NIKKEN

CNC ROTARY TABLE SERIES

CAT.NO.8161

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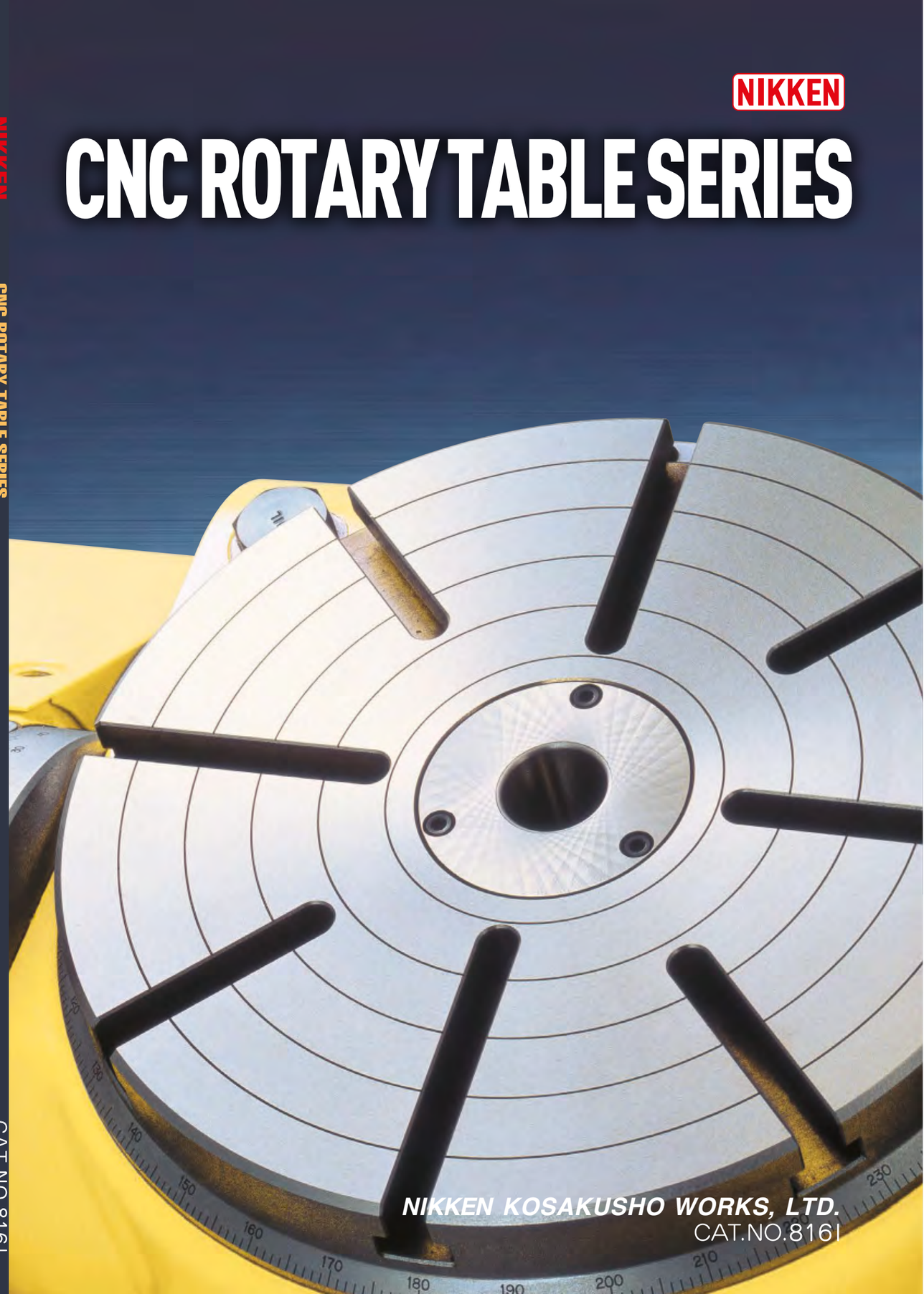
☒ Please give your order to the following agent.

D.QC.1

☒ Specifications are subject to change without notice.


CAT.NO.8161

NIKKEN

# CNC ROTARY TABLE SERIES

***NIKKEN KOSAKUSHO WORKS, LTD.***

CAT.NO.8161

# Made in Japan, Made by

NIKKEN is the manufacturers of CNC rotary tables that designs and manufactures in-house the key components of its rotary tables in order to realize the exceptional performance for customer requirements.

## ■Spirit of Innovation　In pursuit of exceptional performance

Our name "NIKKEN" means "Doing research & study every day", and this expresses the spirit of our company. This spirit is alive in every component of our CNC rotary tables. To achieve unmatched high precision, high rigidity, and durability, we utilize a variety of key components incorporating our own innovative ideas, rather than relying on off-the-shelf parts.

## ■Long Life Concept　In-house design and manufacturing for secure environment

Although our products are highly durable, it is naturally to replace parts occasionally. Since the key components are manufactured in-house, our customers avoid the risk of not being able to perform product repairs due to being discontinued off-the-shelf parts. You can continue to rely on our high-precision products under secure environment over the long term.

The Heart of NIKKEN CNC Rotary Table

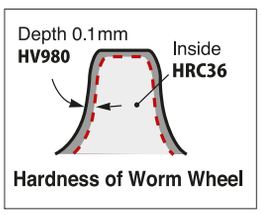
## Carbide Worm Screw System


### ■Carbide Worm Screw

Carbide worm screw (Material : V grade carbide), hard and strong against high speed rotation, is used with ultra heavy duty, maintaining the high accuracy semi-permanently.
Comparing with the traditional worm system (steel worm screw and phosphor/aluminum bronze worm wheel), wearing of worm wheel is largely reduced and rotary table can be used for longer 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.


### ■Harden Worm Wheel

The material used for the NIKKEN worm wheel is custom made steel, specially hardened and ion-nitrided on the teeth to eliminate the friction and gear wear.




Unique “Bearing system”

## Independent Double Thrust and Radial Bearing System


NIKKEN bearing system allow for more points of contact versus conventional cross roller bearings, resulting in smooth and accurate rotation.

### ■Thrust：Tubular Roller Bearings

Tubular thrust bearings are pre-loaded for rigidity, and dampen vibration.

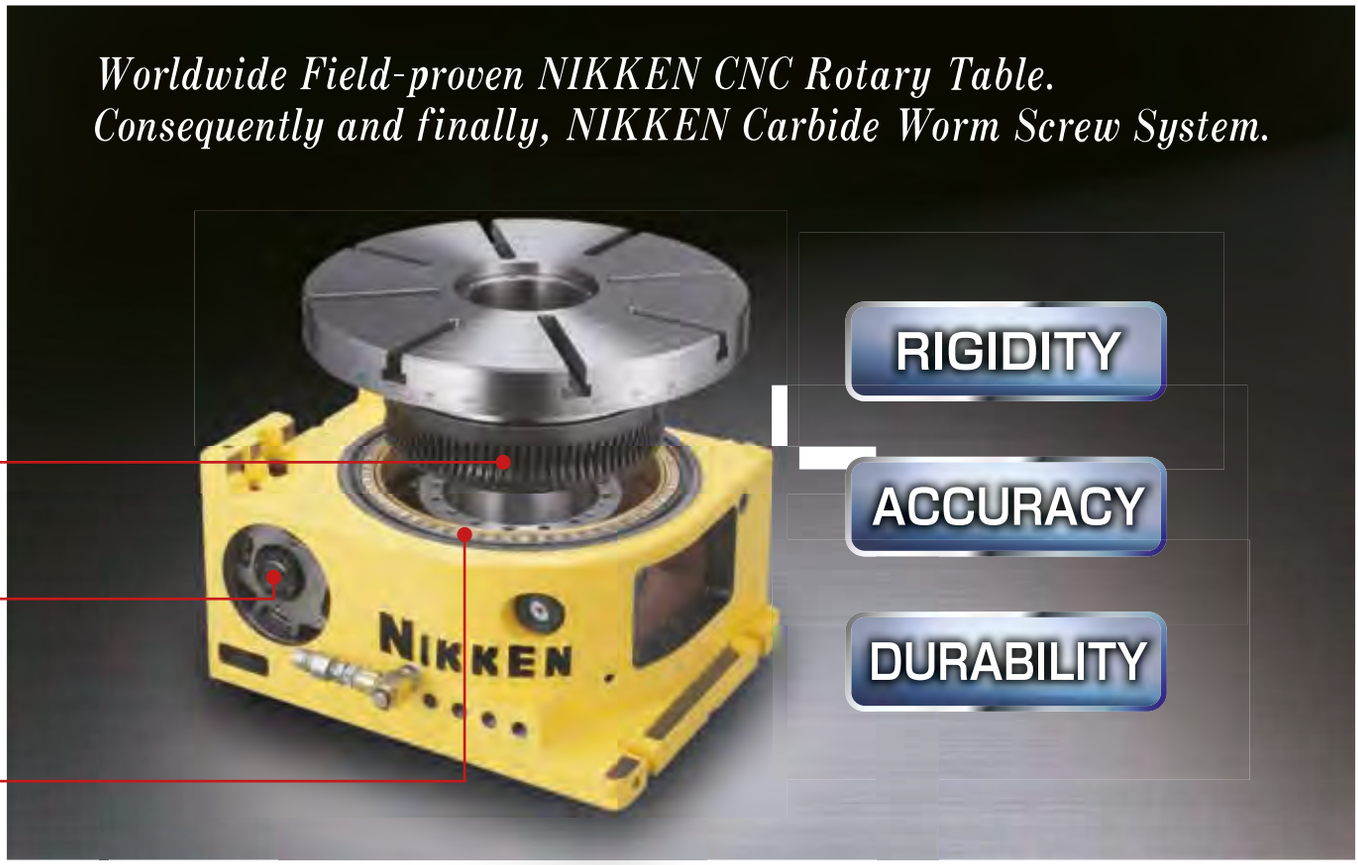
### ■Radial：Needle Roller Bearings

"Hand picked and matched" needle roller bearings between rotary table body and table spindle are implemented for the high accuracy and rigidity.

# NIKKEN.

NIKKEN

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




Our thoroughgoing passion for high rigidity and high precision results in products of excellent durability that retain their precision even after long-term use. This boosts the operating ratio and cuts maintenance costs, contributing to a substantial reduction in costs overall.

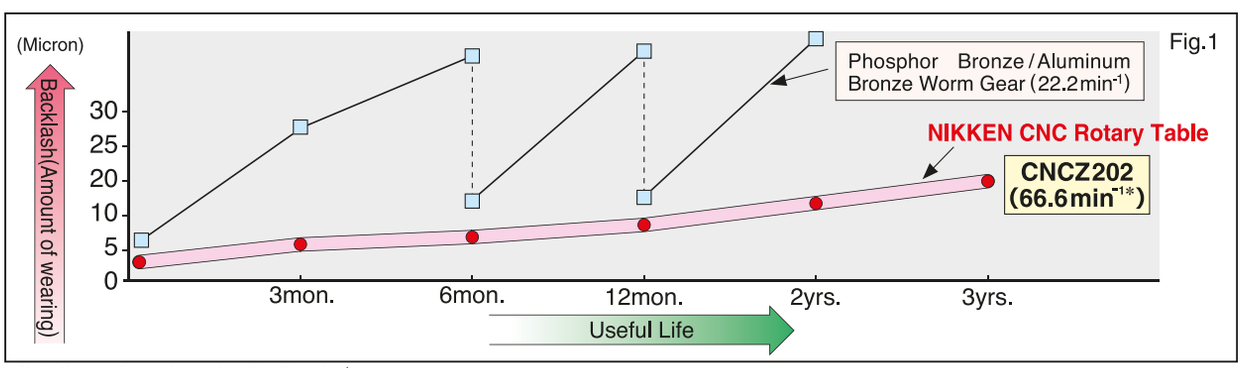
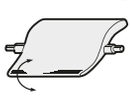



Fig.1

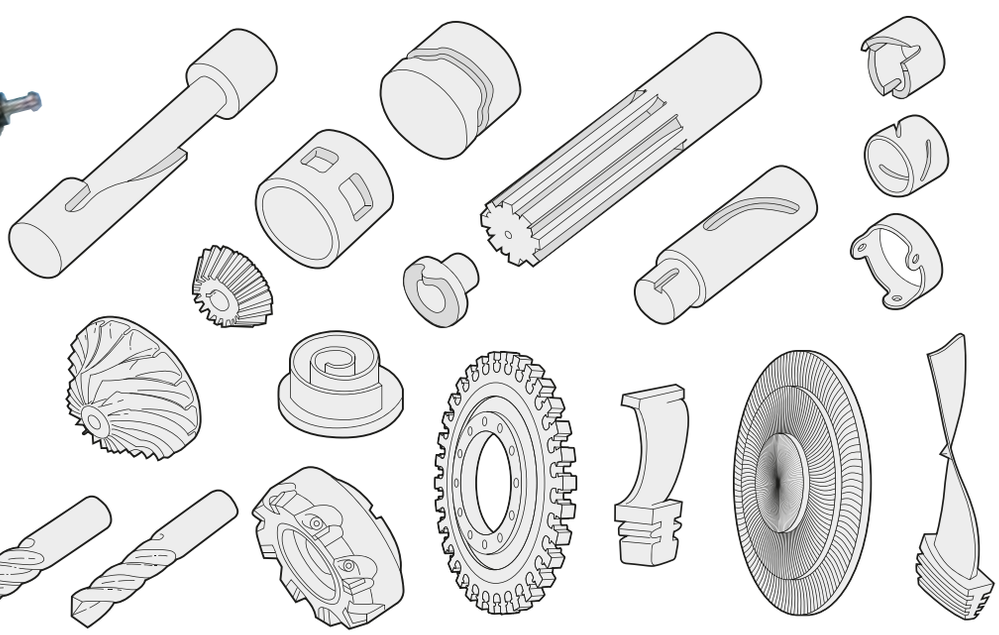
*It is the value of motor 3,000min$^{-1}$.

## Work sample

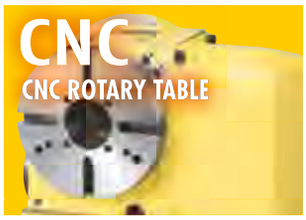
Multi-setting on multi-planes
☞P.94

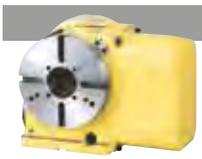


**Turbine Blade**
High Speed CNC Rotary Table Z series for high speed milling marked arrow.

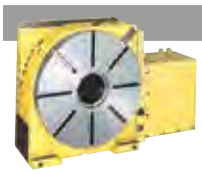


# NIKKEN CNC rotary table extensive

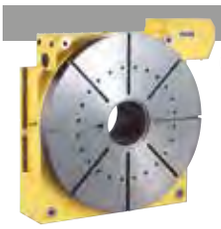




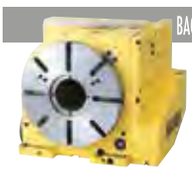




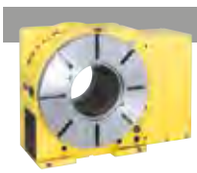






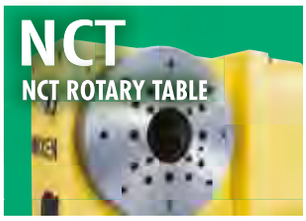




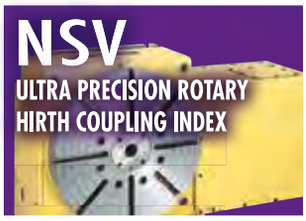








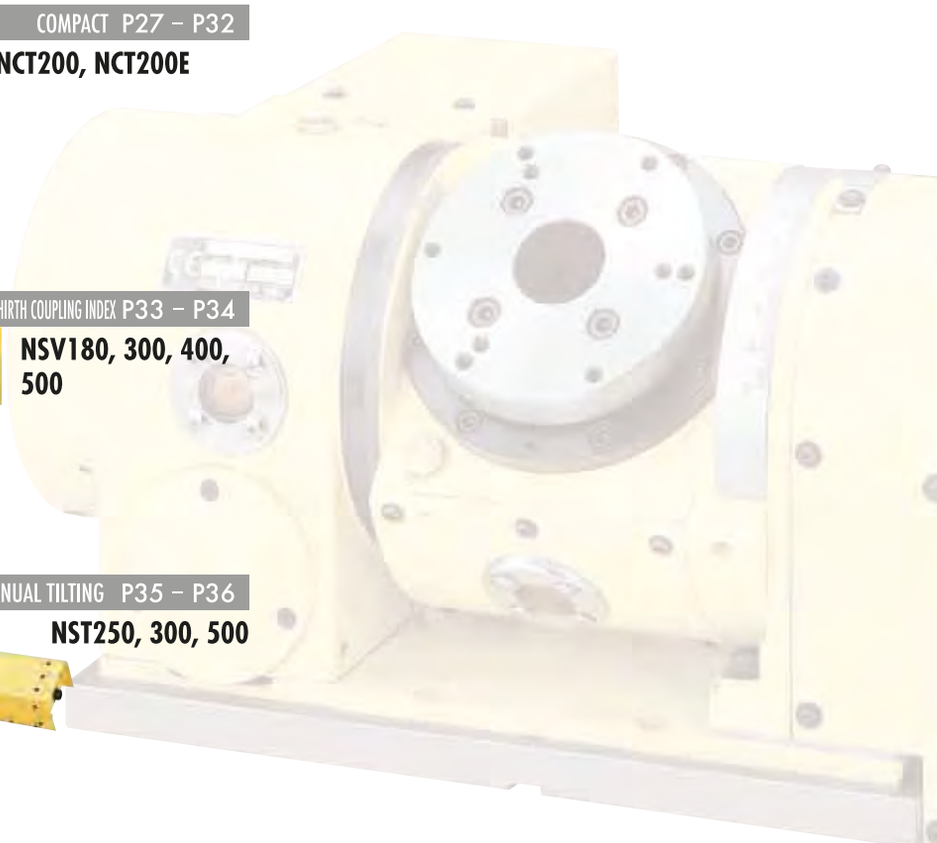










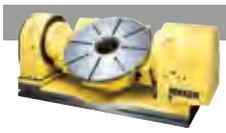
# lineup to match your own applications.


COMPACT P37 – P40

**5AX-100, 130, 201**

STANDARD P41 – P44

**5AX-230, 250, 350, 550**



LARGE P45 – P46

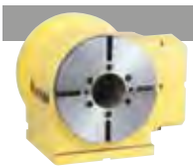
**5AX-800, 1200**

MALTI-SPINDLE P47 – P48

**5AX-2MT-105, 4MT-105**


5AX-DD P49 – P54

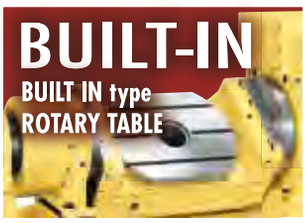
**5AX-DD100, 200A, 201B**

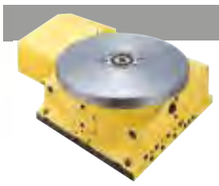


DD P51 – P54

**DD180, 251, 400**

Notes on the Use of DD TABLES P54



CNC P55

**CNC400H, 503H, 802**

5AX P56

**5AX-T400,B450**

SERVO MOTOR

SERVO MOTOR P57 – P58

Servo Motor List • Relation between Unbalancing load and Servo Motor • Flow Chart of the Additional Axis Control


AR21 CONTROLLR P59 – P68

EZ CONTROLLR P69 – P74

TECHNICAL INFORMATION P75 – P78

## ACC ACCESSORIES



## O/P OPTIONAL EQUIPMENT



## TEC TECHNICAL INFORMATION



## NET WORLDWIDE NETWORK

# How to Select Your Best CNC Rotary Table

NIKKEN

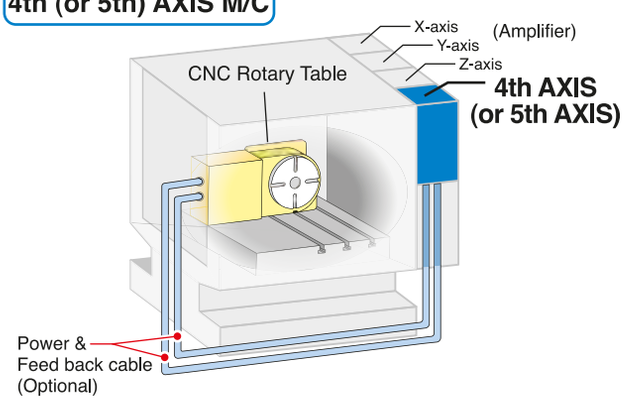
## 1 How CNC Rotary Table is Controlled

### Additional Axis

You can choose additional axis when the machine has 4th or 5th axis.
CNC rotary table can be controlled by machine in this case.

1. 4th or 5th amplifier is required for the machine. It should be used exactly the same one used for X, Y and Z axis. Install same type of servomotor(s) used for X, Y and Z axis.
2. The capacity of the servomotor or amplifier is defined by the types of rotary table.
3. Decide who supplied the servomotor.
4. External dimensions and specifications depend on the type of servomotor.
5. Parameter configuration, hydraulic connection, wiring and installation of amplifiers should be provided by machine tool builders.

**4th (or 5th) AXIS M/C**

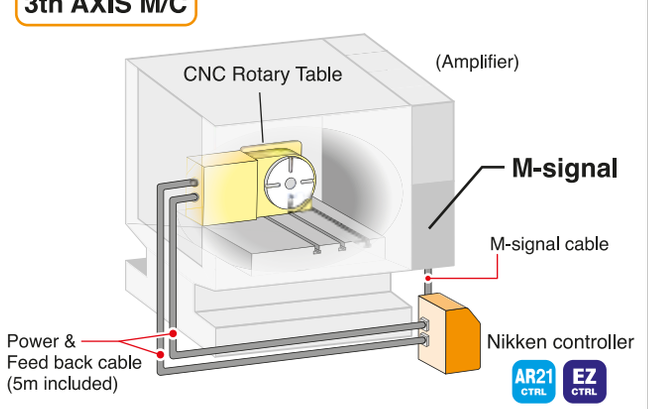



### NIKKEN Controller (M-signal)

You can choose NIKKEN Controller when the machine doesn't have additional axis.
Note: at least one M-signal code is required.

1. At least one M-Signal is required on the machine.
2. Input M-signal as "index start" command on the machine, high accuracy indexing, equally divided indexing (2-9999), or lead operation is allowed.
3. Control unit, servo-motor and all cables will be supplied by NIKKEN.

**3th AXIS M/C**

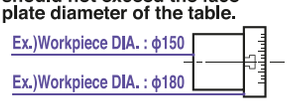


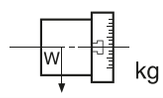

## 2 Select +1 AXIS or +2 AXIS

CNC +1 AXIS OR 5AX +2 AXIS

## 3 Select Face Plate Diameter

| Component DIA. | Component Weight |
|---|---|
| Diameter of the components should not exceed the face plate diameter of the table. | Component weight should not exceed the maximum load capacity. |

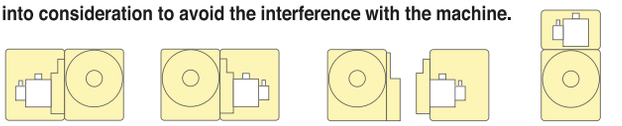



## 4 Select the Servomotor Position

R RIGHT HAND L LEFT HAND T TOP SIDE B BACK SIDE

**Select the servomotor position which is suitable for the application to take into consideration to avoid the interference with the machine.**



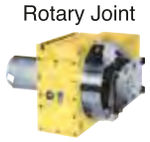

## 5 High Speed or Standard?

Standard OR High speed

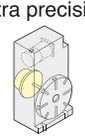
## 6 Select Options

ROTARY JOINT ULTRA PRECISION Waterproof Specification Air Hydraulic Booster

Rotary Joint



Ultra precision



Waterproof Specification

*Refer to icons on each page for the other functions.

## 7 Select Accessories

SUPPORT TABLE TAIL STOCK SCROLL CHUCK POWER CHUCK CLAMP DEVICE T-NUT

Scroll chuck

Tailstock

Suppport Table

*Refer to icons on each page for the other functions.

## 8 Icon list (In this catalog, table Specifcations, accessories, and opion are displayed as icons.)

| MOTOR MOUNTED | MOTOR MOUNTED | MOTOR MOUNTED | MOTOR MOUNTED | FACE PLATE | FACE PLATE | M-SIGNAL METHOD | M-SIGNAL METHOD | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R RIGHT HAND | L LEFT HAND | T TOP SIDE | B BACK SIDE | WITH FACE PLATE | W/O FACE PLATE | AR21 CTRL | EZ CTRL | ADD. AXIS | ACCURACY SPEC. | ROTARY JOINT | ULTRA PRECISION | SUPPORT TABLE | TAIL STOCK | SCROLL CHUCK | POWER CHUCK | CLAMP DEVICE | T-NUT |
| | | | | | | P.59 | P.69 | P.57 | P.99 | P.89 | P.87 | P.79 | P.81 | P.83 | P.84 | P.85 | P.86 |

# How to Read Product Code

NIKKEN

## CNC 401 L F A - M

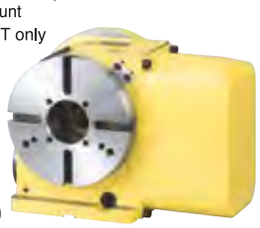
- CNC: Code No. of vertical/horizontal type CNC rotary table
  CNC : Standard
  CNCZ : High Speed
- 401: Diameter of the rotary table face plate (mm)
- L: Motor mounting location
  Non: Right mount, L: Left mount,
  B: Back mount, T: Top mount
- F: Maker code.*
- A: Type of motor
  Non: DC servo, A: AC servo
- M: With/without Motor
  Non: without motor
  M: with motor

| *Maker code. | Makers for Additional Axis Control |
|---|---|
| **Makers for Additional Axis Control** | |
| F | FANUC |
| M | MELDAS |
| OSP | OSP |
| Y | YASNAC |
| Z | SIMENS |
| S | SANYO |
| TOS | TOSNUC |
| **M-signal Control** | |
| *Maker code. | M-signal Control |
| AR21<br>WAR21<br>DAR21<br>EZ | AR21Controller<br>*5AX : Both Axis<br>*5AX : Each Axis<br>EZController |

**Servomotors for Brother SPEEDIO is exclusive. EX.)NCT□200□□SA-BR3**
**The last part of the product code must be "SA-BR2".**

### CNC180 (E)L F A - M

- CNC180: Code No. of vertical/horizontal type CNC rotary table
  CNC : Standard
  CNCZ : High Speed
  NCT : High Clamping Torgue Compact CNC rotary table
  NCTZ : High Speed High Clamping Torgue Compact CNC rotary table
- (E): Faceplate specification for NCT only
- L: Motor mounting location
  Non: Right mount, L: Left mount,
  B: Back mount, T: Top mount
- F: Motor maker
- A: Type of motor Non: DC servo, A: AC servo
- M: With/without Motor Non: without motor
  M: with motor



CNC180

### ●5AX Rotary & Tilting Table

### 5AX- 350 F A - M

- 350: Diameter of the table face plate (mm)
- F: Rotary axis motor mounting location Non: Right mount, L: Left mount
- A: Motor maker
- M: Type of motor Non: DC servo, A: AC servo
- With/without Motor
  Non: without motor, M: with motor
- Tilting axis motor mounting location
  Non: Parallel mount
  A: Back mount
  B: Back of rotary axis
  T: Top mount
- Code No. of Rotray & Tilting Table

5AX-350

### ●Multi-Spindle CNC Rotary Table

### CNC100-2W-120 F A-M

- CNC100: Code No. of vertical/horizontal type CNC rotary table
- 2W: Diameter of the rotary table face plate (mm)
- 120: Number of spindles
- F: Pitch between the spindles 120, 250, 320
- A: Motor mounting location Non: Right mount, L: Left mount, B: Back mount, T: Top mount
- M: Motor maker
- With/without Motor
  Non: without motor, M: with motor
- Type of motor Non: DC servo, A: AC servo

CNC100-2W

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

### 5AX-2MT-105-120 F A - M

- 5AX: Code No. of Rotray & Tilt Table
- 2MT: Number of rotary axis spindles
- 105: Diameter of the table face plate (mm)
- 120: Pitch distance between the spindles
- F: Rotary axis motor mount location
  Non: Right mount, L: Left mount
- A: Motor maker
- M: Type of motor
  Non: DC servo, A: AC servo
- With/without Motor
  Non: without motor
  M: with motor

5AX-2MT-105

### ●Rotary Hirth Coupling Index Table

### NSV X 400 F A-M

- NSV: Code No. of Hirth Coupling Index Table
- X: X: Index & Rotary Table
  Z: Index Table
- 400: Diameter of the table face plate (mm)
- F: Motor mounting location Non: Right mount
  L: Left mount, T: Top mount
- A: Motor maker
- M: Type of motor Non: DC servo, A: AC servo
- With/without Motor
  Non: without motor, M: with motor

NSVX400

### ●Manual Tilting CNC Rotary Table

### NST 300 F A - M

- NST: Code No. of ManualTilting CNC Rotary Table
- 300: Diameter of the table face plate (mm)
- F: Rotary axis motor mount location Non: Right mount, L: Left mount
- A: Motor maker
- M: Type of motor Non: DC servo, A: AC servo
- With/without Motor
  Non: without motor, M: with motor

NST300

# COMPACT CNC ROTARY TABLE

NIKKEN


CNC105 and accessories

- Wide application can be offered from small drilling press to M/C
- Suitable for indexing/leads cutting of small size work pieces
- Various kinds of the work chucking attachments can be offered from 5C collet fixtures to the air/hyd. chuck

Option

ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

Accessories

SUPPORT TABLE P.79 | TAIL STOCK P.81 | SCROLL CHUCK P.83 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86

## Specifications

( ):High Speed CNC ROTARY Table Z series

| Item / Code No. | | CNC105 CNCZ105 | CNC180 CNCZ180 | CNC202 CNCZ202 |
|---|---|---|---|---|
| Diameter of Table | ϕmm | 105 | 180 | 200 |
| Diameter of Spindle Hole | ϕmm | Φ60H7 Φ30 | Φ60H7 Φ40 | Φ60H7 Φ40 |
| Center Height | mm | 105 | 135 | 135 |
| Width of T Slot | mm | Φ10H7 Pin hole | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ |
| Clamping System | | Pneumatic*4 | Pneumatic*4 | Pneumatic*4 |
| Clamping Torque | N·m | 205 | 303 | 303 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 0.06 | 0.08 | 0.09 |
| Servo Motor | r/min | αiF1·3000 | αiF2·3000 | αiF4·3000 |
| MIN. Increment | | 0.001° | 0.001° | 0.001° |
| Rotation Speed*5 | r/min | 33.3(66.6) | 33.3(66.6) | 33.3(66.6) |
| Total Reduction Ratio | | 1/90(1/45) | 1/90(1/45) | 1/90(1/45) |
| Indexing Accuracy | sec | ±30 | ±20 | ±20 |
| Net Weight | kg | 32 | 45 | 55 |
| MAX. Work Load on the Table | Vertical kg | 30 | 100 | 100 |
| | Horizontal kg | 60 | 200 | 200 |
| MAX. Thrust Load applicable on the Table | N | 8800 | 18000 | 18000 |
| | *1 F×L N·m | 275 | 542 | 542 |
| | F×L N·m | 220 | 690 | 690 |
| Guide Line of MAX. Unbalancing Load | *2 N·m | – | 30 | 50 |
| MAX. Work Inertia | Vertical $(\frac{GD^2}{4})$ kg·m² | 0.04(0.02) | 0.4(0.2) | 1.0(0.5) |
| Driving Torque | *3 N·m | 36(27) | 72(54) | 144(115) |

***1 This is the strength of the worm wheel without brake. It is applied against dynamic cutting thrust.**

***2 The guide line of MAX unbalancing load means the unbalancing load, when the rotary table is used with support table in vertical application. The guide line figure will be different according to the servo motor, please refer to ☞ P.57 for more detail.**

***3 Driving torque means the torque at MAX. rotation speed after acceleration. Driving torque is almost constant and independent from the load except unbalancing load is applied.**

*4 Air Intensifying Booster system is available if the supplied air pressure is under 0.5MPa or the brake torque is required to increase. ☞ **P.95**

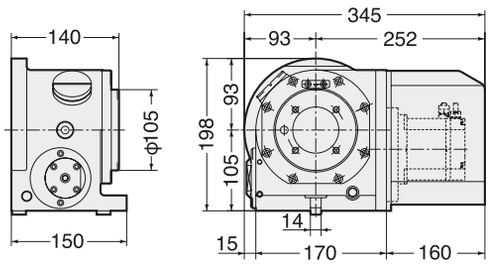
*5 The table rotation speed when the motor rotates at 3000r/min. Depending on the application(unbalance of the jig,work) and the motor specification, the motor may not be able to rotate at 3000r/min. ★αiF4/5000 motor can be mounted on **CNC180**.

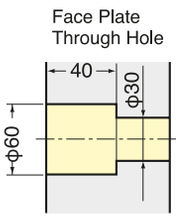
# CNC105, 180, 202

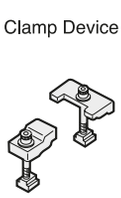
NIKKEN

External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

## CNC105, CNCZ105



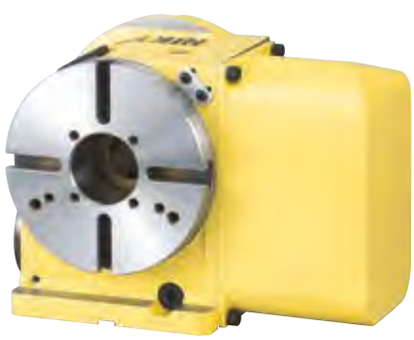



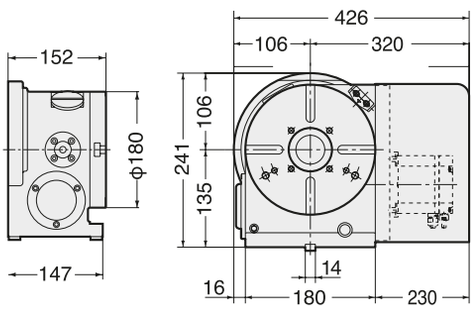



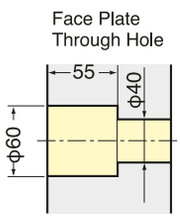

R RIGHT HAND L LEFT HAND W/O FACE PLATE AR21 CTRL EZ CTRL

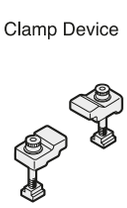
Air purge function is provided inside the motor cover as standard.

## CNC180, CNCZ180





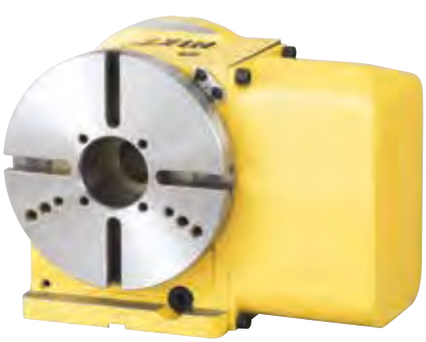



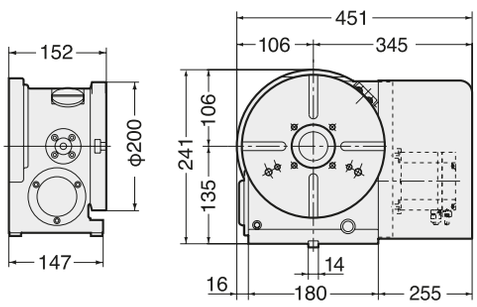



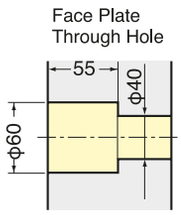

R RIGHT HAND L LEFT HAND WITH FACE PLATE AR21 CTRL EZ CTRL

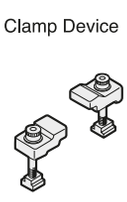
Air purge function is provided inside the motor cover as standard.

## CNC202, CNCZ202






R RIGHT HAND L LEFT HAND WITH FACE PLATE AR21 CTRL EZ CTRL

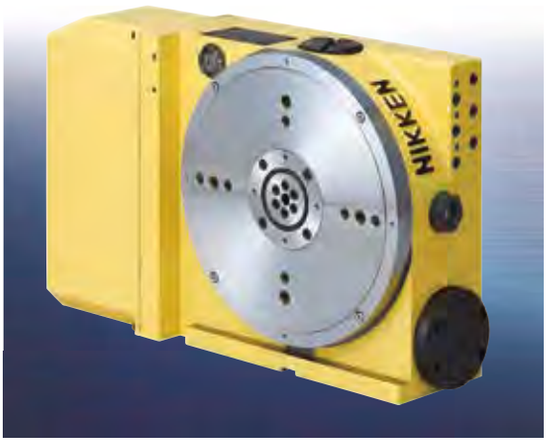
Air purge function is provided inside the motor cover as standard.

# COMPACT CNC ROTARY TABLE

NIKKEN

Ultra Slim Model for Trunnion Application

# CNC205




Option

ADD. AXIS P.57
ACCURACY SPEC. P.99
ROTARY JOINT P.89
ULTRA PRECISIO P.87

Accessories

SUPPORT TABLE P.79
CLAMP DEVICE P.85
T-NUT P.86

## 380Nm

### Air-hydraulic Unit Provided as Standard Equipment

Astoundingly powerful clamping capability in spite of the slim body

For machines with no hydraulic power source, the air-hydro unit provides powerful hydraulic supply functionality using only an air supply. In spite of its slim body, it delivers an astounding 380 Nm of clamping power, enabling a variety of applications, such as use of a cradle jig.

## Ultra-Slim 98mm

### Ultrathin Specification to Maximize Machining Space

Demonstrates the true worth of a compact machining center with limited machining space.

The body thickness of 98mm is 54mm slimmer than previous models. Allows enlargement of the cradle jig work mounting area on machines with limited machining space, such as the BT30 compact machining center.

## High Speed

### Z Type is also Available

Reducing cycle time enhances productivity

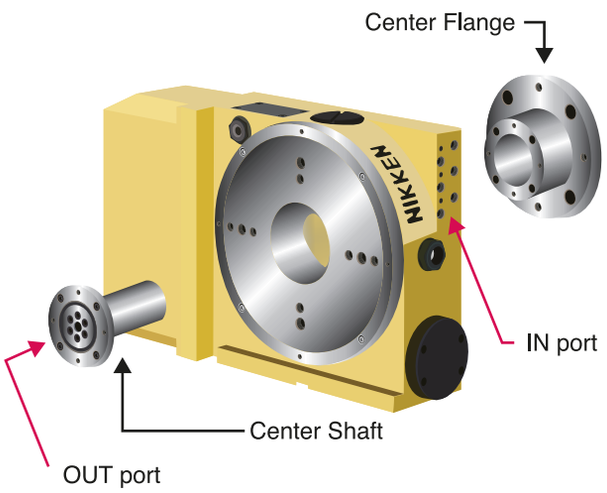
The lineup also includes the highly rotatable Z type that further reduces machining cycle time. By setting the speed reduction ratio to 1/2 that of the standard type, 200% speedup is achieved.

## Built-in Rotary Joint

### Supports Mounting of Built-in Rotary Joints

Automated component mounting/unmounting with minimal increase in size.

The rotary table body is already provided with IN ports, so the rotary joint specification can be changed with minimal increase in the body dimensions.




## Ultra-slim Support

### Ultrathin Support Table is also Available.

Contributes to a further expansion of machining area when used with the CNC205.

**Ultrathin Support Table with Clamping System**

TAS-100N

**Ex.)**
**Trunnion Application with CNC205L and a Support Table**



*Center socket (30H7) will be installed in case of non-rotary joint.

# CNC205

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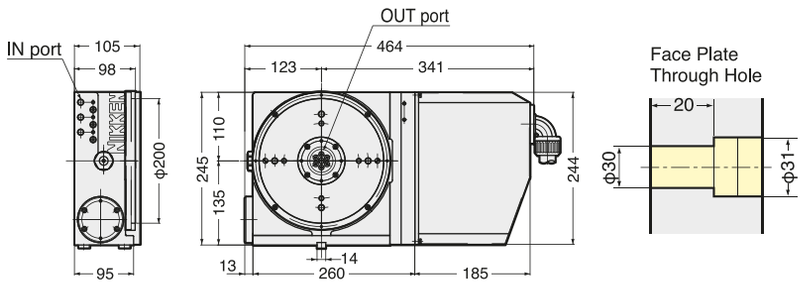
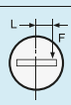
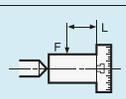
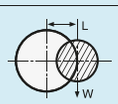
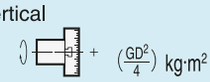
Rotary joint shown in photo is optional.




∗Rotary joint is included in the layout with AR21 controller.

## Specifications

| Item / Code No. | | Standard | High Speed |
|---|---|---|---|
| Right Hand Mounted Motor | | **CNC205** | **CNCZ205** |
| Left Hand Mounted Motor | | **CNC205L** | **CNCZ205L** |
| Diameter of Table | φmm | 200 | 200 |
| Diameter of Spindle Hole | φmm | Φ30H7 | Φ30H7 |
| Center Height | mm | 135 | 135 |
| Width of T Slot | mm | — | — |
| Clamping System | | Air Hydraulic Booster Built-in type | Air Hydraulic Booster Built-in type |
| Clamping Torque | N·m | 380 | 380 |
| Table Inertia at Motor Shaft $(\frac{GD^2}{4})$ | $kg \cdot m^2 \times 10^{-3}$ | 0.15 | 0.15 |
| Servo Motor | r/min | αiF2・3000 | αiF2・3000 |
| MIN. Increment | | 0.001° | 0.001° |
| Rotation Speed∗4 | r/min | 33.3 | 66.6 |
| Total Reduction Ratio | | 1/90 | 1/45 |
| Indexing Accuracy | sec | ±20 | ±20 |
| Net Weight | kg | 45 | 45 |
| MAX. Work Load on the Table | Vertical  kg | 100 (with suppart) | 100 (with suppart) |
| | Horizontal  kg | — | — |
| MAX. Thrust Load applicable on the Table | ∗1  FXL N·m | 670 | 670 |
| |  FXL N·m | 690 | 690 |
| Guide Line of MAX. Unbalancing Load | ∗2  N·m | 30 | 30 |
| MAX. Work Inertia | Vertical  $(\frac{GD^2}{4})$ $kg \cdot m^2$ | 0.40 | 0.20 |
| Driving Torque | ∗3  N·m | 72 | 54 |

**∗1 This is the strength of the worm wheel without brake. It is applied against dynamic cutting thrust.**
**∗2 The guide line of MAX unbalancing load means the unbalancing load, when the rotary table is used with support table in vertical application. The guide line figure will be different according to the servo motor, please refer to ☞P.57 for more detail.**
**∗3 Driving torque means the torque at MAX. rotation speed after acceleration. Driving torque is almost constant and independent from the load except unbalancing load is applied.**
∗4 The table rotation speed when the motor rotates at 3000r/min. Depending on the application(unbalance of the jig,work) and the motor specification, the motor may not be able to rotate at 3000r/min.

# STANDARD CNC ROTARY TABLE

NIKKEN

CNC260

- The rotary table can be used vertically or horizontally depending on the application
- Best match for a medium-size machining center
- Standard model with motors mounted on the body side

Option

ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

Accessories

SUPPORT TABLE P.79 | TAIL STOCK P.81 | SCROLL CHUCK P.83 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86

## Specifications

( ):High Speed CNC ROTARY Table Z series

| Item / Code No. | | CNC260 CNCZ260 | CNC260P CNCZ260P | CNC302*5 CNCZ302 | CNC302P CNCZ302P | CNC321*5 CNCZ321 | CNC401 CNCZ401 |
|---|---|---|---|---|---|---|---|
| Diameter of Table | φmm | 260 | 260 | 300 | 300 | 320 | 400 |
| Diameter of Spindle Hole | φmm | φ80H7 | φ80H7 | φ80H7 | φ80H7 | φ105H7 | φ105H7 |
| Center Height | mm | 170 | 170 | 170 | 170 | 230 | 230 |
| Width of T Slot | mm | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ | $14^{+0.018}_{0}$ |
| Clamping System | | Hydraulic | Pneumatic | Hydraulic | Pneumatic | Hydraulic | Hydraulic |
| Clamping Torque | N·m | 1568 | 1430 | 1568 | 1430 | 1760 | 1760 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²X10⁻³ | 0.33 | 0.33 | 0.33 | 0.33 | 2.8 | 2.8 |
| Servo Motor | r/min | αiF4・3000 | αiF4・3000 | αiF4・3000 | αiF4・3000 | αiF12・2000 | αiF12・2000 |
| MIN. Increment | | 0.001° | 0.001° | 0.001° | 0.001° | 0.001° | 0.001° |
| Rotation Speed*6 | r/min | 25.0(50.0) | 25.0(50.0) | 25.0(50.0) | 25.0(50.0) | 22.2(44.4) | 22.2(44.4) |
| Total Reduction Ratio | | 1/120(1/60) | 1/120(1/60) | 1/120(1/60) | 1/120(1/60) | 1/90(1/45) | 1/90(1/45) |
| Indexing Accuracy | sec | 20 | 20 | 20 | 20 | 15 | 15 |
| Net Weight | kg | 115 | 115 | 120 | 120 | 200 | 230 |
| MAX. Work Load on the Table | Vertical kg | 175 | 175 | 175 | 175 | 250 | 250 |
| | Horizontal kg | 350 | 350 | 350 | 350 | 500 | 500 |
| MAX. Thrust Load applicable on the Table | N | 42480 | 42480 | 42480 | 42480 | 53100 | 53100 |
| | *1 FXL N·m | 1442 | 1442 | 1442 | 1442 | 2648 | 2648 |
| | FXL N·m | 2320 | 2320 | 2320 | 2320 | 3840 | 3840 |
| Guide Line of MAX. Unbalancing Load | *2 N·m | 50 | 50 | 50 | 50 | 100 | 100 |
| MAX. Work Inertia | Vertical $+(\frac{GD^2}{4})$ kg·m² | 3.2(1.6) | 3.2(1.6) | 3.2(1.6) | 3.2(1.6) | 6.4(3.2) | 6.4(3.2) |
| Driving Torque | *3 N·m | 192(153) | 192(153) | 192(153) | 192(153) | 432(345) | 432(345) |

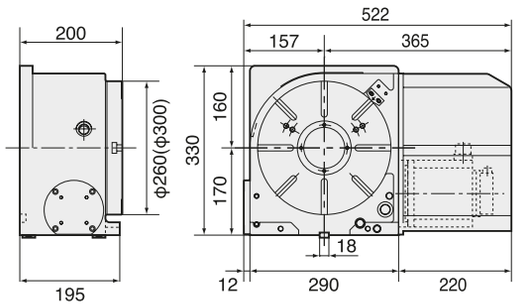
**＊1 This is the strength of the worm wheel without brake. It is applied against dynamic cutting thrust.**
**＊2 The guide line of MAX unbalancing load means the unbalancing load, when the rotary table is used with support table in vertical application. The guide line figure will be different according to the servo motor, please refer to ☞P.57 for more detail.**
**＊3 Driving torque means the torque at MAX. rotation speed after acceleration. Driving torque is almost constant and independent from the load except unbalancing load is applied.**
**＊5 CNC302,321** is semi-standard model. **＊6** The table rotation speed when the motor rotates at 3000r/min. Depending on the application(unbalance of the jig,work) and the motor specification, the motor may not be able to rotate at 3000r/min.
★The air-hydraulic booster is available, when the rotary table with hydraulic clamping system is used on the M/C without hydraulic source, please refer to ☞**P.95**.
★αiF8/4000 motor can be mounted on **CNC260, 302, CNC260P, 302P**.

