CNC ROTARY TABLE SERIES
Worldwide Field-proven NIKKEN CNC Rotary Table. Consequently and finally, NIKKEN Carbide Worm Screw System.

Photo shows the worm system of CNC401.

Work Sample Please see for more work samples. P.37 and P.46

Multi-setting on multi-planes P.44
Carbide Worm Screw
Carbide Worm Screw, hard and strong against high speed rotation, is used. (Photo at right hand side) Material: V grade Carbide: High anti-wearing and tough quality Ultra heavy duty, maintaining the high accuracy semi-permanently. Comparing with the traditional combination of worm system (phosphor bronze, aluminium bronze worm wheel and steel worm screw), wearing is largely reduced and table is usable for much more years, resulting in great cost-down. For better impact capability, the special alloy steel worm screw is used for the worm system of the small tooth module.

Worm Wheel
Material is special NIKKEN order made steel. Specially hardened and furthermore ion-nitrided on the tooth. Thus, the problem of the sliding friction is solved. The hardness of the tooth surface and inside is shown at right hand side.

Dynamic High Pressure Oil Film Effect for High Speed CNC Rotary Table Z Series
NIKKEN’S experience in gear cutting and study of the pressure angle of worm screw carry out the table’s higher rotation speed (66.6min⁻¹). The rotational speed of the screw creates the pressure to force the oil between the gears preventing any metal-to-metal contact, eliminating gear wear and producing high rigidity and durability.

Large size rotary tables are made a lineup
The large size rotary tables for the large size machine tool, the large size die mould, energy and air craft are made a lineup. p.11, p.29 The NIKKEN carbide worm system is installed in the rotary table with the super durability, accuracy and rigidity.
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NIKKEN is keeping the manufacturing not only the quality, but also the safety in mind. Please be careful for the content made. e.g. P.60

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<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>CNC105</th>
<th>CNC180</th>
<th>CNC202</th>
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<tbody>
<tr>
<td><strong>CNC105</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Diameter of Table</td>
<td>ø105</td>
<td>180</td>
<td>200</td>
</tr>
<tr>
<td>Diameter of Spindle Hole</td>
<td>ø60H7</td>
<td>ø60H7</td>
<td>ø60H7</td>
</tr>
<tr>
<td>Centre Height</td>
<td>105</td>
<td>135</td>
<td>135</td>
</tr>
<tr>
<td>Width of T Slot</td>
<td>ø10H7</td>
<td>12.5±0.018</td>
<td>12.5±0.018</td>
</tr>
<tr>
<td>Clamping System</td>
<td>Air</td>
<td>Air</td>
<td>Air</td>
</tr>
<tr>
<td>Clamping Torque</td>
<td>205</td>
<td>303</td>
<td>303</td>
</tr>
<tr>
<td>Table Inertia at Motor Shaft (kgf²)</td>
<td>0.06</td>
<td>0.08</td>
<td>0.09</td>
</tr>
<tr>
<td>Servo Motor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIN. Increment</td>
<td>0.001'</td>
<td>0.001'</td>
<td>0.001'</td>
</tr>
<tr>
<td>Rotation Speed</td>
<td>22.2 (44.4)</td>
<td>22.2 (44.4)</td>
<td>22.2 (44.4)</td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td>1/90 (1/45)</td>
<td>1/90 (1/45)</td>
<td>1/90 (1/45)</td>
</tr>
<tr>
<td>Indexing Accuracy</td>
<td>±30</td>
<td>±20</td>
<td>±20</td>
</tr>
<tr>
<td>Net Weight</td>
<td>32</td>
<td>45</td>
<td>55</td>
</tr>
<tr>
<td><strong>MAX. Work Load on the Table</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>kg</td>
<td>30</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Horizontal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>kg</td>
<td>60</td>
<td>200</td>
<td>200</td>
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<tr>
<td><strong>MAX. Thrust Load applicable on the Table</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>8800</td>
<td>10780</td>
<td>10780</td>
</tr>
<tr>
<td>FXL N/m</td>
<td>65</td>
<td>415</td>
<td>415</td>
</tr>
<tr>
<td>FXL N/m</td>
<td>220</td>
<td>960</td>
<td>960</td>
</tr>
<tr>
<td><strong>MAX. Work Inertia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(kgf²) kg m²</td>
<td>0.04 (0.02)</td>
<td>0.40 (0.20)</td>
<td>1.0 (0.5)</td>
</tr>
<tr>
<td>Driving Torque</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N·m</td>
<td>36 (27)</td>
<td>72 (54)</td>
<td>144 (115)</td>
</tr>
</tbody>
</table>

- **CNC105 x21 and attachments**
- **CNC105 LFA-M**
  - No letter: without motor
  - M: with motor
  - A: AC servo motor
  - F: Fanuc
  - S: Siemens
  - M: MHI

- **Explanation of the Code No.** (Example)
  - CNC105 LFA-M: Without motor
  - CNC105 LFA-M A: AC servo motor
  - CNC105 LFA-M F: Fanuc

- **CNC202L**
  - Rotary table with x21 controller, refer P.69

- **Specifications**
  - High Speed CNC ROTARY Table Z series

- **Ultra precision type** is available for all tables, ±3" or ±5", refer P.63
- **Ultra precision type** is available for all tables, ±3" or ±5", refer P.63
External dimensions will be different according to the type of the servo motors. Dimensions with FANUC motor or with NIKKEN K21 controller (K21: ) are shown. Please contact us for CAD data (2D: DXF, 3D: PARASOLID).

CNC105, CNCZ105

Photo shows a rotary table with K21 controller.

Powerful Brake
Brake Torque: 205Nm

Air purge function is provided inside the motor cover as standard.

CNC180, CNCZ180

Photo shows a rotary table with K21 controller.

Powerful Brake
Brake Torque: 303Nm

Air purge function is provided inside the motor cover as standard.

CNC202, CNCZ202

Photo shows a rotary table with K21 controller.

Powerful Brake
Brake Torque: 303Nm

Air purge function is provided inside the motor cover as standard.

For accuracy standard, refer P 51, 52
For swing chuck, tailstock and other optional accessories, refer P 49, 50
For series attachment can be attached for all tables, refer P 48

Counter Balance Cylinder

Counter Balance Cylinder is standardized to solve un-balancing load. JAPAN, PAT

Counter Balance Cylinder

CNC180A21

Un-balancing Load

Photo and illustration show the example of the application for un-balancing load.

Small Size Support Table TAT (JAPAN, PAT)

CST100-105, 135

(w/o brake)

Pneumatic ports are 2 x Rc1/8. Solenoid valve and clamp/undamp confirmation switches are not included.

TAT105

* Please add "- centre height" at the end of Code No. for the support table with different centre height (B). e.g. TAT105-105
## Specifications

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>CNC260 CNCZ260</th>
<th>CNC320 CNCZ320</th>
<th>CNC321 CNCZ321</th>
<th>CNC401 CNCZ401</th>
<th>CNCB350</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table</td>
<td>260</td>
<td>300</td>
<td>320</td>
<td>400</td>
<td>350</td>
</tr>
<tr>
<td>Diameter of Spindle Hole</td>
<td>80×47</td>
<td>80×47</td>
<td>105×47</td>
<td>105×47</td>
<td>154×47</td>
</tr>
<tr>
<td>Centre Height</td>
<td>170</td>
<td>170</td>
<td>230</td>
<td>230</td>
<td>230</td>
</tr>
<tr>
<td>Width of T Slot</td>
<td>12.7×0.18</td>
<td>12.7×0.18</td>
<td>12.7×0.18</td>
<td>14×0.18</td>
<td>14×0.18</td>
</tr>
<tr>
<td>Clamping Torque</td>
<td>N·m</td>
<td>588/1568</td>
<td>588/1568</td>
<td>1760</td>
<td>1760</td>
</tr>
<tr>
<td>Table Inertia at Motor Shaft</td>
<td>(kg·m²)</td>
<td>0.33×10⁶</td>
<td>0.33×10⁶</td>
<td>2.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Servo Motor</td>
<td>( \min^{-1} )</td>
<td>( \text{arIF4/4000} \times 2000 )</td>
<td>( \text{arIF4/4000} \times 2000 )</td>
<td>( \text{arIF12/3000} \times 2000 )</td>
<td>( \text{arIF12/3000} \times 2000 )</td>
</tr>
<tr>
<td>MIN. Increment</td>
<td></td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Rotation Speed</td>
<td>( \min^{-1} )</td>
<td>16.6 (33.3)</td>
<td>16.6 (33.3)</td>
<td>22.2 (44.4)</td>
<td>22.2 (44.4)</td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td>1/120 (1/60)</td>
<td>1/120 (1/60)</td>
<td>1/90 (1/45)</td>
<td>1/90 (1/45)</td>
<td>1/90</td>
</tr>
<tr>
<td>Indexing Accuracy</td>
<td>sec</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Net Weight</td>
<td>kg</td>
<td>115</td>
<td>120</td>
<td>200</td>
<td>230</td>
</tr>
<tr>
<td>MAX. Work Load on the Table</td>
<td>kg</td>
<td>175</td>
<td>175</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Vertical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontal</td>
<td>kg</td>
<td>350</td>
<td>350</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>MAX. Thrust Load applicable on the Table</td>
<td>( N )</td>
<td>25480</td>
<td>25480</td>
<td>31360</td>
<td>31360</td>
</tr>
<tr>
<td>( \text{FXL} \ N\cdot\text{m} )</td>
<td>984</td>
<td>984</td>
<td>1166</td>
<td>1166</td>
<td></td>
</tr>
<tr>
<td>( \text{FXL} \ N\cdot\text{m} )</td>
<td>3332</td>
<td>3332</td>
<td>3920</td>
<td>3920</td>
<td></td>
</tr>
<tr>
<td>MAX. Work Inertia</td>
<td>((\text{kg}·\text{m}^2))</td>
<td>3.2 (1.6)</td>
<td>3.2 (1.6)</td>
<td>6.4 (3.2)</td>
<td>6.4 (3.2)</td>
</tr>
<tr>
<td>Vertical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving Torque</td>
<td>( N\cdot\text{m} )</td>
<td>192 (153)</td>
<td>192 (153)</td>
<td>432 (345)</td>
<td>432 (345)</td>
</tr>
</tbody>
</table>

- L type (left hand mounted motor) is available for all tables.
- AWC system is available for all tables, refer \( \text{P.43} \sim \text{P.46} \).
- Rotary pin is available for all tables, refer \( \text{P.54} \).
- Ultra precision type is available for all tables, refer \( \text{P.55} \).
- For CNC 321 & 401, ultra heavy duty type is available.
- The continuous cutting ability is 5 times compared with standard type, \( \text{P.55} \).
- \( \text{arIF12/3000} \) motor can be mounted on CNC260 & 302.
- \( \text{arIF22/3000} \) motor can be mounted on CNC321 & 401.
- The supplied hydraulic pressure is 3 MPA for hydraulic clamping system.
- Please refer \( \text{P.55} \) for the air-hydraulic booster, when the rotary table with hydraulic clamping system is used on the machining center without hydraulic source.
CNC260, CNCZ260

Pneumatic Brake Torque UP 588Nm

For the rotary table with pneumatic brake, air purge function is provided inside the motor cover as standard.

CNC302, CNCZ302

Pneumatic Brake Torque UP 588Nm

For the rotary table with pneumatic brake, air purge function is provided inside the motor cover as standard.

CNC321, CNCZ321

Built-in type rotary joint can be mounted on CNC321 & 401, refer \( \Rightarrow P.49 \)

CNC401, CNCZ401

Built-in type rotary joint can be mounted on CNC321 & 401, refer \( \Rightarrow P.49 \)

Photo shows with rotary joint (option).

CNCB350 Ultra Big Bore (\( \phi \) 154mm) Specification

Available as an option.

For accuracy standard, refer \( \Rightarrow P.51, 52 \)
For fixing metal and stepped guide piece, refer \( \Rightarrow P.22 \)
For scroll chuck, tailstock and other optional accessories, refer \( \Rightarrow P.49, 50 \)
For the condition of CNC table which is mounted on CNC special purpose machine, refer \( \Rightarrow P.59, 60 \)
# CNC ROTARY TABLE

- Dividing and lead cutting for large size work piece is suitable.
- Large through hole and powerful clamping system.

### Explanation of the Code No. (Example)
- **CNC 601 F A - M**
  - No Letter: without motor
  - M: with motor
  - A: DC servo motor
  - A: AC servo motor
  - X21PW with NIKKEN x21 controller
  - F: FANUC M: MELDAS Y: YASUNI OSP M: ORBIS
  - No Letter: Right hand mounted motor
  - L: Left hand mounted motor
  - V: Vertical
  - H: Horizontal
  - Z: Vertical
  - Diameter of Table
  - 500, 600, 800, 1200

## Specifications

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>CNC501</th>
<th>CNCZ501</th>
<th>CNC601</th>
<th>CNCZ601</th>
<th>CNC802</th>
<th>CNCB450</th>
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<tbody>
<tr>
<td>Diameter of Table</td>
<td>Ømm</td>
<td>500</td>
<td>600</td>
<td>800</td>
<td>450</td>
<td></td>
</tr>
<tr>
<td>Diameter of Spindle Hole</td>
<td>Ømm</td>
<td>130h7</td>
<td>130h7</td>
<td>270h7</td>
<td>205h7</td>
<td></td>
</tr>
<tr>
<td>Centre Height</td>
<td>mm</td>
<td>310</td>
<td>310</td>
<td>470</td>
<td>280</td>
<td></td>
</tr>
<tr>
<td>Width of T Slot</td>
<td>mm</td>
<td>14 (0.018)</td>
<td>14 (0.018)</td>
<td>20 (0.07)</td>
<td>14 (0.018)</td>
<td></td>
</tr>
<tr>
<td>Clamping Torque</td>
<td>N·m</td>
<td>4655</td>
<td>4655</td>
<td>7000</td>
<td>3870</td>
<td></td>
</tr>
<tr>
<td>Table Inertia at Motor Shaft</td>
<td>kg·m²</td>
<td>6.8</td>
<td>4.9</td>
<td>5.3</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>Servo Motor</td>
<td></td>
<td>[\text{motor}1/2/3000\cdot2000]</td>
<td>[\text{motor}1/2/3000\cdot2000]</td>
<td>[\text{motor}1/2/3000\cdot2000]</td>
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<td>MIN. Increment</td>
<td>min⁻¹</td>
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<td>0.001</td>
<td>0.001</td>
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</tr>
<tr>
<td>Rotation Speed</td>
<td>min⁻¹</td>
<td>16 (33.3)</td>
<td>11.1 (22.2)</td>
<td>5.5</td>
<td>25</td>
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</tr>
<tr>
<td>Total Reduction Ratio</td>
<td></td>
<td>1/120 (1/60)</td>
<td>1/180 (1/90)</td>
<td>1/360</td>
<td>1/120</td>
<td></td>
</tr>
<tr>
<td>Indexing Accuracy</td>
<td>sec</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Net Weight</td>
<td>kg</td>
<td>470</td>
<td>500</td>
<td>1100</td>
<td>380</td>
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<tr>
<td>MAX. Work Load on the Table</td>
<td>Vertical</td>
<td>kg</td>
<td>400</td>
<td>400</td>
<td>1500</td>
<td>350</td>
</tr>
<tr>
<td></td>
<td>Horizontal</td>
<td>kg</td>
<td>800</td>
<td>800</td>
<td>3000</td>
<td>700</td>
</tr>
<tr>
<td>MAX. Thrust Load applicable on the Table</td>
<td>N</td>
<td>39200</td>
<td>39200</td>
<td>58800</td>
<td>37632</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F·X·L</td>
<td>N·m</td>
<td>4655</td>
<td>4655</td>
<td>7000</td>
<td>4410</td>
</tr>
<tr>
<td>MAX. Work Inertia</td>
<td>Vertical</td>
<td>(kg·m²)</td>
<td>19.4 (9.7)</td>
<td>37 (18.5)</td>
<td>234</td>
<td>17</td>
</tr>
<tr>
<td>Driving Torque</td>
<td>N·m</td>
<td>576 (460)</td>
<td>864 (690)</td>
<td>3800</td>
<td>576</td>
<td></td>
</tr>
</tbody>
</table>

- **CNC501 & 601**
- **CNCZ501 & 601**
- **CNC802**
- **CNCB450**

* Specifications for CNC501 & 601.*
* Specifications for CNCZ501 & 601.*
* Specifications for CNC802.*
* Specifications for CNCB450.*

- **CNC501 & 601**
- **CNCZ501 & 601**
- **CNC802**
- **CNCB450**

- Specifications for CNC501 & 601.
- Specifications for CNCZ501 & 601.
- Specifications for CNC802.
- Specifications for CNCB450.

- Specifications for CNC501 & 601.
- Specifications for CNCZ501 & 601.
- Specifications for CNC802.
- Specifications for CNCB450.

- Specifications for CNC501 & 601.
- Specifications for CNCZ501 & 601.
- Specifications for CNC802.
- Specifications for CNCB450.

- Specifications for CNC501 & 601.
- Specifications for CNCZ501 & 601.
- Specifications for CNC802.
- Specifications for CNCB450.

- Specifications for CNC501 & 601.
- Specifications for CNCZ501 & 601.
- Specifications for CNC802.
- Specifications for CNCB450.

- Specifications for CNC501 & 601.
- Specifications for CNCZ501 & 601.
- Specifications for CNC802.
- Specifications for CNCB450.

- Specifications for CNC501 & 601.
- Specifications for CNCZ501 & 601.
- Specifications for CNC802.
- Specifications for CNCB450.

- Specifications for CNC501 & 601.
- Specifications for CNCZ501 & 601.
- Specifications for CNC802.
- Specifications for CNCB450.

- Specifications for CNC501 & 601.
- Specifications for CNCZ501 & 601.
- Specifications for CNC802.
- Specifications for CNCB450.

- Specifications for CNC501 & 601.
- Specifications for CNCZ501 & 601.
- Specifications for CNC802.
- Specifications for CNCB450.

- Specifications for CNC501 & 601.
- Specifications for CNCZ501 & 601.
- Specifications for CNC802.
- Specifications for CNCB450.

- Specifications for CNC501 & 601.
- Specifications for CNCZ501 & 601.
- Specifications for CNC802.
- Specifications for CNCB450.

- Specifications for CNC501 & 601.
- Specifications for CNCZ501 & 601.
- Specifications for CNC802.
- Specifications for CNCB450.

- Specifications for CNC501 & 601.
- Specifications for CNCZ501 & 601.
- Specifications for CNC802.
- Specifications for CNCB450.
CNC501, CNCZ501

External dimensions will be different according to the type of the servo motors. Dimensions with FANUC motor are shown. Please contact us for CAD data (2D:DXF, 3D:PARASOLID).

CNC601, CNCZ601

★ Built-in type rotary joint can be mounted on CNC601, refer ⇒ P.54

CNC802  NEW  Ultra Big Bore (φ270mm) Specification

★ 10 ports of built-in type rotary joint can be mounted on CNC802, refer ⇒ P.54

CNC802 can be used for the B-axis table on the horizontal M/C. Different type of the rotary tables with fixtures are installed on the both side of CNC802 to divide the machining processes, then all processes can be done at one rotation of CNC802.

CNCB450  NEW  Ultra Big Bore (φ205mm) Specification

★ For accuracy standard, refer ⇒ P.51, 52
★ For lifting metal and stepped guide piece, refer ⇒ P.22
★ For scroll chuck, tailstock and other optional accessories, refer ⇒ P.49, 50
★ For the conditions of CNC table which is mounted on CNC special purpose machine, refer ⇒ P.59, 60

Example for the utilization for large diameter bar work

Large diameter scroll chuck.
### Specifications

The specification will be varied according to your application. Please contact us.

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>CNC1000</th>
<th>CNC1200</th>
<th>CNC1201</th>
<th>CNC1600</th>
<th>CNC2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table</td>
<td>$\phi$mm</td>
<td>1000</td>
<td>1200</td>
<td>1200</td>
<td>1600</td>
</tr>
<tr>
<td>Diameter of Spindle Hole *1</td>
<td>$\phi$mm</td>
<td>300h7</td>
<td>300h7</td>
<td>300h7</td>
<td>400h7</td>
</tr>
<tr>
<td>Centre Height</td>
<td>mm</td>
<td>Horizontal</td>
<td>Horizontal</td>
<td>650</td>
<td>850</td>
</tr>
<tr>
<td>Width of T Slot *2</td>
<td>mm</td>
<td>22h7 *2</td>
<td>22h7 *2</td>
<td>22h7 *2</td>
<td>28h7 *2</td>
</tr>
<tr>
<td>Clamping Torque</td>
<td>N·m</td>
<td>18000</td>
<td>18000</td>
<td>18000</td>
<td>35000</td>
</tr>
<tr>
<td>Servo Motor</td>
<td>$\min^{-1}$</td>
<td>$\alpha$F22/3000, 2000</td>
<td>$\alpha$F30/3000, 2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIN. Increment</td>
<td></td>
<td>0.001&quot;</td>
<td>0.001&quot;</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Rotation Speed *3</td>
<td>$\min^{-1}$</td>
<td>5.5</td>
<td>5.5</td>
<td>2.7</td>
<td>2.7</td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td></td>
<td>1/360</td>
<td>1/360</td>
<td>1/720</td>
<td>1/720</td>
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<tr>
<td>Indexing Accuracy</td>
<td>sec</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
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<tr>
<td>Indexing Accuracy of Ultra Precision</td>
<td>sec</td>
<td>$\pm3$</td>
<td>$\pm3$</td>
<td>$\pm3$</td>
<td>$\pm3$</td>
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<tr>
<td>Net Weight</td>
<td>kg</td>
<td>1700</td>
<td>1850</td>
<td>3500 *4</td>
<td>5250 *4</td>
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</table>

**MAX. Work Load on the Table**

<table>
<thead>
<tr>
<th>Vertical</th>
<th>kg</th>
<th>6500</th>
<th>10000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal</td>
<td>kg</td>
<td>7000</td>
<td>7000</td>
</tr>
<tr>
<td>13000</td>
<td>30000</td>
<td>30000</td>
<td></td>
</tr>
</tbody>
</table>

**MAX. Thrust Load applicable on the Table**

| N | 137200 | 137200 | 254800 | 392000 | 392000 |
| FNL | N·m | — | — | 18000 | 35000 | — |
| FNL | N·m | 9600 | 9600 | 27000 | 80000 | 80000 |

**MAX. Work Inertia**

| kg·m² | 1300 | 1300 | 2300 | 6400 | 6400 |

**MAX. Allowable Torque**

| N·m | 11000 | 11000 | 36000 | 50000 | 50000 |

---

*1 Centre hole can not be used for the ultra precision type with the Heidenhain rotary encoder.

*2 Without T slots is standard for large rotary table, T slot is available as an option. Please specify the width of the T slot.

