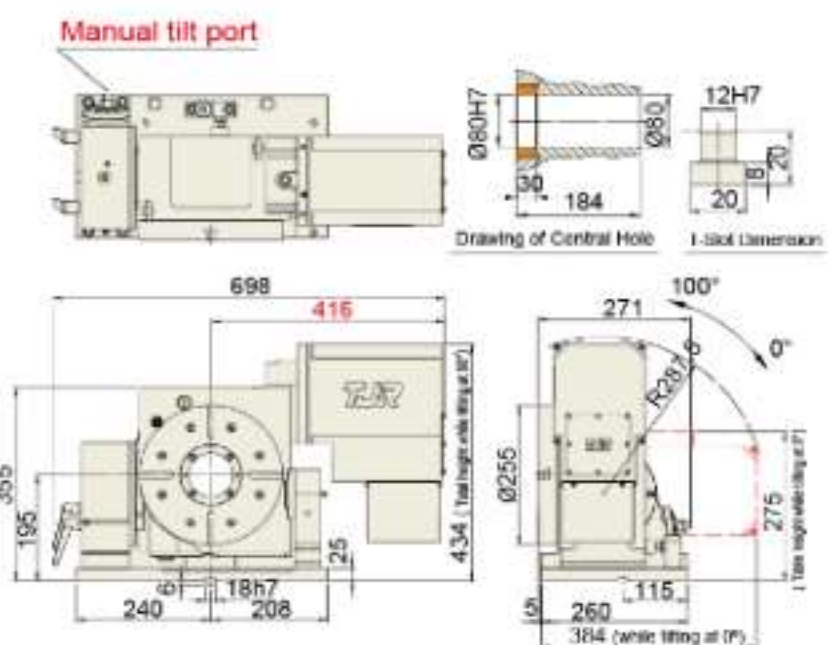


▲ Alloy steel worm gear (Optional)

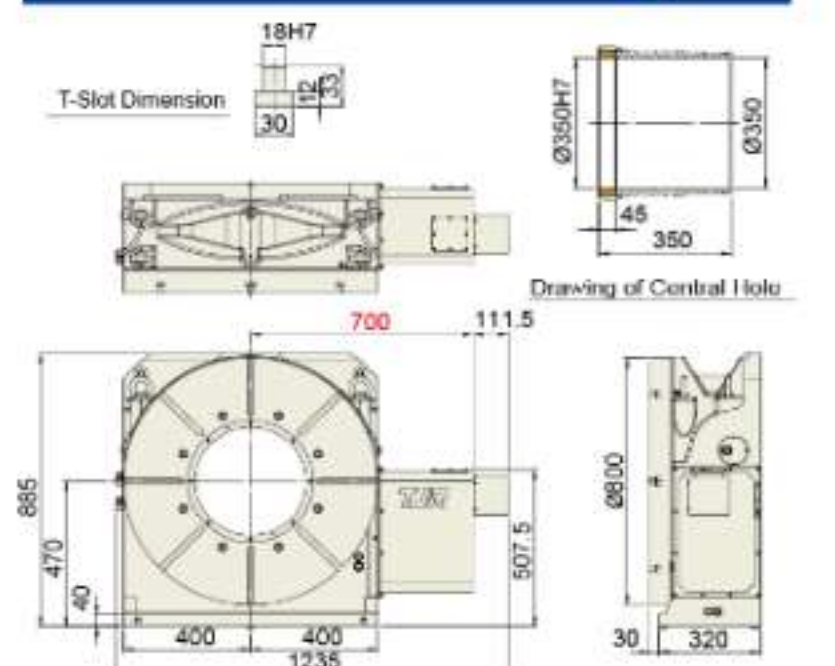
### MTHR(s)-255 (Manual tilt)

| 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                       |
|                                                            | F                      | kgf                  | 1600                      |
| Allowable Load (with Rotary Table Clamping)                | FxL                    | kgf-m                | 85                        |
|                                                            | FxL                    | kgf-m                | 70                        |
| Driving Torque                                             | kgf-m                  | 55 *(31)             |                           |
| Net Weight (servo motor excluded)                          | kg                     | 145                  |                           |

\* ( ) Alloy Steel worm & gear series



### HR-800R



CNC Rotary Tables  
(Min indexing angle – 0.001°)

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

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



▲ HR-320B (Back Side Motor)

FEATURE



Use radial & axial bearings



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



▲ HR-400B (Back Side Motor)

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

FEATURE



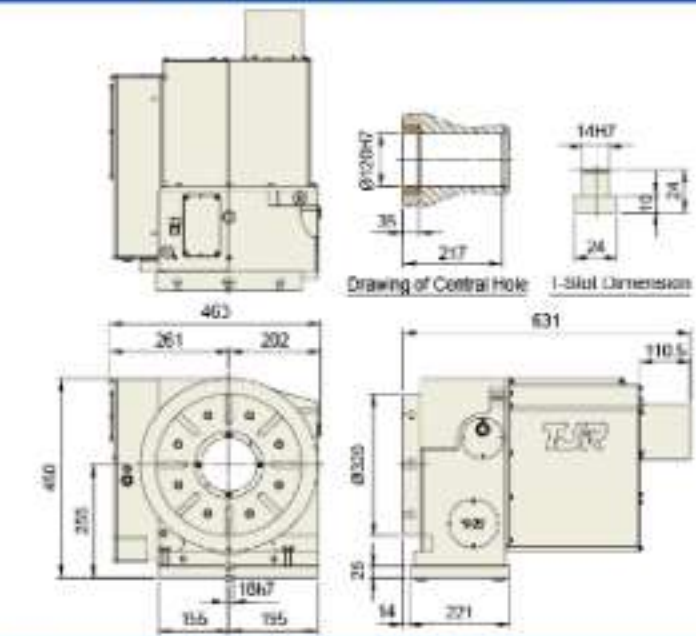
Use radial & axial bearings



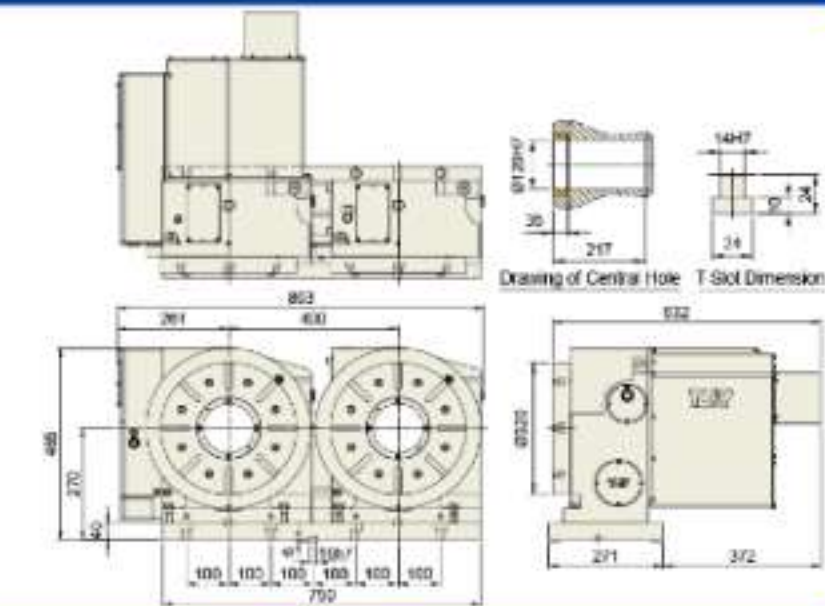
► iHHR-400

| 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<br>MITSUBISHI                          | Straight shaft<br>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<br>with Support Table<br>Horizontal | kg<br>kg<br>kg                   |
| Allowable Load (with Rotary Table Clamping)                | F<br>FxL<br>FxL                              | kgf<br>kgf-m<br>kgf-m            |
| Driving Torque                                             | kgf-m                                        | 170                              |
| Net Weight (servo motor excluded)                          | kg                                           | -                                |

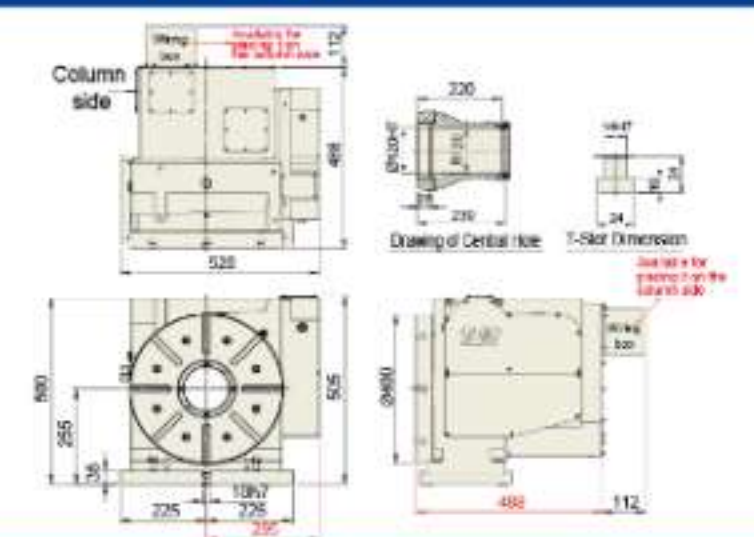
HR-320B (Back Side Motor)



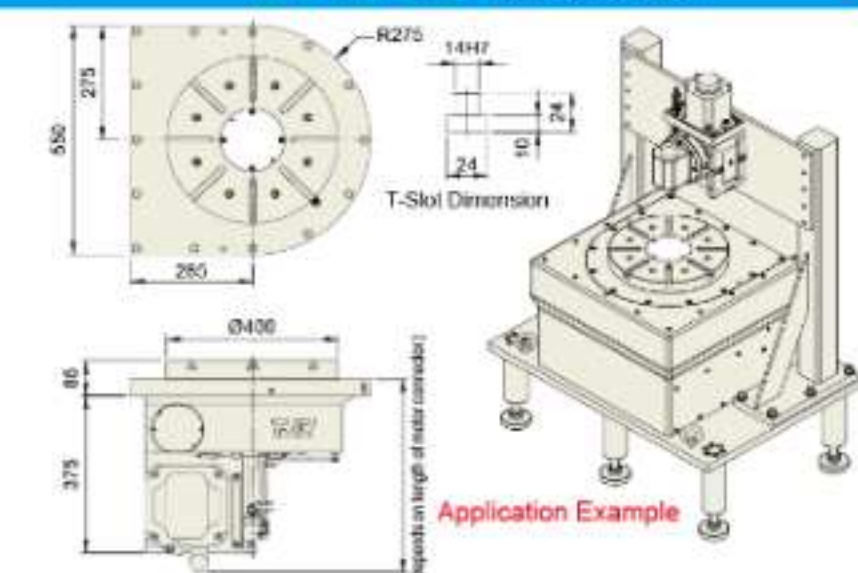
HR-320B-2W (Back side motor / 2-wheel coupled)



HR-400B (Back side motor)



iHHR-400 (Embedded type)



Application Example

## 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



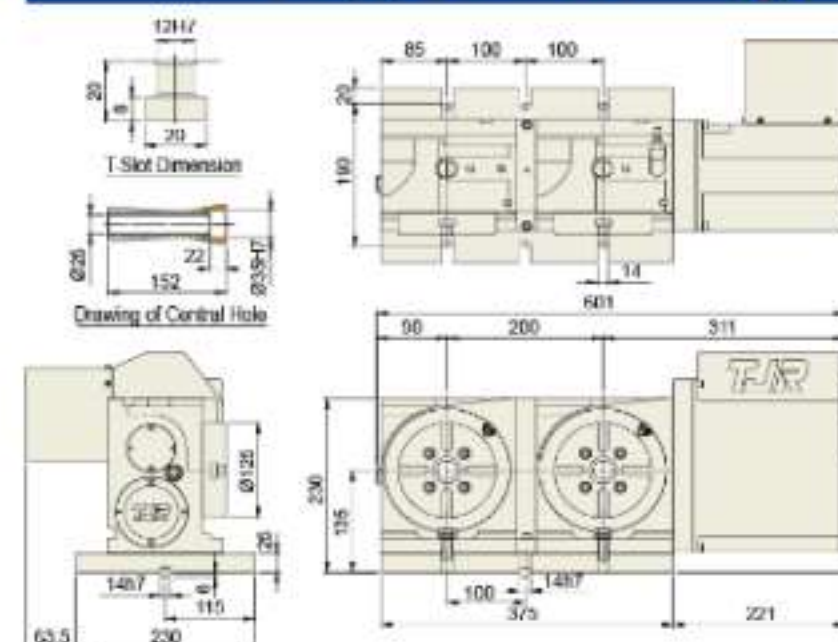
▲ AR(s)-170-2W  
(Horizontal application)  
(Pneumatic chuck is optional)

| 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<br>(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                       | αiF8 / βis12    | αiF8 / βis12    |
|                                                               |                            | [2w] αiF4 / βis8                           |                 |                 |
|                                                               |                            | [3w] αiF6 / βis8                           |                 |                 |
|                                                               |                            | [4w] αiF8 / βis12                          |                 |                 |
| MITSUBISHI                                                    | Straight Shaft without Key | [2w] HG / HF-104                           | HG/HF-104/154   | HG/HF-104/154   |
|                                                               |                            | [3w] HG / HF-154                           |                 |                 |
|                                                               |                            | [4w] HG / HF-224                           |                 |                 |
|                                                               |                            |                                            |                 |                 |
| Speed Reduction Ratio                                         | -                          | 1 : 60                                     | 1 : 90          | 1 : 90          |
| Max. Rotation Rate of Table<br>(Calculate with FANUC α Motor) | r.p.m                      | 83.3 *(33.3)                               | 44.4 *(33.3)    | 44.4 *(33.3)    |
| Allowable Inertia Load<br>Capacity (Horizontal)               | kg.cm.sec <sup>2</sup>     | -                                          | 5.4             | 8.3             |
| Allowable Workpiece Load                                      | kg                         | 50                                         | 75              | 75              |
| Allowable Load (with Rotary Table Clamping)                   | kg                         | 100                                        | 150             | 150             |
| Driven Torque                                                 | kgf                        | 1000                                       | 1450            | 1450            |
| Net Weight (servo motor excluded)                             | kgf-m                      | 45                                         | 110             | 110             |
|                                                               | kgf-m                      | 13                                         | 31              | 31              |
|                                                               | kgf-m                      | 9 *(3.7)                                   | 18 *(14.6)      | 18 *(14.6)      |
|                                                               | kg                         | 82 / 120 / -                               | - / -           | - / 223         |

\*( ) Alloy Steel worm & gear series

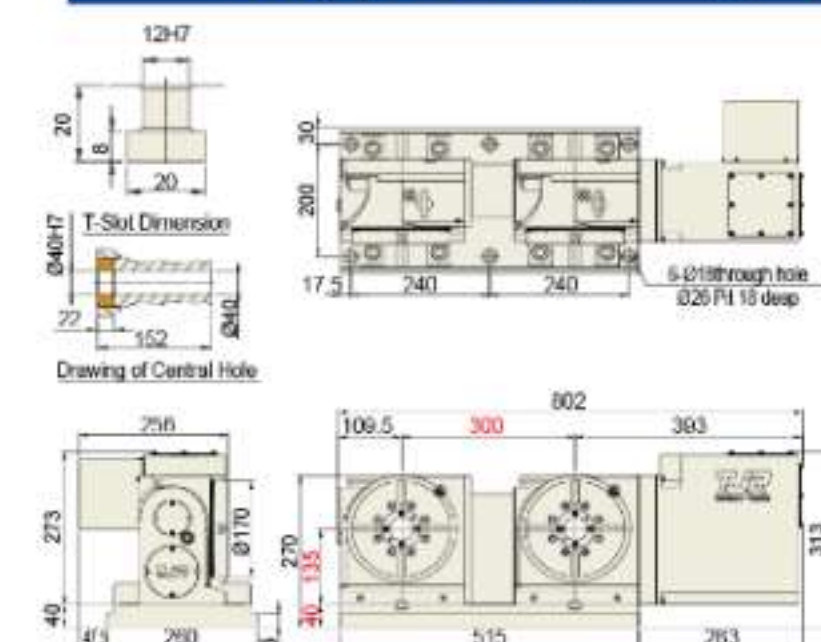
## NEW Powerful Brake System

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



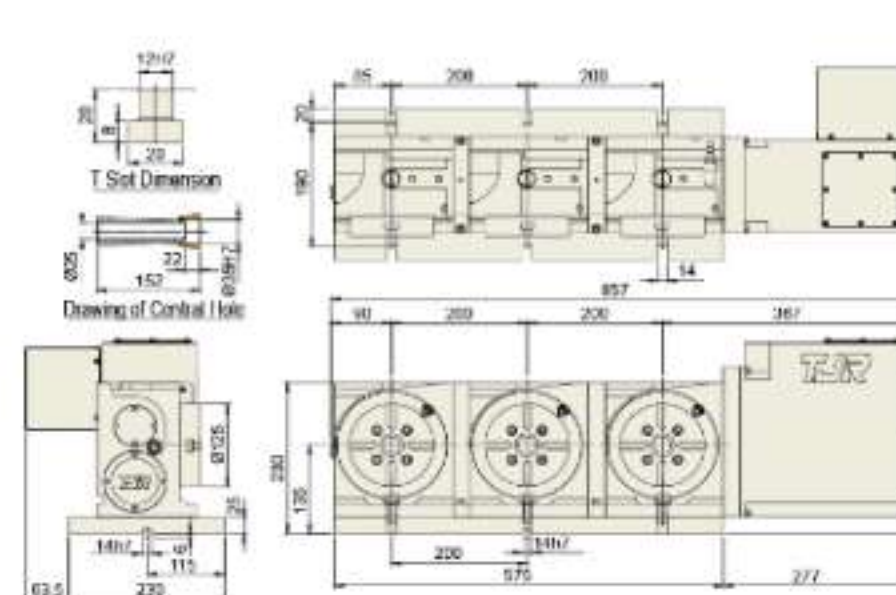
## NEW Powerful Brake System

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



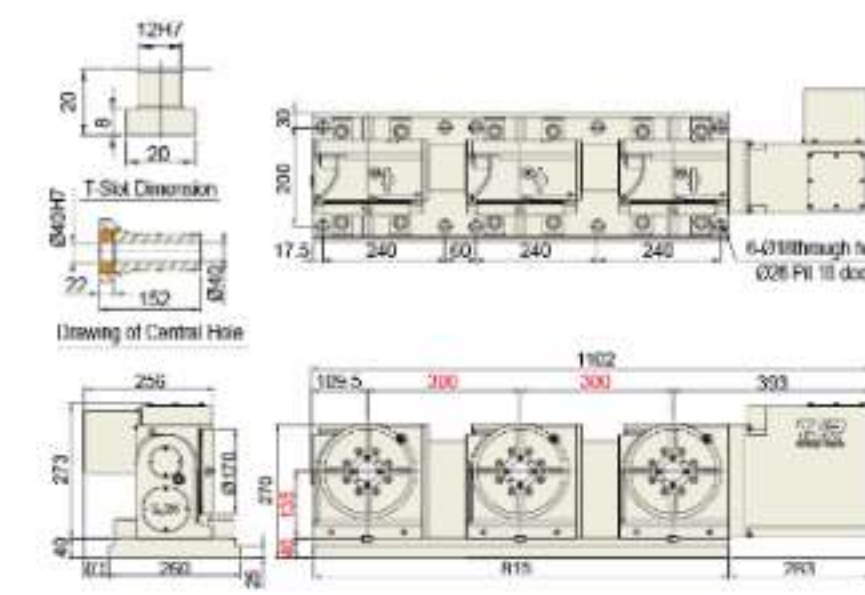
## NEW Powerful Brake System

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



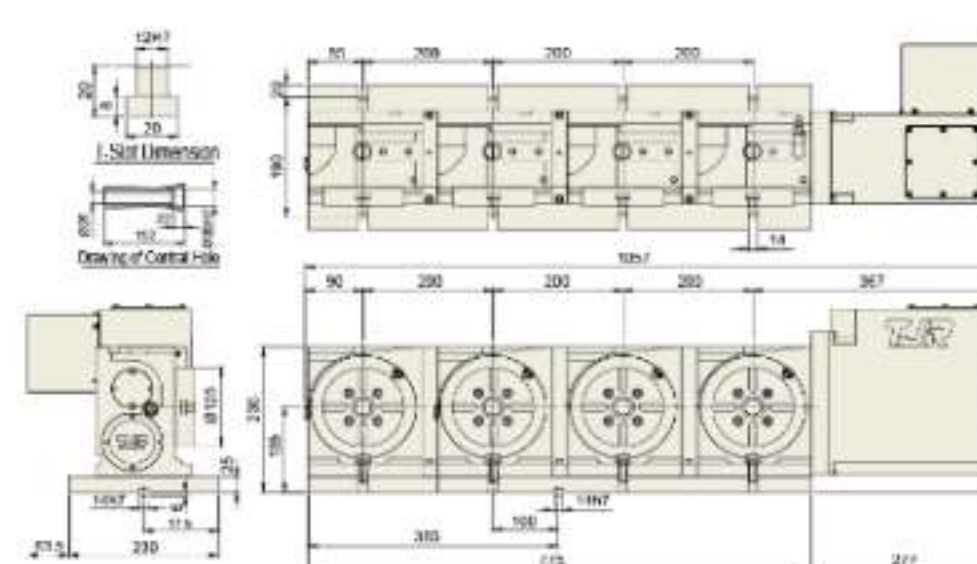
## NEW Powerful Brake System

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



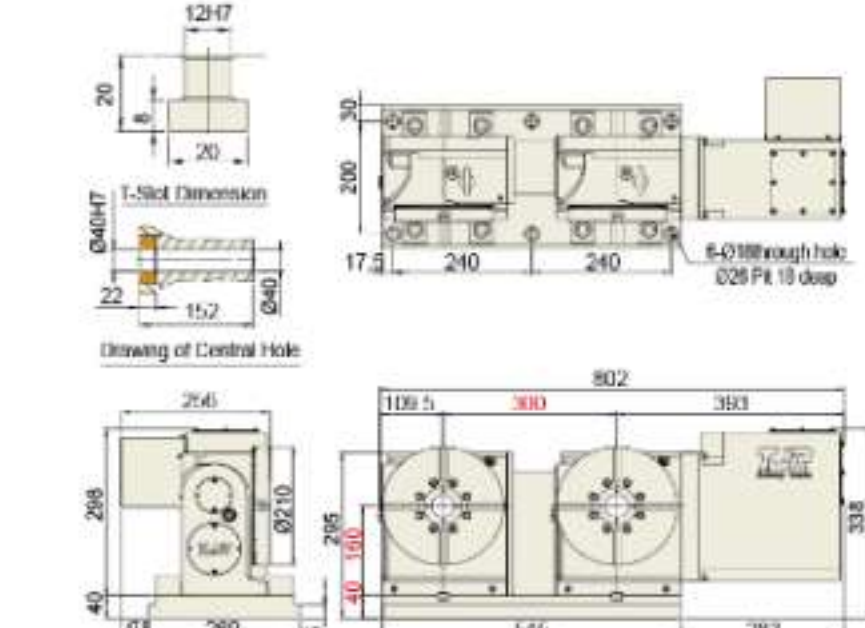
## NEW Powerful Brake System

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



## NEW Powerful Brake System

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



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



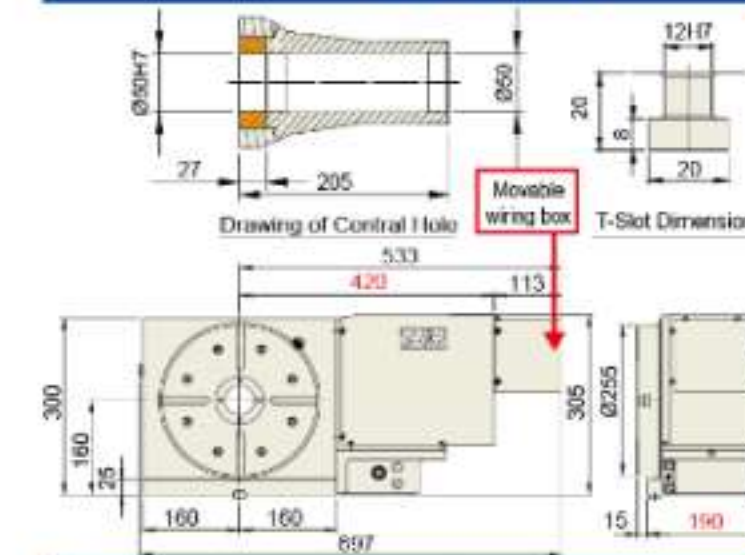
HI Series :  
Use **three-piece** clutch plate

Function:

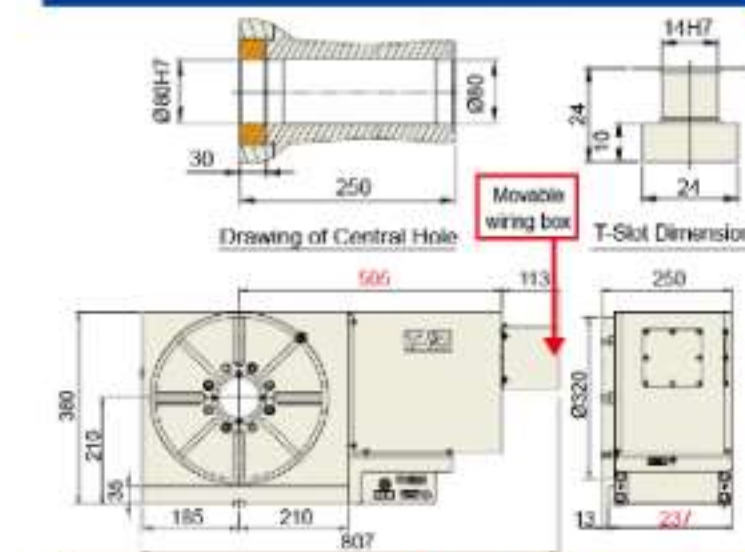
- ① Accuracy:  $\pm 5$  seconds  
(Angle encoder accuracy)
- ② Rotate **without lifting the table** to prevent table from water and particles.

| 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) |
|                                                            | MITSUBISHI             | Taper shaft | HG/HF-104 / 154    | HG/HF-204              | HG/HF-204              |
| Speed Reduction Ratio                                      | -                      | 1 : 120     | 1 : 120            | 1 : 120                | 1 : 180                |
| Max. Rotation Rate of Table (Calculate with Fanuc α Motor) | r.p.m                  | 33.3        | 25                 | 25                     | 16.6                   |
| Allowable Inertia Load Capacity (Horizontal)               | kg.cm.sec <sup>2</sup> | 24.8        | 44.8               | 100                    | 187.5                  |
| Allowable Workpiece Load                                   | Vertical               | kg          | 125                | 175                    | 250                    |
|                                                            | with Support Table     | kg          | 300                | 400                    | 500                    |
|                                                            | Horizontal             | kg          | 300                | 350                    | 500                    |
| Allowable Thrust Load (with Rotary Table Clamping)         | F                      | kgf         | 1600               | 2000                   | 3000                   |
|                                                            | FxL                    | kgf-m       | 175                | 250                    | 300                    |
|                                                            | FxL                    | kgf-m       | 300                | 400                    | 500                    |
| Net Weight (servo motor excluded)                          | kg                     | 120         | 210                | 320                    | 410                    |

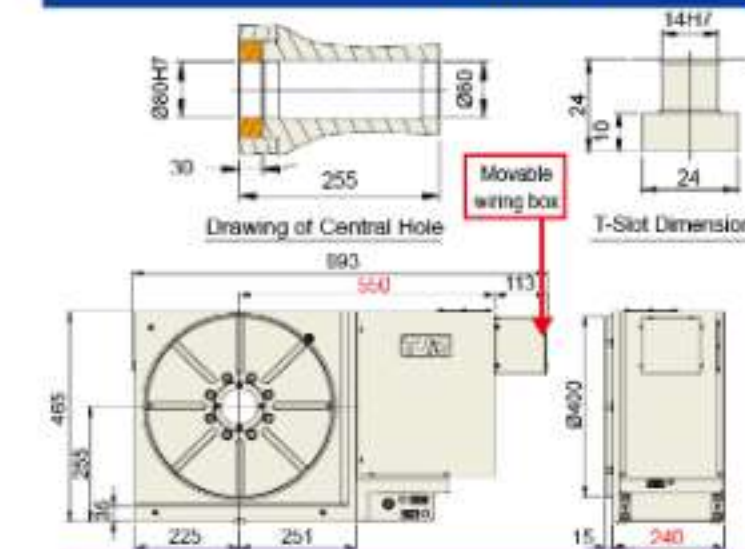
### HI-255R



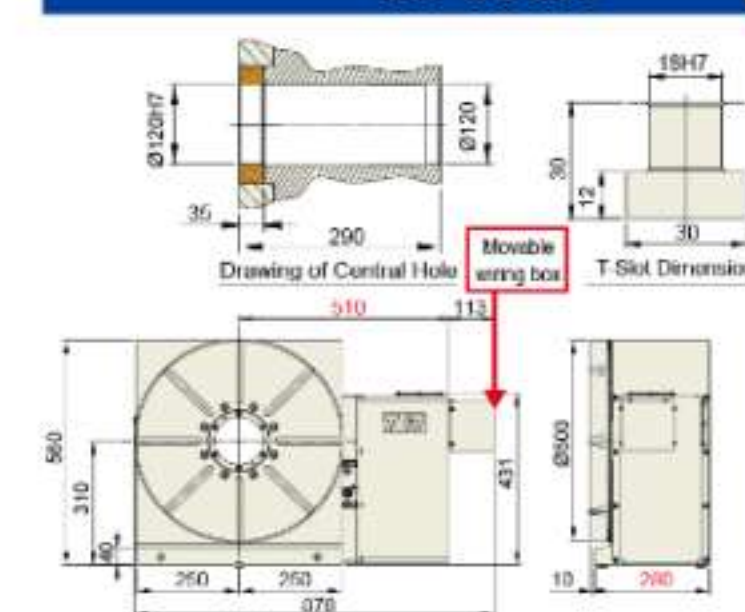
### HI-320R



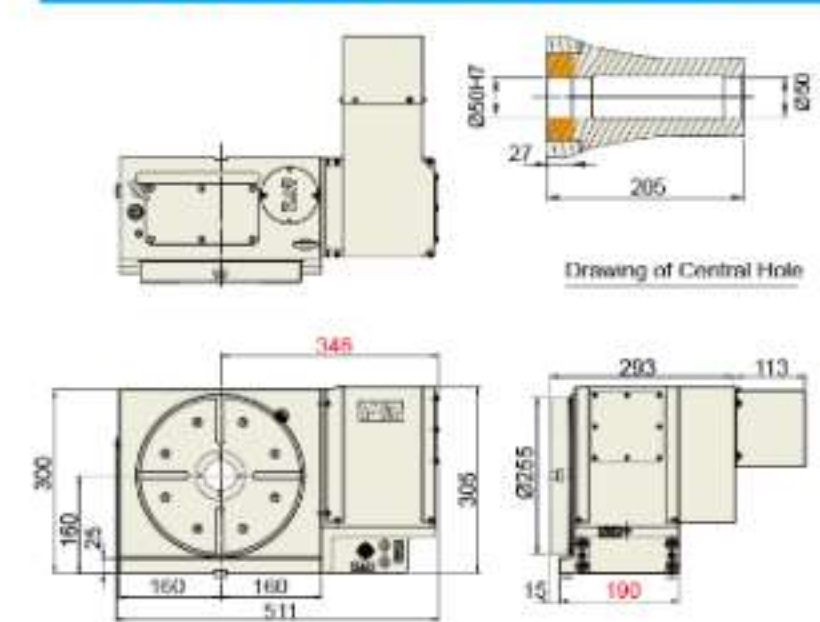
### HI-400R



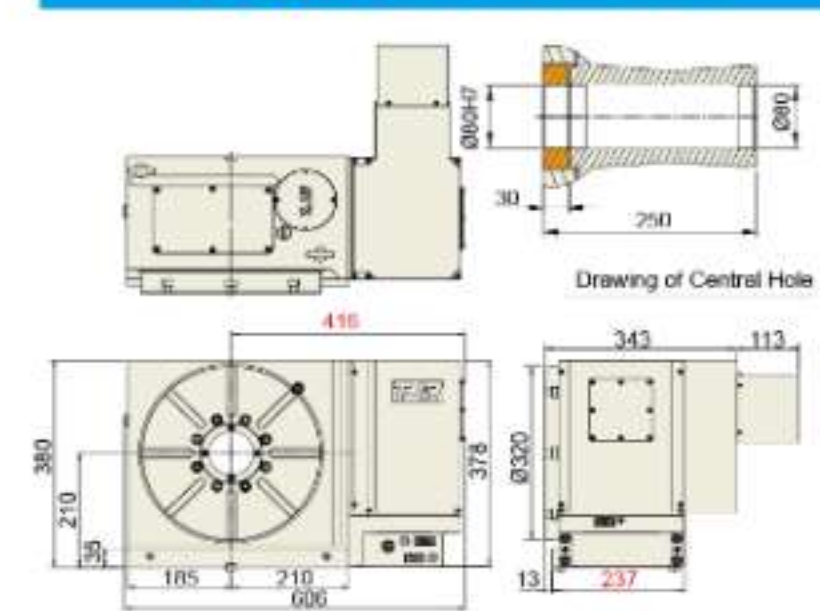
### HI-500R



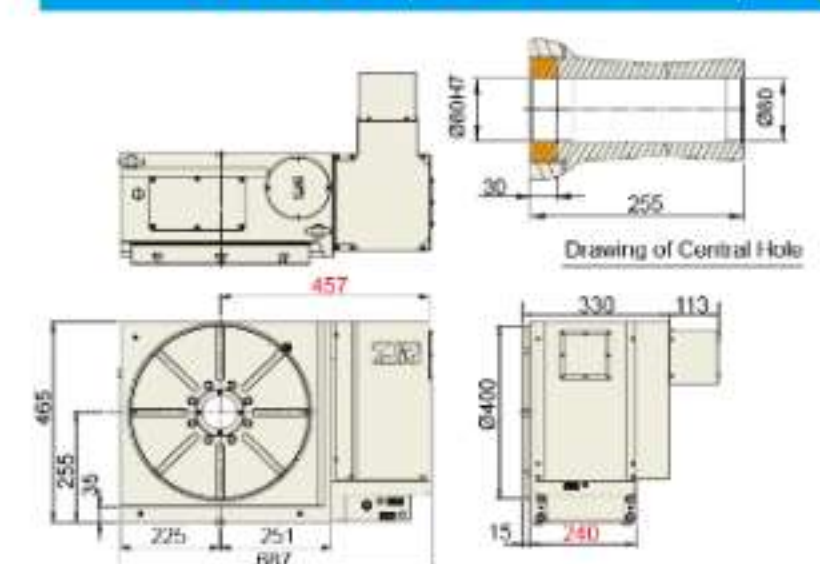
### HI-255N (Sheet metal cover reduction)