# CNC260, 260P, 302, 302P, 321, 401

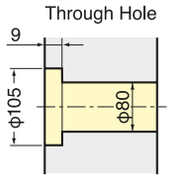
NIKKEN

External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

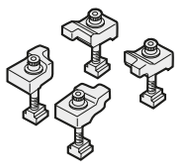
## CNC260, CNCZ260, CNC302, CNCZ302




Face Plate Through Hole



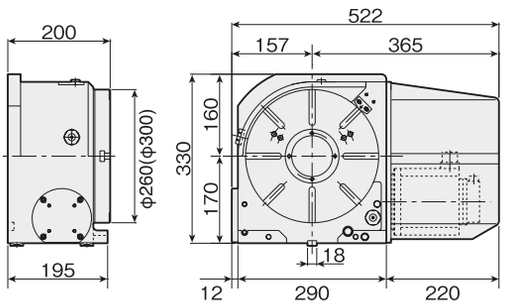

Clamp Device



R RIGHT HAND L LEFT HAND WITH FACE PLATE AR21 CTRL EZ CTRL

( ):Figures is for **CNC302**, **CNCZ302**.
For the rotary table with pneumatic clamping, air purge function is provided inside the motor cover as standard.

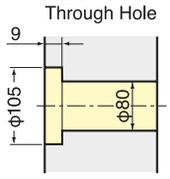
## CNC260P, CNC302P NEW



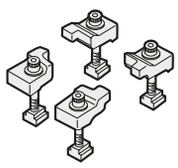

MECHANICAL inside BOOSTER

Powerful Clamping Torque:**1430**N・m

Face Plate Through Hole



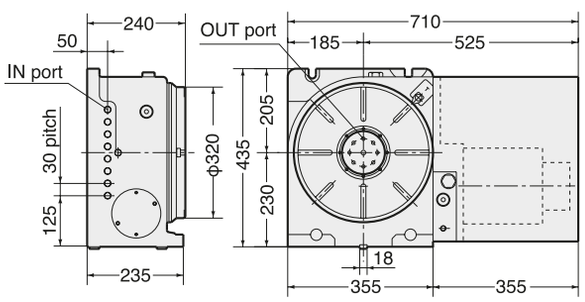

Clamp Device



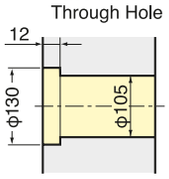
R RIGHT HAND L LEFT HAND WITH FACE PLATE AR21 CTRL EZ CTRL

( ):Figures is for **CNC302P**.
Air purge function is provided inside the motor cover as standard.

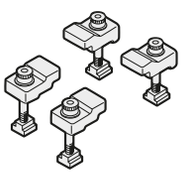
## CNC321, CNCZ321




Face Plate Through Hole




Clamp Device

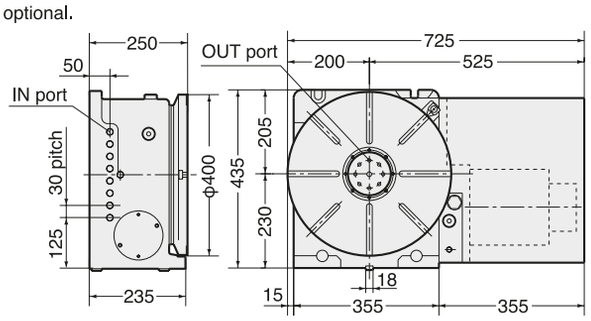


R RIGHT HAND L LEFT HAND WITH FACE PLATE AR21 CTRL

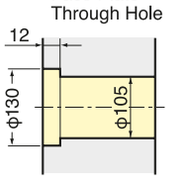
Rotary joint shown in layout is optional.

## CNC401, CNCZ401

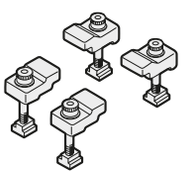
Rotary joint shown in photo & layout is optional.




Face Plate Through Hole



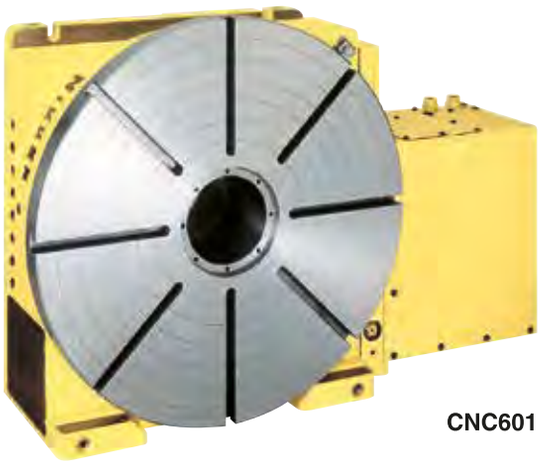

Clamp Device



R RIGHT HAND L LEFT HAND WITH FACE PLATE AR21 CTRL

# STANDARD CNC ROTARY TABLE

NIKKEN



CNC601

- Dividing and lead cutting for large size work piece is suitable
- Large through hole and powerful clamping system
- Ideal for deep cutting of highly rigid material

Option

ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

Accessories

SUPPORT TABLE P.79 | TAIL STOCK P.81 | SCROLL CHUCK P.83 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86

## Specifications

| Item / Code No. | | CNC501 | CNC601 | CNC803 | CNC1003 |
|---|---|---|---|---|---|
| Diameter of Table | ϕmm | 500 | 600 | 800 | 1000 |
| Diameter of Spindle Hole | ϕmm | Φ130H7 | Φ130H7 | Φ230H7 | Φ230H7 |
| Center Height | mm | 310 | 310 | 550 | 550 |
| Width of T Slot | mm | 14 $^{+0.018}_{0}$ | 14 $^{+0.018}_{0}$ | 22H7*4 | 22H7*4 |
| Clamping System | | Hydraulic | Hydraulic | Hydraulic | Hydraulic |
| Clamping Torque | N·m | 4655 | 4655 | 7000 | 7000 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 6.8 | 4.9 | 6.2 | 6.3 |
| Servo Motor | r/min | αiF12・2000 | αiF12・2000 | αiF30・2000 | αiF30・2000 |
| MIN. Increment | | 0.001° | 0.001° | 0.001° | 0.001° |
| Rotation Speed | r/min | 16.6 | 11.1 | 5.5 | 5.5 |
| Total Reduction Ratio | | 1/120 | 1/180 | 1/360 | 1/360 |
| Indexing Accuracy | sec | 15 | 15 | 15 | 15 |
| Net Weight | kg | 470 | 500 | 2070 | 2210 |
| MAX. Work Load on the Table | Vertical kg | 400 | 400 | 2000 | 2000 |
| | Horizontal kg | 800 | 800 | 4000 | 4000 |
| MAX. Thrust Load applicable on the Table | N | 150000 | 150000 | 281250 | 281250 |
| | *1 F×L N·m | 5709 | 5709 | 20067 | 20067 |
| | F×L N·m | 16650 | 16650 | 42190 | 42190 |
| Guide Line of MAX. Unbalancing Load | *2 N·m | 200 | 200 | 300 | 300 |
| MAX. Work Inertia | Vertical $(\frac{GD^2}{4})$kg·m² | 19.4 | 37 | 234 | 234 |
| Driving Torque | *3 N·m | 576 | 864 | 3168 | 3168 |

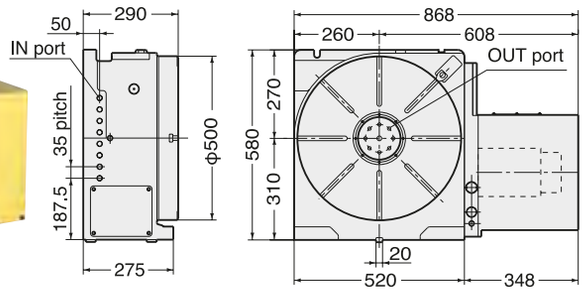
***1 This is the strength of the worm wheel without brake. It is applied against dynamic cutting thrust.**
***2 The guide line of MAX unbalancing load means the unbalancing load, when the rotary table is used with support table in vertical application. The guide line figure will be different according to the servo motor, please refer to ☞ P.57 for more detail.**
***3 Driving torque means the torque at MAX. rotation speed after acceleration. Driving torque is almost constant and independent from the load except unbalancing load is applied.**
***4** Standard large rotary tables are without T slot. T slot is available as an option, please specify the width of the T slot.
★Total reduction ratio of 1/180 is also available for **CNC501.** ★αiF22/4000 motor can be mounted on **CNC501, 601.**

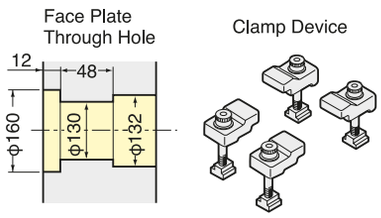
# CNC501, 601, 803, 1003

NIKKEN

External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

## CNC501

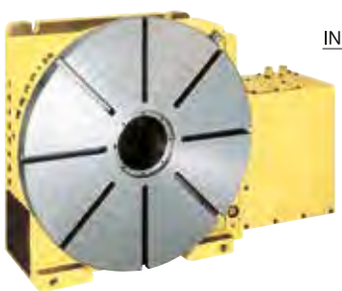


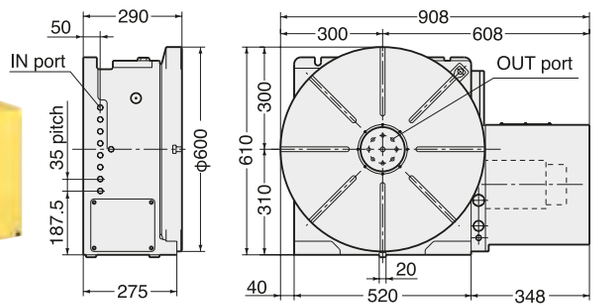



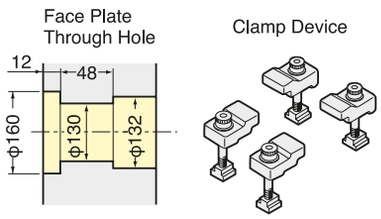

R RIGHT HAND L LEFT HAND WITH FACE PLATE AR21 CTRL

Rotary joint shown in layout is optional.

## CNC601



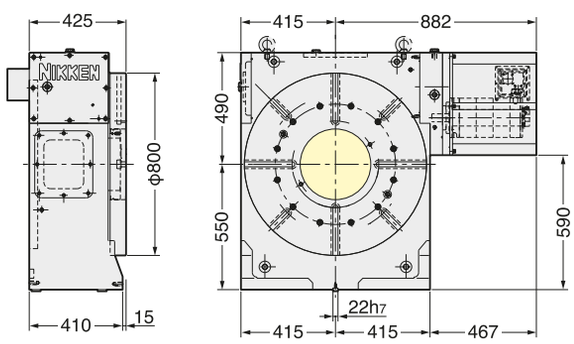


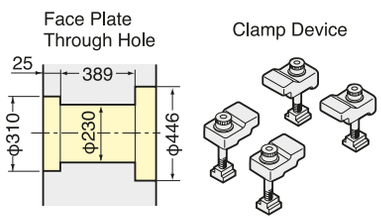




R RIGHT HAND L LEFT HAND WITH FACE PLATE AR21 CTRL

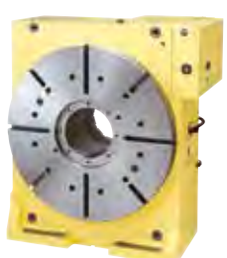
Rotary joint shown in layout is optional.

## CNC803



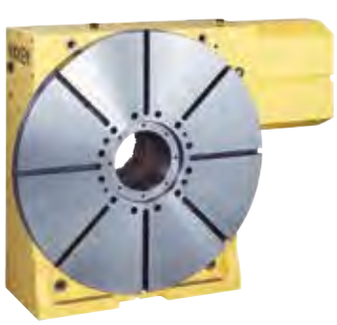

R RIGHT HAND WITH FACE PLATE AR21 CTRL

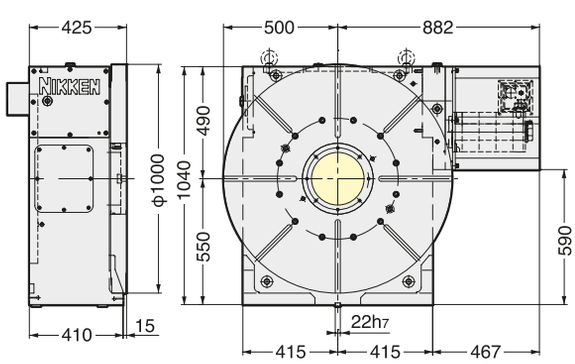


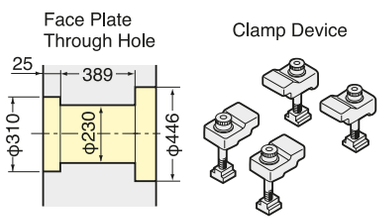
### CNC803B

**CNC803** : the servomotor is mounted at back side, suitable for the application for pallet on Horizontal machines.

## CNC1003






R RIGHT HAND WITH FACE PLATE AR21 CTRL

# LARGE CNC ROTARY TABLE

NIKKEN


- Ideal for indexing and lead cutting of large work pieces
- Tooth thickness module 10 and ultrahigh rigidity among best in class.(CNC1600)
- Ideal for aircraft- and energy-related parts

**Option**

ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

**Accessories**

SUPPORT TABLE P.79 | TAIL STOCK P.81 | SCROLL CHUCK P.83 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86

## Specifications

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

| Item / Code No. | | | CNC1000*1 | CNC1200*1 | CNC1201*1 | CNC1600*1 |
|---|---|---|---|---|---|---|
| Diameter of Table | | ϕmm | 1000 | 1200 | 1200 | 1600 |
| Diameter of Spindle Hole *2 | | ϕmm | ϕ300H7 | ϕ300H7 | ϕ300H7 | ϕ400H7 |
| Center Height | | mm | Horizontal | Horizontal | 650 | 850 |
| Width of T Slot *4 | | mm | 22H7*4 | 22H7*4 | 22H7*4 | 28H7*4 |
| Clamping System | | | Hydraulic | Hydraulic | Hydraulic | Hydraulic |
| Clamping Torque | | N·m | 18000 | 18000 | 18000 | 35000 |
| Servo Motor | | r/min | αiF22・2000 | | αiF30・2000 | |
| MIN. Increment | | | 0.001° | 0.001° | 0.001 | 0.001 |
| Rotation Speed | | r/min | 5.5 | 5.5 | 2.7 | 2.7 |
| Total Reduction Ratio *5 | | | 1/360 | 1/360 | 1/720 | 1/720 |
| Indexing Accuracy | | sec | 15 | 15 | 15 | 15 |
| Indexing Accuracy of Ultra Precision | | sec | ±3 | ±3 | ±3 | ±3 |
| Net Weight | | kg | 1700 | 1850 | 3500*6 | 5250*6 |
| MAX. Work Load on the Table | Vertical | kg | —— | —— | 6500 | 10000 |
| | Horizontal | kg | 7000 | 7000 | 13000 | 30000 |
| MAX. Thrust Load applicable on the Table | | N | 281250 | 375000 | 1333330 | 2000000 |
| | *7 | FXL N·m | 24080 | 24080 | 79025 | 111952 |
| | | FXL N·m | 42190 | 67500 | 240000 | 510000 |
| MAX. Work Inertia | Vertical | kg·m² | 1300 | 1300 | 2300 | 6400 |
| Driving Torque | *3 | N·m | 3168 | 3168 | 8640 | 8640 |

*1 **CNC1000, 1200, 1600** is semi-standard model.
*2 The diameter of the spindle hole is restricted for the ultra precision type with Heidenhain rotary encoder.
*3 **Driving torque means the torque at MAX. rotation speed after acceleration. Driving torque is almost constant and independent from the load except unbalancing load is applied.**
*4 Standard large rotary tables are without T slot. T slot is available as an option, please specify the width of the T slot.
*5 Total reduction ratio and motor can be changed according to your application, please contact us.
*6 Net weight of the rotary table is for horizontal application. The weight of the back support for vertical application is not included.
*7 **This is the strength of the worm wheel without brake. It is applied against dynamic cutting thrust.**

# CNC1000, 1200, 1201, 1600

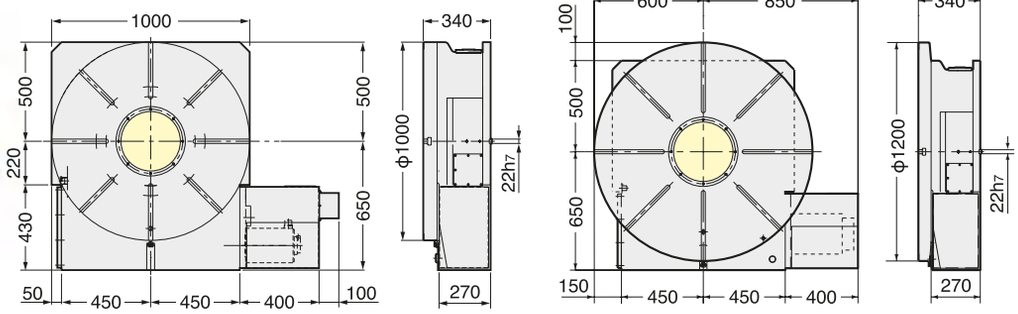
NIKKEN

External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

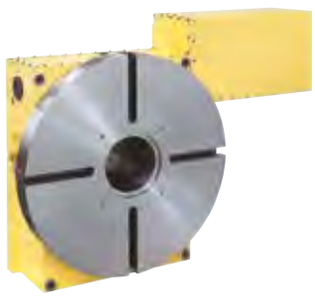
## CNC1000,1200

★ Exclusively for Horizontal models.

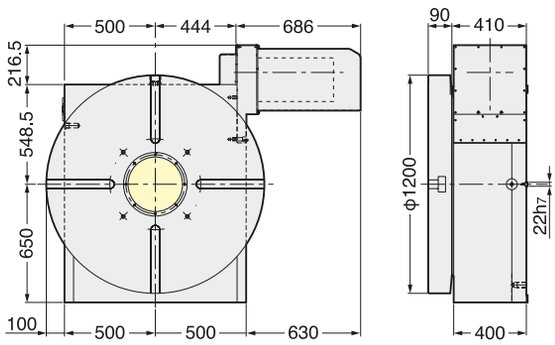
R RIGHT HAND WITH FACE PLATE AR21 CTRL




## CNC1201 PAT.

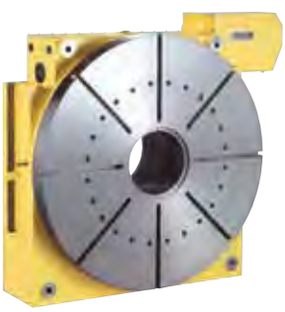


R RIGHT HAND WITH FACE PLATE AR21 CTRL

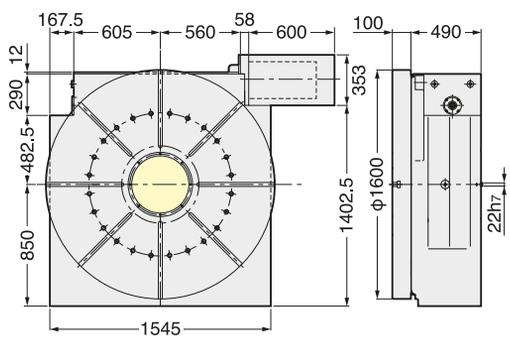



★ Please contact us about the back support for vertical use.

## CNC1600 PAT.



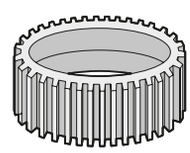
R RIGHT HAND WITH FACE PLATE AR21 CTRL

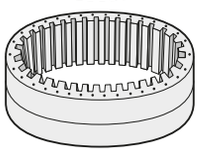


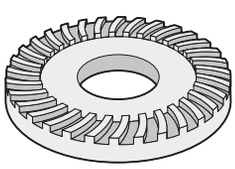

★ Please contact us about the back support for vertical use.

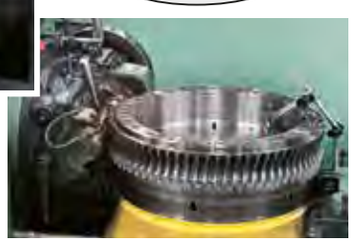
## Application of the Large Rotary Table

Machining of the gears with large module

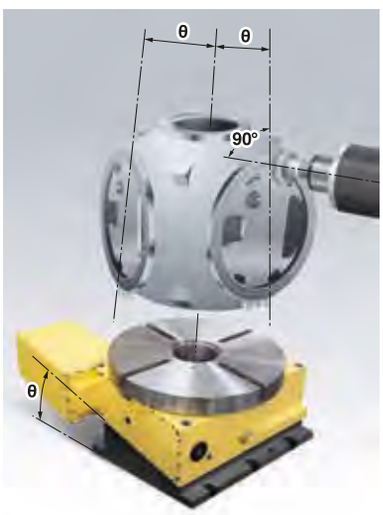








Hobbing of the gears with large module




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

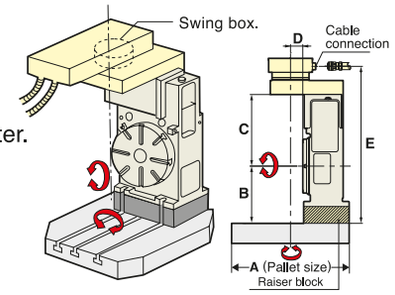
# TOP SIDE MOTOR MOUNTED CNC ROTARY TABLE

NIKKEN


CNC302T

## Ideal for automation of small parts by mounting of jig holder

Also ideal for B-axis of general-purpose horizontal machining center. Figure at right shows example of pallet mounting.
**Please specify A, B, C, D and E.**




**Option**

| ADD. AXIS | ACCURACY SPEC. | ROTARY JOINT | ULTRA PRECISIO |
|---|---|---|---|
| P.57 | P.99 | P.89 | P.87 |

**Accessories**

| SUPPORT TABLE | TAIL STOCK | SCROLL CHUCK | POWER CHUCK | CLAMP DEVICE | T-NUT |
|---|---|---|---|---|---|
| P.79 | P.81 | P.83 | P.84 | P.85 | P.86 |

## Specifications

| Item / Code No. | | CNC202T | CNC260T | CNC302T *5 |
|---|---|---|---|---|
| Diameter of Table | φmm | 200 | 260 | 300 |
| Diameter of Spindle Hole | φmm | φ60H7 φ40 | φ80H7 | φ80H7 |
| Center Height | mm | 150 | 170 | 170 |
| Width of T Slot | mm | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ |
| Clamping System | | Pneumatic*4 | Pneumatic*4 / Hydraulic | Pneumatic*4 / Hydraulic |
| Clamping Torque | N·m | 303 | 588 / 1568 | 588 / 1568 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 1.0 | 1.5 | 1.5 |
| Servo Motor | r/min | αiF4・3000 | αiF4・3000 | αiF4・3000 |
| MIN. Increment | | 0.001° | 0.001° | 0.001° |
| Rotation Speed*6 | r/min | 25.0 | 25.0 | 25.0 |
| Total Reduction Ratio | | 1/120 | 1/120 | 1/120 |
| Indexing Accuracy | sec | ±20 | 20 | 20 |
| Net Weight | kg | 70 | 160 | 165 |
| MAX. Work Load on the Table | Vertical kg | 100 | 175 | 175 |
| | Horizontal kg | —— | —— | —— |
| MAX. Thrust Load applicable on the Table | N | 18000 | 42480 | 42480 |
| | *1 FXL N·m | 542 | 1442 | 1442 |
| | FXL N·m | 690 | 2320 | 2320 |
| Guide Line of MAX. Unbalancing Load | *2 N·m | 50 | 60 | 60 |
| MAX. Work Inertia | Vertical $(\frac{GD^2}{4})$ kg·m² | 1.0 | 3.2 | 3.2 |
| Driving Torque | *3 N·m | 192 | 192 | 192 |

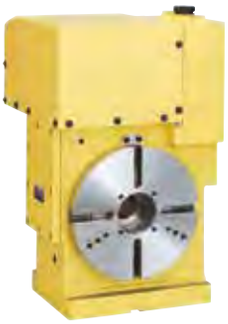
***1 This is the strength of the worm wheel without brake. It is applied against dynamic cutting thrust.**
***2 The guide line of MAX unbalancing load means the unbalancing load, when the rotary table is used with support table in vertical application. The guide line figure will be different according to the servo motor, please refer to ☞ P.57 for more detail.**
***3 Driving torque means the torque at MAX. rotation speed after acceleration. Driving torque is almost constant and independent from the load except unbalancing load is applied.**
*4 Air Intensifying Booster system is available if the supplied air pressure is under 0.5MPa or the brake torque is required to increase. ☞P.95 ***5 CNC302T** is semi-standard model.
***6** The table rotation speed when the motor rotates at 3000r/min. Depending on the application(unbalance of the jig,work) and the motor specification, the motor may not be able to rotate at 3000r/min.

# CNC202T, 260T, 302T

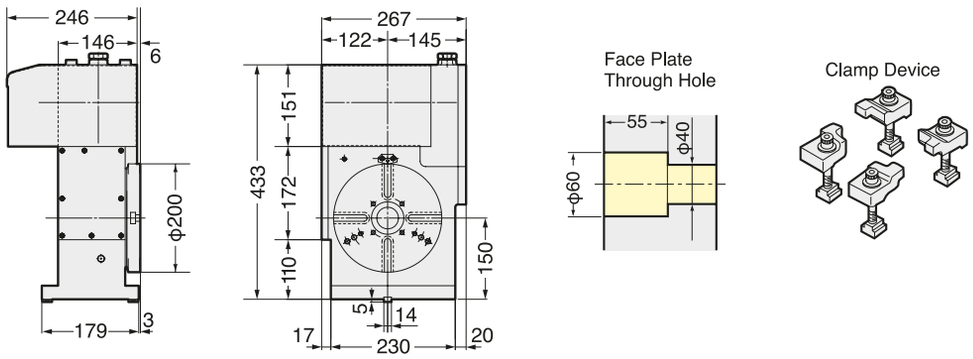
NIKKEN

External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

## CNC202T



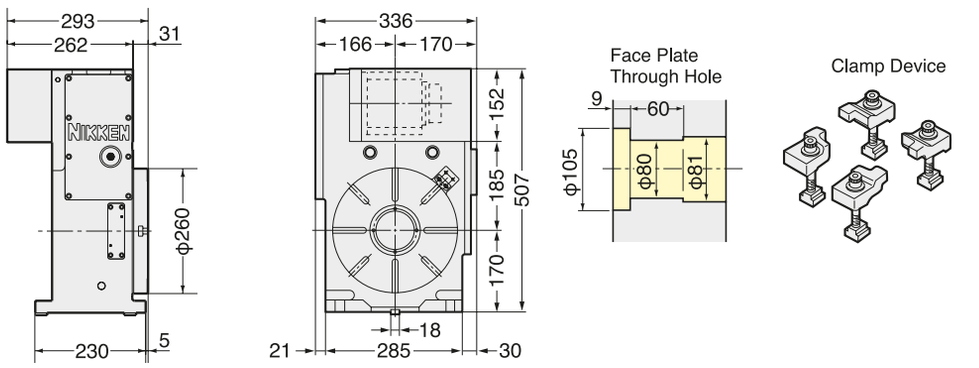
T TOP SIDE | WITH FACE PLATE | AR21 CTRL | EZ CTRL




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

## CNC260T

T TOP SIDE | WITH FACE PLATE | AR21 CTRL | EZ CTRL

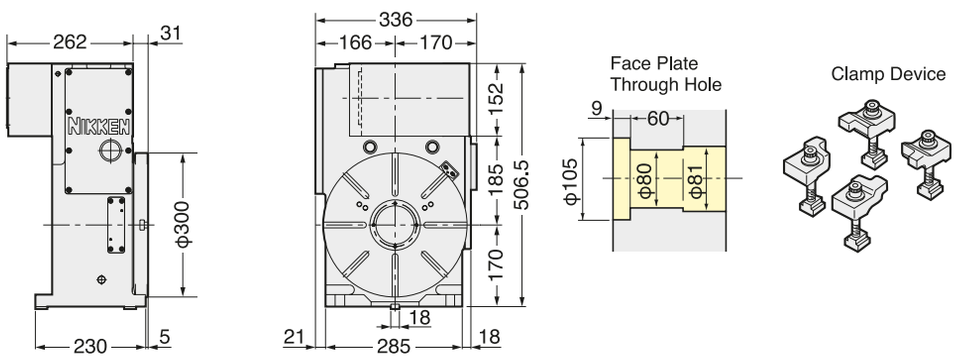



For the rotary table with pneumatic clamping, air purge function is provided inside the motor cover as standard.

## CNC302T

Center socket shown in photo is optional.

T TOP SIDE | WITH FACE PLATE | AR21 CTRL | EZ CTRL




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

## Specification of the Top Side Mounted CNC Rotary Table

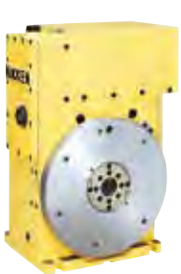


Photo with **CNC302T** without T slot.

Synchronors movement of 2 off **CNC401T**

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.

**CNC401T** is installed on **CNC600.**

**CNCB450T** is used for the tilting axis table of **5AX**-tilting rotary table.

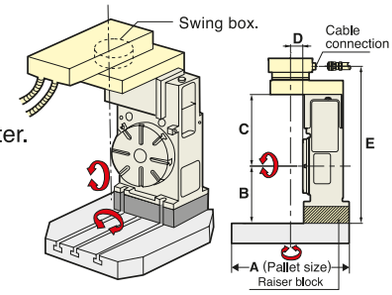
# TOP SIDE MOTOR MOUNTED CNC ROTARY TABLE

NIKKEN

CNC501T

## Ideal for automation of small parts by mounting of jig holder

Also ideal for B-axis of general-purpose horizontal machining center. Figure at right shows example of pallet mounting.
**Please specify A, B, C, D and E.**




**Option**

ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

**Accessories**

SUPPORT TABLE P.79 | TAIL STOCK P.81 | SCROLL CHUCK P.83 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86

## Specifications

| Item / Code No. | | CNC321T*4 | CNC401T | CNC501T | CNC601T |
|---|---|---|---|---|---|
| Diameter of Table | φmm | 320 | 400 | 500 | 600 |
| Diameter of Spindle Hole | φmm | φ105H7 | φ105H7 | φ130H7 | φ130H7 |
| Center Height | mm | 240 | 240 | 310 | 310 |
| Width of T Slot | mm | $12^{+0.018}_{0}$ | $14^{+0.018}_{0}$ | $14^{+0.018}_{0}$ | $14^{+0.018}_{0}$ |
| Clamping System | | Hydraulic | Hydraulic | Hydraulic | Hydraulic |
| Clamping Torque | N·m | 1760 | 1760 | 4655 | 4655 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 2.0 | 2.0 | 9.0 | 8.8 |
| Servo Motor | r/min | αiF12・2000 | αiF12・2000 | αiF22・2000 | αiF22・2000 |
| MIN. Increment | | 0.001° | 0.001° | 0.001° | 0.001° |
| Rotation Speed | r/min | 16.6 | 16.6 | 16.6 | 11.1 |
| Total Reduction Ratio | | 1/120 | 1/120 | 1/120 | 1/180 |
| Indexing Accuracy | sec | 15 | 15 | 15 | 15 |
| Net Weight | kg | 220 | 245 | 495 | 525 |
| MAX. Work Load on the Table | Vertical kg | 250 | 250 | 400 | 400 |
| | Horizontal kg | —— | —— | —— | —— |
| MAX. Thrust Load applicable on the Table | N | 53100 | 53100 | 150000 | 150000 |
| | *1 FXL N·m | 2648 | 2648 | 5709 | 5709 |
| | FXL N·m | 3840 | 3840 | 16650 | 16650 |
| Guide Line of MAX. Unbalancing Load | *2 N·m | 100 | 100 | 200 | 200 |
| MAX. Work Inertia | Vertical $(\frac{GD^2}{4})$ kg·m² | 8.0 | 8.0 | 19 | 37 |
| Driving Torque | *3 N·m | 576 | 576 | 576 | 864 |

**＊1 This is the strength of the worm wheel without brake. It is applied against dynamic cutting thrust.**
**＊2 The guide line of MAX unbalancing load means the unbalancing load, when the rotary table is used with support table in vertical application. The guide line figure will be different according to the servo motor, please refer to ☞P.57 for more detail.**
**＊3 Driving torque means the torque at MAX. rotation speed after acceleration. Driving torque is almost constant and independent from the load except unbalancing load is applied.**
＊4 **CNC321T** is semi-standard model.
★αiF22/4000 motor can be mounted on **CNC321T, 401T**. ★Total reduction ratio of 1/180 is also available for **CNC501T.**

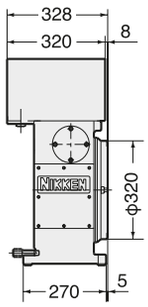
# CNC321T, 401T, 501T, 601T

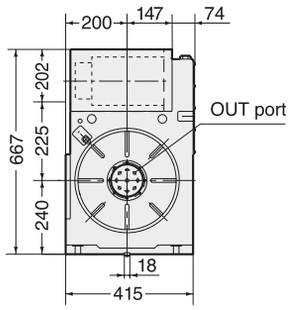
NIKKEN

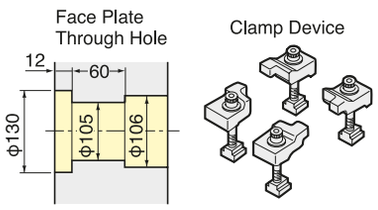
External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

## CNC321T

T TOP SIDE WITH FACE PLATE AR21 CTRL



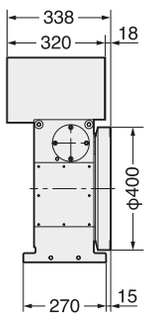



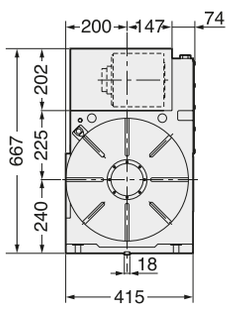

Rotary joint shown in layout is optional. In ports are located in back side.

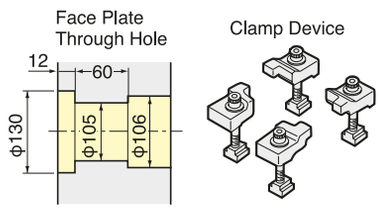
## CNC401T

★ Built-in type rotary joint can be mounted on **CNC401** refer ☞**P.89**

T TOP SIDE WITH FACE PLATE AR21 CTRL




Center socket shown in photo is optional. In ports are located in back side.

## CNC501T

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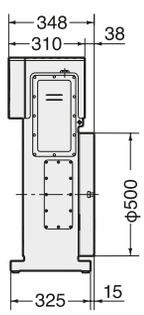
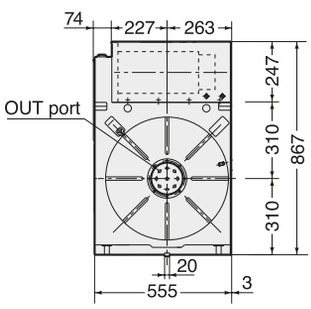
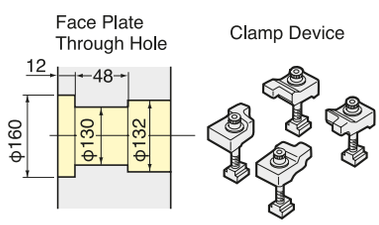


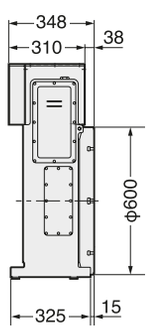



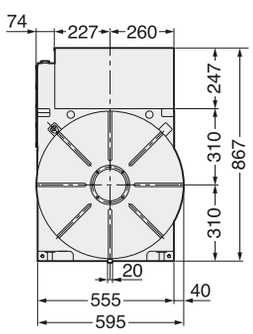



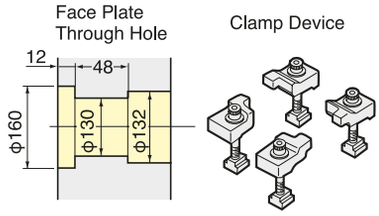

Rotary joint shown in layout is optional. In ports are located in back side.

## CNC601T

T TOP SIDE WITH FACE PLATE AR21 CTRL

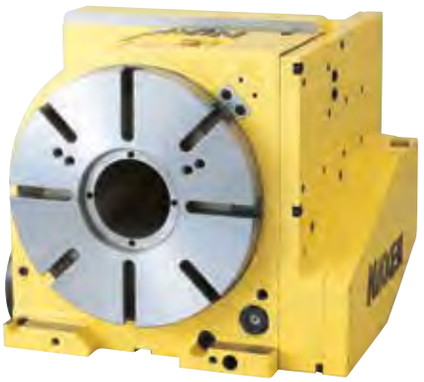



In ports are located in back side.

# BACK SIDE MOTOR MOUNTED CNC ROTARY TABLE NIKKEN



CNC260B

- Suitable for the machine which does not have so wide space for Y axis, such as the gantory type M/C or the M/C with sprash guard
- Also compatible with rotary joints
- Select among pneumatic, hydraulic, and air-hydro clamping systems

**Option**

ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

**Accessories**

SUPPORT TABLE P.79 | TAIL STOCK P.81 | SCROLL CHUCK P.83 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86

## Specifications

| Item / Code No. | | CNC180B | CNC202B | CNC260B | CNC302B*5 | CNC321B*5 | CNC401B |
|---|---|---|---|---|---|---|---|
| Diameter of Table | φmm | 180 | 200 | 260 | 300 | 320 | 400 |
| Diameter of Spindle Hole | φmm | φ60H7 φ40 | φ60H7 φ40 | φ80H7 | φ80H7 | φ105H7 | φ105H7 |
| Center Height | mm | 180 | 180 | 170 | 170 | 230 | 230 |
| Width of T Slot | mm | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ | $14^{+0.018}_{0}$ |
| Clamping System | | Pneumatic*4 | Pneumatic*4 | Pneumatic*4 / Hydraulic | Pneumatic*4 / Hydraulic | Hydraulic | Hydraulic |
| Clamping Torque | N·m | 303 | 303 | 588／1568 | 588／1568 | 1760 | 1760 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 0.4 | 0.4 | 1.7 | 1.8 | 7.0 | 7.0 |
| Servo Motor | r/min | αiF2·3000 | αiF4·3000 | αiF4·3000 | αiF4·3000 | αiF12·2000 | αiF12·2000 |
| MIN. Increment | | 0.001° | 0.001° | 0.001° | 0.001° | 0.001° | 0.001° |
| Rotation Speed*6 | r/min | 33.3 | 33.3 | 25.0 | 25.0 | 22.2 | 22.2 |
| Total Reduction Ratio | | 1/90 | 1/90 | 1/120 | 1/120 | 1/90 | 1/90 |
| Indexing Accuracy | sec | ±20 | ±20 | 20 | 20 | 15 | 15 |
| Net Weight | kg | 56 | 60 | 145 | 150 | 240 | 270 |
| MAX. Work Load on the Table | Vertical kg | 100 | 100 | 175 | 175 | 250 | 250 |
| | Horizontal kg | —— | —— | —— | —— | —— | —— |
| MAX. Thrust Load applicable on the Table | N | 18000 | 18000 | 42480 | 42480 | 53100 | 53100 |
| | *1 FXL N·m | 542 | 542 | 1442 | 1442 | 2648 | 2648 |
| | FXL N·m | 690 | 690 | 2320 | 2320 | 3840 | 3840 |
| Guide Line of MAX. Unbalancing Load | *2 N·m | 30 | 50 | 50 | 50 | 100 | 100 |
| MAX. Work Inertia | Vertical $(\frac{GD^2}{4})$ kg·m² | 0.4 | 1.0 | 3.2 | 3.2 | 6.4 | 6.4 |
| Driving Torque | *3 N·m | 72 | 144 | 192 | 192 | 432 | 432 |

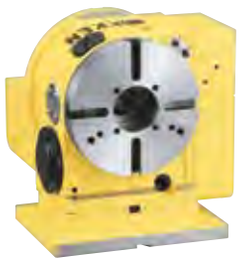
***1 This is the strength of the worm wheel without brake. It is applied against dynamic cutting thrust.**
***2 The guide line of MAX unbalancing load means the unbalancing load, when the rotary table is used with support table.**
**The guide line figure will be different according to the servo motor, please refer to ☞P.57 for more detail.**
***3 Driving torque means the torque at MAX. rotation speed after acceleration. Driving torque is almost constant and independent from the load except unbalancing load is applied.**
*4 Air Intensifying Booster system is available if the supplied air pressure is under 0.5MPa or the brake torque is required to increase. ☞ **P.95**
*5 **CNC302B, CNC321B** is semi-standard model.
*6 The table rotation speed when the motor rotates at 3000r/min. Depending on the application(unbalance of the jig,work) and the motor specification, the motor may not be able to rotate at 3000r/min. ★αiF4/5000 motor can be mounted on **CNC180B**.
★αiF8/4000 motor can be mounted on **CNC260B, 302B**.
★The air-hydraulic Booster is available, when the rotary table with hydraulic clamping system is used on the M/C without hydraulic source, please refer ☞ **P.95**.

# CNC180B, 202B, 260B, 302B, 321B, 401B

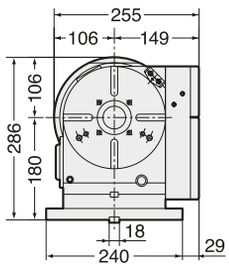
NIKKEN

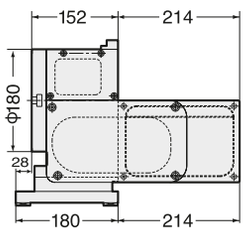
External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

## CNC180B

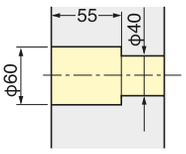


B BACK SIDE WITH FACE PLATE AR21 CTRL EZ CTRL

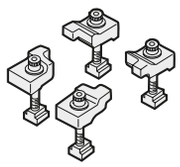



Face Plate Through Hole

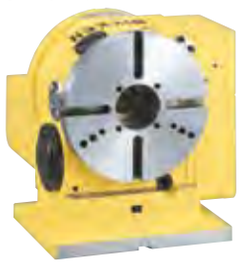



Clamp Device

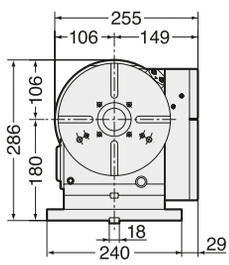


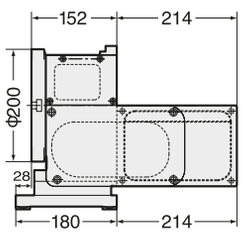
Air purge function is provided.

## CNC202B

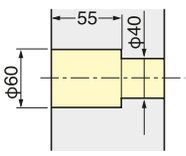


B BACK SIDE WITH FACE PLATE AR21 CTRL EZ CTRL

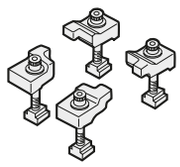



Face Plate Through Hole

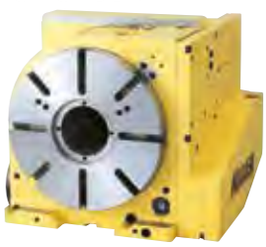



Clamp Device

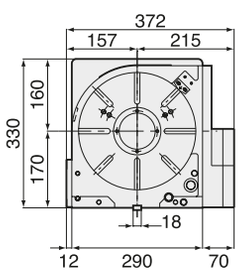


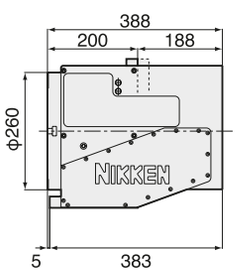
Air purge function is provided.

## CNC260B

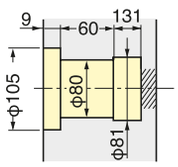


B BACK SIDE WITH FACE PLATE AR21 CTRL EZ CTRL

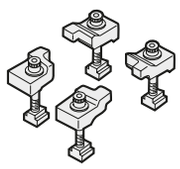



Face Plate Through Hole

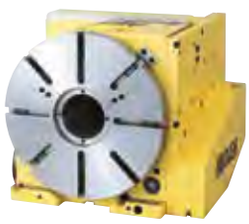



Clamp Device

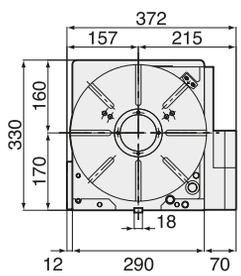


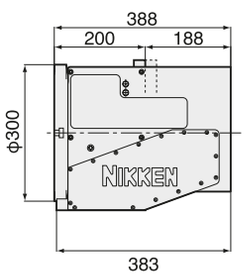
For the rotary table with pneumatic brake, air purge function is provided inside the motor cover as standard.

## CNC302B

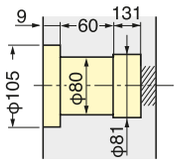


B BACK SIDE WITH FACE PLATE AR21 CTRL EZ CTRL

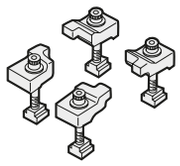



Face Plate Through Hole



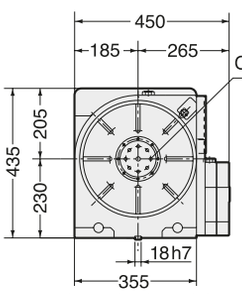

Clamp Device

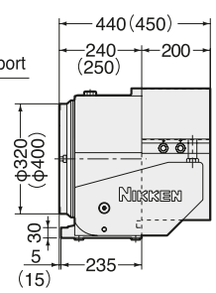


For the rotary table with pneumatic brake, air purge function is provided inside the motor cover as standard.

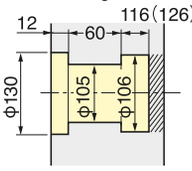
## CNC321B, CNC401B

B BACK SIDE WITH FACE PLATE AR21 CTRL




Face Plate Through Hole

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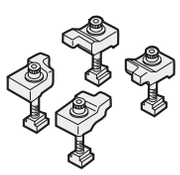


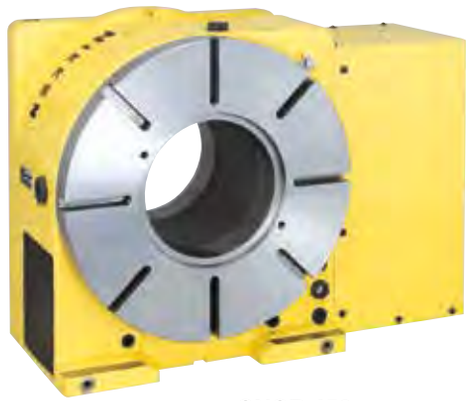
IN ports are located in left side.
( ):**CNC401B**

Center socket shown in photo & layout is optional.