*3 Total reduction ratio will be charged for your application. Motor with the reduction mechanism is used for the rotary tables larger equal to CNC1001. It may be difficult for the system without motor or the system motor is supplied. Please contact us.

*4 The weight is for horizontal use. The weight of the back support for vertical use is not included. Please contact us.

*5 This is the MAX. allowable torque applied to worm system.
Application of the Large Rotary Table

Machining of the gears with large module

Configuration of the large rotary table on the horizontal M/C to machine a propeller hub of the windmill.

Hobbing of the gears with large module
## Specifications

### High Speed CNC ROTARY Table Z series

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table (mm)</td>
<td>180</td>
<td>200</td>
<td>260</td>
<td>300</td>
<td>320</td>
<td>400</td>
</tr>
<tr>
<td>Diameter of Spindle Hole (mm)</td>
<td>φ60H7, φ40</td>
<td>φ60H7, φ40</td>
<td>φ60H7, φ40</td>
<td>φ60H7</td>
<td>φ105H7</td>
<td>φ105H7</td>
</tr>
<tr>
<td>Centre Height (mm)</td>
<td>180</td>
<td>180</td>
<td>170</td>
<td>170</td>
<td>230</td>
<td>230</td>
</tr>
<tr>
<td>Width of T Slot (mm)</td>
<td>12 (φ0.008)</td>
<td>12 (φ0.008)</td>
<td>12 (φ0.008)</td>
<td>12 (φ0.008)</td>
<td>12 (φ0.008)</td>
<td>14 (φ0.008)</td>
</tr>
<tr>
<td>Clamping Torque (N·m)</td>
<td>303</td>
<td>303</td>
<td>588/1568</td>
<td>588/1568</td>
<td>1760</td>
<td>1760</td>
</tr>
<tr>
<td>Table Inertia at Motor Shaft (kg·m²) x 10⁶</td>
<td>0.4</td>
<td>0.4</td>
<td>1.7</td>
<td>1.8</td>
<td>7.0</td>
<td>7.0</td>
</tr>
<tr>
<td>MIN. Increment (°)</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Rotation Speed (min⁻¹)</td>
<td>22.2 (44.4)</td>
<td>22.2 (44.4)</td>
<td>16.6 (33.3)</td>
<td>16.6 (33.3)</td>
<td>22.2 (44.4)</td>
<td>22.2 (44.4)</td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td>1/90 (1/45)</td>
<td>1/90 (1/45)</td>
<td>1/120 (1/60)</td>
<td>1/120 (1/60)</td>
<td>1/90 (1/45)</td>
<td>1/90 (1/45)</td>
</tr>
<tr>
<td>Indexing Accuracy (sec)</td>
<td>±20</td>
<td>±20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Net Weight (kg)</td>
<td>56</td>
<td>60</td>
<td>145</td>
<td>150</td>
<td>240</td>
<td>270</td>
</tr>
<tr>
<td>MAX. Work Load on the Table (kg)</td>
<td>100</td>
<td>100</td>
<td>175</td>
<td>175</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>MAX. Thrust Load applicable on the Table (N)</td>
<td>10780</td>
<td>10780</td>
<td>25480</td>
<td>25480</td>
<td>31360</td>
<td>31360</td>
</tr>
<tr>
<td>MAX. Work Inertia (kg·m²)</td>
<td>0.4 (0.2)</td>
<td>0.4 (0.2)</td>
<td>3.2 (1.6)</td>
<td>3.2 (1.6)</td>
<td>6.4 (3.2)</td>
<td>6.4 (3.2)</td>
</tr>
<tr>
<td>Driving Torque (N·m)</td>
<td>72 (64)</td>
<td>72 (64)</td>
<td>192 (153)</td>
<td>192 (153)</td>
<td>432 (345)</td>
<td>432 (345)</td>
</tr>
</tbody>
</table>

- The supplied hydraulic pressure is 3.5MPa for hydraulic clamping system.
- If using P-56, refer to the air-dynamic booster, when the rotary table with hydraulic clamping system is used on the M/C without hydraulic source.
- Please contact us for ultra-precision type and rotational joint type. Refer to P.53, P.54.
CNC180B, CNCZ180B

External dimensions will be different according to the type of the servo motors. Dimensions with FANUC motor are shown. Please contact us for CAD data (2D:DXF, 3D:PARASOLID).

CNC180B, CNCZ180B

 Powerful Brake
 Brake Torque : 303Nm

Air purge function is provided.

CNC202B, CNCZ202B

 Powerful Brake
 Brake Torque : 303Nm

Air purge function is provided.

CNC260B, CNCZ260B

★ MAX.8 ports of rotary joint can be mounted without changing dimension.
IN ports will be located in left side.

Pneumatic Brake Torque UP 588Nm

For the rotary table with pneumatic brake, air purge function is provided inside the motor cover as standard.

CNC302B, CNCZ302B

★ MAX.8 ports of rotary joint can be mounted without changing dimension.
IN ports will be located in left side.

Pneumatic Brake Torque UP 588Nm

For the rotary table with pneumatic brake, air purge function is provided inside the motor cover as standard.

CNC321B, CNCZ321B

CNC401B, CNCZ401B

★ Built-in type rotary joint can be mounted on CNC321B & 401B, refer ⇒ P.54

Photo shows with centre socket (option).

★ For accuracy standard, refer ⇒ P.51, 52
★ For fitting metal and stepped guide piece, refer ⇒ P.22

★ For scroll chuck, tailstock and other optional accessories, refer ⇒ P.49, 50
★ w series attachment can be attached for all tables, refer ⇒ P.48
TOP SIDE MOTOR MOUNTED
CNC ROTARY TABLE

This is the application that the rotary table with swing box is installed on the pallet of the horizontal M/C. Please specify A, B, C, D and E.

Explanation of the Code No. (Example)

CNC 501 T F A - M
No Letter: without motor
M: with motor
Motor Maker: P.47
A1: with NIKKEN K.27 controller
F: FANUC M: MELDAS Y: YASNAIC O: OSP
T: TOSNAG N: MEC S: SANYO Z: SIEMENS UNICRATAM
H: HEBERHANAK X: BOSFLEX B: BOSCH

Position of motor T: Top side
Diameter of Table: 200, 260, 300, 320, 400, 500, 600

CNC302T
Photo shows with centre socket (option)

Specifications

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>CNC200T</th>
<th>CNC260T</th>
<th>CNC302T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CNCZ200T</td>
<td>CNCZ260T</td>
<td>CNCZ302T</td>
</tr>
<tr>
<td>Diameter of Table</td>
<td>200</td>
<td>260</td>
<td>300</td>
</tr>
<tr>
<td>Diameter of Spindle Hole</td>
<td>150</td>
<td>170</td>
<td>170</td>
</tr>
<tr>
<td>Centre Height</td>
<td>50H7</td>
<td>80H7</td>
<td>80H7</td>
</tr>
<tr>
<td>Width of T Slot</td>
<td>12.5</td>
<td>12.5</td>
<td>12.5</td>
</tr>
<tr>
<td>Clamping System</td>
<td>Air</td>
<td>Air/Hyd.</td>
<td>Air/Hyd.</td>
</tr>
<tr>
<td>Clamping Torque</td>
<td>196</td>
<td>586/1568</td>
<td>586/1568</td>
</tr>
<tr>
<td>Table Inertia at Motor Shaft</td>
<td>1.0</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>MIN. Increment</td>
<td>0.001&quot;</td>
<td>0.001&quot;</td>
<td>0.001&quot;</td>
</tr>
<tr>
<td>Rotation Speed</td>
<td>22.2 (44.4)</td>
<td>16.6 (33.3)</td>
<td>16.6 (33.3)</td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td>1/90 (1/45)</td>
<td>1/120 (1/60)</td>
<td>1/120 (1/60)</td>
</tr>
<tr>
<td>Indexing Accuracy</td>
<td>sec</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Net Weight</td>
<td>kg</td>
<td>85</td>
<td>160</td>
</tr>
<tr>
<td>MAX. Work Load on the Table</td>
<td>Vertical</td>
<td>100</td>
<td>175</td>
</tr>
<tr>
<td></td>
<td>Horizontal</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>MAX. Thrust Load applicable on the Table</td>
<td>10780</td>
<td>25480</td>
<td>25480</td>
</tr>
<tr>
<td>MAX. Work Inertia</td>
<td>637</td>
<td>984</td>
<td>984</td>
</tr>
<tr>
<td>Driving Torque</td>
<td>980</td>
<td>3332</td>
<td>3332</td>
</tr>
<tr>
<td>MAX. Work Inertia</td>
<td>1.0 (0.5)</td>
<td>3.2 (1.6)</td>
<td>3.2 (1.6)</td>
</tr>
</tbody>
</table>

* aIF4/4000 motor can be mounted on CNC200T & 260T.
* AWC system is available for all tables, refer to P.43-46
* Rotary joint is available for all tables, refer to P.54
* Ultra precision type is available for all tables, 2.5° or ±5°, refer to P.53
* CNCZ series table can not be recommended for the application with large unbalancing load. CNCZ series table is recommended to use for the application only with light load.

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**CNC200T, CNCZ200T**

External dimensions will be different according to the type of the servo motors, Dimensions with FANUC motor are shown. Please contact us for CAD data (2D/DXF, 3D/PARASOLID).

Air purge function is provided inside the motor cover as standard.

**CNC260T, CNCZ260T**

Pneumatic Brake Torque UP 588Nm

For the rotary table with pneumatic brake, air purge function is provided inside the motor cover as standard.

**CNC302T, CNCZ302T**

Pneumatic Brake Torque UP 588Nm

For the rotary table with pneumatic brake, air purge function is provided inside the motor cover as standard.

- For accuracy standard, refer to P.51, 52,
- For fitting metal and stopped guide piece, refer to P.22,
- For scroll chuck, tail stock and other optional accessories, refer to P.49, 50,
- For the condition of rotary table which is installed on the special purpose machine, refer to P.59, 60.

**Specification of the Top Side Mounted CNC Rotary Table**

Tubular roller bearing is installed against the thrust load. Therefore, when 2 rotary tables are faced on both side to synchronise movement, the system can be run without affecting the heat expansion of the rotary table.

**CNC401T** is installed on the pallet of the horizontal M/C.

**CNC400T** is installed on CNC600V.

**CNC501T** is used for the tilting axis table of 5AX-tilting rotary table.

Photo shows **CNC302T** without T slot.

Synchronors movement of 2 off **CNC401**
# Specifications

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>CNC321T</th>
<th>CNC401T</th>
<th>CNC501T</th>
<th>CNC601T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table</td>
<td>φ320</td>
<td>400</td>
<td>500</td>
<td>600</td>
</tr>
<tr>
<td>Diameter of Spindle Hole</td>
<td>φ105H7</td>
<td>φ105H7</td>
<td>φ130H7</td>
<td>φ130H7</td>
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<tr>
<td>Centre Height</td>
<td>240</td>
<td>240</td>
<td>310</td>
<td>310</td>
</tr>
<tr>
<td>Width of T Slot</td>
<td>12 +0.0258 14 +0.0258 14 +0.0258 14 +0.0258</td>
<td>14 +0.0258</td>
<td>14 +0.0258</td>
<td>14 +0.0258</td>
</tr>
<tr>
<td>Clamping Torque</td>
<td>1760</td>
<td>1760</td>
<td>4655</td>
<td>4655</td>
</tr>
<tr>
<td>Table Inertia at Motor Shaft (kgm²)</td>
<td>2.0</td>
<td>2.0</td>
<td>9.0</td>
<td>8.8</td>
</tr>
<tr>
<td>MIN. Increment</td>
<td>0.001°</td>
<td>0.001°</td>
<td>0.001°</td>
<td>0.001°</td>
</tr>
<tr>
<td>Rotation Speed (min⁻¹)</td>
<td>16.6</td>
<td>16.6</td>
<td>16.6</td>
<td>11.1</td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td>1/120</td>
<td>1/120</td>
<td>1/120</td>
<td>1/180</td>
</tr>
<tr>
<td>Indexing Accuracy (sec)</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Net Weight (kg)</td>
<td>220</td>
<td>245</td>
<td>495</td>
<td>525</td>
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<tr>
<td>MAX. Work Load on the Table</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical</td>
<td>250</td>
<td>250</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Horizontal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAX. Thrust Load applicable on the Table</td>
<td>31360</td>
<td>31360</td>
<td>39200</td>
<td>39200</td>
</tr>
<tr>
<td>F X L N.m</td>
<td>1166</td>
<td>1166</td>
<td>4655</td>
<td>4655</td>
</tr>
<tr>
<td>F X L N.m</td>
<td>3920</td>
<td>3920</td>
<td>5880</td>
<td>5880</td>
</tr>
<tr>
<td>MAX. Work Inertia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical</td>
<td>8.0</td>
<td>8.0</td>
<td>19</td>
<td>37</td>
</tr>
<tr>
<td>Driving Torque N.m</td>
<td>576</td>
<td>576</td>
<td>576</td>
<td>864</td>
</tr>
</tbody>
</table>

- CNC system is available for all tables.
CNC321T, 401T, 501T, 601T

CNC321T

★ Built-in type rotary joint can be mounted on CNC321 refer to P.54

CNC401T

★ Built-in type rotary joint can be mounted on CNC401 refer to P.54

CNC501T

★ Built-in type rotary joint can be mounted on CNC501 refer to P.54

CNC601T

★ Built-in type rotary joint can be mounted on CNC601 refer to P.54

Support Table TAT

Table without T slot (-N) is standard. Table with T slot is available as an option.

TAT250-N

Hydraulic ports are 2 x Rc3/8 and pneumatic ports are 2 x Rc1/4. Solenoid valve and clamp/unclamp confirmation switches are not included.

TAT400-N

★ Please add "- centre height" at the end of Code No. for the support table with different centre height (B). e.g. TAT320-240 (For CNC321T)
## Specifications

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>CNC100 2W, 3W, 4W</th>
<th>CNC180-2W</th>
<th>CNC202-2W</th>
<th>CNC260-2W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table (φmm)</td>
<td>105</td>
<td>180</td>
<td>200</td>
<td>260</td>
</tr>
<tr>
<td>Diameter of Spindle Hole (φmm)</td>
<td>60H7 / 30</td>
<td>60H7 / 40</td>
<td>60H7 / 40</td>
<td>80H7</td>
</tr>
<tr>
<td>Number of spindles (Pitch)</td>
<td>2, 3, 4, 120</td>
<td>2, 250</td>
<td>2, 250</td>
<td>2, 350</td>
</tr>
<tr>
<td>Centre Height (mm)</td>
<td>105</td>
<td>175</td>
<td>175</td>
<td>220</td>
</tr>
<tr>
<td>Width of T Slot (mm)</td>
<td>16 +0.018</td>
<td>12 +0.018</td>
<td>12 +0.018</td>
<td>12 +0.018</td>
</tr>
<tr>
<td>Clamping System</td>
<td>Air</td>
<td>Air</td>
<td>Air</td>
<td>Air/Hyd.</td>
</tr>
<tr>
<td>Clamping Torque (Nm)</td>
<td>147</td>
<td>303</td>
<td>303</td>
<td>588/1568</td>
</tr>
<tr>
<td>Table Inertia at Motor Shaft (kg·m²)</td>
<td>0.13</td>
<td>0.16</td>
<td>0.2</td>
<td>0.12</td>
</tr>
<tr>
<td>MIN. Increment (min⁻¹)</td>
<td>0.001¹</td>
<td>0.001¹</td>
<td>0.001¹</td>
<td>0.001¹</td>
</tr>
<tr>
<td>Rotation Speed (min⁻¹)</td>
<td>11.1 (44.4)</td>
<td>22.2</td>
<td>22.2</td>
<td>16.6</td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td>1/180 (1/45)</td>
<td>1/90</td>
<td>1/90</td>
<td>1/120</td>
</tr>
<tr>
<td>Indexing Accuracy (sec)</td>
<td>±30</td>
<td>±45</td>
<td>±20</td>
<td>±20</td>
</tr>
<tr>
<td>Net Weight (kg)</td>
<td>70</td>
<td>90</td>
<td>120</td>
<td>115</td>
</tr>
</tbody>
</table>

### MAX. Work Load on the Table

- **Vertical** (kg)
  - CNC100: 15
  - CNC180: 100
  - CNC202: 100
  - CNC260: 175

- **Horizontal** (kg)
  - CNC100: 30
  - CNC180: 200
  - CNC202: 200
  - CNC260: 350

### MAX. Thrust Load applicable on the Table

- **FXL N/m**
  - CNC100: 49
  - CNC180: 415
  - CNC202: 415
  - CNC260: 984

### MAX. Work Inertia (kg·m²)

- **Vertical** (kg·m²)
  - CNC100: 0.019 (0.07 Horizontal)
  - CNC180: 0.5
  - CNC202: 0.5
  - CNC260: 1.9

### Driving Torque (Nm)

- CNC100: 72
- CNC180: 72
- CNC202: 144
- CNC260: 192

---

- L Type (left hand mounted motor) is available for all tables.
- Min. pitch between spindles: CNC100: 120mm, CNC180: 250mm, CNC202: 250mm, CNC260: 320mm. When you need different pitch, please contact us.
- A spindle table to suit 2 spindle machine is available.
- MAX. number of spindles CNC100: 4 spindles, CNC180: 4 spindles, CNC202: 4 spindles, CNC260: 4 spindles.
- Rotary joint is available for all tables, refer to P.54.
- Please refer to P.55 for the air-hydraulic booster, when CNC260-2W is used on the NC without hydraulic source.
CNC100-2W, CNC100-3W, CNC100-4W, CNC180-2W, CNC202-2W, CNC260-2W

External dimensions will be different according to the type of the servo motors. Dimensions with FANUC motor or with NIKKEN control (K21) are shown. Please contact us for CAD data (2D/DXF, 3D/ParaSolid).

CNC100-2W
Air purge function is provided inside the motor cover as standard.

CNC100-3W
Air purge function is provided inside the motor cover as standard.

CNC100-4W
Air purge function is provided inside the motor cover as standard.

CNC180-2W
Pneumatic Brake Torque UP 588Nm
Air purge function is provided inside the motor cover as standard.

CNC260-2W
Pneumatic Tailstock for Multi-Spindle PB-105-2W, -3W, -4W
For the rotary table with pneumatic brake, air purge function is provided inside the motor cover as standard.

CNC202-2W

Accuracy Standard of Multi-Spindle

<table>
<thead>
<tr>
<th>No.</th>
<th>Measuring Item</th>
<th>Measuring Method</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pitch between Spindles</td>
<td>Within ±0.02mm</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Centre Height of Spindle</td>
<td>Within ±0.02mm</td>
<td></td>
</tr>
</tbody>
</table>

Pneumatic Tailstock for Multi-Spindle
PB-105-2W, -3W, -4W
MT (Morse Taper) type quill is also available, please contact us.
The stroke 60mm can be changed, please contact us.

PB-105-4W
For fitting metal and stepped guide piece, refer to P. 22
For steel chuck, tailstock and other optional accessories, refer to P. 49, 50
4-spindle attachment can be added for CNC100-2W, 3W, 4W, CNC180-2W and CNC202-2W, refer to P. 48.
# Manual Tilting Rotary Table

- Table can be tilted at 0°~90° manually.
- Indexing is CNC controlled so that it can be adapted to all kinds of machining.

## Specifications

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>NST250</th>
<th>NST300</th>
<th>NST500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table</td>
<td>250</td>
<td>300</td>
<td>500</td>
</tr>
<tr>
<td>Diameter of Spindle Hole</td>
<td>Ø60H7</td>
<td>Ø52</td>
<td>Ø60H7</td>
</tr>
<tr>
<td>Centre Height</td>
<td>155</td>
<td>208</td>
<td>288</td>
</tr>
<tr>
<td>Width of T Slot</td>
<td>12.0/0.016</td>
<td>12.0/0.016</td>
<td>14.0/0.016</td>
</tr>
<tr>
<td>Clamping System</td>
<td>Air</td>
<td>Air</td>
<td>Air</td>
</tr>
<tr>
<td>Clamping Torque</td>
<td>147</td>
<td>196</td>
<td>196</td>
</tr>
<tr>
<td>Table Inertia at Motor Shaft ((\text{kg} \cdot \text{m}^2))</td>
<td>0.39</td>
<td>0.59</td>
<td>0.69</td>
</tr>
<tr>
<td>Servo Motor</td>
<td>(\text{min}^{-1}) (\text{aIF2} / 5000 \cdot 2000)</td>
<td>(\text{min}^{-1}) (\text{aIF4} / 4000 \cdot 2000)</td>
<td>(\text{min}^{-1}) (\text{aIF4} / 3000 \cdot 2000)</td>
</tr>
<tr>
<td>MIN. Increment</td>
<td>0.001°</td>
<td>0.001°</td>
<td>0.001°</td>
</tr>
<tr>
<td>Rotation Speed</td>
<td>16.6</td>
<td>11.1</td>
<td>5.5</td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td>1/120</td>
<td>1/180</td>
<td>1/360</td>
</tr>
<tr>
<td>Indexing Accuracy</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Net Weight</td>
<td>75</td>
<td>135</td>
<td>320</td>
</tr>
<tr>
<td>MAX. Work Load on the Table</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical</td>
<td>50</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>Horizontal</td>
<td>100</td>
<td>300</td>
<td>500</td>
</tr>
<tr>
<td>MAX. Thrust Load applicable on the Table</td>
<td>9800</td>
<td>14700</td>
<td>24500</td>
</tr>
<tr>
<td>N / m</td>
<td>412</td>
<td>686</td>
<td>1166</td>
</tr>
<tr>
<td>FXL</td>
<td>706</td>
<td>1176</td>
<td>2450</td>
</tr>
<tr>
<td>MAX. Work Inertia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical ((\text{kg} \cdot \text{m}^2))</td>
<td>1.35</td>
<td>3.37</td>
<td>14.70</td>
</tr>
<tr>
<td>Driving Torque</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N / m</td>
<td>144</td>
<td>288</td>
<td>1152</td>
</tr>
</tbody>
</table>

### Notes:
- L-type (left-hand mounted motor) is available for NST300.
- \(\text{aIF4} / 3000 \cdot 2000\) motor can be mounted on NST300.
Fitting Metal

Stepped Guide Piece

Tapped Holes Location on the Base Plane
### Specifications

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>5AX-130</th>
<th>5AX-201</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table (ømm)</td>
<td>ø105 (with ø130 sub table)</td>
<td>200</td>
</tr>
<tr>
<td>Diameter of Spindle Hole (ømm)</td>
<td>ø60H7 x 30</td>
<td>ø60H7 x 50</td>
</tr>
<tr>
<td>Centre Height (90°) (mm)</td>
<td>150</td>
<td>180</td>
</tr>
<tr>
<td>Table Height in Horizontal Position (ø°) (mm)</td>
<td>235</td>
<td>260</td>
</tr>
<tr>
<td>Width of T Slot (mm)</td>
<td>ø10H7 Pin hole</td>
<td>12.925</td>
</tr>
</tbody>
</table>

**Axis:**
- **Rotary:**
  - Tilling (0° - 105°)
  - Tilling (0° - 105°)
- **Clamping System:** Air
- **Clamping Torque (N·m):**
  - 205 (Air)
  - 303 (at 688)/(338)/(612)
- **Table Inertia at Motor Shaft (kg·m²):**
  - 0.09
  - 0.12
  - 0.11
  - 0.16
- **Servo Motor (min⁻¹):**
  - αS2 / 5000: 2000
  - αF2 / 5000: 2000
  - αF2 / 5000: 2000
  - αS4 / 5000: 2000

**MIN. Increment:** 0.001°

**Rotation Speed (min⁻¹):**
- 22.2
- 11.1
- 22.2
- 16.6

**Total Reduction Ratio:**
- 1/90
- 1/180
- 1/90
- 1/120

**Indexing Accuracy (sec):**
- ±30
- 60
- 20
- 60

**Net Weight (kg):**
- 115
- 160

**MAX. Work Load on the Table:**
- 0° to 30° kg
  - 50
  - 60
- 30° to 90° kg
  - 25
  - 40

**MAX. Thrust Load applicable on the Table:**
- **Tilling Angle = 0°:** L = 65mm, F = 2940N, L = 100mm, F = 4900N
- **Tilling Angle = 90°:** L1 = 0mm, F1 = 3460N, L1 = 100mm, F1 = 5860N
- **Tilling Angle = 90°:** L2 = 100mm, F2 = 1590N, L2 = 100mm, F2 = 2940N

**MAX. Work Inertia (kg·m²):**
- 0.12
- 0.5

**Driving Torque (N·m):**
- 72
- 72

---

**Explanation of the Code No. (Example):**
- 5AX: Tilling rotary CNC table
- 130F: Location of the motor for tilting axis
- M: No letter: without motor, M: with motor
- A: Back side of tilting axis
- B: Back side of rotary axis
- T: Top side motor

---

**Notes:**
- AWC system is available for all tables; refer to P. 45 - 46
- Rotary joint is available for all tables; refer to P. 54
- Ultra precision type is available for all tables; refer to P. 53
- Location of tilting axis motor can be changed as an option; e.g., 5AX-B130.
- Please refer to P. 55 for the air-hydraulic booster, when 5AX-201 is used on the N/C without hydraulic source.
5AX-130, 5AX-201

5AX-130

External dimensions will be different according to the type of the servo motors. Dimensions with FANUC motor or with NIKKEN 31 controller are shown. Please contact us for CAD data (2D/DXF, 3D/Parasolid).