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



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



▲ RTH-255

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

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

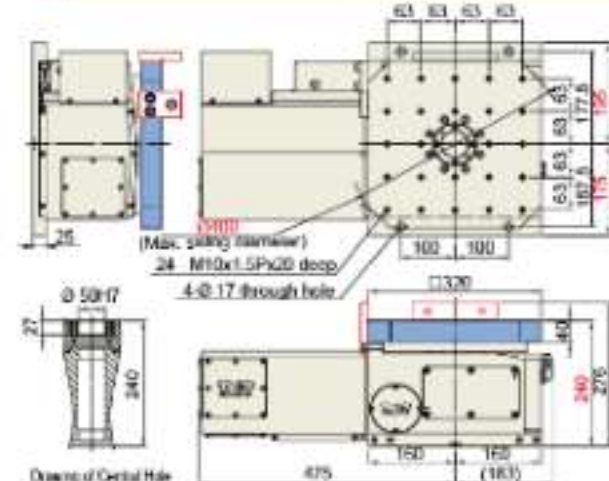


▲ HHI-1000x1000

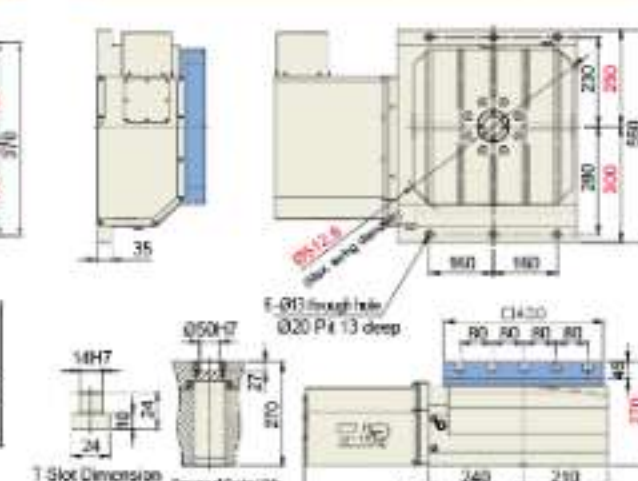
High loading(HL)  
version is an alternative

| 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                  | Ø 50x27 deep                  | Ø 50x27 deep           | Ø 50x27 deep       | Ø 50H7x27 deep     | Ø 50x27 deep               | Ø 50x27 deep       | Ø 50x27 deep                | Ø 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.                | $\pm 5$                       | $\pm 5$                | $\pm 5$            | $\pm 5$            | $\pm 5$                    | $\pm 5$            | 20                          | 15                          |
| Repeatability                                              | sec.                | $\pm 1$                       | $\pm 1$                | $\pm 1$            | $\pm 1$            | $\pm 1$                    | $\pm 1$            | 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<br>MITSUBISHI | Straight shaft<br>without key | βis12<br>HF/HG-104/154 | βis22<br>HF/HG-204 | βis22<br>HF/HG-204 | αiF12 / βis22<br>HF/HG-204 | αiF22<br>HF/HG-354 | αiF12i / βis22<br>HF/HG-204 | αiF12i / βis22<br>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                                   | kg                  | 300                           | 600                    | 1200               | 1800               | 4000                       | 5000               | 500                         | 600                         |
| Allowable Thrust Load (with Rotary Table Clamping)         | kgf                 | 1600                          | 3000                   | 4000               | 6000               | 9000                       | 10000              | 2500                        | 4000                        |
|                                                            | FxL                 | kgf-m                         | 175                    | 300                | 600                | 650                        | 2200               | 300                         | 500                         |
|                                                            | FxL                 | kgf-m                         | 300                    | 500                | 1000               | 1200                       | 4000               | 155                         | 370                         |
| Net Weight (servo motor excluded)                          | kg                  | 149                           | -                      | 518                | 565                | 1053                       | 1971               | -                           | 510                         |

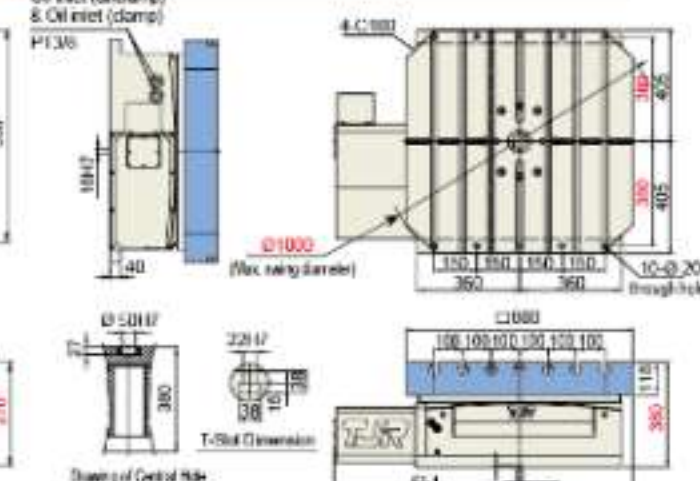
HHI-320x320F (1° or 5°)



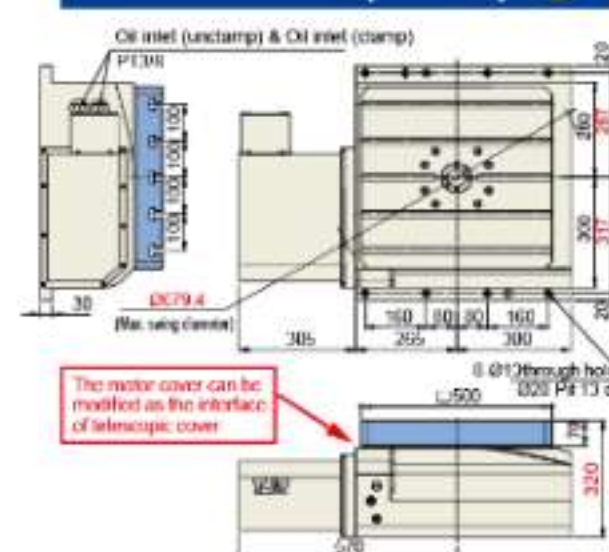
HHI-400x400A (1° or 5°)



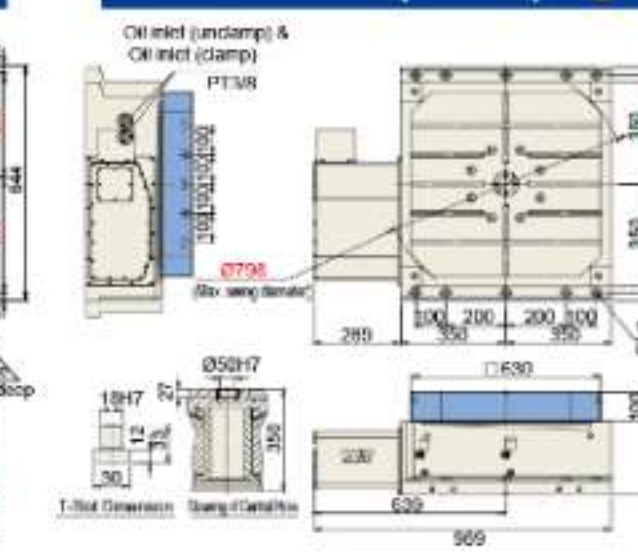
HHI-800x800 (1° or 5°)



HHI-500x500 (1° or 5°)



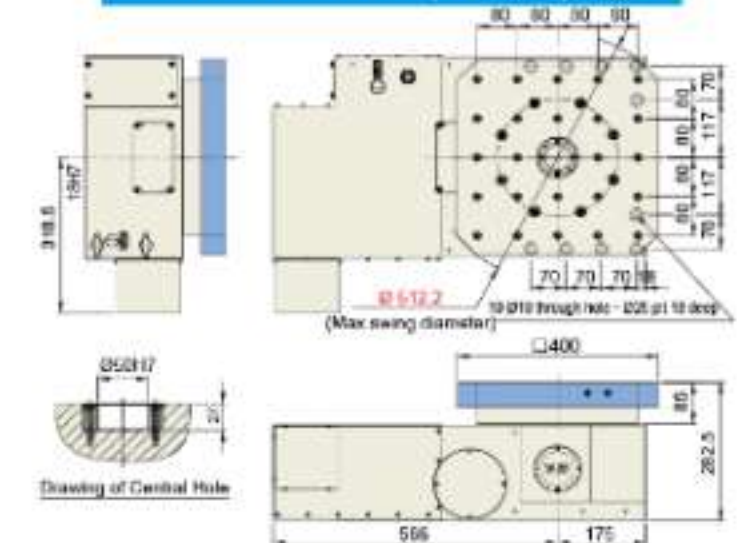
HHI-630x630 (1° or 5°)



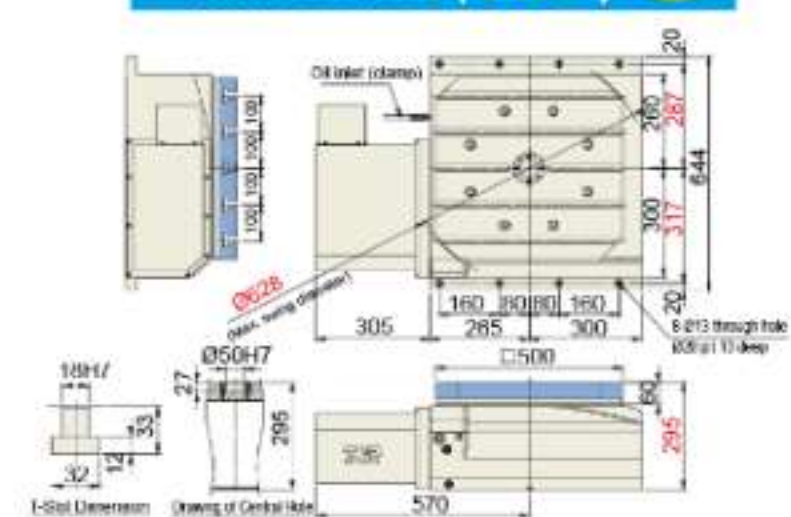
HHI-1000x1000 (1° or 5°)



HHR-400x400 (0.001°)



HHR-500x500 (0.001°)



## 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

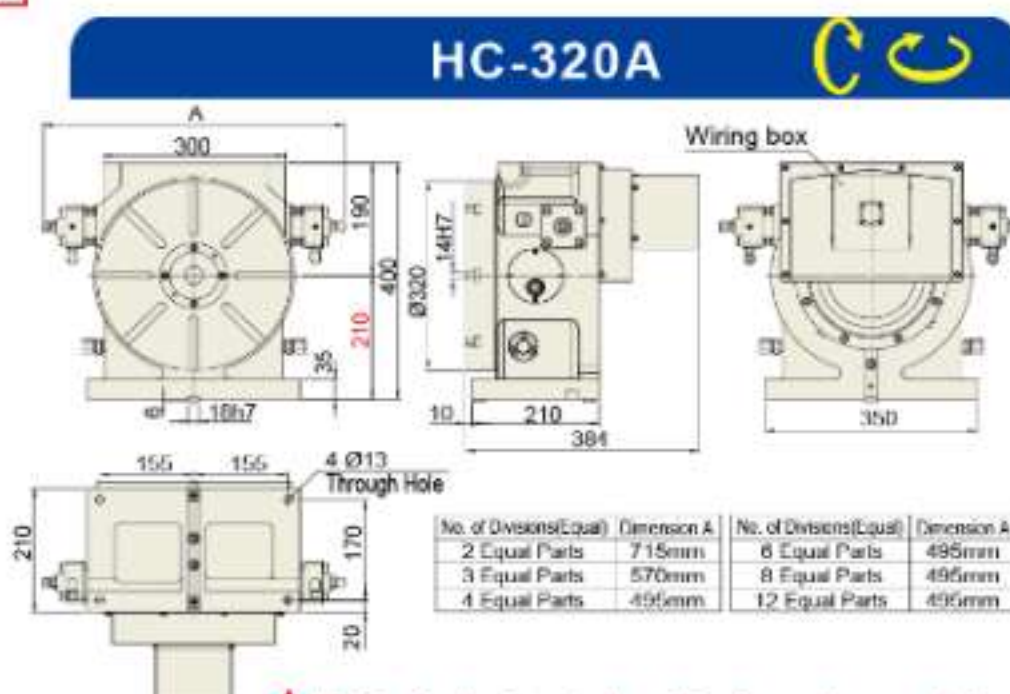
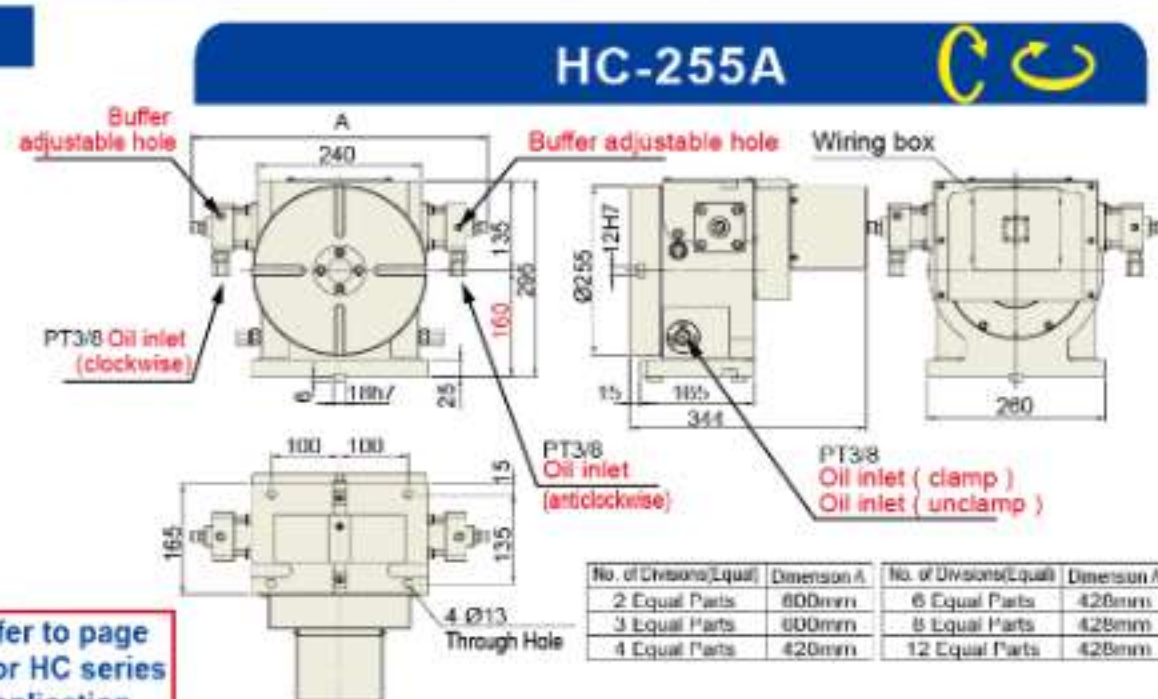
Function:

- 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.                   | $\pm 5$               | $\pm 5$         | $\pm 5$         |
| Repeatability                                      | sec.                   | $\pm 1$               | $\pm 1$         | $\pm 1$         |
| 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                           | kg                     | 110                   | 200             | -               |
| Allowable Thrust Load (with Rotary Table Clamping) | kgf                    | 1300                  | 1500            | 3500            |
| Rotating Torque                                    | kgf-m                  | 42                    | 60              | -               |
| Rotary Table Total Weight                          | kg                     | 65                    | 98              | 214             |

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

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

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



Hirth coupling hydraulic brake (180° to and fro)  
For 3-axis-moving-column vertical machining center



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



HC Series :  
Use three-piece clutch plate

Function:

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

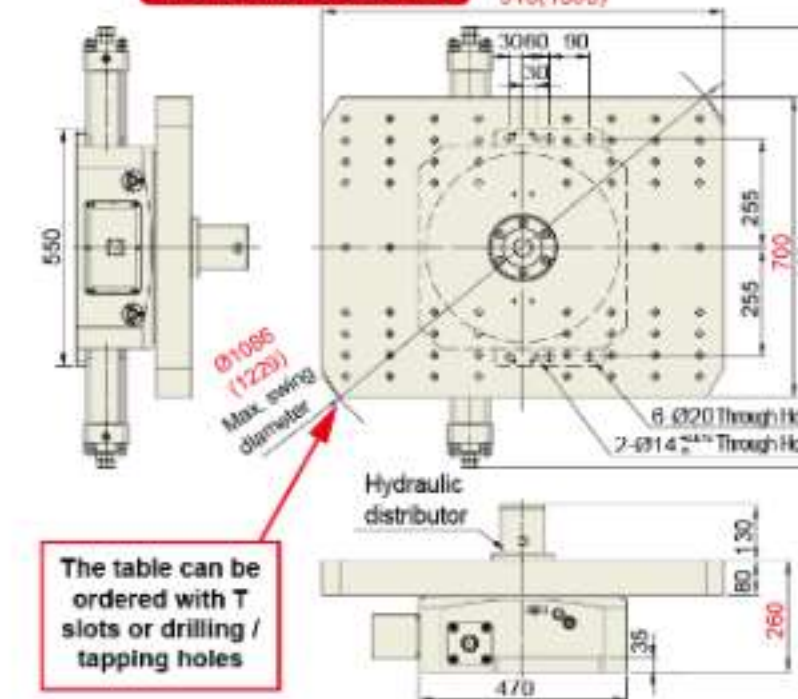


Pallet changing time is 4~5 seconds, which excludes PLC delayed time of machine

| 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.                | $\pm 5$                   |
| Repeatability                               | sec.                | $\pm 1$                   |
| Positioning method                          | -                   | 3-piece clutch plate      |
| Clamping System                             | kgf/cm <sup>2</sup> | Hyd.35                    |
| Clamping force                              | kgf                 | 4600                      |
| Allowable Workpiece Load                    | kg                  | 700                       |
| Inspection accuracy                         |                     |                           |
| Runout of table top during rotation         | mm                  | 0.02                      |
| Runout of table central hole                | mm                  | 0.01                      |
| Parallelism of table top to frame bottom    | mm                  | 0.02                      |
| Flatness of table top (Lower in the center) | mm                  | 0.02                      |
| Total Weight                                | kg                  | 525                       |

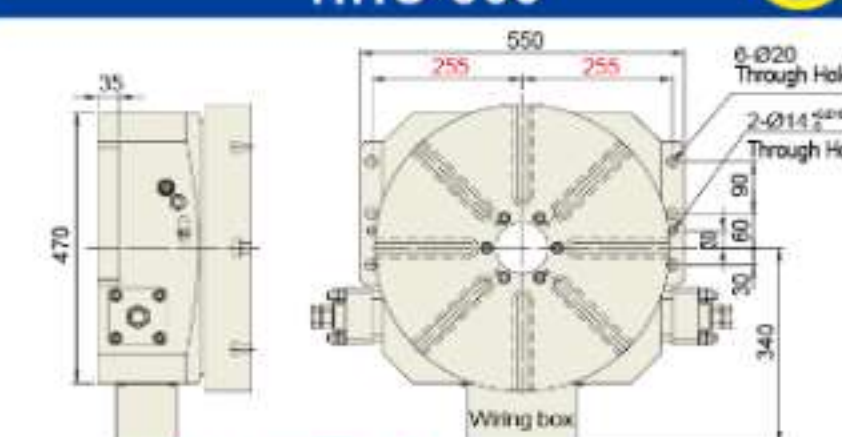
#### CHC-700x910 (Pallet changer)

Table size can be customized 910(1090)

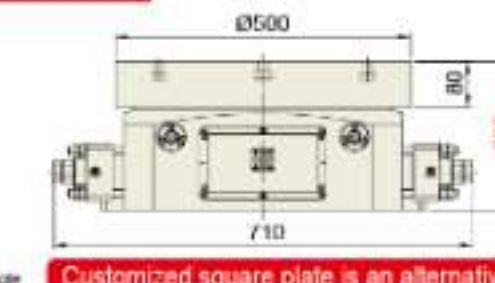


The table can be ordered with T slots or drilling / tapping holes

#### HHC-500



Refer to page 29 for the specification table.



Customized square plate is an alternative

Application diagram of auto pallet changer

(Available for 4-hole hydraulic distributor)



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



## CNC Tilting Rotary Tables Min. indexing angle -0.001°

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

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



Tilting axis  
Rotary axis



▲ FAR(s)-125



▲ FAR(s)-170A(compact type)



▲ FAR(s)-170



▲ Workpiece sample -  
5 axis simultaneous  
contouring

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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.)

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

3 Anti-wear alloy steel worm gear is optional

4 A hydraulic brake for tilting axis is optional.

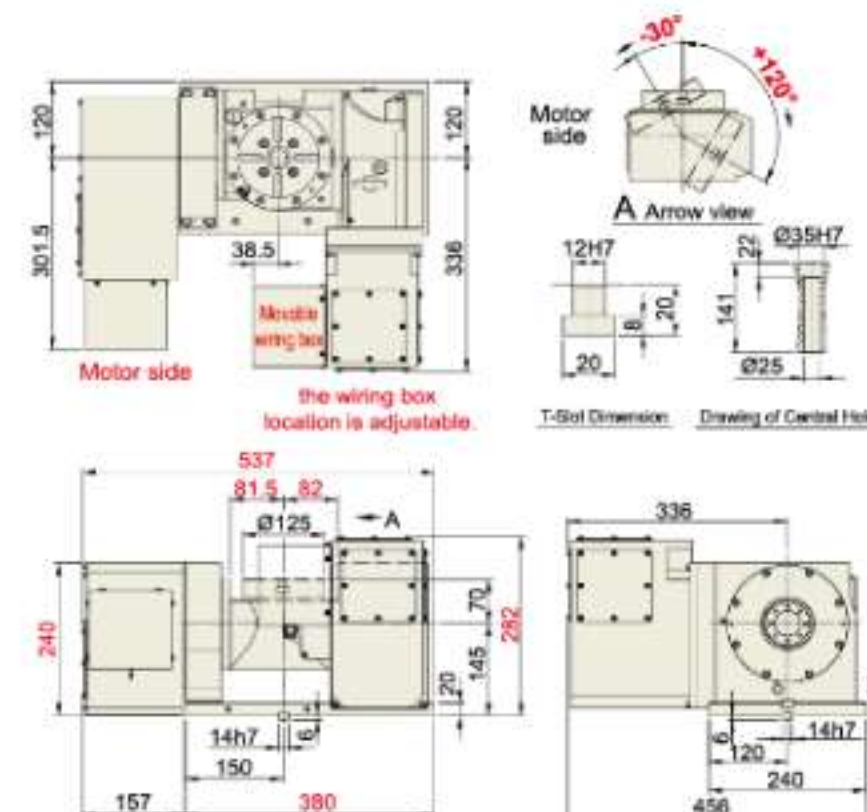
| Item / Model                                               |               | Unit                   |                | FAR(s)-125/125B                         |                     | FAR(s)-170A(Compact type) |                      | FAR(s)-170(Standard type)/FAR(s)-170B(Back side motor type) |                 |
|------------------------------------------------------------|---------------|------------------------|----------------|-----------------------------------------|---------------------|---------------------------|----------------------|-------------------------------------------------------------|-----------------|
| Table Diameter                                             |               | mm                     |                | Ø125                                    |                     | Ø170                      |                      | Ø170                                                        |                 |
| Inner Diameter of Mandrel Sleeve                           |               | mm                     |                | Ø 35H7 (Diameter of Table Central Hole) |                     | Ø40H7                     |                      | Ø40H7                                                       |                 |
| Diameter of Center Through Hole                            |               | mm                     |                | Ø25                                     |                     | Ø40                       |                      | Ø40                                                         |                 |
| Table Height (Horizontal)                                  |               | mm                     |                | 215                                     |                     | 245                       |                      | 270                                                         |                 |
| Table T-slot Width                                         |               | mm                     |                | 12H7                                    |                     | 12H7                      |                      | 12H7                                                        |                 |
| Guide Block Width                                          |               | mm                     |                | 14h7                                    |                     | 18h7                      |                      | 18h7                                                        |                 |
| Axis                                                       |               | -                      |                | Rotation                                | Tilt (-30° ~ +120°) | Rotation                  | Tilt ±100°           | Rotation                                                    | Tilt ±100°      |
| Min. Increment                                             |               | deg.                   |                | 0.001                                   | 0.001               | 0.001                     | 0.001                | 0.001                                                       | 0.001           |
| Indexing Precision (while tilt 0° ~ +90°)                  |               | sec.                   |                | 40                                      | 60 <sup>1</sup>     | 20                        | 60 <sup>1</sup>      | 20                                                          | 60 <sup>1</sup> |
| Repeatability                                              |               | sec.                   |                | 6                                       | 8                   | 6                         | 8                    | 6                                                           | 8               |
| Clamping System (Pneumatic)                                |               | kgf/cm <sup>2</sup>    |                | 6                                       | 6                   | 6                         | 6                    | 6                                                           | 6               |
| Clamping Torque                                            |               | kgf-m                  |                | 13                                      | 31                  | 25                        | 31                   | 31                                                          | 31              |
| Servo Motor Model                                          | FANUC         | Taper/Straight shaft   | αis4 / βis4    | αiF4 / βis8                             | αiS4 / βis4         | αiF4 / βis8               | αiF4 / βis8          | αiF8 / αis12 / βis12                                        |                 |
|                                                            | MITSUBISHI    | Taper/Straight shaft   | HG/HF-75 / 105 | HG/HF-54 / 104                          | HG/HF-75 / 105      | HG/HF-54 / 104            | HG/HF-54 / 104       | HG/HF-104                                                   |                 |
| Speed Reduction Ratio                                      |               | -                      |                | 1 : 60                                  | 1 : 90              | 1 : 72                    | 1:120 / SIEMENS 1:90 | 1 : 90                                                      | 1 : 90          |
| Max. Rotation Rate of Table (Calculate with Fanuc's Motor) |               | r.p.m                  |                | 44.4 *(33.3)                            | 44.4 *(33.3)        | 33.3 *(33.3)              | 25 *(16.6)           | 33.3 *(33.3)                                                | 33.3 *(16.6)    |
| Allowable Inertia Load Capacity (Horizontal)               |               | kg.cm.sec <sup>2</sup> |                | 0.97                                    |                     | 2.2                       |                      | 2.7                                                         |                 |
| Allowable Workpiece Load                                   | 0° Horizontal | kg                     |                | 50                                      |                     | 60                        |                      | 75                                                          |                 |
|                                                            | 0°~90° Tilt   | kg                     |                | 35                                      |                     | 40                        |                      | 50                                                          |                 |
| Allowable Thrust Load (with Rotary Table Clamping)         | F             | kgf                    |                | 400                                     |                     | 600                       |                      | 750                                                         |                 |
|                                                            | FxL           | kgf-m                  |                | 31                                      |                     | 31                        |                      | 31                                                          |                 |
|                                                            | FxL           | kgf-m                  |                | 13                                      |                     | 25                        |                      | 31                                                          |                 |
| Driving Torque (Rotary axis)                               |               | kgf-m                  |                | 9 *(3.7)                                |                     | 18 *(14.6)                |                      | 18 *(14.6)                                                  |                 |
| Net Weight (servo motor excluded)                          |               | kg                     |                | 97 / -                                  |                     | 125                       |                      | 153                                                         |                 |

\* ( ) Alloy Steel worm & gear series

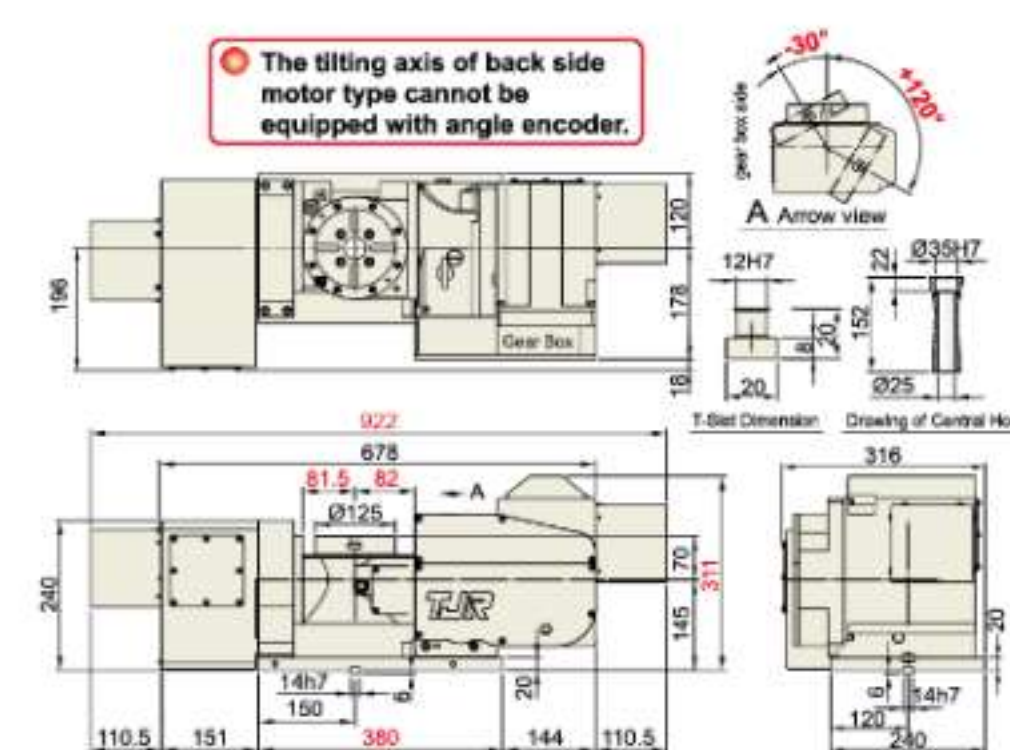
\*1. Indexing precision can be better after installing an additional angle encoder. Please refer to the table on page 70 for more details.

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

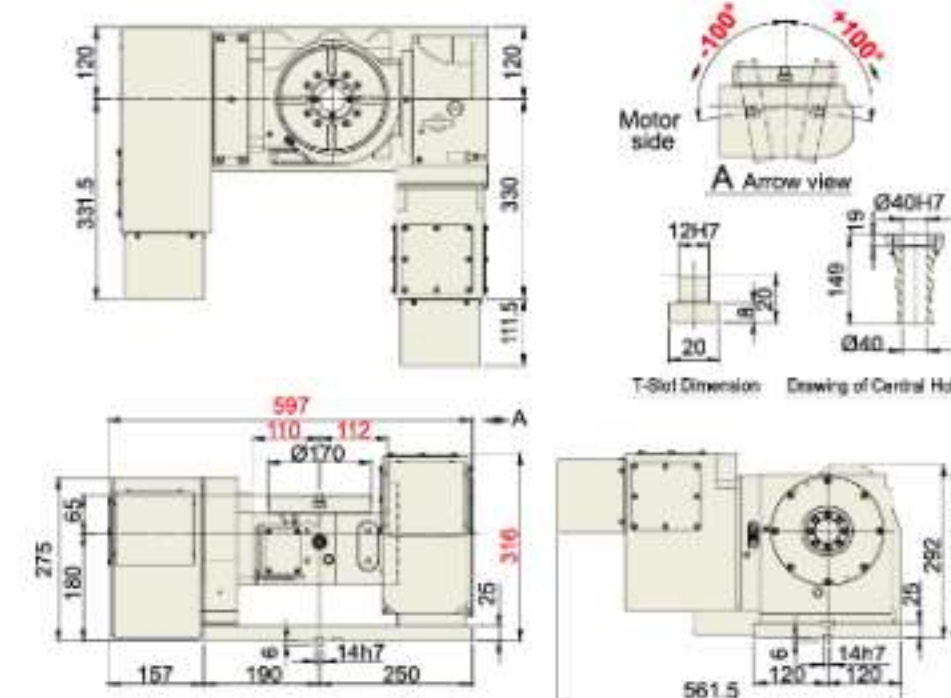
## FAR(s)-125(Standard type)



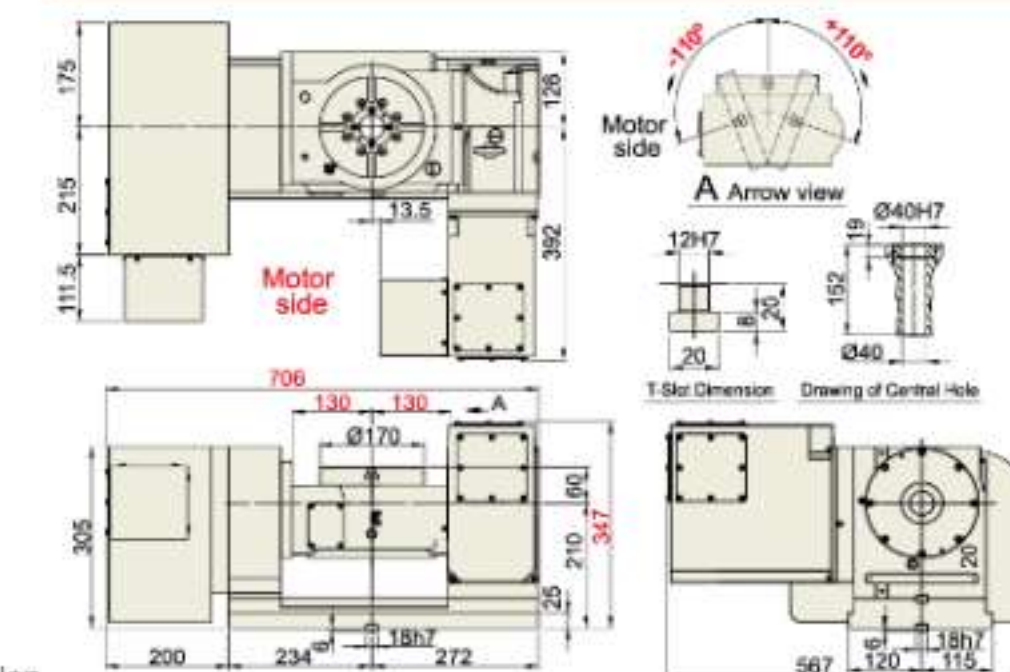
## FAR(s)-125B (Back side motor type)



## FAR(s)-170A FAR(s)-170HA (Compact type)



## FAR(s)-170 FAR(s)-170HB (Standard type)



★ 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 $-0.001^\circ$

### FAR Series

Dual-axis single-arm type  
(Pneumatic Brake)

FAR(s)-160SN

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

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

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



▲ FAR(s)-210 (Standard type)

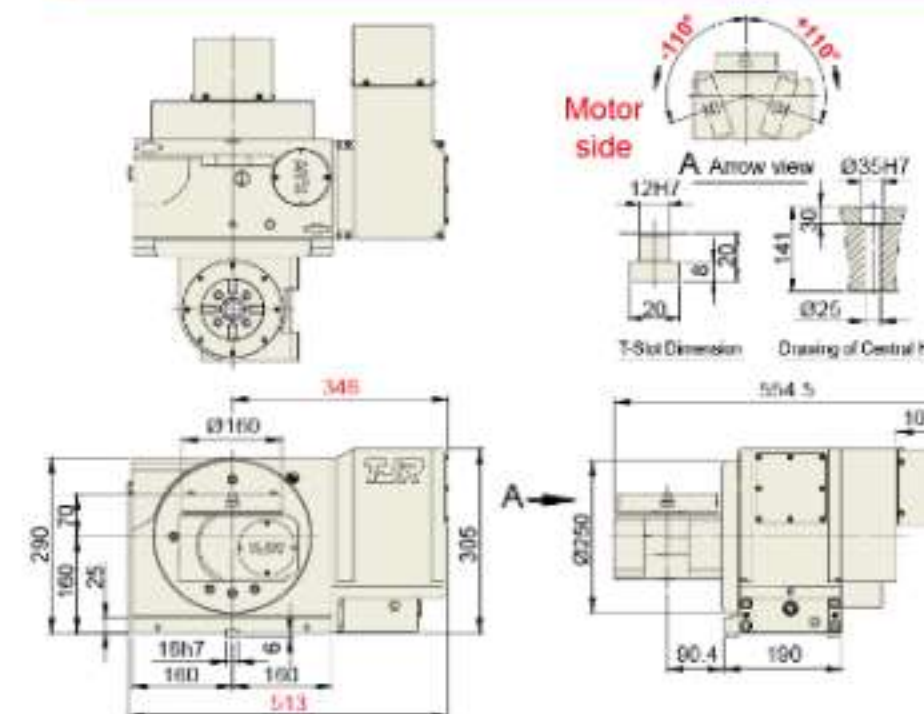


▲ FAR(s)-210B  
(Back side motor type)