★ Built-in type rotary joint can be mounted on **CNC321B & 401B**, refer to ☞**P.89**

# BIG BORE CNC ROTARY TABLE

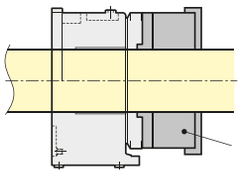
NIKKEN



CNCB 450

- Ideal for machining boring pipes for oil or natural gas
- Capable of cutting through-holes in work pieces
- Supports up to 20 + 1P rotary joint ports

**Example for the utilization for large diameter bar work**




**Option**

ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

**Accessories**

SUPPORT TABLE P.79 | TAIL STOCK P.81 | SCROLL CHUCK P.83 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86

## Specifications

BIG BORE CNC Rotary Tables are all semi-standard models. Please contact us.

| Item / Code No. | | | CNCB350 | CNCB450 | CNCB630 |
|---|---|---|---|---|---|
| Diameter of Table | | φmm | 350 | 450 | 630 |
| Diameter of Spindle Hole | | φmm | φ154H7 | φ205H7 | φ345H7 |
| Center Height | | mm | 230 | 280 | 380 |
| Width of T Slot | | mm | 14 | 14 | 14 |
| Clamping System | | | Hydraulic | Hydraulic | Hydraulic |
| Clamping Torque | | N·m | 3331 | 3870 | 6550 |
| Table Inertia at Motor Shaft | | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 2.9 | 2.8 | 4.8 |
| Servo Motor | | r/min | αiF12・2000 | αiF12・2000 | αiF22・2000 |
| MIN. Increment | | | 0.001° | 0.001° | 0.001° |
| Rotation Speed | | r/min | 22.2 | 16.6 | 11.1 |
| Total Reduction Ratio | | | 1/90 | 1/120 | 1/180 |
| Indexing Accuracy | | sec | 15 | 15 | 15 |
| Net Weight | | kg | 245 | 330 | 750 |
| MAX. Work Load on the Table | Vertical | kg | 250 | 350 | 400 |
| | Horizontal | kg | 500 | 700 | 800 |
| MAX. Thrust Load applicable on the Table | | N | 5300 | 63720 | 250000 |
| | *1 | F×L N·m | 2648 | 3531 | 5297 |
| | | F×L N·m | 3840 | 5990 | 33000 |
| Guide Line of MAX. Unbalancing Load | *2 | N·m | 100 | 150 | 300 |
| MAX. Work Inertia | Vertical | $(\frac{GD^2}{4})$ kg·m² | 6.4 | 17.0 | 40.0 |
| Driving Torque | *3 | N·m | 432 | 576 | 1584 |

**＊1 This is the strength of the worm wheel without brake. It is applied against dynamic cutting thrust.**
**＊2 The guide line of MAX unbalancing load means the unbalancing load, when the rotary table is used with support table in vertical application. The guide line figure will be different according to the servo motor, please refer to ☞ P.57 for more detail.**
**＊3 Driving torque means the torque at MAX. rotation speed after acceleration. Driving torque is almost constant and independent from the load except unbalancing load is applied.**

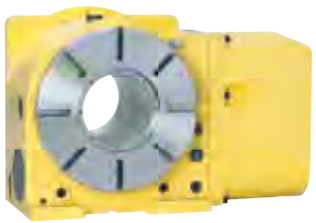
★Total reduction ratio of 1/180 is also available for **CNCB450.** ★αiF22/4000 motor can be mounted on **CNCB350, 450.**

# CNCB350, 450(T), 630

NIKKEN

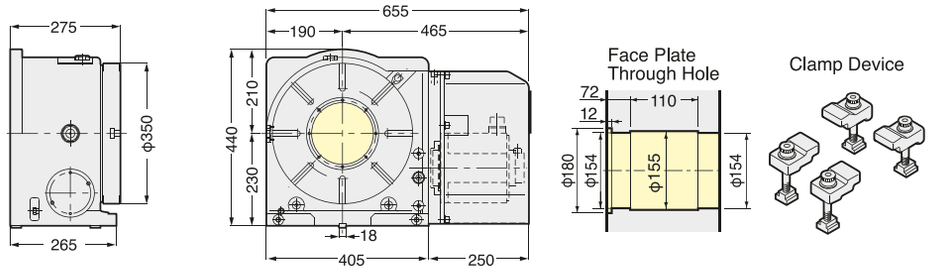
External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

## CNCB350

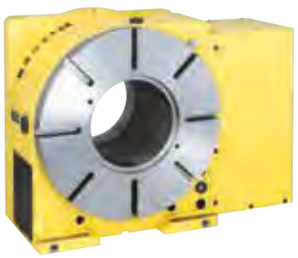


R RIGHT HAND | WITH FACE PLATE | AR21 CTRL

### Ultra Big Bore (ϕ154mm) Specification

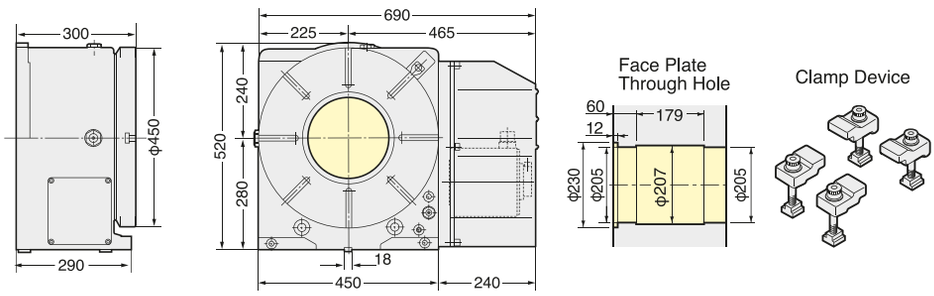



## CNCB450



R RIGHT HAND | L LEFT HAND | WITH FACE PLATE | AR21 CTRL

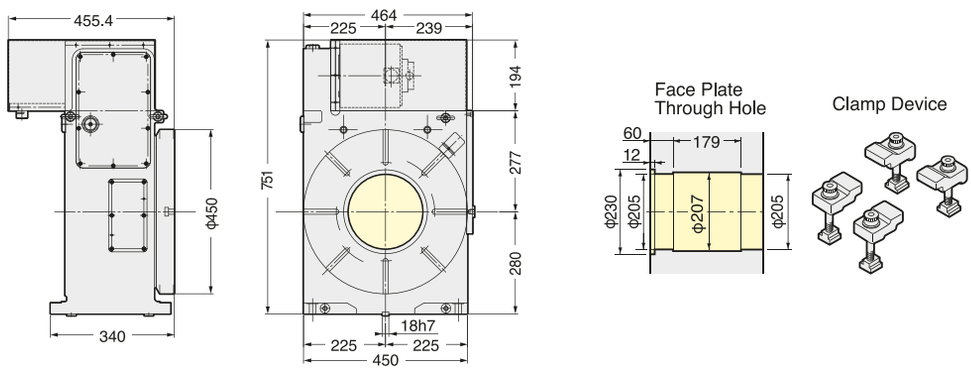
### Ultra Big Bore (ϕ205mm) Specification



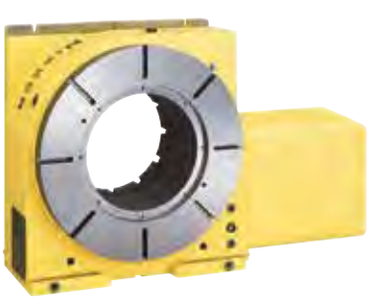

## CNCB450T

WITH FACE PLATE | AR21 CTRL

### Ultra Big Bore (ϕ205mm) Specification

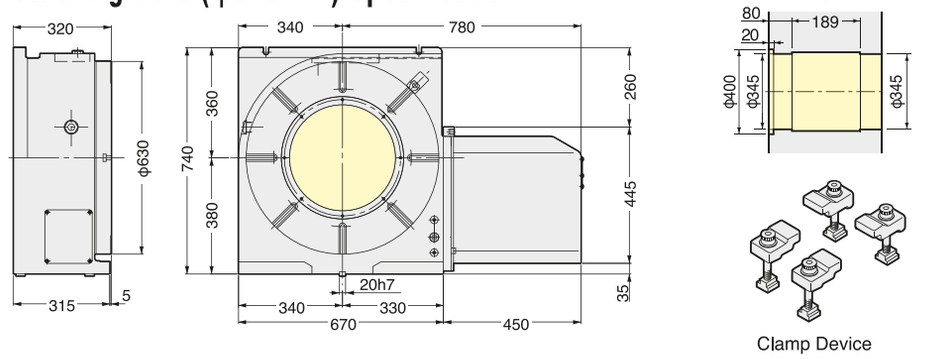



## CNCB630



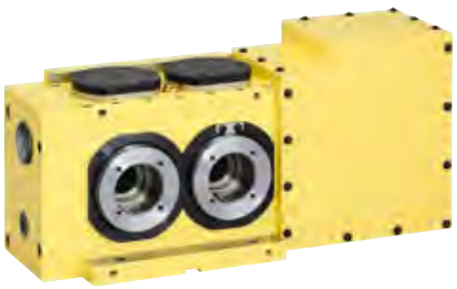
R RIGHT HAND | WITH FACE PLATE | AR21 CTRL

### Ultra Big Bore (ϕ345mm) Specification



# MULTI-SPINDLE CNC ROTARY TABLE

NIKKEN



CNC100-2W

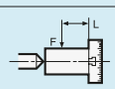
- Multi-Spindle (2, 3 & 4 spindles) CNC rotary table series for rationalization of machining of small size work pieces (φ3～100mm)
- Max. number of spindles CNC100 : 4 spindles, CNC180 : 4 spindles, CNC202 : 4 spindles, CNC260 : 2 spindles. Please contact us
- Ideal for small items and mass-produced parts


Option: ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

Accessories: SUPPORT TABLE P.79 | TAIL STOCK P.81 | SCROLL CHUCK P.83 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86

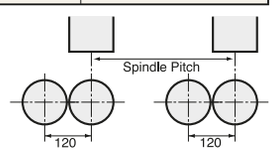

## Specifications

Multi-Spindle CNC Rotary Tables are all semi-standard models. Please contact us. ( ):High Speed type Please contact us.

| Item / Code No. | | CNC100-2W,-3W,-4W | | | CNC180-2W | CNC202-2W | CNC260-2W |
|---|---|---|---|---|---|---|---|
| Diameter of Table | φmm | 105 | | | 180 | 200 | 260 |
| Diameter of Spindle Hole | φmm | 60H7 30 | | | 60H7 40 | 60H7 40 | 80H7 |
| Number of spindles (Pitch) | mm | 2,3,4×120 | | | 2×250 | 2×250 | 2×350 |
| Center Height | mm | 105 | | | 175 | 175 | 220 |
| Width of T Slot | mm | $16^{+0.018}_{0}$ | | | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ |
| Clamping System | | Pneumatic*3 | | | Pneumatic*3 | Pneumatic*3 | Pneumatic*3 / Hydraulic |
| Clamping Torque | N·m | 147 | | | 303 | 303 | 588／1568 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 0.13 | 0.16 | 0.2 | 0.12 | 0.13 | 0.7 |
| Servo Motor | r/min | αiF2・2000(αiS4・2000) | | αiF4・2000 | αiF4・2000 | αiF8・2000 | αiF8・2000 |
| MIN. Increment | | 0.001° | | | 0.001° | 0.001° | 0.001° |
| Rotation Speed | r/min | 11.1(44.4) | | | 22.2 | 22.2 | 16.6 |
| Total Reduction Ratio | | 1/180(1/45) | | | 1/90 | 1/90 | 1/120 |
| Indexing Accuracy | sec | ±30 | | ±45 | ±20 | ±20 | 20 |
| Net Weight | kg | 70 | 90 | 120 | 115 | 120 | 320 |
| MAX. Work Load on the Table | Vertical  kg | 15 | | | 100 | 100 | 175 |
| | Horizontal  kg | 30 | | | 200 | 200 | 350 |
| MAX. Thrust Load applicable on the Table |  N | 3920 | | | 18000 | 18000 | 42480 |
| | *1  F×L N·m | 275 | | | 542 | 542 | 1442 |
| |  F×L N·m | 98 | | | 690 | 690 | 2320 |
| MAX. Work Inertia | Vertical  $(\frac{GD^2}{4})$ kg·m² | 0.019 (0.07Horizontal) | | | 0.5 | 0.5 | 1.9 |
| Driving Torque | *2  N·m | 72 | | | 72 | 144 | 192 |

**＊1 This is the strength of the worm wheel without brake. It is applied against dynamic cutting thrust.**
**＊2 Driving torque means the torque at MAX. rotation speed after acceleration.**
**Driving torque is almost constant and independent from the load except unbalancing load is applied.**
**＊3** Air Intensifying Booster system is available if the supplied air pressure is under 0.5MPa or the brake torque is required to increase. ☞ P.95

**★ Min. pitch between spindles CNC100 : 120mm, CNC180 : 250mm, CNC202 : 250mm, CNC260 : 320mm.** Please contact us when the different pitch is required.
**★ 4 spindles table to suit 2 spindles M/C is available.**
**★ 5 or 6 spindles CNC rotary table is also available.**



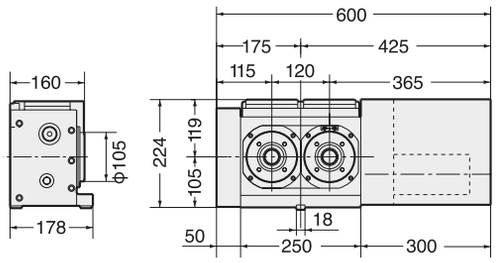
# CNC100-2W, 3W, 4W, CNC180-2W, CNC202-2W, CNC260-2W

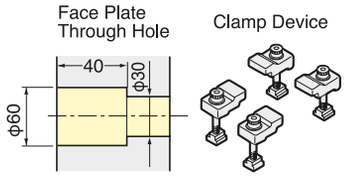
NIKKEN

External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

## CNC100-2W

R RIGHT HAND L LEFT HAND W/O FACE PLATE AR21 CTRL EZ CTRL

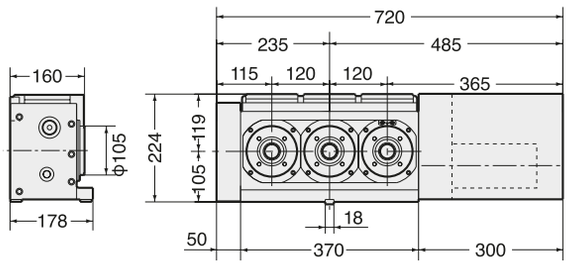


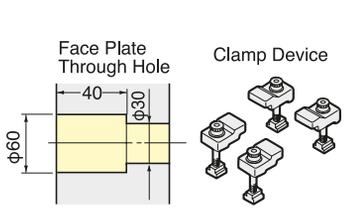




Air purge function is provided inside the motor cover as standard.
If you need a knock hole for positioning or a key way on the table surface, please contact us.

## CNC100-3W

R RIGHT HAND L LEFT HAND W/O FACE PLATE AR21 CTRL EZ CTRL

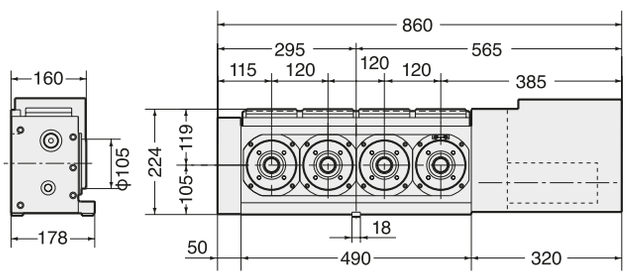


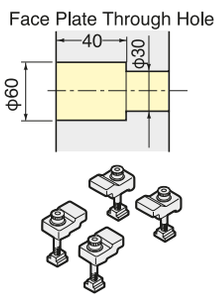




Air purge function is provided inside the motor cover as standard.
If you need a knock hole for positioning or a key way on the table surface, please contact us.

## CNC100-4W

R RIGHT HAND L LEFT HAND W/O FACE PLATE AR21 CTRL EZ CTRL



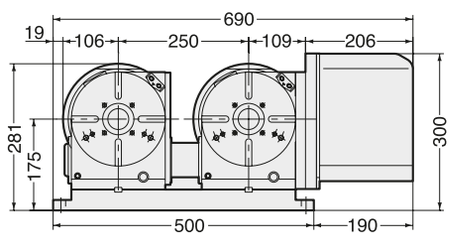




Air purge function is provided inside the motor cover as standard.
If you need a knock hole for positioning or a key way on the table surface, please contact us.

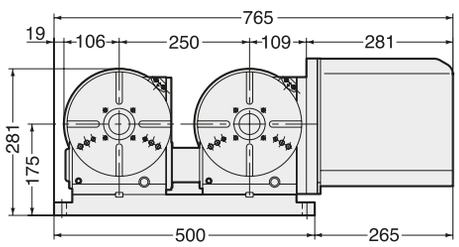
## CNC180-2W, CNC202-2W

CNC202-2W

R RIGHT HAND L LEFT HAND WITH FACE PLATE AR21 CTRL EZ CTRL



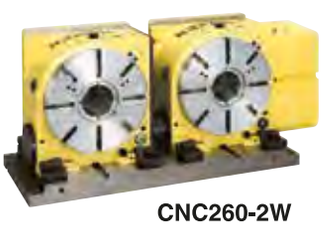

CNC180-2W




CNC202-2W

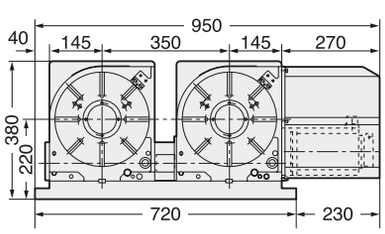
Air purge function is provided inside the motor cover as standard.

## CNC260-2W Pneumatic Clamping Torque UP 588Nm



CNC260-2W

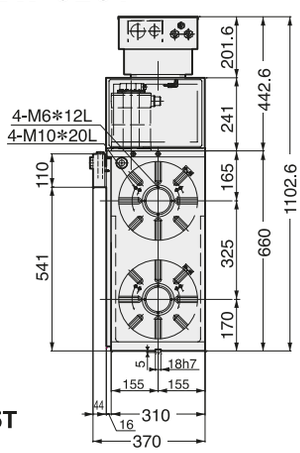
R RIGHT HAND L LEFT HAND WITH FACE PLATE AR21 CTRL EZ CTRL




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

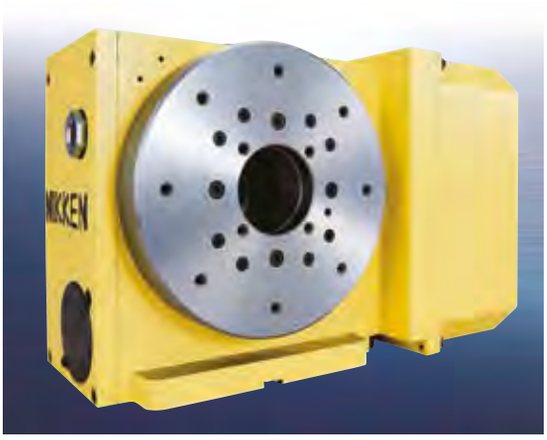
## CNC260-2W-325T

CNC260-2W-325T



# NCT CNC ROTARY TABLE

## New HIGH CLAMPING TORQUE COMPACT CNC ROTARY TABLE



Small but Strong

# NCT200

Option

| ADD. AXIS | ACCURACY SPEC. | ROTARY JOINT | ULTRA PRECISIO |
|---|---|---|---|
| P.57 | P.99 | P.89 | P.87 |

Accessories

| SUPPORT TABLE | TAIL STOCK | SCROLL CHUCK | POWER CHUCK | CLAMP DEVICE | T-NUT |
|---|---|---|---|---|---|
| P.79 | P.81 | P.83 | P.84 | P.85 | P.86 |

## 900Nm

### Super-high Clamping System

**Reliable indexing accuracy enhances profitability**

Super-high Clamping torque 900Nm can be generated by air supply only. Strong clamping torque and better indexing accuracy enhance productivity.

## 25%UP

### High Rigidity of New Driving System

**Maintain high accuracy over the long term**
**Reduce the total maintenance cost**

Redesigning the driving system, the rigidity increases 25%. High durability of the mechanism is allowed to maintain high accuracy and to accomplish high precision machining operation over the long term.

## High Speed

### Z Type is also Available

**Reducing cycle time enhances productivity**

High speed Z type is also available.
Setting up gear ratio 1/2 is allowed rotation speed to be double.

## Great Customization

**Without faceplate models are now available. A variety of options enhance the great utility for your applications.**

### Face Plate

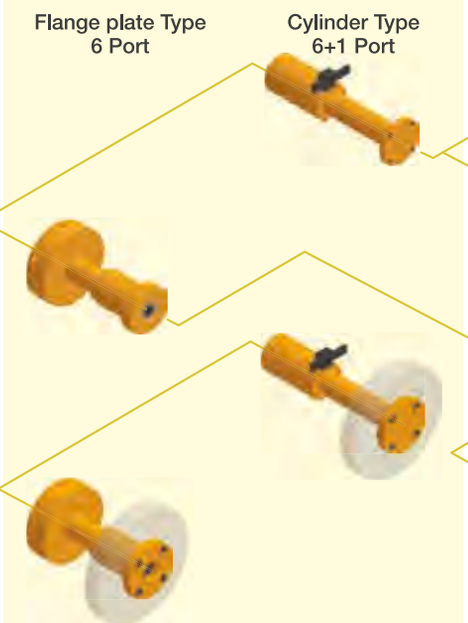
NCT200E

W/O Face Plate

NCT200

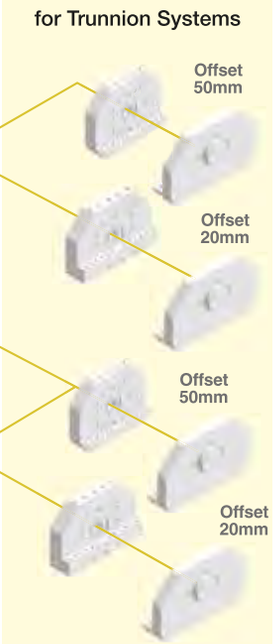
With Face Plate

### Rotary Joint




### Angular Plate

for Trunnion Systems




### Support Table

With Clamping System

TAT-105N-135

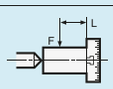
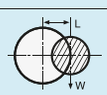
W/O Clamping System

CST-100-135

Ultra-Slim Model

TAS-100N

## Specifications

| Item / Code No. | | With Face Plate | | W/O Face Plate | |
|---|---|---|---|---|---|
| | | Standerd | High Speed | Standerd | High Speed |
| Right Hand Mounted Moter | | **NCT200** | **NCTZ200** | **NCT200E** | **NCTZ200E** |
| Left Hand Mounted Moter | | **NCT200L** | **NCTZ200L** | **NCT200EL** | **NCTZ200EL** |
| Diameter of Table | ϕmm | 200 | 200 | 130 | 130 |
| Diameter of Spindle Hole | ϕmm | ϕ60H7 ϕ40 | ϕ60H7 ϕ40 | ϕ60H7 ϕ40 | ϕ60H7 ϕ40 |
| Center Height | mm | 135 | 135 | 135 | 135 |
| Clamping System | | Pnematic*4 | Pnematic*4 | Pnematic*4 | Pnematic*4 |
| Clamping Torque | N·m | 900 | 900 | 900 | 900 |
| Table Inertia at Motor Shaft | kg·m²X10⁻³ | 0.1 | 0.1 | 0.1 | 0.1 |
| Servo Motor ($\frac{GD^2}{4}$) | r/min | αiF4·3000 | αiF4·3000 | αiF4·3000 | αiF4·3000 |
| MIN. Increment | | 0.001 | 0.001 | 0.001 | 0.001 |
| Rotation Speed*5 | r/min | 33.3 | 66.6 | 33.3 | 66.6 |
| Total Reduction Ratio | | 1/90 | 1/45 | 1/90 | 1/45 |
| Indexing Accuracy | sec | ±20 | ±20 | ±20 | ±20 |
| Net Weight | kg | 65 | 65 | 62 | 62 |
| MAX. Work Load on the Table | Vertical  kg | 100 | 100 | 100 | 100 |
| | Horizontal  kg | 200 | 200 | 200 | 200 |
| MAX. Thrust Load applicable on the Table |  N | 18000 | 18000 | 18000 | 18000 |
| | *1  FXL N·m | 677 | 677 | 677 | 677 |
| |  FXL N·m | 690 | 690 | 690 | 690 |
| Guide Line of MAX. Unbalancing Load | *2  N·m | 60 | 30 | 60 | 30 |
| MAX. Work Inertia | Vertical  ($\frac{GD^2}{4}$) kg·m² | 1.1 | 0.5 | 1.1 | 0.5 |
| Driving Torque | *3  N·m | 151 | 121 | 151 | 121 |

**∗1 This is the strength of the worm wheel without face plate clamping. It is applied against dynamic cutting thrust.**
**∗2 The guide line of MAX unbalancing load means the unbalancing load, when the rotary table is used with support table in vertical application. The guide line figure will be different according to the servo motor, please refer ☞P.57 for more detail.**
**∗3 Driving torque means the torque at MAX. rotation speed after acceleration. Driving torque is almost constant and independent from the load except unbalancing load is applied.**
∗4 Air Intensifying Booster system is available if the supplied air pressure is under 0.5MPa or the brake torque is required to increase. ☞ **P.95**
∗5 The table rotation speed when the motor rotates at 3000r/min. Depending on the application(unbalance of the jig,work) and the motor specification, the motor may not be able to rotate at 3000r/min.
**★Standard faceplate is without T slot. T slot is available as an option. Please contact us.**
★6" (Chuck plate : **X-6B**) and 7" (Chuck plate : **X-7A**) can be mounted for Face Plate with T slots.

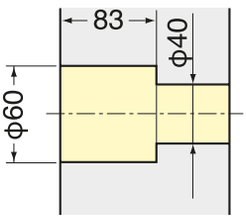
# DIMENSIONS OF NCT200

NIKKEN

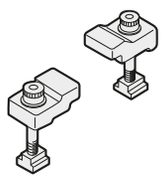
## NCT200 (With Face Plate)

(Photo) **NCT200FA**

**Face Plate Through Hole**

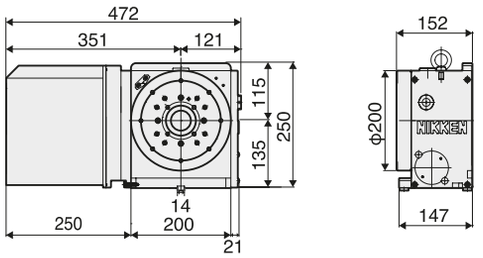



**Clamp Device**

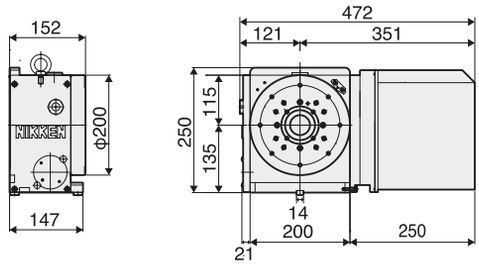


R RIGHT HAND | L LEFT HAND | WITH FACE PLATE | AR21 CTRL | EZ CTRL

### Left Hand : NCT200LFA

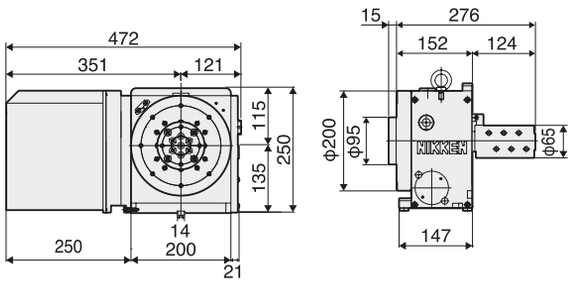



### Right Hand : NCT200FA



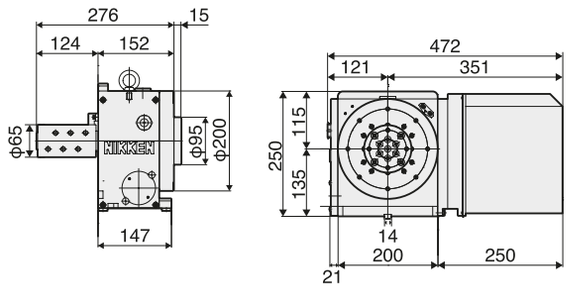

### Left Hand : With Cylinder type Rotary Joint

**NCT200L**+Clinder type Rotary Joint(6+1 Ports)
**RT-NC200SD-6+1-L***1



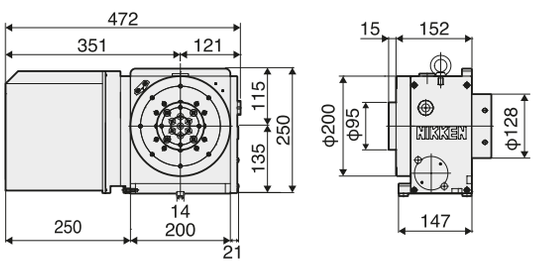

### Right Hand : With Cylinder type Rotary Joint

**NCT200**+Clinder type Rotary Joint(6+1 Ports)
**RT-NC200SD-6+1-R***1



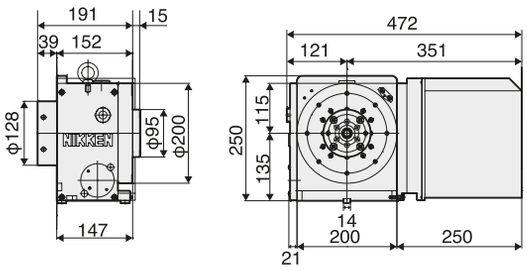

### Left Hand : With Flange Plate type Rotary Joint

**NCT200L**+Flange Plate type Rotary Joint(6 Ports)
**RN-NC200SD-6+N-F***1




### Right Hand : With Flange Plate type Rotary Joint

**NCT200**+Flange Plate type Rotary Joint(6 Ports)
**RN-NC200SD-6+N-F***1



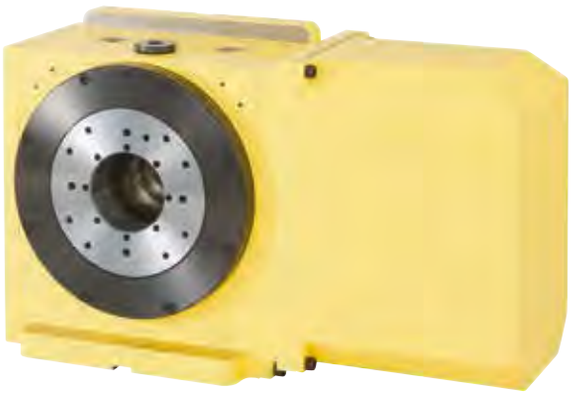

External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

*1 **RT- / RN** is Code No. of Rotay Joint.

# DIMENSIONS OF NCT200E

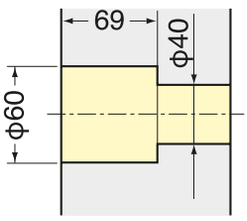
NIKKEN

## NCT200E (W/O Face Plate)

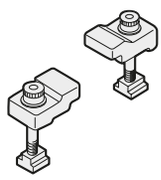


(Photo) **NCT200EFA**

**Face Plate Through Hole**

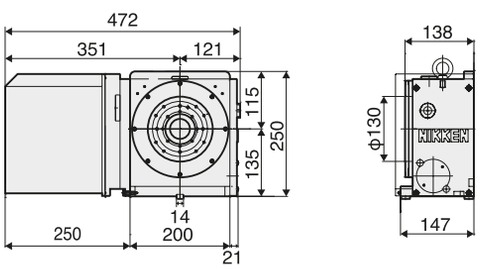



**Clamp Device**

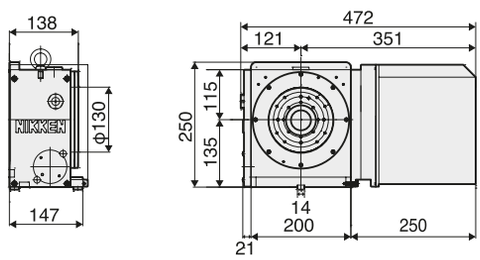


R RIGHT HAND | L LEFT HAND | W/O FACE PLATE | AR21 CTRL | EZ CTRL

### Left Hand : NCT200ELFA

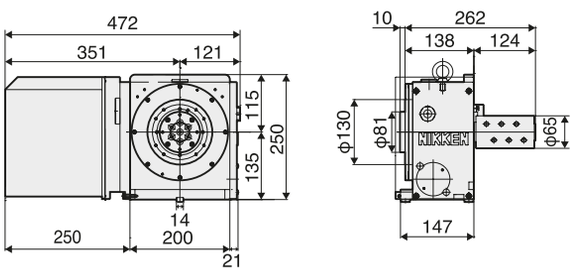



### Right Hand : NCT200EFA



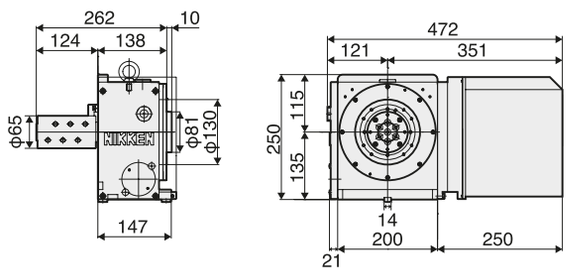

### Left Hand : With Cylinder type Rotary Joint

**NCT200EL**+Clinder type Rotary Joint(6+1 Ports)
**RT-NC20ESD-6+1-L***1



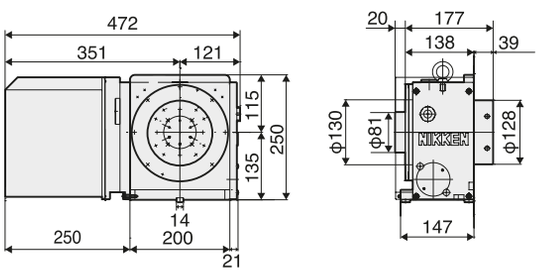

### Right Hand : With Cylinder type Rotary Joint

**NCT200E**+Clinder type Rotary Joint(6+1 Ports)
**RT-NC20ESD-6+1-R***1



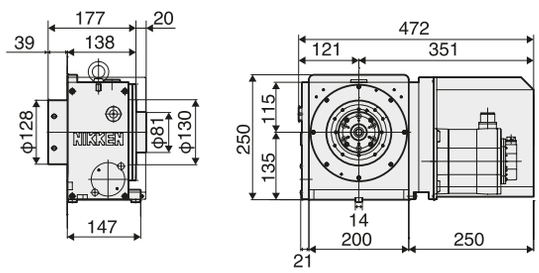

### Left Hand : With Flange Plate type Rotary Joint

**NCT200EL**+Flange Plate type Rotary Joint(6 Ports)
**RN-NC20ESD-6+N-F***1




### Right Hand : With Flange Plate type Rotary Joint

**NCT200E**+Flange Plate type Rotary Joint(6 Ports)
**RN-NC20ESD-6+N-F***1

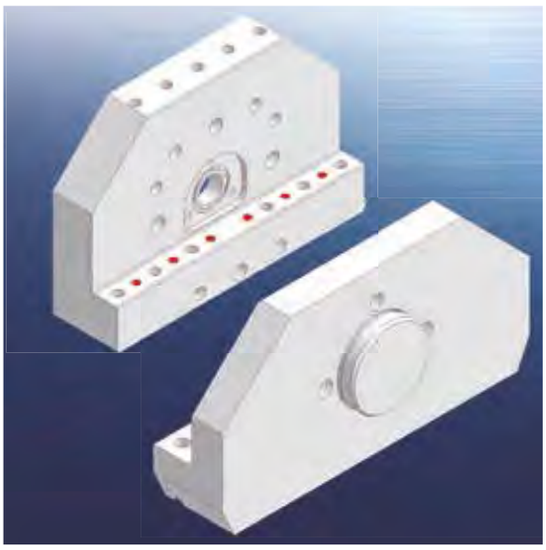



External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

*1 **RT- / RN** is Code No. of Rotay Joint.

# ANGULAR PLATE FOR NCT200E

NIKKEN

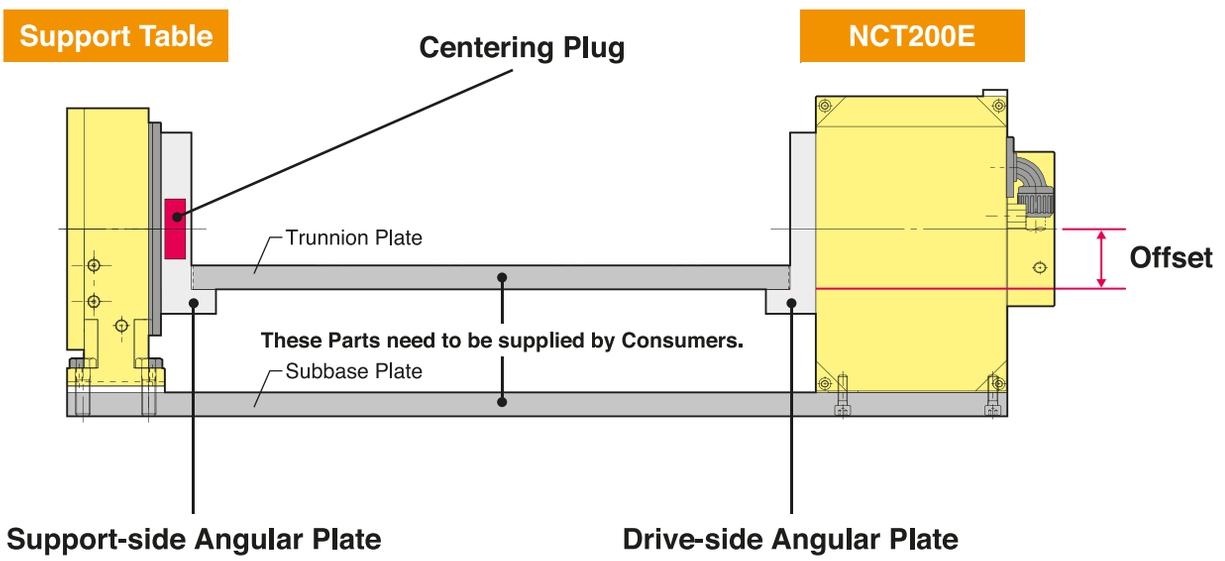


**Model without faceplate: Custom Angular plates for use with the NCT200E. When combined with the NCT200E, they enable configuration of compact trunnion applications that maximize space inside the machine.**

## Trunnion Applications Utilize the NCT's High Rigidity and Powerful Clamping Capability for More Efficient Utilization of Limited Space.

The NCT200 series, which can reliably drive trunnion applications with its powerful clamping capability and high rigidity exceeding the norm for this product class, is now provided with angle plates as a standard accessory. When combined with the NCT200E without faceplate, they allow application configuration that utilizes space inside the machine to the maximum.

### Ex.) Trunnion Application with NCT200E and Angular Plates




### Lineup Of Two Types for Internal or External Rotary Joints

A lineup of two types of drive-side angle plate is available for use in combination with the NCT200E to match the rotary joint specification. Specify the type of angle plate you require according to the componentsor applications.

### 20 mm / 50 mm Selectable Offset

In addition, a lineup of two offset specifications is available for both the drive-side Angular plate and support-side Angular plate. This allows you to configure the optimal application to match the component size.

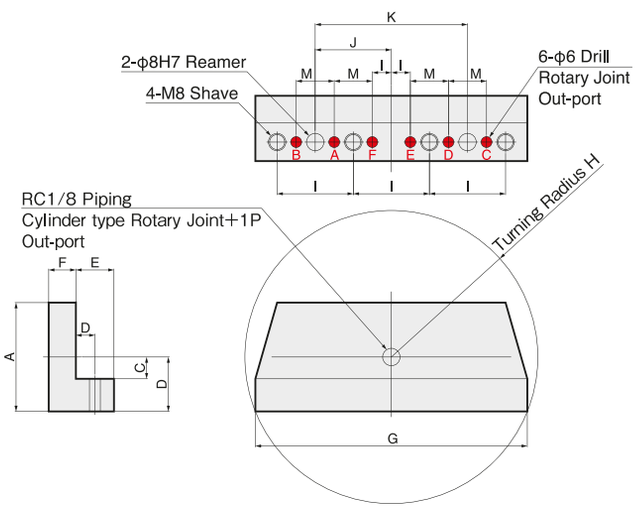
# SPECIFICATION OF ANGULAR PLATE FOR NCT200E NIKKEN

Explanation of the Code No.)

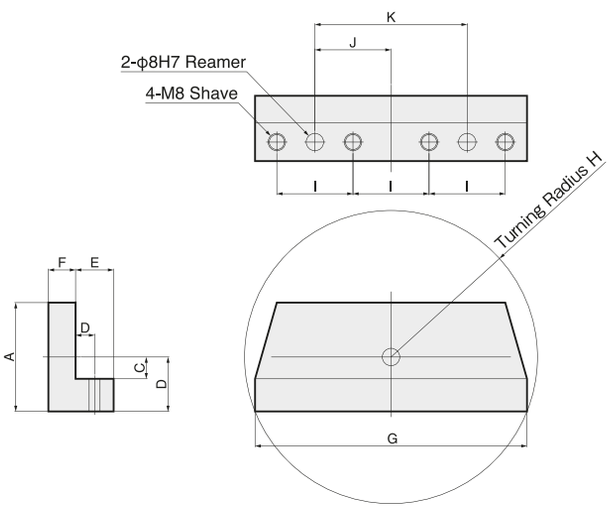
**AP-NC200E-SD-RT6+1-20**

| | | | | |
|---|---|---|---|---|
| Angular Plate Code No. | Product Code No. | SD··· Standard<br>SP··· Special | Number of Ports of Rotary Joint<br>RT··· Cylinder type<br>RN··· Flange Plate type<br>N ··· Non (Support-side Only) | Offset<br>20 ··· 20mm<br>50 ··· 50mm |

## Drive-side




## Support-side



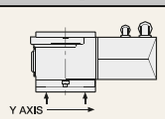

## Specifications

| Subject Models | | type | Offset | Code No. | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Drive-side | NCT200E | Cylinder type Rotary Joint Ports Including | 20mm | AP-NC200E-SD-RT6+1-20 | 133 | 53 | 20 | 11 | 20 | 25 | 200 | 107 | 60 | 60±0.01 | 120±0.01 |
| | | | 50mm | AP-NC200E-SD-RT6+1-50 | 150 | 70 | 50 | | | | | 114 | | | |
| | | Flange Plate type Rotary Joint Ports Including | 20mm | AP-NC200E-SD-RN6-20 | 133 | 53 | 20 | | | 35 | | 113 | | | |
| | | | 50mm | AP-NC200E-SD-RN6-50 | 150 | 70 | 50 | | | | | 114 | | | |
| Support-side | TAS-100N | with Centering Plug | 20mm | AP-TAS100-SD-N-20 | 105 | 53 | 20 | 16 | 25 | 20 | 200 | 113 | 60 | 60±0.01 | 120±0.01 |
| | | | 50mm | AP-TAS100-SD-N-50 | 122 | 70 | 50 | | | | | 114 | | | |
| | TAT-105N-135 | with Centering Plug | 20mm | AP-TAT105-SD-N-20 | 105 | 53 | 20 | | | | | 113 | | | |
| | | | 50mm | AP-TAT105-SD-N-50 | 122 | 70 | 50 | | | | | 114 | | | |

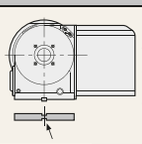
The rotary joint is not included in the set of the angular plate. Please order both angular plate and rotary joint.

## ⚠ Check point for trunnion fixture

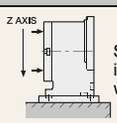
①When installing the table onto the sub-base, measure and check as follows.




Parallelism between table & sub-base is recommended within 0.01mm

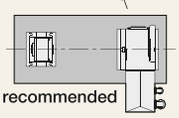


Difference between table center and sub-base center is recommended within 0.02mm

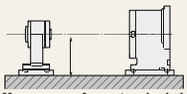



Squareness of table is recommended within 0.02mm

②Install the table & support table onto the M/C as follows.



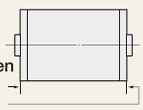
Center lines are recommended within 0.02mm



Difference of center height is recommended within 0.01mm

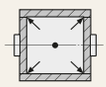
③Trunion fixture is recommended to be aligned as follows.

⚠ After installing the trunion fixture jig, if you want to drive it with manual pulse generator, the magnification of the manual pulse generator should be X1. Never drive at X10 or X100.



Squareness between center line & these faces is important

Center of both side are recommended within 0.01mm



Squareness is important

# NSV ROTARY HIRTH COUPLING INDEX


- Ideal for deep cutting of highly rigid material
- Indexing Accuracy : ±2"
- No Lifting up of Table at Indexing Time.
  (Built-in 3 pieces of Hirth Coupling) **JAPAN : PAT.**

**Option**

ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

**Accessories**

SUPPORT TABLE P.79 | TAIL STOCK P.81 | SCROLL CHUCK P.83 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86

## Specifications

| Item / Code No. | | NSVZ180 | NSVZ300 | NSVX400 | NSVX500 | NSVX400T |
|---|---|---|---|---|---|---|
| Diameter of Table | φmm | 180 | 300 | 400 | 500 | 400 |
| Diameter of Spindle Hole | φmm | φ60H7 φ30 | φ60H7 φ52 | φ80H7 | φ80H7 | φ80H7 |
| Center Height | mm | 135 | 170 | 240 | 310 | 240 |
| Width of T Slot | mm | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ | $14^{+0.018}_{0}$ | $14^{+0.018}_{0}$ | $14^{+0.018}_{0}$ |
| Clamping System | | Hydraulic | Hydraulic | Hydraulic | Hydraulic | Hydraulic |
| Clamping Torque | N·m | 910 | 2155 | 5880 | 5880 | 5880 |
| Table Inertia at Motor Shaft $(\frac{GD^2}{4})$ | kg·m²×10⁻³ | 0.11 | 0.16 | 2.9 | 3.9 | 2.9 |
| Servo Motor | r/min | αiF2·2000 | αiF4·2000 | αiF12·2000 | αiF12·2000 | αiF12·2000 |
| MIN. Increment | | 1° | 1° | 1°*/0.001° | 1°*/0.001° | 1°*/0.001° |
| Rotation Speed | r/min | 11.1 | 11.1 | 22.2 | 16.6 | 16.6 |
| Total Reduction Ratio | | 1/180 | 1/180 | 1/90 | 1/120 | 1/120 |
| Indexing Accuracy | sec | ±3 | ±2 | ±2* | ±2* | ±2* |
| Net Weight | kg | 60 | 150 | 325 | 410 | 350 |
| 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 | N | 23520 | 39200 | 58800 | 58800 | 58800 |
| | *1 FXL N·m | 911 | 2156 | 5880 | 5880 | 5880 |
| | FXL N·m | 569 | 1421 | 3920 | 3920 | 3920 |
| Guide Line of MAX. Unbalancing Load | *2 N·m | 30 | 30 | 100 | 100 | — |
| MAX. Work Inertia | Vertical $(\frac{GD^2}{4})$ kg·m² | 0.14 | 1.0 | 6.4 | 6.4 | 11.5 |
| Driving Torque | N·m | —— | —— | 432 | 576 | 576 |

*1 This is the strength of the clamping by the hirth coupling.
*2 The guide line of MAX unbalancing load means the unbalancing load, when the rotary table is used with support table in vertical application. The guide line figure will be different according to the servo motor, please refer to ☞P.57 for more detail.

★ NSVZ series are indexing table which is indexable at each 1°.
★ NSVX series are rotary and indexing table which clamped by hirth coupling (of high precision & high rigidity) at each 1°, also perform min. command incremental at 0.001° and profile milling.
★ αiF4/5000 motor can be mounted on **NSVZ180** and **NSVZ300**.
★ The air-hydraulic booster is available, when **NSVZ180** or **NSVZ300** is used on the M/C without hydraulic source.
★ Please be careful that the centralizing of work piece or jig fixture should be done after indexing, not rotating.
★ The solenoid valve is installed inside the table for the indexing table with NIKKEN controller. The solenoid valve must be installed at the hydraulic tank for the indexing table of the additional axis control.

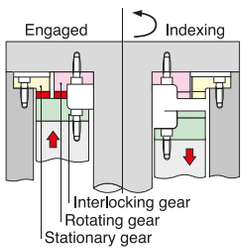
# NSVZ180, 300, NSVX400, 400T, 500

NIKKEN

## No lift (Three pieces of Hirth Coupling)

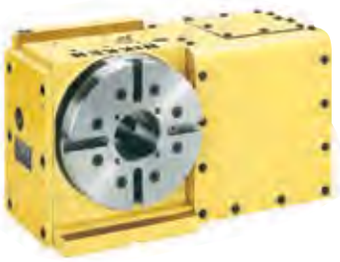
Three pieces of 360 division precision hirth coupling ensures smooth and fast indexing without table lifting.