5AX-201

centre height of high column table is 65mm higher than that of standard table, refer to P.45

Built-in type 4 ports rotary joint is optional accessory. (High column type is not necessary.)

■ The Area of Noninterference in Tilting Position.

<table>
<thead>
<tr>
<th>Angle</th>
<th>5AX-130</th>
<th>5AX-201</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°</td>
<td><img src="image1" alt="Diagram" /></td>
<td><img src="image2" alt="Diagram" /></td>
</tr>
<tr>
<td>45°</td>
<td><img src="image3" alt="Diagram" /></td>
<td><img src="image4" alt="Diagram" /></td>
</tr>
<tr>
<td>0°</td>
<td><img src="image5" alt="Diagram" /></td>
<td><img src="image6" alt="Diagram" /></td>
</tr>
<tr>
<td>90°</td>
<td><img src="image7" alt="Diagram" /></td>
<td><img src="image8" alt="Diagram" /></td>
</tr>
<tr>
<td>0°</td>
<td><img src="image9" alt="Diagram" /></td>
<td><img src="image10" alt="Diagram" /></td>
</tr>
<tr>
<td>105°</td>
<td><img src="image11" alt="Diagram" /></td>
<td><img src="image12" alt="Diagram" /></td>
</tr>
</tbody>
</table>

■ Calculation Method of Drilling Thrust Load

\[ T = 9.8 \times (0.711 \times HB \times f^{4.4} \times D^{2.8} + 0.0022 \times HB \times D^3) \]

T: Thrust load (N)

f: Feed per one revolution (mm/rev)

HB: Brinell hardness of the work piece

D: Diameter of drill (mm)

For example, if case of drilling an aluminum (HB=100, D=19.5mm, f=0.2mm/rev), the calculation method is as follows.

\[ T = 9.8 \times (0.711 \times 100 \times 0.2^{4.4} \times 19.5^{2.8} + 0.0022 \times 100 \times 19.5^3) = 1359N \]

This is the thrust load of new drill. When the drill wear, thrust load will increase. (140～160%)
# Specifications

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>5AX-200 II *</th>
<th>5AX-230</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table</td>
<td>200</td>
<td>230</td>
</tr>
<tr>
<td>Diameter of Spindle Hole</td>
<td>Ø60r</td>
<td>Ø60r</td>
</tr>
<tr>
<td>Centre Height (90°)</td>
<td>180</td>
<td>240</td>
</tr>
<tr>
<td>Table Height in Horizontal Position (0°)</td>
<td>260</td>
<td>285</td>
</tr>
<tr>
<td>Width of T Slot</td>
<td>12.0±0.018</td>
<td>12.0±0.018</td>
</tr>
<tr>
<td>Axis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clamping System</td>
<td>3.5MPa</td>
<td></td>
</tr>
<tr>
<td>Clamping Torque</td>
<td>N·m</td>
<td>588</td>
</tr>
<tr>
<td>Table Inertia at Motor Shaft ((5D)) kg·m²×10⁻⁳</td>
<td>0.11</td>
<td>0.16</td>
</tr>
<tr>
<td>Servo Motor</td>
<td>min⁻¹</td>
<td>(\alpha I/4 / 4000\cdot2000)</td>
</tr>
<tr>
<td>MIN. Increment</td>
<td></td>
<td>0.001°</td>
</tr>
<tr>
<td>Rotation Speed</td>
<td>min⁻¹</td>
<td>22.2</td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td>1/90</td>
<td>1/180</td>
</tr>
<tr>
<td>Indexing Accuracy</td>
<td>sec</td>
<td>20</td>
</tr>
<tr>
<td>Net Weight</td>
<td>kg</td>
<td>210</td>
</tr>
</tbody>
</table>

**MAX. Work Load on the Table**

- 0° to 30°
  - kg | 80 | 100
- 30° to 90°
  - kg | 50 | 100

**MAX. Thrust Load applicable on the Table**

- Tilt Angle = 0°
  - F | 9800 | 11760
- Tilt Angle = 90°
  - L₁ = 100mm | F₁ = 5880N | L₁ = 115mm | F₁ = 5880N
  - L₂ = 100mm | F₁ = 2940N | L₂ = 100mm | F₁ = 2940N

**MAX. Work Inertia**

- (\(5D\)) kg·m² | 0.5 | 0.66

**Driving Torque**

- N·m | 144 | 288

- L type (left hand mounted motor) is available for S5AX-230.
- AWC system is available for all tables, refer to P.43−46.
- Rotary joint is available for all tables, refer to P.54.
- Ultra precision type is available for all tables, rotary axis: ±0.5°, tilt axis: ±10°, refer to P.54.
- Please specify S5AX-2003 as the Code No. of S5AX-200II when ordering.
- \(\alpha I/4000\) meter can be mounted on the rotary axis of S5AX-230.
- The supplied hydraulic pressure is 3.5MPa.
- The range of tilt angle (0°−105°) can be expanded as an option, please contact us.
- Please refer to P.55 for the air-hydraulic booster, when S5AX-200E is used on the M/C without hydraulic source. The air-hydraulic booster can not be used for S5AX-200.
- The hydraulic tank is always necessary for S5AX-230.
5AX-200II, 5AX-230

External dimensions will be different according to the type of the servo motors. Dimensions with FANUC motor or with NIKKEN \( K21 \) controller \( (K21:\ldots) \) are shown. Please contact us for CAD data \( (2D: DXF, 3D: PARASOLID) \).

5AX-200II

Centre height of high column table is 65mm higher than that of standard table, refer \( \rightarrow \) P.54

5AX-230

Photo shows with centre socket (option).

Centre height of high column table is 75mm higher than that of standard table, refer \( \rightarrow \) P.54

The Area of Noninterference in Tilting Position.

<table>
<thead>
<tr>
<th>Angle</th>
<th>5AX-200II</th>
<th>5AX-230</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°</td>
<td>[210]</td>
<td>[350]</td>
</tr>
<tr>
<td>5°</td>
<td>[210]</td>
<td>[350]</td>
</tr>
<tr>
<td>45°</td>
<td>[210]</td>
<td>[350]</td>
</tr>
<tr>
<td>0°</td>
<td>[260]</td>
<td>[210]</td>
</tr>
<tr>
<td>5°</td>
<td>[260]</td>
<td>[210]</td>
</tr>
<tr>
<td>90°</td>
<td>[350]</td>
<td>[210]</td>
</tr>
<tr>
<td>0°</td>
<td>[260]</td>
<td>[210]</td>
</tr>
<tr>
<td>5°</td>
<td>[260]</td>
<td>[210]</td>
</tr>
</tbody>
</table>

5AX-250

Built-in type 3 port rotary joint is optional accessory.

Example when the tilting base is supplied.
# Specifications

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>5AX-350</th>
<th>5AX-550</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table</td>
<td>Ømm</td>
<td>350</td>
</tr>
<tr>
<td>Diameter of Spindle Hole</td>
<td>Ømm</td>
<td>#80H7</td>
</tr>
<tr>
<td>Centre Height (90°)</td>
<td>mm</td>
<td>300</td>
</tr>
<tr>
<td>Table Height in Horizontal Position (°)</td>
<td>mm</td>
<td>300</td>
</tr>
<tr>
<td>Width of T Slot</td>
<td>mm</td>
<td>12 $\pm$0.016</td>
</tr>
<tr>
<td>Axis</td>
<td>Rotary</td>
<td>Ttilting (0°~105°)</td>
</tr>
<tr>
<td>Clamping Torque</td>
<td>Nm</td>
<td>1568</td>
</tr>
<tr>
<td>Table inertia at Motor Shaft (kgt)</td>
<td>kg·m²</td>
<td>0.8</td>
</tr>
<tr>
<td>Servo Motor</td>
<td>min⁻¹</td>
<td>αF18 / 3000·2000</td>
</tr>
<tr>
<td>MIN. Increment</td>
<td></td>
<td>0.001°</td>
</tr>
<tr>
<td>Rotation Speed</td>
<td>min⁻¹</td>
<td>22.2</td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td>1/90</td>
<td>1/90</td>
</tr>
<tr>
<td>Indexing Accuracy</td>
<td>sec</td>
<td>20</td>
</tr>
<tr>
<td>Net Weight</td>
<td>kg</td>
<td>420 (without Base:355)</td>
</tr>
</tbody>
</table>

## MAX. Work Load on the Table

<table>
<thead>
<tr>
<th>Angle</th>
<th>0° to 30°</th>
<th>30° to 90°</th>
</tr>
</thead>
<tbody>
<tr>
<td>kg</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>kg</td>
<td>500</td>
<td>300</td>
</tr>
</tbody>
</table>

## MAX. Thrust Load applicable on the Table

<table>
<thead>
<tr>
<th>Tilt Angle</th>
<th>0°</th>
</tr>
</thead>
<tbody>
<tr>
<td>L=175mm</td>
<td>F=4900N</td>
</tr>
<tr>
<td>L=275mm</td>
<td>F=9800N</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tilt Angle</th>
<th>90°</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1=0mm</td>
<td>F1=17160N</td>
</tr>
<tr>
<td>L2=100mm</td>
<td>F2=8580N</td>
</tr>
<tr>
<td>L3=200mm</td>
<td>F3=14120N</td>
</tr>
</tbody>
</table>

## MAX. Work Inertia

| 0.047 kg·m² | 3.2 | 23 |

## Driving Torque

| Nm | 288 | 864 |

---

- AWC system is available for all tables, refer to P.43~46.
- The supplied hydraulic pressure is 3.5MPa.
- Rotary joint is available for all tables, refer to P.55.
- Ultra precision type is available for all tables, Rotary axis: ±3° or ±5° Tiling axis: ±10°, refer to P.53.
5AX-350, 5AX-550

5AX-350

External dimensions will be different according to the type of the servo motors. Dimensions with FANUC motor are shown. Please contact us for CAD data (2D: DXF, 3D: PARASOLID).

For accuracy standard refer to P.51, 52.
For tilting tool and stepped guide piece, refer to P.22.
For scroll chuck, tailstock and other optional accessories, refer to P.49, 50.

Built-in type 6 ports rotary joint is optional accessory. (High column type is not necessary.)

5AX-550

Powerful double clamping system on both ends of tilting axis

Photo shows with centre socket (option). Built-in type 4 ports rotary joint is optional accessory. (High column type is not necessary.)

The Area of Noninterference in Tilting Position.

<table>
<thead>
<tr>
<th>Angle</th>
<th>5AX-350</th>
<th>5AX-550</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°</td>
<td>455</td>
<td>660</td>
</tr>
<tr>
<td></td>
<td>400</td>
<td>550</td>
</tr>
<tr>
<td>45°</td>
<td>450</td>
<td>550</td>
</tr>
<tr>
<td>90°</td>
<td>450</td>
<td>440</td>
</tr>
<tr>
<td></td>
<td>550</td>
<td>440</td>
</tr>
<tr>
<td>105°</td>
<td>450</td>
<td>440</td>
</tr>
</tbody>
</table>

Built-in type 5AX rotary tables are more and more getting popular as a component of M/C, even for the special applications.

Utilization for 4th and 5th axis rotary table of the M/C for die moulding

Utilization for 4th and 5th axis rotary table of special grinding centre

Ball Bar System
Accuracy of Speeds and Interpolations for 5AX- Table ISO10791-6
CNC tilting rotary table with powerful clamping system at both sides.

Counter balance weight can be attached on 5AX-1200A to compensate the unbalancing load as standard.

Explanation of the Code No. (Example)

5AX - 1200 A F A - M

| No Letter: without motor M: with motor
| Motor Maker: \( \pm \) P:77

Location of Tilting Axis Centre
A: Centre of Rotary Axis Body B: Top Surface of Rotary Axis

Diameter of Table
800: 800 1200: 1200

Specifications
The specification will be varied according to your application. Please contact us.

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>5AX-800</th>
<th>5AX-1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table</td>
<td>φmm</td>
<td>800X500</td>
</tr>
<tr>
<td>Diameter of Spindle Hole</td>
<td>φmm</td>
<td>130</td>
</tr>
<tr>
<td>Centre Height (90°)</td>
<td>mm</td>
<td>550</td>
</tr>
<tr>
<td>Table Height in Horizontal Position (90°)</td>
<td>mm</td>
<td>500</td>
</tr>
<tr>
<td>Width of T Slot</td>
<td>mm</td>
<td>(-\left(14.0^{\circ}\right)^{\circ})</td>
</tr>
<tr>
<td>Sliding Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clamping Torque</td>
<td>N·m</td>
<td>4655</td>
</tr>
<tr>
<td>Table Inertia at Motor Shaft</td>
<td>(\left(\frac{\text{kg}}{\text{m}^2}\right)\times\times10^3)</td>
<td>6.8</td>
</tr>
<tr>
<td>Servo Motor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIN. Increment</td>
<td>(\text{min}^{-1})</td>
<td>(\pm F22/3000 \times 2000)</td>
</tr>
<tr>
<td>Rotation Speed</td>
<td>(\text{min}^{-1})</td>
<td>25</td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td></td>
<td>1/60</td>
</tr>
<tr>
<td>Indexing Accuracy</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>Indexing Accuracy of Ultra Precision</td>
<td></td>
<td>(\pm 5)</td>
</tr>
<tr>
<td>Net Weight</td>
<td>kg</td>
<td>2300</td>
</tr>
</tbody>
</table>

MAX. Work Load on the Table

| 0° to 30° | kg | 500 | 2500 |
| 30° to 90° | kg | 500 | 1500 |

MAX. Thrust Load applicable on the Table

| Tilting Angle | N | 31360 | 137200 |
| 0° | | | |
| Tilting Angle = 0° | 2695 | 5488 |
| Tilting Angle = 90° | 2824 | 9600 |
| Tilting Angle = 90° | FXL | 2548 | 14700 |

MAX. Work Inertia

| \(\left(\frac{\text{kg}}{\text{m}^2}\right)\) | N·m | 23 | 276 |

Driving Torque

| N·m | 422 | 3168 |

* Rotary joint is available for all types, refer \(\div P 54\)
* Without T slots is standard for large tilting rotary table. T slot is available as an option. Please specify the width of the T slot.
* For ultra precision type, indexing accuracy depends on the type of the Heidenhain rotary encoder. Please refer \(\div P 53\) for higher accuracy.
* The supplied hydraulic pressure is 3.5MPa.
## 5AX-800, 5AX-1200

**Powerful double clamping system on both ends of tilting axis.**

![Diagram of 5AX-800](image)

- For accuracy standard refer to P.51, 52
- For tilting metal and stepped guide piece, refer to P.22
- For scroll chuck, tailstock and other optional accessories, refer to P.49, 50

### 5AX-1200

**Powerful double clamping system on both ends of tilting axis**

![Diagram of 5AX-1200](image)

### The Area of Noninterference in Tilting Position.

<table>
<thead>
<tr>
<th>Angle</th>
<th>5AX-800</th>
<th>5AX-1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°</td>
<td>365</td>
<td>365</td>
</tr>
<tr>
<td>5°</td>
<td>365</td>
<td>365</td>
</tr>
<tr>
<td>45°</td>
<td>365</td>
<td>365</td>
</tr>
</tbody>
</table>

Counter balance weight can be attached on 5AX-1200A to compensate the unbalancing load as standard.

![Details of counter balance](image)

- ROD800 to measure the tilting accuracy
- Powerful disc brake

![5AX-1200 Rotary Axis Ultra Precision Positioning Accuracy](image)

Rotary axis measured accuracy ±3 sec.

![5AX-1200 Tilt Axis Ultra Precision Positioning Accuracy](image)

Tilting axis measured accuracy ±3 sec.
# Specifications

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>5AX-2MT-105</th>
<th>5AX-4MT-120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table (φmm)</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td>Diameter of Spindle Hole (φmm)</td>
<td>60°±0.03</td>
<td>60°±0.03</td>
</tr>
<tr>
<td>Number of spindles (Pitch)</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>Centre Height (90°) (mm)</td>
<td>175</td>
<td>235</td>
</tr>
<tr>
<td>Table Height in Horizontal Position (mm)</td>
<td>250</td>
<td>300</td>
</tr>
<tr>
<td>Width of T Slot (mm)</td>
<td>16 19.5/18</td>
<td>16 19.5/18</td>
</tr>
<tr>
<td>Axis</td>
<td>Rotary Tilt (0°~105°)</td>
<td>Rotary Tilt (−110°~−110°)</td>
</tr>
<tr>
<td>Clamp System</td>
<td>Air</td>
<td>Air</td>
</tr>
<tr>
<td>Clamping Torque</td>
<td>147</td>
<td>147</td>
</tr>
<tr>
<td>Table Inertia at Motor Shaft (kg·m²·10⁻⁶)</td>
<td>0.13</td>
<td>0.13</td>
</tr>
<tr>
<td>MIN. Increment</td>
<td>0.001°</td>
<td>0.001°</td>
</tr>
<tr>
<td>Rotation Speed (min⁻¹)</td>
<td>22.2</td>
<td>11.1</td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td>1/90</td>
<td>1/180</td>
</tr>
<tr>
<td>Indexing Accuracy (sec)</td>
<td>±30</td>
<td>60</td>
</tr>
<tr>
<td>Net Weight (kg)</td>
<td>150</td>
<td>350</td>
</tr>
</tbody>
</table>

**MAX. Work Load on the Table**

<table>
<thead>
<tr>
<th>Angle</th>
<th>0° to 30°</th>
<th>30° to 90°</th>
</tr>
</thead>
<tbody>
<tr>
<td>kg</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>kg</td>
<td>25</td>
<td>15</td>
</tr>
</tbody>
</table>

**MAX. Thrust Load applicable on the Table**

<table>
<thead>
<tr>
<th>Tilt Angle</th>
<th>0°</th>
<th>90°</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>3920</td>
<td>49</td>
</tr>
<tr>
<td>L=60mm</td>
<td>F₁=784N</td>
<td>F₁=1380N</td>
</tr>
<tr>
<td>L=100mm</td>
<td>F₂=653N</td>
<td>L₂=100mm</td>
</tr>
<tr>
<td>F₂=490N</td>
<td>L₂=100mm</td>
<td>F₂=1040N</td>
</tr>
<tr>
<td>L₁=0mm</td>
<td>F₁=653N</td>
<td></td>
</tr>
<tr>
<td>L₂=100mm</td>
<td>F₂=490N</td>
<td></td>
</tr>
<tr>
<td>F₂=2858N</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MAX. Work Inertia**

| (kg·m²) | 0.014 | 0.021 |

**Driving Torque**

| N·m | 36 | 144 |

---

* Min. pitch between spindles 105°120mm. If you need different pitch, please contact us.
* 4-spindle rotary table to suit 3-spindle M/C is also available, please contact us.
* Max. number of spindles 105°4 spindles.
* The supplied hydraulic pressure is 3.5MPa for hydraulic clamping system.
5AX-2MT-105

External dimensions will be different according to the type of the servo motors. Dimensions with FANUC motor or with NIKKEN K21 controller (K21:) are shown. Please contact us for CAD data (2D: DXF, 3D: PARASOLID).

Rotary axis cable stay type is available.
Centre height of high column table is 35mm higher than that of standard table.
MAX. number of ports in rotary joint: Standard: 4 ports, High Column: 6 ports

5AX-4MT-120

Photo shows with 4” power chuck (option).
MAX. 6 ports can be used in the rotary joint for standard model.

Multi-Spindle Tilting Rotary Table

For Multi-Spindle Tilting Rotary Table, please contact us with the required faceplate diameters, fixture attachment (e.g. Power Chuck etc), the required spindle pitch, the M/C model and the type of NC.