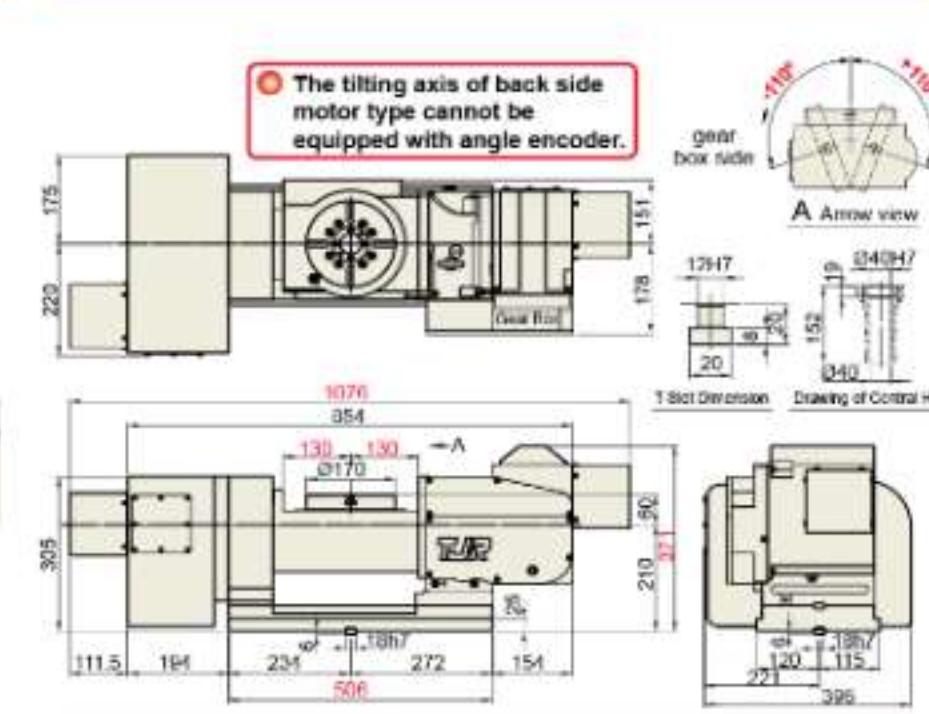


Installation of  
5C Chuck

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

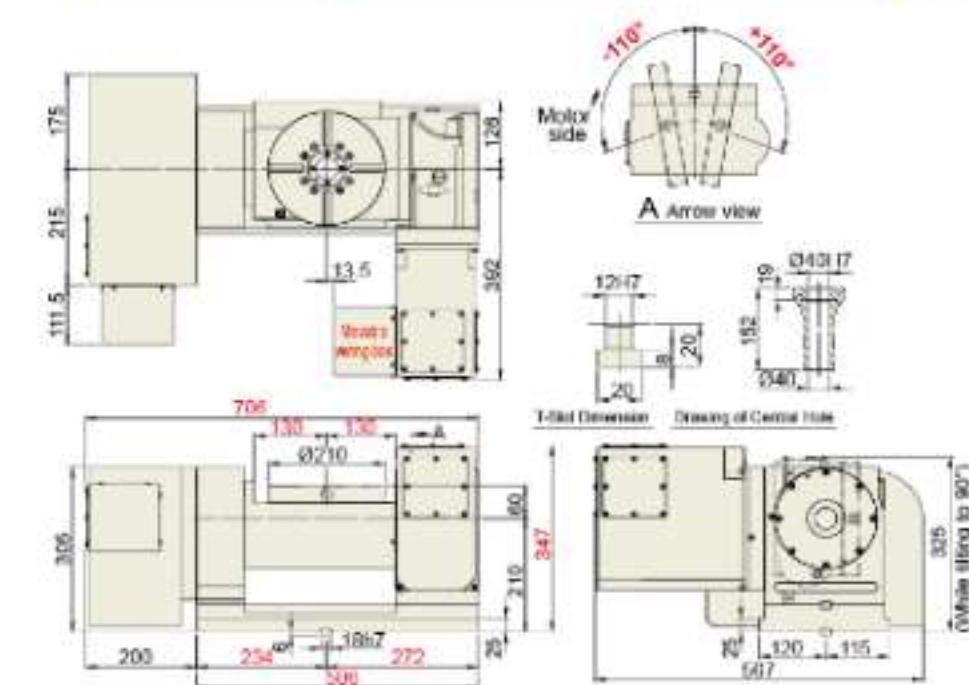


## FAR(s)-170B (Back side motor type)

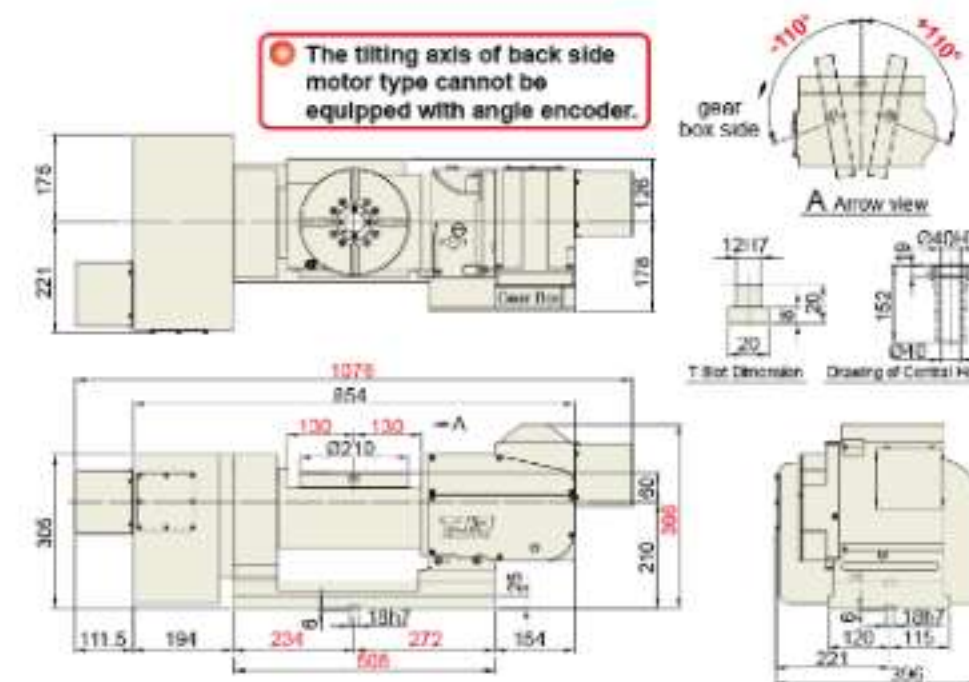


Remark: Please refer to Page 32 for the specification of FAR-170B

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



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



| Item / Model                                              |                        | Unit | FAR(s)-160SN (single-arm type)                 |                      | FAR(s)-210 (Standard type) |                       | FAR(s)-210B (Back side motor type) |                       |
|-----------------------------------------------------------|------------------------|------|------------------------------------------------|----------------------|----------------------------|-----------------------|------------------------------------|-----------------------|
| Table Diameter                                            | mm                     |      | Ø160                                           |                      | Ø210                       |                       | Ø210                               |                       |
| Inner Diameter of Mandrel Sleeve                          | mm                     |      | Ø35H7x30 deep (Diameter of Table Central Hole) |                      | Ø40H7                      |                       | Ø40H7                              |                       |
| Diameter of Center Through Hole                           | mm                     |      | Ø25                                            |                      | Ø40                        |                       | Ø40                                |                       |
| Table Height (Horizontal)                                 | mm                     |      | 230                                            |                      | 270                        |                       | 270                                |                       |
| Table T-slot Width                                        | mm                     |      | 12H7                                           |                      | 12H7                       |                       | 12H7                               |                       |
| Guide Block Width                                         | mm                     |      | 18h7                                           |                      | 18h7                       |                       | 18h7                               |                       |
| Axis                                                      | -                      |      | Rotation                                       | Tilt $\pm 110^\circ$ | Rotation                   | Tilt $\pm 100^\circ$  | Rotation                           | Tilt $\pm 100^\circ$  |
| Min. Increment                                            | deg.                   |      | 0.001                                          | 0.001                | 0.001                      | 0.001                 | 0.001                              | 0.001                 |
| Indexing Precision (while tilt $0^\circ \sim +90^\circ$ ) | sec.                   |      | 40                                             | 60                   | 20                         | 60 <sup>1</sup>       | 20                                 | 60 <sup>1</sup>       |
| Repeatability                                             | sec.                   |      | 6                                              | 8                    | 6                          | 8                     | 6                                  | 8                     |
| Clamping System (Pneumatic)                               | kgf/cm <sup>2</sup>    |      | Pne.5                                          | 35                   | 6                          | 6 / Hyd.35 (optional) | 6                                  | 6 / Hyd.35 (optional) |
| Clamping Torque                                           | kgf-m                  |      | 13                                             | 70                   | 31                         | 31 / Hyd.55           | 31                                 | 31 / Hyd.55           |
| Servo Motor Model                                         |                        |      | FANUC                                          | Taper/Straight shaft | ais4 / Bis4                | aiF8 / Bis8           | aiF4 / Bis8                        | aiF8 / ais12 / Bis12  |
|                                                           |                        |      | MITSUBISHI                                     | Taper/Straight shaft | HF-KP43JW04-S6 / HG-56     | HF/HG-154             | HG/HF-54/104                       | HG/HF-104             |
| Speed Reduction Ratio                                     | -                      |      | 1 : 60                                         | 1 : 120              | 1 : 90                     | 1 : 90                | 1 : 90                             | 1 : 90                |
| Max. Rotation Rate of Table (Calculate with FANUC Motor)  | r.p.m.                 |      | 44.4 *(33.3)                                   | 16.6 *(11.1)         | 33.3 *(33.3)               | 33.3 *(16.6)          | 33.3 *(33.3)                       | 33.3 *(16.6)          |
| Allowable Inertia Load Capacity (Horizontal)              | kg.cm.sec <sup>2</sup> |      | 0.8                                            |                      | 4.13                       |                       | 4.13                               |                       |
| Allowable Workpiece Load                                  | kg                     |      | 25                                             |                      | 75                         |                       | 75                                 |                       |
| Allowable Thrust Load (with Rotary Table Clamping)        | kgf                    |      | 600                                            |                      | 750                        |                       | 750                                |                       |
| Driving Torque (Rotary axis)                              | kgf-m                  |      | 25                                             |                      | Pne.31 / Hyd.55            |                       | Pne.31 / Hyd.55                    |                       |
| Net Weight (servo motor excluded)                         | kg                     |      | 13                                             |                      | 31                         |                       | 31                                 |                       |
|                                                           |                        |      | 9(3.7)                                         |                      | 18 *(14.6)                 |                       | 18 *(14.6)                         |                       |
|                                                           |                        |      | 116                                            |                      | 160                        |                       | 163                                |                       |

\*( ) Alloy Steel worm & gear series

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

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

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

### FHR Series Dual-axis dual-arm type (Hydraulic Brake) FHR(s)-255C/255CL FHR-320/320C

Alloy steel worm gear  
(Optional)

Supporting axis  
Rotary axis  
Tilting axis

▲ FHR-320  
(Standard type)

▲ FHR(s)-255CL  
(Extended cradle type)

▲ FHR-320C  
(Cradle type)

▲ Workpiece sample - 5 axis  
simultaneous contouring

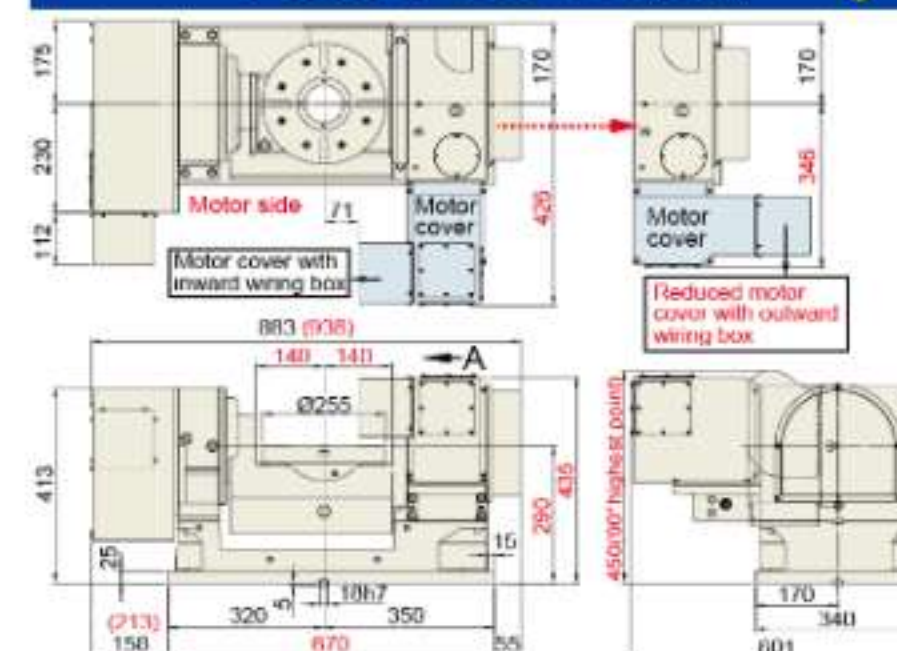
5  
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▲ FHR(s)-255C  
(Cradle type)

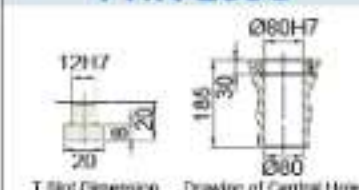
- Both the tilting axis and rotary axis use large-diameter radial & axial bearings.
- Because the tilting axis normally needs to bear heavy load, Japanese-made worm and worm gear are employed to improve wear resistance and precision of tilting axis. **standard component** (It's wear life is 2.6 times longer than aluminum bronze PBC3.)
- The tilting, supporting, and rotary axis are all equipped with the hydraulic-brake mechanisms. (Employing three independent hydraulic drum-brake systems)
- Max. tilting angle:  $\pm 110^{\circ}$
- Anti-wear alloy steel worm gear is optional

### FHR(s)-255C (Cradle type)

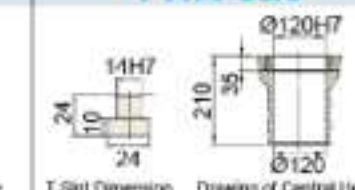


\* ( ) when Fanuc all motor is employed  
4-port rotary joint can be accommodated.

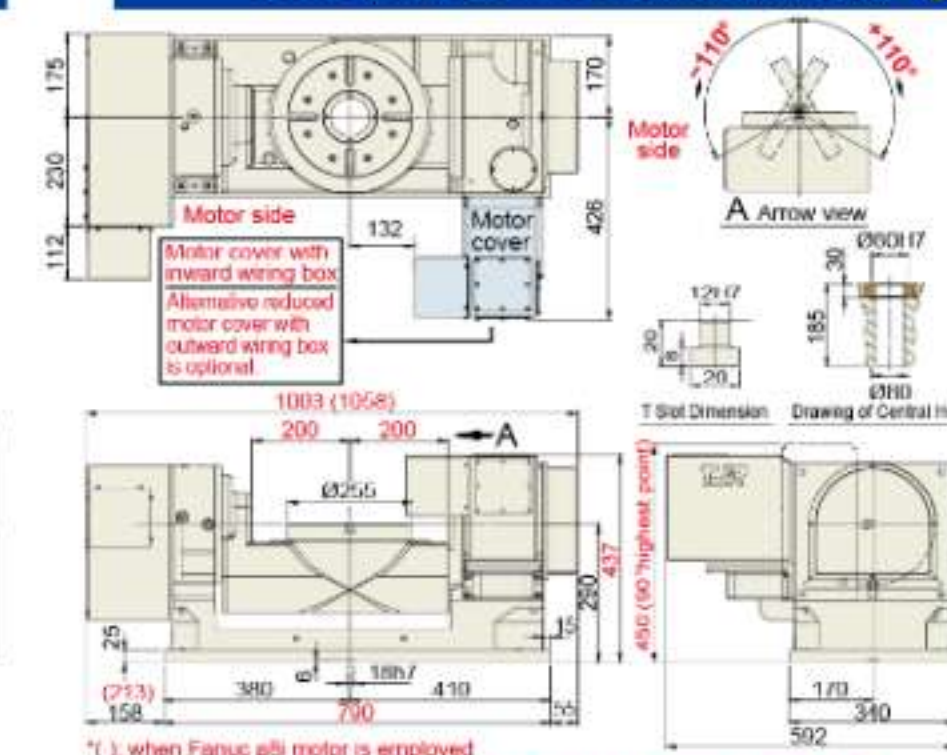
### FHR-255C



### FHR-320

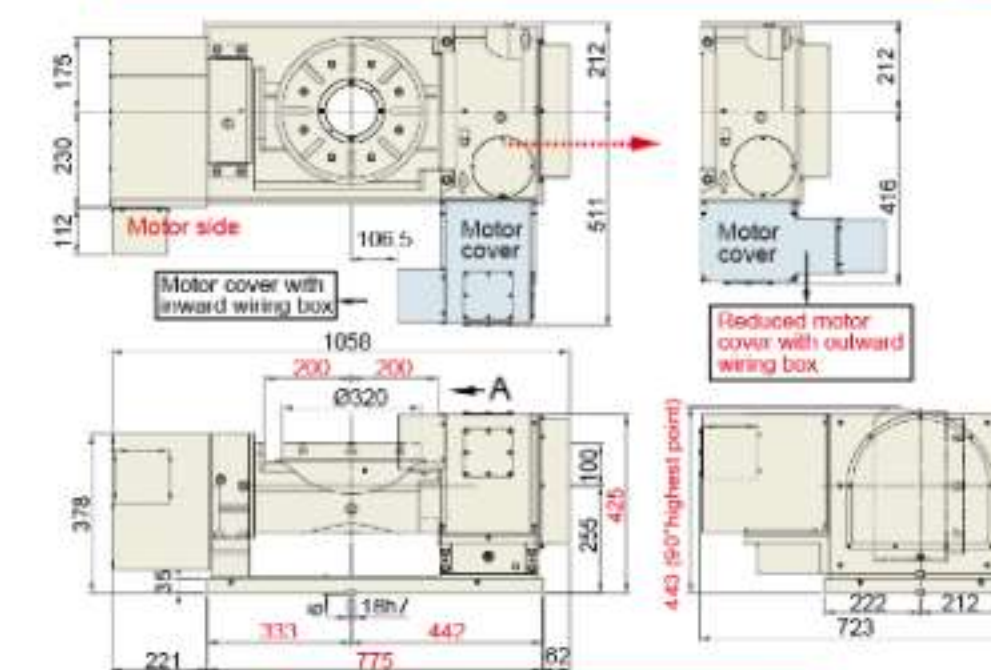


### FHR(s)-255CL (Extended cradle type)



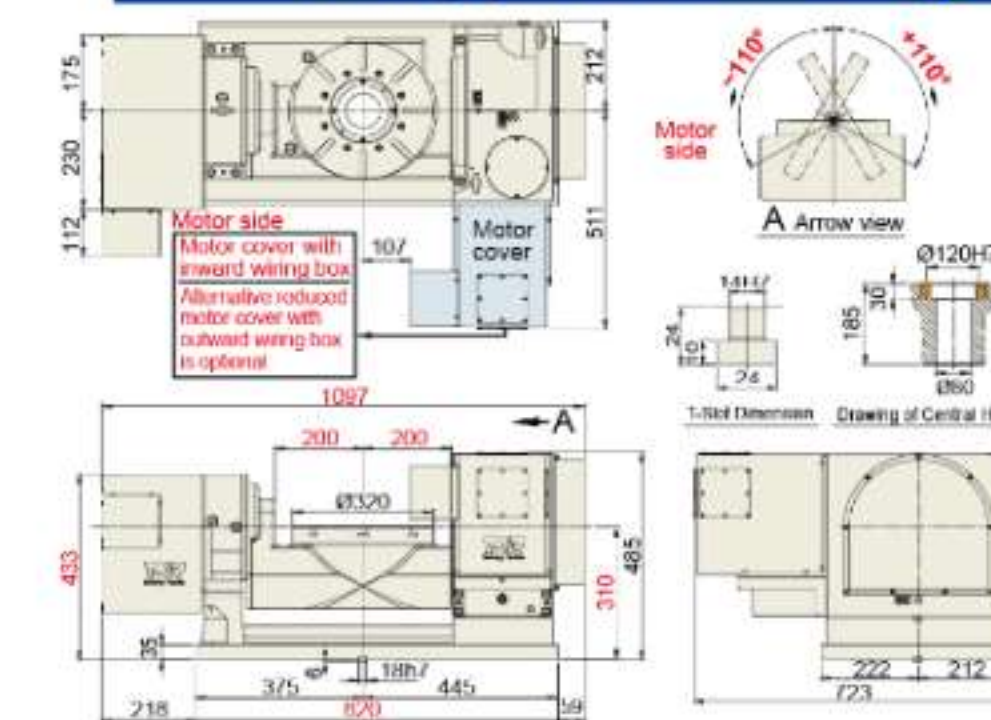
\* ( ) when Fanuc all motor is employed  
4-port rotary joint can be accommodated.

### FHR(s)-320 (Standard type)



6-port rotary joint can be accommodated.

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



4-port rotary joint can be accommodated.

| Item / Model                                                      |                        | Unit                 | FHR(s)-255C / 255CL                                             |                                                    | FHR-320 (Standard type)                            |                                        | FHR-320C (Cradle type)                             |                                        |
|-------------------------------------------------------------------|------------------------|----------------------|-----------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------|----------------------------------------|----------------------------------------------------|----------------------------------------|
| Table Diameter                                                    | mm                     |                      | Ø 255                                                           |                                                    | Ø 320                                              |                                        | Ø 320                                              |                                        |
| Diameter of Table Central Hole                                    | mm                     |                      | Ø 110                                                           |                                                    | Ø 150                                              |                                        | Ø 150                                              |                                        |
| Inner Diameter of Mandrel Sleeve                                  | mm                     |                      | Ø 80H7                                                          |                                                    | Ø 120H7                                            |                                        | Ø 120H7x30 deep                                    |                                        |
| Diameter of Center Through Hole                                   | mm                     |                      | Ø 80                                                            |                                                    | Ø 120                                              |                                        | Ø 80                                               |                                        |
| Table Height (Horizontal)                                         | mm                     |                      | 290                                                             |                                                    | 355                                                |                                        | 310                                                |                                        |
| Table T-slot Width                                                | mm                     |                      | 12H7                                                            |                                                    | 14H7                                               |                                        | 14H7                                               |                                        |
| Guide Block Width                                                 | mm                     |                      | 18h7                                                            |                                                    | 18h7                                               |                                        | 18h7                                               |                                        |
| Axis                                                              | -                      |                      | Rotation                                                        | Tilt $\pm 110^{\circ}$                             | Rotation                                           | Tilt $\pm 110^{\circ}$                 | Rotation                                           | Tilt $\pm 110^{\circ}$                 |
| Min. Increment                                                    | deg.                   |                      | 0.001                                                           | 0.001                                              | 0.001                                              | 0.001                                  | 0.001                                              | 0.001                                  |
| Indexing Precision (while tilt $0^{\circ} \sim +90^{\circ}$ )     | sec.                   |                      | 15                                                              | $60^{\circ}$                                       | 15                                                 | $50^{\circ}$                           | 15                                                 | $60^{\circ}$                           |
| 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                  |                      | 70                                                              | 140                                                | 115                                                | 175                                    | 70                                                 | 175                                    |
| Servo Motor Model                                                 | FANUC                  | Taper/Straight shaft | $\alpha$ F4 / $\alpha$ F8 / $\alpha$ is12 / $\beta$ is8 (Taper) | $\alpha$ F8 / $\alpha$ is12 / $\beta$ is12 (Taper) | $\alpha$ F8 / $\alpha$ is12 / $\beta$ is12 (Taper) | $\alpha$ F12 / $\beta$ is22 (Straight) | $\alpha$ F8 / $\alpha$ is12 / $\beta$ is12 (Taper) | $\alpha$ F12 / $\beta$ is22 (Straight) |
|                                                                   | MITSUBISHI             | Straight shaft       | HG/HF-104                                                       | HG/HF-154                                          | HG/HF-104                                          | HG/HF-204                              | HG/HF-104                                          | HG/HF-204                              |
| 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.                 |                      | 33.3 * (25)                                                     | 16.6 * (11.1)                                      | 25                                                 | 16.6                                   | 25                                                 | 16.6                                   |
| Allowable Inertia Load Capacity (Horizontal)                      | kg·cm·sec <sup>2</sup> |                      | 8.13                                                            |                                                    | 25.6                                               |                                        | 25.6                                               |                                        |
| Allowable Workpiece Load                                          | 0° Horizontal          | kg                   | 100                                                             |                                                    | 200                                                |                                        | 200                                                |                                        |
|                                                                   | 0°~90° Tilt            | kg                   | 75                                                              |                                                    | 150                                                |                                        | 100                                                |                                        |
| Allowable Thrust Load (with Rotary Table Clamping)                | F                      | kgf                  | 1500                                                            |                                                    | 1800                                               |                                        | 1800                                               |                                        |
|                                                                   | FxL                    | kgf·m                | 140                                                             |                                                    | 175                                                |                                        | 175                                                |                                        |
|                                                                   | FxL                    | kgf·m                | 70                                                              |                                                    | 115                                                |                                        | 70                                                 |                                        |
| Driving Torque (Rotary axis)                                      | kgf·m                  |                      | 55 * (31)                                                       |                                                    | 80                                                 |                                        | 55                                                 |                                        |
| Net Weight (servo motor excluded)                                 | kg                     |                      | 296 (Ø255C) / 312 (Ø255CL)                                      |                                                    | 470                                                |                                        | 489                                                |                                        |

\* ( ) 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.

★ 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 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)

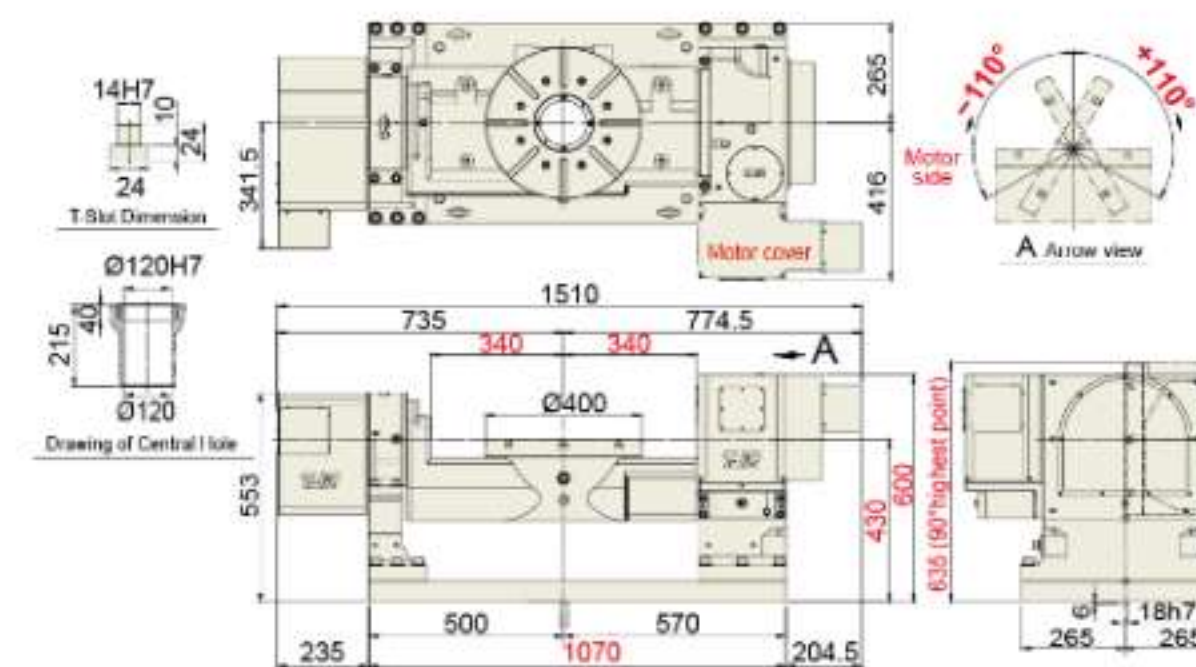
| Item / Model                                                  | Unit                   | FHR-400CF (Cradle type)    |                            | FHR-400C-540-HR400B (Cradle type) |           | FHR-401C-820-HR400B (Cradle type) |                         |
|---------------------------------------------------------------|------------------------|----------------------------|----------------------------|-----------------------------------|-----------|-----------------------------------|-------------------------|
| 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                   |                            | Rotation                          |           | Rotation                          |                         |
| Min. Increment                                                | deg.                   | 0.001                      |                            | 0.001                             |           | 0.001                             |                         |
| Indexing Precision (while tilt $0^{\circ} \sim +90^{\circ}$ ) | 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                               |           | 115                               |                         |
| Servo Motor                                                   | FANUC                  | Taper/Straight shaft       | αiF8/αis12/βis12(Straight) | αiF12/βis22(Straight)             | αis12     | αiF22                             | αiF8/αis12/βis12(Taper) |
| Model                                                         | 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                           |                         |
| Max. Rotation Rate of Table (Calculate with Fanuc α Motor)    | r.p.m                  | 25                         |                            | 25                                |           | 25                                |                         |
| Allowable Inertia Load Capacity (Horizontal)                  | kg.cm.sec <sup>2</sup> | 40                         |                            | 44                                |           | 44                                |                         |
| Allowable Workpiece Load                                      | kg                     | 200                        |                            | 220                               |           | 220                               |                         |
| Allowable Thrust                                              | kgf                    | 1800                       |                            | 1800                              |           | 1800                              |                         |
| Load (with Rotary Table Clamping)                             | kgf-m                  | 175                        |                            | 275                               |           | 275                               |                         |
| Driving Torque(Rotary axis)                                   | kgf-m                  | 80                         |                            | 80                                |           | 80                                |                         |
| Net Weight (servo motor excluded)                             | kg                     | 818                        |                            | 702                               |           | 958                               |                         |

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

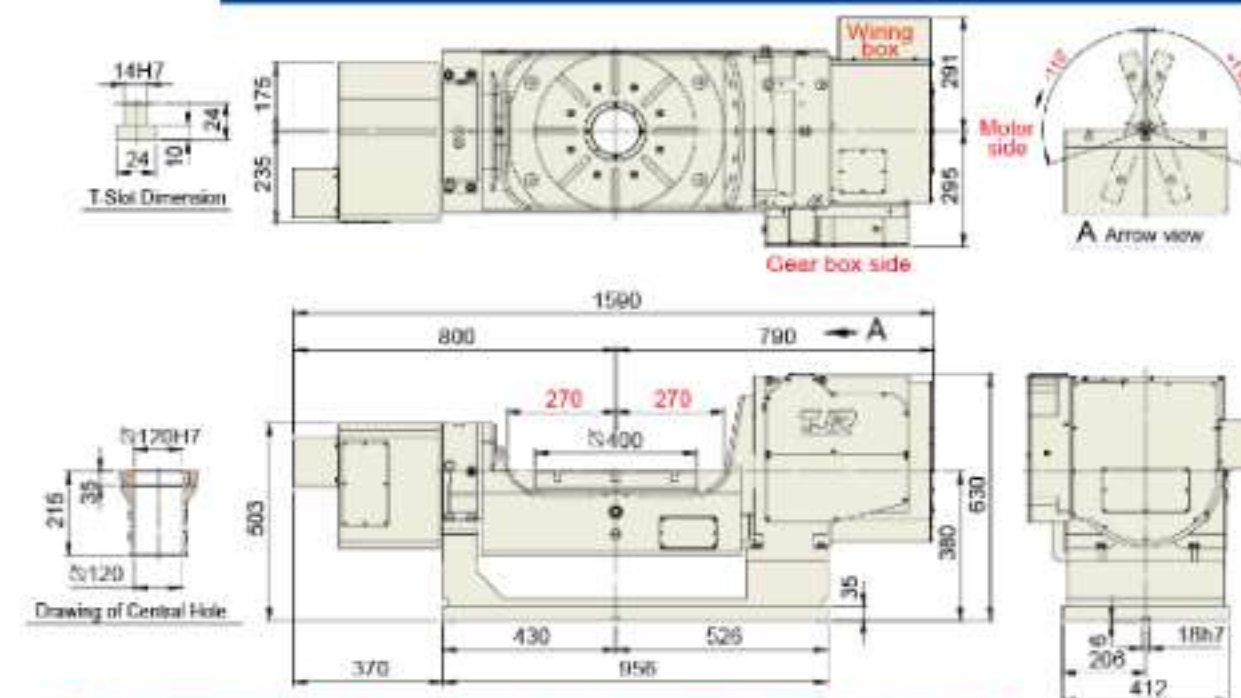
★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.

## FHR-400CF (Cradle type)

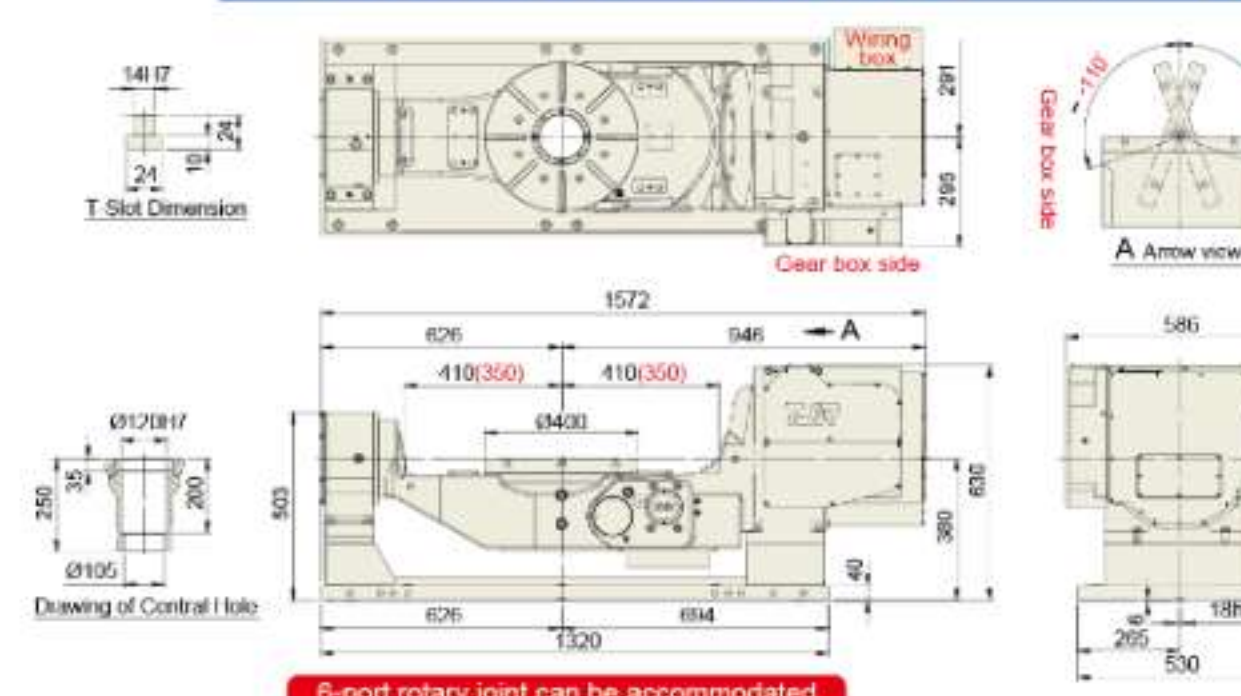
The model is recommended for workpiece made of light material such as aluminum or copper.