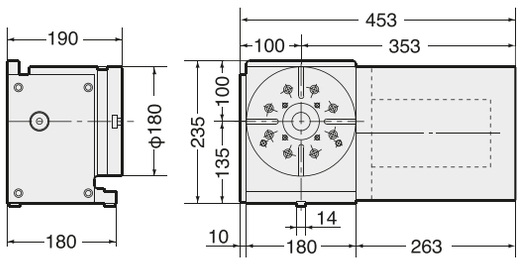
●3-piece Hirth coupling developed in-house by NIKKEN

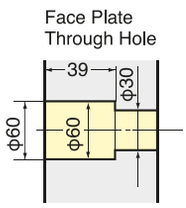



External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

### NSVZ180





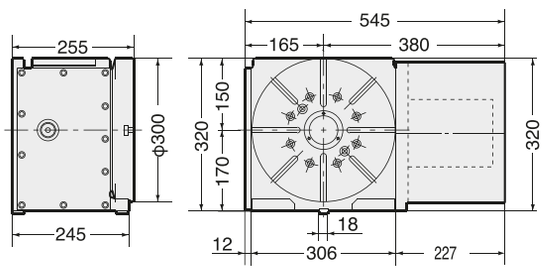



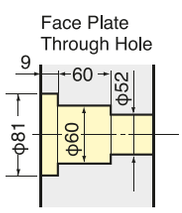


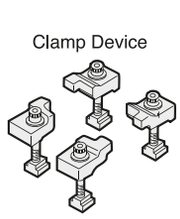
R RIGHT HAND L LEFT HAND WITH FACE PLATE AR21 CTRL

### NSVZ300

Photo with center socket. (optional)

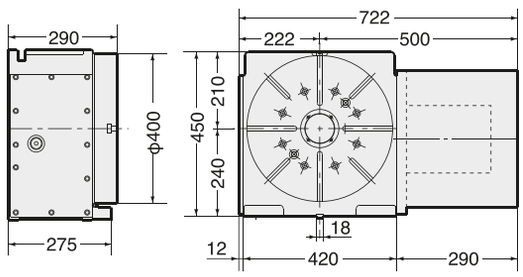


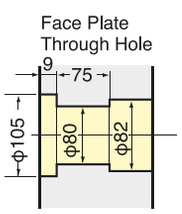



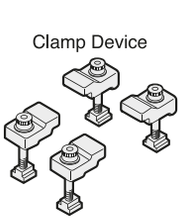




R RIGHT HAND L LEFT HAND WITH FACE PLATE AR21 CTRL

### NSVX400

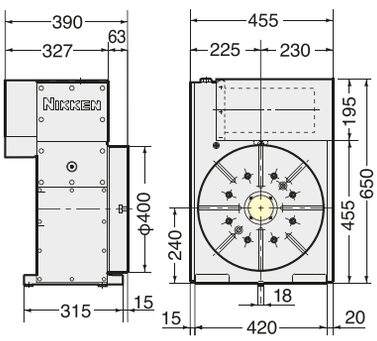


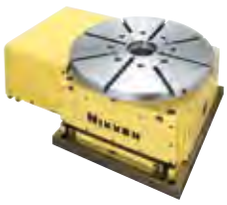

R RIGHT HAND L LEFT HAND WITH FACE PLATE AR21 CTRL

### NSVX400T




T TOP SIDE WITH FACE PLATE AR21 CTRL

### NSVX500



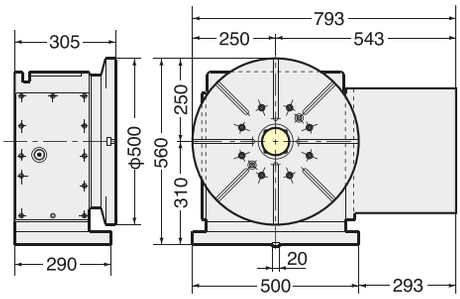
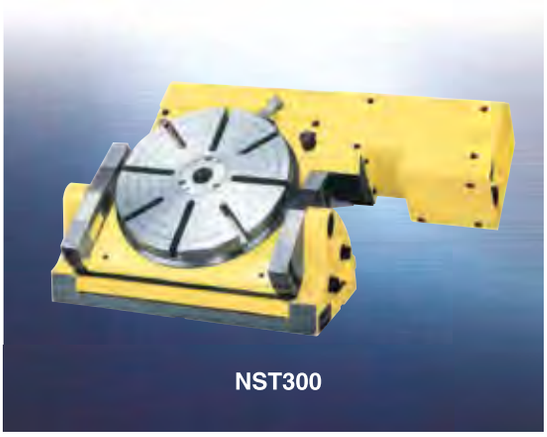



Photo : for horizontal use.
Please contact us for external dimension.

# NST MANUAL TILTING ROTARY TABLE


NST300

- Table can be tilted at 0°～90° manually
- Indexing is CNC controlled so that it can be adapted to all kinds of machining
- Suitable for wide variety of applications thanks to numerical tilting axis control

Option: ADD. AXIS P.57, ACCURACY SPEC. P.99

Accessories: TAIL STOCK P.81, SCROLL CHUCK P.83, POWER CHUCK P.84, CLAMP DEVICE P.85, T-NUT P.86

## Specifications

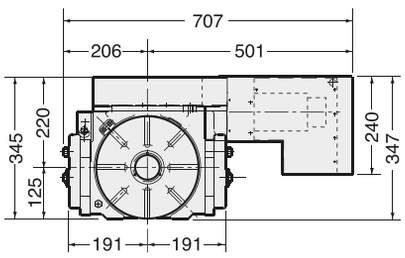
| Item / Code No. | | NST250 | NST300 | NST500 |
|---|---|---|---|---|
| Diameter of Table | φmm | 250 | 300 | 500 |
| Diameter of Spindle Hole | φmm | φ60H7 φ52 | φ60H7 φ60 | φ75H7 φ61.5 |
| Center Height | mm | 155 | 208 | 288 |
| Width of T Slot | mm | $12^{+0.018}_{0}$ | $12^{+0.018}_{0}$ | $14^{+0.018}_{0}$ |
| Clamping System | | Pneumatic*2 | Pneumatic*2 | Pneumatic*2 |
| Clamping Torque | N·m | 147 | 196 | 196 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 0.39 | 0.59 | 0.69 |
| Servo Motor | r/min | αiF2・2000 | αiF4・2000 | αiF8・2000 |
| MIN. Increment | | 0.001° | 0.001° | 0.001° |
| Rotation Speed | r/min | 16.6 | 11.1 | 5.5 |
| Total Reduction Ratio | | 1/120 | 1/180 | 1/360 |
| Indexing Accuracy | sec | 20 | 20 | 20 |
| Net Weight | kg | 75 | 135 | 320 |
| MAX. Work Load on the Table | 90° kg | 50 | 100 | 200 |
| | Horizontal kg | 100 | 300 | 500 |
| MAX. Thrust Load applicable on the Table | N | 17500 | 31860 | 75000 |
| | *1 FXL N·m | 603 | 903 | 2884 |
| | FXL N·m | 770 | 2010 | 8330 |
| MAX. Work Inertia | 90° $(\frac{GD^2}{4})$ kg·m² | 1.35 | 3.37 | 14.70 |
| Driving Torque | N·m | 144 | 288 | 1152 |

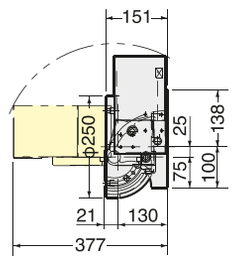
**＊1 This is the strength of the worm wheel without brake. It is applied against dynamic cutting thrust.**
**＊2** Air Intensifying Booster system is available if the supplied air pressure is under 0.5MPa or the brake torque is required to increase. ☞ **P.95**
★**αiF4** motor can be mounted on **NST250**.
★**αiF8/3000** motor can be mounted on **NST300**.

External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

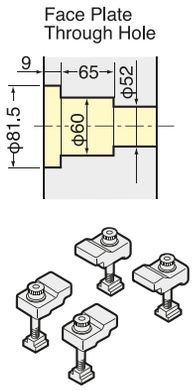
## NST250

Center socket shown in photo is optional.




Center height at 90° : 155mm





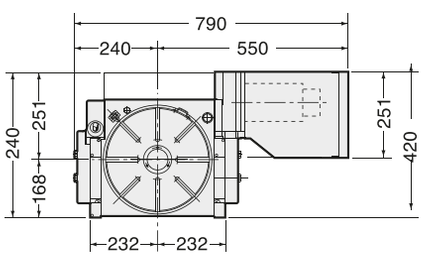

Clamp Device

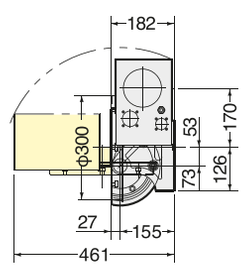
R RIGHT HAND WITH FACE PLATE AR21 CTRL EZ CTRL

Guide key width: 18mm
Table height in horizontal position: 151mm

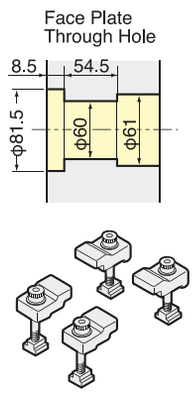
## NST300

Center socket shown in photo is optional.




Center height at 90° : 208mm





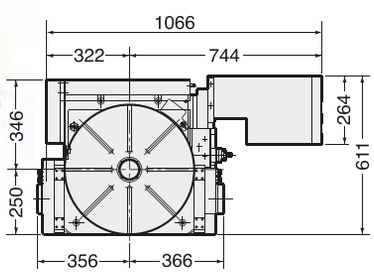

Clamp Device

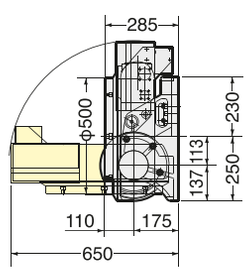
R RIGHT HAND L LEFT HAND WITH FACE PLATE AR21 CTRL EZ CTRL

Guide key width: 18mm
Table height in horizontal position: 182mm

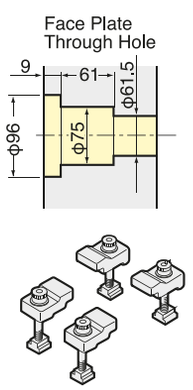
## NST500

Center socket shown in photo is optional.




Center height at 90° : 288mm





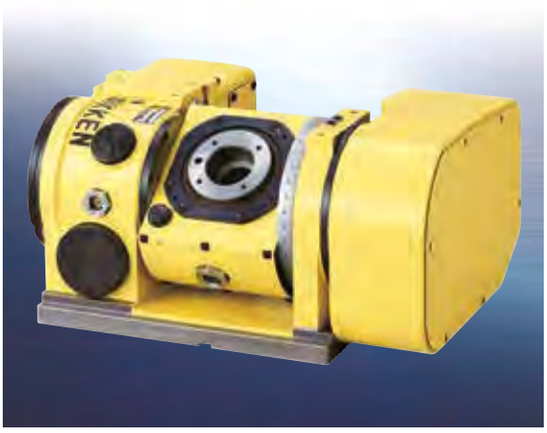

Clamp Device

R RIGHT HAND WITH FACE PLATE AR21 CTRL

Guide key width: 18mm
Table height in horizontal position: 285mm

# 5AX TILTING ROTARY TABLE

## New THE SMALLEST TILTING CNC ROTARY TABLE FOR COMPACT MACHINES



Ultra Compact Tilting Rotary Table

# 5AX-100 PAT.

Option

ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

Accessories

TAIL STOCK P.81 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86



## Minimum & Lightest Weight

### The Smallest and Lightest 5AX

**Demonstrates the true worth of a compact machining center with limited machining space.**

With a body width of 466mm and product weight of 84 kg, the 5AX series is the smallest and lightest tilting rotary table in NIKKEN's history. It is an ideal counterpart to products such as the BT30 compact machining center. It allows you to secure more machining space than was possible with earlier models.

## Tilting Axis600Nm

### Powerful braking system with double clamping sleeve type PAT. Tilt-axis with Air-hydranlic unit as Standard Equipment.

**Astoundingly powerful clamping capability in spite of compact body.**

For machines with no hydraulic power source, the tilt-axis is equipped with an air-hydro unit that provides powerful hydraulic clamping using only an air supply. In spite of its compact body, it delivers an astounding 600 Nm of clamping power, enabling high positioning accuracy for highly precise machining.

## Extensive Lineup of Attachments

This extensive attachment lineup from NIKKEN allows machining of a wide variety of work pieces.

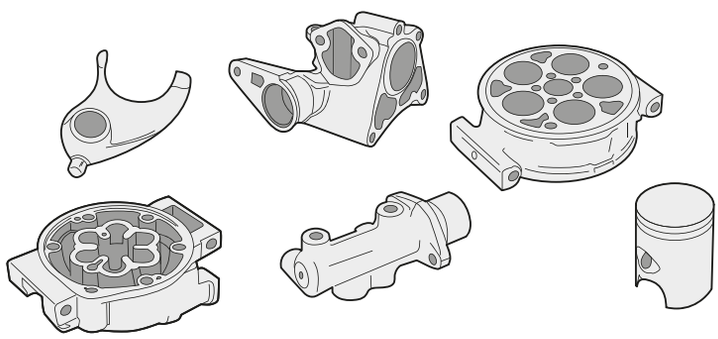
Jig Plate

Scroll Chuck

Center Socket

High-precision 5-axis machining of precision electronic devices such as smartphones, automobile parts, etc. can be accomplished using a compact machining center.

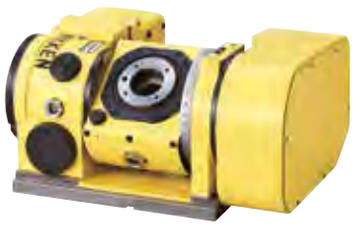
Impeller

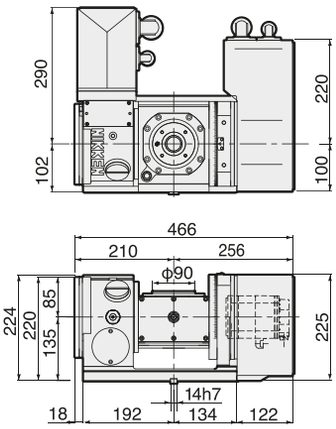


Components of Automotive Parts

# 5AX-100 PAT.

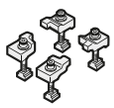
NIKKEN



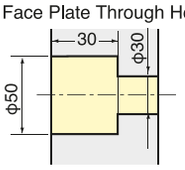


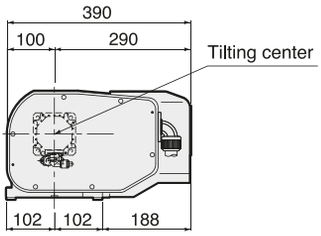

★Dimensions with FANUC motor

Clamp Device



Face Plate Through Hole



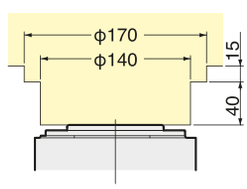
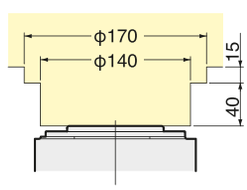
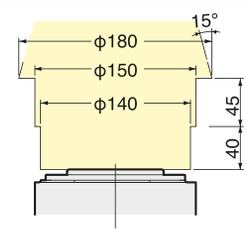




W/O FACE PLATE AR21 CTRL EZ CTRL

## Specifications

| Item / Code No. | | 5AX-100 | |
|---|---|---|---|
| Diameter of Table | ϕmm | 90 | |
| Diameter of Spindle Hole | ϕmm | ϕ50H7 ϕ30 | |
| Center Height (90˚) | mm | 135 | |
| Table Height in Horizonatal Position (0˚) | mm | 190 | |
| Width of T Slot | mm | ϕ8H7 Pin hole | |
| Axis | | Rotary | Tilting (0°～105°) |
| Clamping System | | Pneumatic*1 | Air Hydraulic Booster Built-in type |
| Clamping Torque | N·m | 205 | 600 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 0.09 | 0.12 |
| Servo Motor | r/min | αiF1・2000 | αiF1・2000 |
| MIN. Increment | | 0.001˚ | 0.001˚ |
| Rotation Speed | r/min | 44.4 | 22.2 |
| Total Reduction Ratio | | 1/45 | 1/90 |
| Indexing Accuracy | sec | ±30 | 60 |
| Net Weight | kg | 84 | |
| MAX. Work Load on the Table | 0° to 30° kg | 40 | |
| | 30° to 90° kg | 20 | |
| MAX. Thrust Load applicable on the Table | Tilting Angle = 0° N | 5300 | |
| | Tilting Angle = 0° | L=45mm F=3820N | |
| | Tilting Angle = 90° | L₁=0mm F₁=2945N<br>L₂=100mm F₂=1045N | |
| | Tilting Angle = 90° FXL N·m | 98 | |
| MAX. Work Inertia | $(\frac{GD^2}{4})$ kg·m² | 0.03 | |
| Driving Torque | N·m | 18 | |

### The Area of Noninterference in Tilting Position.

| Angle | 5AX-100 |
|---|---|
| 0˚ ∫ 45˚ |   |
| 0˚ ∫ 90˚ |   |
| 0˚ ∫ 105˚ |   |

5AX

# COMPACT TILTING ROTARY TABLE

NIKKEN

5AX-130FA

- Rotary and tilting axes are controlled by CNC
- Various kinds of attachments



**Option**

ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

**Accessories**

TAIL STOCK P.81 | SCROLL CHUCK P.83 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86



## Specifications

| Item / Code No. | | 5AX-130 | | 5AX-201 | |
|---|---|---|---|---|---|
| Diameter of Table | φmm | 105 | | 200 | |
| Diameter of Spindle Hole | φmm | φ60H7 φ30 | | φ60H7 φ50 | |
| Center Height (90°) | mm | 150 | | 180 | |
| Table Height in Horizonatal Position (0°) | mm | 220 | | 260 | |
| Width of T Slot | mm | φ10H7 Pin hole | | $12\ ^{+0.018}_{0}$ | |
| Axis | | Rotary | Tilting (0°～105°) | Rotary | Tilting (0°～105°) |
| Clamping System | | Pneumatic*2 | Pneumatic*2 | Pneumatic*1*2/ Hydraulic | Pneumatic*1*2/ Hydraulic |
| Clamping Torque | N·m | 205 | 303 | 303*1*2/ 588 | 303*1*2/ 612 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 0.09 | 0.12 | 0.11 | 0.16 |
| Servo Motor | r/min | αiF2・3000 | αiF2・2000 | αiF2・3000 | αiS4・2000 |
| MIN. Increment | | 0.001° | 0.001° | 0.001° | 0.001° |
| Rotation Speed | r/min | 33.3 | 11.1 | 33.3 | 16.6 |
| Total Reduction Ratio | | 1/90 | 1/180 | 1/90 | 1/120 |
| Indexing Accuracy | sec | ±30 | 60 | ±15 | 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 | Tilting Angle = 0° N | 5880 | | 9800 | |
| | Tilting Angle = 0° | L=65mm F=2940N | | L=100mm F=4900N | |
| | Tilting Angle = 90° | L₁=0mm F₁=3460N<br>L₂=100mm F₂=1590N | | L₁=0mm F₁=5880N<br>L₂=100mm F₂=2940N | |
| | Tilting Angle = 90° FXL N·m | 98 | | 382 | |
| MAX. Work Inertia | $(\frac{GD^2}{4})$ kg·m² | 0.12 | | 0.5 | |
| Driving Torque | N·m | 72 | | 72 | |

*1 Air brake system is also available for **5AX-201**.
*2 Air Intensifying Booster system is available if the supplied air pressure is under 0.5MPa or the brake torque is required to increase. ☞ P.95
★Location of tilting axis motor can be changed as an option. **e.g. 5AX-130B**.

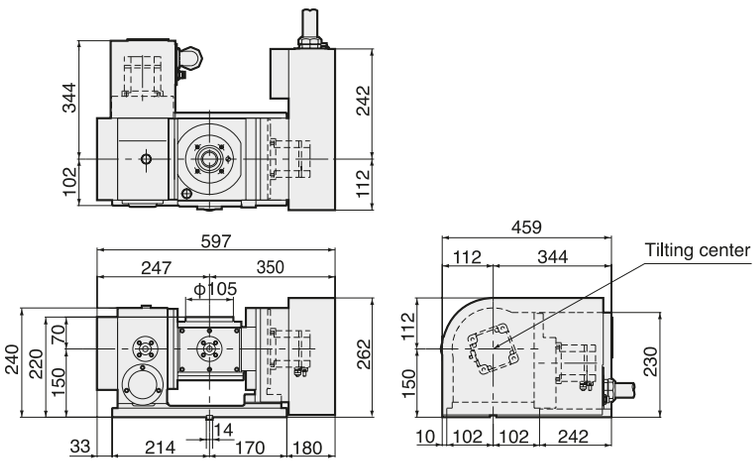
# 5AX-130, 5AX-201

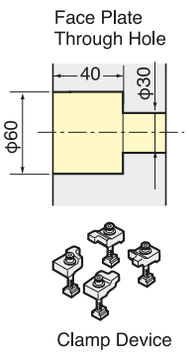
NIKKEN

External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

## 5AX-130

Photo with ϕ130mm plate.
(Standard accessories)



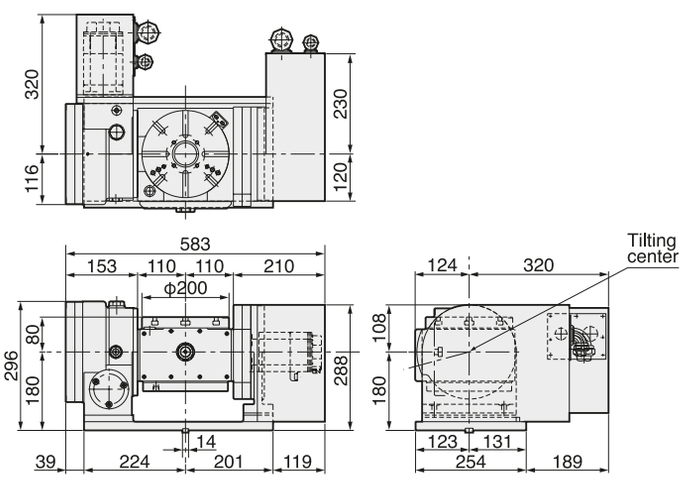


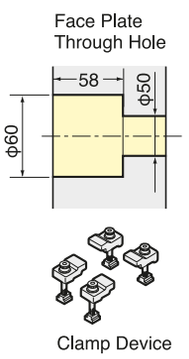


B BACK SIDE WITH FACE PLATE AR21 CTRL EZ CTRL

Center height of high column table is 65mm higher than that of standard table.

## 5AX-201



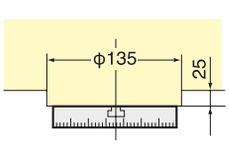
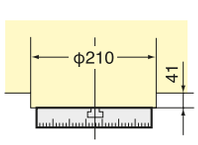
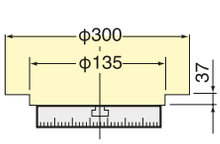
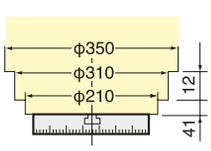
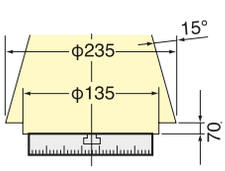
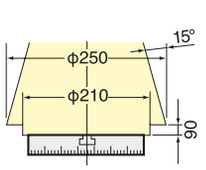




B BACK SIDE WITH FACE PLATE AR21 CTRL EZ CTRL

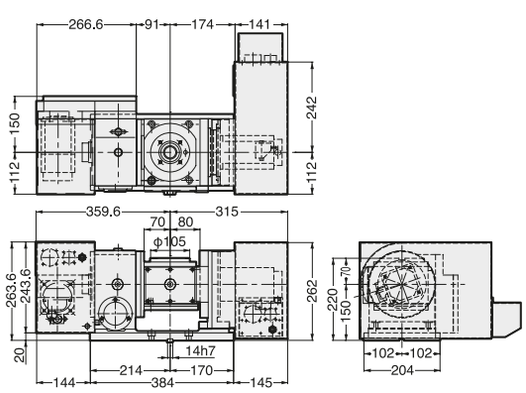
**Built-in type 4 ports rotary joint can be attached on standard type as an option. (High column type is not necessary.)**

### The Area of Noninterference in Tilting Position.

| Angle | 5AX-130 | 5AX-201 |
|---|---|---|
| 0° ⟆ 45° |   |   |
| 0° ⟆ 90° |   |   |
| 0° ⟆ 105° |   |   |

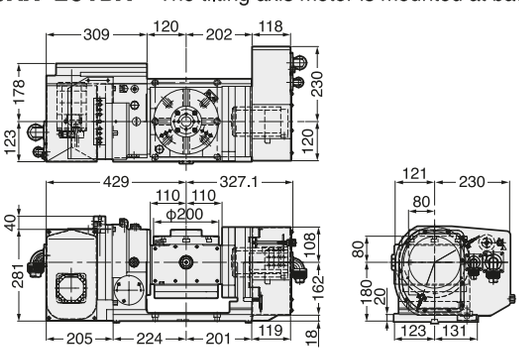
## 5AX-130BA

The tilting axis motor is mounted at back side.




## 5AX-201BA

The tilting axis motor is mounted at back side.



# STANDARD TILTING ROTARY TABLE

NIKKEN


5AX-230

- CNC tilting rotary table with powerful clamping system **USA, EU : PAT**
- A best-selling product suitable for use with mediumsize machining center
- Ideal for lines consisting of horizontal machines only

Option

ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

Accessories

TAIL STOCK P.81 | SCROLL CHUCK P.83 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86

5AX

## Specifications

| Item / Code No. | | 5AX-230 | | 5AX-250 | |
|---|---|---|---|---|---|
| Diameter of Table | φmm | 230 | | 250 | |
| Diameter of Spindle Hole | φmm | φ60H7 φ40 | | φ60H7 φ50 | |
| Center Height (90°) | mm | 240 | | 250 | |
| Table Height in Horizonatal Position (0°) | mm | 285 | | 250 | |
| Width of T Slot | mm | $12^{+0.018}_{0}$ | | $12^{+0.018}_{0}$ | |
| Axis | | Rotary | Tilting (0°～105°) | Rotary | Tilting (0°～105°) |
| Clamping System | | Hydraulic | Hydraulic | Hydraulic | Hydraulic |
| Clamping Torque | N·m | 490 | 3430 | 588 | 490 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 0.3 | 0.5 | 0.11 | 0.16 |
| Servo Motor | r/min | αiF4・2000 | αiF8・2000 | αiF4・2000 | αiF4・2000 |
| MIN. Increment | | 0.001° | 0.001° | 0.001° | 0.001° |
| Rotation Speed | r/min | 11.1 | 5.5 | 22.2 | 11.1 |
| Total Reduction Ratio | | 1/180 | 1/360 | 1/90 | 1/180 |
| Indexing Accuracy | sec | 20 | 60 | 20 | 60 |
| Net Weight | kg | 220 | | 290 | |
| MAX. Work Load on the Table | 0° to 30°  kg | 100 | | 80 | |
| | 30° to 90°  kg | 100 | | 50 | |
| MAX. Thrust Load applicable on the Table | Tilting Angle = 0°  N | 11760 | | 9800 | |
| | Tilting Angle = 0°  | L=115mm F=5880N | | L=100mm F=4900N | |
| | Tilting Angle = 90°  | L₁=0mm F₁=5880N<br>L₂=100mm F₂=2940N | | L₁=0mm F₁=12040N<br>L₂=100mm F₂=6020N | |
| | Tilting Angle = 90°  FXL N·m | 451 | | 382 | |
| MAX. Work Inertia |  $(\frac{GD^2}{4})$ kg·m² | 0.66 | | 0.5 | |
| Driving Torque |  N·m | 288 | | 144 | |

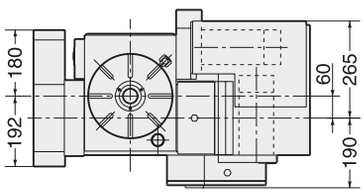
# 5AX-230, 5AX-250

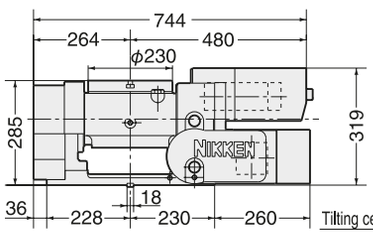
NIKKEN

External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

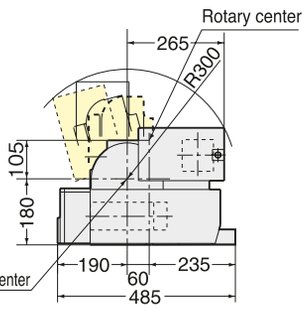
## 5AX-230


Center socket shown in photo is optional.

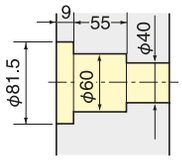


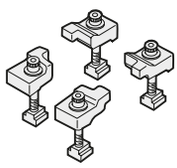




★ Swing box in which cables and hydraulic hoses are fixed is also available. Please contact us.




Face Plate Through Hole



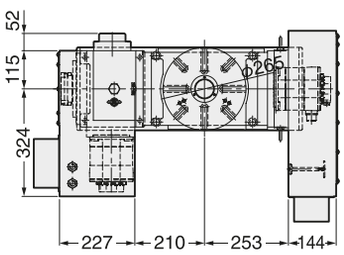



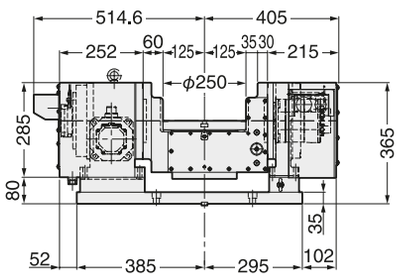
Clamp Device

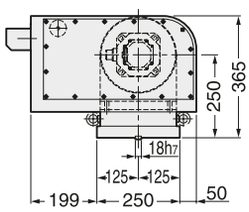
WITH FACE PLATE AR21 CTRL

Center height of high column table is 75mm higher than that of standard table.

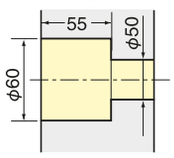
## 5AX-250

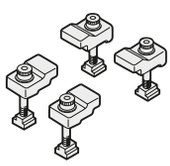



Face Plate Through Hole



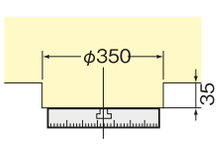
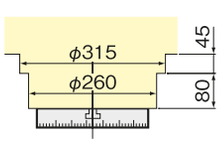
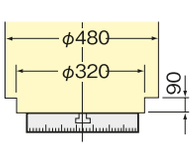
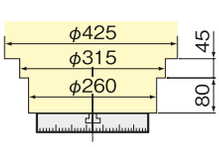
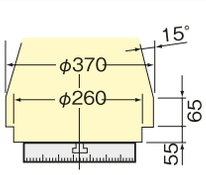
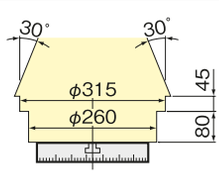



Clamp Device

WITH FACE PLATE AR21 CTRL

**Built-in type 3 ports rotary joint can be attached on standard type as an option.**

## The Area of Noninterference in Tilting Position.

| Angle | 5AX-230 | 5AX-250 |
|---|---|---|
| 0° ⟆ 45° |   |   |
| 0° ⟆ 90° |   |   |
| 0° ⟆ 105° |   |   |

## Example when tilting base is supplied from M/C builder.


Tilting Base

5AX

# STANDARD TILTING ROTARY TABLE

NIKKEN

5AX-350

- CNC tilting rotary table with powerful clamping system
- A best-selling product suitable for use with medium-size and large machining center
- Ideal for lines consisting of horizontal machines only

Option

ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

Accessories

TAIL STOCK P.81 | SCROLL CHUCK P.83 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86



## Specifications

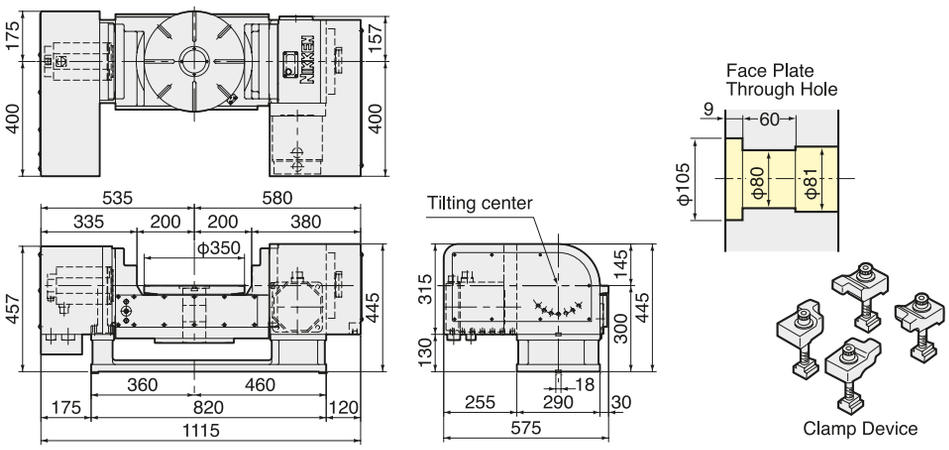
| Item / Code No. | | 5AX-350 | | 5AX-550 | |
|---|---|---|---|---|---|
| Diameter of Table | φmm | 350 | | 550 | |
| Diameter of Spindle Hole | φmm | φ80H7 | | φ130H7 | |
| Center Height (90˚) | mm | 300 | | 380 | |
| Table Height in Horizonatal Position (0˚) | mm | 300 | | 518 | |
| Width of T Slot | mm | $12^{+0.018}_{0}$ | | $14^{+0.018}_{0}$ | |
| Axis | | Rotary | Tilting (0°～105°) | Rotary | Tilting (0°～105°) |
| Clamping System | | Hydraulic | Hydraulic | Hydraulic | Hydraulic |
| Clamping Torque | N·m | 1568 | 1568 | 3430 | 6272 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 0.8 | 1.35 | 5.5 | 5.2 |
| Servo Motor | r/min | αiF8 ·2000 | αiF12 ·2000 | αiF12 ·2000 | αiF12 ·2000 |
| MIN. Increment | | 0.001˚ | 0.001˚ | 0.001˚ | 0.001˚ |
| Rotation Speed | r/min | 22.2 | 22.2 | 11.1 | 5.5 |
| Total Reduction Ratio | | 1/90 | 1/90 | 1/180 | 1/360 |
| Indexing Accuracy | sec | 20 | 60 | 20 | 60 |
| Net Weight | kg | 420 (without Base:355) | | 1150 | |
| MAX. Work Load on the Table | 0° to 30°  kg | 200 | | 500 | |
| | 30° to 90°  kg | 200 | | 300 | |
| MAX. Thrust Load applicable on the Table | Tilting Angle = 0°  N | 19600 | | 31360 | |
| | Tilting Angle = 0°  | L=175mm F=4900N | | L=275mm F=9800N | |
| | Tilting Angle = 90°  | L₁=0mm F₁=17160N<br>L₂=100mm F₂=8580N | | L₁=0mm F₁=19600N<br>L₂=200mm F₂=14120N | |
| | Tilting Angle = 90°  F×L N·m | 858 | | 2548 | |
| MAX. Work Inertia |  $(\frac{GD^2}{4})$ kg·m² | 3.2 | | 23 | |
| Driving Torque |  N·m | 288 | | 864 | |

# 5AX-350, 5AX-550

NIKKEN

External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

## 5AX-350



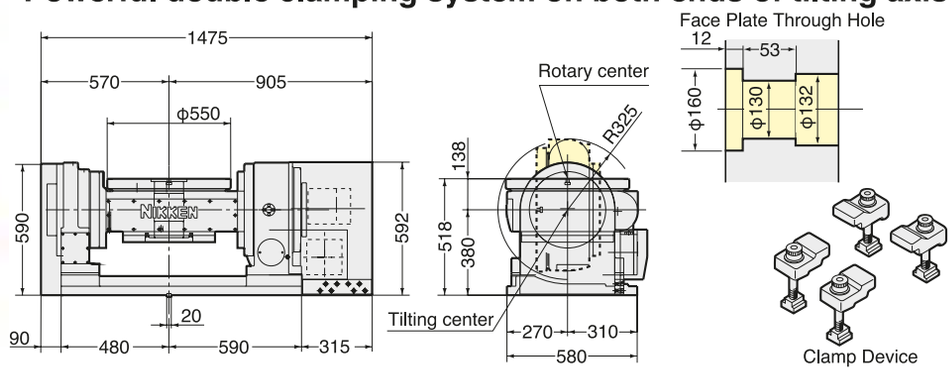

WITH FACE PLATE AR21 CTRL

**Built-in type 6 ports rotary joint is available on standard type. (optional) (High column type is not necessary)**

## 5AX-550

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

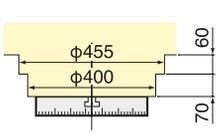
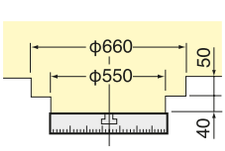
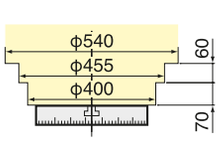
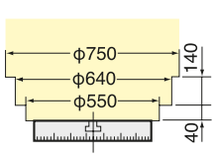
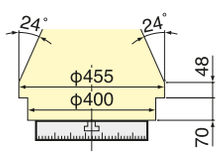
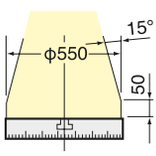
Center socket shown in photo is optional.




WITH FACE PLATE AR21 CTRL

**Built-in type 4 ports rotary joint is available on standard type. (optional) (High column type is not necessary)**

## The Area of Noninterference in Tilting Position.

| Angle | 5AX-350 | 5AX-550 |
|---|---|---|
| 0° ∫ 45° |   |   |
| 0° ∫ 90° |   |   |
| 0° ∫ 105° |   |   |

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 molding

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

Ball Bar System

R-Test System

Accuracy of Speeds and Interpolations for 5AX- Table ISO10791-6

5AX

# LARGE TILTING ROTARY TABLE

NIKKEN


5AX-1200

- CNC tilting rotary table with powerful clamping system at both side
- Counter balance weight can be installed on 5AX-1200A to compensate the unbalancing load as standard
- Ideal for gantry type systems, machining centers, and 5-plane machines

Option

ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

Accessories

TAIL STOCK P.81 | SCROLL CHUCK P.83 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86

5AX

## Specifications

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

| Item / Code No. | | 5AX-800 | | 5AX-1200 | |
|---|---|---|---|---|---|
| Diameter of Table | φmm | 800×500 | | 1200 | |
| Diameter of Spindle Hole | φmm | φ130 | | φ300H7 | |
| Center Height (90°) | mm | 550 | | 750 | |
| Table Height in Horizonatal Position (0°) | mm | 500 | | 950 | |
| Width of T Slot | mm | $(14\ ^{+0.018}_{0})$*1 | | $22^{+0.018}_{0}$ *1 | |
| Axis | | Rotary | Tilting | Rotary | Tilting (-20°～105°) |
| Clamping System | 3.5MPa | Hydraulic | Hydraulic | Hydraulic | Hydraulic |
| Clamping Torque | N·m | 4655 | 6125 | 14700 | 19600 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 6.8 | 6.0 | 10.8 | 3.5 |
| Servo Motor | r/min | αiF22・2000 | αiF40・2000 | αiF22・2000 | αiF22・2000 |
| MIN. Increment | | 0.001° | 0.001° | 0.001° | 0.001° |
| Rotation Speed | r/min | 25 | 12.5 | 5.5 | 2.7 |
| Total Reduction Ratio | | 1/60 | 1/120 | 1/360 | 1/720 |
| Indexing Accuracy | sec | 20 | 60 | 20 | 60 |
| Indexing Accuracy of Ultra Precision *2 | sec | ±5 | ±10 | ±5 | ±10 |
| Net Weight | kg | 2300 | | 7300 | |
| 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 = 0° N | 31360 | | 137200 | |
| | Tilting Angle = 0° | 2695 | | 5488 | |
| | Tilting Angle = 90° | 2824 | | 9600 | |
| | Tilting Angle = 90° F×L N·m | 2548 | | 14700 | |
| MAX. Work Inertia | $(\frac{GD^2}{4})$ kg·m² | 23 | | 276 | |
| Driving Torque | N·m | 422 | | 3168 | |

*1 Standard large rotary tables are without T slot. T slot is available as an option, please specify the width of the T slot.

# 5AX-800, 5AX-1200

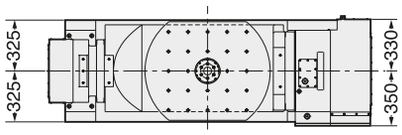
NIKKEN

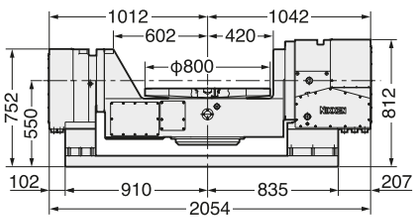
External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

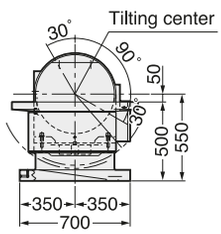
## 5AX-800

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

WITH FACE PLATE AR21 CTRL



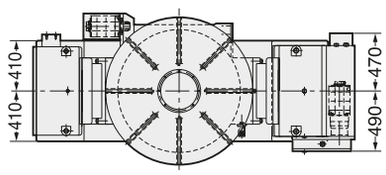



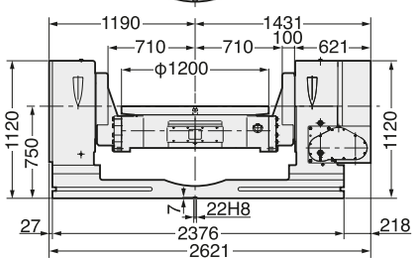

## 5AX-1200

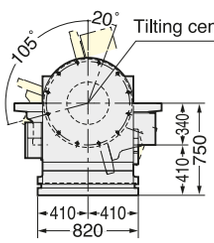
### Powerful double clamping system on both ends of tilting axis.


5AX-1200B

WITH FACE PLATE AR21 CTRL



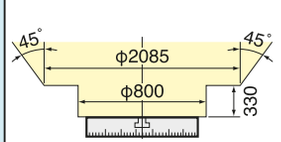
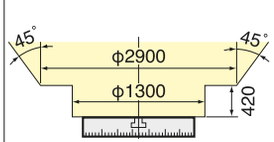
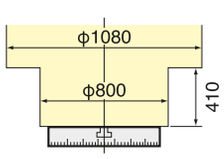
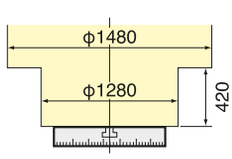
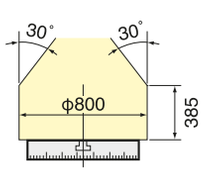
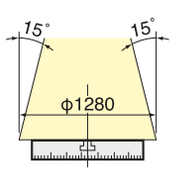





**5AX-1200A** is also available.
The face plate is located above the center of the tilting axis.

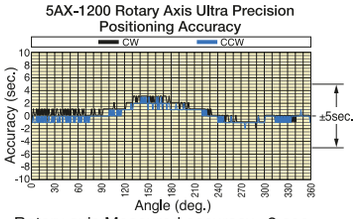
## The Area of Noninterference in Tilting Position.

| Angle | 5AX-800 | 5AX-1200 |
|---|---|---|
| 0° ∫ 45° |   |   |
| 0° ∫ 90° |   |   |
| 0° ∫ 120° |   |   |

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

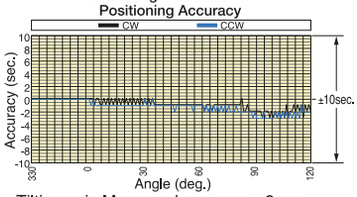



5AX-1200 Rotary Axis Ultra Precision Positioning Accuracy




Rotary axis Measured accuracy ±3 sec.

5AX-1200 Tilting Axis Ultra Precision Positioning Accuracy



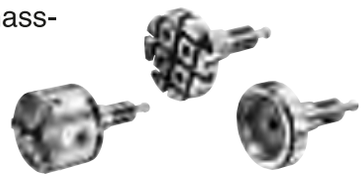

Tilting axis Measured accuracy ±3 sec.

# MULTI-SPINDLE TILTING ROTARY TABLE

NIKKEN

5AX-4MT-105-120

- Tilting rotary table with Multi-Spindle
- Various attachment for fixing work piece
- Ideal for small items and mass-produced parts



**Option**

ADD. AXIS P.57 | ACCURACY SPEC. P.99 | ROTARY JOINT P.89 | ULTRA PRECISIO P.87

**Accessories**

TAIL STOCK P.81 | SCROLL CHUCK P.83 | POWER CHUCK P.84 | CLAMP DEVICE P.85 | T-NUT P.86

## Specifications Multi-Spindle Tilting Rotary Tables are all semi-standard models. Please contact us.

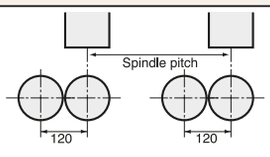
| Item / Code No. | | 5AX-2MT-105-120 | | 5AX-4MT-105-120 | |
|---|---|---|---|---|---|
| Diameter of Table | φmm | 105 | | 105 | |
| Diameter of Spindle Hole | φmm | $\phi 60_{H7}$ φ30 | | $\phi 60_{H7}$ φ30 | |
| Number of spindles (Pitch) | mm | 2 spindles (120) | | 4 spindles (120) | |
| Center Height (90°) | mm | 175 | | 235 | |
| Table Height in Horizonatal Position (0°) | mm | 250 | | 300 | |
| Width of T Slot | mm | $16^{+0.018}_{0}$ | | $16^{+0.018}_{0}$ | |
| Axis | | Rotary | Tilting (0°～105°) | Rotary | Tilting (−110°～+110°) |
| Clamping System | | Pneumatic*1 | Pneumatic*1 | Hydraulic | Hydraulic |
| Clamping Torque | N·m | 147 | 147 | 147 | 343 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 0.13 | 0.13 | 0.2 | 0.48 |
| Servo Motor | r/min | αiF2・3000 | αiF2・2000 | αiF8・3000 | αiF4・2000 |
| MIN. Increment | | 0.001° | 0.001° | 0.001° | 0.001° |
| Rotation Speed | r/min | 33.3 | 11.1 | 16.6 | 16.6 |
| Total Reduction Ratio | | 1/90 | 1/180 | 1/180 | 1/120 |
| Indexing Accuracy | sec | ±30 | 60 | ±45 | ±30 |
| Net Weight | kg | 150 | | 350 | |
| MAX. Work Load on the Table | 0° to 30° kg | 15 | | 25 | |
| | 30° to 90° kg | 10 | | 15 | |
| MAX. Thrust Load applicable on the Table | Tilting Angle = 0° N | 3920 | | 3920 | |
| | Tilting Angle = 0° | L=60mm $F_1$=784N | | L=60mm F=2858N | |
| | Tilting Angle = 90° | $L_1$=0mm $F_1$=653N<br>$L_2$=100mm $F_2$=490N | | $L_1$=0mm $F_1$=1380N<br>$L_2$=100mm $F_2$=1040N | |
| | Tilting Angle = 90° F×L N·m | 49 | | 49 | |
| MAX. Work Inertia | $(\frac{GD^2}{4})$ kg·m² | 0.014 | | 0.021 | |
| Driving Torque | N·m | 36 | | 144 | |

*1 Air Intensifying Booster system is available if the supplied air pressure is under 0.5MPa or the brake torque is required to increase. ☞ P.95

★ **Min. pitch between spindles:120mm.** If you need different pitch, please contact us.