5AX-2MT-170-200  5AX-2MT-201-250FA  5AX-2MT-200-360  5AX-2MT-200-250

5AX-2MT-200-350  5AX-2MT-200-457.2 (18")  5AX-2MT-130-170  5AX-2MT-200-250

Accuracy Standard of Multi-Spindle

<table>
<thead>
<tr>
<th>No.</th>
<th>Measuring Item</th>
<th>Measuring Method</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pitch between Spindles</td>
<td>Within ±0.02mm from nominal pitch</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Centre Hight of Spindle</td>
<td>Within ±0.02mm</td>
<td></td>
</tr>
</tbody>
</table>

* How to mount the above tables on your M/C, please contact us.
* For fitting metal of standard accessories, refer to P.22
* For scroll chuck, tailstock and other optional accessories, refer to P.49, 50
* Please contact us about the chucking or clamps system of your work piece.
* 5-series attachment can be used for 5AX-2MT-10S and 5AX-4MT-10S, refer to P.48

5AX-2MT-200-250
# ROTARY HIRTH COUPLING INDEX

**NSVX400**

**INDEXING ACCURACY : ±2°**

## Specifications

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>NSVZ180</th>
<th>NSVZ300</th>
<th>NSVX400</th>
<th>NSVX500</th>
<th>NSVX400T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table (Φmm)</td>
<td>180</td>
<td>300</td>
<td>400</td>
<td>500</td>
<td>400</td>
</tr>
<tr>
<td>Diameter of Spindle Hole (Φmm)</td>
<td>#60H7</td>
<td>#30</td>
<td>#60H7</td>
<td>#60H7</td>
<td>#60H7</td>
</tr>
<tr>
<td>Centre Height (mm)</td>
<td>135</td>
<td>170</td>
<td>240</td>
<td>310</td>
<td>240</td>
</tr>
<tr>
<td>Width of T Slot (mm)</td>
<td>12×1.018</td>
<td>12×1.018</td>
<td>14×1.018</td>
<td>14×1.018</td>
<td>14×1.018</td>
</tr>
<tr>
<td>Clamping Torque (N·m)</td>
<td>910</td>
<td>2155</td>
<td>5860</td>
<td>5860</td>
<td>5860</td>
</tr>
<tr>
<td>Table Inertia at Motor Shaft (kg·m²)</td>
<td>0.11</td>
<td>0.16</td>
<td>2.9</td>
<td>3.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Servo Motor (min⁻¹)</td>
<td>w/F2/5000·2000</td>
<td>w/F2/5000·2000</td>
<td>w/F12/3000·2000</td>
<td>w/F12/3000·2000</td>
<td>w/F12/3000·2000</td>
</tr>
<tr>
<td>MIN. Increment</td>
<td>1°</td>
<td>1°</td>
<td>1°/0.001°</td>
<td>1°/0.001°</td>
<td>1°/0.001°</td>
</tr>
<tr>
<td>Rotation Speed (min⁻¹)</td>
<td>11.1</td>
<td>11.1</td>
<td>22.2</td>
<td>16.6</td>
<td>16.6</td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td>1/180</td>
<td>1/180</td>
<td>1/90</td>
<td>1/120</td>
<td>1/120</td>
</tr>
<tr>
<td>Indexing Accuracy (sec)</td>
<td>±3</td>
<td>±2</td>
<td>±2°</td>
<td>±2°</td>
<td>±2°</td>
</tr>
<tr>
<td>Net Weight (kg)</td>
<td>60</td>
<td>150</td>
<td>325</td>
<td>410</td>
<td>350</td>
</tr>
</tbody>
</table>

**MAX. Work Load on the Table**

- **Vertical (kg):** 50, 150, 250, 250, 250
- **Horizontal (kg):** 100, 300, 500, 500, —

**MAX. Thrust Load applicable on the Table**

- **FXL N/m: NVZ180 23520, 39200, 58800, 58800, 58800**
- **NSVZ300 911, 2156, 5880, 5880, 5880**
- **NSVX400 569, 1421, 3920, 3920, 3920**
- **NSVX500 569, 1421, 3920, 3920, 3920**
- **NSVX400T 569, 1421, 3920, 3920, 3920**

**MAX. Work Inertia (kg·m²):** 0.14, 1.0, 6.4, 6.4, 11.5

**Driving Torque (N·m):** 432, 576, 576

---

### Notes:
- **NSVZ series** are index table which is indexable by 1°.
- **NSVX series** are rotary and indexing table which perform indexing by 1° with hirth coupling of high precision & high rigidity and can also perform min. command incremental by 0.001° and profile milling.
- **Indexing accuracy = 2sec.** marked in the table is only for indexing by 1° with hirth coupling.
- **Be careful that centralizing of work piece or jig fixture should be done after indexing.**
- **NIKKEN controller, the solenoid valve is installed inside the table.**
- **For additional axis control, the solenoid valve is not installed inside the table.**
- **1/8/4000 motor can be mounted on NSVZ180 & 300.**

---

### Contact Information:
- **When NSVZ series or NSVX series is used on the M/C without the hydraulic source:**
- **Please contact us for the separate air-hydraulic booster, when NSVZ180 or NSVZ300 is used on the M/C without the hydraulic source.**
NSVZ180,300 NSVX400,500

External dimensions will be different according to the type of the servo motors. Dimensions with FANUC motor or with NIKKEN Φ21 controller (Φ21: ) are shown. Please contact us for CAD data (2D: DXF, 3D: PARASOLID).

NSVZ180

Photo shows with centre socket (option).

NSVZ300

Photo shows with centre socket (option).

NSVX400

Photo shows with centre socket (option).

NSVX500

Photo shows only for horizontal use. Please contact us for external dimension.

NSVX400T

No lift (Three pieces of Hirth Coupling)

Three pieces of 360 division precision hirth coupling ensures smooth and fast indexing without table lifting.
## Specifications

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>CNC401H</th>
<th>CNCZ401H</th>
<th>CNC503H</th>
<th>CNCZ503H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table</td>
<td>Φ400</td>
<td>Φ500</td>
<td>Φ105</td>
<td>Φ105</td>
</tr>
<tr>
<td>Diameter of Spindle Hole</td>
<td>Φ400</td>
<td>Φ500</td>
<td>Φ105</td>
<td>Φ105</td>
</tr>
<tr>
<td>Clamping Torque</td>
<td>1470</td>
<td>1890</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Table Inertia at Motor</td>
<td>2.8</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIN. Increment</td>
<td>0.001°</td>
<td>0.001°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotation Speed</td>
<td>22.2(44.4)</td>
<td>16.6(33.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td>1/90(1/45)</td>
<td>1/120(1/60)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indexing Accuracy</td>
<td>sec</td>
<td>20</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Net Weight</td>
<td>kg</td>
<td>295</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>MAX. Load on the Table</td>
<td>kg</td>
<td>800</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>MAX. Thrust Load</td>
<td>N</td>
<td>31360</td>
<td>37632</td>
<td></td>
</tr>
<tr>
<td>MAX. Work Inertia</td>
<td>(kgf²)</td>
<td>1166</td>
<td>1554</td>
<td></td>
</tr>
<tr>
<td>MAX. Torque</td>
<td>N·m</td>
<td>3920</td>
<td>5644</td>
<td></td>
</tr>
</tbody>
</table>

### Notes
- αIF12/3000 can be mounted on CNC401H & CNCZ503H.
- A square table is available as an option. Please contact us.

*Conditions of CNC Rotary Table when being used to NC special machines. Refer P.60*
# BUILT IN type TILTING ROTARY TABLE

**5AX-T400**

Built-in type 8 ports rotary joint is optional accessory.
- The position of the motor of the tilting axis table can be right & left side for the vertical M/C.

**5AX-B450**

Built-in type 17 ports rotary joint is optional accessory.
- The position of the motor of the tilting axis table can be right & left side for the vertical M/C.

## Specifications

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>5AX-T400</th>
<th>5AX-B450</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table</td>
<td>φ400</td>
<td>φ500</td>
</tr>
<tr>
<td>Diameter of Spindle Hole</td>
<td>φ105 H7</td>
<td>φ155 H7</td>
</tr>
<tr>
<td>Centre Height (90°) mm</td>
<td>390</td>
<td>280*1</td>
</tr>
<tr>
<td>Table Height in Horizontal Position (0°) mm</td>
<td>390</td>
<td>280*1</td>
</tr>
<tr>
<td>Width of T Slot mm</td>
<td>14 *0.016</td>
<td>—</td>
</tr>
<tr>
<td>Axis</td>
<td>Rotary</td>
<td>Tilting</td>
</tr>
<tr>
<td>Clamping Torque N·m</td>
<td>1760</td>
<td>1760</td>
</tr>
<tr>
<td>Table Inertia at Motor Shaft (kg m²/10⁶)</td>
<td>2.8</td>
<td>2.44</td>
</tr>
<tr>
<td>MIN. Increment</td>
<td>0.001*</td>
<td>0.001*</td>
</tr>
<tr>
<td>Rotation Speed min⁻¹</td>
<td>22.2</td>
<td>16.6</td>
</tr>
<tr>
<td>Total Reduction Ratio</td>
<td>1/90</td>
<td>1/120</td>
</tr>
<tr>
<td>Indexing Accuracy sec</td>
<td>15</td>
<td>60</td>
</tr>
<tr>
<td>Net Weight kg</td>
<td>750 (w/o base) 995 (with base)</td>
<td>1050 (w/o base)</td>
</tr>
</tbody>
</table>

## Work Load on the Table

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>5AX-T400</th>
<th>5AX-B450</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX. Thrus Load applicable on the Table</td>
<td>300</td>
<td>300</td>
</tr>
</tbody>
</table>

## Tilting Angle 0°

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>5AX-T400</th>
<th>5AX-B450</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX. Work Load on the Table 0° to 30°</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>MAX. Work Load on the Table 30° to 90°</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>MAX. Thrus Load applicable on the Table</td>
<td>31360</td>
<td>31360</td>
</tr>
</tbody>
</table>

## Tilting Angle 90°

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>5AX-T400</th>
<th>5AX-B450</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX. Work Load on the Table 90° to 0°</td>
<td>1166</td>
<td>1166</td>
</tr>
</tbody>
</table>

## Driving Torque

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>5AX-T400</th>
<th>5AX-B450</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driving Torque N·m</td>
<td>432</td>
<td>432</td>
</tr>
</tbody>
</table>

* Ultra precision type is available, Rotatory axis: ±5° Tiling axis: ±10°, refer to P.53
* The figure marked *1 shows the dimension without tilting axis base.
Current development of production technology in automobile industry is remarkable improved, and the work pieces that used to be machined by medium/large BT40/50 spindle M/C can now be carried by small M/C or T/C with BT30/NC5-46 spindle. The following are the typical CNC rotary tables used on the small M/C or T/C.

### CNC Rotary Table for BROTHER TAPPING CENTER

There are two types of the servo motor for CNC-A00 (SA III) or for CNC-B00 (SA-BR, SA-YA). The type of the servo motor depends on the kind of the tapping center. Please specify the kind of the tapping center and the location of the CNC rotary table (right or left), when ordering. Nikken will supply CNC rotary table with the suitable servo motor, amplifier, and the connection cables. Please refer the exclusive catalogue of BROTHER.

<table>
<thead>
<tr>
<th>TC-32BNQT</th>
<th>CNC100LYA-BR, 202LYA-BR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5AX-130BAYA-BR</td>
</tr>
<tr>
<td></td>
<td>5AX-2MT-10G-120BAYA-BR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TC-S2D</th>
<th>CNC105LSA-BR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CNC100LSA-BR, 202LSA-BR</td>
</tr>
<tr>
<td></td>
<td>CNC260LSA-BR</td>
</tr>
<tr>
<td></td>
<td>5AX-130SA-BR, 5AX-201SA-BR</td>
</tr>
<tr>
<td></td>
<td>5AX-200JASA-BR</td>
</tr>
</tbody>
</table>

Example **CNC202LYA-BR on TC-32BNQT X2** (CNC180LYA-BR is also available.)

---

CNC100L X 2 units on TC-31AN with Robot

CNC202LYA-BR

Swing Box Cover

Swing Box

Cable

External Solenoid Valve Unit to be mounted on T/C Power Circuit Pannel.

★Figures with blue bold show the strokes of Tapping Center.
CNC ROTARY TABLE for small M/C and T/C

(Tapping Center)

CNC Rotary Table for BROTHER TAPPING CENTER

Example CNC202LSA-BR on TC-S2D (CNC180LSA-BR is also available.)

The figures on (*) means the figures for TC-S2D-O.

Example CNC260LSA-BR on TC-S2D

The figures on (*) means the figures for TC-S2D-O.

Example 5AX-130SA-BR on TC-S2D

The figures on (*) means the figures for TC-S2D-O.
CNC ROTARY TABLE for small M/C and T/C

CNC Rotary Table for FANUC ROBO DRILL

CNC180LFA/202LFA as the 4th axis rotary table, 5AX-130FA/201FA as the 4th and 5th axes rotary table are typical rotary table for FANUC ROBO DRILL. Please refer to the exclusive catalogue of FANUC. DD250 P.41 and 5AX-DD200 P.42 can be installed. Please contact us.

Example 5AX-130FA on ROBO DRILL

5AX-130FA can be moved full stroke of the standard ROBO DRILL. But, software stroke limit has to be used for emergency stop due to the small space marked * (3°, 7°).

Example 5AX-201FA on ROBO DRILL

There is no stroke restriction on the ROBO DRILL with 200mm higher column.
Compact CNC ROTARY TABLE for small M/C and T/C
(Tapping Center)

CIT170  NEW

High speed positioning table for light load and light machining

Internal mechanism is different from worm system.

5AX-HB150  NEW

The external dimension and the specification of 5AX-HB150 with Φ21 are shown. Internal mechanism is different from worm system.

We have further applications and experiences for installation on other model or other makers M/C. Please contact us for the details.

CNC180LFA for KIRA M/C  CNC202FA for TOYOSK M/C  5AX-130HYA for MIYANO (MECTRON)
CNC ROTARY TABLE with DD MOTOR

There is no mechanical reduction mechanism such as worm system in a rotary table with DD motor. DD (Direct Drive) motor is built in the the rotary table to drive directly.

High rotation speed and high acceleration/deceleration can be done. But, the driving torque of the rotary table is weak due to no mechanical reduction mechanism. Therefore, the suitable application of the rotary table with DD motor must be selected.

**Configuration**

- **150min⁻¹ (DD250)**
- **Indexing of 90° : Within 0.2sec.**
- **High Response of Micro Spike Clamping System**

**Micro Spike**

**Explanation of the Code No. (Example)**

**DD 250 F - 150**

- **DD No. of the DD Motor**
- **F: FANUC M: MELDAS Y: YASMAC**
- **Position of the Motor Cover**
- **No Letter: Right L: Left**
- **Diameter of Table 250, 400, 500**
- **DD : rotary table with DD motor**

**Specifications**

The external dimension and the specification will be varied according to the DD motor. Please contact us.

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>DD250F-150</th>
<th>DD400F-250</th>
<th>DD500F-1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table</td>
<td>250</td>
<td>400</td>
<td>500</td>
</tr>
<tr>
<td>Diameter of Spindle Hole</td>
<td>75h7</td>
<td>100h7</td>
<td>120h7</td>
</tr>
<tr>
<td>Centre Height</td>
<td>170</td>
<td>230</td>
<td>310</td>
</tr>
<tr>
<td>Width of T Slot</td>
<td>12h7</td>
<td>14h7</td>
<td>14h7</td>
</tr>
<tr>
<td>Clamping System</td>
<td>Air (0.5MPa)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clamping Torque Nm</td>
<td>500</td>
<td>1000</td>
<td>2000</td>
</tr>
<tr>
<td>Motor (FANUC)</td>
<td>DIS150/300</td>
<td>DIS250/250</td>
<td>DIS1000/200</td>
</tr>
<tr>
<td>Encoder</td>
<td>α/CZ Sensor 512A</td>
<td>α/CZ Sensor 1024A</td>
<td></td>
</tr>
<tr>
<td>Min. Incremental deg.</td>
<td></td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td>Rotation Speed min⁻¹</td>
<td>150</td>
<td>125</td>
<td>100</td>
</tr>
<tr>
<td>indexing Accuracy sec.</td>
<td></td>
<td>±10</td>
<td></td>
</tr>
<tr>
<td>Net Weight kg</td>
<td>105</td>
<td>245</td>
<td>470</td>
</tr>
<tr>
<td>MAX. Work Load kg</td>
<td>100</td>
<td>250</td>
<td>400</td>
</tr>
<tr>
<td>MAX. Torque Nm</td>
<td>380</td>
<td>600</td>
<td>1900</td>
</tr>
<tr>
<td>Constant Torque Nm</td>
<td>73/170*¹</td>
<td>120/225*¹</td>
<td>470/840*¹</td>
</tr>
</tbody>
</table>

*The figure marked #1 shows the figure with cooling system.*
ROTARY TILTING TABLE with DD MOTOR

High Acc./Dec., High Speed, Compact Design

- Indexing of 90° on Rotary Axis: Within 0.2sec.
- Tilting Axis: Within 0.3sec.

5AX-DD200A

Suitable for the machining of the impeller.

5AX-DD200B

- Explanation of the Code No. (Example)
  - 5AX - DD 200 A F
    - Motor Maker: FANUC
    - Diameter of Table: 200
    - Location of the tilting axis center: A, B

5AX-DD200A

5AX-DD200B

★1 The tilting axis center is located in the same position as the center of the rotary axis body for 5AX-200A.

★1 The tilting axis center is located in the same position as the top surface of the rotary axis for 5AX-200B.

Specifications

The external dimension and the specification will be varied according to the DD motor. Please contact us.

<table>
<thead>
<tr>
<th>Item / Code No.</th>
<th>5AX-DD200AF</th>
<th>5AX-DD200BF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Table, mm</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Diameter of Spindle Hole, mm</td>
<td>53/1</td>
<td>53/1</td>
</tr>
<tr>
<td>Centre Height (90°), mm</td>
<td>195</td>
<td>270</td>
</tr>
<tr>
<td>Table Height in Horizontal Position (9°), mm</td>
<td>295</td>
<td>270</td>
</tr>
<tr>
<td>Width of T Slot, mm</td>
<td>12H7</td>
<td>12H7</td>
</tr>
<tr>
<td>Axis</td>
<td>Rotary</td>
<td>Tilting</td>
</tr>
<tr>
<td>Clamping System</td>
<td>Air (0.5MPa)</td>
<td>Air (0.5MPa)</td>
</tr>
<tr>
<td>Clamping Torque Nm</td>
<td>150</td>
<td>500</td>
</tr>
<tr>
<td>Motor (FANUC)</td>
<td>DI/S60/400</td>
<td>DI/S150/300</td>
</tr>
<tr>
<td>Encoder</td>
<td>αCiC 512A</td>
<td>αCiC 512A</td>
</tr>
<tr>
<td>Min. Incremental, deg.</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Rotation Speed, min⁻¹</td>
<td>200</td>
<td>150</td>
</tr>
<tr>
<td>Indexing Accuracy, sec.</td>
<td>±10</td>
<td>±15</td>
</tr>
<tr>
<td>MAX. Torque, Nm</td>
<td>130</td>
<td>380</td>
</tr>
<tr>
<td>Constant Torque, Nm</td>
<td>24</td>
<td>73/170*¹</td>
</tr>
<tr>
<td>Net Weight, kg</td>
<td>190</td>
<td>185</td>
</tr>
<tr>
<td>MAX. Work Load, 0°–30° deg., kg</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>0°–90° deg., kg</td>
<td>15</td>
</tr>
</tbody>
</table>

*¹The figure marked #1 shows the figure with cooling system.
AWC SYSTEM 1

- Very sure and space saving Work Changer, operated by X, Y and Z axes movements and spindle orientation of Vertical M/C. JAPAN: PAT.
- Substitutes expensive robot or pallet changer. Just set on the machine’s table, and is automatically operated by only one M-signal.
- Extremely flexible, and can take many kinds of work pieces. Jig Holder is firmly held in the centre hole of CNC Rotary Table as Century Type Holder System. (Simultaneous taper and flange contact) Jig Block can take various work fixtures designed according to each work piece. Plural number of work pieces can be held, Jig Holder with ID is available (option), and automatic selection of Jig Holder in magazine is possible.
- AWC magazine, Disc type, Chain type, Horizontal type and Bar Work type are available. ☞ P.44 For details, please contact with us.

Layout of AWC System
- CNC rotary table is to be set at right hand side end of X-stroke.
- AWC magazine is to be set where Jig Holder is being taken out from AWC Magazine and left hand side end of X-stroke, and at the Operator’s side of Y-stroke. Please contact with us when the M/C has splash guard.

The minimum X, Y and Z strokes necessary for setting AWC System; Length : 200mm
  X: 550mm (When longer, the longer Jig Block can be used. e.g. X:560mm Jig Block)
  Y: 400mm (Even when shorter, AWC System can be mounted by moving the position of key slot of CNC Rotary Table.)
  Z: 450mm (The minimum distance from table surface to spindle nose is 600mm.)
AWC SYSTEM 2

AWC System can be utilized to all type of NIKKEN CNC Rotary Tables.
The most popular combination of CNC Rotary Table and Hydraulic Tailstock is shown below:

<table>
<thead>
<tr>
<th>No.</th>
<th>CNC Rotary Table</th>
<th>Code No. &amp; Number of Pots</th>
<th>MAX Dia. (D) X MAX Length (L)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>CNC260A21-AWC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>②</td>
<td>Hydraulic Tailstock</td>
<td>H-170S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>③</td>
<td>SAX-230WA21-AWC</td>
<td>H-230S</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the following items, the most suitable one can be selected irrespective of model of CNC Rotary Tables.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Code No. &amp; Number of Pots</th>
<th>MAX Dia. (D) X MAX Length (L)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>④</td>
<td>Disc type AWC Magazine</td>
<td>AWC-F40-8,12,16</td>
<td># 63  X 250</td>
<td>36, 38, 40kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AWC-F45-6,8,10</td>
<td># 85  X 250</td>
<td>38, 40, 43kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AWC-C45-20</td>
<td># 85  X 300</td>
<td>145kg</td>
</tr>
<tr>
<td>⑤</td>
<td>Chain type AWC Magazine</td>
<td>BT40-RN40, RN45</td>
<td>According to the model of WC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>BT50-RN40, RN45</td>
<td>According to the model of WC</td>
<td></td>
</tr>
<tr>
<td>⑥</td>
<td>Work Change Finger</td>
<td>RN40-63X25</td>
<td>Most suitable jig block will</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>RN45-85X32</td>
<td>be recommended. (Optional)</td>
<td></td>
</tr>
<tr>
<td>⑦</td>
<td>Work Fixing Jig Holder</td>
<td>TCC-150AWC</td>
<td>Specification varies depending on the system. ⇒ P.44</td>
<td></td>
</tr>
</tbody>
</table>

★Work Fixing Jig Holder; ISO Taper (7/24) or NC5 Taper (1/10 short taper & double contact) is also available.

⇒ Please refer NC5 TOOLING SYSTEM catalog for NC5 Taper.

### Disk type AWC Magazine

AWC-F40: PCD=385mm  
AWC-F45: PCD=340mm

### Chain type AWC Magazine

AWC-C45-20  
Pitch between Pots =130mm

### Work Fixing Jig Holder

Whether Work Fixing Jig Holder is suitable to the work or not results in big difference in productivity. We have wide and deep experiences and know-how. Please contact us.