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



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



## 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)

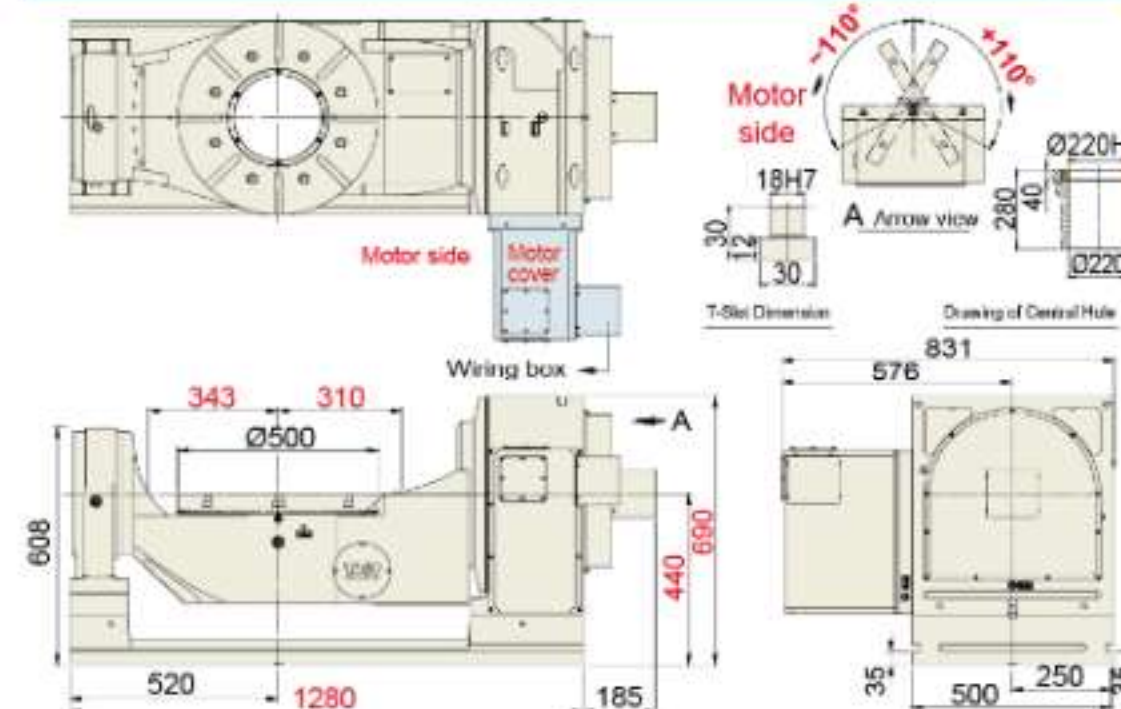


(pallet change type)

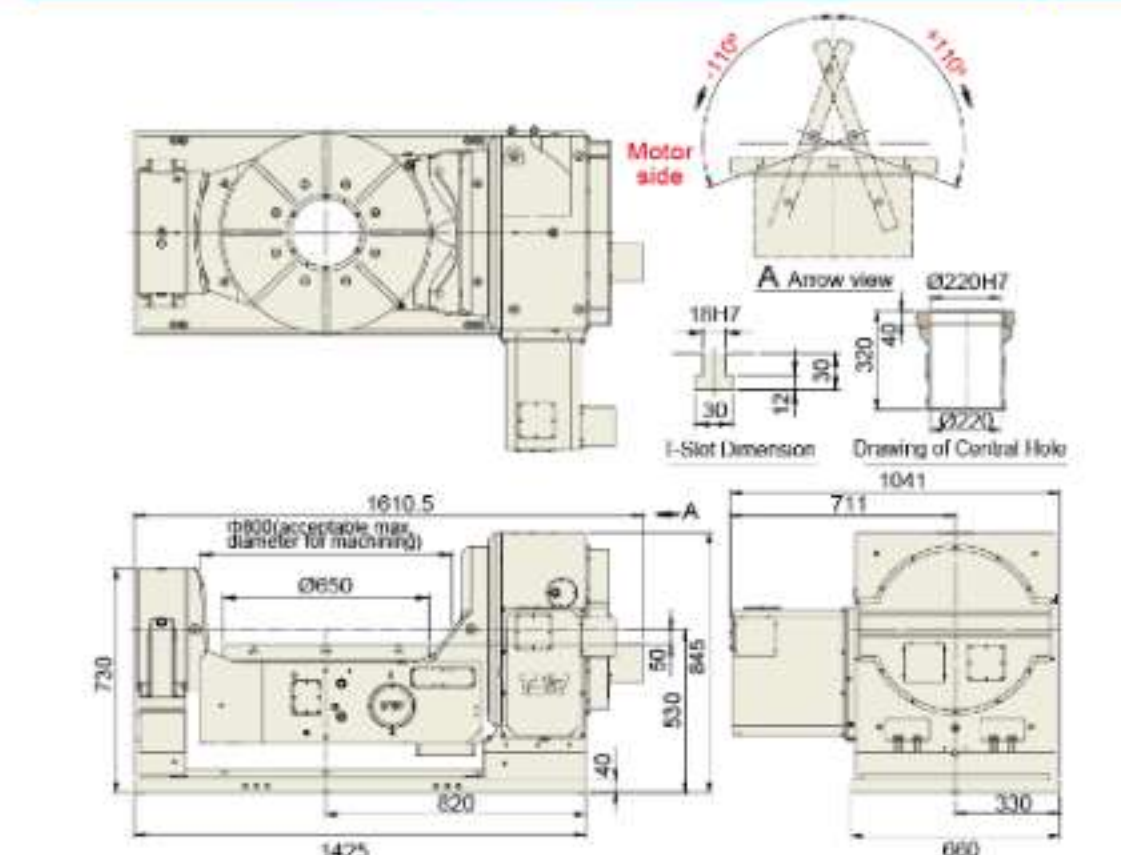


Artificial intelligence (AI) rotary table provides 4 foolproof functions to save your money and time.

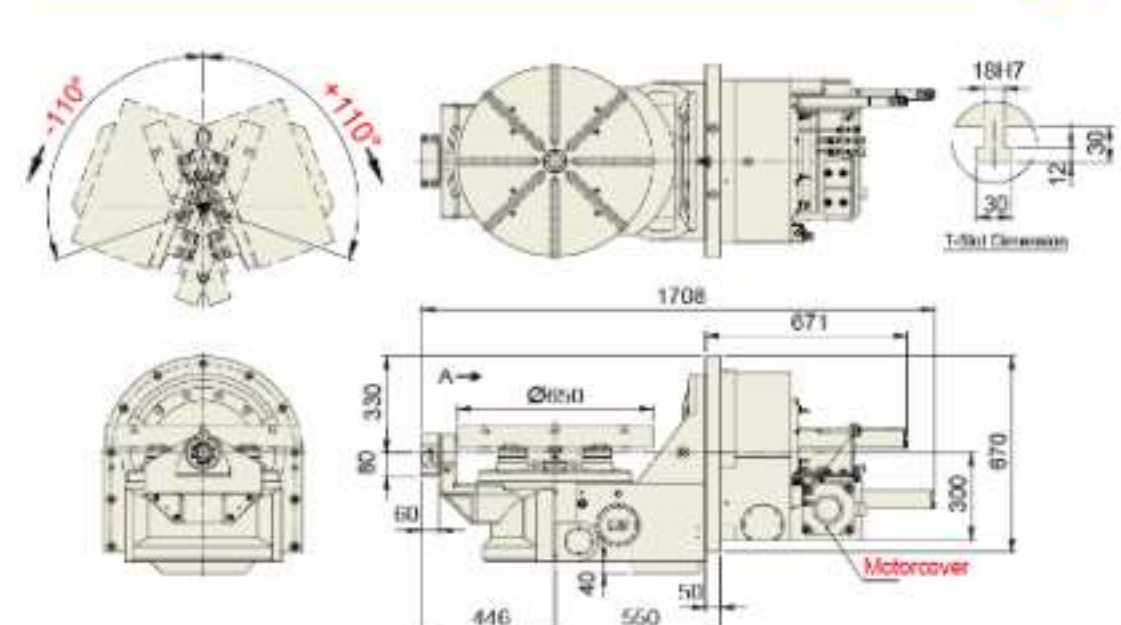
### FHR-500C (Dual-arm / Cradle type)



### 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                     | Ø500                            |                   | Ø650                            |                   | Ø650                                          |                   |
| Inner Diameter of Mandrel Sleeve                                                                                 |                                                                                                   | mm                     | Ø220H7                          |                   | Ø220H7                          |                   | Ø50H7x27 deep                                 |                   |
| Diameter of Center Through Hole                                                                                  |                                                                                                   | mm                     | Ø220                            |                   | Ø220                            |                   | -                                             |                   |
| Table Height (Horizontal)                                                                                        |                                                                                                   | mm                     | 440                             |                   | 480                             |                   | -                                             |                   |
| Table T-slot Width                                                                                               |                                                                                                   | mm                     | 18H7                            |                   | 18H7                            |                   | 18H7                                          |                   |
| Guide Block Width                                                                                                |                                                                                                   | mm                     | 18h7                            |                   | 18h7                            |                   | -                                             |                   |
| Axis                                                                                                             |                                                                                                   | -                      | Rotation                        | Tilt <b>±110°</b> | Rotation                        | Tilt <b>±110°</b> | Rotation                                      | Tilt <b>±110°</b> |
| Min. Increment                                                                                                   |                                                                                                   | deg.                   | 0.001                           | 0.001             | 0.001                           | 0.001             | 0.001                                         | 0.001             |
| Indexing Precision (while tilt 0°~+90°)                                                                          |                                                                                                   | sec.                   | 15                              | 60 <sup>*1</sup>  | 15                              | 60 <sup>*1</sup>  | 15*1                                          | 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                  | 370                             | 410               | 370                             | 800               | 370                                           | 500               |
| Servo Motor Model                                                                                                | FANUC                                                                                             | Straight shaft         | αiF12 / βis22                   | αiF22 / βis30     | αiF12                           | αiF30             | αiF12                                         | αiF40             |
|                                                                                                                  | MITSUBISHI                                                                                        | Straight shaft         | HG/HF-204                       | HG/HF-354         | HG/HF-204                       | HG/HF-703         | HG/HF-204                                     | HG/HF-703         |
| Speed Reduction Ratio                                                                                            |                                                                                                   | -                      | 1 : 120                         | 1 : 180           | 1 : 120                         | 1 : 180           | 1 : 120                                       | 1 : 150           |
| Max. Rotation Rate of Table (Calculate with Fanuc α Motor)                                                       |                                                                                                   | r.p.m                  | 25                              | 11.1              | 25                              | 11.1              | 25                                            | 13.3              |
| Allowable Inertia Load Capacity (Horizontal)                                                                     |                                                                                                   | kg.cm.sec <sup>2</sup> | 93.75                           |                   | 158.4                           |                   | 154.8                                         |                   |
| Allowable Workpiece Load                                                                                         | 0° Horizontal  | kg                     | 500                             |                   | 500                             |                   | 250                                           |                   |
|                                                                                                                  | 0°~90°Tilt     | kg                     | 300                             |                   | 400                             |                   | 250                                           |                   |
| Allowable Thrust Load (with Rotary Table Clamping)                                                               | F              | kgf                    | 3000                            |                   | 3200                            |                   | -                                             |                   |
|                                                                                                                  | FxL            | kgf-m                  | 410                             |                   | 800                             |                   | 500                                           |                   |
|                                                                                                                  | FyL            | kgf-m                  | 370                             |                   | 370                             |                   | 370                                           |                   |
| Driving Torque (Rotary axis)  |                                                                                                   | kgf-m                  | 250                             |                   | 250                             |                   | 250                                           |                   |
| Net Weight (servo motor excluded)                                                                                |                                                                                                   | kg                     | 1091                            |                   | 1867                            |                   | 1434 (including 2 pallets)                    |                   |

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

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

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

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

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

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

**FHR-400S**

**FHR-650S-525**

**FHR-650S-550**



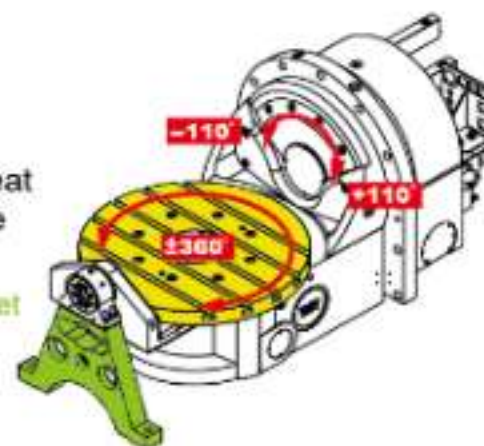
**FHR-400S** ▲



▲ **FHR-650S-525**

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

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



| Item / Model                                                  |                        | Unit           | FHR-400S        |                        | FHR-650S-525 / 550 |                        |
|---------------------------------------------------------------|------------------------|----------------|-----------------|------------------------|--------------------|------------------------|
| Table Diameter                                                | mm                     |                | Ø 400           |                        | Ø 650              |                        |
| Inner Diameter of Mandrel Sleeve                              | mm                     |                | Ø 120H7x35 deep |                        | -                  |                        |
| Diameter of Center Through Hole                               | mm                     |                | Ø 105           |                        | -                  |                        |
| Table Height (Horizontal)                                     | mm                     |                | -               |                        | -                  |                        |
| Table T-slot Width                                            | mm                     |                | 14H7            |                        | 18H7               |                        |
| Guide Block Width                                             | mm                     |                | -               |                        | -                  |                        |
| Axis                                                          | -                      |                | Rotation        | Tilt $\pm 110^{\circ}$ | 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 o 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                |                        |
|                                                               | FxL                    | kgf-m          | 115             |                        | 370                |                        |
| Driving Torque (Rotary axis)                                  | kgf-m                  |                | 80              |                        | 250                |                        |
| Net Weight (servo motor excluded)                             | kg                     |                | 482             |                        | 1120               |                        |

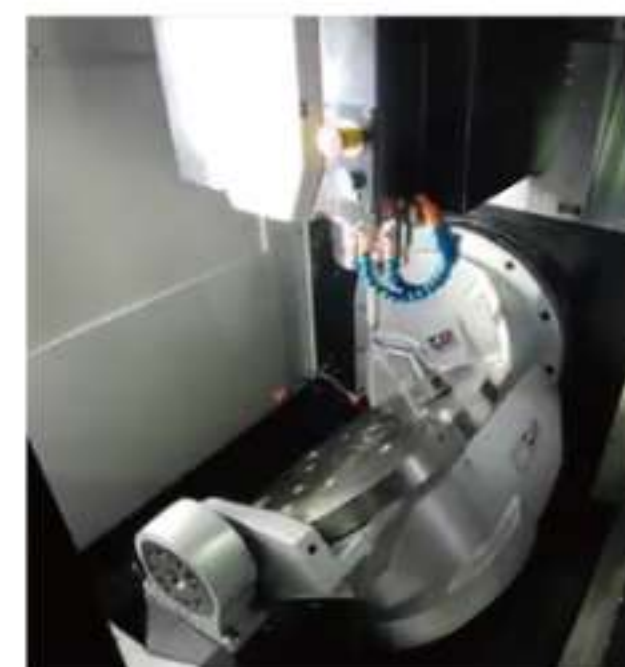
\*1. Indexing precision can be better after installing an additional angle encoder.

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

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

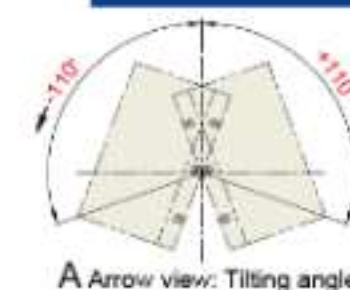


▲ **FHR-650S-550**

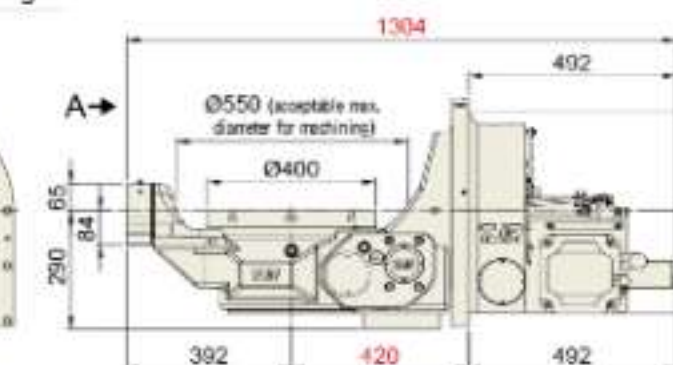
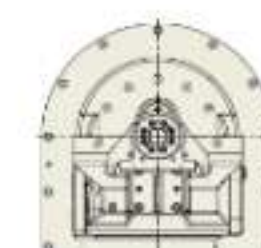
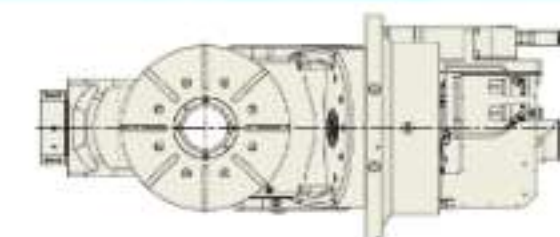


Please see page 57 & 58  
for FHR-350F-2W-RC320-2A

### FHR-400S

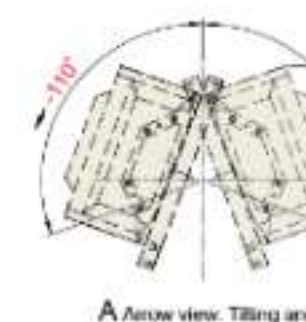


A Arrow view: Tilting angle



Drawing of Central Hole

### FHR-650S-525 (Dual-axis single-arm type (Hydraulic Brake))



A Arrow view: Tilting angle

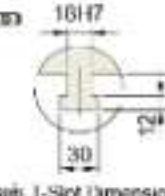
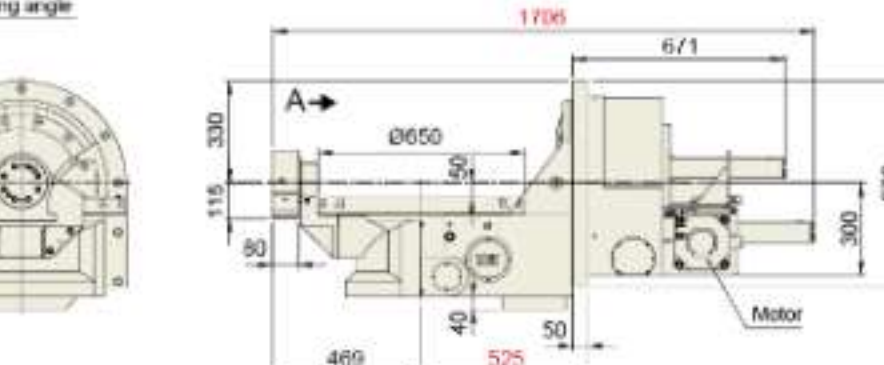
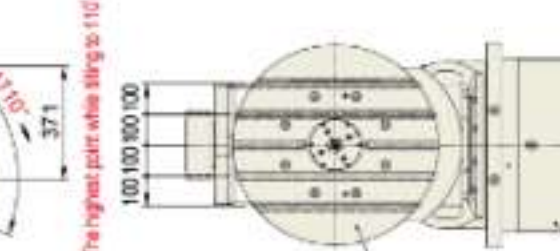


Table (C axis)

Motor body of tilting axis (B axis)

T-Slot Dimension

### FHR-650S-550 (Dual-axis single-arm type (Hydraulic Brake))



A Arrow view: Tilting angle

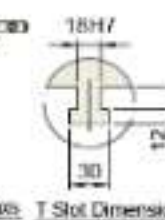
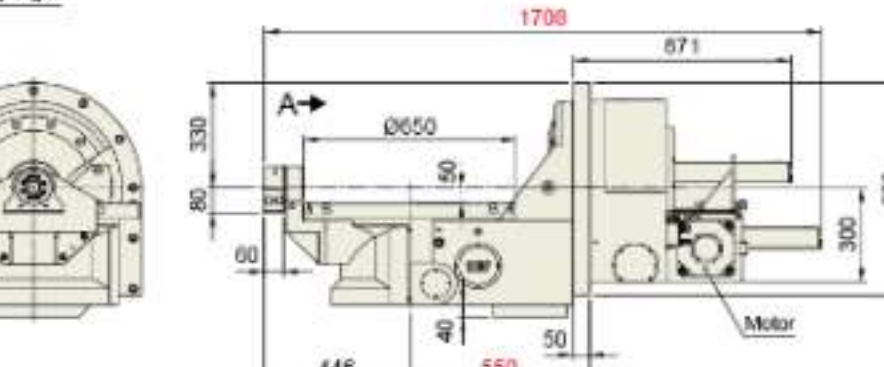
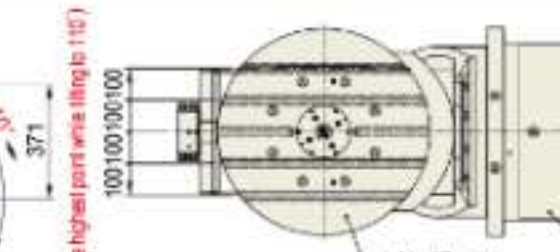


Table (C axis)

Motor body of tilting axis (B axis)

T-Slot Dimension

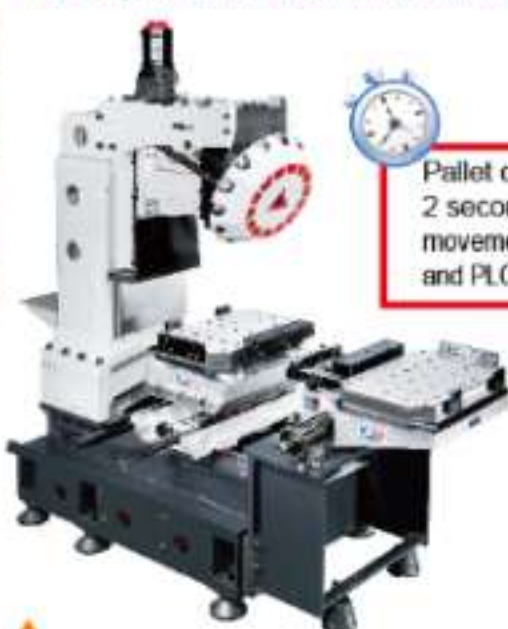
## CURC series

(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          | HG-224                       |
| 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                          |

**A living legend**  
create a surprising exchange mechanism

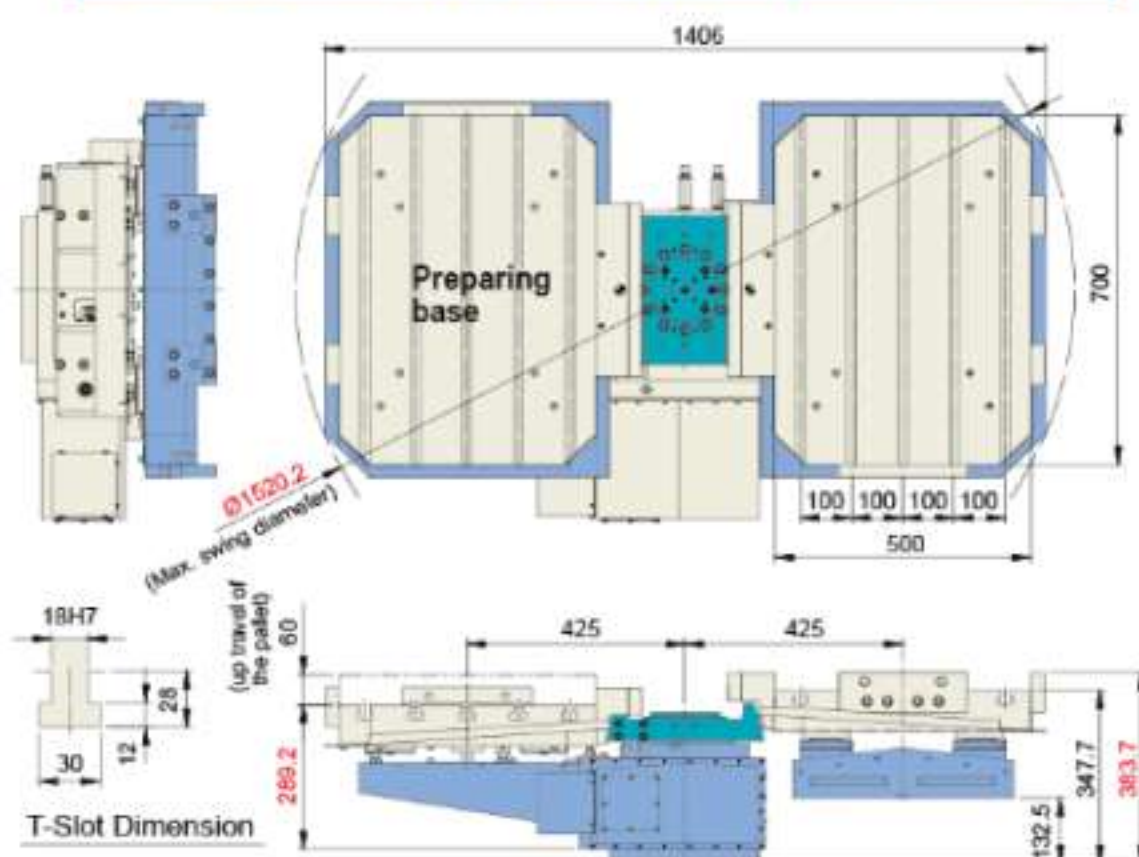
Auto pallet changer chapter

Beyond the rotational inertia  
Reach unimaginable stability



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

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



## CTU series

(Hook type auto pallet changer)

**CTU-400x600 / 500x700**

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

For C type vertical machining center or drilling & tapping center

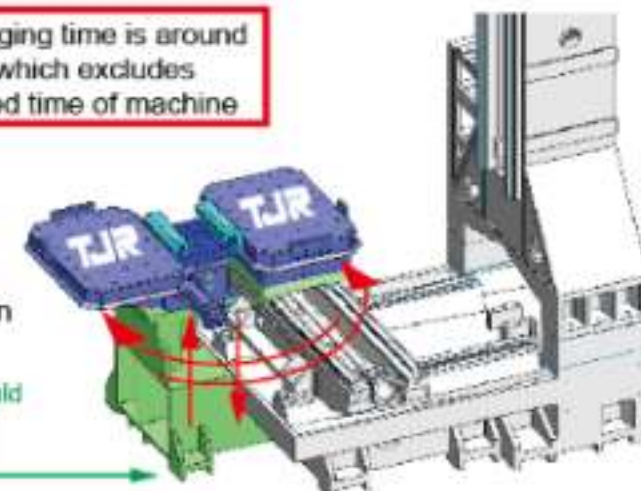


**▲ CTU-500x700 (hook type APC)**

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

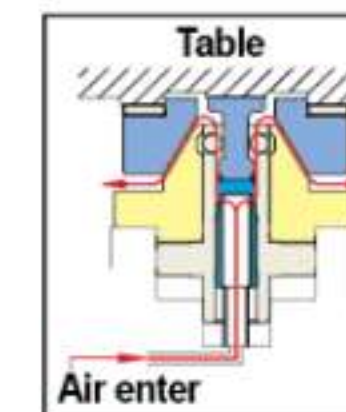
The location of CTU can vary, depending on the machine design & dimensions.

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



**▲ Application diagram: retrofits vertical machining center with CTU**

| Item / Model                                                | Unit                | CTU-400x600              | CTU-500x700              |
|-------------------------------------------------------------|---------------------|--------------------------|--------------------------|
| Lift-up mechanism                                           | -                   | Hook type (U type)       | Hook type (U type)       |
| Table size                                                  | mm                  | □ 400 x 600              | □ 500 x 700              |
| Rotation method                                             | -                   | Hydraulic hirth coupling | Hydraulic hirth coupling |
| Rotation angle                                              | deg.                | 180° to and fro          | 180° to and fro          |
| Clamping System (Hydraulic)                                 | kgf/cm <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             | 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                     |                          |



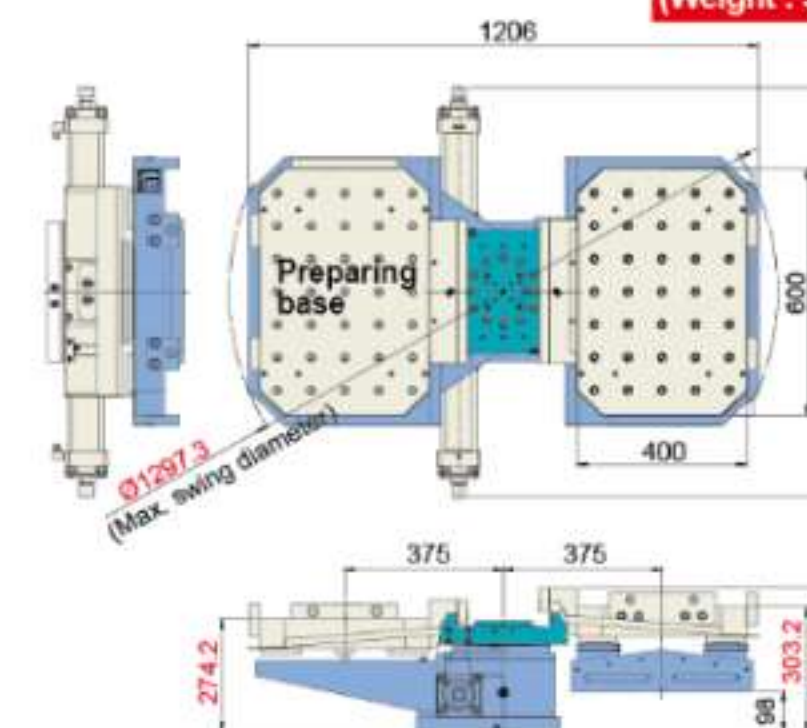
**▲ The function of cones :**  
① Precise positioning  
② Air blast for chip removal  
③ Airtight testing



**▲ Cones:**  
Powerful hydraulic clamping

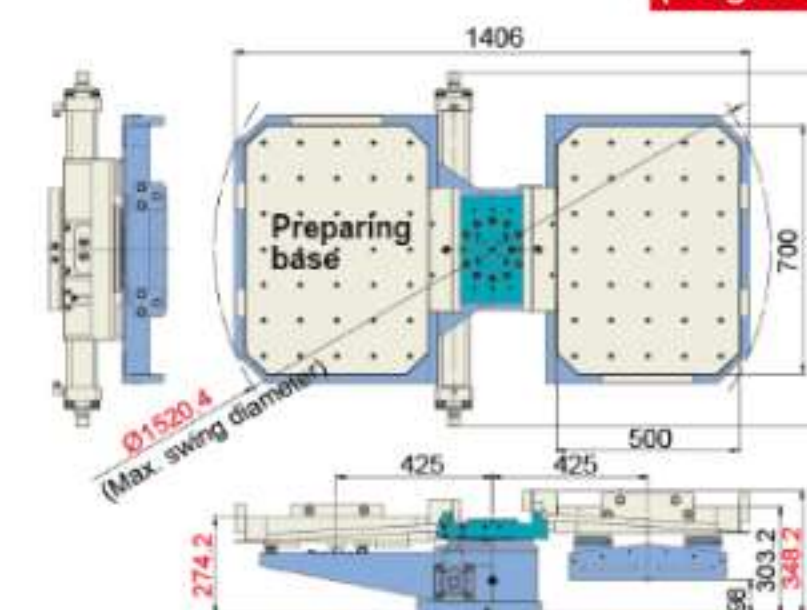
**CTU-400x600** (The type of hook plate fixed on the exchanging mechanism.)