★ **4 spindle rotary table to suit 2 Spindle M/C is also available, please contact with us.**

★ **Max numbers of spindles:4 spindles.**

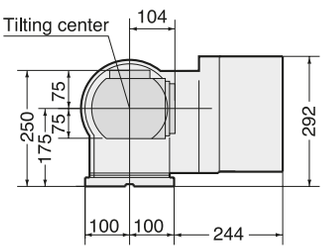


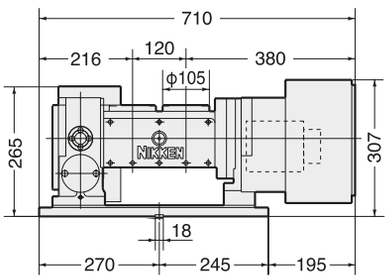
# 5AX-2MT,5AX-4MT

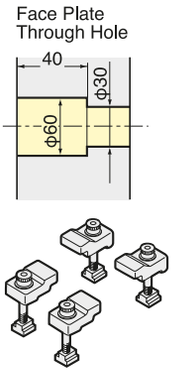
NIKKEN

External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

## 5AX-2MT-105-120



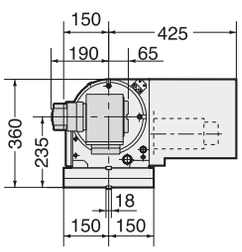



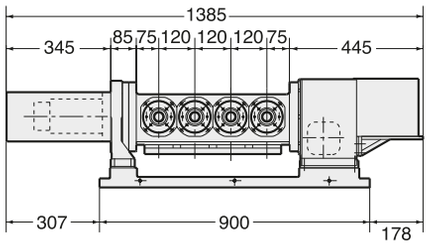

W/O FACE PLATE AR21 CTRL EZ CTRL

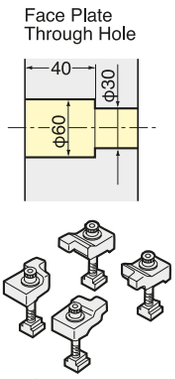
Center height of high column table is 35mm higher than that of standard table.
MAX. number of ports in rotary joint Standard: 4 ports, High Column: 6 ports
If you need a knock hole for positioning or a key way on the table surface, please contact us.

## 5AX-4MT-105-120

4" Power chuck in photo is optional.




W/O FACE PLATE AR21 CTRL

**MAX. 6 port rotary joint can be installed on standard type as an option.**
If you need a knock hole for positioning or a key way on the table surface, please contact us.

## Multi-Spindle Tilting Rotary Table

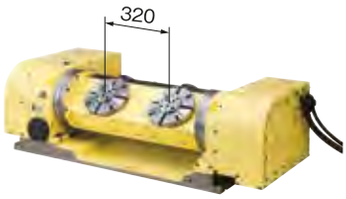
For Multi-Spindle Tilting Rotary Table, please contact us to know the required faceplate diameters, fixture attachment (e.g. Power Chuck etc), the required spindle pitch, the M/C model and the type of NC.

5AX-2MT-170-200

5AX-2MT-201-250FA

5AX-2MT-200-360

5AX-2MT-200-250

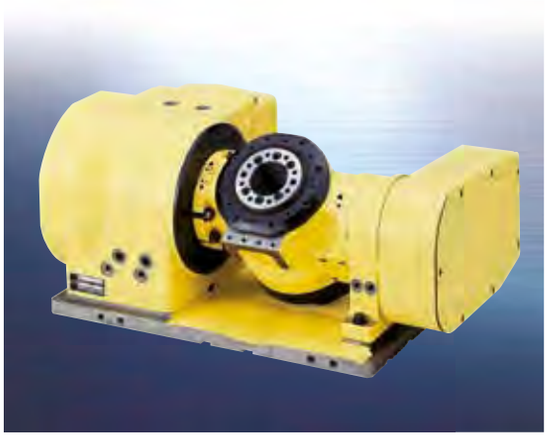



5AX-2MT-201-320

5AX-2MT-180-250FA

5AX-2MT-130-170

5AX-2MT-182-250-205B



Ultra Compact Tilting Rotary Table with DD Motor

# 5AX-DD100

●Explanation of the Code No.(Example)

**5AX-DD 200 A F 2**

- 5AX: Tilting rotary table
- DD: With DD motor
- Diameter of Table: ϕmm
- Location of the tilting axis centre*1 **A, B**
- Motor Maker F: FANUC M: MELDAS Y: YASNAC
- Version

**Option**

| ADD. AXIS | ACCURACY SPEC. | ROTARY JOINT | ULTRA PRECISIO |
|---|---|---|---|
| P.57 | P.99 | P.89 | P.87 |

**Accessories**

| TAIL STOCK | POWER CHUCK | CLAMP DEVICE | T-NUT |
|---|---|---|---|
| P.81 | P.84 | P.85 | P.86 |

DD

## Only 554mm Wide

### The Smallest 5AX with DD Motor

**Demonstrates the true worth of a compact machining center with limited machining space.**

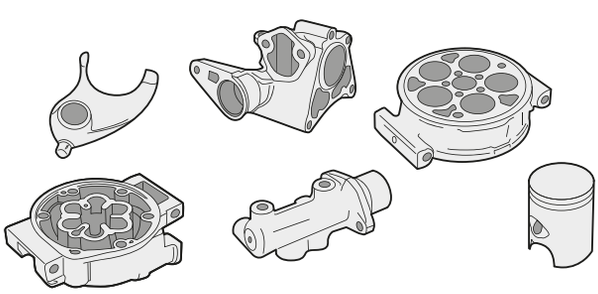
With a body width of 554 mm, 5AX-DD100 is he smallest tilting rotary table with DD motor in NIKKEN's history. It is an ideal counterpart to products such as the BT30 compact machining center. It allows you to secure more machining space than was possible with earlier models.

## Opens up New Possibilities for Machining with Compact M/C

**Suitable for many applications, from IT parts to automotive parts.**

High-precision 5-axis machining of precision electronic devices such as smartphones, automobile parts, etc. can be accomplished using a compact machining center.

Impeller



Components of Automotive Parts

## High-acceleration/ deceleration.

### Compact unit with high-speed rotation

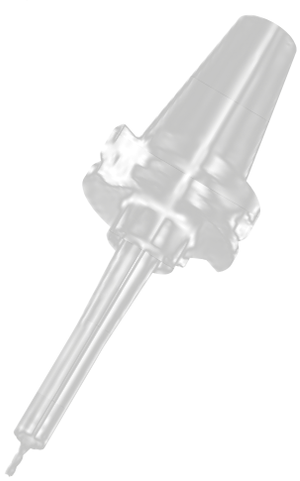
**Standout performers in 5-axis high-speed machining**

This compact unit employs a DD motor for high-speed rotation and high-acceleration/deceleration. Opens up new possibilities for cutting and machining, ranging from IT parts requiring high-speed, high-grade machining to auto parts requiring high-speed machining.

## NIKKEN's Exclusive "TT Solutions"

**As an expert in both tables and tooling, NIKKEN offers more.**

Allows for even higher precision and efficiency when combined with our Mini-Mini Chuck Advanced Alpha collet chucks, which are standout performers in 5-axis machining.



Mini-Mini Chuck Advanced Alpha

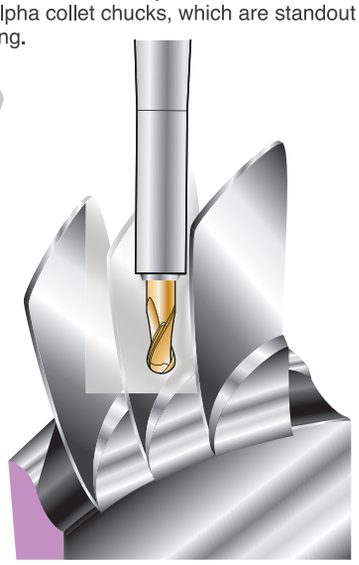
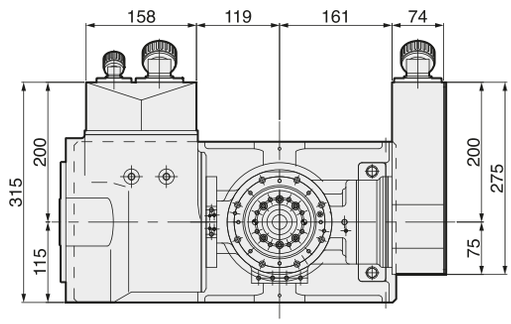


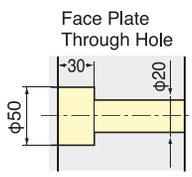
Image: 5AX Machining

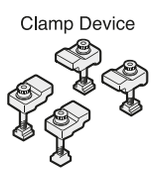
# 5AX-DD100

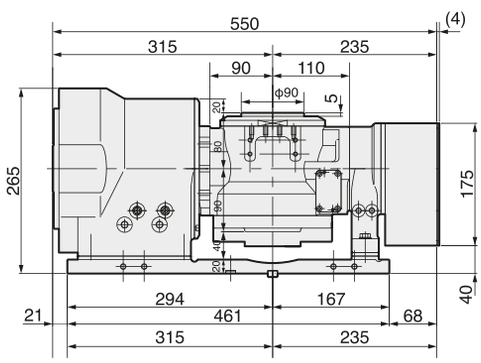
NIKKEN

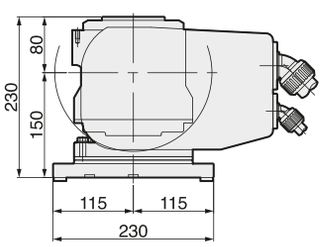
W/O FACE PLATE



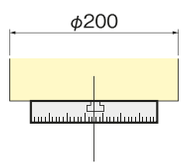
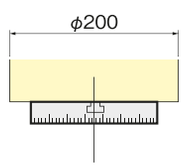
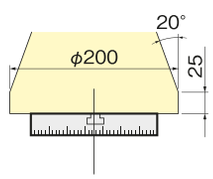




## The Area of Noninterference in Tilting Position.

| Angle | 5AX-DD100 |
|---|---|
| 0° ⟆ 45° |   |
| 0° ⟆ 90° |   |
| 0° ⟆ 110° |   |

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

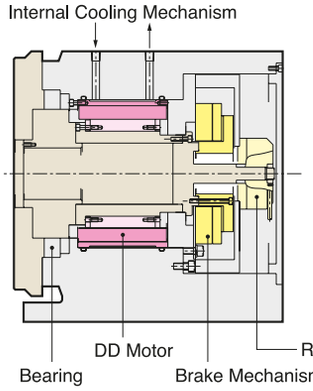
| Item / Code No. | | 5AX-DD100AF | |
|---|---|---|---|
| Diameter of Table | φmm | 90 | |
| Diameter of Spindle Hole | φmm | 50H7 φ20 | |
| Center Height (90°) | mm | 150 | |
| Table Height in Horizonatal Position (0°) | mm | 230 | |
| Width of T Slot | mm | φ8H7 Pin hole | |
| Axis | | Rotary | Tilting (0°～110°) |
| Clamping System | | Pneumatic*1 (0.5MPa) | Pneumatic*1 (0.5MPa) |
| Clamping Torqyue | Nm | 75 | 205 |
| Motor (FANUC) | | DiS15/1000 | DiS60/400 |
| Encoder | | MPRZ-536A | MPRZ-536A |
| Min. Incremental | deg. | 0.001 | |
| Rotation Speed | r/min | 200 | 200 |
| indexing Accuracy | sec. | ±10 | ±1 |
| MAX. Torque | Nm | 35 | 130 |
| Constant Torque | Nm | 8.7/16*2 | 24/65*2 |
| Net Weight | kg | 120 | |
| MAX. Work Load | 0～30deg. kg | 20 | |
| | 0～90deg. kg | 10 | |

*1 Air-air Booster system is available if the supplied air pressure is under 0.5MPa or the brake torque is required to increase. ☞P.95
*2 Show the figures with cooling system.

# CNC ROTARY TABLE with DD MOTOR

NIKKEN

Internal Cooling Mechanism




## Configuration

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. However, the driving torque of the rotary table is not strong due to no mechanical reduction mechanism.
Therefore, the suitable application of the rotary table with DD motor must be selected.

- High Response : 150r/min (DD251)
- High Response of Micro Spike Clamping System

Micro Spike

● Explanation of the Code No.(Example)

**DD 251 F - 150**

- DD: rotary table with DD motor
- Diameter of Table 180, 250, 400
- Position of the Motor Cover No Letter: Right L: Left
- Motor Maker F: FANUC M: MELDAS Y: YASNAC Z: SIEMENS E: Etel
- Code No. of the DD Motor

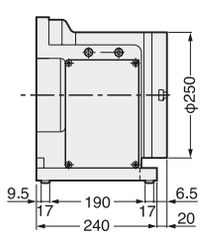
## High-Acceleration / High-Speed / Compact Unit

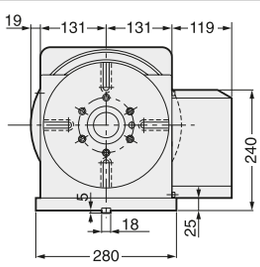
**Suitable for the machining of the impeller.**

Suitable for the machining of the impeller.

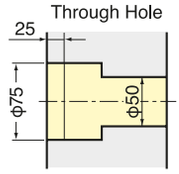


## DD251F-150

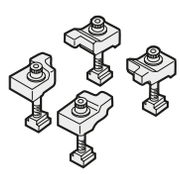



Face Plate Through Hole




Clamp Device



R RIGHT HAND L LEFT HAND WITH FACE PLATE

## Specifications

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

| Item / Code No. | | DD180F-60 | DD251F-150 | DD400F-250 |
|---|---|---|---|---|
| Diameter of Table | φmm | 180 | 250 | 400 |
| Diameter of Spindle Hole | φmm | φ30H7 | φ75H7 | φ100H7 |
| Center Height | mm | 135 | 170 | 230 |
| Width of T Slot | mm | 12H7 | 12H7 | 14H7 |
| Clamping System | | Pneumatic*1 (0.5MPa) | | |
| Clamping Torqyue | Nm | 150 | 500 | 1000 |
| Motor (FANUC) | | DiS60/400 | DiS180/800-B | DiS250/250 |
| Encoder | | αiCz Sensor 512A | | αiCz Sensor 1024A |
| Min. Incremental | deg. | 0.001 | | |
| Rotation Speed | r/min | 200 | 150 | 125 |
| indexing Accuracy | sec. | ±10 | | |
| Net Weight | kg | 70 | 105 | 245 |
| MAX. Work Load | kg | 50 | 100 | 250 |
| MAX. Torque | Nm | 130 | 380 | 600 |
| Constant Torque | Nm | 24/65*2 | 73/170*2 | 120/225*2 |
| Necessary Cooling Capacity | w | 1500 | 1600 | 1200 |

*1 Air Intensifying Booster system is available if the supplied air pressure is under 0.5MPa or the brake torque is required to increase. ☞P.95
*2 Show the figures with cooling system. Please be careful that cooling by the special liquid may not be good for the chiller system.
When cooling system is used, please check the cooling system, and stop the DD motor when the unusual condition is found.

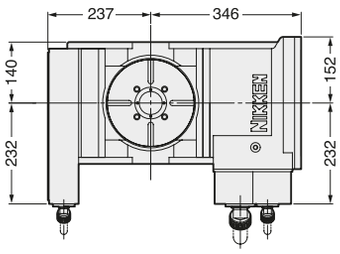
# ROTARY TILTING TABLE with DD MOTOR

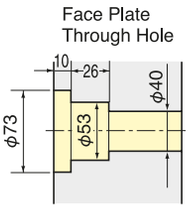
NIKKEN

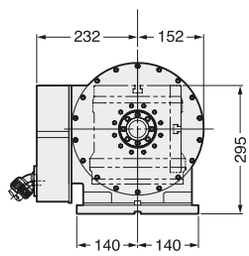
## 5AX-DD200AF2 PAT.

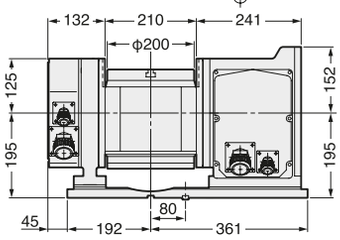

WITH FACE PLATE

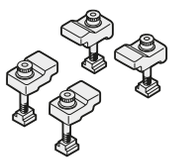
★The tilting axis center is located in the same position as the center of the rotary axis body.



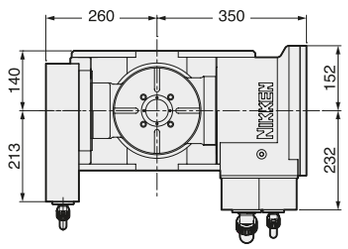



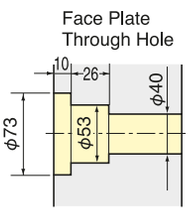


Clamp Device

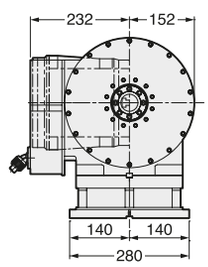
## 5AX-DD201BF3 PAT.

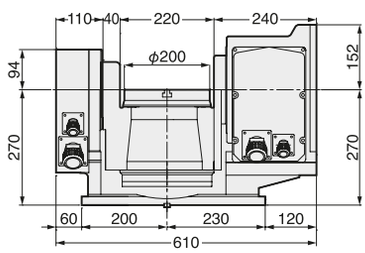
WITH FACE PLATE

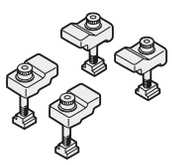
★The tilting axis center is located in the same position as the top surface of the rotary axis body.





Clamp Device

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

| Item / Code No. | | 5AX-DD200AF2 | | 5AX-DD201BF3 | |
|---|---|---|---|---|---|
| Diameter of Table | ϕmm | 200 | | 200 | |
| Diameter of Spindle Hole | ϕmm | 53H7 | | 53H7 | |
| Center Height (90˚) | mm | 195 | | 270 | |
| Table Height in Horizonatal Position (0˚) | mm | 295 | | 270 | |
| Width of T Slot | mm | 12H7 | | 12H7 | |
| Axis | | Rotary | Tilting (±110˚) | Rotary | Tilting (±110˚) |
| Clamping System | | Pneumatic*1 (0.5MPa) | Pneumatic*1 (0.5MPa) | Pneumatic*1 (0.5MPa) | Pneumatic*1 (0.5MPa) |
| Clamping Torqyue | Nm | 150 | 500 | 150 | 500 |
| Motor (FANUC) | | DiS60/400 | DiS150/300 | DiS60/600-B | DiS180/800-B |
| Encoder | | αiCz 512A | | αiCz 512A | |
| Min. Incremental | deg. | 0.001 | | 0.001 | |
| Rotation Speed | r/min | 200 | 150 | 200 | 150 |
| indexing Accuracy | sec. | ±10 | ±15 | ±10 | ±15 |
| MAX. Torque | Nm | 130 | 380 | 140 | 400 |
| Constant Torque | Nm | 24 | 73/170*2 | 34 | 75/180*2 |
| Net Weight | kg | 190 | | 205 | |
| MAX. Work Load | 0～30deg. kg | 30 | | 30 | |
| | 0～90deg. kg | 15 | | 30 | |

*1 Air Intensifying Booster system is available if the supplied air pressure is under 0.5MPa or the brake torque is required to increase. ☞ P.95

*2 Show the figures with cooling system. Please be careful that cooling by the special liquid may not be good for the chiller system. When cooling system is used, please check the cooling system, and stop the DD motor when the unusual condition is found.

# ROTARY TILTING TABLE with DD MOTOR

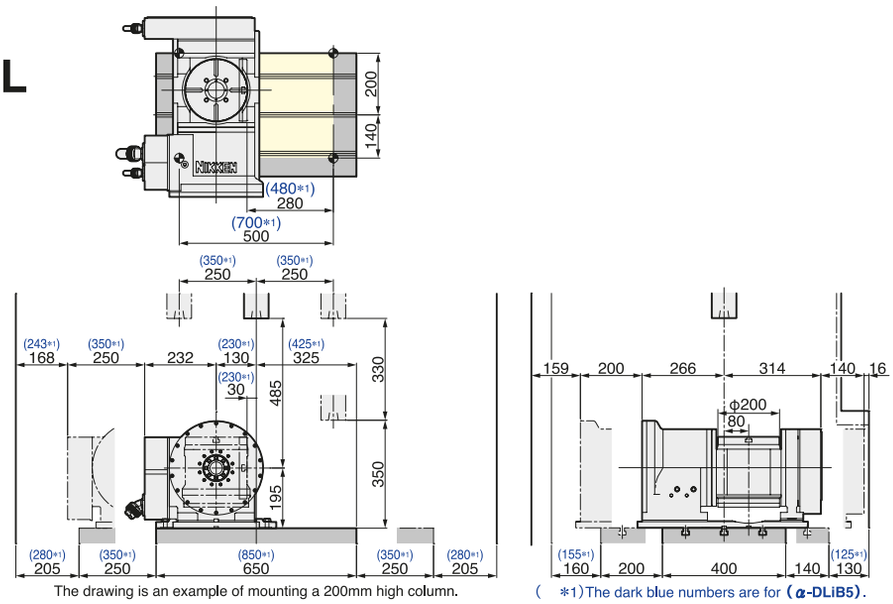
NIKKEN

## 5AX-DD Table for FANUC ROBO DRILL

### 5AX-DD200AF2

WITH FACE PLATE

Layout for the ROBO DRILL with 200mm high column



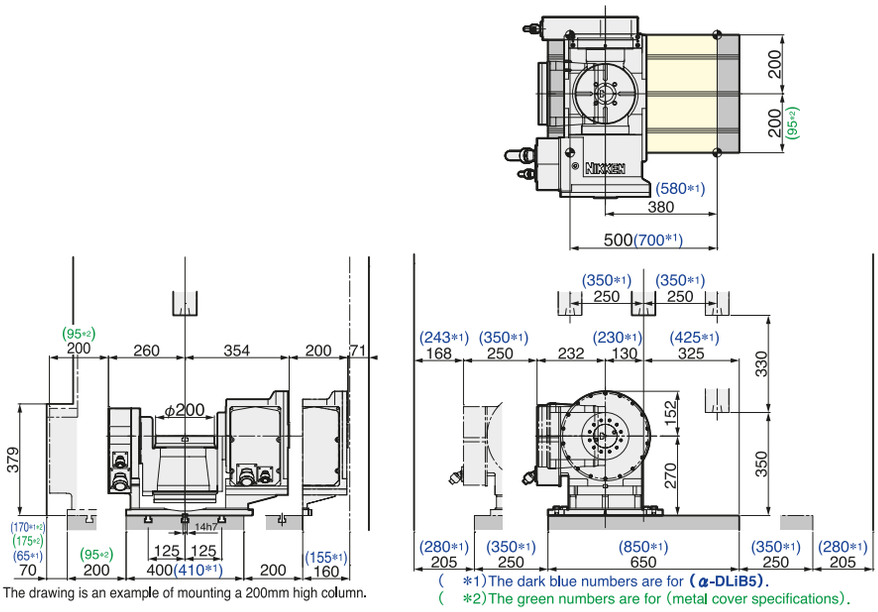

The drawing is an example of mounting a 200mm high column.

( *1)The dark blue numbers are for (α-DLiB5).

### 5AX-DD201BF3

WITH FACE PLATE

Layout for the ROBO DRILL with 200mm high column



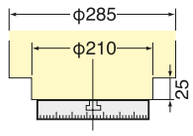
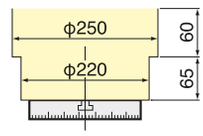
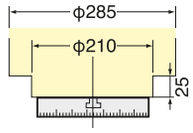
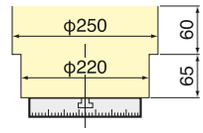
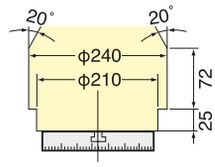
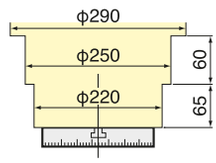

The drawing is an example of mounting a 200mm high column.

( *1)The dark blue numbers are for (α-DLiB5).

( *2)The green numbers are for (metal cover specifications).

5AX-DD200AF2

## The Area of Noninterference in Tilting Position.

| Angle | 5AX-DD200AF2 | 5AX-DD201BF3 |
|---|---|---|
| -45° ∫ 45° |   |   |
| -90° ∫ 90° |   |   |
| -110° ∫ 110° |   |   |

# Notice on the Use of DD TABLES

NIKKEN

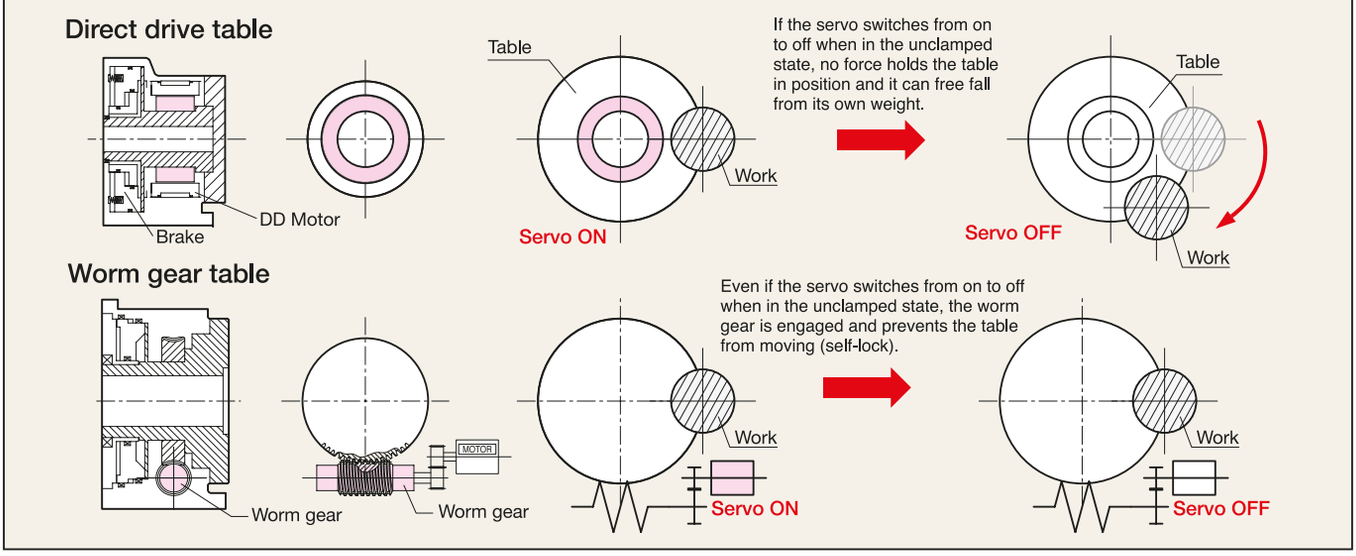
## DD table characteristics

- The spindle is linked directly to the motor for excellent responsiveness. As a tradeoff for this responsiveness, the system is very sensitive to external force and loads, so it is necessary to set suitable parameters for each application.
- Adjustment is necessary to perform 5-axis simultaneous machining (synchronized machining). The NIKKEN standard parameters can be used for indexing and positioning. After confirming with the machine manufacturer that optional functions* for synchronized machining are available, it is necessary to make appropriate settings to satisfy the customer's machining time and machining precision requirements. For simultaneous operation, suitable settings must be made to align the 4th (5th) axis with the three basic axes (XYZ).

### Clamping operation

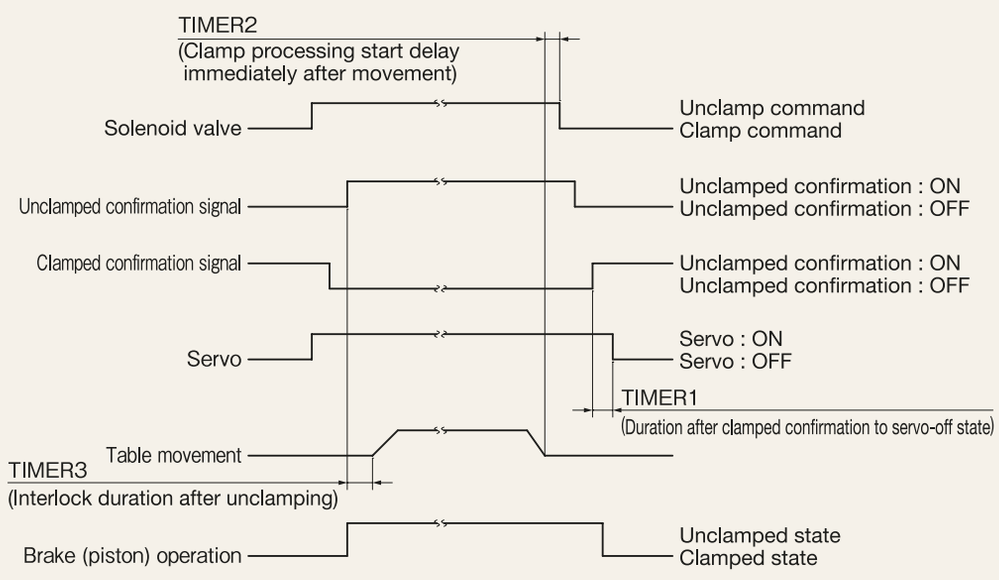
Due to the characteristics of the DD table it can be turned easily by hand if power is not being supplied (free run state). The table will again be in the free run state when the servo turns off after the brake is applied, unless appropriate settings are made, and this can cause positioning inaccuracy. Consult with the machine manufacturer to ensure that the timing is as shown in the timing chart below to prevent a free run state from occurring.

### Difference in structure between Direct Drive and Worm gear system




- **Preventing emergencies (in case of power interruption)**
  Configure a pneumatic (hydraulic) circuit (off-clamp) that will provide an effective brake should an emergency stop occur. Unlike normal clamping operation, in an emergency stop the brake is applied at the same time that the servo turns off momentarily, and this can result in positioning inaccuracy on an axis carrying a large load, such as the weight axis. To prevent this, enable the brake control function (FANUC), vertical axis drop prevention function (Mitsubishi), etc.
- **Brake control function**
  To prevent the fall of the weight axis when an alarm is generated or an emergency stop occurs, instead of stopping excitation of the motor immediately, excitation of the motor continues for the duration specified by a parameter to allow the mechanical brake to engage.
- **Shaft core cooling system PAT.**
  In the case of a DD table for turning ,there is also a system that forcibly cools from the center of the table in order to suppress the thermal displacement of the DD table itself.

### Reference timing chart




### ⚠Cooling of Direct Drive Servomotor

Except for some types of direct drive servomotor, you can choose no-cooling or liquid cooling. Keep cooling makes it possible to use under continuous rating torque.
However, the special care is required because the continuous rating torque may fluctuate depending on the cooling condition.
External cooling devices should be prepared for cooling, such as chiller unit which is normally used for high speed spindles.Oil cooling must be used; water cooling is not allowed to prevent the rust.
Recommended cooling oil is [ISO VG2] equivalents. (Ex. IDEMITSU "SUPER MULTI 2")

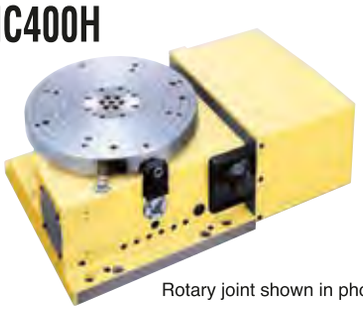
- In the case cooling is needed : ① Long time continuous running under high (close to maximum) speed rotation ② Very long time running under overload (above rated torque-below maximum torque) ③ Using special super-high speed servomotors
- Examples of cooling needed : ① Always-servo on under high-load condition (continuous turning operation) ② No-brake or the configuration that the servo is not off when clamping (Note: NIKKEN default configuration is servo OFF when clamping)
- Examples of cooling NOT needed : ① Indexing only ② Special use considering overload duty characteristics during non-cooling

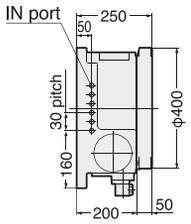
Please feel free to contact us if you need any concerns of questions regarding cooling or if you use direct drive rotary table under special conditions.

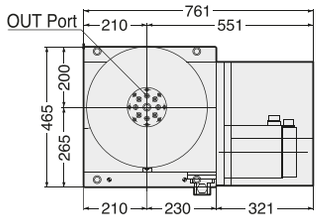
# BUILT-IN type CNC ROTARY TABLE

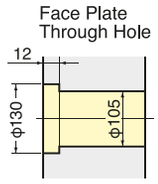
External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

## CNC400H





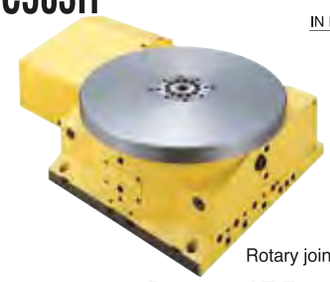



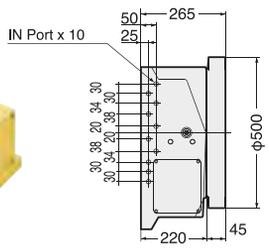

★Horizontal use only.

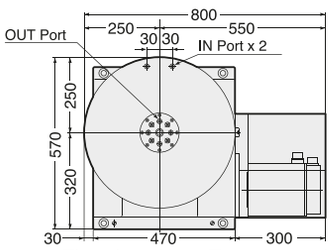
Rotary joint shown in photo & layout is optional.

The table without Tslots is standard.

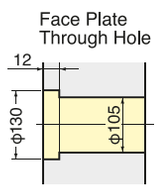
## CNC503H






- **12 Ports Rotary Joint is optional.**
- Suitable design for easy maintenance
- Economical price due to standardization




★Horizontal use only.

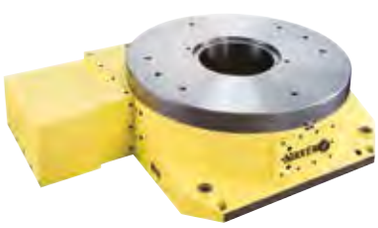
Rotary joint shown in photo & layout is optional.

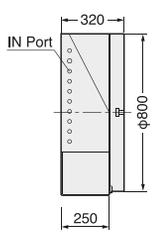
The table without Tslots is standard.

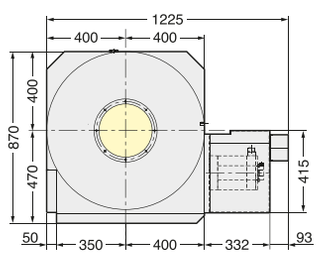
**B-type and T-Type are now available. Please contact us for more detail.**

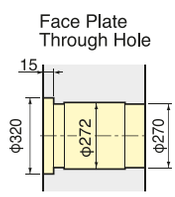
## CNC802 Ultra Big Bore (φ270mm) Specification

★Built-in type rotary joint can be mounted on **CNC802** refer to ☞ **P.89**






The table without Tslots is standard.

## Specifications

**Built-type CNC Rotary Tables are all semi-standard models. Please contact us.**

( ):High Speed type Please contact us.

| Item / Code No. | | CNC400H CNCZ400H | CNC503H CNCZ503H | CNC802 |
|---|---|---|---|---|
| Diameter of Table | φmm | φ400 | φ500 | φ800 |
| Diameter of Spindle Hole | φmm | φ105H7 | φ105H7 | φ270H7 |
| Clamping System | 3.5MPa | Hydraulic | Hydraulic | Hydraulic |
| Clamping Torque | N·m | 1760 | 1890 | 7000 |
| Table Inertia at Motor Shaft ($\frac{GD^2}{4}$) | kg·m²×10⁻³ | 2.8 | 8 | 5.3 |
| Servo Motor | r/min | αiF12·2000 | αiF12·2000 | αiF22·2000 |
| MIN. Increment | | 0.001° | 0.001° | 0.001° |
| Rotation Speed | r/min | 22.2(44.4) | 16.6(33.3) | 5.5 |
| Total Reduction Ratio | | 1/90(1/45) | 1/120(1/60) | 1/360 |
| Indexing Accuracy | sec | 20 | 20 | 15 |
| Net Weight | kg | 295 | 400 | 1100 |
| MAX. Work Load on the Table | Horizontal kg | 500 | 1000 | 3000 |
| MAX. Thrust Load applicable on the Table | N | 53100 | 63720 | 247920 |
| | *1 FXL N·m | 2648 | 3531 | 8563 |
| | FXL N·m | 3840 | 5990 | 36260 |
| MAX. Work Inertia | ($\frac{GD^2}{4}$) kg·m² | 16.6(8.3) | 32.5(16.3) | 234 |
| Driving Torque | N·m | 432(345) | 576(460) | 3168 |

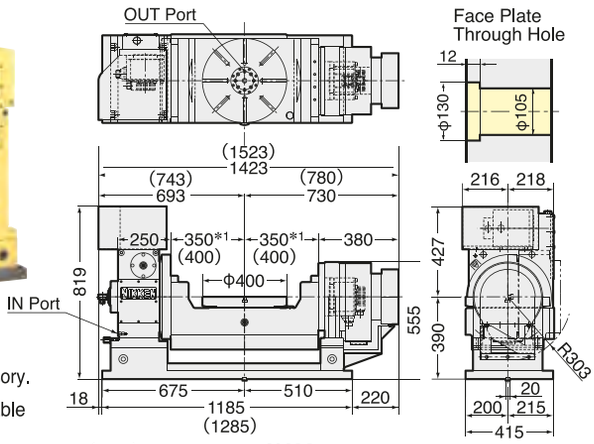
*1 **This is the strength of the worm wheel without brake. It is applied against dynamic cutting thrust.**

# BUILT-IN type TILTING ROTARY TABLE

NIKKEN

External dimensions depend on the type of the servo motor. Indicated dimensions are in case of FANUC. Please contact us for CAD files (2D:DXF, 3D:PARASOLID).

## 5AX-T400, N400




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.

*( ) : Figures is for **N400**.
*1500 is available on the figures marked.

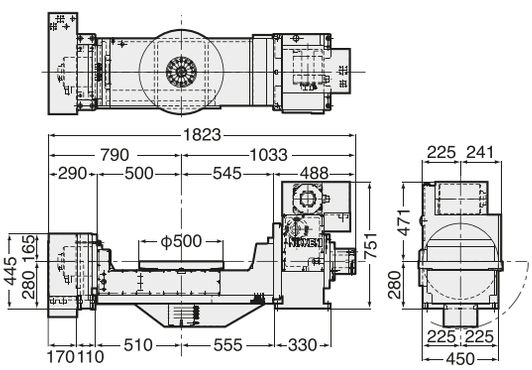
**Example when the tilting base is supplied.**

**5AX-N400**

**Combination of CNC503H & CNC302T**

## 5AX-B450

Tilting base will be supplied from M/C builder.




Built-in type 17 ports rotary joint is optional accessory.

The position of the motor of the tilting axis table can be right or left side for the vertical M/C.

**When only tilting axis is needed, an extended work piece can be machined.**

**5AX-T400-780**

| Item / Code No. | | 5AX-T400 N400 | | 5AX-B450 | |
|---|---|---|---|---|---|
| Diameter of Table | φmm | 400 | | 500 | |
| Diameter of Spindle Hole | φmm | Φ105H7 | | Φ155H7 Φ109 | |
| Center Height | (90°) mm | 390 | | 280*1 | |
| Table Height in Horizontal Position | ( 0°) mm | 390 | | 280*1 | |
| Width of T Slot | mm | $14^{+0.018}_{0}$ | | — | |
| Axis | | Rotary | Tilting | Rotary | Tilting |
| Clamping System | 3.5MPa | Hydraulic | Hydraulic | Hydraulic | Hydraulic |
| Clamping Torque | N·m | 1760 | 1760 | 1760 | 3870 |
| Table Inertia at Motor Shaft | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 2.8 | 2.44 | 2.8 | 2.9 |
| Servo Motor | r/min | αiF12 ·2000 | αiF22 ·2000 | αiF12 ·2000 | αiF22 ·2000 |
| MIN. Increment | | 0.001° | 0.001° | 0.001° | 0.001° |
| Rotation Speed | r/min | 22.2 | 16.6 | 22.2 | 16.6 |
| Total Reduction Ratio | | 1/90 | 1/120 | 1/90 | 1/120 |
| Indexing Accuracy | sec | 15 | 60 | 20 | 60 |
| Net Weight | kg | 750(**w/o base**) 995(**with base**) | | 1050(**w/o base**) | |

| Item / Code No. | | 5AX-T400 N400 | 5AX-B450 |
|---|---|---|---|
| MAX. Work Load on the Table | 0° to 30° W kg | 300 | 300 |
| | 30° to 90° W kg | 250 | 250 |
| MAX. Thrust Load applicable on the Table | Tilting Angle=0° F | 31360 | 31360 |
| | Tilting Angle=0° L F | L=200mm F=6860N | L=250mm F=5488N |
| | Tilting Angle=90° F₁ F₂ | L=100mm F=11660N | L=100mm F=11660N |
| | Tilting Angle=90° L F F×L N·m | 1166 | 1166 |
| MAX. Work Inertia | $(\frac{GD^2}{4})$ kg·m² | 5.1 | 5.1 |
| Driving Torque | N·m | 432 | 432 |

★Ultra precision type is available for all rotary tables, Rotary axis: **±5″**Tilting axis: **±10″**, please refer to ☞ **P.87**.
The figures marked *1 show the dimension without tilting axis base.

# Servo Motor List

NIKKEN

## Maker and Motor Model

| Stall Torque | | | 1 Nm | 2 Nm | 3 Nm | 6 Nm | 12 Nm | 22 Nm |
|---|---|---|---|---|---|---|---|---|
| Rotation Speed | | | 2000r/min | 2000r/min | 2000r/min | 2000r/min | 2000r/min | 2000r/min |
| Maker | | | Model 1 | Model 2 | Model 3 | Model 6 | Model 12 | Model 22 |
| FANUC | | | αiF1/5000 | αiF2/5000 | αiF4/5000 | αiF8/3000 | | αiF22/3000 |
| | | | αiS2/5000 | αiS4/5000 | αiS8/4000 | αiS12/4000 | | αiS30/4000 |
| | | | βiS2/4000 | βiS4/4000 | βiS8/3000 | βiS12/3000 | | |
| MELDAS | | | HF75T | HF105T | HF54T | HF104T | | HF354S |
| | | | | | HP54T | HP104T | | HP354S |
| | | | HG56T | HG75T | HG104T | HG154T | | HG354S |
| YASNAC | | | SGMPH-04AAA6S | SGMPH-08AAA6S | SGMGH-05ACA5S | SGMGH-09ACA5S | | SGMGH-30ACA2S |
| | | | SGMAV-04A3A6S | SGMGV-03A3A6S | SGMGV-05A3A6S | SGMGV-09A3A6S | | SGMGV-30A3A2S |
| | | | SGM7A-04A7A6S | SGM7G-03A7A6S | SGM7G-05A7A6S | SGM7G-09A7A2S | | SGM7A-30A7A2S |
| OSP | OSP2 | | | BL-MC24J-30S | BL-MC25J-30T | BL-MC50J-30T | | BL-MC200J-20S |
| | OSP3 | | | BL-ME24J-50SN | BL-ME40J-40TN | BL-ME80J-40TN | | BL-ME200J-20SN |
| | OSP4 | OLD | | BL-ME24M-50SN | BL-ME40M-40TN | BL-ME80M-40TN | | BL-ME200M-20SN |
| | OSP4 | NEW | | | BL-MT40M-40TN | BL-MT80M-40TN | | BL-MT200M-20SN |
| TOSNUC | | | | | MFA055MBJNC1 | MFA100MBJNC1 | | MFA350MBJNB |
| | | | MDM032R4L | MDM062R4L | MDM052R4L | MDM152R4L | | MDM402R4C |
| | | | | | MHMA052K2LA | MHME102F2CA | | MTMA552F2CA |
| | | | MHMD482S1C | MHMD082S1C | MHME102SCC | MHME152SCC | | MHME402SCC |
| Brother | SANYO*1 | | R2AD08040FXPGA | | R2AAB8100HXPGA | | | |
| | SANYO*2 | | R2AA08040FXR5E | | R2AAB8100HXRGA | | | |
| SIEMENS | | | 1FT-6031-4AK71 | 1FT-6034-4AK71 | 1FT-6044-1AK71 | 1FT-6064-1AK71 | | 1FT-6086-1AF71 |
| | | | | 1FK-7042 | 1FK-7060 | 1FK-7063 | | |
| INDRAMAT | | | MAC63A | MAC63C | MAC71B | MAC71C | | MAC93C |
| HEIDENHAIN | | | | QSY96A | QSY116C | QSY116E | | QSY155D |
| ISOFLEX | | | | | 444,2,20 | 444,3,20 | | |
| SEM | | | | HJ96C6-44 | HJ116C6-64 | HJ116E6-130 | | HJT155D8-180 |
| BOSCH | | | SE-B2.010 | SE-B2.020 | SE-B3.055 | SE-B3.075 | | SE-B4.210 |
| GLENTEK | | | GM3340 | GM4020 | GM4040,GM4050 | GM5065 | | |
| KOLLMORGEN | | | 6SM37L | 6SM47L | 6SM57L | 6SM57M | | |

*1 The end of the rotary table Code No. is **"SA-BR2"**.
*2 The end of the rotary table Code No. is **"SA-BR3"**.
★The characteristics(stall torque, MAX. torque and rotor inertia etc.)of the servo motors differ, therefore the specification of CNC rotary table will be a little different.
★Other servo motor can be mounted, please inform us the external dimension, specification of your servo motor.

MOTORS

# Relation between Unbalancing Load and Servo Motor

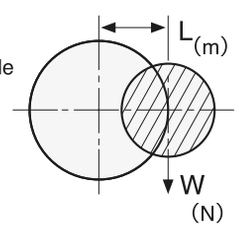
NIKKEN

**This table shows the guide line. Please make the unbalancing load as small as possible to use the counter balance weight for the precision machining.**

Excessive unbalancing load causes the indexing accuracy and the durability to be worse. The relation between the guide line of the unbalancing load and the servo motor shows below. Please do not apply the load exceeding the guide line.

**CNCZ** series table can not be recommended for the application with large unbalancing load. **CNCZ** series table is recommended for the application only with light load.

Please inform us the detail of the component, jig fixture, indexing time etc. prior to your order. Then, the calculation of the load is studied and the best suitable rotary table (including the suitable motor) for your application is proposed. The servo parameter is also tuned.




## Guide Line of MAX. Unbalancing Load for Additional Axis Control

FANUC motor is described.
Please contact us for the other maker.

| MAX. Unbalancing Load (N·m) | CNC180FA | CNC202FA | NCT200FA | CNC260FA 302FA | CNC321FA 401FA | CNCB450FA | CNC501FA 601FA |
|---|---|---|---|---|---|---|---|
| 30 | αiF2 | | | | | | |
| 50 | αiF4 | αiF4 | | | | | |
| 60 | | | αiF4 | αiF4 | | | |
| 100 | | | | αiF8 | αiF12 | | |
| 150 | | | | | | αiF12 | |
| 200 | | | | | αiF22 | | αiF12 |
| 300 | | | | | | αiF22 | |
| 400 | | | | | | | αiF22 |

## Guide Line of MAX. Unbalancing Load with NIKKEN Controller

| MAX. Unbalancing Load (N·m) | CNC180 | CNC202 | NCT200 | CNC260 | CNC302 |
|---|---|---|---|---|---|
| 10 | CNC180AR21-04 | | | | |
| 20 | CNC180AR21-08 | CNC202AR21-08 | NCT200AR21-08 | | |
| 30 | | | | CNC260AR21-08 | CNC302AR21-08 |
| 50 | CNC180AR21-06 | CNC202AR21-06 | | | |
| 60 | | | NCT200AR21-06 | CNC260AR21-06 | CNC302AR21-06 |

# Flow Chart of the Additional Axis Control

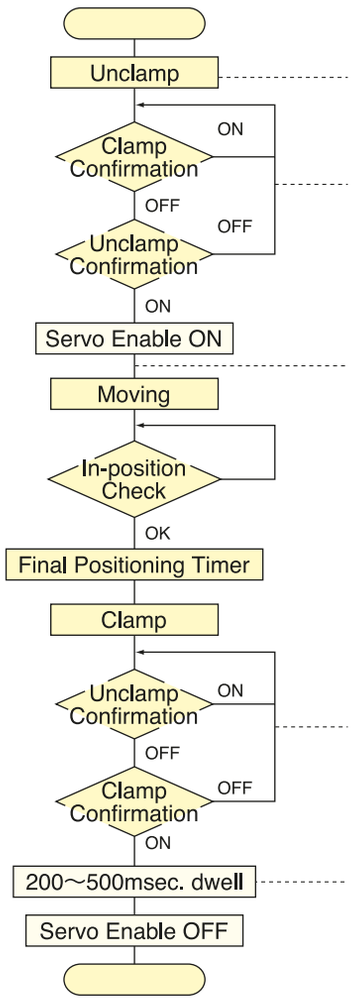
NIKKEN

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.