#### Side Lock type Holder

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Dia. (D)</th>
<th>d</th>
<th>K</th>
<th>H</th>
<th>R</th>
<th>L</th>
<th>M</th>
<th>G</th>
<th>PCD</th>
<th>A</th>
<th>B</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN40-63X25</td>
<td>63</td>
<td>25H6</td>
<td>10H7</td>
<td>40</td>
<td>5</td>
<td>30</td>
<td>15</td>
<td>M10</td>
<td>52</td>
<td>16</td>
<td>18</td>
<td>1.5kg</td>
</tr>
<tr>
<td>RN45-85X32</td>
<td>85</td>
<td>32H6</td>
<td>12H7</td>
<td>45</td>
<td>5</td>
<td>35</td>
<td>20</td>
<td>M12</td>
<td>55</td>
<td>18</td>
<td>20</td>
<td>2.5kg</td>
</tr>
</tbody>
</table>

#### Examples of Jig Block (Option)

- [Image A]  
- [Image B]  
- [Image C]  
- [Image D]  
- [Image E]

Standard Pull Stud : PS-3  
Holder with ID, Pull Stud with ID are available. (Option)

44
**Improvement in Productivity with AWC SYSTEM**

When the disc type AWC magazine is operated for one hour during the noon recess and another one hour after the official working hour, three months of the practical machining (not theoretical) can be obtained.

\[
\frac{(1+1\text{ hour}) \times 22\text{ days/month} \times 12\text{month}}{8\text{ hours/day} \times 22\text{ days/month}} = 3\text{ months}
\]

Further, as shown below, AWC system provides more cost performance per one operator with an increase in the number of AWC system.

<table>
<thead>
<tr>
<th>Item</th>
<th>Operating Condition</th>
<th>Operating one M/C with one operator</th>
<th>Operating two M/C with one operator</th>
<th>Operating three M/C with one operator using AWC system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation rate of one M/C</td>
<td>100%</td>
<td>80~90%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Operation rate of M/C during noon recess (60min.)</td>
<td>5% (Stopped after completion of the machining work piece)</td>
<td>5%</td>
<td>80~100% (Operated until the finishing of all materials in AWC magazine)</td>
<td></td>
</tr>
<tr>
<td>Operating time after official working hour</td>
<td>0 min.</td>
<td>0 min.</td>
<td>50~400min. (Power is cut off by automatic power circuit breaker)</td>
<td></td>
</tr>
<tr>
<td>Operator's Cost Performance</td>
<td>100%</td>
<td>160~180%</td>
<td>250~270%</td>
<td></td>
</tr>
</tbody>
</table>

**PROGRAM of AWC SYSTEM**

AWC system is the very sure and space saving automatic work changer operated by X, Y and Z axes movements and spindle orientation of Vertical M/C. The following sub program will be called, when the AWC finger is selected in the M/C spindle after all machining, X0, Y0, Z0, is the position where AWC finger is gripped the jig holder on the CNC rotary table.

```
01000 ;
N0 MXX ; (Air blow ON)
N1 MXX ; (CNC rotary table 360° rotation)
N2 MXX ; (Air blow OFF)
N3 S100 ; (Spindle low gear change)
N4 G00 G90 X0 ; G19 ; (Spindle orientation·CNC rotary table X position)
N5 Z0 ; ; (CNC rotary table Z position)
N6 Y_ ; ; (Y approach)
N7 G01 Y0, F500 ; (CNC rotary table Y position)
N8 MXX ; ; (Unlock jig holder)
N9 MXX ; ; (Air blow ON)
N10 G01 X-=10_ ; ; (Pull jig holder out.)
N11 G04 P2000 ; ; (Dwell for cleaning)
N12 G00 X_ ; ; (Completely pull jig holder out.)
N13 Z_ ; ; (AWC magazine Z position)
N14 X_ ; ;
N15 Y_ ; ; (AWC magazine Y position)
N16 Z_ ; ; (X approach)
N17 G01 X_ ; ; (AWC magazine X position·Insert jig holder)
N18 Y_ ; ;
N19 Y_ Z_ ; ; (Index AWC magazine)
N20 Z_ ; ;
N21 G00 X_ ; ; (Y relief)
N22 Z_ ; ; (AWC magazine X position)
N23 Y_ ; ; (Y approach)
N24 G01 X_ ; ; (AWC magazine Y position·Grip jig holder)
N25 G00 X_ ; ; (Pull jig holder out)
N26 Y0 ; ; (CNC rotary table Y position)
N27 X_ ; ;
N28 Z0 ; ; (CNC rotary table Z position)
N29 X_ ; ;
N30 G01 X-=10_ , F1000 ; (X approach)
N31 G04 P2000 ; ; (Dwell for cleaning)
N32 X-=3_ , F500 ; ; (X final approach)
N33 MXX ; ; (Air blow OFF)
N34 MXX ; ; (Clamp jig holder·Jig holder is pulled 3mm in axial direction)
M35 G00 X_ ; ;
N36 G28 Y0. Z0. ;
N37 G28 X0. ;
N38 M99 ;
```

★ This program is made under the condition that there is no interference for the movement of AWC finger between CNC rotary table and AWC magazine.
The followings are the drawings of AWC systems and the work samples. Please contact with us about the reduction of your production processes, improvement of precision and flexibility of your plant.

**AWC Disc type Magazine & Example of Face Mill Cutter as Work Piece**

- Face mill (work piece)
- Cutter arbor with ID
- AWC magazine with R/W head for ID

**Horizontal AWC Magazine with Work Identification Function**

- R/W head for ID

**Rotary Joint & Swing Box**

Cables and hoses are fixed relatively to the tilting movement. Apply to 5AX-230.

- Swing box
- Rotary joint

---

**Advantage of 5AX-Table in Automation Production Line**

The originally system

- Fixture A
- Fixture B
- Fixture C

It's necessary to prepare suitable jig fixtures for each process, then the machining cycle time will be adjusted with increasing the number of processes.
- It’s difficult to obtain the exactly same reference location in each operation, therefore it’s easy to affect the finish quality.
- If the one machine breaks down, all of the production line will be stopped.
- The cost and the delivery for making a new jig fixture for the new design causes problems.

**System with 5AX-Table**

The full surface machining on top half of the component can be achieved with only one setup. The machining cycle time will be adjusted with increasing the number of machines.
- As the full surface machining can be done with only one setup, the finish quality will be improved.
- Even if one machine breaks down, the extended operation time on another machine can achieve same quantity of production.
- It’s easy and quick to machine new design component only by changing machining program.
- The random production can be done by the jig holder with ID tip. (That’s ideal for the automotive production line as there are many pair parts of right and left.)

---

**Work Samples**
### Servo Motor List

<table>
<thead>
<tr>
<th>Maker</th>
<th>Model</th>
<th>Stall Torque 1 Nm</th>
<th>Stall Torque 2 Nm</th>
<th>Stall Torque 3 Nm</th>
<th>Stall Torque 6 Nm</th>
<th>Stall Torque 12 Nm</th>
<th>Stall Torque 22 Nm</th>
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<td>HC102T</td>
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<td>HJ15A6-130</td>
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<td>6M47L</td>
<td>6M57L</td>
<td>6M57L</td>
<td>6M57L</td>
<td>6M57K</td>
</tr>
</tbody>
</table>

**Flow Chart of the Additional Axis Control**

Servo enable is basically kept OFF during the mechanical brake clamps. Servo enable is recommended to be kept ON, even when the mechanical brake clamps for the CNC rotary tables listed in the box below. But, the case when a big electric current always flows in the motor due to the heavy unbalancing load, please keep servo enable OFF when the mechanical brake clamps.

---

**Please specify the type of the solenoid valve and the action at clamping.**

- AC100V or DC24V
- ON Clamping or OFF Clamping

**Guide line of unclamp timer**

- Pneumatic system: Approx. 150msec
- Hydraulic system: Approx. 450msec
- It will differ depending on the types of the brake and piping layout.

**100-200msec, of the dwell after unclamp confirmation is required for SAG-301 (Rotary), SAX-200 (Rotary) and SAX-250 (Rotary).**

---

**Please specify the type of the solenoid valve and the action at clamping.**

- AC100V or DC24V
- ON Clamping or OFF Clamping

**Guide line of clamp timer**

- Pneumatic system: Approx. 100msec
- Hydraulic system: Approx. 300msec
- It will differ depending on the types of the brake and piping layout.

**300-500msec, of the dwell after clamp confirmation is required for the hydraulic clamping system and the clamping system using the air-hydro booster. The timer value should be specified by the parameter setting.**
All of α Series CNC Rotary Tables, as the through holes are standardized φ60 straight hole, they have same attachment in common. Plentiful attachment can be supplied according to your application.

### 5C Collet Chuck

CNC105A21-5C

### Air/Hydraulic Tailstock

G3 P.50

### Hydraulic Unit

TCC-150

**Specifications**
- MAX. 144/min.
- MAX. 3.5MPa
- AC 200~220V, 3 phases. Capacity : 1KVA.
- Solenoid valves and pressure switches depends on your applications.
- Dimension: 400×405×479mm

### Rotary Cylinder for Work Clamp/Unclamp

Pulling Force: 3130KN at air 0.5MPa
(Hydraulic cylinder is also available)

### Slim Chuck

SK Collet
SK10: φ0.75~φ10mm
SK16: φ12.5~φ16mm
SK25: φ16~φ25.4mm

### O.D.Chuck

Chucking range: φ25~φ80mm

### I.D.chuck

Chucking range:
- φ10~φ12mm
- φ13~φ16mm
- φ17~φ20mm
- φ20~φ30mm

Changeable jaw
Scroll Chuck & Power Chuck

Chuck Plate  Scroll Chuck

Holes for bolts of Front Mounting

- Scroll Chucks with Chuck Plate marked * are NIKKEN Scroll Chuck for Front Mounting (Fig.1)
- NIKKEN Scroll Chuck is used for X-4B, X-6E & X-9F.
- The chuck plates for the scroll chucks without * can be used for the scroll chuck based on JIS B6151 SC/TC standard.

<table>
<thead>
<tr>
<th>Scroll Chuck Table Model</th>
<th>4&quot;</th>
<th>5&quot;</th>
<th>6&quot;</th>
<th>7&quot;</th>
<th>9&quot;</th>
<th>10&quot;</th>
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<td>CNC180</td>
<td>X-5C*</td>
<td>X-6B*</td>
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<td>CNC202</td>
<td>X-5C*</td>
<td>X-6B*</td>
<td>X-7A*</td>
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<td>CNC260, 302</td>
<td>X-6G*</td>
<td>X-7L*</td>
<td>X-9H, X-9J</td>
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<tr>
<td>CNC321, 401</td>
<td>X-7N, 7K*</td>
<td>X-9K, 9D*</td>
<td>X-10G, 10D*</td>
<td>X-12F, 12G*</td>
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<tr>
<td>CNC501, 601</td>
<td>X-9D</td>
<td>X-10</td>
<td>X-12B</td>
<td></td>
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</tr>
<tr>
<td>NST250</td>
<td>X-5B</td>
<td>X-6A</td>
<td>X-7B</td>
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<tr>
<td>NST300</td>
<td>X-5B</td>
<td>X-6A</td>
<td>X-7B</td>
<td>X-9A</td>
<td>X-10B-1</td>
<td>X-12A-1</td>
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<td>NST500</td>
<td>X-7G</td>
<td>X-9B</td>
<td>X-10C</td>
<td>X-12</td>
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<td>5AX-130</td>
<td>X-4B</td>
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<tr>
<td>5AX-201, 200I</td>
<td>X-4B</td>
<td>X-6C*</td>
<td>X-6B*</td>
<td>X-7A*</td>
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<td>5AX-230</td>
<td>X-6B*</td>
<td>X-7A*</td>
<td>X-9F</td>
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<td>5AX-350</td>
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<td>X-9J</td>
<td>X-10E-1</td>
<td>X-12D-1</td>
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<td>NSV4400</td>
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<td>X-12C</td>
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*Chuck plate marked #1 is used for #300 table.
*Chuck plate marked #2 are used for #400 table.

Chuck Sizes

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<tr>
<th>Chuck Size</th>
<th>External Range</th>
<th>Internal Range</th>
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<tr>
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<td>36~76</td>
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<td>5&quot;</td>
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<td>6&quot;</td>
<td>3~135</td>
<td>52~119</td>
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<tr>
<td>7&quot;</td>
<td>3~153</td>
<td>56~134</td>
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<tr>
<td>9&quot;</td>
<td>4~190</td>
<td>64~169</td>
</tr>
<tr>
<td>10&quot;</td>
<td>10~229</td>
<td>72~208</td>
</tr>
<tr>
<td>12&quot;</td>
<td>10~258</td>
<td>82~238</td>
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</tbody>
</table>

This is the actual gripping range not jaw stroke.

Chuck & Rotational Cylinder

- The maker of the scroll chuck was changed. This table shows the chuck plate of the new maker.
- Please refer CAT.8168 or older for the chuck plate of the old maker.
- The dimension from the table surface to the jaw is B+C. Others: E+B+C

Power Chuck & Rotary Cylinder

<table>
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<tr>
<th>Chuck Size</th>
<th>Power Chuck Code No.</th>
<th>Rotary Cylinder Code No.</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>MIN.Table</th>
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</table>

*HOIMA power chucks and rotary cylinders (Higher/hydraulic, Lower/Air) are listed. Other maker’s one can be mounted, please specify the Code No.
*Above power chucks are not applicable to NST Table. Please contact us for mounting.
*Rotary Cylinder for SAX-table is NIKKEN made.
*NIKKEN air/hydraulic rotary cylinder is also available.

The additional machining may be necessary for the mounting of the power chuck after shipping. Please inform us when ordering, if the power chuck will be mounted after shipping.
**TAILSTOCK (MANUAL, AIR, HYDRAULIC)**

### List of Tailstock and Support Table

<table>
<thead>
<tr>
<th>Table Model</th>
<th>Tailstock</th>
<th>Manual Stroke: 15mm</th>
<th>Air/Hyd Tailstock Stroke: 60mm</th>
<th>Hyd. Tailstock Stroke: 100mm</th>
<th>Support Table</th>
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<tbody>
<tr>
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<td>P-105S</td>
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<td>CNC110, 202</td>
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<td>P-125S</td>
<td>PBA-140</td>
<td>H-140S</td>
<td>TAT140</td>
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<td>P-150S</td>
<td>PBA-150</td>
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<td>TAT150</td>
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<td>P-170S</td>
<td>PBA-170</td>
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<td>CNC321, 401</td>
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<td>PBA-230</td>
<td>H-230S</td>
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<td>TAT500,600</td>
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<td>PBA-210</td>
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<td>SAW150</td>
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<td>P-150S</td>
<td>PBA-150</td>
<td>H-150S</td>
<td>TAT150</td>
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<td>SAW301, 200</td>
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<td>P-200S</td>
<td>PBA-200S</td>
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<td>TAT200</td>
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<td>PBA-230S</td>
<td>H-230S</td>
<td>TAT230</td>
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<td>SAW350</td>
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<td>PBA-310S</td>
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<td>TAT310</td>
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<td>PBA-105-2,3,4W</td>
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**Support Table TAT** refer to P.6, 18

---

**Dimension of Manual Tailstock**

<table>
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<th>Code No.</th>
<th>Centre Height H</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>Weight (Kg)</th>
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</thead>
<tbody>
<tr>
<td>P-105S</td>
<td>102  – 110</td>
<td>27</td>
<td>150</td>
<td>76</td>
<td>74</td>
<td>120</td>
<td>195</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>P-125S</td>
<td>152  – 135</td>
<td>27</td>
<td>150</td>
<td>76</td>
<td>74</td>
<td>120</td>
<td>210</td>
<td>14</td>
<td>11.5</td>
</tr>
<tr>
<td>P-150S</td>
<td>145  – 160</td>
<td>25</td>
<td>195</td>
<td>98</td>
<td>102</td>
<td>145</td>
<td>210</td>
<td>18</td>
<td>22</td>
</tr>
<tr>
<td>P-170S</td>
<td>160  – 180</td>
<td>25</td>
<td>195</td>
<td>98</td>
<td>102</td>
<td>145</td>
<td>210</td>
<td>18</td>
<td>22.5</td>
</tr>
<tr>
<td>P-230S</td>
<td>220  – 240</td>
<td>25</td>
<td>195</td>
<td>98</td>
<td>102</td>
<td>145</td>
<td>250</td>
<td>18</td>
<td>27</td>
</tr>
<tr>
<td>P-280S</td>
<td>280  – 300</td>
<td>15</td>
<td>230</td>
<td>103</td>
<td>124</td>
<td>145</td>
<td>330</td>
<td>20</td>
<td>41</td>
</tr>
<tr>
<td>P-310S</td>
<td>300  – 310</td>
<td>15</td>
<td>230</td>
<td>103</td>
<td>124</td>
<td>145</td>
<td>330</td>
<td>20</td>
<td>41.5</td>
</tr>
</tbody>
</table>

* Left-hand tailstocks are available in all sizes.
* For P-150S or larger size tailstocks, 6 pcs of interchangeable centres are included.

---

**Air/Hyd, both usable Small Size Tailstock**

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Centre Height H</th>
<th>H1</th>
<th>G</th>
<th>Thrust (N) Air 0.5MPa</th>
<th>Thrust (N) Hyd. 2MPa</th>
<th>Weight (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBA-105</td>
<td>105</td>
<td>25</td>
<td>14</td>
<td>1176</td>
<td>4733</td>
<td>15</td>
</tr>
<tr>
<td>PBA-135</td>
<td>135</td>
<td>55</td>
<td>14</td>
<td>1176</td>
<td>4733</td>
<td>20</td>
</tr>
<tr>
<td>PBA-150</td>
<td>150</td>
<td>70</td>
<td>18</td>
<td>1176</td>
<td>4733</td>
<td>22</td>
</tr>
<tr>
<td>PBA-170</td>
<td>170</td>
<td>90</td>
<td>18</td>
<td>1176</td>
<td>4733</td>
<td>24.5</td>
</tr>
<tr>
<td>PBA-175</td>
<td>175</td>
<td>95</td>
<td>18</td>
<td>1176</td>
<td>4733</td>
<td>25</td>
</tr>
<tr>
<td>PBA-180</td>
<td>180</td>
<td>100</td>
<td>18</td>
<td>1176</td>
<td>4733</td>
<td>25.5</td>
</tr>
</tbody>
</table>

* Rotary centre is built-in.
* MT (Morse Taper) type quill is also available. Please contact us.
* The different length of the stroke is available. Please contact us.

---

**Hydraulic Tailstock**

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Centre Height H</th>
<th>H1</th>
<th>G</th>
<th>Thrust (N) Hyd. 3.5MPa</th>
<th>Weight (Kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H150S</td>
<td>145  – 160</td>
<td>191</td>
<td>18</td>
<td>5370</td>
<td>28</td>
</tr>
<tr>
<td>H170S</td>
<td>160  – 180</td>
<td>211</td>
<td>18</td>
<td>5370</td>
<td>35</td>
</tr>
<tr>
<td>H210S</td>
<td>200  – 220</td>
<td>251</td>
<td>18</td>
<td>5370</td>
<td>41</td>
</tr>
<tr>
<td>H230S</td>
<td>220  – 240</td>
<td>271</td>
<td>18</td>
<td>5370</td>
<td>45</td>
</tr>
</tbody>
</table>

* Rotary centre is built-in.
* MAX. work piece diameter must be smaller than \( \phi \) 130mm, when the stroke of changing the work piece is more than 30mm marked *.

* For Support Table TAT, refer to P.6, 18
* For details of CNC rotary table for tailstock, please contact us for more details.
* In case of air/hyd. tailstock, the hydraulic unit, connecting cables and air/hyd. hoses are supplied as an option.
### CNC Rotary Table only for Vertical Use

Back side motor mounted type P.13, 14  
Top side motor mounted type P.15~P.18

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Runout of table surface</td>
<td></td>
<td>0.01 mm</td>
<td>0.015 mm</td>
<td>0.015 mm</td>
<td>0.015 mm</td>
<td>0.02 mm</td>
</tr>
<tr>
<td>3</td>
<td>Concentricity of centre bore</td>
<td></td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
</tr>
<tr>
<td>4</td>
<td>Squareness of table surface (Minus deviation of upper part is not permitted.)</td>
<td></td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.03 mm</td>
</tr>
<tr>
<td>5</td>
<td>Parallelism between centre line of test bar and key way</td>
<td>At 150 mm 0.02 mm</td>
<td></td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
</tr>
<tr>
<td>6</td>
<td>Parallelism between frame bottom surface and table centre line</td>
<td>At 150 mm 0.02 mm</td>
<td></td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.03 mm</td>
</tr>
<tr>
<td>7</td>
<td>Indexing accuracy</td>
<td></td>
<td>±20°</td>
<td>20°</td>
<td>15°</td>
<td>15°</td>
<td>15°</td>
</tr>
<tr>
<td>8</td>
<td>Repeatability</td>
<td></td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
</tr>
</tbody>
</table>

* For ultra-precision option: One rank higher accuracies than the above figures are inspected.  
* Please contact us for the accuracy of the rotary table larger than CNC102 for vertical use.

### CNC Rotary Table only for Horizontal Use

Built-in type P.35

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Parallelism between table surface and frame bottom surface (Concave)</td>
<td></td>
<td>0.015 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.03 mm</td>
<td>0.04 mm</td>
<td>0.05 mm</td>
</tr>
<tr>
<td>2</td>
<td>Runout of table surface at horizontal position</td>
<td></td>
<td>0.01 mm</td>
<td>0.015 mm</td>
<td>0.015 mm</td>
<td>0.015 mm</td>
<td>0.03 mm</td>
<td>0.03 mm</td>
<td>0.04 mm</td>
</tr>
<tr>
<td>3</td>
<td>Concentricity of centre bore</td>
<td></td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
</tr>
<tr>
<td>6</td>
<td>Squareness between frame bottom surface and table centre line</td>
<td>At 150 mm 0.02 mm</td>
<td></td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.03 mm</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>7</td>
<td>Indexing accuracy</td>
<td></td>
<td>±20°</td>
<td>20°</td>
<td>15°</td>
<td>15°</td>
<td>15°</td>
<td>15°</td>
<td>15°</td>
</tr>
<tr>
<td>8</td>
<td>Repeatability</td>
<td></td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
</tr>
</tbody>
</table>

* For ultra-precision option: One rank higher accuracies than the above figures are inspected.  
* Center socket is provided at the centre bore for the table marked #1. Concentricity of the internal center socket is shown.
### CNC Rotary Table for both of Vertival and Horizontal Use

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Parallelism between table surface and frame bottom surface (Concave)</td>
<td></td>
<td>0.015 mm</td>
<td>0.015 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
</tr>
<tr>
<td>2</td>
<td>Runout of table surface</td>
<td></td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.015 mm</td>
<td>0.015 mm</td>
<td>0.015 mm</td>
<td>0.02 mm</td>
</tr>
<tr>
<td>3</td>
<td>Concentricity of centre bore</td>
<td></td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
</tr>
<tr>
<td>4</td>
<td>Squareness of table surface</td>
<td>(Minus deviation at upper part is not permitted.)</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.03 mm</td>
</tr>
<tr>
<td>5</td>
<td>Parallelism between centre line of test bar and key way</td>
<td>At 150 mm 0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Parallelism between frame bottom surface and table centre line</td>
<td>At 150 mm 0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.03 mm</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Indexing accuracy</td>
<td>±30°</td>
<td>±20°</td>
<td>20°</td>
<td>15°</td>
<td>15°</td>
<td>15°</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Repeatability</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td></td>
</tr>
</tbody>
</table>

* For ultra precision option: One rank higher accuracies than the above figures are inspected.
* Please contact us for the accuracy of the rotary table larger equal to CNC602 for both of vertical and horizontal use.