(Weight : 530kg)



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

(Weight : 603kg)

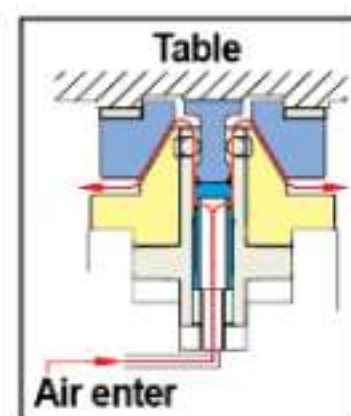


## CHI/CHR Series

(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)



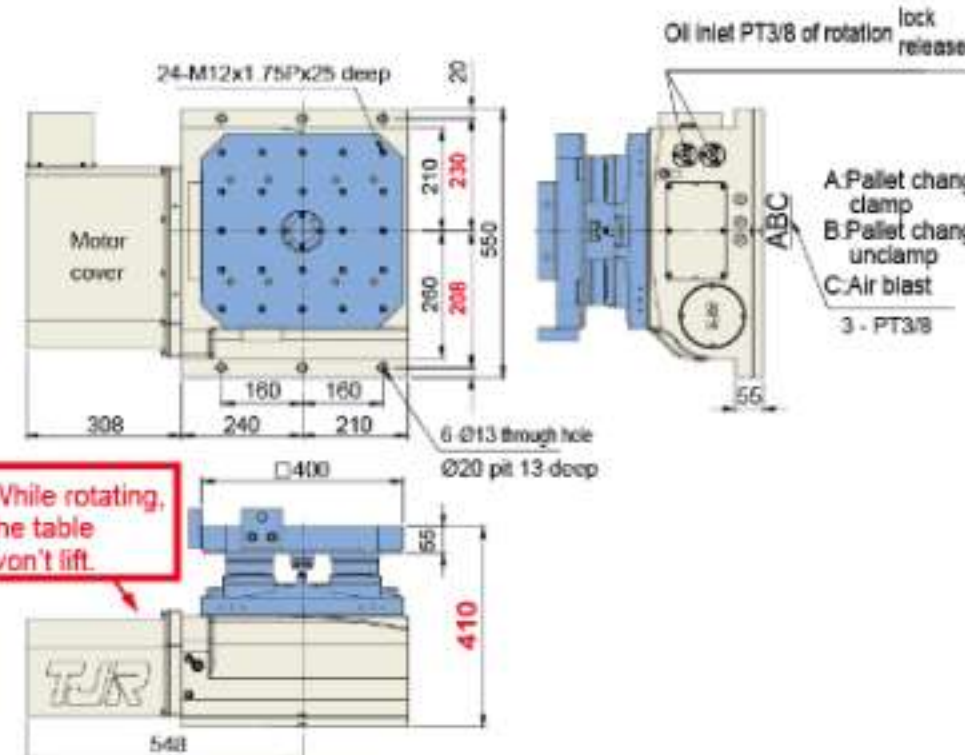
▲ **CHI Series :**  
Use **three-piece** clutch plate

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



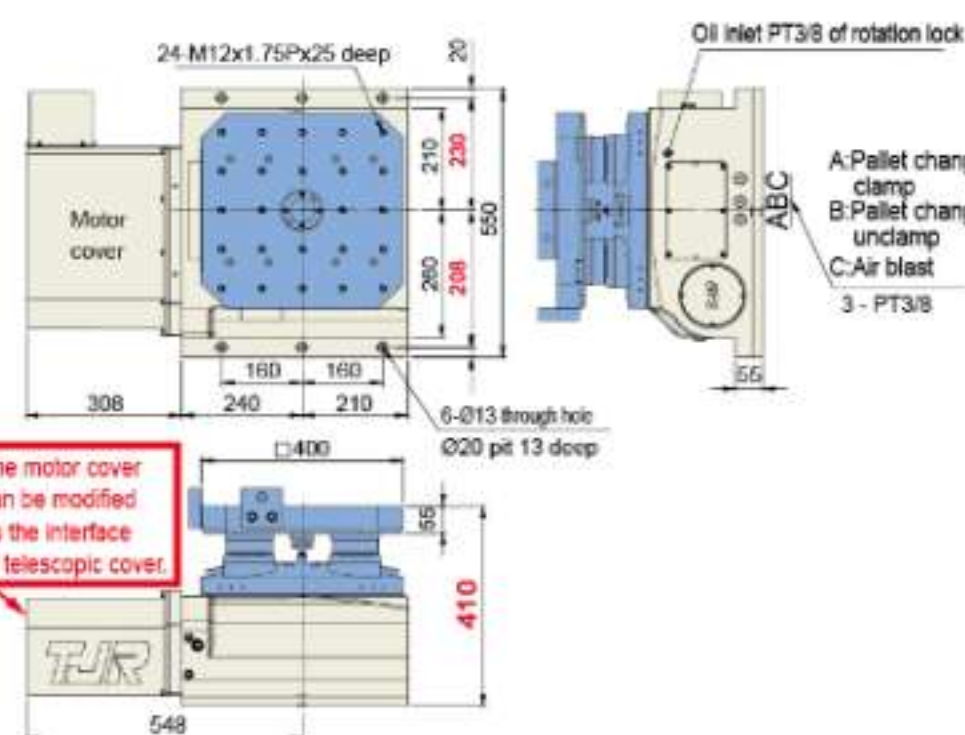
▲ **CHR series :**  
Use **large-diameter radial & axial bearings**

**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.

## CTH Series

(Tray type auto pallet changer)

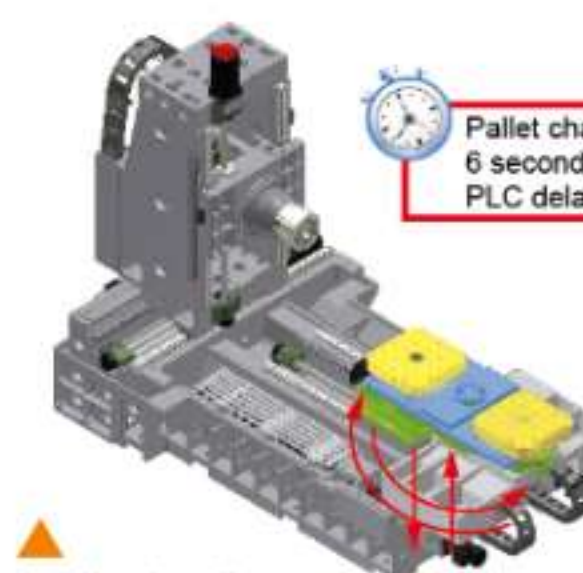
**CTH-400** (Go with CHI/CHR series)

For horizontal machining center

(180° to and fro)



▲ **CTH-400** (Tray type APC)



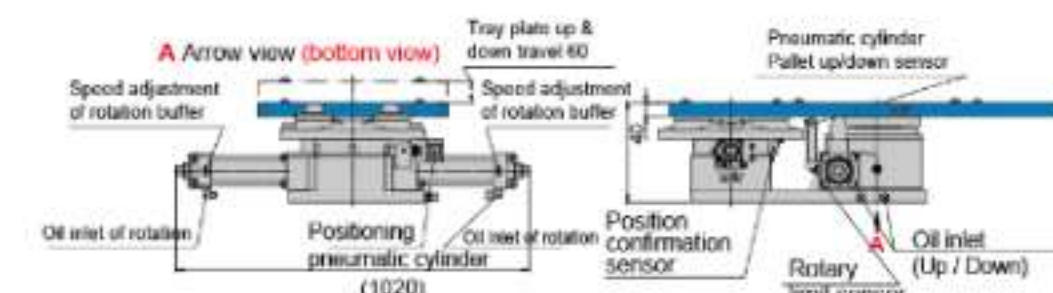
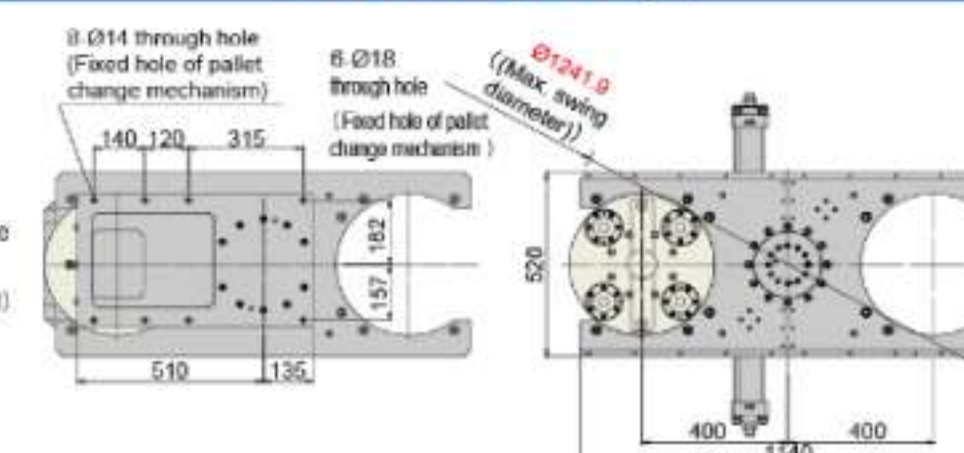
Application diagram:  
retrofits horizontal machining center with CTH+ CHI

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



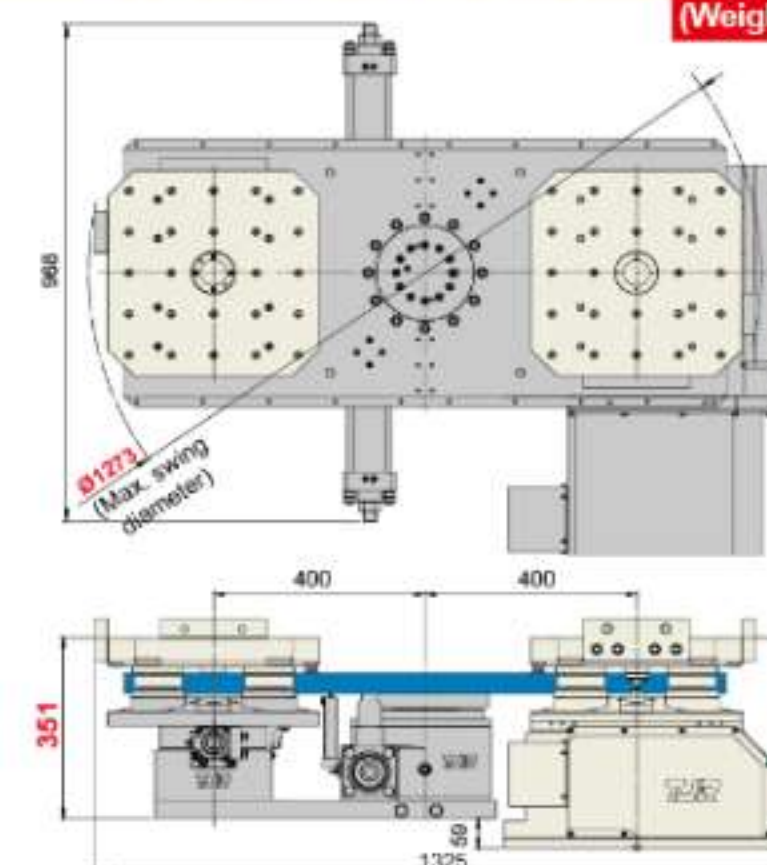
▲ **CTH-400 + CHI-400**  
Tray type APC + Dual pallets rotary table  
(Flat bottom type)

**CTH-400** (Pallet changer)



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

(Weight : 335kg)



| Item / Model                                               | Unit                | 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.                | $\pm 5$       | 15            |
| Repeatability                                              | sec.                | $\pm 1$       | 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                                                      | Straight shaft      | αiF12 / βis22 | αiF12 / βis22 |
| MITSUBISHI                                                 | without key         | HG/HF-204     | HG/HF-204     |
| Speed Reduction Ratio                                      | -                   | 1 : 120       | 1 : 120       |
| Max. Rotation Rate of Table (Calculate with Fanuc a Motor) | r.p.m               | 25            | 25            |
| Allowable Workpiece Load                                   | kg                  | 400           | 400           |
| Driving Torque                                             | kgf.m               | -             | 170           |
| Net Weight (servo motor excluded)                          | kg                  | 410           | -             |

| 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                     |

## 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)

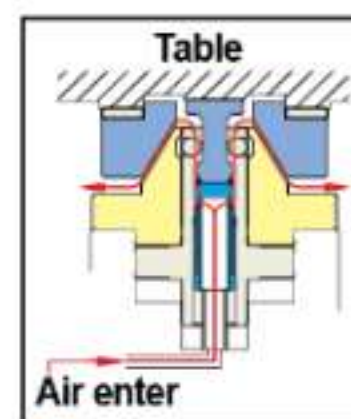


▲ **CHI Series :**  
Use **three-piece** clutch plate

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**

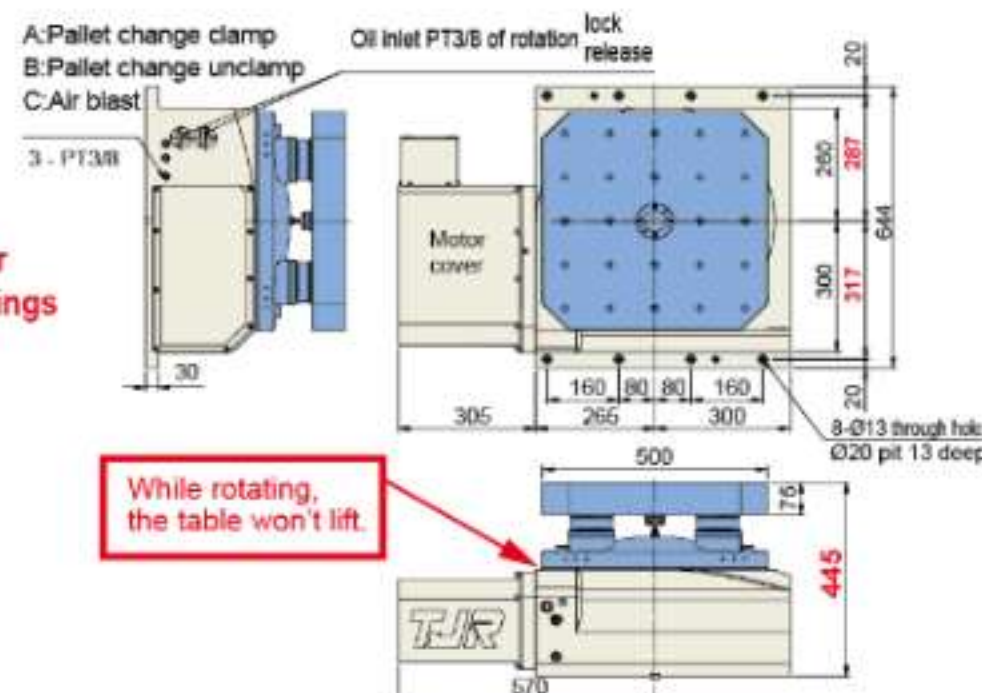


The function of cones :  
① Precise positioning  
② Air blast for chip removal  
③ Airtight testing

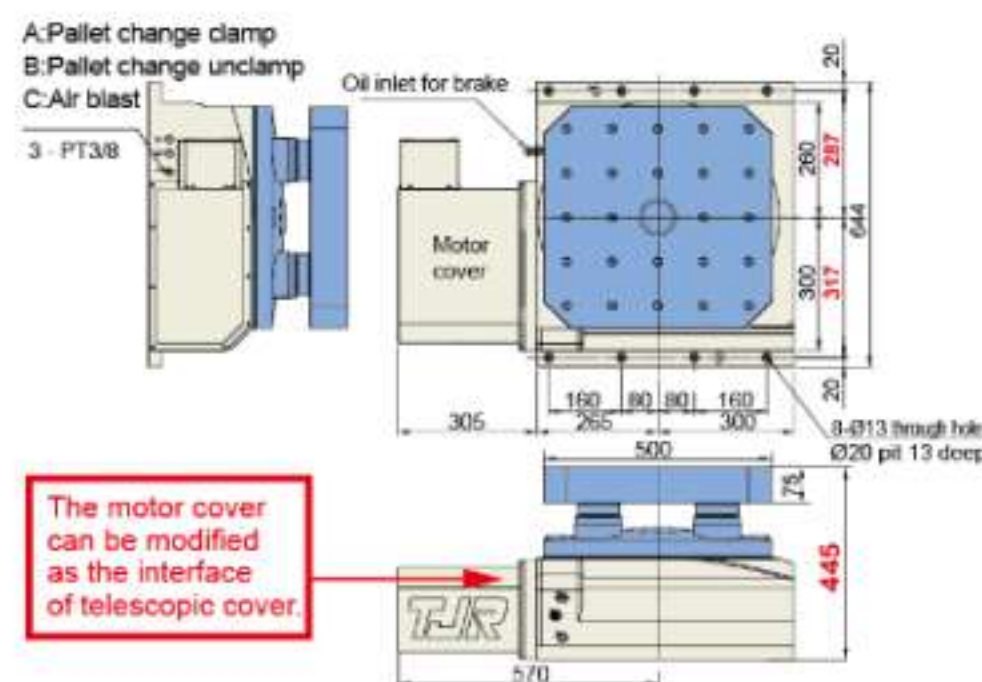


▲ **Cones:**  
Powerful hydraulic clamping

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



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



| 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                                           | Straight shaft without key | pis22                     | oilF12 / pis22 |
| Speed Reduction Ratio                                       | -                          | 1 : 180                   | 1 : 180        |
| Max. Rotation Rate of Table (Calculate with Fanuc or Motor) | r.p.m                      | 16.6                      | 16.6           |
| Allowable Workpiece Load                                    | kg                         | 600                       | 600            |
| Driving Torque                                              | kgf-m                      | -                         | 250            |
| Net Weight (servo motor excluded)                           | kg                         | 716 (including 2 pallets) | -              |

## CTH Series

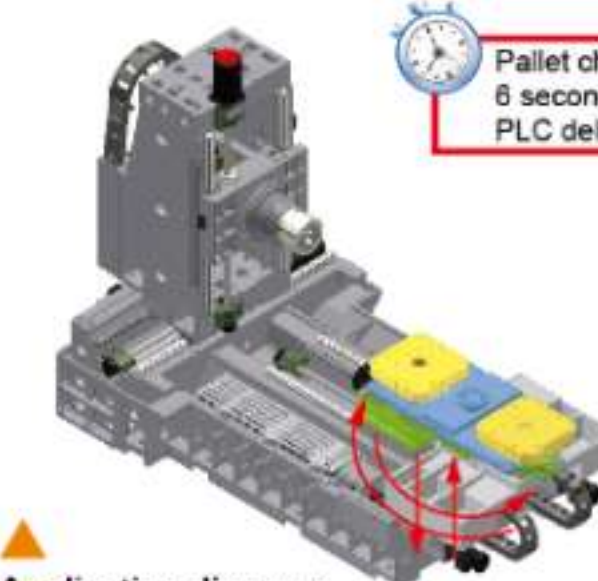
(Tray type auto pallet changer)

**CTH-500** (Go with CHI/CHR series)

For horizontal machining center  
(180° to and fro)



▲ **CTH-500** (Tray type APC)



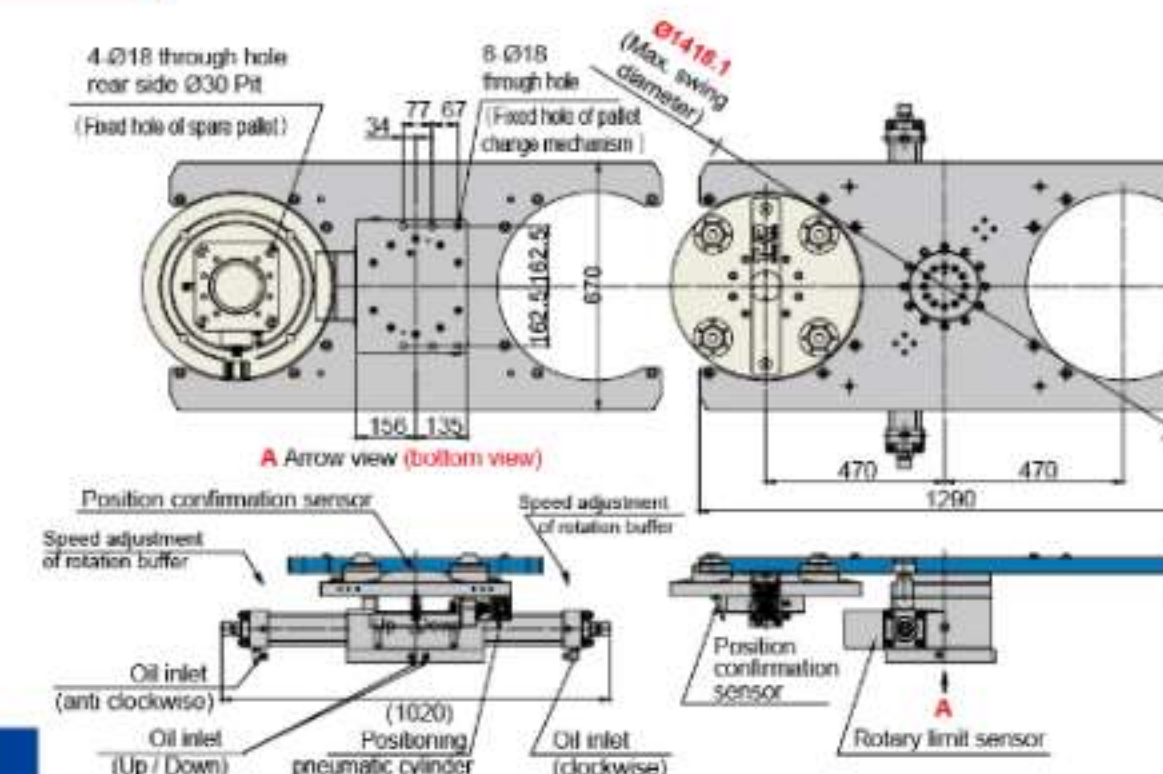
Application diagram:  
retrofits horizontal machining center with CTH+ CHI

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



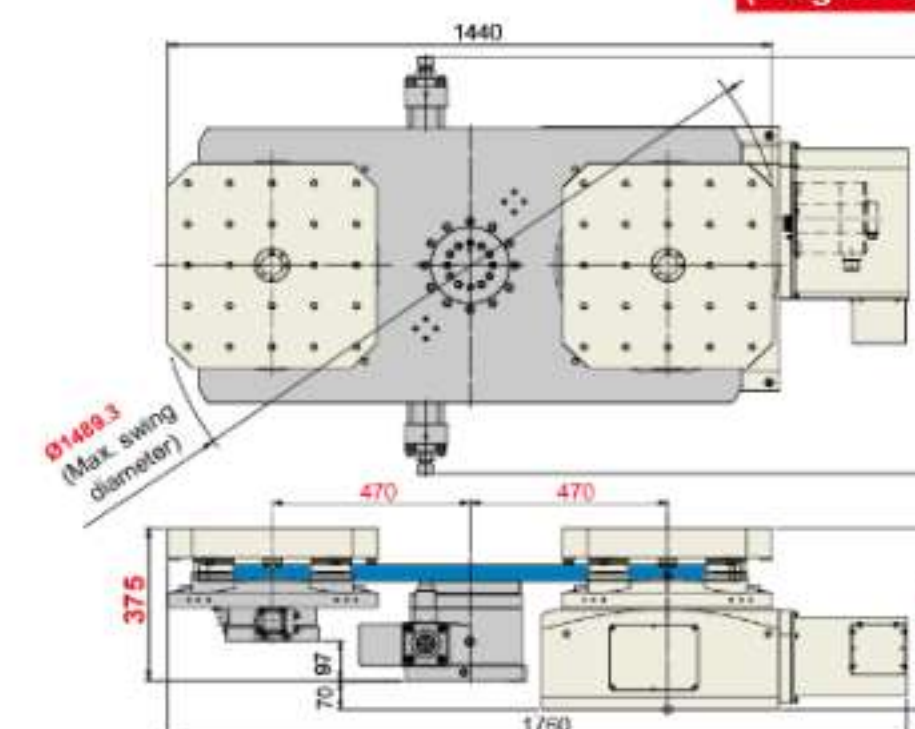
▲ **CTH-500 + CHI-500**  
Tray type APC + Dual pallets rotary table  
(Flat bottom type)

### CTH-500 (Pallet changer)



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

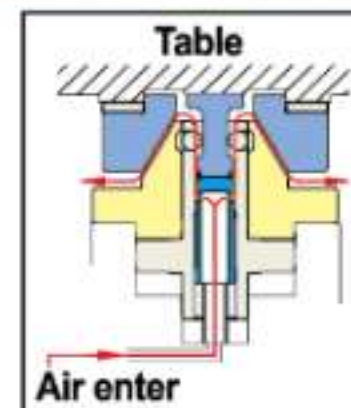
(Weight : 400kg)



| Item / Model                                             | Unit                | CTH-500                  |
|----------------------------------------------------------|---------------------|--------------------------|
| Lift-up mechanism                                        | -                   | Tray type ( H type )     |
| Table size                                               | mm                  | 670 x 1290               |
| Rotation method                                          | -                   | Hydraulic hirth coupling |
| Rotation angle                                           | deg.                | 180° to and fro          |
| Clamping System (Hydraulic)                              | kgf/cm <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               |
| Inspection accuracy                                      |                     |                          |
| Repeatability accuracy on positioning of the same pallet | mm                  | 0.01                     |
| Max. positioning tolerance for 2 pallets                 | mm                  | 0.02                     |
| Parallelism of pallet top and base bottom                | mm                  | 0.02                     |

## CHI/CHR Series (Dual pallets rotary table)

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



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



Cones:  
 Powerful hydraulic clamping

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

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

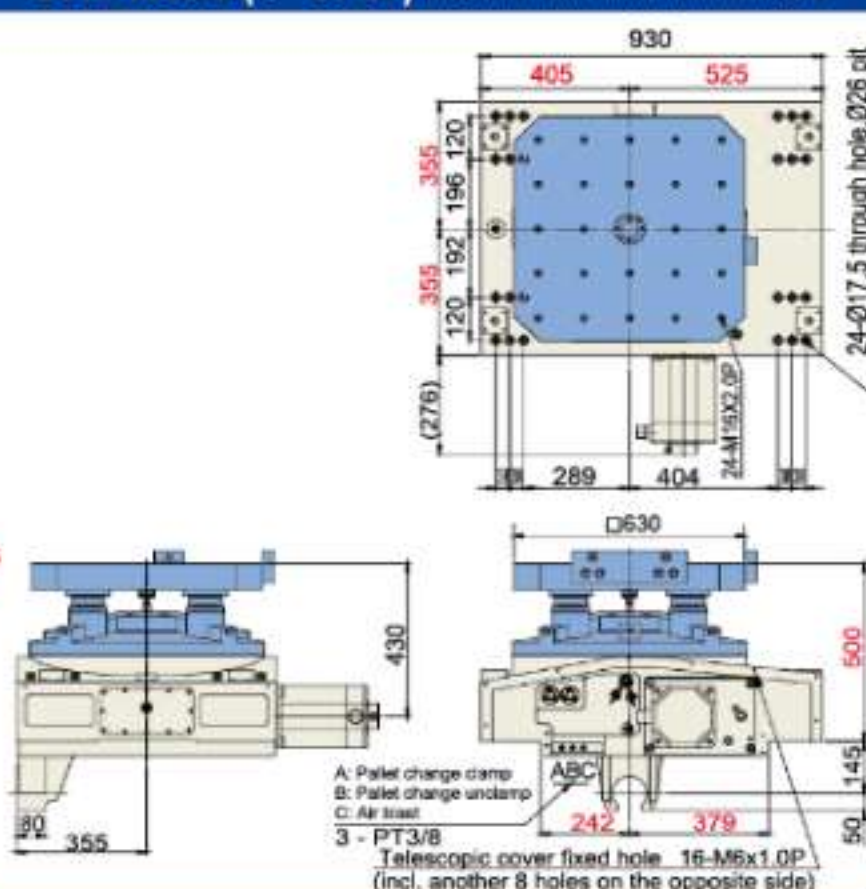


▲ **CHI Series :**  
 Use **three-piece** clutch plate

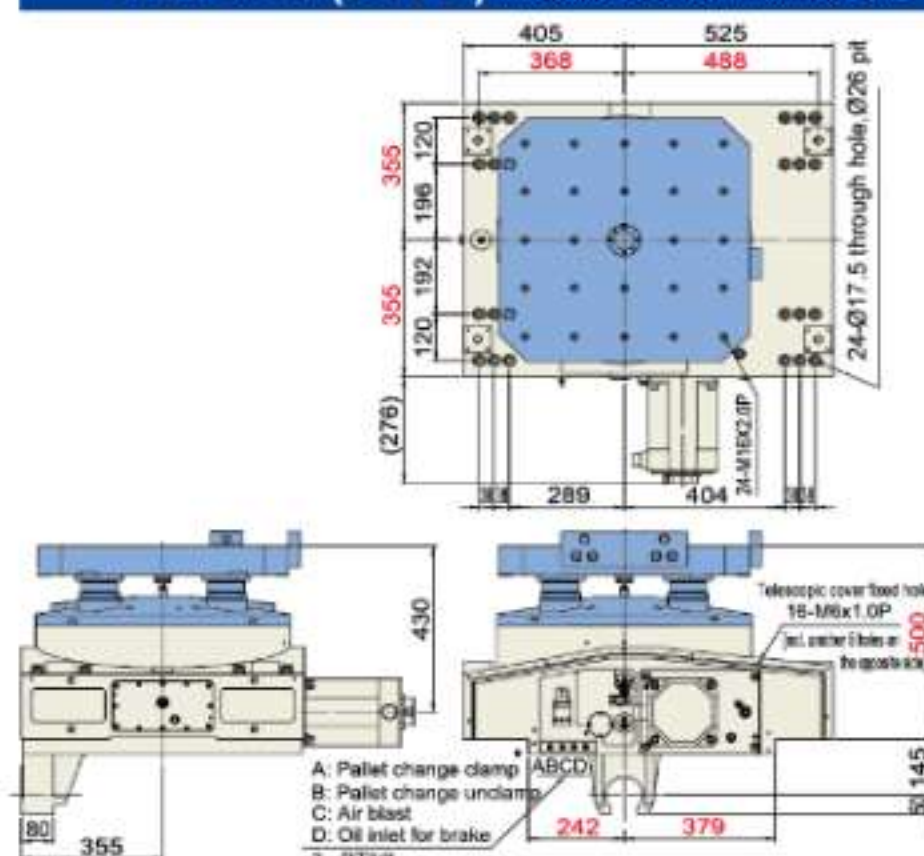
Function: ① Accuracy:  $\pm 5$  seconds  
 ② Rotate **without lifting the table** to prevent table from water and particles.



▲ **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                  | Ø50x27 deep | Ø50x27 deep   |
| Table height                                                | mm                  | 500         | 500           |
| Table T-slot Width                                          | mm                  | -           | -             |
| Guide Block Width                                           | mm                  | -           | -             |
| Min. Increment                                              | deg.                | 1 or 5      | 0.001         |
| Indexing Precision                                          | sec.                | $\pm 5$     | 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                                                       | Straight shaft      | βis22       | αiF22 / βis22 |
| MITSUBISHI                                                  | without key         | HG/HF-204   | HG/HF-204     |
| Speed Reduction Ratio                                       | -                   | 1 - 180     | 1 - 180       |
| Max. Rotation Rate of Table (Calculate with Fanuc's 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        | -             |

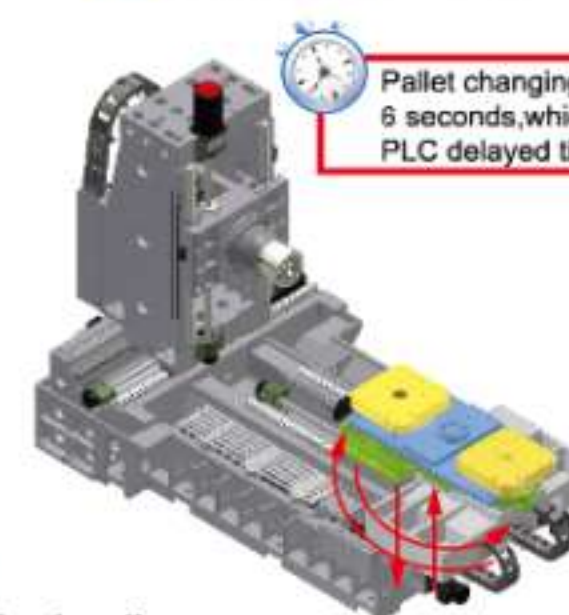
## CTH Series (Tray type auto pallet changer)

**CTH-630** (Go with CHI/CHR series)

For horizontal machining center  
 (180° to and fro)



▲ **CTH-630 (Tray type APC)**



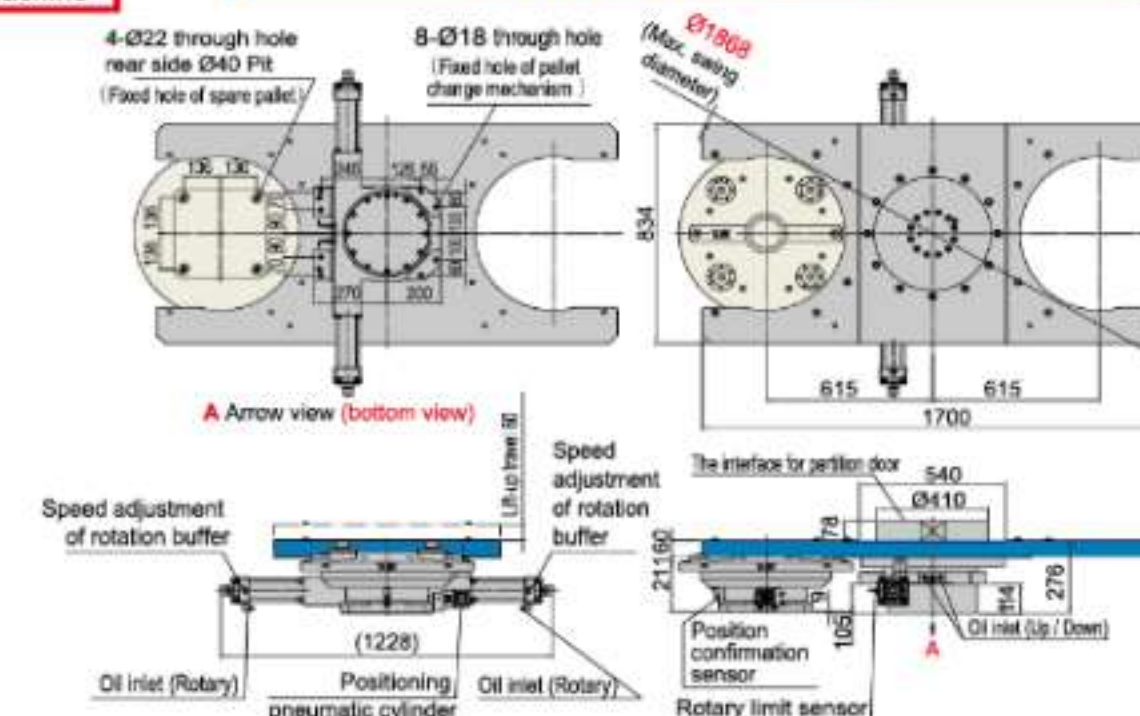
Application diagram:  
 retrofits horizontal machining center with CTH+ CHR

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



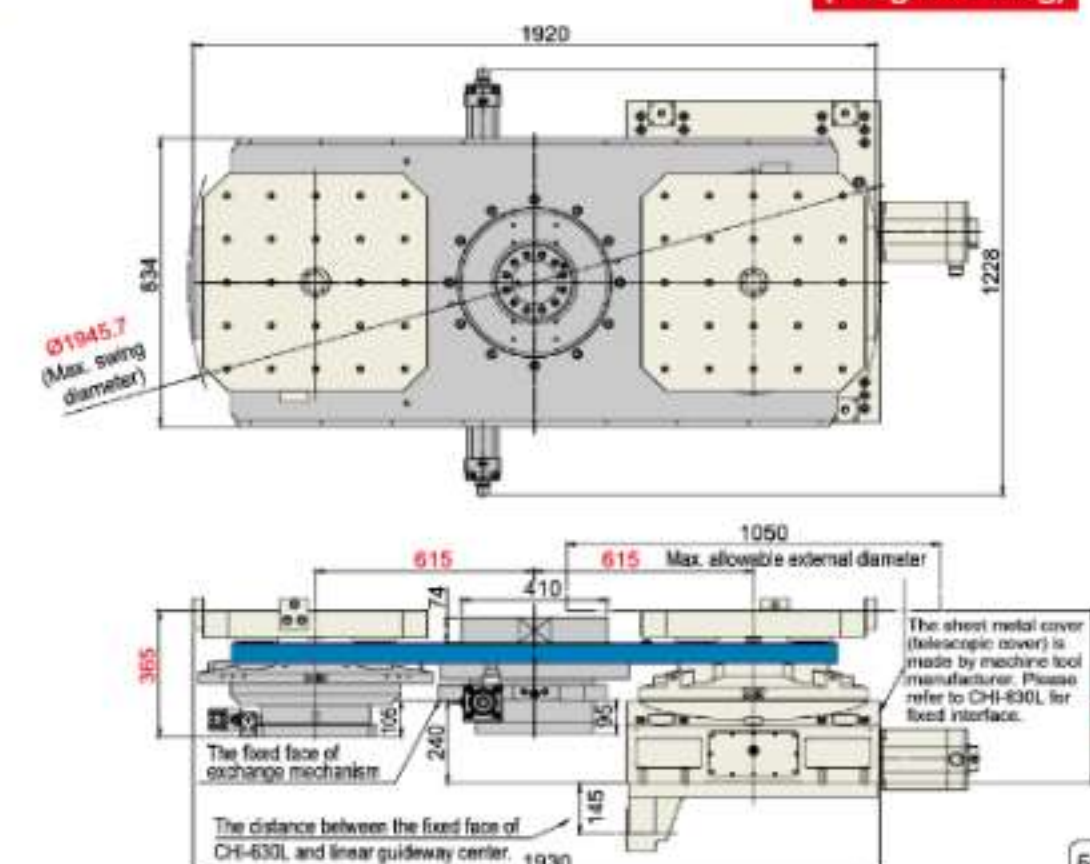
▲ **CTH-630 + CHI-630L**  
 Tray type APC + Dual pallets rotary table  
 (Integrated ball-screw-interface type)

**CTH-630 (Pallet changer)**



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

(Weight : 600kg)



| 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              |
| Inspection accuracy                                      |                     |                          |
| Repeatability accuracy on positioning of the same pallet | mm                  | 0.01                     |
| Max. positioning tolerance for 2 pallets                 | mm                  | 0.02                     |
| Parallelism of pallet top and base bottom                | mm                  | 0.02                     |

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

- Pneumatic Brake / Hydraulic Brake



RC-170R



RC-255N



RC-320N



RC-400N



Driven by Roller Gear Cam  
(Speed : 80 rpm)

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.