- **·CNC321, 401, 501, 601, 802, 803**
- **·CNC400H, 503H**
- **·5AX-250 (Tilting)**
- **·5AX-T(N)400 (Rotary. Tilting)**

⚠ **Please specify the brake control when ordering**
**·Type of solenoid valve (AC100V or DC24V)**
**·Motion of solenoid valve for clamp (ON: Clamp, OFF: Clamp)**

## Flow Chart of the Additional Axis Control




● **Please specify the type of the solenoid valve and the action at clamping.**
**AC100V or DC24V**
**ON Clamp or OFF Clamp**

● 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.

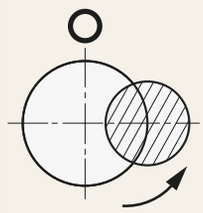
● 100～200msec. of the dwell after unclamp confirmation is required for **5AX-201**(Rotary), and **5AX-250**(Rotary).

● 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.

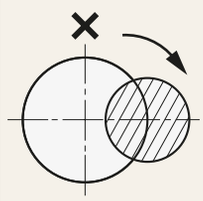
● **200～500msec. of the dwell after clamp confirmation is required for the hydraulic clamping system and the clamping system using the air-hydro booster. The timer value should be specified by the parameter setting.**

### ⚠ Positioning under unbalancing load

Please move the unbalancing load up to the destination position.



Positioning of the unbalancing up to the destination position is recommended.



Positioning of the unbalancing down to the destination position is not recommended.

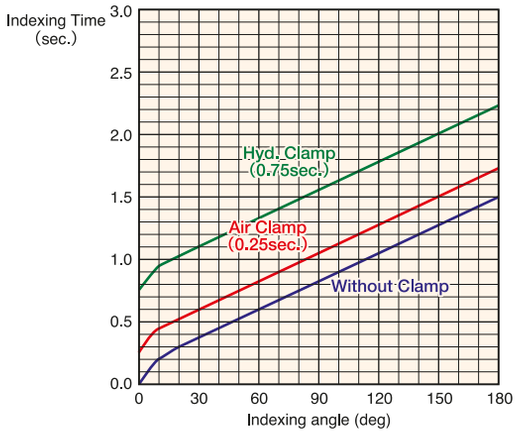
MOTORS

# Indexing Time

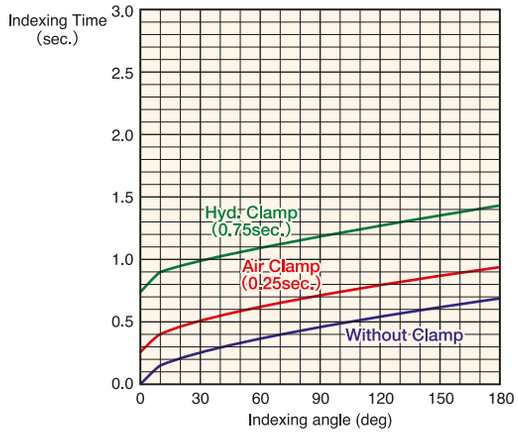
NIKKEN

Guide line of the indexing time is shown. The indexing time will be different according to the total reduction ratio, motor rotation speed, servo parameter setting and the piping of the brake circuit. Please contact us for more detail.

Standard CNC rotary table (22.2r/min)
Total reduction ratio: 90/1 Motor rotation speed: 2,000r/min, Acc. time constant: 100msec.




High speed CNC rotary table (66.6r/min)
Total reduction ratio: 45/1 Motor rotation speed: 3,000r/min, Acc. time constant: 200msec.



# M-signal CNC ROTARY TABLE with AR21 CONTROLLER

## Minimum Command Increment: 0.001° or 1sec.
AR21 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.

## USB interface as standard equipment
By connecting to a PC, program data and parameters can be input and output. (However, communication software is required on the PC side.)

## Upgrade of Water Proof Characteristic EMC Assessment ☞ P.103
The direct out type connection is applied for all models of CNC rotary table, and the EMC assessment is satisfied as the total system.

## Digital Servo System & Absolute Encoder
Very excellent acceleration/deceleration characteristics, the powered up torque and the best suited servo parameter realize the high quality and long life.
M ZRN after Power ON or after releasing the emergency stop condition is not necessary.*

## Plenty of Optional Functions
True Closed Loop, Manual Pulse Generator, M Function (Input: 5/ Output: 5), External N Number Search, External Position Display, External Power ON/OFF, Pitch Error Compensation

## More than 30,000 sets working in the field.
This fact ensures the highest reliability.

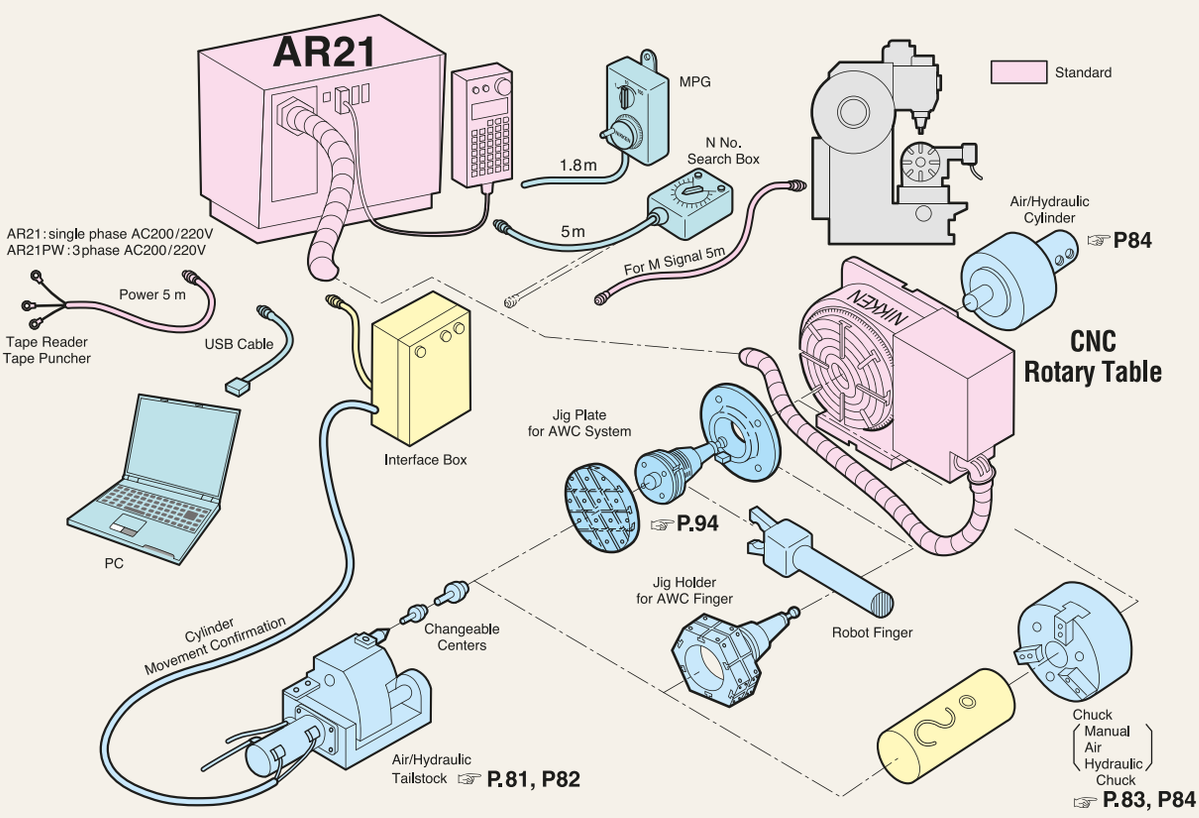
## Product compatible with ROHS2-10 commands
The AR21 controller is now ROHS2-10 compliant and has the product code AR21, which can be shipped to EU member countries.

* : The operation to establish the coordinate system is required at once, when turning the POWER ON at first time just after connecting the cable. Please refer to ☞ P.62

AR21 controller
- Standard (400W, 750W) 300×280×285 10kg
- **Single Phase AC200/220V**

AR21 PW controller
- Power up (1.3KW, 1.8KW) 540×360×400 28kg
- **3 phase AC200/220V**

AR21 controller for larger capacity
- (2.7KW, 4.4KW and 11kW) is available.
- **3 phase AC200/220V**



# AR21 CONTROLLER Specification

NIKKEN

## Main Specification of Controller (NIKKEN-AR21 controller)

| Item | Specification | Remarks |
|---|---|---|
| MIN. Increment | 0.001° or 1″ | Free Selection |
| MAX. Programmable Angle | ±9999 rotation, ±999.999° & ±999°59'59" | Free Selection |
| MAX. Equal Dividing | 2～9999 equal dividing | |
| Program Capacity | 1000 Blocks | N000～N999 |
| Input System | MDI Key Board, Pendant type | 5 years memory |
| Programming System | Combined use of Incremental/Absolute | Free Selection of G91 / G90 |
| Zero Return | Machine Zero Position/Work Zero Position | can be commanded from outside. |
| Manual Feed | Rapid Feed/Fine Feed/Step Feed/Continuous Feed | |
| Uni-directional Positioning | Uni-directional Positioning can be done to eliminate the mechanical backlash. | G14 |
| Emergency Stop | Whole system stops | can be commanded from outside. |
| Feed Hold | Table rotation temporarily stops. | can be commanded from outside. |
| Jump Function | Jump to sub program etc. | |
| Repeating Function | By specifying start No. and final No., multiple sequence are repeated. | |
| Buffer Function | Reading next block, and execute job without stop. | Useful for lead cutting etc. |
| Dry Run | Table always rotates in rapid feed for checking. | |
| Key Lock Function | Even if operation button is pressed by mistake, such command is neglected for safety. | |
| Preparatory Function | Dwell, Clamping/Unclamping, Lead Cutting... | G04～G92 |
| G1 Code, G2 Code | 2 kind of G codes can be entered in one block. | |
| Block Data display | At programming, previous block data or next block data are displayed. | ⬆ ⬇ |
| USB Interface | Program data and parameters can be input and output. | |
| Software Limit Function | ± stroke limit values can be set by parameter. | |
| Over Travel Detection Function | 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. | Standard for 5AX- type tilting axis |
| Alarm No. Automatic Indication Function | When alarm is detected, controller automatically goes to diagnosis mode and Alarm No. is displayed. | When duplicated, it flickers every 2 sec. |
| Alarm Out | Alarm condition of AR21 can be sent to M/C | |
| Emergency Stop Out | Emergency stop condition of AR21 can be sent to M/C. | |
| Self Diagnosis Function | Inside situations of controller can be seen. | |
| Modal G Code Flicker Function | All G codes used in program are indicated in flickering. | Every 2 sec. |
| Pitch Error Compensation Function | Rotary axis: 15° unit, Tilting axis: 5° unit | Option |
| Feed Rate Override | 5～200%,999% (Rapid feed) | ±5% |
| Input Signals | 1 kind of Auxiliary Function.(Automatic operation can be done by only one M signal.) | With or without contact signal *1 |
| Output Signal | 1 Block Finish signal, Work Zero Position Signal, Alarm Out Signal *2 | Ask Time Chart |
| Servo Motor | AC servo motor with serial encoder | |
| Input Power | AR21 : Single phase AC200～220V、50Hz / 60Hz | 400W : 480VA*3,750W : 760VA*3 |
| | AR21 PW : 3 phase AC200～220V、50Hz / 60Hz | 1.3kW : 960VA*3,1.8kW : 1.2KVA*3 |

*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.

*3 Input load capacity at 40% of average load factor.

## 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 AR21side. AR21 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 Power ON/OFF

Interface to perform Power ON/OFF by external circuit is available.

### 6 Pitch Error Compensation

Rotary Axis:
by 15° unit × 24 points
Tilting Axis:
by 5° unit × 24 points
The optimum correction value is adjusted and shipped with increased indexing accuracy.

### 7 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 AR21 is in alarm condition. These signals can be used for interlocking function.

### 8 Direct Angle Command Interface

By connecting the machine side RS232C interface to the AR21 controller, it is possible to manage all the programs of the AR21 controller.
For details, please refer to ☞ page 76.

### 9 Harting Connector Type...Only for AR21

Harting Connector can be corresponded to the CNC Rotary Table side.
The AR21PW controller is not compatible.

# Explanation of PENDANT 1

NIKKEN


ON OFF ① Power Switch

② Emergency Stop Button

−◀ ▶+ ③④ Manual Jog Button

HI ⑤ High Speed Button

AUT/MAN ⑥ Auto/Manual Select Switch

EDT/POS ⑦ Edit/Current Position Select Switch

START ⑧ Start Button

STOP ⑨ Stop Button

CF ⑩ Continuous Feed Button

ORG ⑪ Original Point Set Button

M ZRN ⑫ Machine Zero Return Button

W ZRN ⑬ Work Zero Return Button

DGN ⑭ Diagnosis Button

⬆ ⬇ ⑮ Increment/ Decrement of Block No.

− OVR + OVR ⑯ Feed Rate Override Button

RESET ⑰ Reset Key

- **READY** ·····Turned ON when input power is supplied.
- **COM.**·····Turned ON while AR21 main unit and the pendant are communicating.
- **ALARM**·····Turned ON when AR21 is in alarm condition.
- **COM. ALARM** ····Turned ON when communication time out error occurs between AR21 main unit and the pendant.

ON OFF **① Power Switch**

**② Emergency Stop Button**

−◀ ▶+ **③④ Manual Jog Button**

▶+ Clockwise, −◀ Counter clockwise.
While this button is being depressed, the table continually rotates slowly. When this button is depressed once, the table steps by 0.001°(1").

HI **⑤ High Speed Button**

When this button is depressed together with ③ or ④,the table rotates in rapid feed.
When jog ⑪ while depressing ⑤ ,table moves as following;

| Gear Ratio | Table Movement |
|---|---|
| 1 : 720 | 0.5° |
| 1 : 360 | 1.0° |
| 1 : 180 | 2.0° |
| 1 : 120 | 3.0° |

| Gear Ratio | Table Movement |
|---|---|
| 1 : 90 | 4.0° |
| 1 : 60 | 6.0° |
| 1 : 45 | 8.0° |

AUT/MAN **⑥ 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 ①,②,⑥,⑧,⑨,⑭,⑯,⑰ are ineffective.

EDT/POS **⑦ Edit/Current Position Select Switch**

On θ of ⑱, programming or present position is displayed alternatively.

START **⑧ Start Button**

The table rotates as programmed.

STOP **⑨ Stop Button**

The table slows down and stops. (Feed Hold Function). When ⑧ is depressed again, the table rotates the remaining angle of the program.

CF **⑩ Continuous Feed Button**

When this button is depressed, the table rotates continually. And, when ⑨ is depressed, the table stops. The desired feed and direction are to be input in N997 Block. (Refer ☞ **P.53** ⑧)

ORG **⑪ Original Point Set Button**

When this button is depressed at any angle, the position display shows 000.000°, and it is used as the work zero position. When the cumulative angle becomes 360°,work zero position signal is sent, which can be used as interlock.

M ZRN **⑫ 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.

W ZRN **⑬ Work Zero Return Button**

When this button is depressed, the table returns to the position set by ⑪ clockwise in rapid feed.

DGN **⑭ Diagnosis Button**

⬆ ⬇ **⑮ Increment/Decrement of Block No.**

Previous block data and next block data are displayed.

− OVR + OVR **⑯ 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.

RESET **⑰ Reset Key**

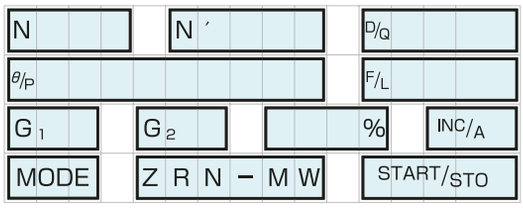
This is for calling N000 and also for resetting alarm display etc.

M-SIGNAL

# Explanation of PENDANT 2

NIKKEN

⑱ **Display**




**N** : Sequence No. N000～N999
**N RS**: Direct angle command interface is selected.
**N'**: Jump & Return J000～J999, RET
θ : Rotation angle of table (Decimal, Sexagecimal)
0～±999.999° (Decimal)
0～±999.59'59" (Sexagecimal)
**D** : Equal division (divided by 2 to 9999)
**F** : Feed rate
Cutting feed: 0.01～9.99r/min
Rapid feed: 000
**G** : Preparatory function G01～G92
Two kind of G codes (G1, G2)
can be input in one block.
**%**: Feed rate override
(5% to 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)

N (3digits)

⑲ **Key Encoder**
For calling a certain sequence, input the number after this key so that the program of the block is display, also you can start from the program.

J (3digits)

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

RET

When sub program is finished, enter R at ⑱ N' display. And, it returns to the block next to the one where J' was commanded in the main program.

θ P
θ (±6～7digits)
P (3digits)

θ : You can input 0° to ±999.999° in 0.001° increment, or 0° to ±999° 59'59" 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 Q
DIV(4digits)
Q(3digits)

**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 L
F、L(3digits)

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

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

G NO

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 : Droop check
＊G16 : Droop cancel
G21 : Simultaneous start
G22 : Continuous start
G23 : Machine zero point return
G24 : Work zero point return
G27 : Repeating function
G28 : Programmable machine Pzero position return
＊G90 : Absolute command
＊G91 : Incremental command
G92 : Coordinate system setting

**M Function (Option)**
**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 0 8 ＊
and indication will become as ;

| G1 | G2 |
|---|---|
| 07 | 08 |

• DATA
When you want to enter 9°, just depress keys as θ → 9 → ·, and 9.000° or 9°00′00″ is displayed.

− PRM
This is for command of Counter clockwise rotation.

INPUT
This is depressed as programming of each block being completed.
(Hereafter shown as ＊).

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

**Deleting successive blocks**
For example, in order to delete blocks from **N000** to **N999**, push keys N **0** − **999** at Edit mode, and jog ＊ while depressing C key.

means optional function.

Operation of the pendant of AR21 controller for tilting axis specification and for NSV index specification differs, please refer instruction manual.

## ⚠ Caution for AR21 Controller

- The alarm regarding the absolute encoder will be appeared, when turning the POWER ON at first time just after connecting the cable. This is because the coodinate system is not established yet. Please try as follows;
  - DGN Return to pervious mode.
  - − PRM DGN 1 • DATA 1 ＊ PRM#110=1 Writting parameter value enable.
  - G NO 7 2 • DATA 1 ＊ PRM#72=1
  - Turn the POWER OFF and ON
  - For rotary axis M ZRN Execute machine zero return.
    For tilting axis First set the temporary machine zero position and M ZRN. Please refer instruction manual for more detail.
- When the alarms regarding the absolute encoder such as ALARM#1101 or #1102 are appeared, please set PRM#71=1 and turn the POWER OFF and ON to establish the coodinate system again.

M-SIGNAL

# Operation & Confirmation of PROGRAMS

NIKKEN

## Operation of Keys.

Before programing, be sure that mode is EDT.
Before start the programs, push ⬇⬇ ..... or ⬆⬆ ..... in EDT mode, and confirm input date.
Then start the program in MAN mode to confirm the moving.

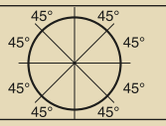
### ① Angle Dividing


```
N 0 0 0  θ 4 5  ·  F 0  ✻
```
Rapid feed.
Input Angle
No need of pressing 0 under decimal point.
`N 0 0 0 → START`
Sequence No.

### ② Arc Milling


```
N 0 0 0  θ 4 5 1 2 3  F 1 2 3  ✻
```
123 x 1/100 r/min rotation speed.
means 45.123°
Cutting Feed : = 2πR x 1.23 r/min
= 7.7 R mm/min.
`N 0 0 0 → START`

### ③ Equal Dividing

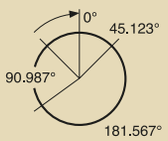



```
N 0 0 0  J 0 θ 4 5  · F 0  ✻
```
After finishing N000 return to N000.
`N 0 0 0 → START`

### ④ Unequal Dividing

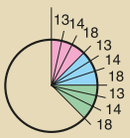

```
N 0 0 0 θ 4 5 ·        F 0 ✻
  0 0 1 θ 3 5 1 2 0      ✻
  0 0 2 θ 6 1 5 6 7      ✻
  0 0 3 θ 9 3 5 6 7      ✻
  0 0 4 θ 6 7 3 5 0      ✻
  0 0 5 J 0 θ 5 7 3 9 6  ✻
```
In case of the same feed rate in the following blocks just command once. (Modal type)
After finishing N005 return to N000.
`N 0 0 0 → START`

### ⑤ Incremental/ Absolute Dividing




```
N 0 0 0 θ 4 5 1 2 3     F 0 G 9 1 ✻
  0 0 1 θ 1 8 1 5 6 7       ✻
  0 0 2 θ 9 0 9 8 7         ✻
  0 0 3 J 0 θ 0 ·         G 9 0 ✻
```
Incremental Command (Modal Type)
`N 0 0 0 → START` To W zero-point
Absolute Command (Modal Type)

### ⑥ Repeating Function




```
N 0 0 0 θ 1 3 ·   F 0 ✻
  0 0 1 θ 1 4 ·     ✻
  0 0 2 θ 1 8 ·     ✻
  0 0 3 G 2 7 Pθ 0 DIV 0 2 LF 2 ✻
```
L : Repeat 2 times
Q : Finishing N002
θ : Starting N000
Command of repeating function
`N 0 0 0 → START`

- 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.

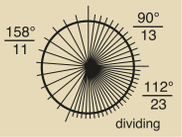
### ⑦ Counter Clockwise Rotation


```
N 0 0 0 θ PRM 4 5 · F 0 ✻
```
Counter Clockwise (CCW)
`N 0 0 0 → START`

### ⑧ Continuous Feed 0.5

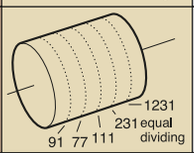
```
N 9 9 7 θ PRM 0 · F 5 0 ✻
```
Continuous feed 0.5r/min (CCW)
Command of continuous FeedStart
RESET CF Start STOP
Stop

### ⑨ Equal Dividing of Arc



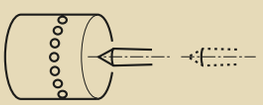

```
N 0 0 0 θ 9 0 · DIV 1 3 F 2 0 0 ✻
  0 0 1 θ 1 1 2 · DIV 2 3 F 0   ✻
  0 0 2 J 0 θ 1 5 8 · DIV 1 1   ✻
```
This means 90°÷13.
Feed rate can be commanded from 0.01 r/min to rapid speed.
`N 0 0 0 → START`

### ⑩ Equal Dividing of Circle (360°)




```
N 0 0 0 θ 3 6 0 · DIV 9 1 F 0 ✻
  0 0 1 θ 3 6 0 · DIV 7 7     ✻
  0 0 2 θ 3 6 0 · DIV 1 1 1   ✻
  0 0 3 θ 3 6 0 · DIV 2 3 1   ✻
  0 0 4 J 0 θ 3 6 0 · DIV 1 2 3 1 ✻
```
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

### ⑪ M function



**Optional Specification**

```
N 0 0 0 G 6 0          ✻
  0 0 1 θ 3 6 0 · DIV 1 0 ✻
  0 0 2 G 6 1          ✻
```
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 5AX- table.

M-SIGNAL

# Example of PROGRAMS

NIKKEN

## ① Example for Circle Drilling & Tapping (23 equal division)

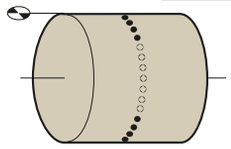
### ● Program of NC Machine

```
O 0000 ;···Main program
  :
  M98 P0100 L23 ;···Drilling cycle 23 times
  :
  M98 P0101 L23 ;···Tapping cycle 23 times
  M02 ;
O 0100 ;···Sub program 1
  :
  G01Z—— ;···Drilling fixed cycle
  M21 ;
  M99 ;
O 0101 ;···Sub Program 2
  :
  G01Z—— ;···Tapping fixed cycle
  M21 ;
  M99 ;
```

### ● Program of AR21

```
N000 J0 θ360 · DIV 23 F0 ✻
```

- 23 equal dividing of 360°
- After finishing **N000**, return to **N000** again.



23 equal dividing on circle for drilling & tapping

When NC Machine executes the sub program 23 times, drilling & tapping of 23 holes is completed with 23 equal divisions calculated to 1/23rd of 360° to third decimal places automatically, e.g. 15.652°.

## ② Example for Arc Milling

### ● Program of NC Machine

```
O 0001 ;
  :
  M21 ;
  G01Z—— ;···Z axis down
  M21 ;
  G00Z—— ;···Z axis up
  M21 ;
  :
```

### ● Program of AR21

```
N010 θ210 · F0 G91 ✻ ···Rapid feed to starting point ①
```

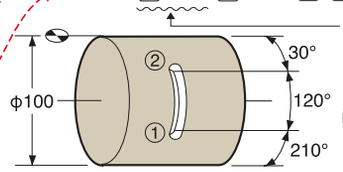
- Incremental command (Modal Type)

```
011 θ120 · F50 ✻ ·····Arc milling to ②
```

- Milling by rotating speed of 0.5r/min

```
012 J10 θ30 · F0 ✻ 30°of rapid feed to work zero position
```

- After finishing **N012**, return to **N010**




Calculation of cutting speed
100 × π × 50 × 1/100r/min=
157 mm/min

## ③ Example for Lead Cutting

### ● Program of NC Machine

```
O 0003 ;
  :
  M21 ;
  G01Z—— ;···Z axis down
  M21 ;
  M21 ;
  G01X40. F100 ; *1
  G00Z—— ;···Z axis up
  M21 ;
  :
```

### ● Program of AR21

```
N020 θ240 · F0 G91 ✻ ··· Rapid feed to starting point ①
021 G10 ✻ ····· Brake unclamped
022 θ79338 F55 G21 ✻ ···Cutting feed to ②
                *2
```

- Simultaneous start

```
023 J20 θ0 · G9011 ✻ ··· Rapid feed to work zero position
```

- **G90** (Absolute) & **G11** (Brake clamped)

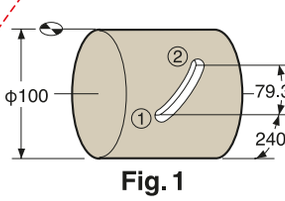



Fig. 1

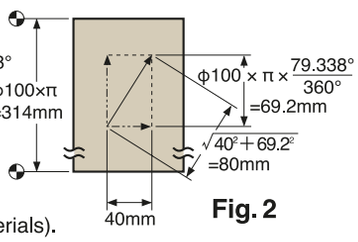



Fig. 2

### 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: Fx= 200 mm/min x 40 mm ÷ 80mm =100 mm/min F100 *1
4. Cutting speed of θ axis: f = 200 mm/min x 69.2 mm ÷ 80mm =173 mm/min
   173 mm/min x 1r/min ÷ 314 mm/min =0.55r/min F55 *2

## ④ Example of continuous rotation as turning operation

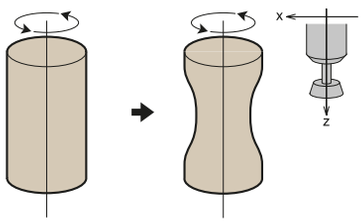
### ● Program of NC Machine

```
O 0004 ;
  :
  M21 ; Start continuous rotation
  :
  X & Z Contouring
  :
  M21 ; Stop continuous rotation

  M21 ; Machine zero position return with dog
```

### ● Program of AR21

```
N030 G22 ✻ ·····Continuous rotation
N031 J30 G28 ✻ ·····Programmable machine zero position return with dog
N997 θ PRM 10 · F300 ✻
```



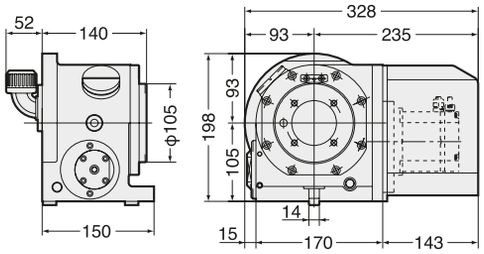

The direction and feed rate of continuous rotation are specified on N997. When higher rotation speed than standard is required, please contact with us.

M-SIGNAL

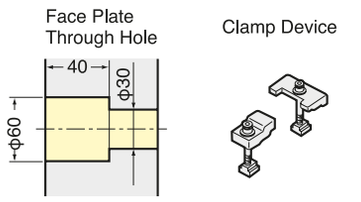
# CNC ROTARY TABLE with AR21 CONTROLLER

NIKKEN

## CNC105AR21-04

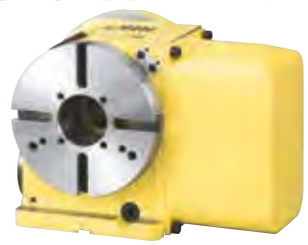



**Powerful Clamping Torque : 205Nm**

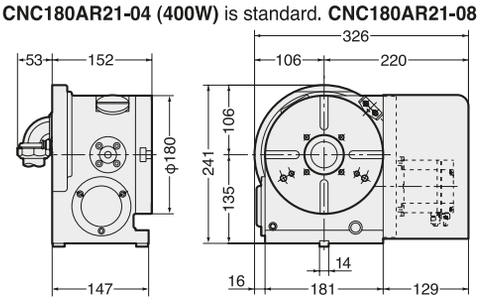



Air purge function is provided.

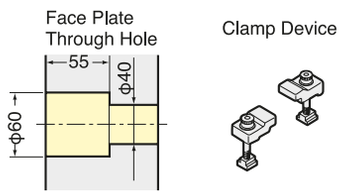
## CNC180AR21-04



**CNC180AR21-04 (400W)** is standard. **CNC180AR21-08 (750W)** and **CNC180AR21-06 (High Torque)** are available.

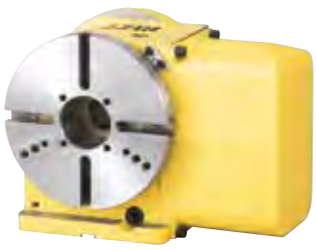



**Powerful Clamping Torque : 303Nm**

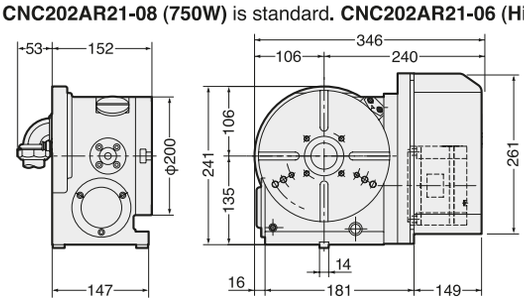



Air purge function is provided.

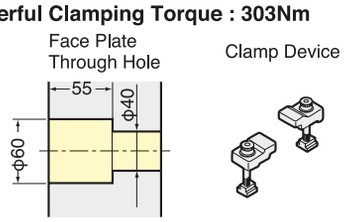
## CNC202AR21-08



**CNC202AR21-08 (750W)** is standard. **CNC202AR21-06 (High Torque)** is available.




**Powerful Clamping Torque : 303Nm**

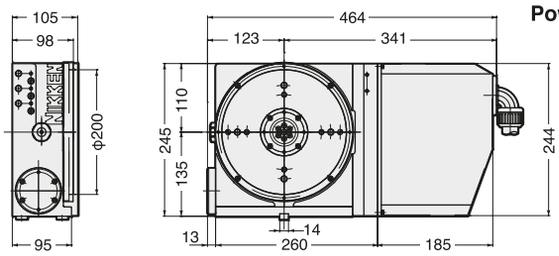



Air purge function is provided.

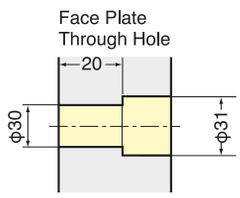
## CNC205AR21-05

Rotary joint shown in photo is optional.

**NC202AR21-05 (450W)** is standard. ★Built-in type rotary joint 6+1 can be mounted.

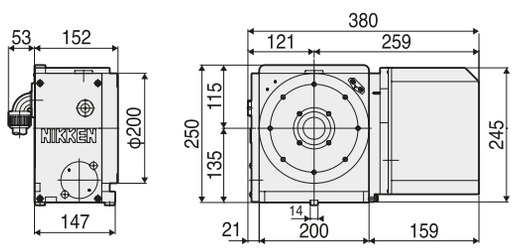



**Powerful Clamping Torque : 380Nm**

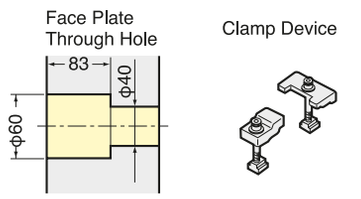



Air purge function is provided.

## NCT200AR21-08




**Powerful Clamping Torque : 900Nm**

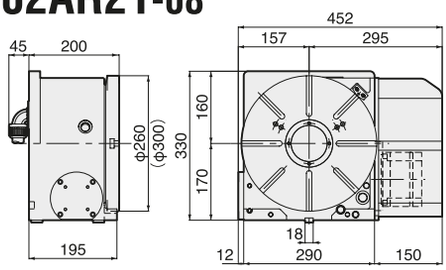



Air purge function is provided.

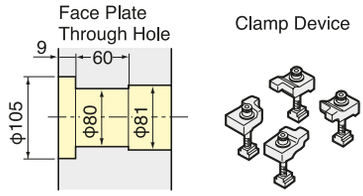
## CNC260AR21-08, 302AR21-08

**CNC260**

**CNC260, 302AR21-08 (750W)** is standard. **CNC260, 302AR21-06 (High Torque)** is available.




**Pneumatic Clamping 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. CNCZ260AR21**

M-SIGNAL

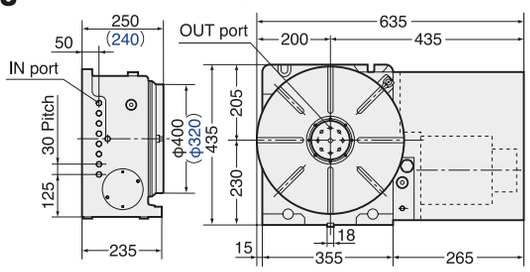
# CNC ROTARY TABLE with AR21 CONTROLLER

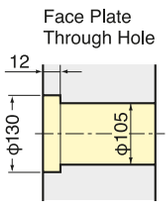
NIKKEN

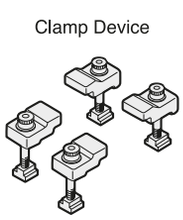
## CNC321, 401AR21-18

★Built-in type rotary joint can be mounted, refer to ☞P.89

Rotary joint shown in photo is optional.



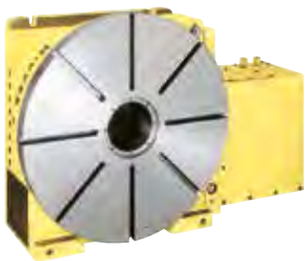



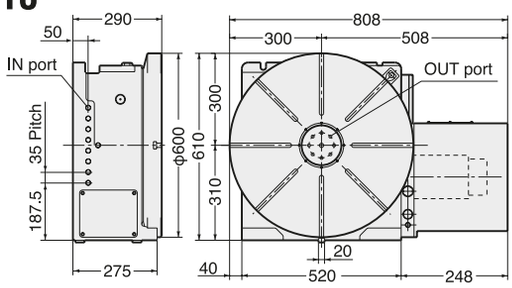



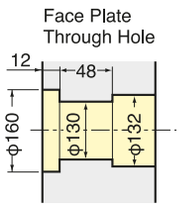

★ Please contact us for the dimension of **CNC321AR21-18.**

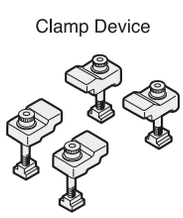
## CNC501, 601, 802AR21-18

★Built-in type rotary joint can be mounted, refer to ☞P.89





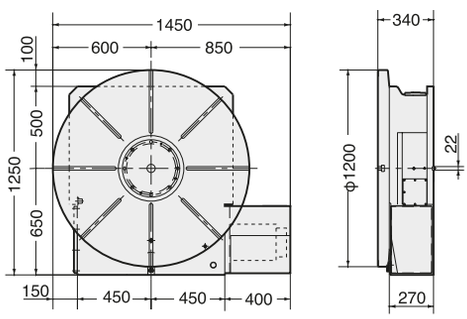




★ Please contact us for the dimension of **CNC501, 802AR21-18.**

## CNC1000, 1200AR21

Center socket shown in photo is optional.

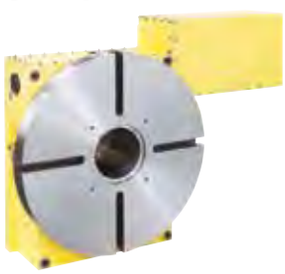


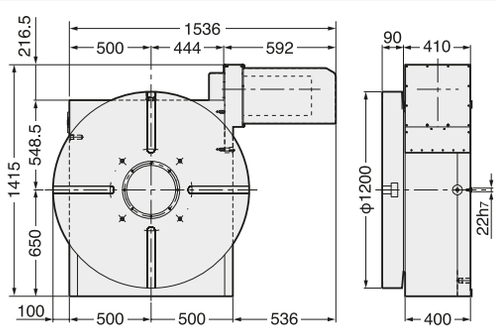

★ Ultra precision of ±3sec. is available as an option. There is no through hole on the rotary table due to the rotary encoder for ultra precision option.

★ Please contact us for the dimension of **CNC1000AR21.**

★ **Code No. will be varied according to the servo motor capacity. e.g CNC1000AR21-44 (4.4KW Motor)**

## CNC1201AR21



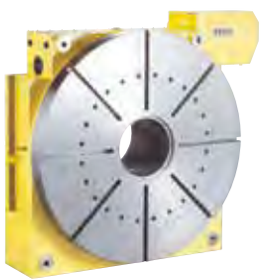


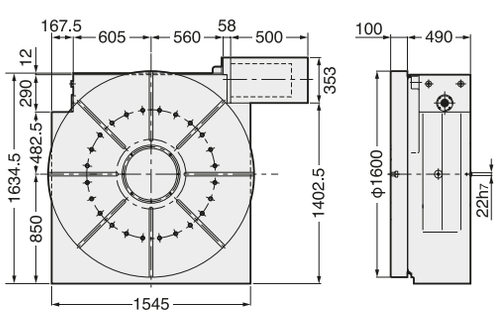

★ Ultra precision of ±3sec. is available as an option. There is no through hole on the rotary table due to the rotary encoder for ultra precision option.

★ Please contact us for the dimension of **CNC1000AR21.**

★ **Code No. will be varied according to the servo motor capacity. e.g CNC1201AR21-110 (11KW Motor)**

## CNC1600AR21






★ Ultra precision of ±3sec. is available as an option. There is no through hole on the rotary table due to the rotary encoder for ultra precision option.

★ Please contact us for the dimension of **CNC2000AR21.**

★ **Code No. will be varied according to the servo motor capacity. e.g CNC1600AR21-44 (5KW Motor)**

**The specification of the large rotary table will be varied according to your application.**

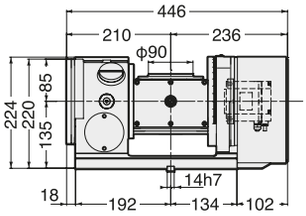
1. With/without T slot, Width of T slot
2. Spindle hole dimension···Center socket for centering is normally installed.
3. Layout of the rotary table···Vertical use, horizontal use, vertical and horizontal use
4. Total reduction ratio···Suitable capacity of the servo motor can be selected.

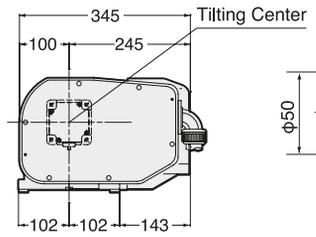
M-SIGNAL

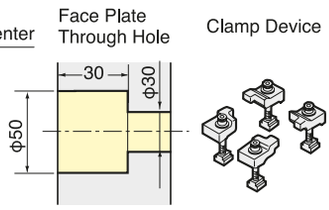
# Tilting Rotary Table with AR21 Controller

NIKKEN

## 5AX-100WAR21



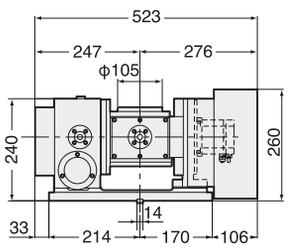



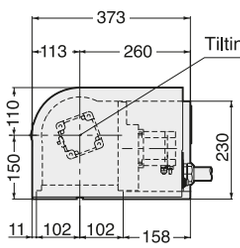



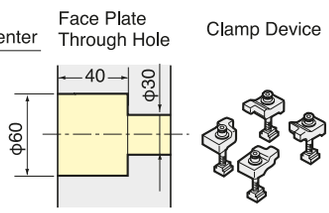

**Motor capacity of rotary axis and tilting axis are added at the end of Code No. e.g 5AX-100WAR21-0404**

## 5AX-130WAR21

Photo with φ130mm plate.
Rotary axis cable stays.

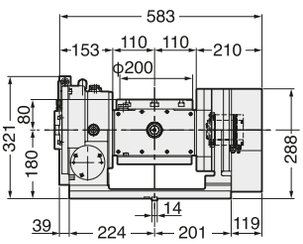


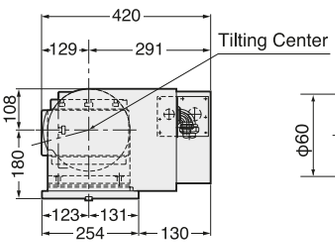



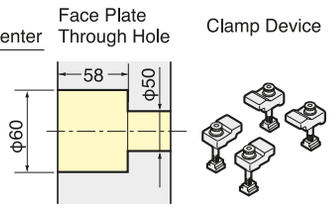




**Motor capacity of rotary axis and tilting axis are added at the end of Code No. e.g 5AX-130WAR21-0404**

## 5AX-201WAR21

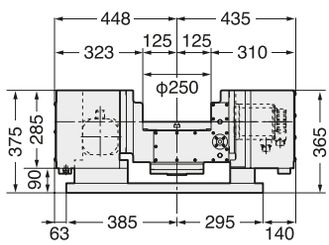


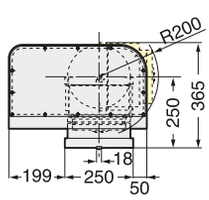



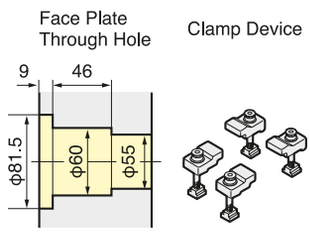




**Motor capacity of rotary axis and tilting axis are added at the end of Code No. e.g 5AX-201WAR21-0408**

## 5AX-250WAR21

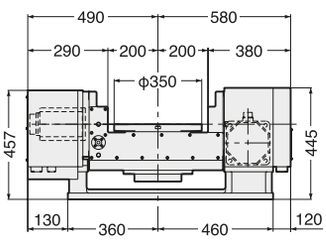


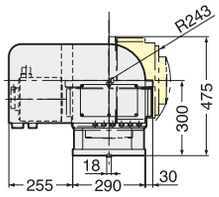



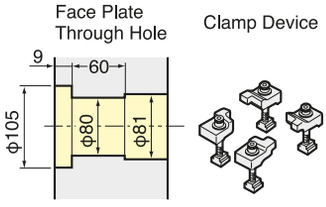




**Motor capacity of rotary axis and tilting axis are added at the end of Code No. e.g 5AX-250WAR21-1313**

## 5AX-350WAR21




**Motor capacity of rotary axis and tilting axis are added at the end of Code No. e.g 5AX-350WAR21-1318**

M-SIGNAL

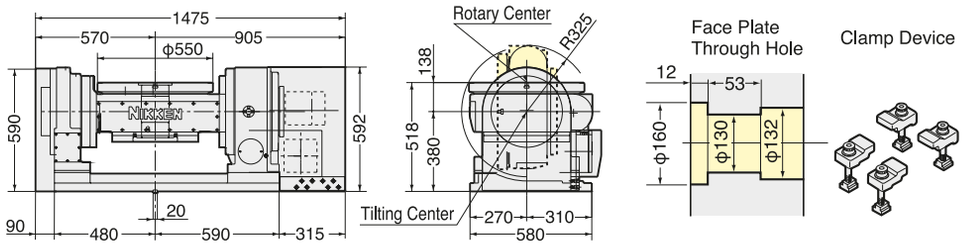
# Tilting Rotary Table with AR21 Controller

NIKKEN

## 5AX-550WAR21

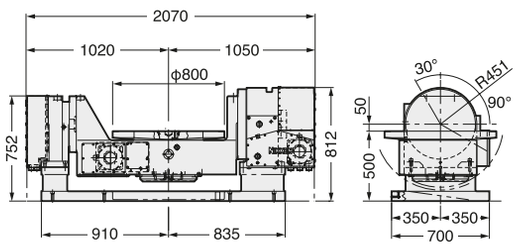
**The specification of the large rotary table will be varied according to your application.**

Center socket shown in photo is optional.



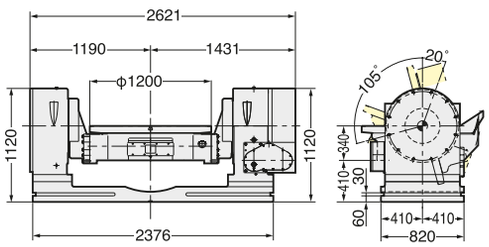

**Motor capacity of rotary axis and tilting axis are added at the end of Code No. e.g 5AX-550WAR21-1818**

## 5AX-800WAR21




**Motor capacity of rotary axis and tilting axis are added at the end of Code No. e.g 5AX-800WAR21-1875**

## 5AX-1200BWAR21




**Motor capacity of rotary axis and tilting axis are added at the end of Code No. e.g 5AX-1200BWAR21-4444**

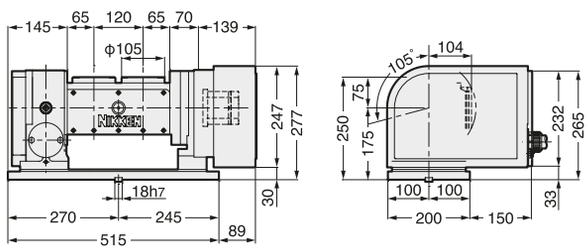
1. Moving angle of the tilting axis
2. Relation between the tilting axis center and the rotary axis

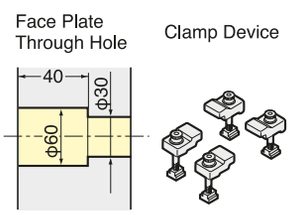
**5AX-1200A**:The tilting axis center is located in the same position as the center of the rotary axis body.

**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. With/ witout T slot, Width of T slot
5. Spindle hole dimension
   ···Center socket for centering is normally attached.