### NST, 5AX- Tilting Rotary Table

<table>
<thead>
<tr>
<th>No.</th>
<th>Measuring Item</th>
<th>Measuring Method</th>
<th>NST250 300</th>
<th>NST500</th>
<th>5AX-130 150</th>
<th>5AX-201</th>
<th>5AX-200II</th>
<th>5AX-230 350</th>
<th>5AX-500</th>
<th>5AX-800</th>
<th>5AX-1200*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Parallelism between table surface and frame bottom at tilting angle 0° (Concave)</td>
<td></td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.015 mm</td>
<td>0.015 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.03 mm</td>
<td>0.04 mm</td>
<td>0.05 mm</td>
</tr>
<tr>
<td>2</td>
<td>Deviation of table surface at tilting angle 0°</td>
<td></td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.03 mm</td>
<td>0.04 mm</td>
</tr>
<tr>
<td>3</td>
<td>Deviation of table centre hole at tilting angle 0°</td>
<td></td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm</td>
<td>0.01 mm*</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Deviation of centre line of rotary axis at tilting angle 90°</td>
<td></td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.03 mm</td>
<td>0.04 mm</td>
<td>0.05 mm</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Parallelism between table surface and centre line of guide key at tilting angle 90°</td>
<td>At 150 mm 0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.015 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>——</td>
<td>——</td>
<td>——</td>
</tr>
<tr>
<td>6</td>
<td>Squareness of test bar centre line at tilting angle 90°</td>
<td>At 150 mm 0.02 mm</td>
<td>0.03 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.02 mm</td>
<td>0.04 mm</td>
<td>0.04 mm</td>
<td>0.05 mm</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Indexing accuracy of rotary axis</td>
<td>Cumulative 20°</td>
<td>20°</td>
<td>±30°</td>
<td>Cumulative 20°</td>
<td>20°</td>
<td>20°</td>
<td>20°</td>
<td>20°</td>
<td>20°</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Repeatability of rotary axis</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td>4°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Indexing accuracy of lifting axis</td>
<td>Cumulative 60°</td>
<td>60°</td>
<td>60°</td>
<td>60°</td>
<td>60°</td>
<td>60°</td>
<td>60°</td>
<td>60°</td>
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<td></td>
</tr>
<tr>
<td>10</td>
<td>Repeatability of lifting axis</td>
<td>——</td>
<td>——</td>
<td>±6°</td>
<td>±6°</td>
<td>±6°</td>
<td>±6°</td>
<td>±6°</td>
<td>±6°</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* For ultra precision option: One rank higher accuracies than the above figures are inspected.
* Center socket is provided at the centre bore for the table marked *1. Concentricity of the internal center socket is shown.
**CNC ROTARY TABLE Special Specification 1**

### Ultra Precision (True Closed Loop)

In ultra precision, 3 grades can be selected for indexing accuracy: ±3", ±5" and ±10" (ISO 230 Accuracy Measuring Method).

High resolution rotary encoder is mounted at the back of Rotary Table for detecting positioning feedback, to realize true closed loop. (Position is detected on the rotating table itself.)

In case indexing unit of 1" or very high rigidity is required, please select Hirth Coupling Index NSVZ, NSVX series table. [→ P.33](#)

### Rotary Encoder and Wave Forming Unit for CNC Rotary Table

<table>
<thead>
<tr>
<th>Table Model</th>
<th>IndexingAccuracy</th>
<th>±3&quot;</th>
<th>±5&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNC105, 180, 202</td>
<td></td>
<td></td>
<td>RON285, IBV101</td>
</tr>
<tr>
<td>CNC260, 302</td>
<td>RON886, IBV102</td>
<td>RON285, IBV101</td>
<td></td>
</tr>
<tr>
<td>CNC321~2000</td>
<td>RON886, IBV102</td>
<td>RON786, IBV101</td>
<td></td>
</tr>
</tbody>
</table>

★ EXE unit and cables are not included in ultra precision option. Please order separately.

★ In case of FANUC, the encoder with FANUC serial interface (RCN223, 727 (φ60 or φ100 hole)) is recommended. In this case, EXE unit is not necessary.

★ Air purge of the encoder inside is available as an option for water proof. Please contact us.

### Rotary Encoder and Wave Forming Unit for 5AX·Tilting Rotary Table

<table>
<thead>
<tr>
<th>Table Model</th>
<th>IndexingAccuracy</th>
<th>±5&quot;</th>
<th>±10&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>5AX-130, 201, 202</td>
<td>Rotary</td>
<td>RON285, IBV101</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tilting</td>
<td>RON285, IBV101</td>
<td></td>
</tr>
<tr>
<td>5AX-350</td>
<td>Rotary</td>
<td>RON285, IBV101</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tilting</td>
<td>RON285, IBV101</td>
<td></td>
</tr>
<tr>
<td>5AX-550, 800</td>
<td>Rotary</td>
<td>RON786, IBV101</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tilting</td>
<td>RON786, IBV101</td>
<td></td>
</tr>
</tbody>
</table>

### ISO 230-2 1997 (JIS B 6192-1999)

Accuracy Measuring Method
Rotating Axis: 30.2°×12 points
Tilting Axis: 15.2°×8 points
Continuously repeating 5 times rotation of CW/CCW, measuring are to be done at above-mentioned points.
And, bidirectional accuracy of positioning, bidirectional repeatability of positioning, unidirectional accuracy of positioning, unidirectional repeatability of positioning etc. are calculated.
Test data sheet is available in English.
CNC ROTARY TABLE Special Specification 2

### Rotary Joint
There are 3 types of the rotary joint such as cylinder type, flange plate type and built-in type. Rotary joint is used for clamp/unclamp of the work piece, confirmation of proper clamp, cleaning, coolant etc. 3 types of rotary joint are available. The line cutting swarf may come through the filter into the coolant port, therefore the coolant port is recommended to be separated. (Refer cylinder type rotary joint)

1. Cylinder type Rotary Joint
   Retrofitting to standard CNC rotary table is possible.

2. Flange Plate type Rotary Joint
   IN ports position can be changed at any angle of 360°. The every position which causes no interference against M/C can be selected.

3. Built-in type Rotary Joint
   JAPAN : PAT.
   For CNC321,401,501,601,802,400H,503H, 8 IN ports are arranged on the table body. Centre flange and centre shaft are as an option.

Even the number of IN ports is limited, rotary joint can be installed for the rotary table with the rotary encoder for ultra precision. Please contact us.

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Cylinder type</th>
<th>Flange Plate type</th>
<th>Built-in type</th>
<th>Code No.</th>
<th>Cylinder type</th>
<th>Flange Plate type</th>
<th>Built-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNC 105</td>
<td>4+1 1*</td>
<td>4</td>
<td>25</td>
<td>5AX-130,150</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>180,202</td>
<td>6+1 1*</td>
<td>6</td>
<td>25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>260,302</td>
<td>10+1 1*</td>
<td>11 (6°)</td>
<td>60 (−6°)</td>
<td>201</td>
<td>4</td>
<td>6 (6)</td>
<td>4°2</td>
</tr>
<tr>
<td>321,401,</td>
<td>12+1 1*</td>
<td></td>
<td>8+1 1*</td>
<td>250</td>
<td>3</td>
<td></td>
<td>3°3</td>
</tr>
<tr>
<td>401H</td>
<td>12+1 1*</td>
<td></td>
<td></td>
<td>350</td>
<td>10</td>
<td></td>
<td>6+1 1*</td>
</tr>
<tr>
<td>B350</td>
<td>16+1 1*</td>
<td></td>
<td></td>
<td>550</td>
<td>10+5</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>B450</td>
<td>20+1 1*</td>
<td></td>
<td></td>
<td>800</td>
<td></td>
<td>800</td>
<td>6</td>
</tr>
<tr>
<td>503H</td>
<td>12+1 1*</td>
<td></td>
<td>8+1 1*</td>
<td>DD250—</td>
<td>6</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td>501,601</td>
<td>14+1 1*</td>
<td>15</td>
<td></td>
<td>400—</td>
<td>8</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>802</td>
<td>16+1 1*</td>
<td></td>
<td>10+1 1*</td>
<td>5AX-DD200A,B</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CAUTION OF IN port**
- When the air is supplied for all IN ports, please contact us.
- Please do not supply the different pressure of the air in the IN ports next each other.
- Please make sure that the line filter should be provided for pneumatic supply use in order to avoid swarf and water ingress for rust problem.
- This is not avoidable that the oil of the hydraulic port may be leaked to the next air port for the long time use, due to the characteristic of the seal. Please do not assign the air port next to the hydraulic port as much as possible.
- The rotary joint must be specially treated to prevent from the rust, when using the glycol solution for the operating fluid. Please inform us when ordering.
- When the rotary joint is designed at your side, please select the low friction type seal. Then, please check the rotary table movement after installation of your rotary joint, not to over load.

- **MAX**: No. of high column table,
- **1**: 1 port is the port located in the centre hole (for coolant),
- **2**: 3 reserve ports are provided on SAK-23, 2 external ports are available,
- **3**: 6 reserve ports are provided on SAK-350, 6 additional ports are available.
- **4**: MAX, 8 ports for CNC320H, 302B.
CNC ROTARY TABLE Special Specification 3

Waterproof specifications
- Mechanical parts of the table are perfectly sealed. For water resistance to electric parts such as cables, the hard-wired type connection on the motor cover is available as an option.
- For the rotary table with pneumatic brake, air purge is arranged inside the motor cover as standard.
- In case of the table which with K21 controller, the hard-wired type connection on the rotary table side and harthing connector fitting on the controller side, however, the harthing connector fitting on the rotary table side is also available as an option.
- For K21PW controller, water resistant connector type cables are supplied as standard.

For all CNC rotary tables, △ mark obtained parts or equivalent and ○ marked electric parts are used, ensuring high safety.
△ : Safety approval mark by TÜV RHEINLAND.
○ : Safety mark required for marketing in Europe from ’95.

Position & Direction of Connecting Cable
The standard of the cable connecting direction is B or D. A or C is possible on demand.

Air Intensifying Booster (Max. Output: 0.7MPa)
The air pressure can be double by Air Intensifying Booster. This is suitable for tables with the Double Intensifying Braking System such as the tilting axis of 5AX-130. See P.66

Air Hydraulic Booster
Please order an air hydraulic unit for the machine without hydraulic source.
Applicable for CNC260, CNC302 : NB-70×5×30
CNC321-CNC801 : NBH-100-X
Please ask for the layout of the booster.

Ultra Heavy Duty CNC Rotary Table
In such lead milling as right hand, the movement of rotating axis is very small in relation to the movement of X axis, servo control will be very difficult. If the cutting conditions and surface finish etc. can not be satisfied with standard CNC rotary table, Ultra Heavy Duty CNC Rotary Table is recommended. (Cutting capability is 5 times of the standard type.)

Built-in Pallet Clamp System
Available to CNC rotary table and 5AX-tilting rotary table. Very suitable to NC special purpose machine and Horizontal M/C as built-in B axis table.

Special Color
Please order with the color sample or Munsell Color No.
Assessment of CNC ROTARY TABLE

Accessment for Reliability & Quality.

- **Over Load Test**
  The wearing of the worm wheel is very small under very severe testing condition.

- **Brake Torque Test**

- **Rigidity Test**

- **Cutting Stability Test**
  The micro vibration during machining or the surface finish are measured.

- **EMC Test**
  Electromagnetic Compatibility Test

- **Water Proof Test**

- **Load Test for Large Rotary Table**
  2 units of **CNC501 (940Kg)** are used for the load on **5AX-800**.

  **CNC802 (1100Kg)** is used for the load on **5AX-1200**.

  Testing of **5AX-1200** with counter balance weight
NIKKEN CNC rotary tables are used in various kinds of world wide applications. Please contact with us with the dimension of your work piece and construction of the jig fixture etc. We will recommend you the best application.

- Combination with Pallet Changer
  2 units of CNC rotary tables are used on the TAPPING CENTER with swing type pallet changer.

- Combination of CNC Rotary Tables
  5AX-400FA-RJ8-800/150
  5AX-500MA-RJ10-900/100
  5AX-321FA
  CNC180 + TAT105 + CNCZ503
  Machining of turbine wheel to use 2 units of CNC rotary tables, one for the swing axis of the HF motor and the other for the rotary axis of the work piece.

- Application of CNC Rotary Table with Support Table
  CNC170 + TAT105
  CNC601, 3m Jig Block & TAT500
  3 sets of power chucks are used for work clamping.

- Synchronous Rotation by CNC401 X 2 units
- CNC170 + Special Support Table

Counter balance cylinder
In case of the application with the support table, unbalancing load used to be large. The counter balance cylinder is highly recommended. ⇒ P. 6
Example of 5AX Rotary Table location on M/C

- Tail Stock is used together.
- Y-axis stroke of the M/C is not enough.
- Y-axis stroke is enough.
- Tilting range is 30-135°.

5AX-300 Example on the angle base (60°)

Application of 5AX-Table

5AX-500 with pallet clamp unit

Bar removing after the machining of face mill cutter body

Automatic change of the insert tips of the huge segment cutter

Welding on curved plane

Cutting off on curved plane

5AX-Table on Laser Welding/Cutting off Machine

1. The work piece is exchanged by ROBOT, the positioning pin goes forward, then the work piece is clamped at the tilting axis = 90°.
2. The positioning pin goes backward, the tilting axis moves to 0°, then the machining starts. The tilting movement is used only for automatic work piece exchange.

5AX-150 for 4th and 5th axes tilting rotary table on special grinding centre

Simultaneous 3 axes control of X, Z & A axis instead of turning.

Other Application

Sensor to detect the cutting edge

Angular Head

Simultaneous 3 axes control of X, Z & A axis

Support Branch

CNC1800 & Support Branch

Indexing/ clamping of the turbine disk

Work piece (Cutter) is exchanged by ROBOT, and the cutting edge will be detected automatically.

High Frequency Heat Treatment

Anti noise process is required.

CNC1201 Indexing of the turbine shaft. Turbine shaft is supported and clamped by the roller support.

Hobbing of tooth module 6-7

Separate Roller Bearing

Separate Brake

Rotary table is used to drive by spline and positioning.
Conditions of CNC Rotary Table
when being used to CNC Special Purpose Machine

Not only indexing accuracy, the following conditions must also be
filled for continuous operation of 24 hours. Namely, Load calculation, Indexing time, Durability etc.
And the overseas service branches and after service ability are
also important.

1. Load Calculation
In case using conditions are beyond the specification of CNC
rotary table, please inform us the work piece, jig fixtures, required
indexing time etc. Then, we will calculate the load of your
application, and select the suitable CNC rotary table.
When such jig fixture and work as right hand are to be rotated on
CNC rotary table, we analyze into ① ～ ⑥ elements, and calculate as per the list shown at right hand side.

<table>
<thead>
<tr>
<th>No.</th>
<th>Shape</th>
<th>Quantity</th>
<th>Approx. Weight (Kg)</th>
<th>Approx. GD² (GD²/4-Kg.mm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>CNC400T Eccentricity 450mm</td>
<td>1</td>
<td>260</td>
<td>59</td>
</tr>
<tr>
<td>②</td>
<td>Tailstock Eccentricity 120mm</td>
<td>1</td>
<td>80</td>
<td>14</td>
</tr>
<tr>
<td>③</td>
<td>Base</td>
<td>1</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>④</td>
<td>Upper Support Parts</td>
<td>1</td>
<td>30</td>
<td>2</td>
</tr>
<tr>
<td>⑤</td>
<td>Pallet Clamp Eccentricity 120mm</td>
<td>1</td>
<td>80</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>560</td>
<td>91</td>
</tr>
</tbody>
</table>

2. Indexing Time Comparison
Indexing Time = Acceleration Time + Rapid Positioning Time + Deceleration Time
MAX. moving angle is 180°. Therefore, not only rapid
positioning time, but also acceleration/deceleration
characteristics is very important. The graph at right hand side shows that CNCZ202(high speed),
which is excellent acceleration/deceleration
capability, gives a very substantial time saving of
approximately 300 msec. on this 90° movement
comparing with CNC202 (standard).
CNCZ202 : 500 msec.
CNC 202 : 800 msec.

3. Durability
In 24 hours continuous operation, durability is one of the most important conditions.
Thanks to Carbide Worm System, NIKKEN CNC rotary table ensures highest anti wearing
nature even at the severest load conditions with high speed indexing. The graph at right hand
side shows the worm wheel & worm screw and accuracy inspection of the table having been
used for 7 years on CNC special purpose machine in production line of automobile parts plant.

4. World Wide Service Network
Even for the perfect product, an unexpected accident can not be avoided. Please choose the NIKKEN CNC rotary table not only the
completeness of the product, but also the world wide service network.☞ P.73～P.77

**SI Unit & Gravity Unit**
SI is the abbreviation of "Systeme International d'Unites".

<table>
<thead>
<tr>
<th>Item</th>
<th>SI Unit</th>
<th>Gravity Unit</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clamping torque</td>
<td>N·m</td>
<td>kgf·m</td>
<td>1kgf·m=9.8N·m</td>
</tr>
<tr>
<td>Table Inertia at Motor Shaft *</td>
<td>(GD²/4)·kg·m²×10⁻³</td>
<td>kg cm sec²</td>
<td>1kg cm sec²=10.2X(GD²/4)·kg·m²</td>
</tr>
<tr>
<td>MAX. Motor Rotation Speed</td>
<td>min⁻¹</td>
<td>rpm</td>
<td>1rpm=1min⁻¹</td>
</tr>
<tr>
<td>MAX. Thrust Load applicable on the Table</td>
<td>N</td>
<td>kgf</td>
<td>1kgf=9.8N</td>
</tr>
<tr>
<td>MAX. Work Inertia *</td>
<td>(GD²/4)·kg·m²</td>
<td>kg cm sec²</td>
<td>1kg cm sec²=10.2X(GD²/4)·kg·m²</td>
</tr>
<tr>
<td>Driving Torque</td>
<td>N·m</td>
<td>kgf·m</td>
<td>1kgf·m=9.8N·m</td>
</tr>
<tr>
<td>Air/Hydraulic Pressure</td>
<td>MPa</td>
<td>kgf/cm²</td>
<td>1kgf/cm²=0.098MPa</td>
</tr>
</tbody>
</table>

* The unit of inertia is expressed in GD².
Specifications of the rotary table to be used on the special purpose machines.

1. Custom made on the Table Face Plate
   - Drilled hole, tapped hole, or dwell pin hole etc.
   - Without T-slot or with T-slot
   - Additional process at centre hole
2. The location of the Oil Sight Grass, Oil Supply Port and Drain
   Port can be changed.
3. How to be mounted on the Machine
   - U-groove
   - Additional tapped holes on the backside
   - Shift the guide key position
4. Modification of the Motor Cover
5. Rotary Joint
6. Built-In Pallet Clamp System
7. Special Color

- Please order with the color sample or Munsell Color No.

**Selection of the CNC rotary table**

- The support table is basically used in case of vertical application.
- The machining operation is generally light cut on aluminium materials, however, if the fixture or the component is large size, please make sure that the fixture inertia is within the MAX. work inertia.
- If the unbalance load is too big, it will affect on not only the indexing accuracy but also the durability. Please make sure the unbalance load will be within the following figures:
  CNC105 : 10Nnm, CNC180, 202 : 20Nnm, CNC260, 302 : 30Nnm
- In case of the unbalance load is large,
  - The high speed Z series rotary table is not suitable, please use standard rotary table.
  - Please install the balance cylinder or counter balance. (Ref. P.6)
  - Please advise us the details of the component, fixture, indexing time etc. prior to your order, and we will make a calculation of the load and select the best suitable rotary table for your application.
- If the huge amount of coolant has to be applied, we could prepare air purge (with pneumatic pressure of 0.03MPa) on the CNC rotary table body as an option. Please contact us for details.

**Check point for trunnion fixture**

1. When installing the table onto the sub-base, measure and check as follows.
2. Install the table & support table onto the M/C as follows.
3. Trunnion fixture is recommended to be aligned as follows.

**Caution**

- Always be careful not to inflict personal injury on any shop objects when unpacking this equipment.
- Caution should always be used when lifting this product. Especially when using lifting equipment. Manual lifting of this product may cause serious back injury. Always use safe lifting techniques.
- Install the rotary table on a well ventilated place hidden from direct sunlight, on a place not exposed to corrosive gas such as sulfuric acid and hydrochloric acid. Do not install the rotary table on a place with excessive high/low temperature. (Normal operating temperature: 50°C~40°C)
- Under the lower temperature condition, please warm the rotary table up just after power on. Or, please use lighter lubrication oil as another solution.
- Only the specified power voltage should be used. Incorrect power supply may result in fire.
- Always power off the machine before attempting any installation and wiring work. Failure to do this may result in serious personal injury or electric shock.
- The machine on which CNC rotary table is installed should have a complete cover or splash guard.
- When installing this product onto a machine tool, always pay special attention to the location of cables, hoses and hydraulic oil piping (if installed), to check for interference.
- Please make sure that all cables and hoses are sufficiently long to allow full axis travel.
- Always ensure that there is no interference with the CNC rotary table or its automatic tool changer unit of the ATC (Automatic Tool Change) position.
- Always ensure safe cable runs according to the instruction manual in order not to interfere with the machine operation. It is dangerous if the cables become entangled with the machine table or spindle unit.
- Always check the parallelism and squareness of the table to the machine axes and fix to the machine table using the fixings provided.
- Please follow the instruction manual for installation, wiring of cables and hoses. Failure to connect wiring correctly may cause fire or a serious accident.
- This table has been given a waterproof treatment, however if ingress of coolant should occur, stop using the table immediately. Failure to do so may result in the unit catching fire or causing serious electric malfunction.
- Always ensure that pneumatic or hydraulic hoses are connected correctly.
- Always keep the air filter clean to prevent water and dirt ingress from the air supply.
- Please ensure that the hydraulic pressure flows constantly on the pump line at brake clamp in the save energy type hydraulic circuit.
- Please use CNC rotary table within the specification. Exceeding the specification may cause defective components and irreparable damage. Please contact us in case of the beyond the specification before ordering. (Ref. P.5)
- Never modify the table by yourself without previous agreement of NIKKEN.
- Never touch any moving parts. Failure to follow this instruction may result in serious personal injury.
- For the rotary table with the NIKKEN controller, firstly turn the power of NIKKEN controller off, then turn the power of main M/C off at the end of operation.
- Always remove swarf from the table after use. Long term operation without cleaning may cause damage to the internal mechanism.
- Always change the lubrication oil annually to prevent the gear wear.
- If a collision occurs with the table, power off the machine controller immediately and contact your distributor for repair.
Minimum Command Increment: 0.001° or 1sec.
- Controller can drive all models of NIKKEN CNC rotary table.