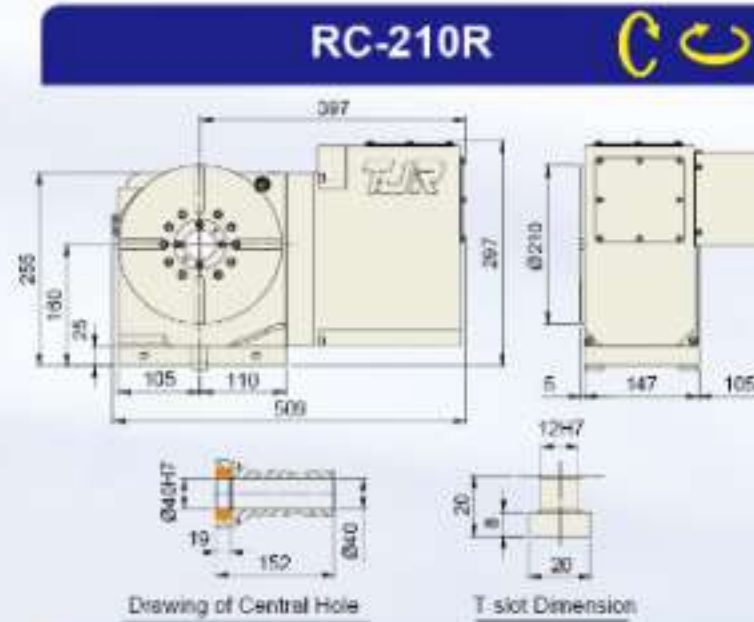


90° indexer

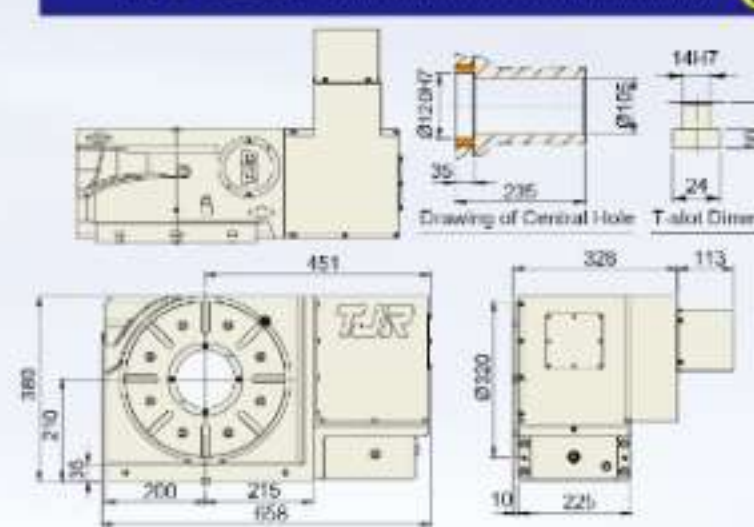
| Item                                                         | Unit                   | RC-170R              | RC-210R                  | RC-255R(N)            | RC-320R(N) / 320L        | RC-400                   |
|--------------------------------------------------------------|------------------------|----------------------|--------------------------|-----------------------|--------------------------|--------------------------|
| 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 / βis12 (Taper)  | αiF12 / βis22 (Straight) | αiF12 / βis22 (Straight) |
|                                                              | MITSUBISHI             | Taper/Straight shaft | 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<br>(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<br>(dynamic)                        | Vertical               | kg                   | 75                       | 75                    | 100                      | 200                      |
|                                                              | with Support Table     | kg                   | 150                      | 150                   | 250                      | 500                      |
|                                                              | Horizontal             | kg                   | 150                      | 150                   | 250                      | 500                      |
| Allowable Load<br>(with clamping)                            | F                      | kgf                  | 1450                     | 1450                  | 2000                     | 4000                     |
|                                                              | FxL                    | kgf-m                | 110                      | 110                   | 150                      | 300                      |
|                                                              | FxL                    | kgf-m                | 31                       | 31 (Pne.) / 50 (Hyd.) | 70                       | 115                      |
| Driving Torque                                               | kgf-m                  | 37                   | 37                       | 55                    | 107                      | 140                      |
| Net Weight (Servo motor excluded)                            | kg                     | 44                   | 52                       | 110                   | 187                      | -                        |



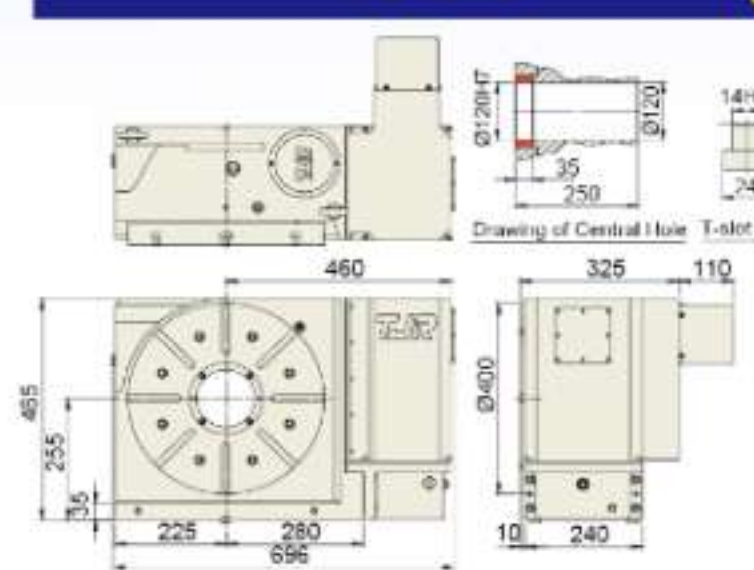
▲ HRC-400-SP



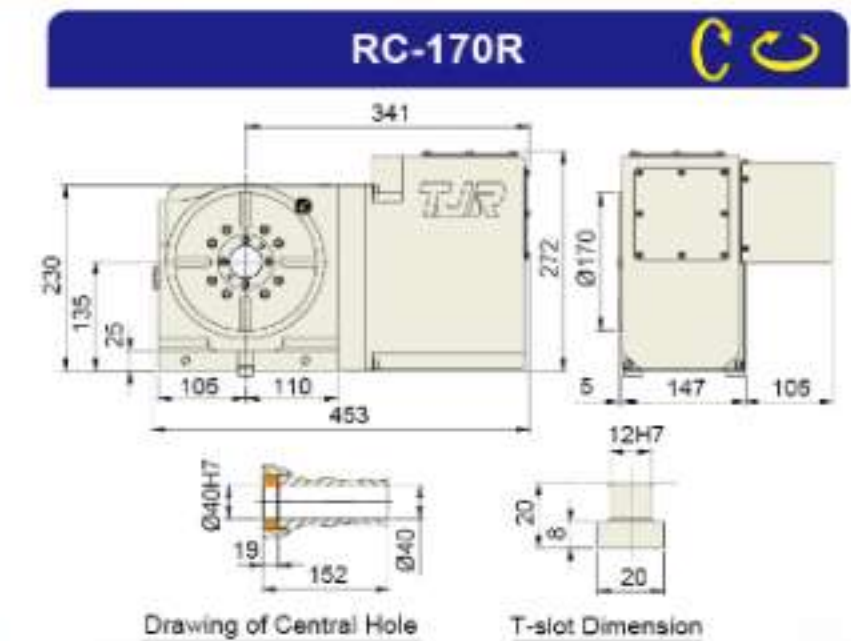
RC-210R



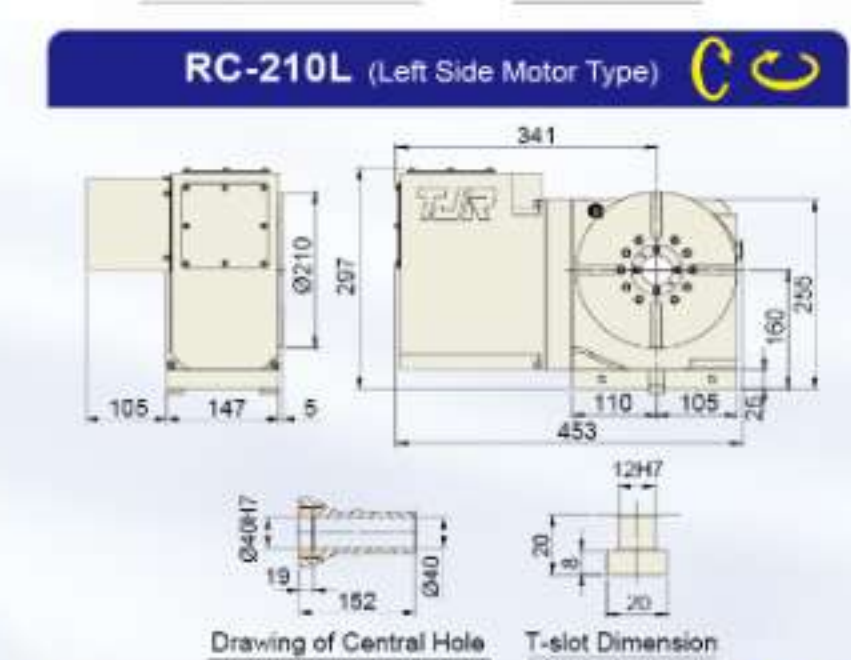
RC-320N (Sheet Metal Cover Reduction)



RC-400N



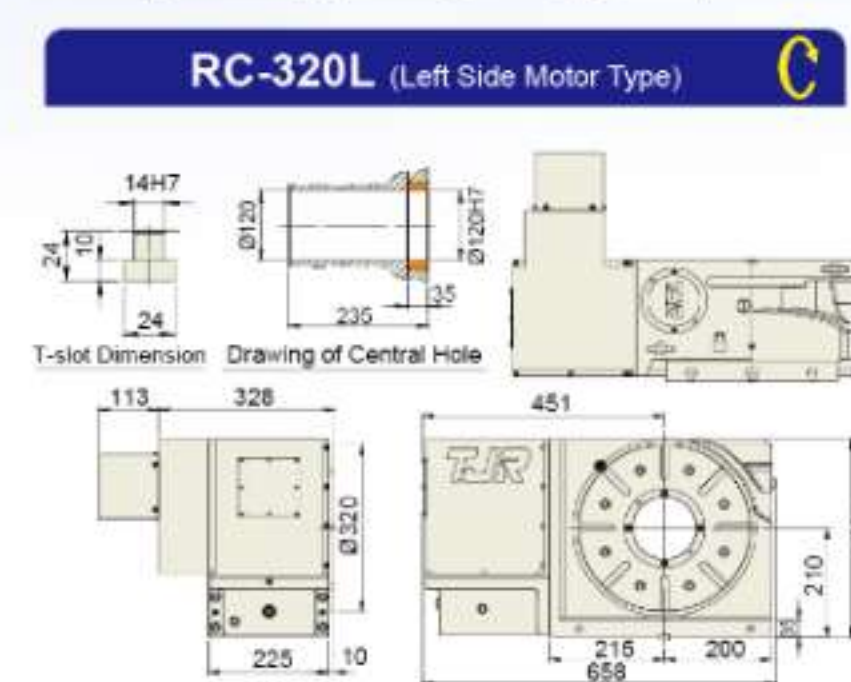
RC-170R



RC-210L (Left Side Motor Type)



RC-255N (Sheet Metal Cover Reduction)



RC-320L (Left Side Motor Type)

Driven by  
Roller Gear Cam

## The 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)



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



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



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

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



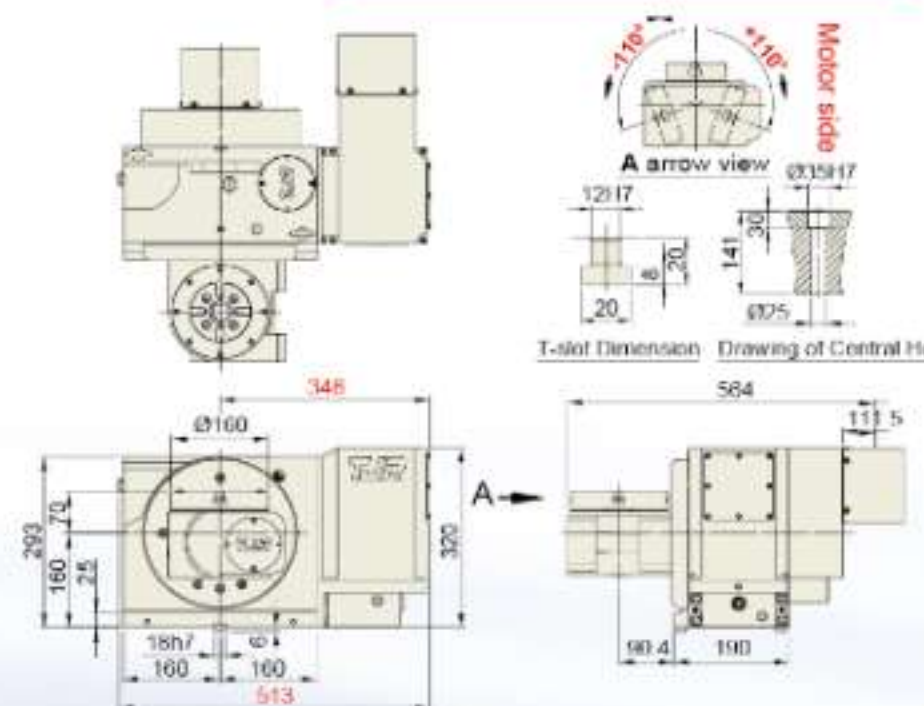
FAR(s)-170-RC210  
(Standard type)



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

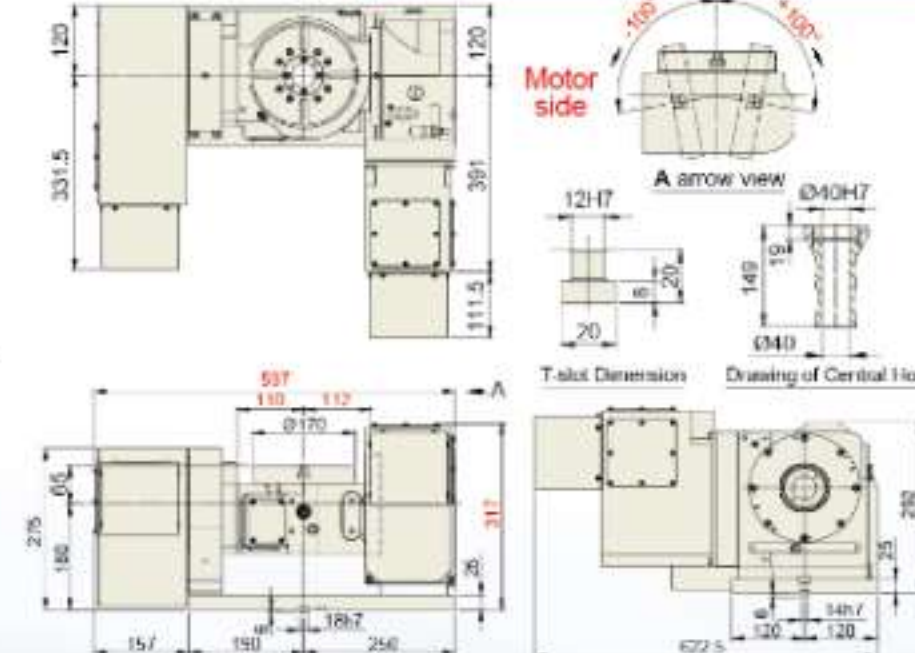
## FAR(s)-160SN-RC255 (Single-arm type)

Tilt axis: Driven by Roller Gear Cam



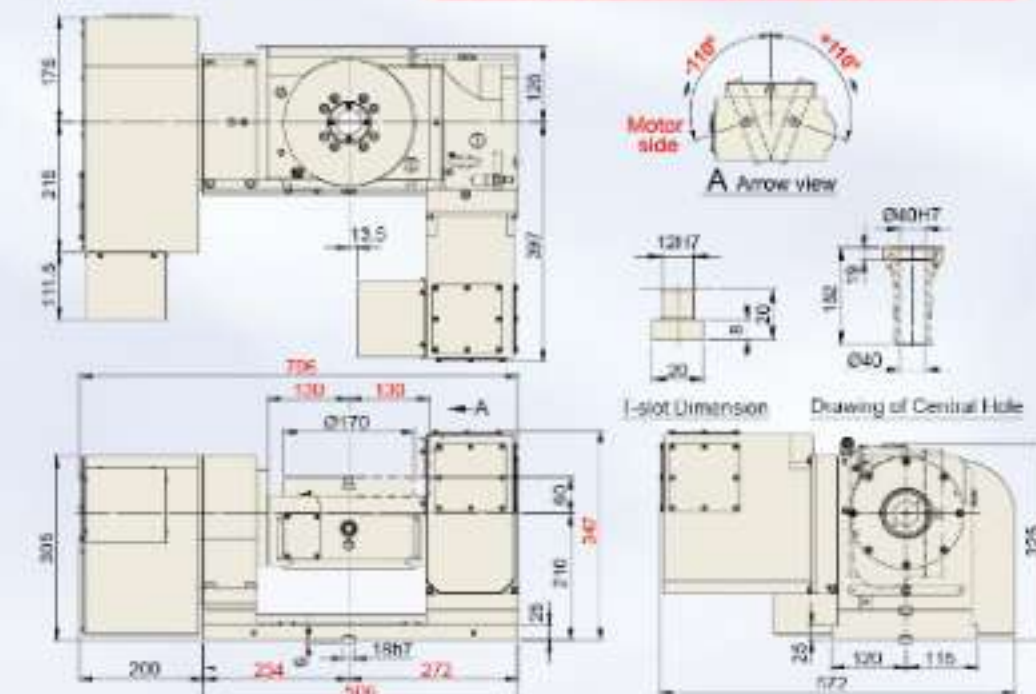
## FAR(s)-170A-RC210(H) (Compact type)

Tilt axis: Driven by Roller Gear Cam



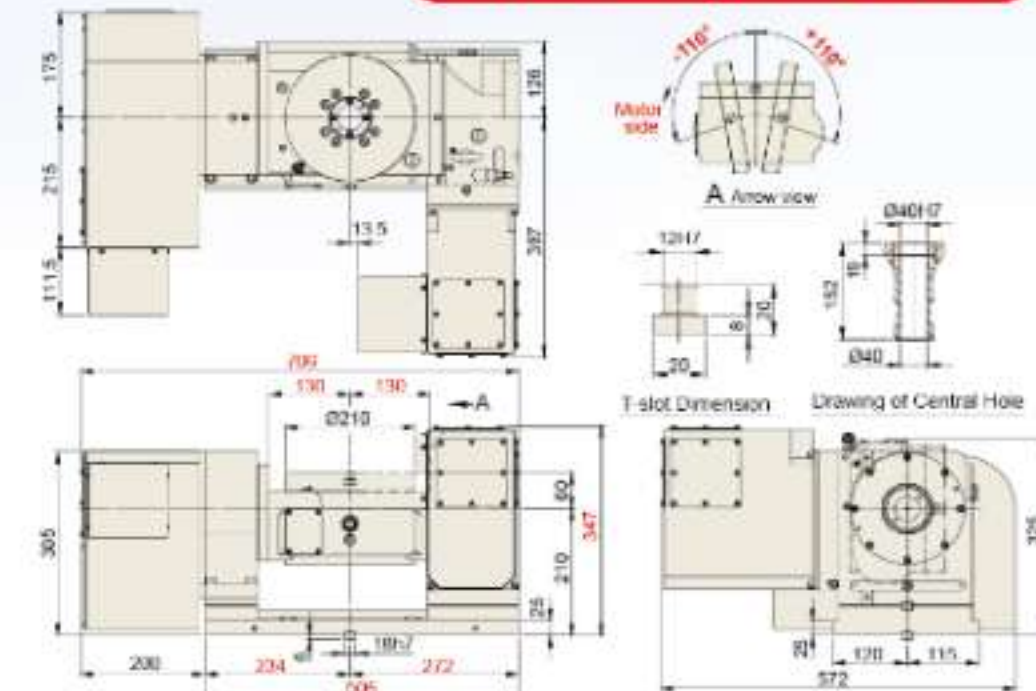
## FAR(s)-170-RC210(H) (Standard type)

Tilt axis: Driven by Roller Gear Cam



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

Tilt axis: Driven by Roller Gear Cam



| Item                                                       | Unit                   | FAR(s)-160SN-RC255                               |                        | FAR(s)-170A-RC210(H) |                | FAR(s)-170-RC210(H) / FAR(s)-210-RC210(H) |               |
|------------------------------------------------------------|------------------------|--------------------------------------------------|------------------------|----------------------|----------------|-------------------------------------------|---------------|
| Table Diameter                                             | mm                     | Ø160                                             |                        | Ø170                 |                | Ø170 / Ø210                               |               |
| Inner Diameter of Mandrel Sleeve                           | mm                     | Ø35H7 x 30 deep (Diameter of Table Central Hole) |                        | Ø40H7                |                | Ø40H7                                     |               |
| Diameter of Center Through Hole                            | mm                     | Ø25                                              |                        | Ø40                  |                | Ø40                                       |               |
| Table Height (Horizontal)                                  | mm                     | Single-arm type 230                              |                        | 245                  |                | 270                                       |               |
| Table T-slot Width                                         | mm                     | 12H7                                             |                        | 12H7                 |                | 12H7                                      |               |
| Guide Block Width                                          | mm                     | 18h7                                             |                        | 18h7                 |                | 18h7                                      |               |
| Axis                                                       | -                      | Rotary axis                                      |                        | Tilt axis ±110°      |                | Rotary axis                               |               |
| Transmission Mechanism                                     | -                      | Worm gear                                        |                        | Roller Gear Cam      |                | Worm gear                                 |               |
| Min. Increment                                             | deg.                   | 0.001                                            |                        | 0.001                |                | 0.001                                     |               |
| Indexing Precision (while tilt 0°~90°)                     | sec.                   | 40                                               |                        | 60                   |                | 20                                        |               |
| Repeatability                                              | sec.                   | 6                                                |                        | 8                    |                | 6                                         |               |
| Clamping System (Pneumatic)                                | kgf/cm <sup>2</sup>    | 6                                                |                        | Hyd.35               |                | 6                                         |               |
| Clamping Torque                                            | kgf-m                  | 13                                               |                        | 70                   |                | 31 (Pne.) / 50 (Hyd.)                     |               |
| Servo Motor Model                                          | FANUC                  | Taper/Straight                                   | ais4 / bis4            | ais12 / bis12        | ais4 / bis4    | ais12 / bis12                             | ais12 / bis12 |
|                                                            | MITSUBISHI             | Straight                                         | HF-KP43JW04-S6 / HG-56 | HG/HF-154            | HG/HF-75 / 105 | HG/HF-104                                 | HG/HF-154     |
| Speed Reduction Ratio                                      | -                      | 1 : 60                                           |                        | 1 : 60               |                | 1 : 90                                    |               |
| Max. Rotation Rate of Table (Calculate with FANUC a Motor) | r.p.m.                 | 33.3 *(33.3)                                     |                        | 50                   |                | 33.3 *(33.3)                              |               |
| Allowable Inertia Load Capacity (Horizontal)               | kg-cm-sec <sup>2</sup> | 0.8                                              |                        | 2.2                  |                | 2.7 (Ø170) / 4.13 (Ø210)                  |               |
| Allowable Workpiece Load (dynamic)                         | 0° Horizontal          | kg                                               |                        | 25                   |                | 60                                        |               |
|                                                            | 0~90° Tilt             | kg                                               |                        | 20                   |                | 40                                        |               |
| Allowable Load (with clamping)                             | F                      | kg                                               |                        | 600                  |                | 600                                       |               |
|                                                            | FxL                    | kgf                                              |                        | 70                   |                | 31                                        |               |
|                                                            | FxL                    | kgf-m                                            |                        | 13                   |                | 31                                        |               |
| Driving Torque                                             | kgf-m                  | 9 *(3.7)                                         |                        | 18 *(14.6)           |                | 18 *(14.6)                                |               |
| Net Weight (servo motor excluded)                          | kg                     | 126                                              |                        | -                    |                | 163                                       |               |

\*( ) Alloy Steel worm & gear series

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

## The 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

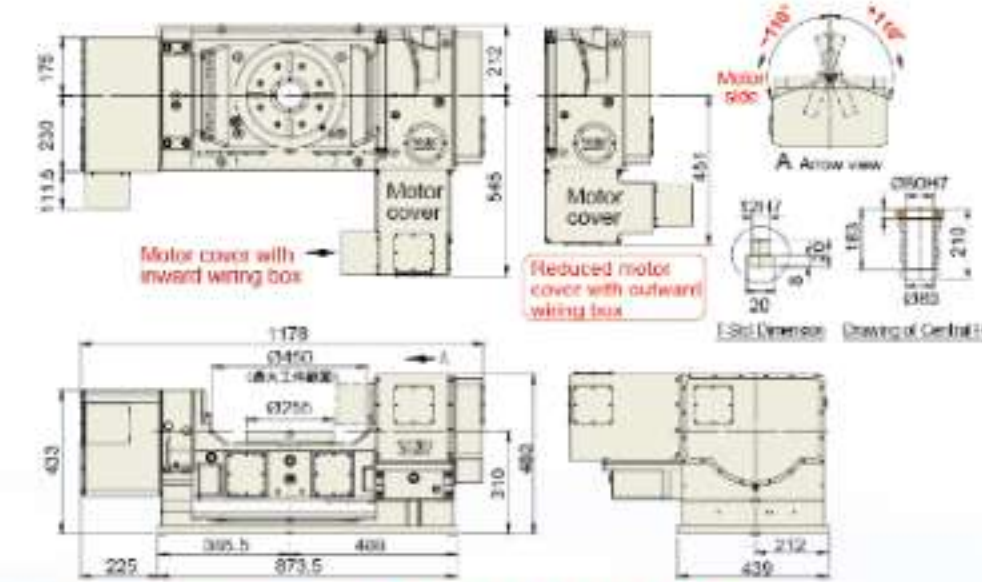


**FRC(s)-255CL-RC320**  
(Extended cradle type)



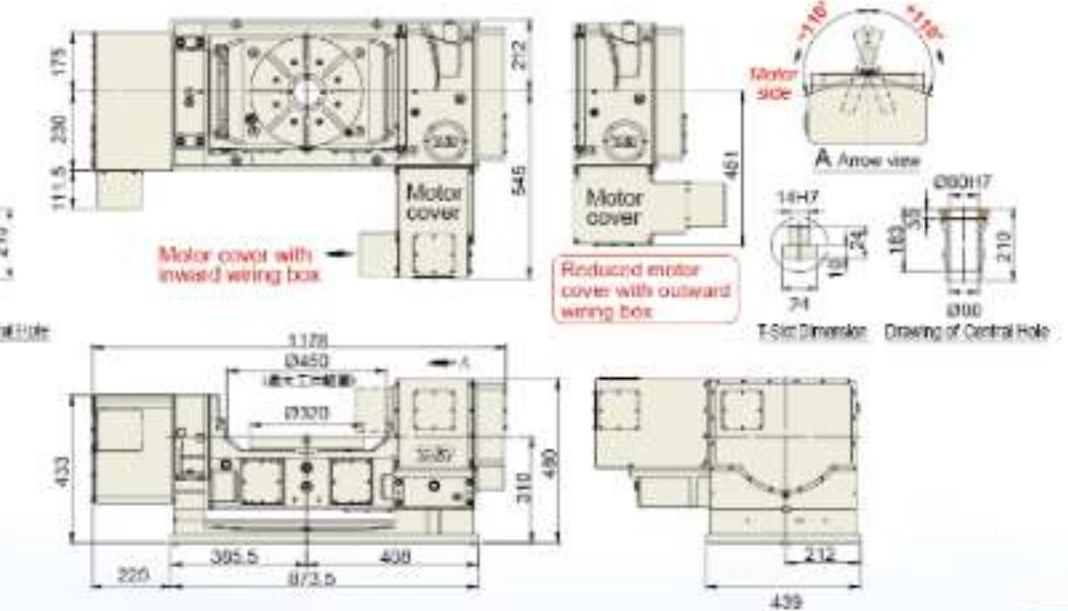
**FRC(s)-320CF-RC320**  
(Cradle type)

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



可裝6油孔分配器+光學尺

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



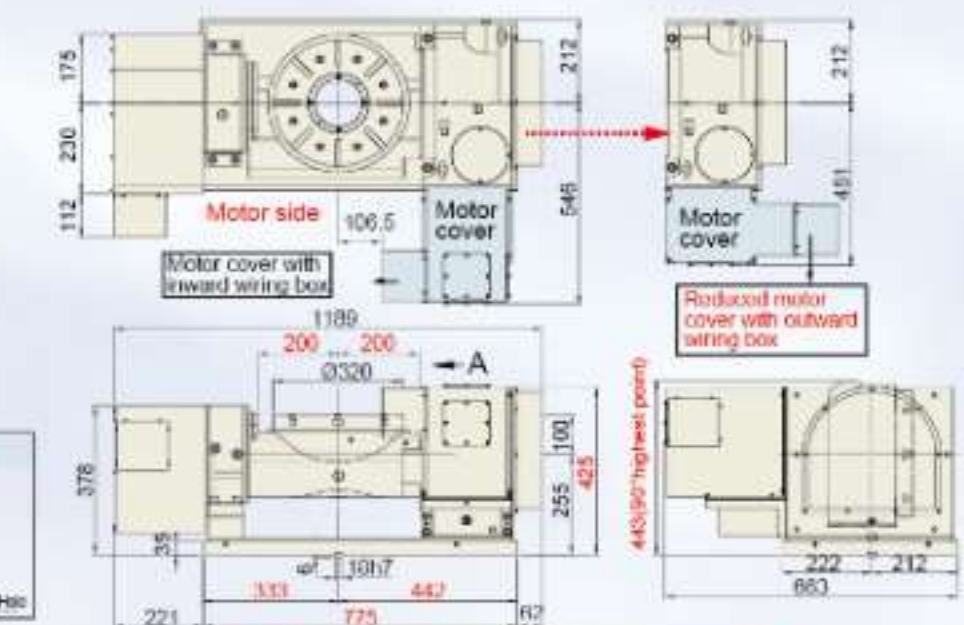
可裝6油孔分配器+光學尺

| 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                      | Tilt axis ±110°      | Rotary axis                   | Tilt axis ±110°       |
| Transmission Mechanism                                     | -                      | Roller Gear Cam                           |                      | Roller Gear Cam                  |                      | Worm & Worm Gear              | Roller Gear Cam       |
| Min. Increment                                             | deg.                   | 0.001                                     | 0.001                | 0.001                            | 0.001                | 0.001                         | 0.001                 |
| Indexing Precision (while tilt 0°~+90°)                    | sec.                   | 20                                        | 60                   | 20                               | 60                   | 15                            | 60                    |
| Repeatability                                              | sec.                   | 6                                         | 8                    | 6                                | 8                    | 6                             | 8                     |
| Clamping System (Hydraulic)                                | kgf/cm <sup>2</sup>    | 35                                        | 35                   | 35                               | 35                   | 35                            | 35                    |
| Clamping Torque                                            | kgf-m                  | 70                                        | 175                  | 70                               | 175                  | 115                           | 175                   |
| Servo Motor Model                                          | FANUC                  | Taper / Straight                          | αiF8 / αis12 / βis12 | αiF12 / βis12                    | αiF8 / αis12 / βis12 | αiF12 / βis22                 | αiF12 / βis22         |
|                                                            | MITSUBISHI             | Straight                                  | HG/HF-154            | HG/HF-154                        | HG/HF-154            | HG/HF-154                     | HG/HF-104 / HG/HF-204 |
| Speed Reduction Ratio                                      | -                      | 1 : 60                                    | 1 : 120              | 1 : 60                           | 1 : 120              | 1 : 120                       | 1 : 90                |
| Max. Rotation Rate of Table (Calculate with FANUC α Motor) | r.p.m                  | 50                                        | 25                   | 50                               | 25                   | 25                            | 33.3                  |
| Allowable Inertia Load Capacity (Horizontal)               | kg·cm·sec <sup>2</sup> | 16.2                                      |                      | 25.6                             |                      | 25.6                          |                       |
| Allowable Workpiece Load (dynamic)                         | 0° Horizontal          | 200                                       |                      | 200                              |                      | 200                           |                       |
|                                                            | 0°~90° Tilt            | 150                                       |                      | 150                              |                      | 150                           |                       |
| Allowable Load (with clamping)                             | F                      | 1600                                      |                      | 1600                             |                      | 1800                          |                       |
|                                                            | FxL                    | 175                                       |                      | 175                              |                      | 175                           |                       |
|                                                            | FxL                    | 70                                        |                      | 70                               |                      | 115                           |                       |
| Driving Torque                                             | kgf-m                  | 35                                        |                      | 35                               |                      | 80                            |                       |
| Net Weight (servo motor excluded)                          | kg                     | 580                                       |                      | 585                              |                      | -                             |                       |

\* ( ) Alloy Steel worm & gear series

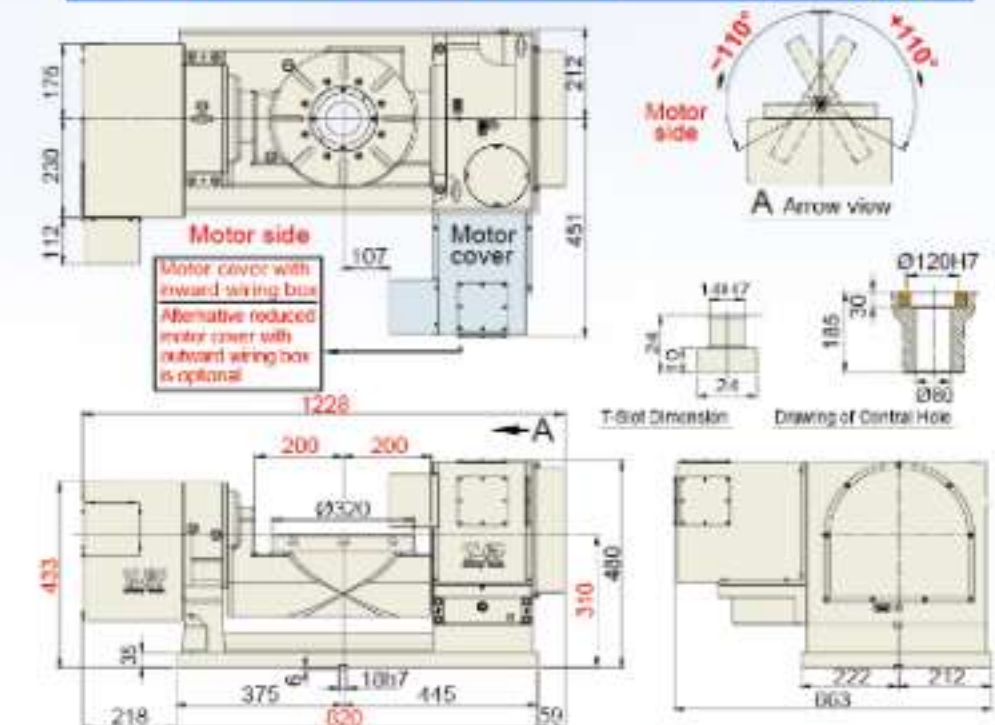
★ In accordance with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting dual-axis products overseas.

## FHR-320-RC320 (Standard type)



6-port rotary joint can be accommodated.

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



4-port rotary joint can be accommodated.