## 5AX-2MT-105WAR21




**Motor capacity of rotary axis and tilting axis are added at the end of Code No. e.g 5AX-2MT-105WAR21-0404**
If you need a knock hole for positioning or a key way on the table surface, please contact us.

AR21 controller can drive the all models of NIKKEN rotary tables. Please contact us for the external dimension.

Back side motor mounted CNC rotary table

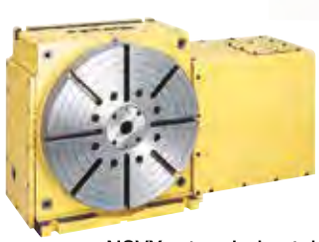
Top side motor mounted CNC rotary table

Multi-spindle CNC rotary table

NST manual tilting rotary table

NSVZ index

Indexing of MIN. incremental of 1° is done by AR21 controller.



NSVX rotary index table

AR21 controller can perform indexing of MIN. 1° with hirth coupling and can also perform indexing of MIN. incremental by 0.001° and profile milling.

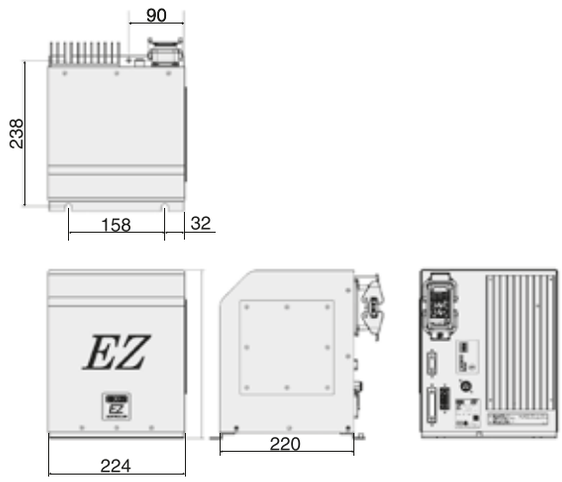
M-SIGNAL

# M-signal CNC ROTARY TABLE with EZ CONTROLLER

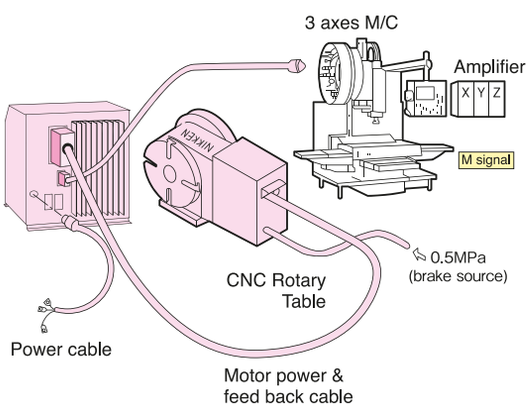
- **Compact and lightweight state-of-the-art numerical control unit**
- **Minimum setting unit of 0.001 or 1 second**
- **Digital servo and absolute encoder**
- **Large-capacity, high-torque servo motor**
  (1.0 kw, 3.92 N·m continuous stall torque)
- **Ability to back up programs and parameters to USB flash drive**

## Method of connection to machining center

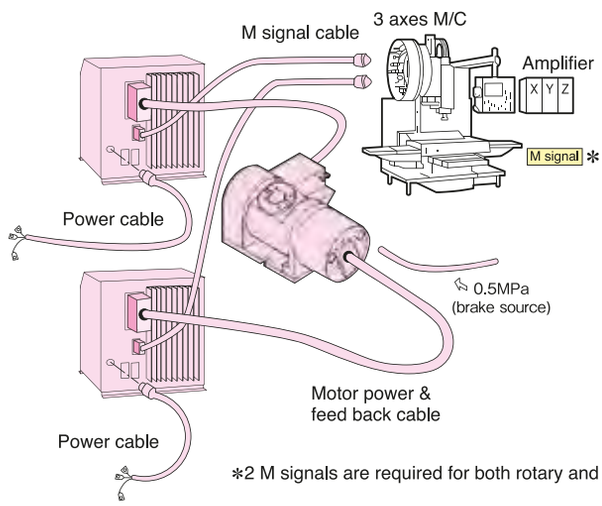
For a CNC rotary table, the interface is the same as that used previously with **AR21** controllers. ☞ **P.75**
For **5AX** rotary tables using EZ controllers for the rotation and tilt-axes, a power supply and M signal cable is required for each EZ controller.




## EZ controller connection for CNC rotary table (1-axis)




## EZ controller (2 units) connection for 5AX tilting rotary table (2-axis)




✻2 M signals are required for both rotary and tilting axis.

# EZ CONTROLLER SPECIFICATION

NIKKEN

## Main Specification of Controller

**EZ controller is interchangeable for operation and program with existing α21 controller in case of 1 axis control.**

| Item | Specification | Remarks |
|---|---|---|
| **MIN. Increment** | 0.001° or 1″ | Free Selection |
| **MAX. Programmable Angle** | ±999.999° & ±999°59'59" | Free Selection |
| **Program Capacity** | 1000 Blocks | N000～N999 |
| **Input System** | MDI Key Board, Pendant type | Maintained by a ten-year battery |
| **Programming System** | Combined use of Incremental/Absolute | Free Selection of G91 / G90 |
| **Zero Return** | Machine Zero Position/Work Zero Position | |
| **Manual Feed** | Rapid Feed/Fine Feed/Step Feed/Continuous Feed | |
| **Uni-directional Positioning** | Uni-directional Positioning can be done to eliminate the mechanical backlash. | G14 |
| **Emergency Stop** | Whole system stops | can be commanded from outside. |
| **Jump Function** | Jump to sub program etc. | |
| **Dry Run** | Table always rotates in rapid feed for checking. | |
| **Preparatory Function** | Dual, brake enable / disable, unidirectional positioning, machining origin return… | G04～G92 |
| **$G_1$ Code, $G_2$ Code** | 2 kind of G codes can be entered in one block. | |
| **Block Data display** | At programming, previous block data or next block data are displayed. Nine lines are displayed per screen. | ⬆ ⬇ |
| **Software Limit Function** | ± stroke limit values can be set by parameter. | |
| **Over Travel Detection Function** | 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. | Standard for 5AX- type tilting axis |
| **Alarm No. Automatic Indication Function** | When alarm is detected, controller automatically goes to diagnosis mode and Alarm No. is displayed. | |
| **Self Diagnosis Function** | Inside situations of controller can be seen. | |
| **Modal G Code Flicker Function** | All G codes used in the program are displayed. | |
| **Feed Rate Override** | 1 to 255% (increment determined by parameter setting), 999% (fast feed) | |
| **Input Signals** | 1 kind of Auxiliary Function.(Automatic operation can be done by only one M signal.) | ±5% |
| **Output Signal** | 1 Block Finish signal, Work Zero Position Signal, Alarm Out Signal | With or without contact signal *1 |
| **Servo Motor** | AC servo motor with serial encoder **R2AAB8100HXPGA**（**1.0kW**） | Ask Time Chart |
| **Input Power** | Single phase AC200～230V、50Hz / 60Hz | 840VA (Average load factor) |

*1: M signal of M/C is valid only the block without DEN (Distribution End).

## Explanation of code numbers of products with EZ controller

● 1-axis CNC rotary table

**CNC 180 EZ**

- EZ: With EZ controller
- 180: Motor mounting location
- Diameter of the rotary table face plate
- CNC: Code No. CNC rotary table

● 1-axis added axis･1-axis **5AX** rotary table with EZ controller

**5AX - 100 DEZ F A - M**

- M: With/without Motor Non: without motor, M: with motor
- A: Type of motor Non: DC servo, A: AC servo
- F: Motor maker F: Fanuc, M: Meldas, T: Tosnac Y: Yasnac, O: OSP, S: Sanyo, Z: Siemens
- EZ: With 1 axis EZ controller
- 100: Diameter of the rotarytable face plate
- 5AX: Code No. of Rotray & Tilting Table

● 2-axis **5AX** rotary table with EZ controller

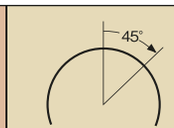
**5AX - 100 WEZ**

- WEZ: With 2 axis EZ controller
- 100: Diameter of the rotarytable face plate
- 5AX: Code No. of Rotray & Tilting Table

## Operation & Confirmation of Programs

●Before programing, be sure that mode is EDT.
Before start the programs, push ↓ ↓ ..... or ↑ ↑ ..... in EDT mode, and confirm input date.
●Then start the program in MAN mode to confirm the moving.

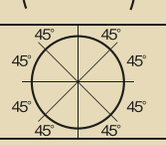
### ① Angle Dividing




```
N 0 0 0  θ 4 5  •  F 0 INPUT
```
Input Angle
Rapid feed.
No need of pressing 0 under decimal point.

```
N 0 0 0 → START
```
Sequence No.

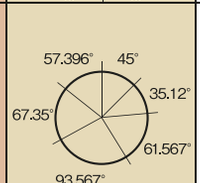
### ② Equal Dividing




```
N 0 0 0  J 0 θ 4 5  •  F 0 INPUT
```
After finishing N000 return to N000.

```
N 0 0 0 → START
```

### ③ Unequal Dividing




```
N 0 0 0 θ 4 5 •
0 0 1 θ 3 5 1 2 0
0 0 2 θ 6 1 5 6 7
0 0 3 θ 9 3 5 6 7
0 0 4 θ 6 7 3 5 0
0 0 5 J 0 θ 5 7 3 9 6
```
F 0 INPUT INPUT INPUT INPUT INPUT INPUT

In case of the same feed rate in the following blocks just command once. (Modal type)

```
N 0 0 0 → START
```
After finishing N005 return to N000.

M-SIGNAL

# Explanation of PENDANT 1

NIKKEN

Power ON/OFF switch


① Power ON/OFF switch
② Emergency Stop Button
③④ Manual Jog Button
⑤ High Speed Button
⑥ Auto/Manual Select Switch
⑦ Edit/Current Position Select Switch
⑧ Start Button
⑨ Stop Button
⑩ Continuous Feed Button
⑪ Original Point Set Button
⑫ Machine Zero Return Button
⑬ Work Zero Return Button
⑭ Diagnosis Button
⑮ Increment/ Decrement of Block No.
⑯ Feed Rate Override Button
⑰ Reset Key

Turned ON when input power is supplied.
Turned ON when EZ is in alarm condition.

**① Power ON/OFF switch**

**② Emergency Stop Button**

**③④ Manual Jog Button**
▶+ Clockwise, –◀ Counter clockwise.
While this button is being depressed, the table continually rotates slowly. When this button is depressed once, the table steps by 0.001°(1").

**⑤ High Speed Button**
When this button is depressed together with ③ or ④,the table rotates in rapid feed.
When jog ⑪ while depressing ⑤ ,table moves as following;

| Gear Ratio | Table Movement |
|---|---|
| 1 : 720 | 0.5° |
| 1 : 360 | 1.0° |
| 1 : 180 | 2.0° |
| 1 : 120 | 3.0° |

| Gear Ratio | Table Movement |
|---|---|
| 1 : 90 | 4.0° |
| 1 : 60 | 6.0° |
| 1 : 45 | 8.0° |

**⑥ 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 ①,②,⑥,⑧,⑨,⑭,⑯,⑰ are ineffective.

**⑦ Edit/Current Position Select Switch**
On θ of ⑱, programming or present position is displayed alternatively.

**⑧ Start Button**
The table rotates as programmed.

**⑨ Stop Button**
The table slows down and stops. (Feed Hold Function). When ⑧ is depressed again, the table rotates the remaining angle of the program.

**⑩ Continuous Feed Button**
When this button is depressed, the table rotates continually. And, when ⑨ is depressed, the table stops. The desired feed and direction are to be input in N997 Block. (Refer ☞ **P.53** ⑧)

**⑪ Original Point Set Button**
When this button is depressed at any angle, the position display shows 000.000°, and it is used as the work zero position. When the cumulative angle becomes 360°,work zero position signal is sent, which can be used as interlock.

**⑫ 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.

**⑬ Work Zero Return Button**
When this button is depressed, the table returns to the position set by ⑪ clockwise in rapid feed.

**⑭ Diagnosis Button**

**⑮ Increment/Decrement of Block No.**
Previous block data and next block data are displayed.

**⑯ 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.

**⑰ Reset Key**
This is for calling N000 and also for resetting alarm display etc.

M-SIGNAL

# Explanation of PENDANT 2

NIKKEN

⑱ **Display**

| N | J | θ | F | $G_1$ | $G_2$ |
|---|---|---|---|---|---|
| 000 | | θ +0 1 5 . 0 0 0 | F 0 . 5 0 | G 9 1 | |
| 001 | | θ +0 3 0 . 0 0 0 | F 0 . 0 0 | | |
| 002 | | θ +0 1 0 . 0 0 0 | F 0 . 2 5 | | |
| 003 | | θ +0 9 0 . 0 0 0 | F 0 . 0 0 | | |
| 004 | | θ +0 1 5 . 0 0 0 | F 1 . 0 0 | | |
| 005 | | θ +0 1 5 . 0 0 0 | F 0 . 5 0 | | |
| 006 | | θ +0 9 0 . 0 0 0 | F 0 . 0 0 | | |
| 007 | | θ +0 9 0 . 0 0 0 | | | |
| 008 | J 0 0 0 | θ +0 0 0 . 0 0 0 | | G 9 0 | |

| θ | F |
|---|---|
| MODE | ZRN_MW INC/ABS % |

The program is displayed nine lines at a time.

**N** : Sequence No. N000～N999

**J** : Jump target sequence number and return display
J000～J999, RET

θ : Rotation angle of table (Decimal, Sexagecimal)
0～±999.999° (Decimal)
0～±999.59'59" (Sexagecimal)

**F** : Feed rate
Cutting feed: 0.01～9.99r/min
Rapid feed: 000

**$G_1$, $G_2$**: Preparatory function G01～G92
Two kind of G codes (G1, G2)
can be input in one block.

θ : Rotation angle of table (Decimal, Sexagecimal)
0～±999.999° (Decimal)
0～±999.59'59" (Sexagecimal)

**F** : Feed rate
Cutting feed: 0.01～9.99r/min
Rapid feed: 000

**MODE: EDT** (Edit mode)
**MAN** (Manual mode)
**AUT** (Auto. mode)
**DGN** (Diagnostic mode)

**ZRN-MW**:
**M** (Stop at M ZERO)
**W** (Stop at W ZERO)

**INC/ABS: INC** (Incremental)
**ABS** (Absolute)

**%** : Feed rate override
(5% to 200%, or 999 for rapid feed rate)

N (3digits)

**Key Encoder**

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

J (3digits)

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

RET

When sub program is finished, enter R at ⑱ N' display. And, it returns to the block next to the one where J' was commanded in the main program.

P
θ (±6～7digits)
P (3digits)

θ : You can input 0° to ±999.999° in 0.001° increment, or 0° to ±999° 59'59" 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.).

DIV Q

Not used

F L
F、L(3digits)

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

G NO

Without G : Positioning
G04 : Dwell
✻G10 : Brake unclamped
✻G11 : Brake clamped
G14 : Uni-directional positioning
G21 : Simultaneous start
G23 : Machine zero point return
G24 : Work zero point return
G28 : Programmable machine zero position return
✻G90 : Absolute command
✻G91 : Incremental command
G92 : Coordinate system setting

**How to enter G code :**

0 cannot be suppressed for both G1 and G2 codes.
For example, when G1=14 and G2=91, enter them as follows;
1 4 9 1 ✻
and indication will become as ;

| $G_1$ | $G_2$ |
|---|---|
| 14 | 91 |

• DATA

When you want to enter 9°, just depress keys as θ → 9 → ·, and 9.000° or 9°00′00″ is displayed.

— PRM

This is for command of Counter clockwise rotation.

INPUT

This is depressed as programming of each block being completed.
(Hereafter shown as ✻).

C

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

**Deleting successive blocks**

For example, in order to delete blocks from **N000** to **N999**, push keys N **0** — **999** at Edit mode, and jog ✻ while depressing C key.

Pendant operation is somewhat different on the tilt-axis specification EZ. Refer to the EZ instruction manual for details.

## ⚠Caution for EZ Controller

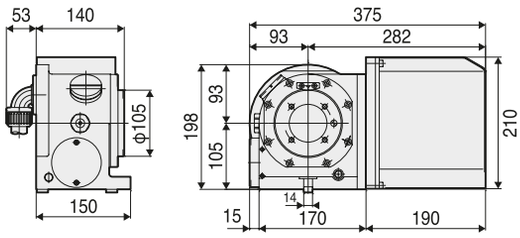
- This is an absolute encoder, with alarm #2162 displayed when the cable is initially connected to the rotary table and the power is turned on because the coordinate system is not established. Proceed with the following steps:
  - DGN Return to pervious mode.
  - — PRM DGN 1 1 ✻ PRM#110=1 Writting parameter value enable.
  - G NO 7 2 ✻ 1 ✻ PRM#72=1
  - Turn the POWER OFF and ON
  - For rotary axis M ZRN Execute machine zero return.
    For tilting axis First set the temporary machine zero position and M ZRN. Please refer instruction manual for more detail.
- When the alarms regarding the absolute encoder such as ALARM#1101 or #1102 are appeared, please set PRM#71=1 and turn the POWER OFF and ON to establish the coodinate system again.

M-SIGNAL

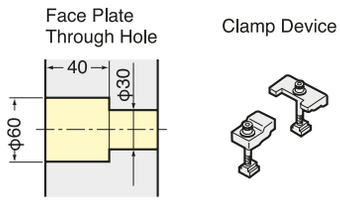
# CNC ROTARY TABLE with EZ CONTROLLER

NIKKEN

## CNC105EZ

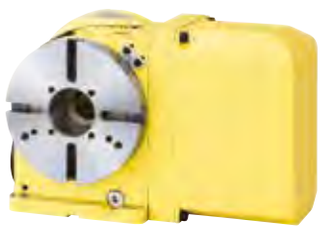


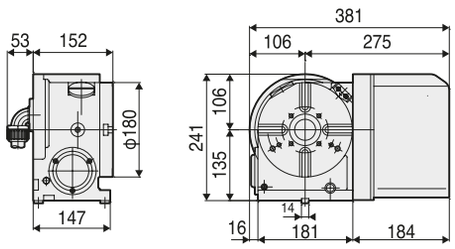

**Powerful Clamping Torque : 205Nm**



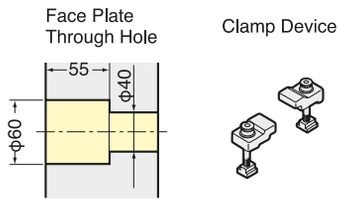

Air purge function is provided.

## CNC180EZ



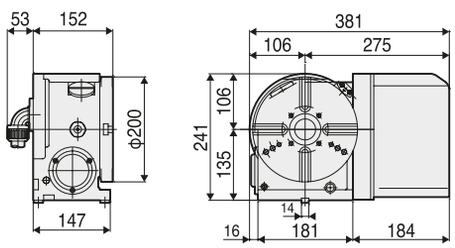



**Powerful Clamping Torque : 303Nm**

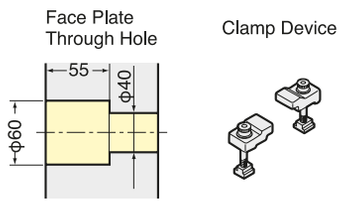



Air purge function is provided.

## CNC202EZ




**Powerful Clamping Torque : 303Nm**

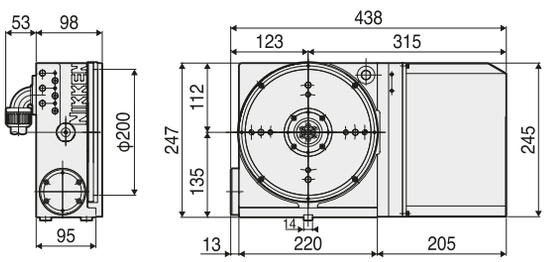



Air purge function is provided.

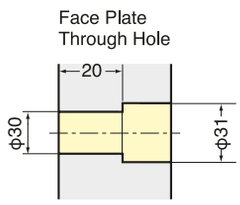
## CNC205EZ

Rotary joint shown in photo is optional.

★Built-in type rotary joint 6+1 can be mounted.

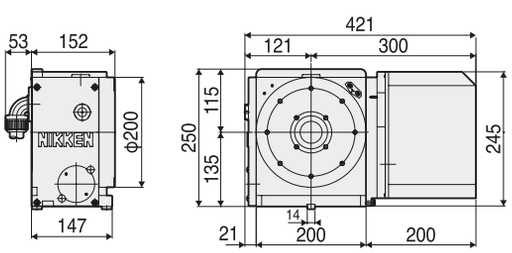



**Powerful Clamping Torque : 380Nm**

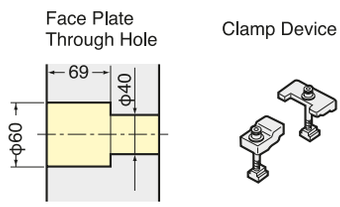



Air purge function is provided.

## NCT200EZ



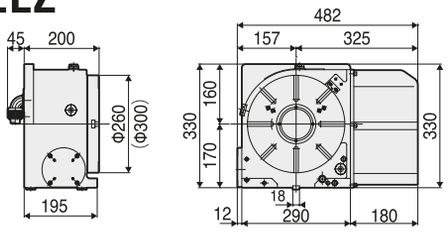

**Powerful Clamping Torque : 900Nm**



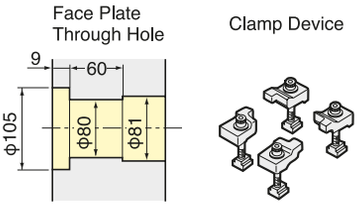

Air purge function is provided.

## CNC260EZ, CNC302EZ

CNC260




**Pneumatic Clamping Torque UP 588Nm**




Air purge function is provided.

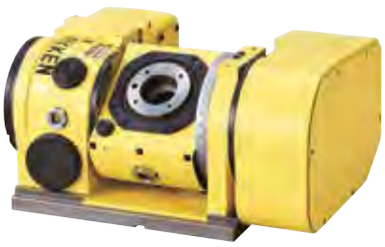
High seed rotation Z series is available for all models of CNC rotary table. **e.g. CNCZ260EZ**

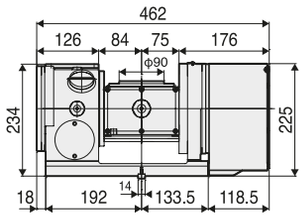
M-SIGNAL

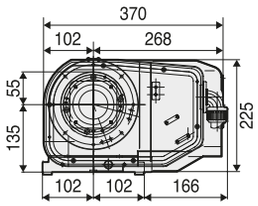
# TILTING ROTARY TABLE with EZ CONTROLLER

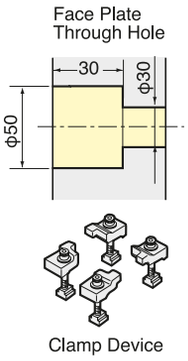
NIKKEN

## 5AX-100WEZ



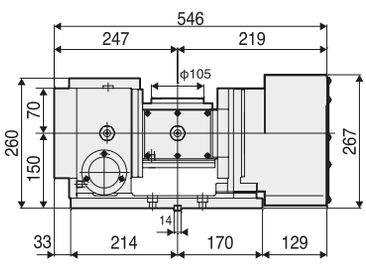


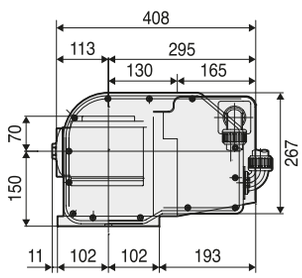



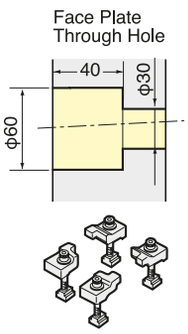




## 5AX-130WEZ

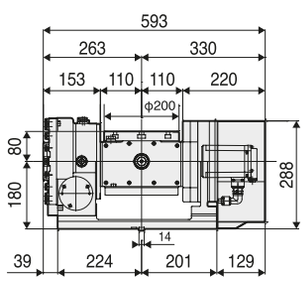
Photo with φ130mm plate.

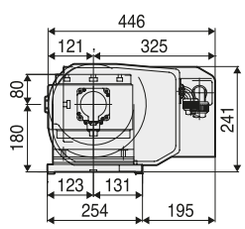


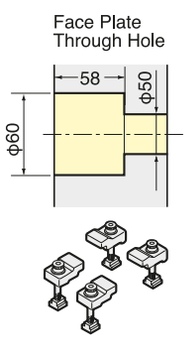



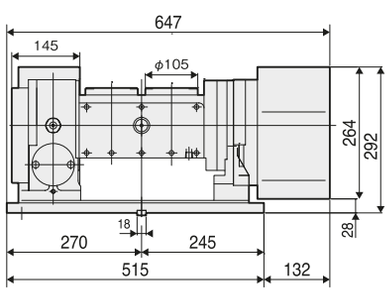

## 5AX-201WEZ

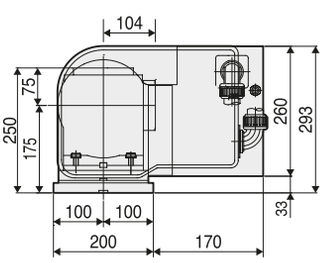


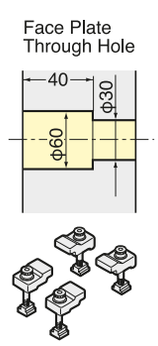




## 5AX-2MT-105WEZ



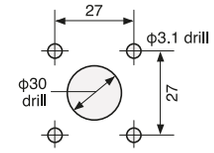

If you need a knock hole for positioning or a key way on the table surface, please contact us.

M-SIGNAL

## AR21 and EZ controller connection

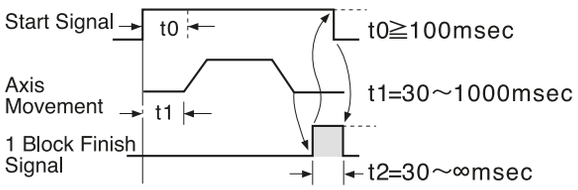
Normally the controller will be operated only by connecting M Signal (Start Signal) and 1 Block Fin. Signal. Emergency Stop Input must be set to B contact only for 5AX-Tables. For other Tables, you can choose A/B contact for Emergency Stop Input.

When to be connected to machine,receptacle MS3102A18-1P is provided. Arrange the electric circuits of your machine side.

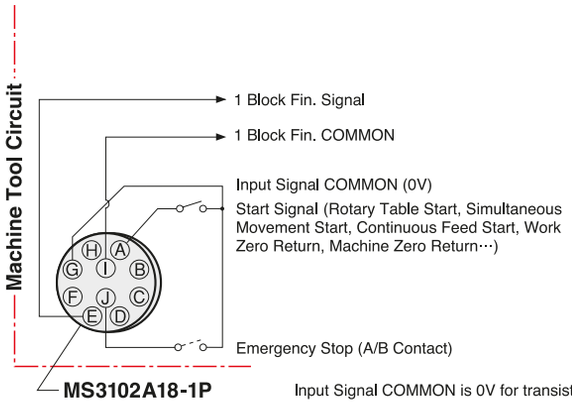



Mounting dimensions

## Input/Output Time Chart




t1 and t2 can be set by parameter.

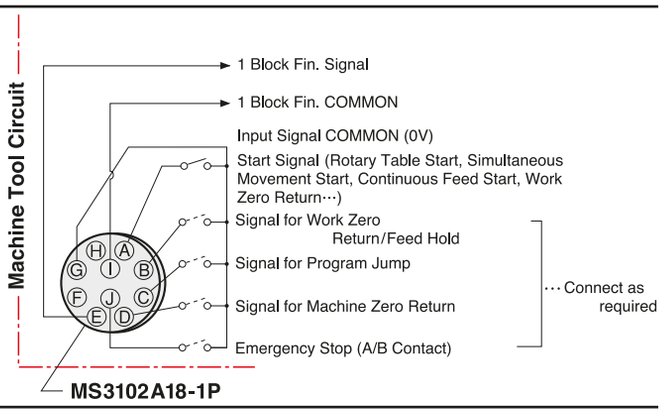



Input Signal COMMON is 0V for transistor output.

## Connection for Automatic Operation(AR21only)

Once program is loaded to AR21, 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 5AX- tilting rotary table.
e.g.

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



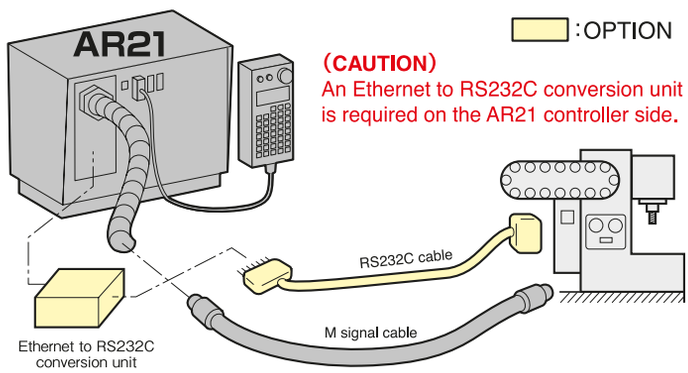

## RS232C Automatic Loading Interface. ··· Pendant is to be used for manual operation and maintenance only. (AR21only)(OPTION)

Program is loaded from Custom Macro of M/C, and start the program by the ordinary M signal. Total management of programs can be done on only M/C side. The necessary functions of M/C side are;

- Custom Macro
- Custom Macro External Output Function
- 2 sets of M signals

e.g.

**M21** : Start signal
**M24** : Start signal of RS232C Automatic Loading Function (Start signal without 1 Block Fin. signal confirmation and keep this signal ON at least 100msec.)




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

M/C Main Program
e.g. Machining of Imperial Blade

```
O0001;
  G65   P8000;
   :
  G01   Z_;
        X300;
        Y_Z_M21;
        X0;
        Y_Z_M21;
        X300;
   :
```


Macro Program
(Down Loading to AR21)

```
O8000;
  M24;  Activate AR21 automatic loading function.
  POPEN;
  #100=165;                    } Send %,CR,LF.
  BPRNT[#100[0]];
  DPRNT[N10  G90  A22.149];    } Send block data.
   :
  #100=165;                    } Send %,
  BPRNT[#100[0]];              } CR,LF.
  G04  P3000;      Dwell 3sec.
  PCLOS;
  M66;
```

⚠ N No.must be specified on each block data.

## RS232C Direct Angle Command Interface (AR21 only)(OPTION)

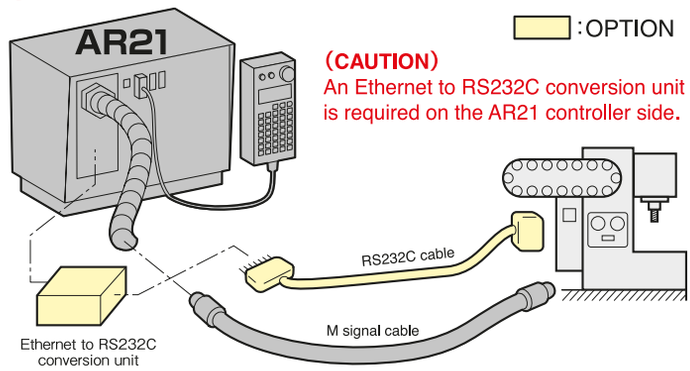
JAPAN PAT.

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

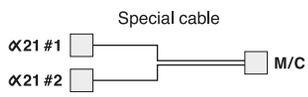
- Custom macro
- Custom macro external output function
- 1 M signal (Start signal) **M21**

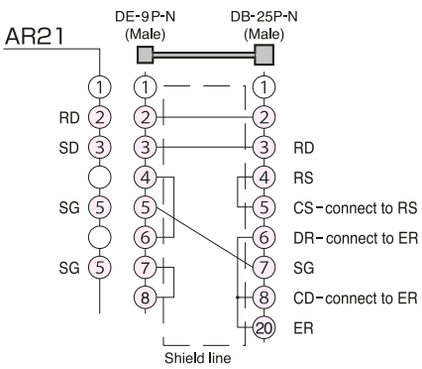
5AX-table with 2 off AR21 controllers can be connected to use RS232C direct angle command interface. In this case, special RS232c cable is required and 2 off M signals are required.




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

### ● RS232C interface




The cable is available as an option.
Baud rate : 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 ____ ;