Single M signal provides Various Automatic Operation.
- Any unequal dividing, equal dividing, arc cutting, lead cutting etc. can be done very easily.

RS232C Interface is provided as standard.
Block data/parameter data can be up loaded/down loaded through RS232C interface. Moreover when the direct angle command interface is used, all program and management can be done on M/C side.

Upgrade of Water Proof Characteristic
EMC Assessment ⇒ P.56
- The direct output type connection is applied for all models of CNC rotary table, and the EMC assessment is satisfied as the total system.

The Latest Designed Digital Servo System
- The dimension of the servo motor became more compact and the torque is powered up.
- Very excellent acceleration/deceleration characteristics, the powered up torque and the best suited servo parameter realize the high quality and long life.

Plenty of Optional Functions

More than 25,000 sets working in the field.
- This fact ensures the highest reliability.
### Main Specification of Controller (NIKKEN-Ω 21 controller)

The operation, programming and the interface to M/C are interchangeable with the old NIKKEN controllers (Ω, 8800AX).

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN. Increment</td>
<td>0.001° or 1&quot;</td>
<td>Free Selection</td>
</tr>
<tr>
<td>MAX. Programmable Angle</td>
<td>±9999 rotation, ±999 999° &amp; ±999°59'59&quot;</td>
<td>Free Selection</td>
</tr>
<tr>
<td>MAX. Equal Dividing</td>
<td>2~9999 equal dividing</td>
<td></td>
</tr>
<tr>
<td>Program Capacity</td>
<td>1000 Blocks</td>
<td>N000~N999</td>
</tr>
<tr>
<td>Input System</td>
<td>MDI Key Board, Pendant type</td>
<td>5 years memory</td>
</tr>
<tr>
<td>Programming System</td>
<td>Combined use of Incremental/Absolute</td>
<td>Free Selection of G91/G90</td>
</tr>
<tr>
<td>Zero Return</td>
<td>Machine Zero Position/Work Zero Position</td>
<td>can be commanded from outside.</td>
</tr>
<tr>
<td>Manual Feed</td>
<td>Rapid Feed/Fine Feed/Step Feed/Continuous Feed</td>
<td></td>
</tr>
<tr>
<td>Uni-directional Positioning</td>
<td>Uni-directional Positioning can be done to eliminate the mechanical backlash, G14</td>
<td></td>
</tr>
<tr>
<td>Emergency Stop</td>
<td>Whole system can be commanded from outside.</td>
<td></td>
</tr>
<tr>
<td>Feed Hold</td>
<td>Table rotation temporarily stops.</td>
<td>can be commanded from outside.</td>
</tr>
<tr>
<td>Jump Function</td>
<td>Jump to sub program etc.</td>
<td></td>
</tr>
<tr>
<td>Repeating Function</td>
<td>By specifying start No. and final No., multiple sequence are repeated.</td>
<td></td>
</tr>
<tr>
<td>Buffer Function</td>
<td>Reading next block, and execute job without stop.</td>
<td>Useful for lead cutting etc.</td>
</tr>
<tr>
<td>Dry Run</td>
<td>Table always rotates in rapid feed for checking.</td>
<td></td>
</tr>
<tr>
<td>Key Lock Function</td>
<td>Even if operation button is pressed by mistake, such command is neglected for safety.</td>
<td></td>
</tr>
<tr>
<td>Preparatory Function</td>
<td>Dwell, Clamping/Unclamping, Lead Cutting...</td>
<td>G01~G92</td>
</tr>
<tr>
<td>G1 Code, G2 Code</td>
<td>2 kind of G codes can be entered in one block.</td>
<td></td>
</tr>
<tr>
<td>Block Data display</td>
<td>At programming, previous block data or next block data are displayed.</td>
<td></td>
</tr>
<tr>
<td><strong>RS232C Interface</strong></td>
<td>Block data/parameter data can be up loaded/down loaded through RS232C interface.</td>
<td></td>
</tr>
<tr>
<td>Direct angle command interface</td>
<td>Enables the positioning can be commanded from M/C, and all management of the program can be done on M/C.</td>
<td>Custom macro is necessary on M/C.</td>
</tr>
<tr>
<td>RS232C automatic loading function</td>
<td>Enables the successive block data can be down loaded from M/C and all management of the program can be done on M/C.</td>
<td>Custom macro is necessary on M/C.</td>
</tr>
<tr>
<td>Software Limit Function</td>
<td>± stroke limit values can be set by parameter, and table does not move beyond this range.</td>
<td></td>
</tr>
<tr>
<td>Over Travel Detection Function</td>
<td>Over travel detection zone can be set at outside of software limit by using control circuit, and the CNC rotary table can be protected not to exceed safety zone.</td>
<td>Standard for 5AX-type tilting axis.</td>
</tr>
<tr>
<td>Alarm No. Automatic Indication Function</td>
<td>When alarm is detected, controller automatically goes to diagnosis mode and Alarm No. is displayed.</td>
<td>When duplicated, it flickers every 2 sec.</td>
</tr>
<tr>
<td>Alarm Out</td>
<td>Alarm condition of Ω 21 can be sent to M/C</td>
<td>Option</td>
</tr>
<tr>
<td>Self Diagnosis Function</td>
<td>Inside situations of controller can be seen.</td>
<td></td>
</tr>
<tr>
<td>Modal G Code Flicker Function</td>
<td>All G codes used in program are indicated in flickering.</td>
<td>Every 2 sec.</td>
</tr>
<tr>
<td>Pitch Error Compensation Function</td>
<td>Rotary axis: 15 unit, Tilting axis: 5 unit</td>
<td>Option</td>
</tr>
<tr>
<td>Feed Rate Override</td>
<td>5~200%, 999%, ( Rapid feed) ±5%</td>
<td></td>
</tr>
<tr>
<td>Input Signal</td>
<td>1 kind of Auxiliary Function. (Automatic operation can be done by only one M signal.)</td>
<td>With or without contact signal *1</td>
</tr>
<tr>
<td>Output Signal</td>
<td>1 Block Finish signal, Work Zero Position Signal, Alarm Out Signal *2</td>
<td>Ask Time Chart</td>
</tr>
<tr>
<td>Servo Motor</td>
<td>AC servo motor with serial encoder</td>
<td></td>
</tr>
<tr>
<td>Input Power</td>
<td>Ω 21: Single phase AC200~220V, 50Hz/60Hz</td>
<td>400W: 0.7KVA, 750W: 1.3KVA</td>
</tr>
<tr>
<td></td>
<td>Ω 21 PW: 3 phase AC200~220V, 50Hz/60Hz</td>
<td>1,300W: 1.4KVA, 1,800W: 1.8KVA</td>
</tr>
</tbody>
</table>

*1: M signal of M/C is valid only the block without DEN (Distribution End).
*2: Work Zero Position Signal and Alarm Out Signal are optional signals.

### OPTIONAL SPECIFICATION

1. **True Closed Loop**
   - This is to be used for ultra precision rotary table.

2. **Manual pulse generator (X1.x10.x100)**
   - This pulse generator enables the table to be rotate or tilted by manual operation on every 0.001~0.1° unit.

3. **Five M functions**
   - Control and confirmation of other actuator (hydraulic tailstock, coolant controller, robot etc.) can be done from Ω 21 side. Ω 21 for AWC, this is included as standard.

4. **External N Number Search Function**
   - When plural programs are entered in 1000 blocks, Desired N number can be searched from outside (applicable also to FMS line).

5. **External Position Display**
   - When the direct angle command interface is used, this display will be used near M/C MDI panel.

6. **External Power ON/OFF**
   - Interface to perform Power ON/OFF by external circuit is available.

7. **Pitch Error Compensation**
   - Rotary Axis: by 15° unit X 24 points
   - Tilting Axis: by 5° unit X 24 points

8. **Output Signal #2**
   - Work Zero position signal is the signal set to ON while the CNC rotary table is in the work zero position. Alarm Out signal is the signal set to ON when Ω 21 is in alarm condition. These signals can be used for interlocking function.

9. **Harling Connector Type...Only for Ω 21**
   - Harling Connector can be corresponded to the CNC Rotary Table side.
Explanation of the PENDANT 1

1. Power Switch
2. Emergency Stop Button
   - Clockwise, - Counterclockwise.
   - While this button is being depressed, the table continually rotates slowly. When this button is depressed once, the table steps by 0.001" (1"
3. High Speed Button
   - When this button is depressed together with 3 or 5, the table rotates in rapid feed.
   - When jog 5 is depressed, the table moves as follows:

<table>
<thead>
<tr>
<th>Gear Ratio</th>
<th>Table Movement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:720</td>
<td>0.5'</td>
</tr>
<tr>
<td>1:360</td>
<td>1.0'</td>
</tr>
<tr>
<td>1:180</td>
<td>2.0'</td>
</tr>
<tr>
<td>1:120</td>
<td>3.0'</td>
</tr>
</tbody>
</table>

4. Auto/Manual Select Switch
   - When this button is turn to Manual, all buttons are workable.
   - When this button is turn to Auto, all other buttons except 1, 2, 4, 5, 6, 7, 8, 9, 10 are ineffective.

5. Edit/Current Position Select Switch
   - On 9 or 8, programming or present position is displayed alternatively.

6. Start Button
   - The table rotates as programmed.

7. Stop Button
   - The table slows down and stops. (Feed Hold Function)

8. Continuous Feed Button
   - When this button is depressed, the table rotates continually. And, when 3 is depressed, the table stops. The desired feed and direction are to be input in N997 Block. (Refer to P. 53 8)

9. Original Point Set Button
   - When this button is depressed at any angle, the position display shows 000,000", and it isused as the work zero position. When the cumulative angle becomes 360", work zero position signal is sent, which can be used as interlock.

10. Machine Zero Return Button
    - When this button is depressed, the table returns to the machine zero position (0' of the graduation of the table) clockwise in rapid feed, then low speed for final positioning.

11. Work Zero Return Button
    - When this button is depressed, the table returns to the position set by 1, clockwise in rapid feed.

12. Diagnosis Button
    - When this button is depressed, the table returns to the position set by 1 clockwise in rapid feed.

13. Increment/Decrement of Block No.
    - Previous block data and next block data are displayed.

14. Feed Rate Override Button
    - POS mode: Increasing feed rate 5 to 200% every 5% Rapid feed (999).
    - PRM mode: Displays the following parameters sequentially.
    - POS mode: Decreasing feed rate 200 to 5% every 5%.
    - PRM mode: Displays the proceeding parameters sequentially.

15. Reset Key
    - This is for call N000 and also for resetting alarm display etc.

- READY
  - Turned ON when input power is supplied.
- COM
  - Turned ON while "21 main unit and the pendant are communicating.
- ALARM
  - Turned ON when "21 is in alarm condition.
- COM. ALARM
  - Turned ON when communication time out error occurs between "21 main unit and the pendant.
Explanation of the PENDANT 2

Display

- **N**: Sequence No. N000~N999
- **NRS**: Direct angle command interface is selected.
- **N’**: Jump & Return J000~J999, RET
- **θ**: Rotation angle of table (Decimal, Sexagesimal)
  0~±999.999° (Decimal)
  0~±999.59°F (Sexagesimal)
- **D**: Equal division (divided by 2 to 9999)
- **F**: Feed rate
  Cutting feed: 0.01~9.99min⁻¹
  Rapid feed: 000
- **G**: Preparatory function G01~G92
  Two kind of G codes (G1, G2) can be input in one block.
- **%**: Feed rate override
  (% of 200%, or 999 for rapid feed rate)
- **P**: Starting block No. of repeating function (G27)
- **Q**: Final block No. of repeating function (G27)
- **L**: Repeating frequency (G27)
- **INC/ABS**: INC (Incremental)
  ABS (Absolute)
- **MODE**: EDT (Edit mode)
  MAN (Manual mode)
  AUT (Auto. mode)
  MPG (MPG mode)
  DGN (Diagnostic mode)
- **ZRN-MW**: M Flickering (Returning to M ZERO)
  M (Stop at M ZERO)
  W Flickering (Returning to W ZERO)
  W (Stop at W ZERO)
- **START/STOP**: START (Starting)
  STOP (Stop)

Key Encoder

- For calling a certain sequence, input the number after this key so that the program of the block is displayed, also you can start from the program.

This key is to be used when you want to call sub program N or jump to N’ after N block is completed.

When sub program is finished, enter R at N’ display. And, it returns to the block next to the one where J was commanded in the main program.

**θ**: You can input 0° to ±999.999° in 0.001° increment, or 0.0° to ±999°59.9°F in 1° increment.

The selection of decimal or sexagesimal system is set up by parameter.
In case of Dwell Instruction (G04), the waiting time is inputted (0.001 to ±999.999 sec.).

**P**: Starting number of repeating function (G27) 000 to 999.

**DIV**: Automatic equal dividing times 0 to 9999.
Lead cutting instruction (G07) 0 to 999.

**Q**: Final number of repeating function (G27) 000 to 999.

**F**: Cutting feed F001 (0.01min⁻¹) to F999 (9.99 min⁻¹)
Rapid feed F000 or F0.

**L**: Repeating frequency 0 to 999.

Without G: Positioning
**G04**: Dwell
**G06**: Constant acceleration
**G07**: Rotation number
**G08**: Buffer commencing
**G09**: Buffer ending
**G10**: Brake unclamped
**G11**: Brake clamped
**G14**: Uni-directional positioning
**G15**: Drop check
**G16**: Drop cancel

**G60~G74**: Activate an actuator

**How to enter G code**

0 cannot be suppressed for both G1 and G2 codes.

For example, when G1=07 and G2=08, enter them as follows;
G 0 7
* G 0 8
and indication will become as ;
G07 08

When you want to enter 9°, just depress keys as
G 0 7
and 9°000 000° is displayed.

This is for command of Counter clockwise rotation.

This is depressed as programming of each block being completed.

For deletion or alternation of θ, DIV, or F individually, just depress θ, DIV, or F, then depress. Also when you depress (C) with pressing (G), complete one block is deleted.

Deleting successive blocks

For example, in order to delete blocks from N000 to N999, push keys
b) [G] 000 999 at Edit mode, and (jog (j)) while depressing (C) key.

Means optional function.

Operation of the pendant of K21 controller for tilting axis specification differs, please refer instruction manual.

Operation of the pendant of K21 controller for NSVZ index specification differs, please refer instruction manual.

**The hole to hang the pendant panel on**

is located back side of the pendant.

Please make the hook by yourself.

---

**Diagram**

[Diagram showing the layout of the pendant control panel]
Operation & Confirmation of PROGRAMS

Before programming, be sure that mode is EDIT. Before start the programs, push ①②③... or ④⑤... in EDIT mode, and confirm input data. Then start the program in MAS mode to confirm the moving.

### Operation of Keys

1. **Angle Dividing**
   - Input Angle: Rapid feed.
   - No need of pressing 0 under decimal point.
   - Sequence No.

2. **Arc Milling**
   - Sequence No.
   - 123 x 1/100 min⁻¹ rotation speed.
   - means 45.123°
   - Cutting Feed: \( \frac{2 \pi R \times 1.23}{min} \)
   - \( = 7.7 \) R mm/min.

3. **Equal Dividing**
   - Sequence No.
   - After finishing N000 return to N000.

4. **Unequal Dividing**
   - Sequence No.
   - To W zero-point
   - Absolute Command (Modal Type)

5. **Incremental/Absolute Dividing**
   - Sequence No.
   - After finishing N005 return to N000.

6. **Repeating Function**
   - Sequence No.
   - Repeat 2 times
   - \( \# \): Starting N000
   - \( \#: \) Finishing N002
   - Command of repeating function
   - SUB-Program (J/RET) and Loop-Jump Function (G25) can be used. However, programming can be done more easily when Repeating Function (G27) is used.

7. **Counter Clockwise Rotation**
   - Sequence No.
   - Counter Clockwise (CCW)

8. **Continuous Feed 0.5**
   - Sequence No.
   - Continuous feed 0.5 min⁻¹ (CCW)
   - Command of continuous Feed
   - Start
   - Stop

9. **Equal Dividing of Arc**
   - Sequence No.
   - This means 90° = 13.
   - Feed rate can be commanded from 0.01 min⁻¹ to rapid speed.

10. **Equal Dividing of Circle (360°)**
    - Sequence No.
    - 91 Equal dividing of circle and go to N001
    - 77 Equal dividing of circle and go to N002
    - 111 Equal dividing of circle and go to N003
    - 231 Equal dividing of circle and go to N004
    - 1231 Equal dividing of circle and return to N000

### Optional Specification

- M function
  - ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳
  - Tailstock forward
  - Circle is equally divided into 10 sections.
  - Tailstock backward

Example of automatic operation using M function.
G62 on the rotary axis controller is M function to active the tilting axis controller for SAD-Table.
Example of PROGRAMS

1. Example for Circle Drilling & Tapping (23 equal division)
   - Program of NC Machine
     - Main program
       M98 P0100 L23 Drilling cycle 23 times
       M98 P0101 L23 Tapping cycle 23 times
     - Sub program 1
       M02:
       G01 Z --- Drilling fixed cycle
       M21:
       M99:
     - Sub Program 2
       G01 Z --- Tapping fixed cycle
       M21:
       M99:

2. Example for Arc Milling
   - Program of NC Machine
     M21:
     G01 Z --- Z axis down
     M21:
     G00 Z --- Z axis up
     M21:

3. Example for Lead Cutting
   - Program of NC Machine
     M21:
     G01 Z --- Z axis down
     M21:
     G01 X40 F1001
     G00 Z --- Z axis up
     M21:

Calculations for Feed Rate in Lead Cutting
1. Make a development elevation like Fig.2 to calculate the vector.
2. Give feed in lead cutting (cutting feed from ① to ②) .... e.g. 200 mm/min (depend on work piece materials).
3. Cutting speed of X axis: \( F_x = \frac{200 \text{ mm/min} \times 40 \text{ mm}}{80 \text{ mm}} = 100 \text{ mm/min} \) F100 1
4. Cutting speed of \( \theta \) axis: \( f = \frac{200 \text{ mm/min} 	imes 69.2 \text{ mm} \div 80 \text{ mm}}{173 \text{ mm/min}} = 0.55 \text{ mm/min} \) F55 2

4. Example of continuous rotation as turning operation
   - Program of NC Machine
     M21: Start continuous rotation
     X & Z Contouring
     M21: Stop continuous rotation
     M21: Machine zero position return with dog

- Program of \( \alpha \) 21
  - Rapid feed to starting point (①)
  - Arc milling to (②)
  - Rapid feed to work zero position (③)

Program of \( \alpha \) 21
- Rapid feed to starting point (①)
- Brake unclamped
- Cutting feed to (②)
- Rapid feed to work zero position (③)
- Brake clamped

Fig.1
- Calculation of cutting speed

Fig.2
- Feed rate specifications

Continuous rotation
Programmable machine zero position return with dog

The direction and feed rate of continuous rotation are specified on N997. When higher rotation speed than standard is required, please contact with us.
The Connection of \( \alpha 21 \)

Normally the controller will be operated only by connecting M Signal (Start Signal) and 1 Block Fin. Signal. Emergency Stop Input must be set to B contact only for SAX-Tables. For other Tables, you can choose A/B contact for Emergency Stop Input.

Input/Output Time Chart

Start Signal: \( t_0 \leq 100 \text{msec} \)
Axis Movement: \( t_1 = 30 \sim 1000 \text{msec} \)
1 Block Finish Signal: \( t_2 = 30 \sim \infty \text{msec} \)

\( t_1 \) and \( t_2 \) can be set by parameter.

Connection for Automatic Operation

Once program is loaded to \( \alpha 21 \), all operations such as Power ON, Machine Zero Return, Program Section, Start etc. can be done by machine side. 3 sets of M signals are required for CNC rotary table and 6 sets of M signal are required for SAX-tilting rotary table.

\( M21 \): Start Signal
\( M22 \): Program Jump (Selection) Signal
\( M23 \): Machine Zero Return and Reset

RS232C Automatic Loading Interface.

The Pendant to be used for manual operation and maintenance only.

Macro Program

(Down Loading to \( \alpha 21 \))

\( \text{O}8000: \)

M24: Activate \( \alpha 21 \) automatic loading function.
POPEN:
\[ \#100=165; \]
BPRNT[\#100[0]];
DPRNT[N10 G90 A22.149];
\]

Send block data.

\[ \#100=165; \]
BPRNT[\#100[0]];
G04 P3000; Dwell 3 sec.
PCL05;
M66;
RS232C Direct Angle Command Interface

This interface can start the block after sending one block data from custom macro of M/C. Equal dividing function (e.g. divided by 7) also can be sent. Therefore, program will be simple and more accurate and the total management of the programs can be done only on M/C.

Required functions at the M/C
- Custom macro
- Custom macro external output function
- 1 M signal (Start signal) M21

5AX-table with 2 off A21 controllers can be connected to use RS232C direct angle command interface. In this case, special RS232c cable is required and 2 off M signals are required.

RS232C Interface

The cable is available as an option.
Baud rate : 4800, 9600 bps
Code : ISO
Data bit length : 7 bits
Parity bit : Even parity
Stop bit length : 2 bits
Parameter setting of M/C must be "LF CR" or "CR LF" is sent at EOB sending.

Call off macro program for direct angle command

G65 P8000 M A E F D :

ID No. (can not be omitted.)
Please specify the value of PRM #1 on A21.

Feed rate 000,001~999

Equal dividing

Angle command (can not be omitted. A : Rotary axis, B : Tilting axis)

90/91 = Absolute/Incremental

M21 (start) will be executed as required times after execution of macro program for direct angle command.