## 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)



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



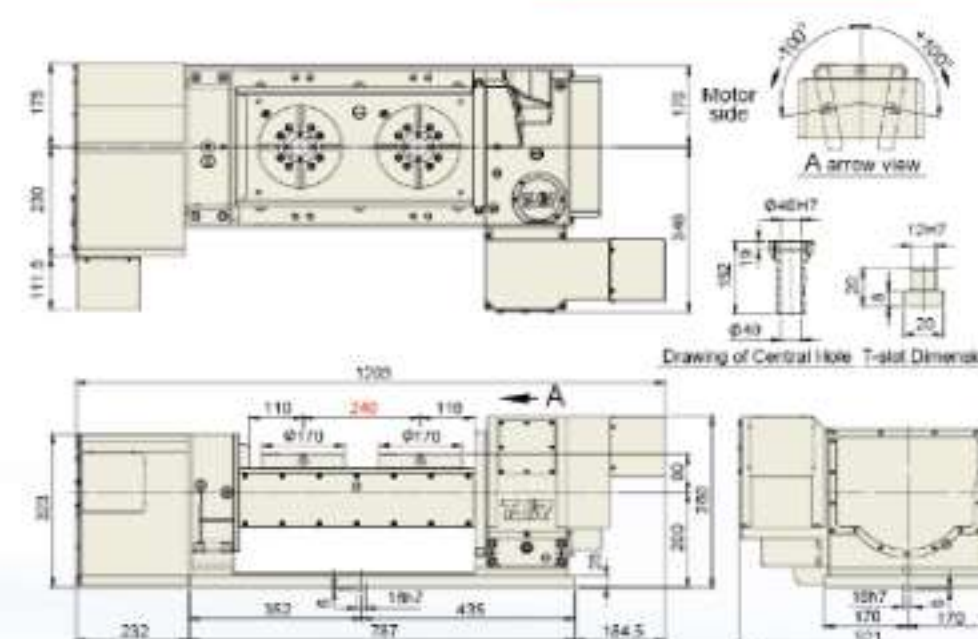
**Swivel Spindle Head  
HRC-400SP**  
(Roller Gear Cam)



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

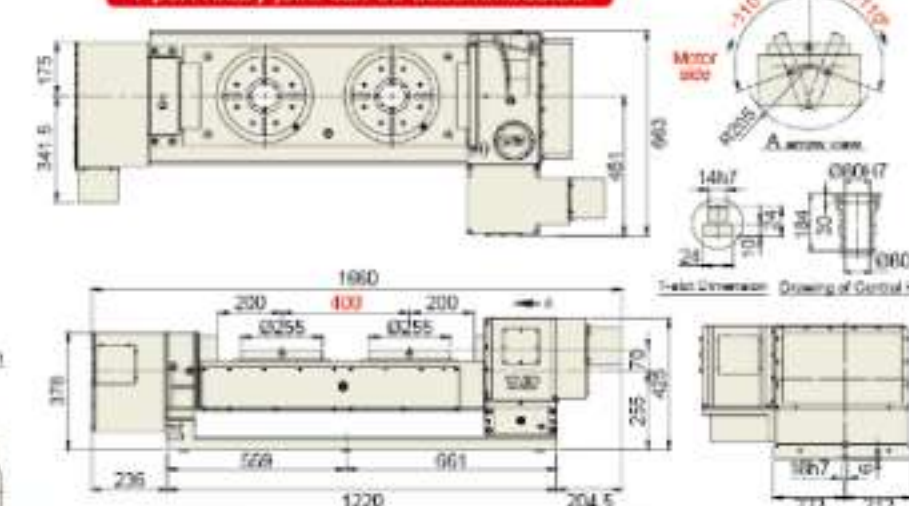
**FAR(s)-170-2W-RC255** (2 wheel coupled)

Tilt axis : Driven by Roller Gear Cam



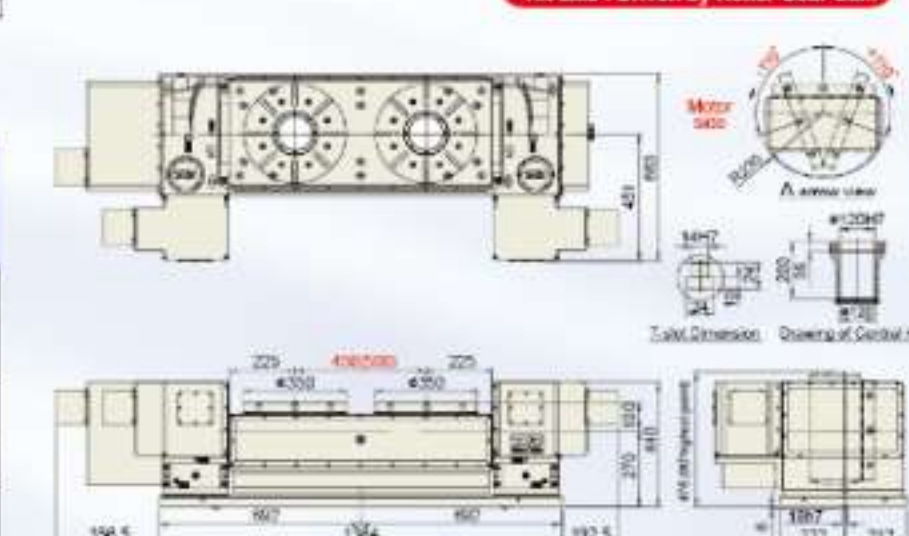
**FHR-255-2W-RC320** (2 wheel coupled)

4-port rotary joint can be accommodated

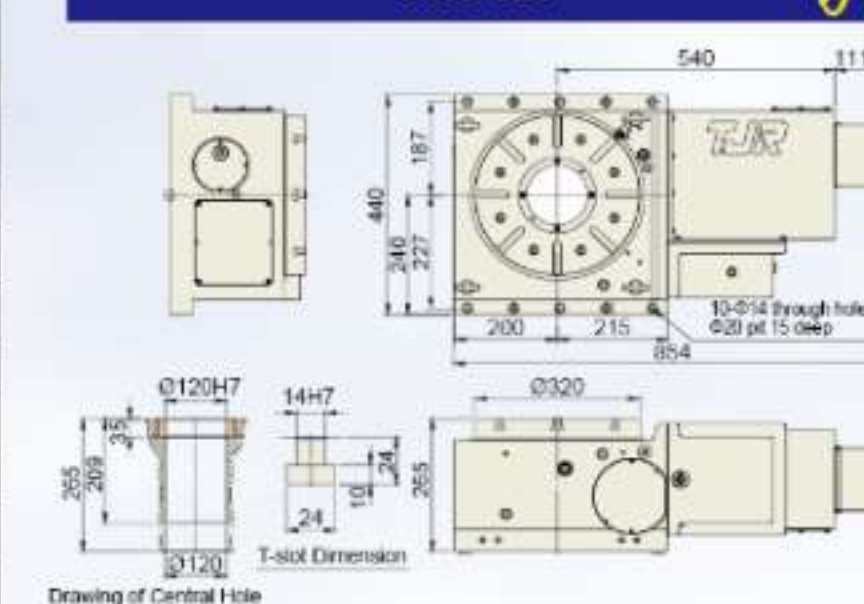


**FHR-350F-2W-RC320-2A** (2 wheel coupled)

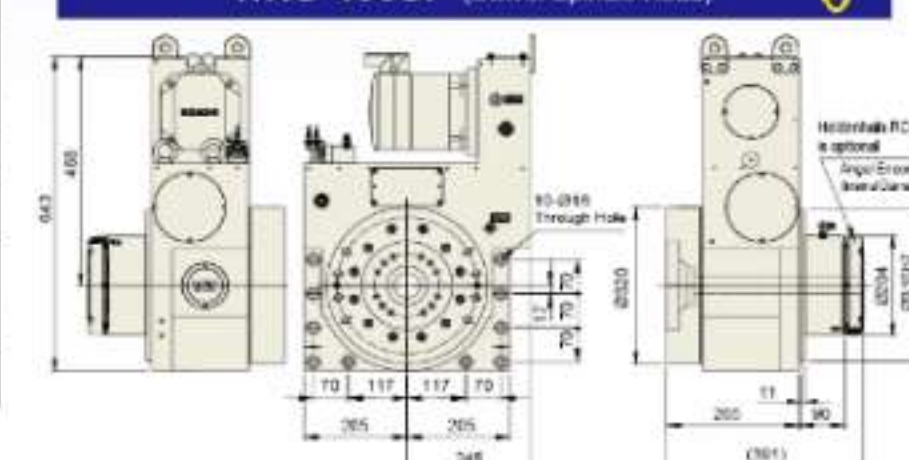
Tilt axis : Driven by Roller Gear Cam



**HRC-320**



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



| Item                                                       | Unit                   | FAR(s)-170-2W-RC255 / FAR(s)-210-2W-RC255 |                 | FHR-255-2W-RC320 |                 | FHR-350F-2W-RC320-2A |                 | HRC-320                      | HRC-400SP       |
|------------------------------------------------------------|------------------------|-------------------------------------------|-----------------|------------------|-----------------|----------------------|-----------------|------------------------------|-----------------|
| Table Diameter                                             | mm                     | Ø170 / Ø210                               |                 | Ø255             |                 | Ø350                 |                 | Ø320                         | Ø400            |
| Diameter of Table Central Hole                             | mm                     | Ø67                                       |                 | Ø110             |                 | Ø150                 |                 | Ø150                         | Ø180            |
| Inner Diameter of Mandrel Sleeve                           | mm                     | Ø40H7                                     |                 | Ø80H7            |                 | Ø120H7               |                 | Ø120H7                       | -               |
| Diameter of Center Through Hole                            | mm                     | Ø40                                       |                 | Ø80              |                 | Ø120                 |                 | Ø120 <small>Big Size</small> | 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° | Rotary axis          | Tilt axis ±110° | -                            | -               |
| Transmission Mechanism                                     | -                      | Worm Gear                                 | Roller Gear Cam | 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           | 0.001                        | 0.001           |
| Indexing Precision (while tilt 0°~+90°)                    | sec.                   | 40                                        | 60              | 40               | 60              | 40                   | 60              | 20                           | ±10             |
| Repeatability                                              | sec.                   | 6                                         | 8               | 6                | 8               | 6                    | 8               | 6                            | 6               |
| Clamping System (Hydraulic)                                | kgf/cm <sup>2</sup>    | Pne.6                                     | 35              | 35               | 35              | 35                   | 35              | 35                           | 45              |
| Clamping Torque                                            | kgf-m                  | 31                                        | 140             | 70               | 175             | 115                  | 230             | 115                          | 155             |
| Servo Motor Model                                          | FANUC                  | Taper / Straight                          | αiF8 / βis12    | αis12 / βis12    | αis12 / βis12   | αis12 / βis22        | αis12 x2        | αiF12 / βis22                | αiF12 / 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 x2      | -                            | 1FK7083         |
| Speed Reduction Ratio                                      | -                      | 1:90                                      | 1:60            | 1:150            | 1:90            | 1:120                | 1:90            | 1:90                         | 1:90            |
| Max. Rotation Rate of Table (Calculate with FANUC α Motor) | r.p.m                  | 44.4 *(33.3)                              | 33.3            | 16.6             | 16.6            | 25                   | 16.6            | 33.3                         | 33.3            |
| Allowable Inertia Load Capacity (Horizontal)               | kg-cm-sec <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          | kg                                        | 50 (per plate)  |                  | 100 (per plate) |                      | 150 (per plate) |                              | 350             |
|                                                            | 0°-90° Tilt            | kg                                        | 40 (per plate)  |                  | 75 (per plate)  |                      | 150 (per plate) |                              | -               |
| Allowable Load (with clamping)                             | F                      | kg                                        | 750             |                  | 1000            |                      | 1800            |                              | 3000            |
|                                                            | FxL                    | kgf                                       | 140             |                  | 175             |                      | 230             |                              | 300             |
|                                                            | FxL                    | kgf-m                                     | 31              |                  | 70              |                      | 115             |                              | 155             |
| Driving Torque                                             | kgf-m                  | 18 *(14.6)                                |                 | 55               |                 | 80                   |                 | 56 (dynamic)                 | 75 (dynamic)    |
| Net Weight (servo motor excluded)                          | kg                     | 305 (Ø170) / 312 (Ø210)                   |                 | 740              |                 | 1080                 |                 | -                            | 406             |

\*( ) Alloy Steel worm & gear series

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## 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**



**RT-135**

Support table without brake



**RT-170F**

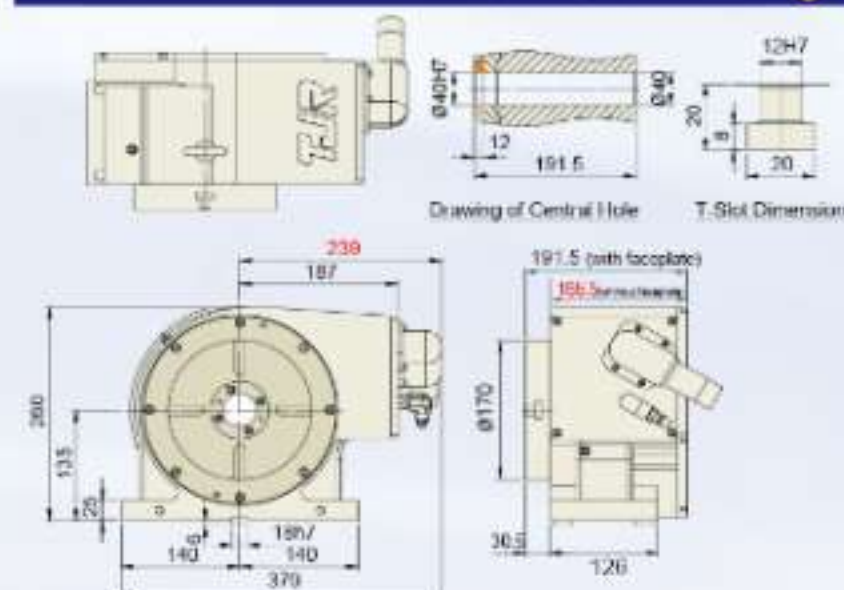


**AD-260iB** + support table + fixture plate

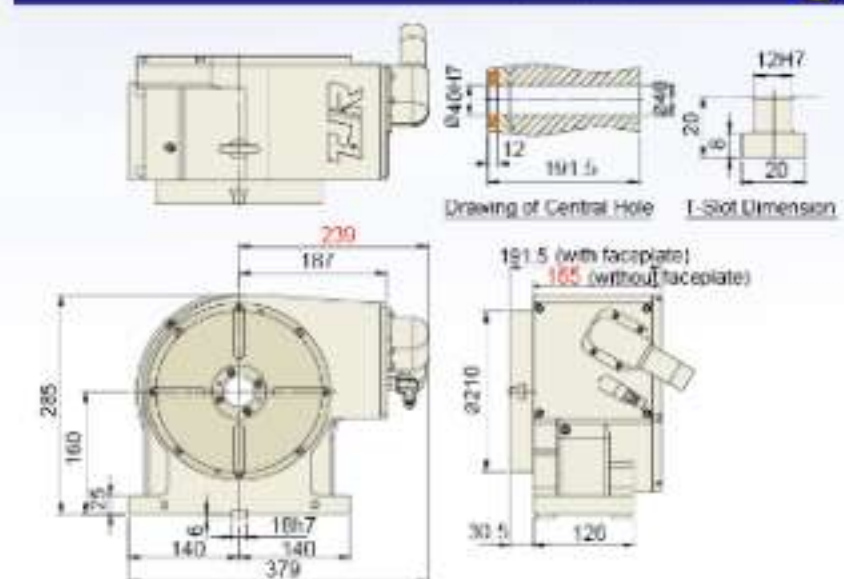
While using DDM rotary table, it's recommended to employ table **without faceplate** and simplified support table. Thus, it can increase the available loading capacity for fixtures and workpieces.

| 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) | kg                     | 30                               | 30                               | 60                                                       | 100 (Rated Speed)                |
| Allowable Load (with clamping)     | kg                     | 70                               | 70                               | 100                                                      | 100 (Rated Speed)                |
| Allowable Load (with clamping)     | N                      | 8000                             | 8000                             | 10000                                                    | 10000                            |
| Allowable Load (with clamping)     | FxL                    | Nm                               | 105                              | 105                                                      | 231                              |
| Allowable Load (with clamping)     | FxL                    | Nm                               | 310                              | 310                                                      | 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)<br>11.8 / 34.5 (Water Cooling) | 9.3/56.6                         |
| Power Rating                       | KW                     | 0.75                             | 0.75                             | 0.75 / 1.9 (Water Cooling)                               | -                                |

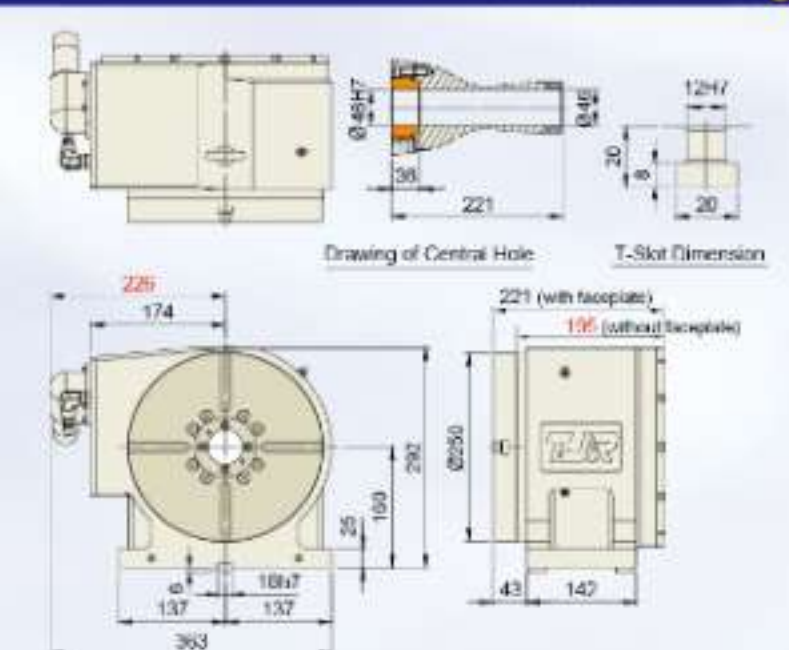
### AD-170 Direct Drive (200 rpm)



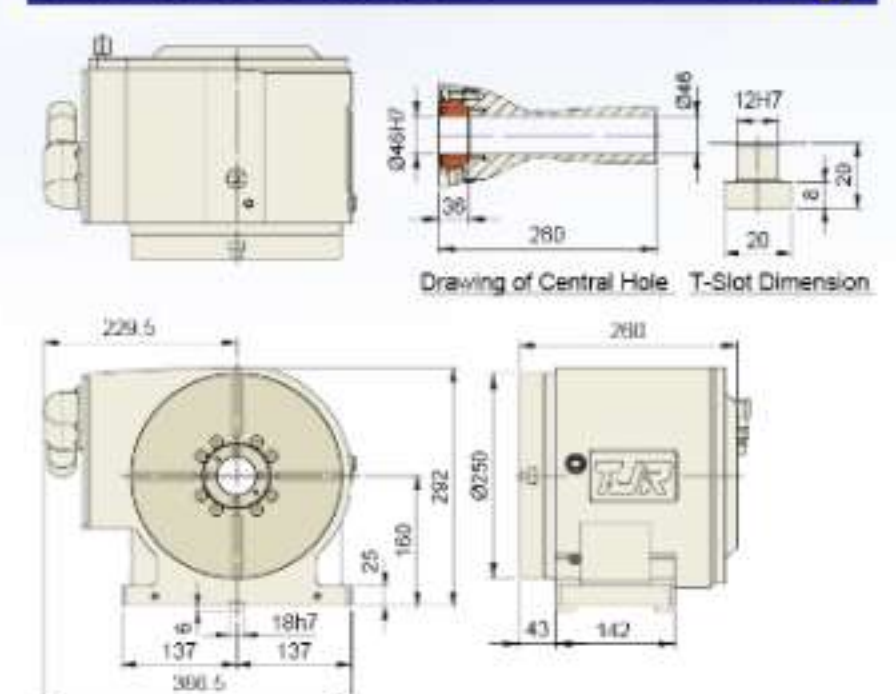
### AD-210 Direct Drive (200 rpm)



### 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)

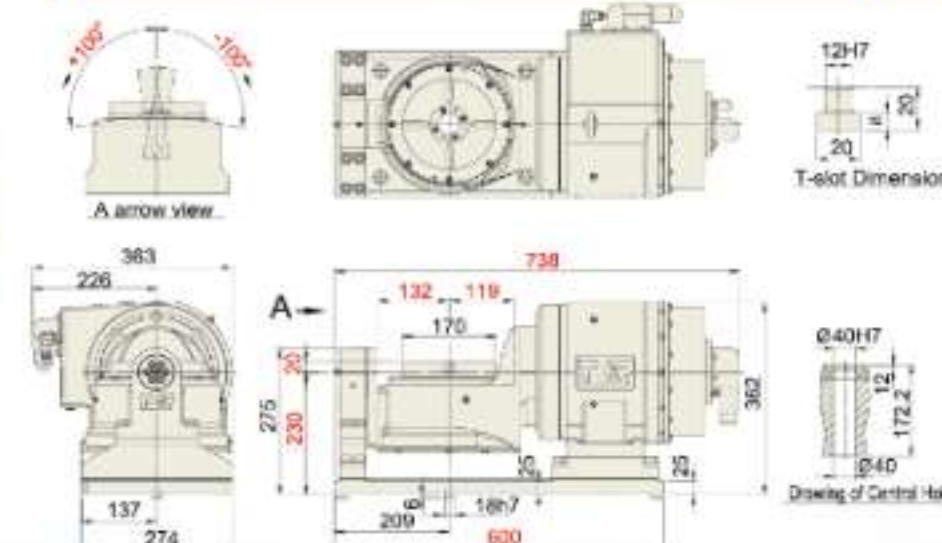


**FHD-650-iD650**  
(Two D.D. Motors / Hydraulic Brake)

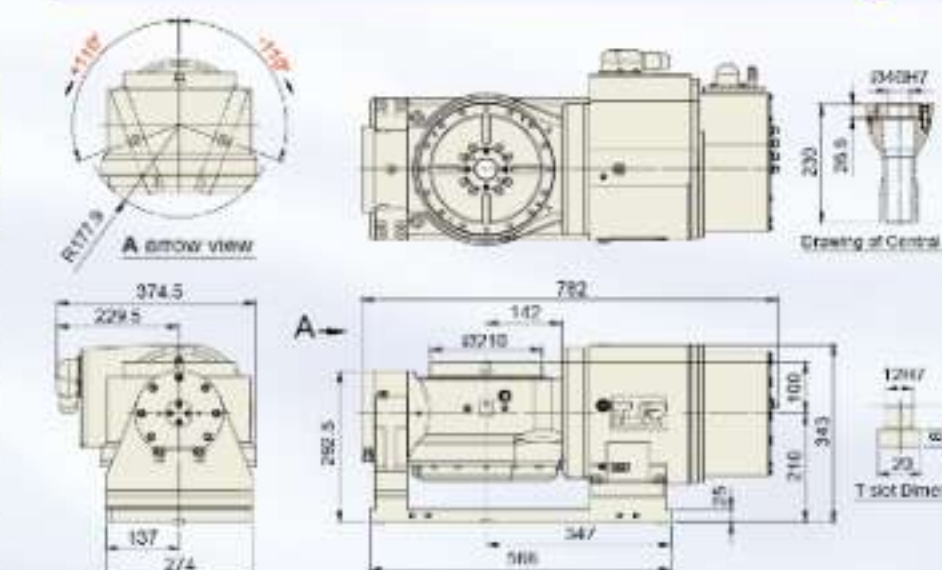


**iHHD-650**

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



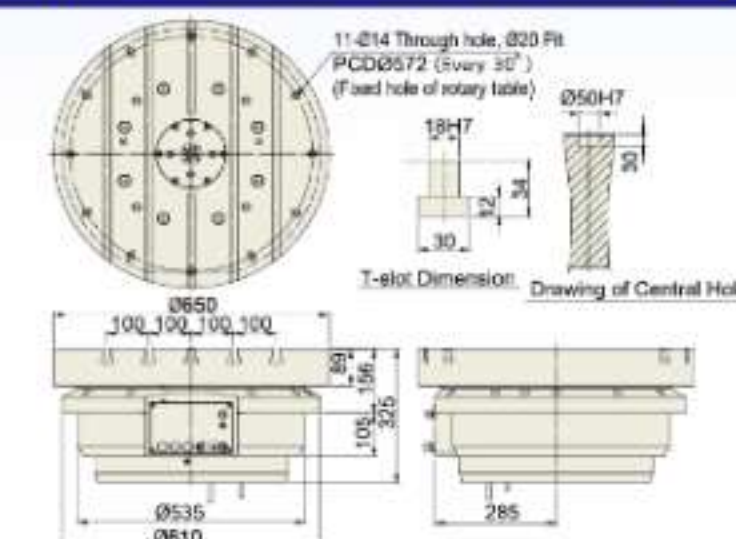
### FAD-211-AD261iB-FA-CZ (Two axis FANUC DDM)



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



### iHHD-650 (Embedded type) (210 rpm)



| Item                                         |                                                                                                   | Unit                   | Two D.D. Motors : 300 rpm |                              | Two axis FANUC DDM          |                            | Two D.D.Motors              |                 | Embedded type                                  |
|----------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------|---------------------------|------------------------------|-----------------------------|----------------------------|-----------------------------|-----------------|------------------------------------------------|
|                                              |                                                                                                   |                        | FAD-170F / FAD-210F       |                              | FAD-211-AD261iB-FA-CZ       |                            | FHD-650-iD650               |                 | iHHD-650                                       |
| Table Diameter                               |                                                                                                   | mm                     | Ø170 / Ø210               |                              | Ø210                        |                            | Ø650                        |                 | Ø650                                           |
| Inner Diameter of Mandrel Sleeve             |                                                                                                   | mm                     | Ø40H7                     |                              | Ø40H7                       |                            | -                           |                 | Ø50 x 30 deep (Diameter of table central hole) |
| Diameter of Center Through Hole              |                                                                                                   | mm                     | Ø40                       |                              | Ø40                         |                            | -                           |                 | -                                              |
| Table Height (Horizontal)                    |                                                                                                   | mm                     | 250                       |                              | 310                         |                            | -                           |                 | -                                              |
| Table T-slot Width                           |                                                                                                   | mm                     | 12H7                      |                              | 12H7                        |                            | 18H7                        |                 | 18H7                                           |
| Guide Block Width                            |                                                                                                   | mm                     | 18h7                      |                              | 18h7                        |                            | -                           |                 | -                                              |
| Axis                                         |                                                                                                   | -                      | Rotary axis               | Tilt axis ±100°              | Rotary axis                 | Tilt axis ±100°            | Rotary axis                 | Tilt axis ±110° | -                                              |
| Transmission Mechanism                       |                                                                                                   | -                      | DD Motor                  | DD Motor                     | DD Motor                    | DD Motor                   | DD Motor                    | DD Motor        | DD Motor                                       |
| Cooling System                               |                                                                                                   | -                      | Free Cooling              | Free Cooling (Water Cooling) | Free Cooling                | Free Cooling (Oil Cooling) | Water Cooling               | Water Cooling   | Water Cooling                                  |
| Min. Increment                               |                                                                                                   | deg.                   | 0.001                     | 0.001                        | 0.001                       | 0.001                      | 0.001                       | 0.001           | 0.001                                          |
| Indexing Precision (while tilt 0°~+90°)      |                                                                                                   | sec.                   | 20                        | 30                           | 20                          | 30                         | 20 <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<br>MITSUBISHI                                                                               | Taper shaft with key   | DD Motor                  | DD Motor                     | FANUC DiS<br>DD Motor       | FANUC DIS<br>DD Motor      | DD Motor                    | DD Motor        | DD Motor                                       |
| Speed Reduction Ratio                        |                                                                                                   |                        | -                         | 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                                    | 0° Horizontal  | kg                     | 50                        |                              | 50 (Rated Speed)            |                            | 500                         |                 | 400                                            |
| Workpiece Load                               | 0°-90° Tilt    | kg                     | 30                        |                              | 30 (Rated Speed)            |                            | 300                         |                 | -                                              |
| Allowable Load<br>(with clamping)            | F              | N                      | 4000                      |                              | 4000                        |                            | 25000                       |                 | 40000                                          |
|                                              | FxL            | Nm                     | 450                       |                              | 450                         |                            | 5000                        |                 | 5000                                           |
|                                              | FxL            | Nm                     | 310                       |                              | 310                         |                            | 3700                        |                 | 3700                                           |
| Net Weight (D.D. motor included)             |                                                                                                   | kg                     | 220 (Ø170) / 223 (Ø210)   |                              | 237                         |                            | 1173                        |                 | 479                                            |
| Electrical Specification                     |                                                                                                   |                        |                           |                              |                             |                            |                             |                 |                                                |
| Encoder                                      |                                                                                                   | -                      | Renishaw or Heidenhain    |                              | FANUC aiCZ                  |                            | Heidenhain                  |                 | Heidenhain                                     |
| Voltage (Back E.M.F)                         |                                                                                                   | Vrms/100rpm            | Rotary axis 38.8          |                              | -                           | -                          | 125.6                       |                 | 125.6                                          |
| Rotor Poles                                  |                                                                                                   | -                      | 44                        |                              | Rotary axis : 28            | Tilt axis : 28             | 66                          |                 | 66                                             |
| Rated / Max. Current                         |                                                                                                   | Arms                   | 4.25 / 12.75              |                              | 10.2 / 28.3 (Rotary axis)   | 19.5 / 53.2 (Tilt axis)    | 29.8 / 75.7 (Water Cooling) |                 | 29.8 / 75.7 (Water Cooling)                    |
| Power Rating                                 |                                                                                                   | kW                     | 0.77                      | 0.76                         | -                           | -                          | 4.7                         | 10.1            | 4.7                                            |

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

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

## The 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



D.D. Motor

**AD-250HS**  
(super high speed: 2000 rpm)  
Can work as a mill / turn component



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



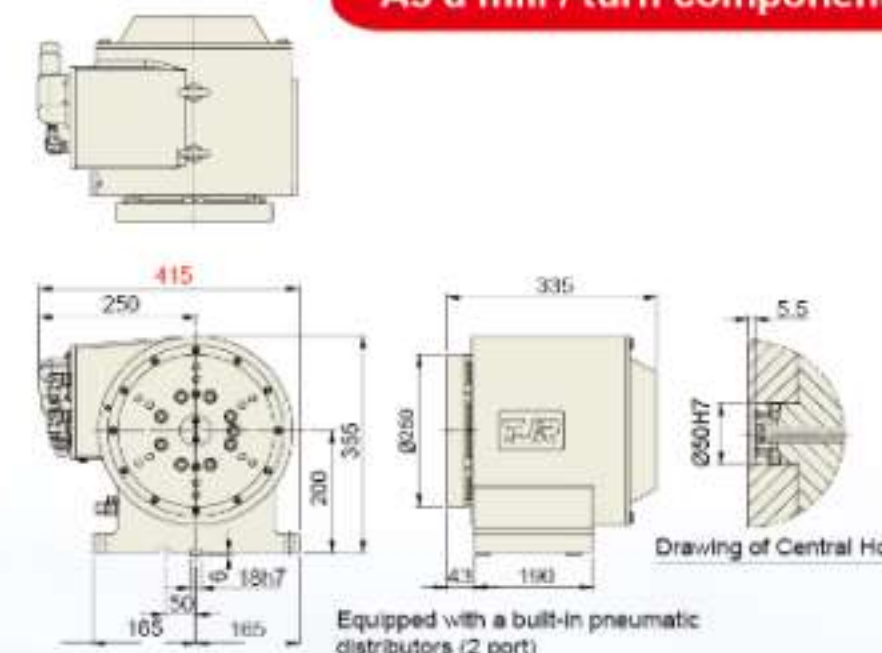
FAD-500FHS-AD500i-480



**FAD-400HS-AD500i-420**  
(The faceplate can be customized.  
Please refer to the below drawing  
for the standard faceplate.)

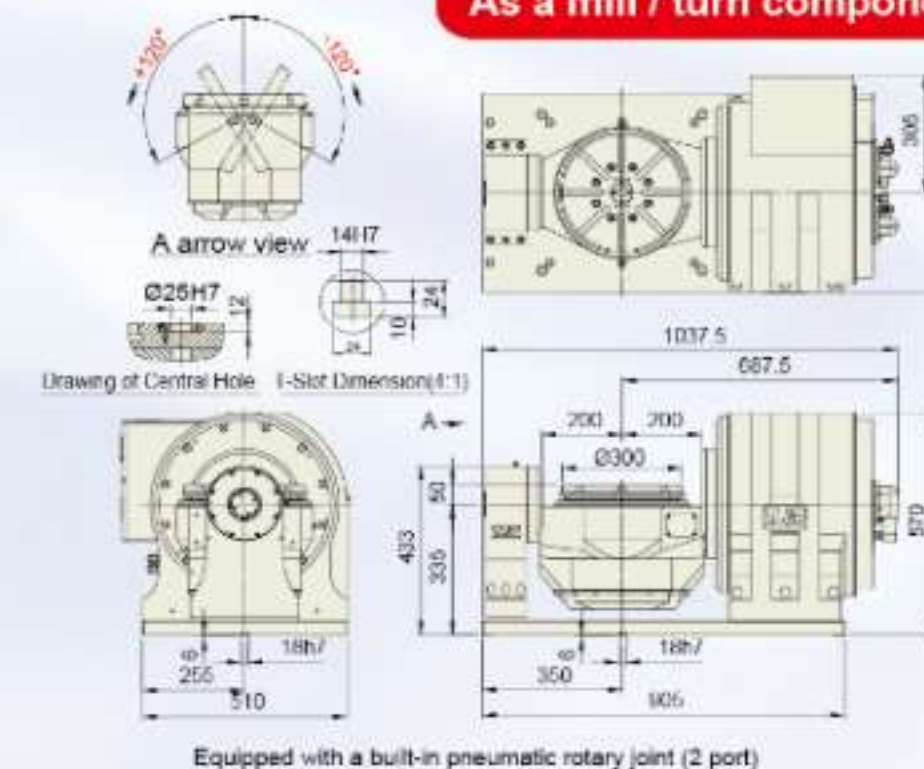
### AD-250HS (2000 rpm)

As a mill / turn component



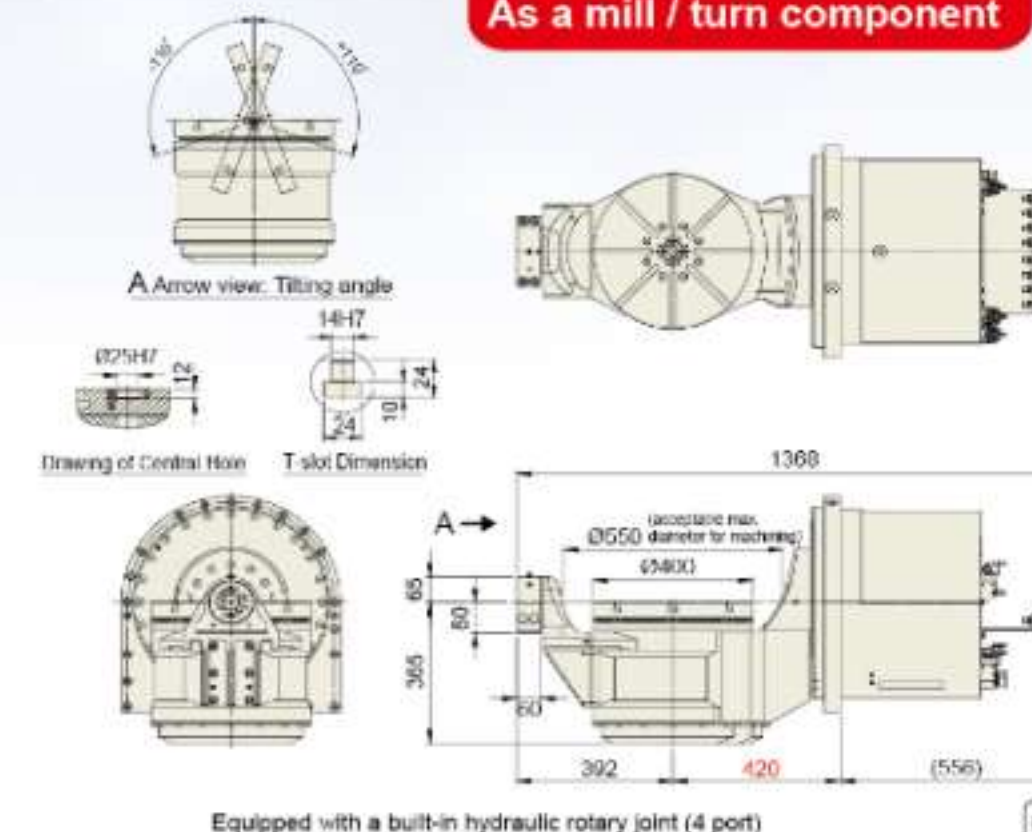
### FAD-300F-HS (2000 rpm)

As a mill / turn component



### FAD-400-HS (1200 rpm)

As a mill / turn component



| Item                                         | Unit                                                                                             | As a mill / turn component                        | Two D.D. Motors : 2000 rpm As a mill / turn component |                 | FAD-400HS-AD500i-420 / FAD-500FHS-AD500i-480     |                 |
|----------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------|-----------------|--------------------------------------------------|-----------------|
|                                              |                                                                                                  | AD - 250HS                                        | FAD-300F-HS                                           |                 |                                                  |                 |
| Table Diameter                               | mm                                                                                               | Ø250                                              | Ø300                                                  |                 | Ø400 / Ø500                                      |                 |
| Inner Diameter of Mandrel Sleeve             | mm                                                                                               | Ø50H7 x 5.5 deep (Diameter of table central hole) | Ø25H7 x 12 deep (Diameter of table central hole)      |                 | Ø25H7 x 12 deep (Diameter of table central hole) |                 |
| Diameter of Center Through Hole              | mm                                                                                               | -                                                 | -                                                     |                 | -                                                |                 |
| Center Height (Vertical)                     | mm                                                                                               | 200                                               | -                                                     |                 | -                                                |                 |
| Table Height (Horizontal)                    | mm                                                                                               | 335                                               | 385                                                   |                 | -                                                |                 |
| Table T-slot Width                           | mm                                                                                               | -                                                 | 14H7                                                  |                 | 14H7                                             |                 |
| Guide Block Width                            | mm                                                                                               | -                                                 | 14h7                                                  |                 | -                                                |                 |
| Axis                                         | -                                                                                                | -                                                 | Rotary axis                                           | Tilt axis ±120° | Rotary axis                                      | Tilt axis ±110° |
| Cooling System                               | -                                                                                                | Water Cooling                                     | Water Cooling                                         | Water Cooling   | Water Cooling                                    | Water Cooling   |
| Transmission Mechanism                       | -                                                                                                | D.D. Motor                                        | D.D. Motor                                            | D.D. Motor      | D.D. Motor                                       | D.D. Motor      |
| Min. Increment                               | deg.                                                                                             | 0.001                                             | 0.001                                                 | 0.001           | 0.001                                            | 0.001           |
| Indexing Precision (while tilt 0°~+90°)      | sec.                                                                                             | 20                                                | 20                                                    | 30              | 20                                               | 25              |
| Repeatability                                | sec.                                                                                             | 4                                                 | 4                                                     | 4               | 4                                                | 4               |
| Clamping System (Pneumatic)                  | kgf/cm²                                                                                          | 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         | 586 / 1200 (Ø400) or 586 / 800 (Ø500)            | 50 / 50         |
| Rated / Max. Cutting Torque                  | Nm                                                                                               | 113 / 169                                         | 113 / -                                               | 554 / 741       | 402 / -                                          | 1217 / 2120     |
| Allowable Inertia Load Capacity (Horizontal) | kg-cm-sec²                                                                                       | 3.1                                               | -                                                     |                 | 40 (Ø400) / 62.5 (Ø500)                          |                 |
| Allowable Workpiece Load (dynamic)           | 0°Horizontal  | kg                                                | 100 (Rated Speed)                                     |                 | 200 (balanced load)                              |                 |
|                                              | 0°~90° Tilt   | kg                                                | 100 (Rated Speed)                                     |                 | 100 (balanced load)                              |                 |
| Allowable Load (with clamping)               | F             | N                                                 | -                                                     |                 | 15000                                            |                 |
|                                              | FxL           | Nm                                                | 1150                                                  |                 | 2000                                             |                 |
|                                              | FxL           | Nm                                                | 550                                                   |                 | 850                                              |                 |
| Net Weight (D.D motor included)              | kg                                                                                               | 158                                               | 730                                                   |                 | - (Ø400) / 914 (Ø500)                            |                 |
| Electrical Specification                     |                                                                                                  |                                                   |                                                       |                 |                                                  |                 |
| Encoder                                      | -                                                                                                | Subject to demand and controller                  | Renishaw or Heidenhain                                |                 | Renishaw or Heidenhain                           |                 |
| Voltage (Back E.M.F)                         | Vrms/100rpm                                                                                      | 33                                                | Rotary axis : 33                                      |                 | Rotary axis : 45.55                              |                 |
| Rotor Poles                                  | -                                                                                                | 22                                                | 22                                                    |                 | 44                                               |                 |
| Rated / Max. Current                         | Arms                                                                                             | 26.5 / 50.2                                       | 26.5 / 50.2                                           |                 | Rotary axis : 66.9 / 151                         |                 |
| Power Rating                                 | KW                                                                                               | 9.9                                               | 9.9                                                   | 4.7             | 25.6                                             | 6.5             |

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

## Support Table

RTA Series (Pneumatic Brake) RTA-125/170/210

RTH Series (Hydraulic Brake) RTH-255/320/400A



▲ RTA-170

▲ RTH-255

▲ RTH-320

▲ RT-170F

▲ RT-135

### RTA-125 (Pneumatic brake 13 kgf-m)

(Weight : 18kg)



### RTH-255 (Hydraulic brake 70 kgf-m)

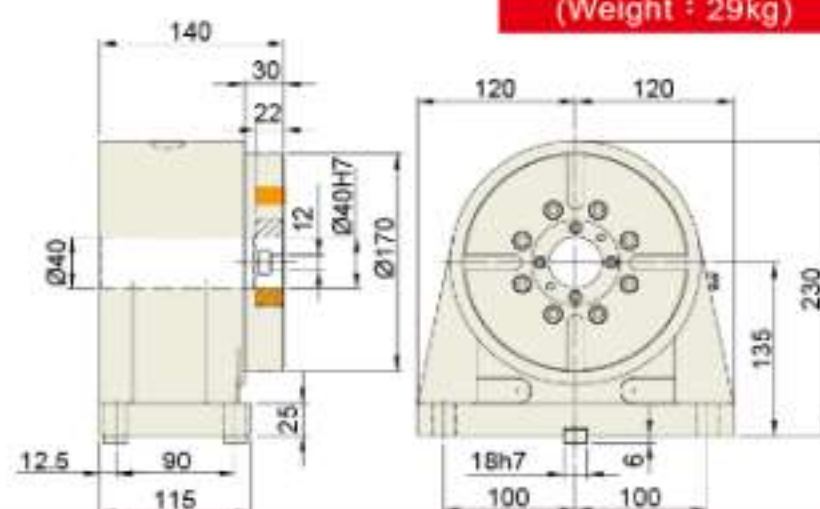
(Weight : 57kg)



### RTA-170 (Pneumatic brake 31 kgf-m)

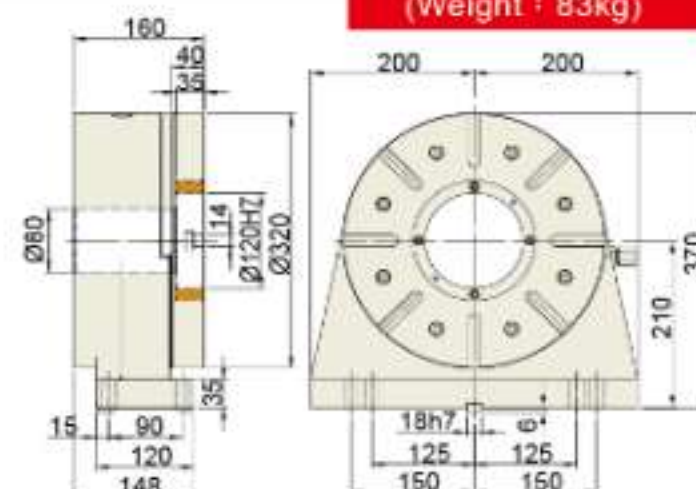
RTA-170H (Hydraulic brake 55 kgf-m)

(Weight : 29kg)



### RTH-320 (Hydraulic brake 115 kgf-m)

(Weight : 83kg)



### RTA-210 (Pneumatic brake 31 kgf-m)

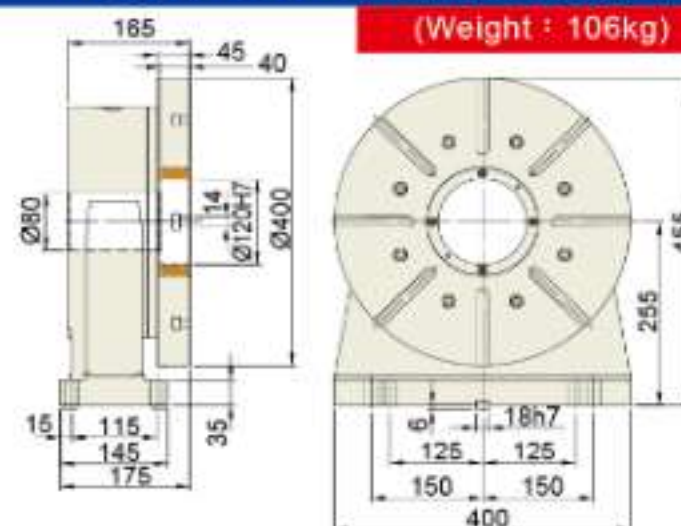
RTA-210H (Hydraulic brake 55 kgf-m)

(Weight : 35kg)



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

(Weight : 106kg)



## Manual Tailstock

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

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

TTJ-125~400

ATTJ-125~210

HTTJ-210~400

TTJ-125A=MT2



▲ TTJ-125A

▲ TJ-210  
(with Fixed Taper)

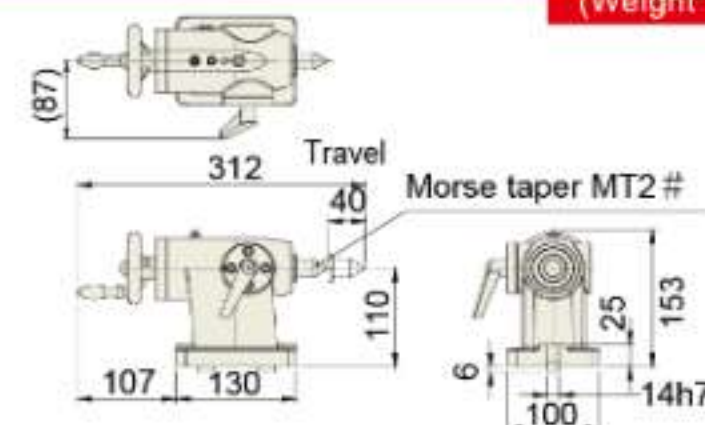
▲ TTJ-210  
(with Replaceable Taper)

▲ ATTJ-170  
(with Pneumatic switching valve)

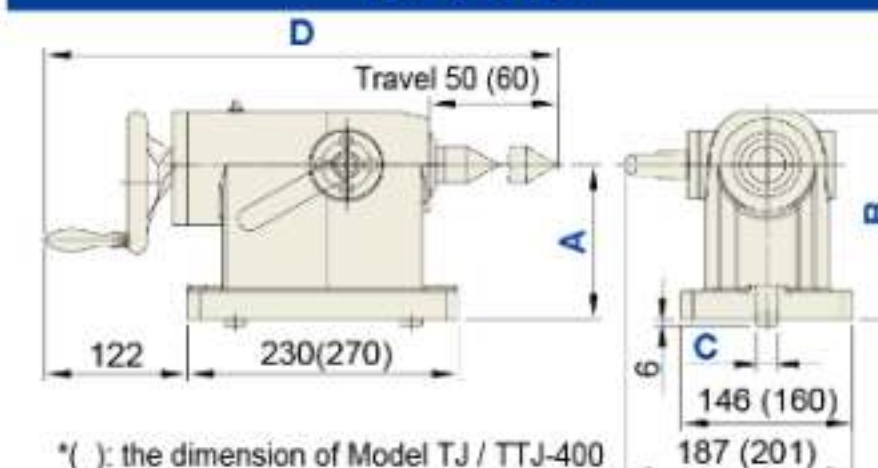
▲ HTTJ-320  
(with Hydraulic switching valve)

### TTJ-125A (For light cutting)

(Weight : 8.5kg)

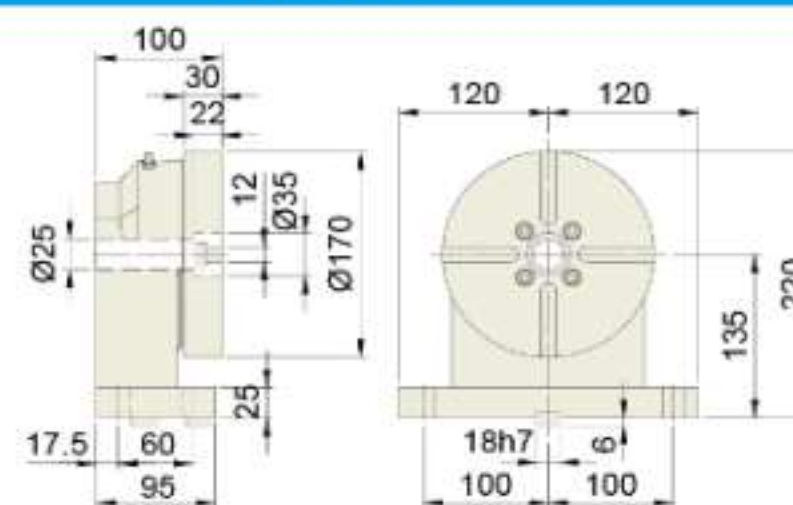


### TJ / TTJ

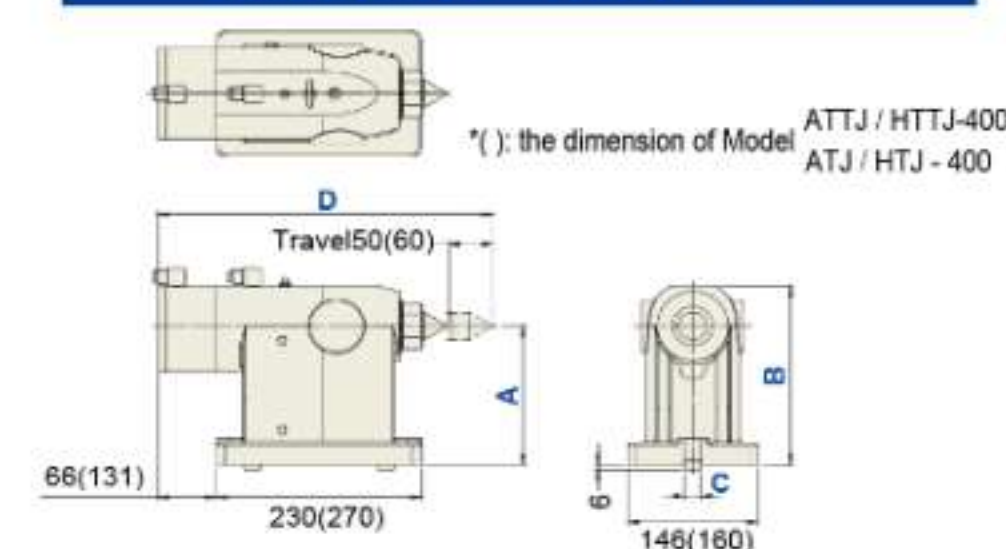


\*( ) : the dimension of Model TJ / TTJ-400

### RT-170F (Without brake)

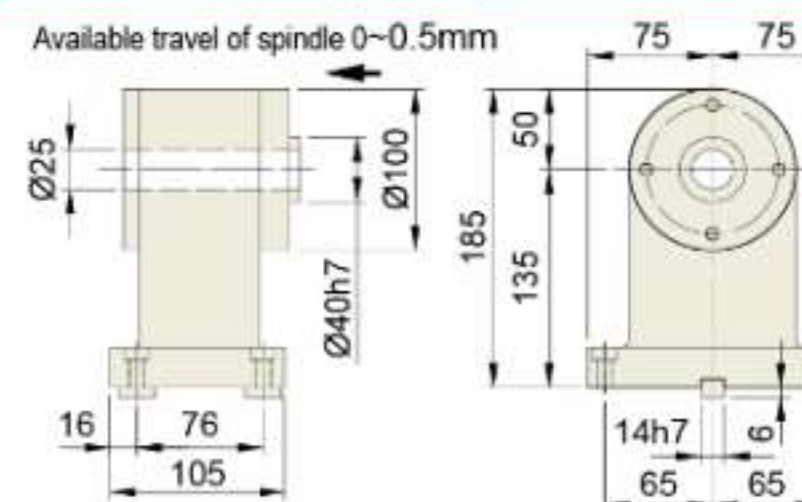


### ATJ/ATTJ HTJ/HTTJ



\*( ) : the dimension of Model ATTJ / HTTJ-400  
ATJ / HTJ - 400

### RT-135 (Simplified type / Without brake)



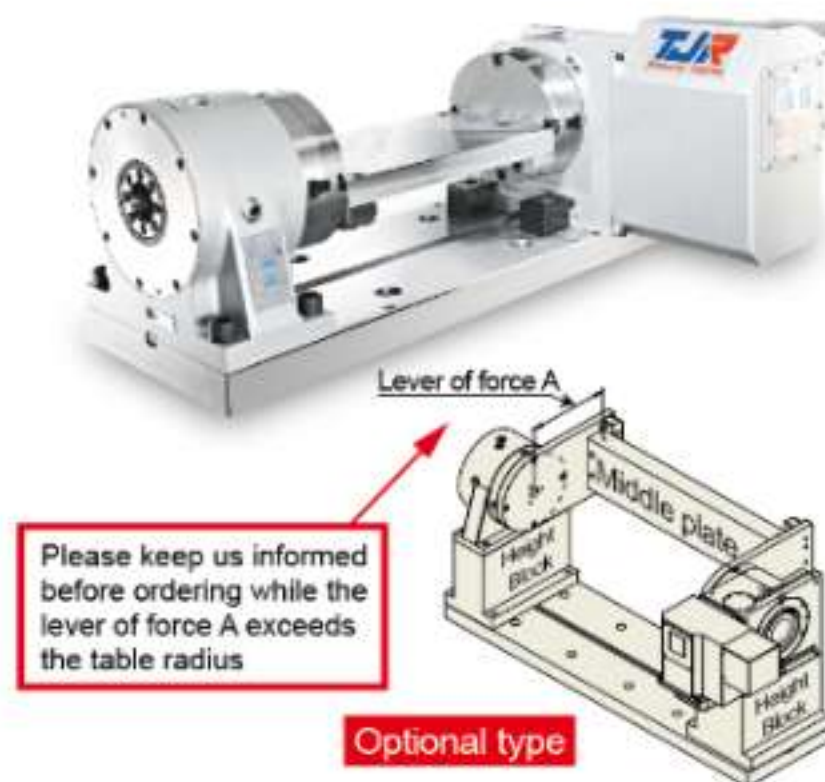
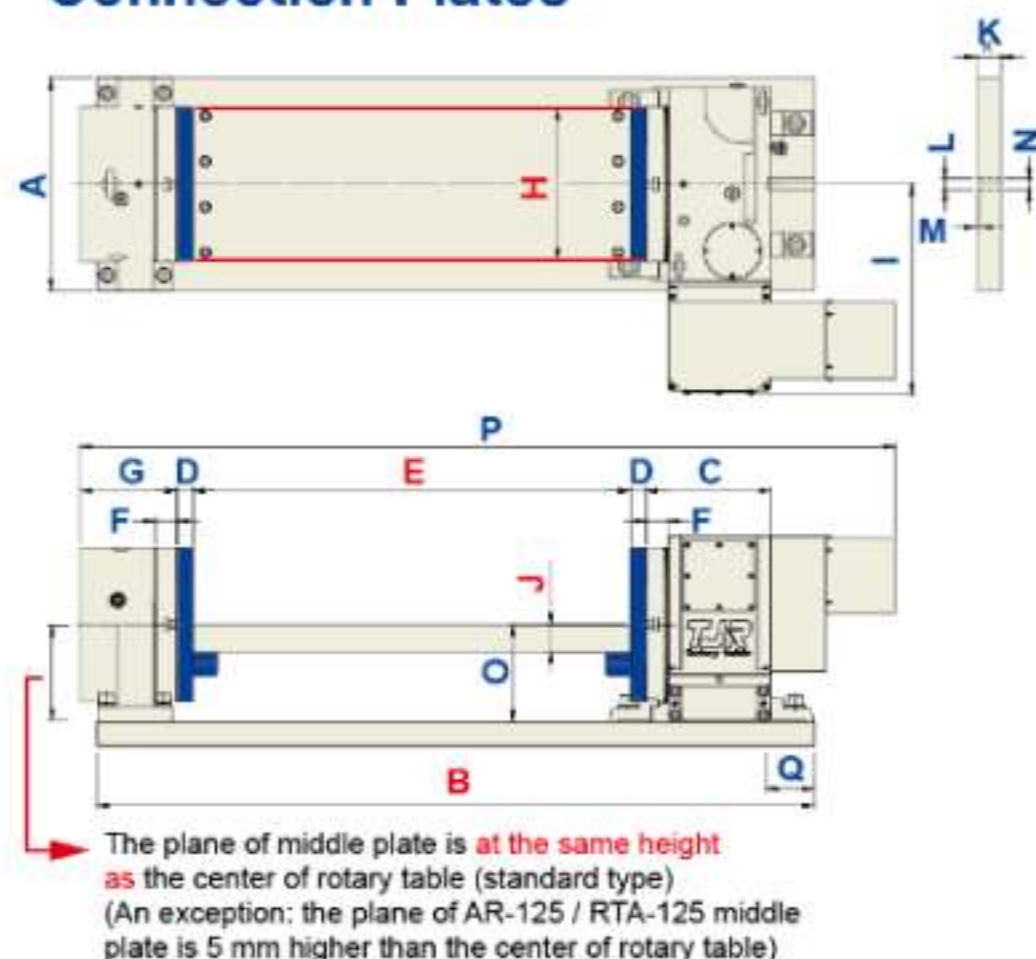
### Manual Tailstock Series (Unit : mm)

| 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 | 256 | 18 | 423/435.5 | 29        |
| TJ / TTJ-400 | 255 | 310 | 18 | 487/503.5 | 48        |

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

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

## CNC Rotary Table + Support Table + Connection Plates



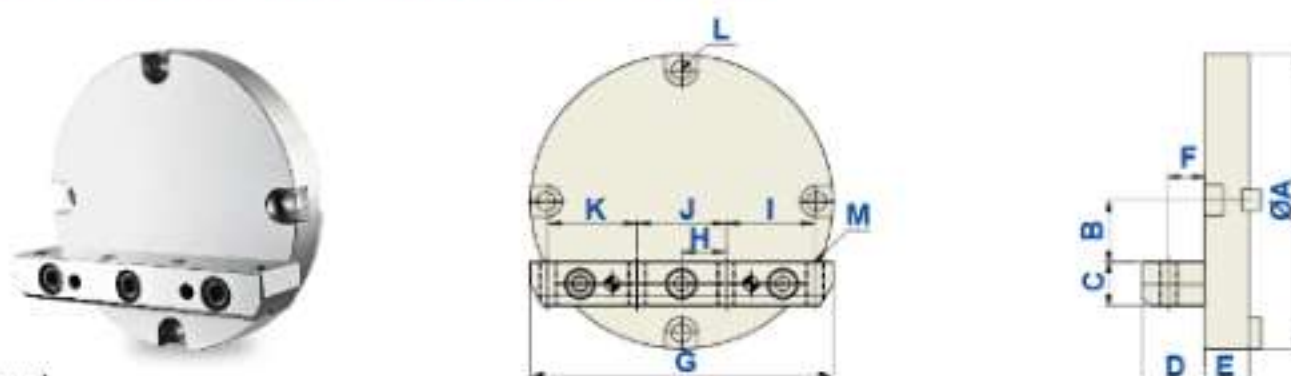
## Specification

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

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

(Unit : mm)

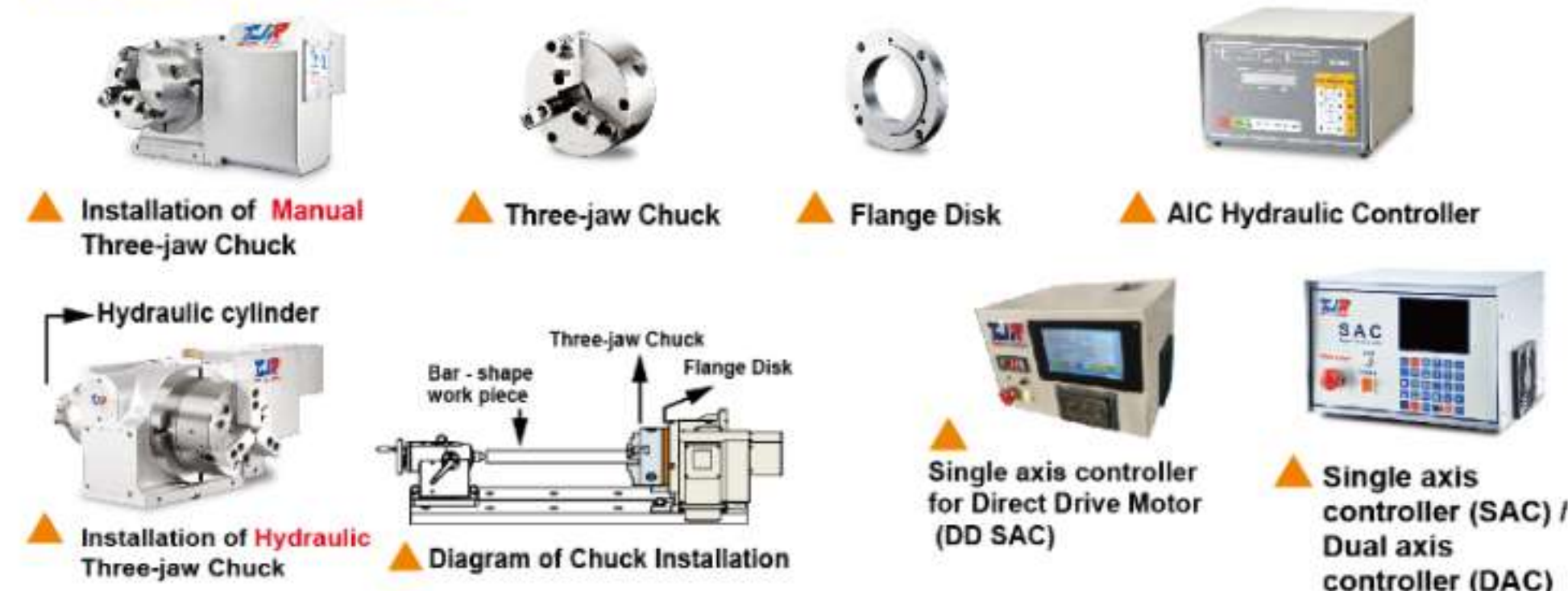
## Disk L-block



## Specification (Unit : mm)

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

## Accessories Series



## Specification Table of Manual Three-jaw Chuck

| Specification Table of Manual Three-jaw 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 |                    |                 |               |                |               |
|-----------------------------------------------|-------------------------------------------|------------------------|-----------------------|-----------------------------------------------------------------------------------|-------------------------------|--------------------------------|--------------------|-----------------|---------------|----------------|---------------|
| Model- Dimension                              | Gripping Range<br>O.D. Range / I.D. Range | Manual chuck thickness | Through hole of chuck |                                                                                   |                               | 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 / Ø82-Ø170                        | 76.5                   | Ø58                   | Ø30                                                                               | Ø30                           |                                | 16                 | 16              | 20            |                |               |
| SK-8                                          | Ø8-Ø190 / Ø88-Ø180                        | 76.5                   | Ø58                   | Ø30                                                                               | Ø30                           |                                | 16                 | 16              | 20            | 25             |               |
| SK-9                                          | Ø11-Ø220 / Ø70-Ø210                       | 84                     | Ø70                   | Ø70                                                                               | Ø70                           |                                |                    |                 | 20            | 25             |               |
| SK-10                                         | Ø12-Ø260 / Ø80-Ø250                       | 89                     | Ø89                   | Ø70                                                                               | Ø70                           |                                |                    |                 | 20            | 25             |               |
| SK-9                                          | Ø11-Ø220 / Ø70-Ø210                       | 84                     | Ø70                   | Ø70                                                                               | Ø110                          |                                |                    |                 | 20            | 25             |               |
| SK-10                                         | Ø12-Ø260 / Ø80-Ø250                       | 89                     | Ø89                   | Ø89                                                                               | Ø110                          |                                |                    |                 | 20            | 25             |               |
| SK-12                                         | Ø15-Ø300 / Ø90-Ø290                       | 96                     | Ø105                  | Ø105                                                                              | Ø110                          |                                |                    |                 |               | 25             |               |
| SK-12                                         | Ø15-Ø300 / Ø90-Ø290                       | 96                     | Ø105                  | Ø105                                                                              | Ø210                          |                                |                    |                 |               | 25             |               |
| SK-16                                         | Ø30-Ø380 / Ø110-Ø350                      | 122                    | Ø160                  | Ø160                                                                              | Ø210                          |                                |                    |                 |               |                | 28            |
| SK-16                                         | Ø30-Ø380 / Ø110-Ø350                      | 122                    | Ø160                  | Ø160                                                                              | Ø270                          |                                |                    |                 |               |                | 28            |

Unit : mm

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

The data in the CNC rotary table specification sheet are calculated based on FANUC 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<br>aiS4 / 4000<br>BiS4 / 4000 | aiF4 / 4000<br>aiS8 / 4000<br>BiS8 / 3000 | aiF8 / 3000<br>aiS12 / 4000<br>BiS12 / 3000 | aiF12 / 3000<br>aiS22 / 4000<br>BiS22 / 2000 | aiF22 / 3000<br>aiS22 / 4000<br>aiS40 / 4000 | aiF40 / 3000<br>aiS40 / 4000<br>aiS80 / 4000 |
|------------|-------------------------------------------|-------------------------------------------|---------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|
| MITSUBISHI | HF-75T / HG75T                            | HF-54T / HG104T                           | HG154S                                      | HF-204S / HG204S                             | HF-354S / HG354S                             | HF-703S                                      |
| YASKAWA    | SGM7J-08A                                 | SGM7G-09A                                 | SGM7G-13A<br>SGM7G-20A                      | SGM7G-30A                                    | SGM7G-30A<br>SGM7G-44A                       | SGM7G-44A                                    |
| SIEMENS    | 1FK7042                                   | 1FK7060                                   | 1FK7063                                     | 1FK7083                                      | 1FK7101                                      | 1FK7103 / 1FK7105                            |
| HEIDENHAIN | QSY-96A                                   | QSY-116C                                  | QSY-116E<br>QSY-130C                        | QSY-155B                                     | QSY-155D                                     | QSY-190D                                     |
| SYNTEC     | AM3-60                                    | AM5-40                                    | AM8-40<br>AM11-40                           | AM18-40                                      | AM28-40                                      | AM35-20(Ø35)                                 |

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

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



## Accessories Series

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

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

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

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

**Internal Cable inside rotary table**

7 I/O signals

**Cable assembly we provide (Standard)**

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

- As shown in the right diagram, internal cables include:
- No. ① - ② power cable
- No. ⑦ - ⑧ feedback cable
- 7 I/O signals for rotary table
- TJR can also provide ③ - ⑥ and ⑨ - ⑫ cables

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

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

(A) No hole and cable

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

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

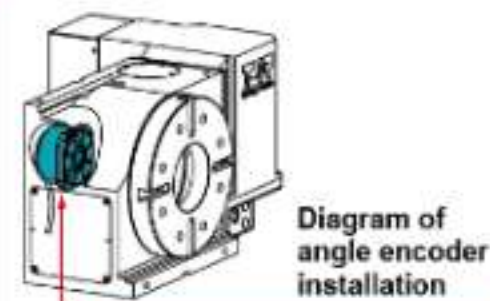
(D) Wiring of adaption and connection for combined power cable and feedback cable

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

Take Heidenhain for example

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

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



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



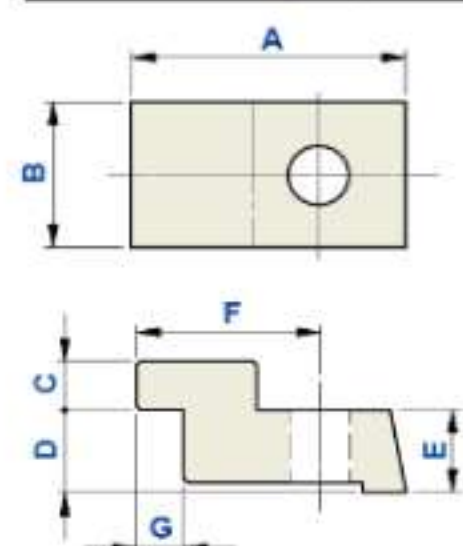
## Geometry Precision Test Standard of Rotary Table (Unit : mm)

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

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

## Specification – Clamping device

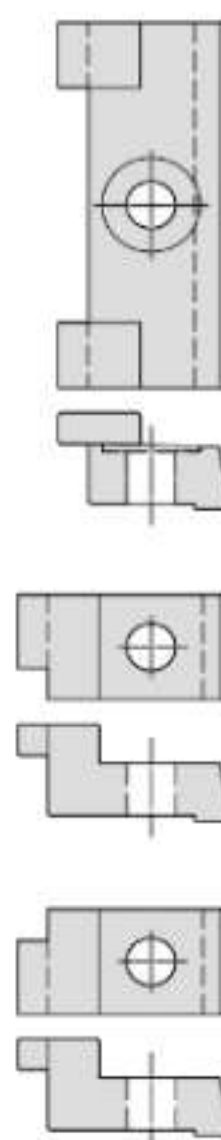
### Standard Clamping device



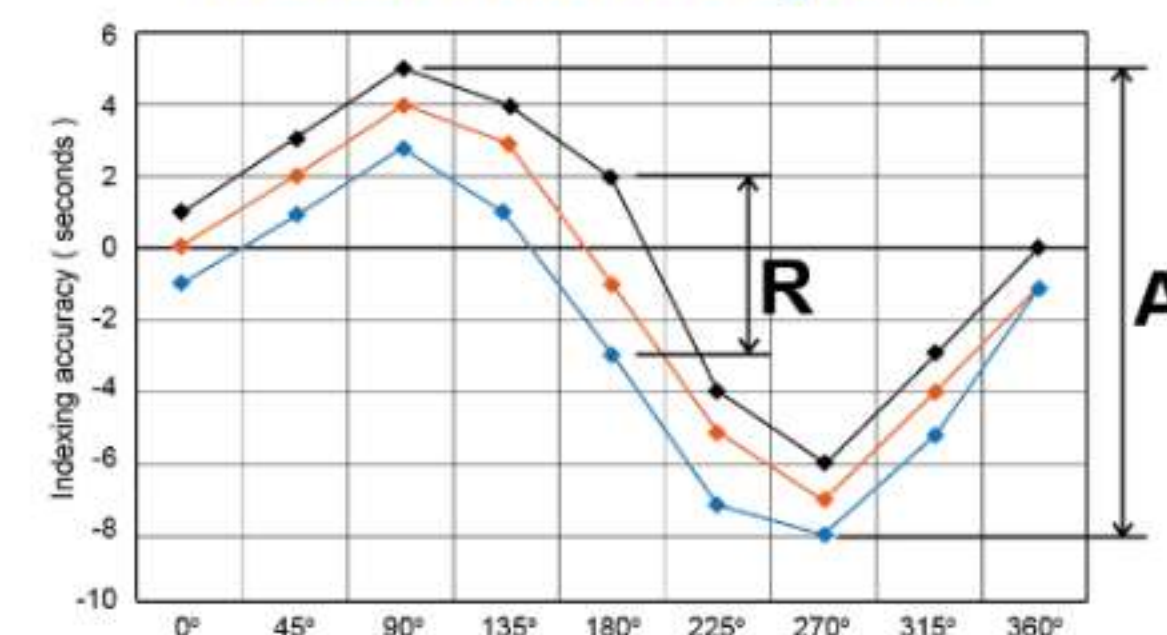
| Model     | Standard Clamping Device |    |    |    |    |    |    |
|-----------|--------------------------|----|----|----|----|----|----|
|           | A                        | B  | C  | D  | E  | F  | G  |
| AR-125    | 63                       | 35 | 12 | 20 | 20 | 43 | 11 |
| AR-170(H) | 78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

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

### Examples of special clamping device



## Rotary angle measurement of rotary table



### The measurement of ISO 230-2

#### Indexing Precision

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

#### Repeatability

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



**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