Macro program for direct angle command (Example for only rotary axis control)

O 8000:
POPEN;
#100=165;
BPRNT [#100[0]]; IF [#13 EQ #0] GOTO 5;
IF [# 8 EQ #0] GOTO 3;
IF [# 9 EQ #0] GOTO 2;
GOTO 10;
N3 IF [#9 EQ #0] GOTO 4;
N5 IF [#8 EQ #0] GOTO 7;
IF [#9 EQ #0] GOTO 6;
DPRNT [ID#7[10] A#1[43]E#8[40]F#9[30]];
GOTO 10;
N6 DPRNT [ID#7[10] A#1[43]E#8[40]];
GOTO 10;
N7 IF [#9 EQ #0] GOTO 8;
DPRNT [ID#7[10] A#1[43]F#9[30]];
GOTO 10;
N8 DPRNT [ID#7[10] A#1[43]];
N10 BPRNT [#100[0]]; G04 P200; M99;

Termination of the maintenance work for NIKKEN controllers

The maintenance work of the NIKKEN controllers is continued as long as the electric parts could be supplied. However, about the following controllers, the maintenance has to be terminated, because supply of the electric parts became impossible. Please examine resupplying to the CNC rotary table with A21 controller by all means.

Terminated at April 2005 for CNC rotary table ND5000, 8000DC, 8800DC, 9000DC
Terminated at April 2005 for NSV index table NSV controller (M signal I/F, B signal IF)
CNC ROTARY TABLE with α21 CONTROLLER

Dimensions with NIKKEN α21 controller are shown. Please contact us for CAD data (2D: DXF, 3D: PARASOLID).

CNC105A21-04
Powerful Brake
Brake Torque: 205Nm
Air purge function is provided.

CNC180A21-04 (400W) is standard. CNC180A21-08 (750W) and CNC180A21-06 (High Torque) are available.
Powerful Brake
Brake Torque: 303Nm
Air purge function is provided.

CNC202A21-08 (750W) is standard. CNC202A21-06 (High Torque) is available.
Powerful Brake
Brake Torque: 303Nm
Air purge function is provided.

CNC260A21-08 (750W) is standard. CNC260A21-06 (High Torque) is available.
Pneumatic Brake Torque UP 588Nm
For the rotary table with pneumatic brake, air purge function is provided inside the motor cover as standard.

CNC302A21-08 (750W) is standard. CNC302A21-06 (High Torque) is available.
Pneumatic Brake Torque UP 588Nm
For the rotary table with pneumatic brake, air purge function is provided inside the motor cover as standard.

High seed rotation Z series is available for all models of CNC rotary table. e.g. CNC260A21

Guide Line of MAX. Unbalancing Load

<table>
<thead>
<tr>
<th>MAX. Unbalancing Load</th>
<th>CNC180</th>
<th>CNC202</th>
<th>CNC260</th>
<th>CNC302</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Nm</td>
<td>CNC180A21-04</td>
<td>CNC202A21-08</td>
<td>CNC260A21-08</td>
<td>CNC302A21-08</td>
</tr>
<tr>
<td>20</td>
<td>CNC180A21-08</td>
<td>CNC202A21-08</td>
<td>CNC260A21-08</td>
<td>CNC302A21-08</td>
</tr>
<tr>
<td>30</td>
<td>CNC180A21-06</td>
<td>CNC202A21-06</td>
<td>CNC260A21-06</td>
<td>CNC302A21-06</td>
</tr>
<tr>
<td>50</td>
<td>CNC180A21-06</td>
<td>CNC202A21-06</td>
<td>CNC260A21-06</td>
<td>CNC302A21-06</td>
</tr>
</tbody>
</table>

This is just a guide line. For high precision machining, the balancing of the rotary table is strongly recommended with counter balance weight.

High speed CNCZ series can not be recommended for the application with large unbalancing load. Please select standard CNC series.
The specification of the large rotary table will be varied according to your application.

1. With/without T slot, Width of T slot
2. Spindle hole dimension—Centre socket for centreing is normally attached.
3. Layout of the rotary table—Vertical use, horizontal use, vertical and horizontal use
4. Total reduction ratio—Suitable capacity of the servo motor will be selected.
**Tilting Rotary Table with α21 Controller**

*Dimensions with NIKKEN α21 controller are shown. Please contact us for CAD date (2D:DXF, 3D:PARASOLID).*

---

**5AX-130WA21**

Photo shows 130mm plate. Rotary axis cable stays.

Motor capacity of rotary axis and tilting axis is added at the end of Code No. e.g 5AX-130WA21-0404

---

**5AX-201WA21 NEW**

Motor capacity of rotary axis and tilting axis is added at the end of Code No. e.g 5AX-201WA21-0408

---

**5AX-250WA21**

Motor capacity of rotary axis and tilting axis is added at the end of Code No. e.g 5AX-250WA21-1313

---

**5AX-350WA21**

Motor capacity of rotary axis and tilting axis is added at the end of Code No. e.g 5AX-350WA21-1318

---

**5AX-550WA21**

Photo shows centre socket (option). Rotary axis cable stays.

Motor capacity of rotary axis and tilting axis is added at the end of Code No. e.g 5AX-550WA21-1818
Tilting Rotary Table with χ21 Controller

**5AX-800WA21** NEW

Motor capacity of rotary axis and tilting axis is added at the end of Code No. e.g 5AX-800WA21-1875

**5AX-1200WA21** NEW

Motor capacity of rotary axis and tilting axis is added at the end of Code No. e.g 5AX-1200WA21-4444

5AX controller can drive the all models of NIKKEN rotary tables. Please contact us for the external dimension.

Dimensions with NIKKEN χ21 controller are shown. Please contact us for CAD date (2D: DXF, 3D: PARASOLID).

1. Moving angle of the tilting axis
2. Relation between the tilting axis centre and the rotary axis

5AX-1200A: The tilting axis center is located in the same position as the center of the rotary axis body.

5AX-1200B: The tilting axis center is located in the same position as the top surface of the rotary axis.

3. Tilting axis base: It can be supplied to us.
4. Width without T slot, Width of T slot
5. Spindle hole dimension
   - Centre socket for centreing is normally attached.

**5AX-2MT-105WA21**

Motor capacity of rotary axis and tilting axis is added at the end of Code No. e.g 5AX-2MT-105WA21-0404

NST manual tilting rotary table

K21 controller can perform indexing of MIN. 1” with hirth coupling and can also perform indexing of MIN. incremental by 0.001” and profile milling.

Back side motor mounted CNC rotary table

Top side motor mounted CNC rotary table

Multi-spindle CNC rotary table

NST manual tilting rotary table

Indexing of MIN. incremental of 1” is done by K21 controller.

NSVZ index

NSVX rotary indexing table
## Selection of the CNC ROTARY TABLE

### CNC Rotary Table with Additional Axis Interface

In case of that the M/C has **an additional axis interface** for CNC rotary table, please select this series. In this case, we could supply the rotary table to suit any of your M/C interface and the servo motors. Please refer to P.47 for the details of the motors.

1. 4th axis amplifier which has to match up with X, Y & Z axes to suit the M/C controller.
2. The same series of the motors as the other axis has to be fitted on the rotary table to be driven.
   (The size of the motor and amplifier is dependent on the CNC rotary table model.)
3. The motor can be provided by the customer or by NIKKEN.
4. The overall dimensions and the specifications will be changed according to the servo motor.
5. It might be necessary to be prepared to install the 4th axis interface; cable connections, hydraulic supply, and set up the parameter by the M/C builder.

### CNC Rotary Table with NIKKEN Controller (M-signal series)

The CNC rotary table with NIKKEN's controller that can be driven by 1 off M-signal (or contact signal) from your M/C, NC Milling machine or conventional milling machine for high precision indexing, equality dividing (2~9999 dividing), or spiral cutting etc. The retrofitting can be done on your existing machine; 

1. Required 1 off M-signal at the machine side.
2. The rotary table can be installed on any machine, e.g. NC milling machine or conventional machine.
3. NIKKEN provide the rotary table complete with the controller, servomotor and set of cables.

### Explanation of Code No.

#### Single Axis CNC Rotary Table

<table>
<thead>
<tr>
<th>Model</th>
<th>F</th>
<th>A</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNC 401</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Without Motor** Non. with motor
- **With Motor** M. with motor
- **Type of Motor** Non. DC servo, A: AC servo
- **Motor Maker** P.47
- **Motor Mounting Location** Non. Right mount, L: Left mount, T: Top mount
- **Diameter of the Rotary Table Face Plate (mm)**
- **Code No. of Vertical/Horizontal Type CNC Rotary Table**

#### Multi-Spindle CNC Rotary Table

<table>
<thead>
<tr>
<th>Model</th>
<th>F</th>
<th>A</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNC 100-2W-120</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Without Motor** Non. without motor, M: with motor
- **Type of Motor** Non. DC servo, A: AC servo
- **Motor Maker** P.47
- **Number of Spindles** 2, 3W, 4W, 5W, 6W
- **Pitch Between the Spindles** 120, 250, 320
- **Diameter of the Rotary Table Face Plate (mm)**
- **Code No. of Vertical/Horizontal Type CNC Rotary Table**

#### Rotary Hirth Coupling Index Table

<table>
<thead>
<tr>
<th>Model</th>
<th>F</th>
<th>A</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSV X 400</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Without Motor** Non. without motor, M: with motor
- **Type of Motor** Non. DC servo, A: AC servo
- **Motor Maker** P.47
- **Number of Indexes** 10, 50, 100, 200, 300
- **Index Table**
- **Diameter of the Rotary Table Face Plate (mm)**
- **Code No. of Vertical/Horizontal Type CNC Rotary Table**

#### 5AX Rotary & Tilt Table

<table>
<thead>
<tr>
<th>Model</th>
<th>F</th>
<th>A</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>5AX-350</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Without Motor** Non. without motor, M: with motor
- **Type of Motor** Non. DC servo, A: AC servo
- **Motor Maker** P.47
- **Tilting Axis Motor Mounting Location** Non. Parallel mount, A: Back mount, B: Back of Tilt mount, T: Top mount
- **Diameter of the Table Face Plate (mm)**
- **Code No. of Rotary & Tilt Table**

#### 5AX Multi Spindle Rotary & Tilting Table

<table>
<thead>
<tr>
<th>Model</th>
<th>F</th>
<th>A</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>5AX-2MT-105-120</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Without Motor** Non. without motor, M: with motor
- **Type of Motor** Non. DC servo, A: AC servo
- **Motor Maker** P.47
- **Number of Rotary Axes Spindles**
- **Pitch Distance Between the Spindles**
- **Code No. of Rotary & Tilt Table**

#### Manual Tilting CNC Rotary Table

<table>
<thead>
<tr>
<th>Model</th>
<th>F</th>
<th>A</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>NST 300</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Without Motor** Non. without motor, M: with motor
- **Type of Motor** Non. DC servo, A: AC servo
- **Motor Maker** P.47
- **Rotary Axis Motor Mounting Location** Non. Right mount, L: Left mount
- **Diameter of the Rotary Table Face Plate (mm)**
- **Code No. of Manual Tilting CNC Rotary Table**
**Carbonizing & Sub-Zero Treatment**

NIKKEN is the only tooling product manufacturer which performs sub-zero treatment for tooling. This refers to a technique where 90 deg ultra-low-temperature processing is performed after carbonizing and quenching in order to eliminate the residual austenite and to form 100% martensite compositions to prevent deterioration over time. This technique has been applied for block gauges and for bearings of the highest grade in the past. It is an example of how NIKKEN pays attention to those aspects which are often hidden from view and how we put our hearts and souls into each and every tooling product.

**Ion Nitriding**

Ion nitriding refers to a nitriding process where glow discharges are generated in a vacuum of a nitrogen-mixed gas atmosphere to heat the workpieces at a low temperature of 450 deg while at the same time nitriding them by a sputtering action. This processing improves both the wear resistance and sliding performance. (It reduces the surface friction coefficient.) The experience and know-how of ion nitriding have been utilized in a large number of NIKKEN's products, including worm wheels for CNC Rotary Tables and Tough-Cut Slot Reamers.
NC Lathe Lines
Unmanned NC lathe lines are in full operation with utilizing of the Oil Jetter System and Combat Z Drills.

Small T/C and M/C line
Utilizing small CNC rotary tables, NCS-46 toolings and Major Dream holders, this is highly sophisticated for high productivity line.

Horizontal Machining Centre Lines
Utilizing NIKKEN’s double contact tooling system, such as NC5 and 3LOCK tooling improves the cutting performance and productivity.

Finish Machining Room
The fine finish machining operation is carried out in a designated room where the room temperature is kept at 20.5°C ±0.5°C at all times. The machines in the room are specially designed for the ultra high precision (European Fine Jig Borer also).

Design & Development
We fully utilize the high advanced technology, e.g. 3D CAD and FEM analysis to improve the quality and the speed of design and development.
Hobbing of the Worm Wheel

Screw Grinding Lines for Carbide Worm Screw etc.

Grinding of the Hirth Coupling

Mark is required on products exported to European market since 1996 under the safety regulation.

Mark Declaration of Conformity

CNC Table Assembly Lines
The World No.1 durable, high precision and rigidity CNC Rotary Tables are provided from these lines to the worldwide markets.
There are overseas Sales Branches in 12 countries. Each sales branch has stocks for toolings and CNC Rotary Tables, and service engineers look after the maintenance and service operation of our products. In the other region, e.g. East-South Asia, Ozaena, South America, Africa, etc., there are some distributors. At the production line in abroad, as there are many requirements for special tools and CNC Rotary Table to suit the special specifications, please ask us or distributors for spare tools and maintenance parts in advance.

☆ : Sales Branch with Service Engineer  
• : Sales Branch  
■ : Service is available

This mark indicates the locations where the four biggest machine tool exhibitions throughout the world are held. NIKKEN attend numerous exhibitions all the time to promote our products worldwide.
New Nikken facility was opened at Zhao Hua Road, Shanghai on 2004 JAN due to the Chinese business expansion. The standard items of NC tooling & CNC rotary table and each important spare parts are stocked for quick delivery.

You can access to Nikken China with Chinese, Japanese or English. Not only Chinese catalogue but also Chinese instruction manual are provided for Chinese domestic market. Our office has the show room to see and touch our products, and our presentation will be done more practically. Technical seminar of Nikken is also opened at user factory side.

Chinese engineer well trained in Japan is engaged in the service of our products. Different types of the NC controller for the CNC rotary table are provided for the trial running after repair. The most important spare parts are stocked. It is possible to stock the special spare parts of the custom-made tooling or CNC rotary table for further discussion. Please consider to make a contract of "Nikken Rotary Table Overseas Warantee Contract" for the CNC rotary table delivered to China.

The sales of nikken products through Internet is not started in China. For after service and the further maintenance, please purchase Nikken products through authorized distributors.
LYNDEX-NIKKEN (NIKKEN USA)

As North America’s leading supplier of machine tool accessories, LYNDEX-NIKKEN is a wholly-owned subsidiary of NIKKEN Kosakusho Works., Ltd. - Japan. Backed by over a half century of experience, LYNDEX-NIKKEN sets the standard for high quality and high technology with a complete line of superior toolholders and machine tool accessories. From one source you can expect the best of both worlds: Extreme Quality and Advanced Technology.

LYNDEX-NIKKEN has a team of dedicated application and engineering staff available to advise you on your application and support our entire product line throughout the U.S., Canada, Mexico and South America. Our regional managers in Chicago, Los Angeles, Boston, Charlotte, Dallas and Seattle support our 1,000 plus distributors with machine tool accessories expertise. LYNDEX-NIKKEN provides expert process and product consultation for even the most demanding applications with full on-demand field support and ongoing training.

North American Facility
The LYNDEX-NIKKEN North American headquarters is centrally located near Chicago Illinois. Our 50,000 sq. ft. facility warehouses an inventory of over 12,000 machine tool accessories stocked for fast delivery. Over 95% of orders are shipped out same day. Our extensive inventory of products includes:

**Products**

- **Rotary Tables** - NIKKEN’s complete line of CNC Rotary Tables are known worldwide for their wear-resistance, rigidity and high-speed rotation. NIKKEN rotary tables are built to provide high accuracy, increased production and a trouble-free long life.

- **Advanced Toolholders** - Maximize the potential of your machine tools with LYNDEX-NIKKEN’s advanced toolholders.

- **Standard Toolholders** - LYNDEX-NIKKEN’s complete range of quality-driven toolholding solutions are designed to meet your strictest requirements.

- **Presetters** - Our full line of Presetters are full-featured for optimum accuracy in tooling setup, measurement and inspection.

**Service & Support**

- Dedicated application and engineering support staff
- Support for entire product line spans the U.S., Canada, Mexico and South America
- On-demand field support and ongoing training
- Customer service and technical support staff
- Expert process and product consultation for even the most demanding applications
- Cutting trials and testing
- Service, repair and custom configuration completed on-site
- Attention to high-tech application demands, including high-speed and balanced toolholding solutions
The NIKKEN Euro Centre based in the UK was opened in 1999; from here we sell, distribute and support all products to our subsidiaries and dealers in over 20 countries around Europe. At the NIKKEN Euro Centre we take great pride in the consistent delivery of the four founding principles of our business: **Absolute Integrity, Uncompromising Quality, Unflinching Support**, and above all **"Total Commitment" to our customers.**

**Product Inventory**

NIKKEN Euro Centre facilities has a warehouse space of 13,000m², which holds over 50,000 individual items covering a range of some 4,000 product lines, including the latest generation of Single & Multi Axis CNC Rotary tables, thus making it the largest stock of NIKKEN products in Europe.

**Our Technical Support and Training Section** provides our existing customers and potential customers access to:

- A Multimedia based training facility that ensures our customers, through comprehensive training, will realize the full productivity potential of their application.
- A wealth of engineering expertise covering all aspects of application set-up, optimization and implementation that is available for the full life of the NIKKEN product.

**Our machining centre equipped with Testing Facilities enables us to:**

- Research, develop and optimize all of our tooling systems.
- Demonstrate to our potential customers the advantages of using both NIKKEN Tooling and CNC Rotary Tables in their applications.

**Our Service Department specializes in:**

- Providing on-site inspections prior to rotary table repairs and refurbishment by our own NIKKEN trained service engineers.
- Providing tooling and rotary tables optimized to seamlessly integrate into any application.
Nikken Deutschland GmbH, a wholly owned subsidiary in Germany of NIKKEN Kosakusho Works, was established in 2003 to take over the sales activities of the previous distributor. Based in Russelsheim, which is a town made famous by the manufacturing complex of Opel, the company is located about 15 minutes away by car from Frankfurt airport. Germany has ranked at the top of the machine tool industry for many years, and is also the supply source of machine tools that are fuelling the significant expansion now taking place in Eastern Europe. Nikken Deutschland GmbH has its base at the centre of the huge market of Germany and Eastern Europe, and continues to broaden the range of the company’s sales operations.

NIKKEN has achieved some impressive successes in Germany with its CNC rotary tables and tool holders thanks to a long sales history of the company’s sales activities. A sales force consisting mainly of German personnel stands on the front line of this activity to address the sales and servicing needs of the entire country. More specifically, the company provides technical advice, repairs, aftersales support and other services to end users, distributors and machine dealers.

To enable speedy delivery of standard items in the German market and of popular products compliant with European standards, Nikken Deutschland GmbH works closely Nikken Euro Centre to keep a full stock at its disposal. The company uses the most appropriate type of delivery in each case, including parcel post, DHL, door-to-door service and flash shipment, to meet the demands of customers.

The sales territory of Nikken Deutschland GmbH spans the vast area of eastern Europe and covers such countries as the Czech Republic, Slovakia, Austria, Russia, Poland, Hungary, Romania and Bulgaria, all countries in which Japanese companies are rapidly expanding their business. The service is not limited to sales, but engineers make on-site adjustments, repairs and service calls as well.

Nikken Deutschland GmbH has participated in and contributed to many trade shows and exhibitions held in Germany, including the EMO show, METAF, AMB and EURO MOULD. The company’s fully furnished showroom is a Mecca of information to the constant stream of visitors who can inspect products and examples of machining, as well as receive application advice and technical training. They can handle NIKKEN’s products for themselves, learn about the construction and capability of the CNC rotary tables, and learn about the accuracy and other features of NIKKEN’s products.

A complete support organisation is in place to ensure that advice is relayed promptly by telephone and other rapid communication media, that repairs or delivery of tool holders and CNC rotary tables are carried out promptly with all due diligence, and that emergency service calls are responded to rapidly.

To make it possible to support all types of motors and controllers for NIKKEN’s CNC rotary tables, the company has set up trial run equipment that accommodates many different motors, and offers a full range of accessories including tailstocks, support tables, scroll chucks and collet chucks adapted to the CNC rotary tables. The fact that NIKKEN’s CNC rotary tables are endowed with outstanding durability and that a complete support service is provided instil confidence in users that the equipment will give outstanding service in the years ahead.
Procomo France S.A.S was established 30 years ago with the avowed intent to deliver the high-accuracy and high-quality tool holders and CNC rotary tables as well as related services, applications and after-sales servicing, into the hands of engineers in France. A major milestone in the company’s history was marked in 2006 with the change of the company name to PROCOMO-NIKKEN, and the company took on a new lease of life as NIKKEN’s wholly owned subsidiary in France.

In 2005, PROCOMO-NIKKEN embarked on a complete renovation of its buildings and facilities in order to make it possible for users to gain hands-on experience of NIKKEN’s products in a bright and comfortable environment.

In the meeting room, which is fitted out with all the latest multimedia technology, technical seminars are regularly held so that attendees will come away with a clear understanding of NIKKEN’s products and technology. The showroom is where videos of cutting operations are screened, and visitors can actually handle some of NIKKEN’s products in this room as well. The machining centre, which is used for cutting trials, enables visitors to identify what makes NIKKEN’s products different from those of other companies and to judge how impressive are the machining accuracy and advanced cutting capabilities of NIKKEN’s products. As the top tool holder manufacturer, NIKKEN believes is that once customers have their own personal experience of the low machining noise, attractive-looking cut surfaces and uniform discharge of chips, they will be convinced that they can completely trust in and depend on the expertise and capabilities of the company.

The stocks of a large number of standard products are always on hand, enabling the products that customers need to be delivered in the shortest possible time. The NIKKEN Euro Centre and PROCOMO-NIKKEN retain constant and close contact; together they take on the challenge of how to machine products in a more rationalized manner, in a shorter time and to a higher accuracy so that France’s engineers can meet every need of the French marketplace.

NIKKEN has already earned an enviable reputation in the global marketplace for the high accuracy and outstanding wear resistance of the company’s CNC rotary tables. PROCOMO-NIKKEN has a team of five engineers dedicated full-time to providing users with application support prior to placing orders for tool holders and CNC rotary tables and to carrying out the preparation for shipment, education and training programs, maintenance and repairs, and servicing. This support network delivers a wide range of services, while willingly taking up the challenge of coming to grips with new applications.
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Please give your order to the following agent.

Specifications are subject to change without notice.