- D: ID No. (can not be omitted.) Please specify the value of PRM #1 on AR21.
- F: Feed rate 000,001～999
- E: Number of equal dividing
- A: Angle command (can not be omitted. **A** : Rotary axis, **B** : Tilting axis)
- M: 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;
N1    DPRNT [ID#7[10] G#13[20]A#1[43]E#8[40]F#9[30]];
      GOTO 10;
N2    DPRNT [ID#7[10] G#13[20]A#1[43]E#8[40]];
      GOTO 10;
N3    IF [#9 EQ #0] GOTO 4;
      DPRNT [ID#7[10] G#13[20]A#1[43]F#9[30]];
      GOTO 10;
N4    DPRNT [ID#7[10] G#13[20]A#1[43]];
      GOTO 10;
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;
      P CLOS;
      M99;
```

⚠ Work zero position signal and alarm out signal can be output as an option. Be careful that these signals are non-contact type output and output common line is 0V. These signals must be recieved on the relay. Please contact with us for more details.

### 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 the supply of the electric parts became impossible. Please examine reshuffling to the CNC rotary table with α21 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 I/F)**
**Terminated at April 2013 CNC rotary table 8800DX, 8800AX**

# Comparison between AR21 and EZ controller

NIKKEN

## G Codes

| | Groups | Function | AR21 | EZ |
|---|---|---|---|---|
| W/O G codes | * | Positioning | ○ | ○ |
| G04 | * | Dwell command | ○ | ○ |
| G06 | * | Constant acceleration command | ○ | × |
| G07 | * | Lead-cut command | ○ | × |
| G08 | A | Buffer command | ○ | × |
| G09 | (A) | Buffer command cancel | ○ | × |
| G10 | B | Brake disused command | ○ | ○ |
| G11 | (B) | Brake used command | ○ | ○ |
| G12 | C | Running | ○ | ○ |
| G13 | (C) | Running cancel | ○ | ○ |
| G14 | * | One way positioning command | ○ | ○ |
| G15 | D | For Droop check | ○ | × |
| G16 | (D) | Droop check cancel | ○ | × |
| G21 | * | Interlock start | ○ | ○ |
| G22 | * | Interlock start command | ○ | × |
| G23 | * | Machine Zero return | ○ | ○ |
| G24 | * | Program Zero return | ○ | ○ |
| G27 | * | Repeat command | ○ | × |
| G28 | * | Programmable dog machine zero return | ○ | ○ |
| G60～G74 | – | M function | Optional | × |
| G90 | E | Absolute command | ○ | ○ |
| G91 | (E) | Incremental command | ○ | ○ |
| G92 | * | Configuration of coordinate system | ○ | ○ |

## Program

| | Remarks | Function | AR21 | EZ |
|---|---|---|---|---|
| Frequency change | PRM#15 | Base 10 / Base 60 | ○ | ○ |
| J | – | Jump command | ○ | ○ |
| RET | – | Return command | ○ | ○ |
| D | – | Dividing command | ○ | × |
| Rotating axis specification | PRM#30=0 | – | ○ | ○ |
| Tilting axis specification | PRM#30=1 | Soft over-travel, Hard over-travel | ○ | ○ |
| NSVZ | PRM#30=2 | Indexing specification | ○ | × |
| NSVX | PRM#30=3 | Rotary Index specification | ○ | × |

# Comparison between AR21 and EZ controller

NIKKEN

## Options

| | Remarks | Function | AR21 | EZ |
|---|---|---|---|---|
| Magnescale(RU77) | – | Fully closed Loop | Optional | × |
| PGSL1～6 | – | Program-select function | Optional | × |
| PRM#213, 216 | – | Pitch-error compensation | Optional | × |
| Manual pulse | – | Manual pulse handle | Optional | × |

## Other functions

| | Remarks | Function | AR21 | EZ |
|---|---|---|---|---|
| PRM#14 | – | Grid-mask amount | ○ | × |
| PRM#41 | – | Moving angle direct command | ○ | × |

## Input signal

| | Remarks | Function | AR21 | EZ |
|---|---|---|---|---|
| START | – | Start | ○ | ○ |
| EM | – | Emergency stop | ○ | ○ |
| WZRN/FHOLD | PRM#54=0 | Interlock start | ○ | × |
| | PRM#54=1 | Component Zero return | ○ | × |
| | PRM#54=2 | Field hold | ○ | × |
| JUMP | PRM#51=0 | Interlock start | ○ | × |
| | PRM#51=1 | Voluntary block skip | ○ | × |
| MZRN | PRM#50=1 | Machine origin return | ○ | × |
| | PRM#50=2 | External reset signal | ○ | × |
| SV OFF | – | Servo off | ○ | × |

## Output signal

| | Remarks | Function | AR21 | EZ |
|---|---|---|---|---|
| WPOS | PRM#55=1 | Component zero position signal (regular OPEN) | ○ | × |
| | PRM#55=2 | Component zero position signal (regular CLOSE) | ○ | × |
| BOUT1 | PRM#90～93 | NSV solenoid valve output [both solenoid] | ○ | × |
| ALM | – | Alarm out signal | ○ | × |
| EMG OUT1～2 | – | Emergency stop signal | ○ | × |

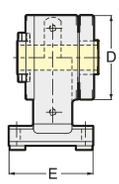
# SUPPORT TABLE

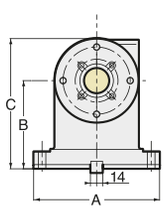
| Table Model | Center Height | W/O Clamping | With Clamping | | Slim Spport Table With Clamping |
|---|---|---|---|---|---|
| | | | Air (0.5MPa) | Hyd. (3.5MPa) | |
| CNC105 | 105 | CST100-105 | TAT-105N | | |
| CNC180, 202,205 | 135 | CST100-135 | TAT-170N | | TAS-100N |
| NCT200 | 135 | CST100-135 | TAT-170N | | TAS-100N |
| CNC180B, 202B | 180 | | TAT-170N*1 | | TAS-100N*1 |
| CNC260, 302 | 170 | | TAT-250N(Shared use Air/Hyd) | | |
| | | | TAT-200N(Shared use Air/Hyd)*2 | | |
| CNC321 | 230 | | | TAT-321N | |
| CNC401 | 230 | | | TAT-401N | |
| CNC321T | 240 | | | TAT-321N*4 | TAT-403N |
| CNC401T | 240 | | | TAT-401N*4,403N | TAT-403N |
| CNC501, 601 | 310 | | | TAT-501N | |
| NSVZ180 | 135 | | TAT-170N | | |
| NSVZ300 | 170 | | TAT-250N(Shared use Air/Hyd) | | |
| | | | TAT-200N(Shared use Air/Hyd)*2 | | |
| NSVX400 | 240 | | | TAT-401N*4 | TAT-403N |
| DD250 | 170 | | TAT-170N*3 | | |

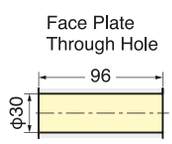
*1 : A separate sub-base is required to align the center height.
*2 : The center height is possible to increase 20mm to use sub-base.
*3 : The support tables that can be used are subject to limitations based on the number of rotations.
*4 : When a sub-base is used to adjust the center height, a +10 mm variation in the specification can be accommodated.

## Compact Support Table

### CST100-105, 135
(W/O Clamping System)



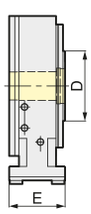



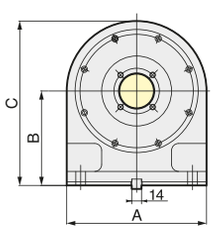



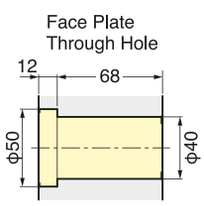

| Code No. | A | B | C | D | E | Weight(kg) |
|---|---|---|---|---|---|---|
| CST100-105 | 150 | 105 | 155 | 100 | 100 | 7 |
| CST100-135 | 150 | 135 | 185 | 100 | 100 | 8 |

## Compact & Slim Support Table

### TAS-100N



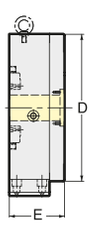



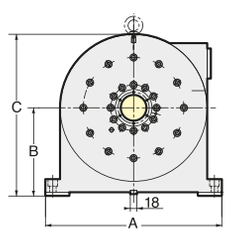



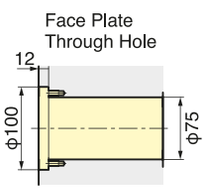

| Code No. | A | B | C | D | E | Clamping System | Clamping Torque(N·m) | Weight(kg) |
|---|---|---|---|---|---|---|---|---|
| TAS-100N | 200 | 135 | 235 | 100 | 80 | Pneumatic | 217 | 17 |

## Slim Support Table

### TAT-403N




The table without T slots "N" is standard.
T slots are available (optional)

| Code No. | A | B | C | D | E | Clamping System | Clamping Torque(N·m) | Weight(kg) |
|---|---|---|---|---|---|---|---|---|
| TAT-403N | 480 | 240 | 440 | 400 | 150 | Hydraulic | 1500 | 155 |

★ Pneumatic ports: 2 x Rc1/8 Solenoid, Clamp-Unclamp switches are not included.
★ Hydraulic connections are RC3/8 X 2 and pneumatic connections are RC1/8 X 2. Confirmation switches for clamp/unclamp and solenoid valve are not included.
★ Hydraulic pressure is 3.5MPa. Air pressure is 0.5MPa.
★ Rotary joint is available for all models. ☞P.89
★ Please add **"— center height"** at the end of Code No. for the support table with different center height **(B). e.g. TAT321-240 (For CNC321T)**

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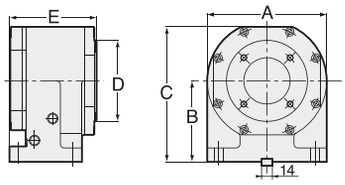
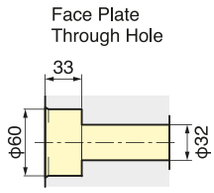
## Support Table

### TAT-105N

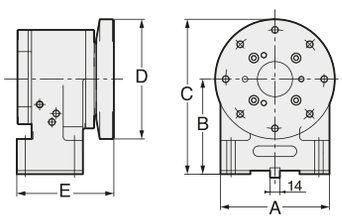


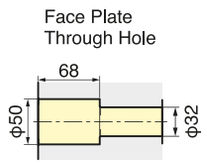




Without T-slots "N" (standard) / With T-slots (optional) in case of **TAT-105**

| Code No. | A | B | C | D | E | Clamping System | Clamping Torque(N·m) | Weight(kg) |
|---|---|---|---|---|---|---|---|---|
| TAT-105N | 155 | 105 | 175 | 105 | 113 | Pneumatic | 205 | 16 |

### TAT-170N

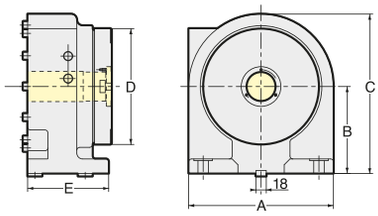


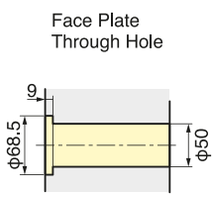




Without T-slots "N" (standard) / With T-slots (optional) in case of **TAT-170**

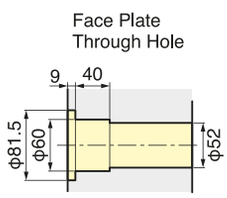
| Code No. | A | B | C | D | E | Clamping System | Clamping Torque(N·m) | Weight(kg) |
|---|---|---|---|---|---|---|---|---|
| TAT-170N | 155 | 135 | 220 | 170 | 138 | Pneumatic | 205 | 25 |

### TAT-200N, 250N




**TAT-200N**



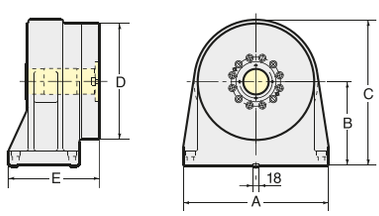

**TAT-250N**

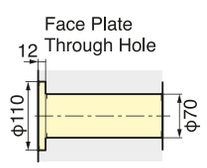
The table without T slots "N" is standard. T slots are available (optional)

| Code No. | A | B | C | D | E | Clamping System | Clamping Torque(N·m) | Weight(kg) |
|---|---|---|---|---|---|---|---|---|
| TAT-200N | 250 | 150 | 275 | 200 | 145 | Pneumatic / Hydraulic | 112/784 | 43 |
| TAT-250N | 250 | 170 | 295 | 250 | 145 | Pneumatic / Hydraulic | 112/784 | 50 |

★**TAT-200N** is used in combination with **CNC321T** or **CNC401T** to install lifting-block.

### TAT-321N, 401N, 501N



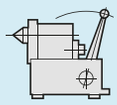
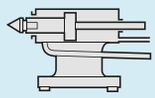
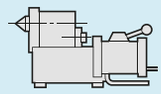




The table without T slots "N" is standard. T slots are available (optional)

| Code No. | A | B | C | D | E | Clamping System | Clamping Torque(N·m) | Weight(kg) |
|---|---|---|---|---|---|---|---|---|
| TAT-321N | 400 | 230 | 400 | 320 | 250 | Hydraulic | 1470 | 120 |
| TAT-401N | 400 | 230 | 430 | 400 | 250 | Hydraulic | 1470 | 140 |
| TAT-501N | 480 | 310 | 560 | 500 | 250 | Hydraulic | 1470 | 220 |

# TAILSTOCK (MANUAL, PNEMATIC, HYDRAULIC) NIKKEN

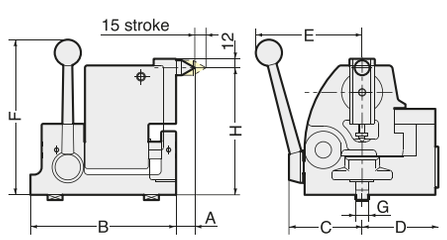
## Tailstock

| Table Model \ Center Height | | Manual | PNEUMATIC / HYDRAULIC | HYDRAULIC |
|---|---|---|---|---|
| Tailstock illust | |  |  |  |
| | | Stroke: 15mm | Stroke: 60mm | Stroke: 100mm |
| CNC105 | 105 | P-105S | PBA-105 | |
| CNC180, 202 | 135 | P-125S | PBA-135 | |
| NCT200 | 135 | P-125S | PBA-135 | |
| CNC180B, 202B | 180 | P-170S | PBA-180 | H-170S |
| NST250 | 155 | P-150S | | H-150S |
| CNC260, 302 | 170 | P-170S | PBA-170 | H-170S |
| CNC321, 401 | 230 | P-230S | | H-230S |
| CNC501, 601 | 310 | P-310S | | |
| NST300 | 208 | P-210S | | H-210S |
| NST500 | 288 | P-280S | | |
| 5AX-100 | 135 | P-125S | PBA-135 | |
| 5AX-130 | 150 | P-150S | PBA-150 | H-150S |
| 5AX-201 | 180 | P-170S | PBA-180 | H-170S |
| 5AX-230 | 240 | P-230S | | H-230S |
| 5AX-250* | 250 | | | |
| 5AX-350 | 300 | P-310S | | |
| CNC100-2, 3, 4W | 105 | | PB-105-2,3,4W | |
| NSVZ180 | 135 | P-125S | PBA-135 | |
| NSVZ300 | 170 | P-170S | PBA-170 | H-170S |
| NSVX400 | 240 | P-230S | | H-230S |

*Please contact us about the Tailstock for **5AX-250**.

## Manual Tailstock

Changeable Center




**The center height can be adjusted.**
**Please refer to Center Height H on the table.**

| Code No. | Center Height H | A | B | C | D | E | F | G | Weight (Kg) |
|---|---|---|---|---|---|---|---|---|---|
| P-105S | 102~110 | 27 | 150 | 76 | 74 | 120 | 195 | 14 | 10 |
| P-125S | 130~140 | 27 | 150 | 76 | 74 | 120 | 210 | 14 | 11.5 |
| P-150S | 145~160 | 25 | 195 | 98 | 102 | 145 | 210 | 18 | 22 |
| P-170S | 160~180 | 25 | 195 | 98 | 102 | 145 | 210 | 18 | 22.5 |
| P-210S | 200~220 | 25 | 195 | 98 | 102 | 145 | 250 | 18 | 26.5 |
| P-230S | 220~240 | 25 | 195 | 98 | 102 | 145 | 250 | 18 | 27 |
| P-280S | 280~300 | 15 | 235 | 103 | 124 | 145 | 330 | 20 | 41 |
| P-310S | 300~320 | 15 | 235 | 103 | 124 | 145 | 330 | 20 | 41.5 |

★Left hand type is available for all models. ★For **P-150S** or larger size tailstocks, 5 pcs of changeable centers are included. ★Live center can be applied.

## Changeable Center

| Code No. | FIG | A | B | C |
|---|---|---|---|---|
| PC-2 | Ⅰ | 25 | | |
| PC-3 | Ⅰ | 50 | | |
| PC-4 | Ⅱ | | 30 | 18.45 |
| PC-5 | Ⅱ | | 40 | 28.45 |
| PC-6 | Ⅱ | | 50 | 38.45 |

FIG Ⅰ

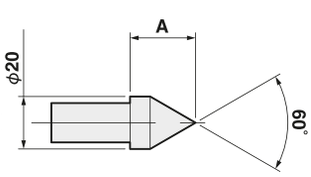
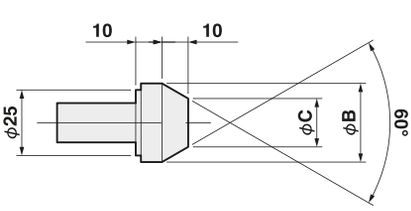


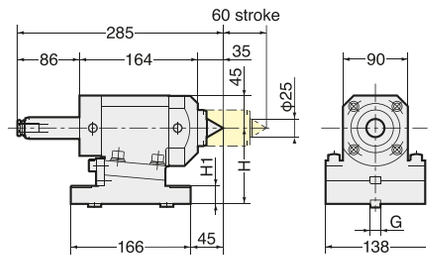

FIG Ⅱ




ACC

# TAILSTOCK (MANUAL, PNEMATIC, HYDRAULIC) NIKKEN

## Pneumatic / Hydraulic both usable Small Size Tailstock

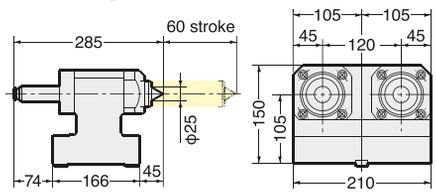




**The center height can be adjusted within 0.35mm.**

| Code No. | Center Height H | $H_1$ | G | Thrust (N) | | Weight (Kg) |
|---|---|---|---|---|---|---|
| | | | | Pneumatic. 0.5MPa | Hydraulic. 2MPa | |
| PBA-105 | 105 | 25 | 14 | 1176 | 4733 | 15 |
| PBA-135 | 135 | 55 | 14 | 1176 | 4733 | 20 |
| PBA-150 | 150 | 70 | 18 | 1176 | 4733 | 22 |
| PBA-170 | 170 | 90 | 18 | 1176 | 4733 | 24.5 |
| PBA-175 | 175 | 95 | 18 | 1176 | 4733 | 25 |
| PBA-180 | 180 | 100 | 18 | 1176 | 4733 | 25.5 |

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

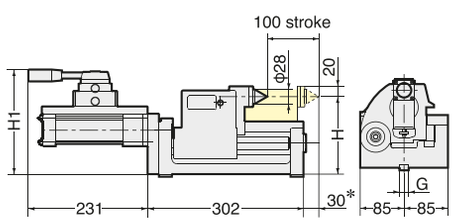
## Pneumatic / Hydraulic both usable for Multi-Spindle Tailstock




| Code No. | Center Height H | $H_1$ | G | Thrust (N) | | Weight (Kg) |
|---|---|---|---|---|---|---|
| | | | | Pneumatic. 0.5MPa | Hydraulic. 2MPa | |
| PB-105-2W | 105 | 25 | 18 | 1176 | 4733 | 28 |
| PB-105-3W | | | | | | 42 |
| PB-105-4W | | | | | | 55 |

★For fitting metal and stepped guide piece, refer to ☞ **P.85**
★MT (Morse Taper) type quill is also available. Please contact us.
★The stroke 60mm can be changed. Please contact us.

## Hydraulic Tailstock




**The center height can be adjusted.**
**Please refer to Center Height H on the table.**

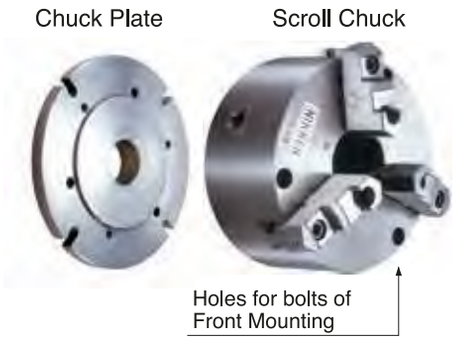
| Code No. | Center Height H | $H_1$ | G | Thrust (N) | Weight (Kg) |
|---|---|---|---|---|---|
| | | | | Hydraulic. 3.5MPa | |
| H-150S | 145～160 | 191 | 18 | 5370 | 28 |
| H-170S | 160～180 | 211 | 18 | 5370 | 35 |
| H-210S | 200～220 | 251 | 18 | 5370 | 41 |
| H-230S | 220～240 | 271 | 18 | 5370 | 45 |

★Rotary center is built-in.
MAX. work piece diameter must be smaller than φ130mm, when the stroke of changing the work piece is more than 30mm marked *.

**For Support Table TAT, refer to ☞ P.79, 80**

# SCROLL CHUCK

NIKKEN




**Scroll Chucks with chuck plate marked * are NIKKEN Scroll Chuck of 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.**

## Scroll Chuck & Chuck Plate

| Chuck Size | Range | |
|---|---|---|
| | External | Internal |
| 4″ | 2～ 89 | 36～ 78 |
| 5″ | 3～104 | 42～ 92 |
| 6″ | 3～135 | 52～119 |
| 7″ | 3～153 | 56～134 |
| 9″ | 4～190 | 64～169 |
| 10″ | 10～229 | 72～208 |
| 12″ | 10～258 | 82～238 |

This is the actual gripping range not jow stroke.

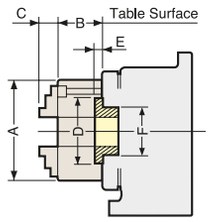



Fig.1

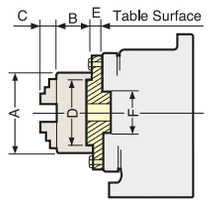



Fig.2

## Front End Dimensions with Scroll Chuck & Chuck Plate

| Table Model | Chuck Size | Chuck Plate | A | B | C | D | E | F | Fig. No. |
|---|---|---|---|---|---|---|---|---|---|
| CNC105 | R-4 | X-4B | 112 | 58 | 31.25 | 80 | 13 | 60 | 2 |
| CNC180 | R-5 | X-5C* | 132 | 60 | 37.25 | 100 | 3.5 | 60 | 1 |
| | R-6 | X-6B* | 167 | 66 | 44.25 | 130 | 4 | 60 | 1 |
| CNC202 | R-5 | X-5C* | 132 | 60 | 37.25 | 100 | 3.5 | 60 | 1 |
| | R-6 | X-6B* | 167 | 66 | 44.25 | 130 | 4 | 60 | 1 |
| | R-7 | X-7A* | 192 | 75 | 46.25 | 155 | 4 | 60 | 1 |
| CNC260 | R-6 | X-6G* | 167 | 66 | 44.25 | 130 | 4 | 80 | 1 |
| | R-7 | X-7L* | 192 | 75 | 46.25 | 155 | 4 | 80 | 1 |
| | R-9 | X-9H | 233 | 82 | 55.25 | 190 | 25 | 80 | 2 |
| CNC302 | R-6 | X-6G* | 167 | 66 | 44.25 | 130 | 4 | 80 | 1 |
| | R-7 | X-7L* | 192 | 75 | 46.25 | 155 | 4 | 80 | 1 |
| | R-9 | X-9J | 233 | 82 | 55.25 | 190 | 18 | 80 | 2 |
| CNC321 | R-7 | X-7N | 192 | 75 | 46.25 | 155 | 16 | 105 | 2 |
| | R-9 | X-9K | 233 | 82 | 55.25 | 190 | 18 | 105 | 2 |
| | R-10 | X-10G | 274 | 86 | 53.25 | 230 | 20 | 105 | 2 |
| | R-12 | X-12F-1 | 310 | 92 | 59.25 | 260 | 25 | 105 | 2 |
| CNC401 | R-7 | X-7K | 192 | 75 | 46.25 | 155 | 16 | 105 | 2 |
| | R-9 | X-9G | 233 | 82 | 55.25 | 190 | 20 | 130 | 2 |
| | R-10 | X-10D | 274 | 86 | 53.25 | 230 | 20 | 105 | 2 |
| | R-12 | X-12G | 310 | 92 | 59.25 | 260 | 20 | 105 | 2 |
| CNC501, 601 | R-9 | X-9D | 233 | 82 | 55.25 | 190 | 20 | 130 | 2 |
| | R-10 | X-10 | 274 | 86 | 53.25 | 230 | 20 | 130 | 2 |
| | R-12 | X-12B | 310 | 92 | 59.25 | 260 | 20 | 130 | 2 |
| NST250, 300 | R-5 | X-5B | 132 | 60 | 37.25 | 100 | 16 | 60 | 2 |
| | R-6 | X-6A | 167 | 66 | 44.25 | 130 | 16 | 60 | 2 |
| | R-7 | X-7B | 192 | 75 | 46.25 | 155 | 16 | 60 | 2 |
| NST300 | R-9 | X-9A | 233 | 82 | 55.25 | 190 | 18 | 60 | 2 |
| | R-10 | X-10B-1 | 274 | 86 | 53.25 | 230 | 25 | 60 | 2 |
| | R-12 | X-12A-1 | 310 | 92 | 59.25 | 260 | 25 | 60 | 2 |
| NST500 | R-7 | X-7G | 192 | 75 | 46.25 | 155 | 18 | 75 | 2 |
| | R-9 | X-9B | 233 | 82 | 55.25 | 190 | 18 | 75 | 2 |
| | R-10 | X-10C | 274 | 86 | 53.25 | 230 | 20 | 75 | 2 |
| | R-12 | X-12 | 310 | 92 | 59.25 | 260 | 20 | 75 | 2 |
| 5AX-100 | R-4 | X-4D*1 | 112 | 58 | 31.25 | 80 | 3 | 40 | 1 |
| 5AX-130 | R-4 | X-4B | 112 | 58 | 31.25 | 80 | 13 | 60 | 2 |
| 5AX-201 | R-4 | X-4B | 112 | 58 | 31.25 | 80 | 13 | 60 | 2 |
| | R-5 | X-5C* | 132 | 60 | 37.25 | 100 | 3.5 | 60 | 1 |
| | R-6 | X-6B* | 167 | 66 | 44.25 | 130 | 4 | 60 | 1 |
| | R-7 | X-7A* | 192 | 75 | 46.25 | 155 | 4 | 60 | 1 |
| 5AX-230<br>5AX-250 | R-6 | X-6B* | 167 | 66 | 44.25 | 130 | 4 | 60 | 1 |
| | R-7 | X-7A* | 192 | 75 | 46.25 | 155 | 4 | 60 | 1 |
| | R-9 | X-9F | 233 | 82 | 55.25 | 190 | 20 | 60 | 2 |
| 5AX-350 | R-7 | X-7M | 192 | 75 | 46.25 | 155 | 16 | 80 | 2 |
| | R-9 | X-9J | 233 | 82 | 55.25 | 190 | 18 | 80 | 2 |
| | R-10 | X-10E-1 | 274 | 86 | 53.25 | 230 | 25 | 80 | 2 |
| | R-12 | X-12D-1 | 310 | 92 | 59.25 | 260 | 25 | 80 | 2 |
| NSVZ180 | R-6 | X-6E | 167 | 66 | 44.25 | 130 | 15 | 60 | 2 |
| NSVZ300 | R-6 | X-6A | 167 | 66 | 44.25 | 130 | 16 | 60 | 2 |
| | R-7 | X-7B | 192 | 75 | 46.25 | 155 | 16 | 60 | 2 |
| | R-9 | X-9A | 233 | 82 | 55.25 | 190 | 18 | 60 | 2 |
| | R-10 | X-10B-1 | 274 | 86 | 53.25 | 230 | 25 | 60 | 2 |
| NSVX400 | R-7 | X-7D | 192 | 75 | 46.25 | 155 | 16 | 80 | 2 |
| | R-9 | X-9C | 233 | 82 | 55.25 | 190 | 18 | 80 | 2 |
| | R-10 | X-10A | 274 | 86 | 53.25 | 230 | 20 | 80 | 2 |
| | R-12 | X-12C | 310 | 92 | 59.25 | 260 | 20 | 80 | 2 |

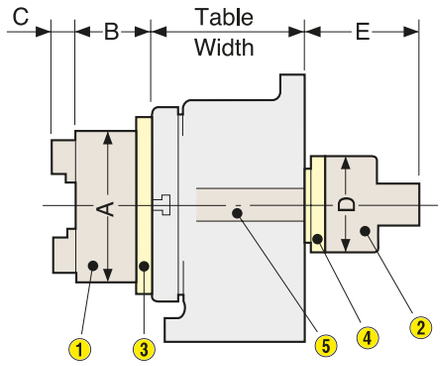
★The maker of the scroll chuck was changed. This table shows the chuck plate of the new maker. Please refer to **CAT NO.8168** or older for the chuck plate of the old maker.

★The dimension from the table surface to the jaw is; ＊:B+C Others: E+B+C ＊1：Jig-plate with ϕ120 (AX101R075) is required.

ACC

NIKKEN

① Power Chuck
② Rotary Cylinder
③ Chuck Adapter
④ Cylinder Adapter
⑤ Connecting Rod




**When power chuck or rotary cylinder is installed on 5AX- table, the 5AX- table must be High Column type.**

● Power chuck Code No.

**HO1MA** □ □
- □ Serration pitch S : 1.5, □ : 3
- Chuck size

## Power Chuck & Rotary Cylinder

| Table Model | Power Chuck Code No. | Pneu. Rotary Cylinder / Hyd. Rotary Cylinder | A | B | C | D | E |
|---|---|---|---|---|---|---|---|
| CNC105 | HO1MA-4 | H05CH-100 | 110 | 70 | 27 | 115 | 215 |
| | | HH4C-80 | | | | 130 | 220 |
| CNC180 | HO1MA-4 | H05CH-100 | 110 | 70 | 27 | 115 | 215 |
| | | HH4C-80 | | | | 130 | 220 |
| | HO1MA-5 | H05CH-150 | 135 | 70 | 27 | 115 | 215 |
| | | HH4C-80 | | | | 186 | 235 |
| | HO1MA-6(S) | H05CH-175 | 165 | 94 | 43 | 135 | 240 |
| | | HH4C-100 | | | | 210 | 240 |
| CNC202 | HO1MA-4 | H05CH-100 | 110 | 70 | 27 | 115 | 215 |
| | | HH4C-80 | | | | 130 | 220 |
| | HO1MA-5 | H05CH-150 | 135 | 70 | 27 | 115 | 215 |
| | | HH4C-80 | | | | 186 | 235 |
| | HO1MA-6(S) | H05CH-175 | 165 | 94 | 43 | 135 | 240 |
| | | HH4C-100 | | | | 210 | 240 |
| NCT200 | HO1MA-4 | H05CH-100 | 110 | 70 | 27 | 115 | 215 |
| | | HH4C-80 | | | | 130 | 220 |
| | HO1MA-5 | H05CH-150 | 135 | 70 | 27 | 115 | 215 |
| | | HH4C-80 | | | | 186 | 235 |
| | HO1MA-6(S) | H05CH-175 | 165 | 94 | 43 | 135 | 240 |
| | | HH4C-100 | | | | 210 | 240 |
| CNC260 | HO1MA-6(S) | H05CH-175 | 165 | 94 | 43 | 135 | 240 |
| | | HH4C-100 | | | | 210 | 240 |
| | HO1MA-8(S) | H05CH-250 | 210 | 110 | 43 | 160 | 250 |
| | | HH4C-125 | | | | 290 | 295 |
| CNC302 | HO1MA-6(S) | H05CH-175 | 165 | 94 | 43 | 135 | 240 |
| | | HH4C-100 | | | | 210 | 240 |
| | HO1MA-8(S) | H05CH-250 | 210 | 110 | 43 | 160 | 250 |
| | | HH4C-125 | | | | 290 | 295 |
| | HO1MA-10(S) | H05CH-300 | 254 | 120 | 43 | 160 | 250 |
| | | HH4C-125 | | | | 340 | 310 |
| CNC321, 401 | HO1MA-8(S) | H05CH-250 | 210 | 110 | 43 | 160 | 250 |
| | | HH4C-125 | | | | 290 | 295 |
| | HO1MA-10(S) | H05CH-300 | 254 | 120 | 43 | 160 | 250 |
| | | HH4C-125 | | | | 340 | 310 |
| | HO1MA-12(S) | H05CH-300 | 304 | 140 | 53 | 180 | 260 |
| | | HH4C-140 | | | | 340 | 310 |
| CNC501, 601 | HO1MA-8(S) | H05CH-250 | 210 | 110 | 43 | 160 | 250 |
| | | HH4C-125 | | | | 290 | 295 |
| | HO1MA-10(S) | H05CH-300 | 254 | 120 | 43 | 160 | 250 |
| | | HH4C-125 | | | | 340 | 310 |
| | HO1MA-12(S) | H05CH-300 | 304 | 140 | 53 | 180 | 260 |
| | | HH4C-140 | | | | 340 | 310 |
| CNC-100-2 (3, 4)W | HO1MA-4 | H05CH-100 | 110 | 70 | 27 | 115 | 215 |
| | | HH4C-80 | | | | 130 | 220 |

| Table Model | Power Chuck Code No. | Pneu. Rotary Cylinder / Hyd. Rotary Cylinder | A | B | C | D | E |
|---|---|---|---|---|---|---|---|
| 5AX-100H 5AX-130H | HO1MA-4 | Please ask for the detail. | 110 | 70 | 27 | – | – |
| 5AX-201H 5AX-230H | HO1MA-4 | | 110 | 70 | 27 | – | – |
| | HO1MA-5 | | 135 | 70 | 27 | – | – |
| | HO1MA-6(S) | | 165 | 94 | 43 | – | – |
| | | | | | | – | – |
| 5AX-250H | HO1MA-6(S) | | 165 | 94 | 43 | – | – |
| | | | | | | – | – |
| | HO1MA-8(S) | | 210 | 110 | 43 | – | – |
| 5AX-350H | HO1MA-6(S) | | 165 | 94 | 43 | – | – |
| | | | | | | – | – |
| | HO1MA-8(S) | | 210 | 110 | 43 | – | – |
| | HO1MA-10(S) | | 254 | 120 | 43 | – | – |
| 5AX-2MT-105H | HO1MA-4 | | 110 | 70 | 27 | 118 | 120 |
| | | | | | | 98 | 115 |
| 5AX-4MT-105 | HO1MA-4 | | 110 | 70 | 27 | 118 | 120 |
| | | | | | | 98 | 115 |
| NSVZ180 | HO1MA-4 | H05CH-100 | 110 | 70 | 27 | 115 | 215 |
| | | HH4C-80 | | | | 130 | 220 |
| | HO1MA-5 | H05CH-150 | 135 | 70 | 27 | 115 | 215 |
| | | HH4C-80 | | | | 186 | 235 |
| | HO1MA-6(S) | H05CH-175 | 165 | 94 | 43 | 135 | 240 |
| | | HH4C-100 | | | | 210 | 240 |
| NSVZ300 | HO1MA-6(S) | H05CH-175 | 165 | 94 | 43 | 135 | 240 |
| | | HH4C-100 | | | | 210 | 240 |
| | HO1MA-8(S) | H05CH-250 | 210 | 110 | 43 | 160 | 250 |
| | | HH4C-125 | | | | 290 | 295 |
| | HO1MA-10(S) | H05CH-300 | 254 | 120 | 43 | 160 | 250 |
| | | HH4C-125 | | | | 340 | 310 |
| NSVX400, 500 | HO1MA-8(S) | H05CH-250 | 210 | 110 | 43 | 160 | 250 |
| | | HH4C-125 | | | | 290 | 295 |
| | HO1MA-10(S) | H05CH-300 | 254 | 120 | 43 | 160 | 250 |
| | | HH4C-125 | | | | 340 | 310 |
| | HO1MA-12(S) | H05CH-300 | 304 | 140 | 53 | 180 | 260 |
| | | HH4C-140 | | | | 340 | 310 |
| – | – | – | – | – | – | – | – |
| | | | | | | – | – |
| – | – | – | – | – | – | – | – |
| | | | | | | – | – |

★HOWA power chucks and rotary cylinders (Higher: Pneu, Lower:Hydraulic) 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 with us for mounting.
★NIKKEN air/hydraulic rotary cylinder is also available.
★For the specifications of power chuck and rotary cylinder, please refer to material of **HOWA MACHINERY, LTD**.

⚠ **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.**

ACC

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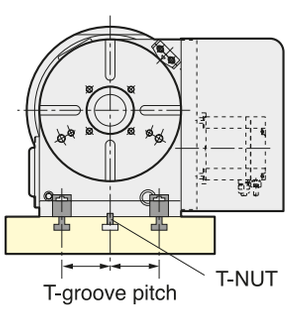
## Clamping device list by CNC rotary table model

| Code No. | Guide-piece width of CNC rotary table(㎜) | Clamping device shape1 Code No. | Quantity | Clamping device shape2 Code No. | Set | Thickness of the sim plate(㎜) |
|---|---|---|---|---|---|---|
| **CNC105** | 14 | **CLA114** | 1 | **CLE13** | 1 | 5 |
| **CNC180** | 14 | **CLA214** | 2 | – | – | – |
| **CNC202** | | | | | | |
| **NCT200** | 14 | **CLA214** | 2 | – | – | – |
| **CNC180B** | 18 | **CLB18** | 2 | **CLC18** | 2 | – |
| **CNC202B** | | | | | | |
| **CNC202T** | 14 | **CLB14** | 2 | **CLC14** | 2 | 5 |
| **CNC260** | 18 | **CLB18** | 2 | **CLC18** | 2 | 5 |
| **CNC302** | | | | | | |
| **CNC260B** | 18 | **CLB18** | 2 | **CLD18** | 2 | 5 |
| **CNC302B** | | | | | | |
| **CNC321(B)** | 18 | **CLB18** | 2 | **CLC18** | 2 | 10 |
| **CNC401(B)** | | | | | | |
| **CNC501** | 20 | **CLA118** | 4 | – | – | 20 |
| **CNC601** | | | | | | |
| **CNC350** | 18 | **CLB18** | 2 | **CLC18** | 2 | 10 |
| **CNC450** | 18 | **CLA118** | 4 | – | – | 10 |
| **CNC100**(Mult spindle) | 18 | **CLA118** | 4 | – | – | 5 |
| **CNC180**(Mult spindle) | 18 | **CLA218** | 4 | – | – | – |
| **CNC202**(Mult spindle) | | | | | | |
| **NST250** | 16<br>W-16B Stepped | **CLA218** | 3 | – | – | 3 |
| **NST300** | 18 | **CLA118** | 3 | **CLB118** | 3 | |
| **NST500** | 20 | **CLA118** | 4 | – | – | – |
| **5AX-100** | 14 | **CLA214** | 4 | – | – | – |
| **5AX-130** | 14 | **CLB14** | 2 | **CLC14** | 2 | – |
| **5AX-150** | 14 | **CLB14** | 2 | **CLC14** | 2 | – |
| **5AX-201** | 14 | **CLA114** | 4 | – | – | – |
| **5AX-230** | 18 | **CLB18** | 2 | **CLC18** | 2 | – |
| **5AX-250** | 18 | **CLA218** | 4 | – | – | 15 |
| **5AX-550** | 20 | **CLA118** | 4 | – | – | 20 |
| **5AX-2MT-105** | 18 | **CLA118** | 4 | – | – | – |
| **NSVZ180** | 14 | **CLA114** | 2 | – | – | – |
| **NSVZ300** | 18 | **CLB18** | 2 | **CLC18** | 2 | 5 |
| **NSVZ400** | 18 | **CLA118** | 4 | – | – | 10 |

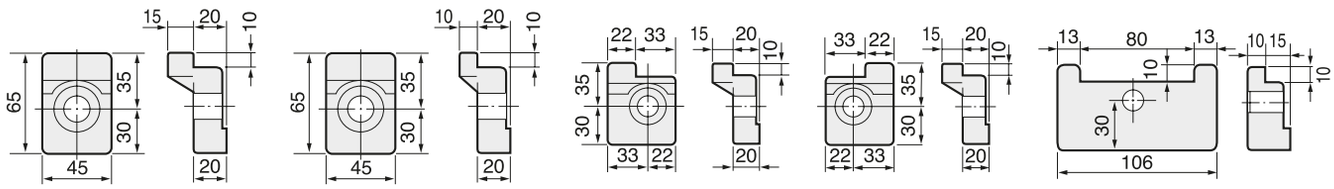
★★**CLD18** is what makes additional processing on **CLC18**, width: from 55 to 50mm




CLAMPING DEVICE is designed for T-slot pitches of 100mm or 125mm on the machine bed table. Please contact with us for the other pitches.

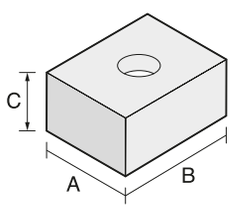
## Code No. of Clamping Device

| Size of clamping device bolt | Clamping Device Type | | | | |
|---|---|---|---|---|---|
| | A1 | A2 | B | C | E |
| M12 | CLA114 | CLA214 | CLB14 | CLC14 | CLE13 |
| M16 | CLA118 | CLA218 | CLB18 | CLC18 | CLE18 |
| M20 | CLA120 | CLA220 | CLB20 | CLC20 | CLE20 |



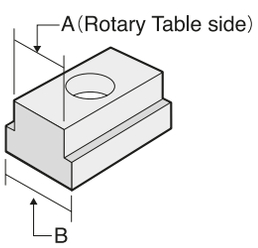

★ Clamping Devices (Fitting Metals) for the following CNC Table Models are Not Included. If necessary, consult NIKKEN sales parson.
CNC400H, CNC503H, CNC802, CNC803, CNC1000, CNC1002, CNC1200, CNC1201, CNC1600,
5AX-800, 5AX-1200, 5AX-T400, 5AX-N400 and 5AX-B450T.

## Standard Guide Piece




| Key width dimension | A × B × C | Code No. |
|---|---|---|
| 14 | 14 × 18 × 9 | W141809 |
| 16 | 16 × 20 × 10 | W162010 |
| 18 | 18 × 25 × 10 | W182510 |
| 20 | 20 × 30 × 14 | W203014 |
| 22 | 22 × 40 × 14 | W224014 |

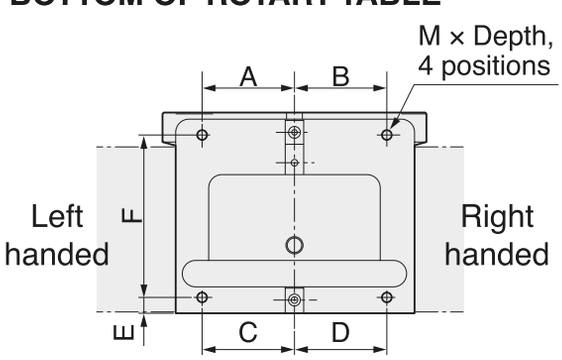
## Stepped Guide Piece




| A \ B | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 7/16″ | 11/16″ |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 | W-14I | W-14H | | W-14A | W-14B | W-14C | | | W-14F | W-14G |
| 18 | | W-18E | W-18A | W-18B | | W-18C | W-18D | | | |
| 20 | | | | W-20A | W-20B | | W-20C | W-20D | | |

★ The item is a set of two each.
●Please note that clamping device is altered when using stepped guide-piece.

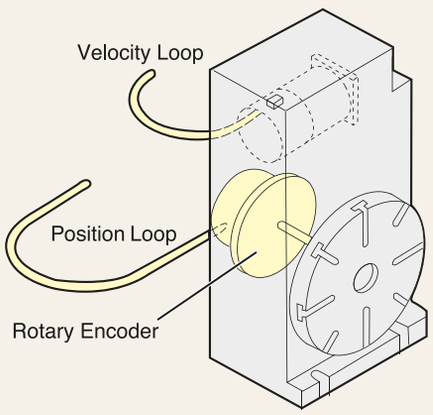
## TAP HOLES POSITION at the BOTTOM OF ROTARY TABLE




●Please refer to the above dimensions for direct mounting with the bolts from base plane side.

| Table Model | A | B | C | D | E | F | M × Depth, 4positions |
|---|---|---|---|---|---|---|---|
| CNC105, 105L | 55 | 55 | 55 | 55 | 10 | 125 | M10×12L, 4positions |
| CNC180, 202 CNC180L, 202L | 70 | 70 | 70 | 70 | 12 | 123 | M 8×10L, 4positions |
| CNC205 | 85 | 85 | 85 | 85 | 15 | 60 | M10×15L, 4positions |
| NCT200 | 70 | 70 | 70 | 70 | 12 | 123 | M 8×15L, 4positions |
| CNC260, 302 | 105 | 120 | 105 | 120 | 12.5 | 167.5 | M12×16L, 4positions |
| CNC260L, 302L | 120 | 105 | 120 | 105 | 12.5 | 167.5 | M12×16L, 4positions |
| CNC321, 401 | 145 | 135 | 165 | 135 | 15 | 200 | M12×20L, 4positions |
| CNC321L, 401L | 135 | 145 | 135 | 165 | 15 | 200 | M12×20L, 4positions |
| CNC501, 501L | 240 | 240 | 240 | 240 | 20 | 235 | M16×30L, 4positions |

# O/P OPTION High Precise Indexing (Full Closed Loop)




**Configuration of High Precise Indexing Models**

Full closed loop control becomes possible by mounting a rotary encoder at the back of rotary table. And high precise indexing becomes possible by detecting the rotary angle of the table directly.

- 3 grades can be selected for indexing accuracy; ±3", ±5" and ±10".
- Every high Precise Indexing models take a test based on ISO 230-2 to measure the positioning accuracy.
- In case indexing unit of 1" or very high rigidity is required, please select Hirth Coupling Index **NSVZ**, **NSVX** series table. ☞ **P.33**

★Cables are not included in ultra precision option. Please order separately.
★Air purge of the encoder inside is available as an option for water proof. Please contact us.
★Encoders from other encoder manufacturers can also be installed. Please contact us separately.

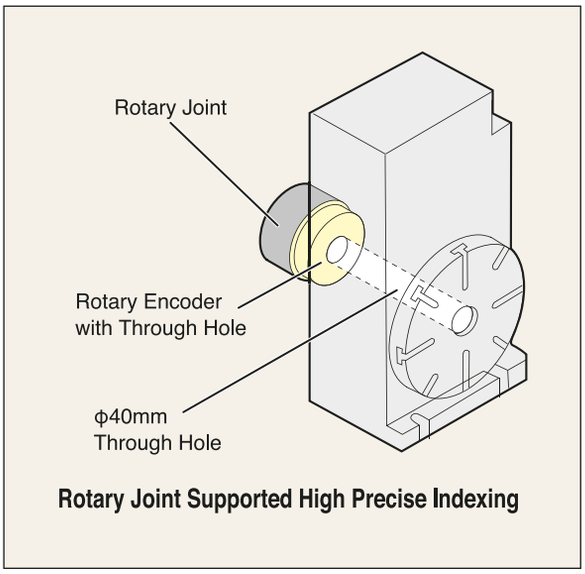
## CNC High Precise Indexing for CNC Rotary Table

| Table Model \ Indexing Accuracy / Maker | ±3″ | ±5″ | |
|---|---|---|---|
| | Heidenhain | Heidenhain | Magnescale |
| **CNC105, 180, 202, NCT200** | — | RCN2391 | RU77-4096A |
| **CNC260, 302** | RCN8591 | RCN2391 | RU77-4096A |
| **CNC321～1600** | RCN8591 | RCN8391 | RU77-4096A |

## 5AX High Precise Indexing for Tilting Rotary Table

| Table Model, axis \ Indexing Accuracy / Maker | | ±5″ | | ±10″ | |
|---|---|---|---|---|---|
| | | Heidenhain | Magnescale | Heidenhain | Magnescale |
| **5AX-130, -201, -230, 250** | Rotary | RCN2391 | RU77-4096A | — | — |
| | Tilting | — | — | RCN2391 | RU77-4096A |
| **5AX-350** | Rotary | RCN2391 | RU77-4096A | — | — |
| | Tilting | — | — | RCN2391 | RU77-4096A |
| **5AX-550, 800** | Rotary | RCN8391 | — | — | — |
| | Tilting | — | — | RCN8391 | — |

★Higher indexing accuracy (Rotary: ±3 sec., Tilting: ±5sec.) is available. Please contact us.
★Some models of Magnescale rotary encoders differ depending on the NC manufacturer used. Please contact us separately.
★There is also a circular table to which a Magnescale (RECAPPS) encoder that realizes high-precision positioning can be attached. Please contact us separately.




Rotary Joint Supported High Precise Indexing

# Rotary Joint Supported High Precise Indexing

- Even the number of IN ports is limited, rotary joint can be installed for the rotary table with the rotary encoder forhigh precision indexing. Please contact us.
- The rotary table with RCN8391 or RCN8591 has ϕ40mm through hole, and the rotary joint can be mounted.

## CNC High Precise Indexing with Through-hole for CNC Rotary Table

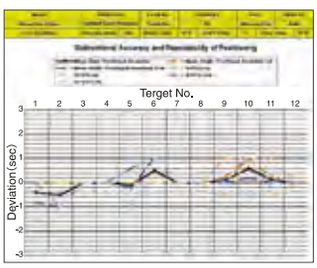
| Table Model \ Indexing Accuracy | ±3″ | ±5″ |
|---|---|---|
| | Rotary Encoder | Rotary Encoder |
| **CNC260, 302** | RCN8591 | — |
| **CNC321～1600** | RCN8591 | RCN8391 |

## 5AX High Precise Indexing with Through-hole for Tilting Rotary Table

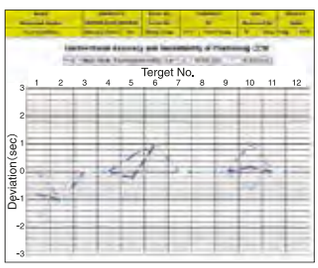
| Table Model \ Indexing Accuracy | | ±5″ | ±10″ |
|---|---|---|---|
| | | Rotary Encoder | Rotary Encoder |
| **5AX-550, 800** | Rotary | RCN8391 | — |
| | Tilting | — | RCN8391 |

## ISO230-2 : Accuracy Measurement Based on International Standard

Accuracy Measuring Method Rotating Axis: 30.2°X 12 points Tilting Axis: 15.2°X 8 points
Continually 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.

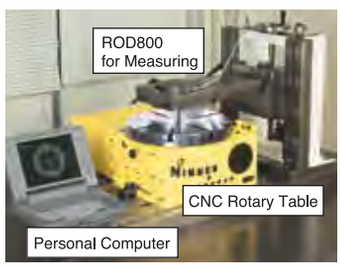



Bidirectional Accuracy and Repeatability of Positioning





Unidirectional Accuracy and Repeatability of Positioning



# ROTARY JOINT

NIKKEN

**Rotary Joint is a rotating connector to supply air, hydraulic pressure or coolant liquid from outside to a fixture on a CNC rotary table. If liquid is supplied with ordinary hoses, twisting will happen on them by rotation of the table. However, rotary joints can solve this problem as it rotates in accordance with the table.**

- Provides Pneumatic, hydraulic pressure or coolant from the rear of the table to a fixture.
- Automation of clamping/unclamping workpieces becomes possible.
- With a choice of 3 types: Cylinder type, Flange Plate type and Built-in type

★The coolant port is recommended to be separated because that the fine cutting swarf may come through the filter into the coolant port.

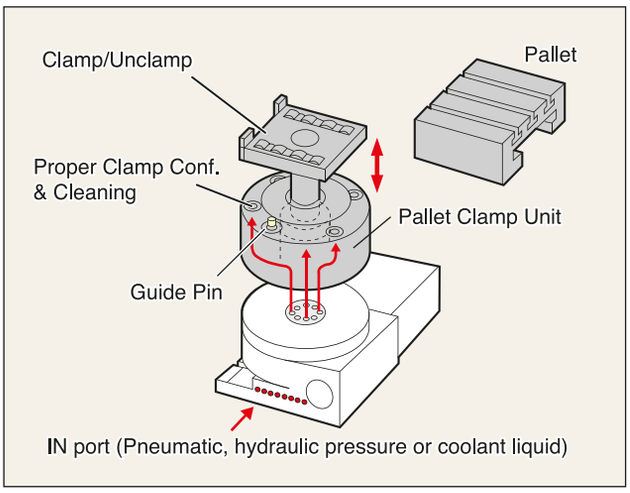
★The cylinder type rotary joint is equipped with a port in the center bore exclusively for the coolant liquid.

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

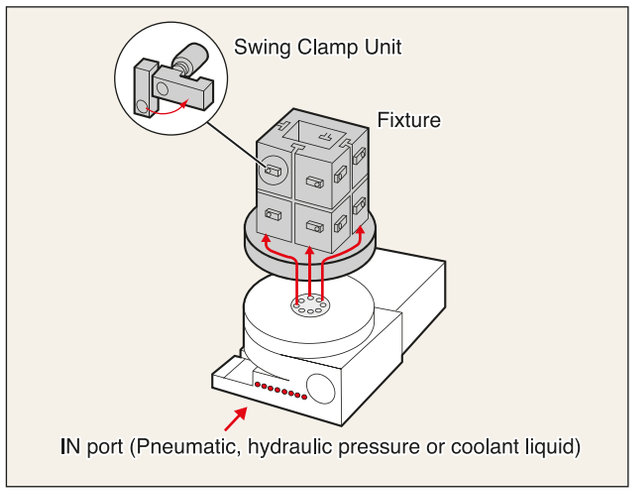
## The Examples of How Rotary Joint is Used

Rotary joint is used for clamping/unclamping workpieces, confirmation of proper clamp, cleaning, coolant etc.

### Automation Application Examples With Pallet Clamp Unit



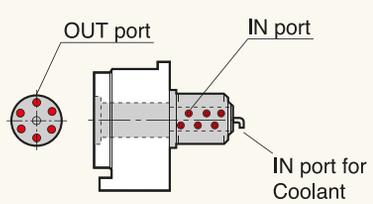

### Automation Application Examples With Swing Clamp Unit




## Type of Rotary Joint

### 1 Cylinder type Rotary Joint

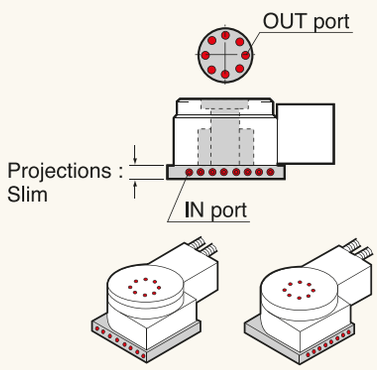
- Cylinder type rotary joint allows many ports.
- Cylinder type rotary joint can be mounted later.




★The cylinder type rotary joint is useful in machining with the coolant liquid, because it's equipped with a port exclusively for the coolant liquid.

### 2 Flange Plate type Rotary Joint

- Flange plate type rotary joint reduces supply block projections
- IN ports position can be changed at any side: front, back, left or right side.

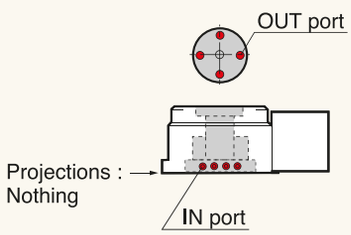



★The every position which causes no interference against M/C can be selected.

★Flange plate type rotary joint is useful in NSV series.

### 3 Built-in type Rotary Joint

- The highest space efficiency of all models of rotary joints
- Built-in type rotary joint can be mounted without changing dimension.




O/P

## CNC Rotary Joints for CNC Rotary Tables

| Code No. | Cylinder type | Flange Plate type | | Built-in type |
|---|---|---|---|---|
| | MAX. Number of Ports | MAX. Number of Ports | T*(mm) | MAX. Number of Ports |
| NCT 200 | 6+1 | 6 | 39 | — |
| CNC 105 | 4+1 | 4 | 25 | — |
| 180, 202 | 6+1 | 6 | 25 | — |
| 205 | — | — | | 6+1 |
| 260, 302 | 10+1 | 11 | 60 | — |
| (260B, 302B) | — | 8+1 | | — |
| 321, 401, 401H | 12+1 | — | | 8+1 |
| B350 | 16+1 | — | | — |
| B450 | 20+1 | — | | — |
| 503H | 12+1 | — | | 12+1 |
| 501, 601 | 14+1 | 15*6 | — | 8+1 |
| 802 | 16+1 | — | — | 10+1 |
| NSVZ 180 | 6+1 | 5 | 25 | — |
| 300 | 8+1 | 6 | 30 | — |
| 400, 500 | 12+1 | 13 | 50 | — |

## Rotary Joints for Support Tables

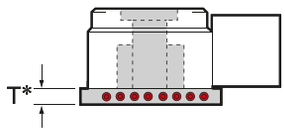
| Code No. | Cylinder type | Flange Plate type | | Built-in type |
|---|---|---|---|---|
| | MAX. Number of Ports | MAX. Number of Ports | T*(mm) | MAX. Number of Ports |
| TAT- 105, 170 | 6+1 | 2 | 25 | — |
| 200, 250 | 9+1*1 | 7 | 30 | — |
| 321, 401, 501 | 14+1 | 8+1 | 35 | — |

*1 MAX Number of Ports is 8+1P for **TAT-200.**

## 5AX Rotary Joints for Tilting CNC Rotary Tables

| Code No. | MAX. Number of Ports on Main Unit | Cylinder type | Flange Plate type | | Built-in type |
|---|---|---|---|---|---|
| | | MAX. Number of Ports | MAX. Number of Ports | T*(mm) | MAX. Number of Ports |
| 5AX- 100 | — | (4) | 3 | 25 | — |
| 130 | — | 2 (4) | — | — | — |
| 201 | 4 | 4 (6) | — | — | 4*2 |
| 250 | 3 | — | — | — | 3*3 |
| 350 | 6 | — | — | — | 6+1*4 |
| 550 | 4 | 10*5 | — | — | — |
| 800 | 6 | — | — | — | 6 |
| DD250 | — | — | 6 | 30 | — |
| DD400 | — | — | 8 | 30 | — |
| 5AX-DD200A,B | — | — | 4 | — | — |

★( ) : MAX No. of high column table.
★"+1" is the port located in the center hole for coolant.
* "T" is dimension of supply block projections after mounting rotary joints.
*2 : 4 reserve ports are provided on **5AX-201.**
*3 : 3 reserve ports are provided on **5AX-250** and 2 external ports are available.
*4 : 6reserve ports are provided on **5AX-350.** No additional port is available.
*5 : 4 reserve ports are provided on **5AX-550** as standard, and the additional 6 ports are available.
*6 : It becomes correspondence of a special use.




### ⚠ 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.

# How to Read Product Code of ROTARY JOINT

NIKKEN

**RT - CN105 SD - 3+1 - L**

RT : Cylinder type Rotary Joint
RN : Flange Plate type Rotary Joint, Built-in type Rotary Joint.

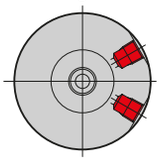
Diameter of Table

SD : Standard

Number of Ports
3+1 With a Center Port
3+N W/O a Center Port

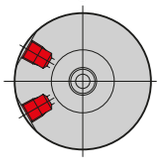
Hose Direction of the Sleeve seen from behind, or sub-code.
R : Right (Cylinder type) Fig.1
L : Left (Cylinder type) Fig.2
F : Flange (Flange Plate type) Fig.3
B : Main Unit (Built-in type)
A : 5AX

Fig.1



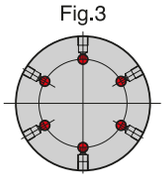
R : Right (Cylinder type)

Fig.2



L : Left (Cylinder type)

Fig.3



Flange (Flange Plate type)

## Code No. of Rotary Joint

| Table Model | No. of port | Type | Code No. | Remarks |
|---|---|---|---|---|
| CNC105 | 3+1 | Cylinder type | RT-CN105SD-3+1-L | 3+1RJ Cylinder type |
| | 3+1 | | RT-CN105SD-3+1-R | |
| | 4+1 | | RT-CN105SD-4+1-L | 4+1RJ Cylinder type |
| | 4+1 | | RT-CN105SD-4+1-R | |
| | 6+1 | | RT-CN105SD-6+1-L | 6+1RJ Cylinder type |
| | 6+1 | | RT-CN105SD-6+1-R | |
| CNC180, 202 | 3+1 | Cylinder type | RT-CN180SD-3+1-L | 3+1RJ Cylinder type |
| | 3+1 | | RT-CN180SD-3+1-R | |
| | 4 | Flange Plate type | RN-CN180SD-4+N-F | 4RJ Flange Plate type |
| | 4+1 | Cylinder type | RT-CN180SD-4+1-L | 4+1RJ Cylinder type |
| | 4+1 | | RT-CN180SD-4+1-R | |
| | 4+1 | Flange Plate type | RN-CN180SD-4+1-F | 4+1RJ Flange Plate type |
| | 5+1 | Flange Plate type | RN-CN180SD-5+1-F | 5+1RJ Flange Plate type |
| | 6 | Flange Plate type | RN-CN180SD-6+N-F | 6RJ Flange Plate type |
| | 6+1 | Cylinder type | RT-CN180SD-6+1-L | 6+1RJ Cylinder type |
| | 6+1 | | RT-CN180SD-6+1-R | |
| CNC205 | 6+1 | Flange Plate type | RN-CN205SD-6+1-B | 6+1RJ Flange Plate type |
| NCT200 | 6 | Flange Plate type | RN-NC200SD-6+N-F | 6RJ Flange Plate type |
| | 6+1 | Cylinder type | RT-NC200SD-6+1-L | 6+1RJ Cylinder type |
| | 6+1 | | RT-NC200SD-6+1-R | |
| NCT200E | 6 | Flange Plate type | RN-NC20ESD-6+N-F | 6RJ Flange Plate type |
| | 6+1 | Cylinder type | RT-NC20ESD-6+1-L | 6+1RJ Cylinder type |
| | 6+1 | | RT-NC20ESD-6+1-R | |
| CNC260, 302 | 4+1 | Cylinder type | RT-CN260SD-4+1-L | 4+1RJ Cylinder type |
| | 4+1 | | RT-CN260SD-4+1-R | |
| | 4+1 | Flange Plate type | RN-CN260SD-4+1-F | 4+1RJ Flange Plate type |
| | 6+1 | Cylinder type | RT-CN260SD-6+1-L | 6+1RJ Cylinder type |
| | 6+1 | | RT-CN260SD-6+1-R | |
| | 6+1 | Flange Plate type | RN-CN260SD-6+1-F | 6+1RJ Flange Plate type |
| | 8+1 | Cylinder type | RT-CN260SD-8+1-L | 8+1RJ Cylinder type |
| | 8+1 | | RT-CN260SD-8+1-R | |
| | 8+1 | Flange Plate type | RN-CN260SD-8+1-F | 8+1RJ Flange Plate type |

O/P

# How to Read Product Code of ROTARY JOINT

NIKKEN

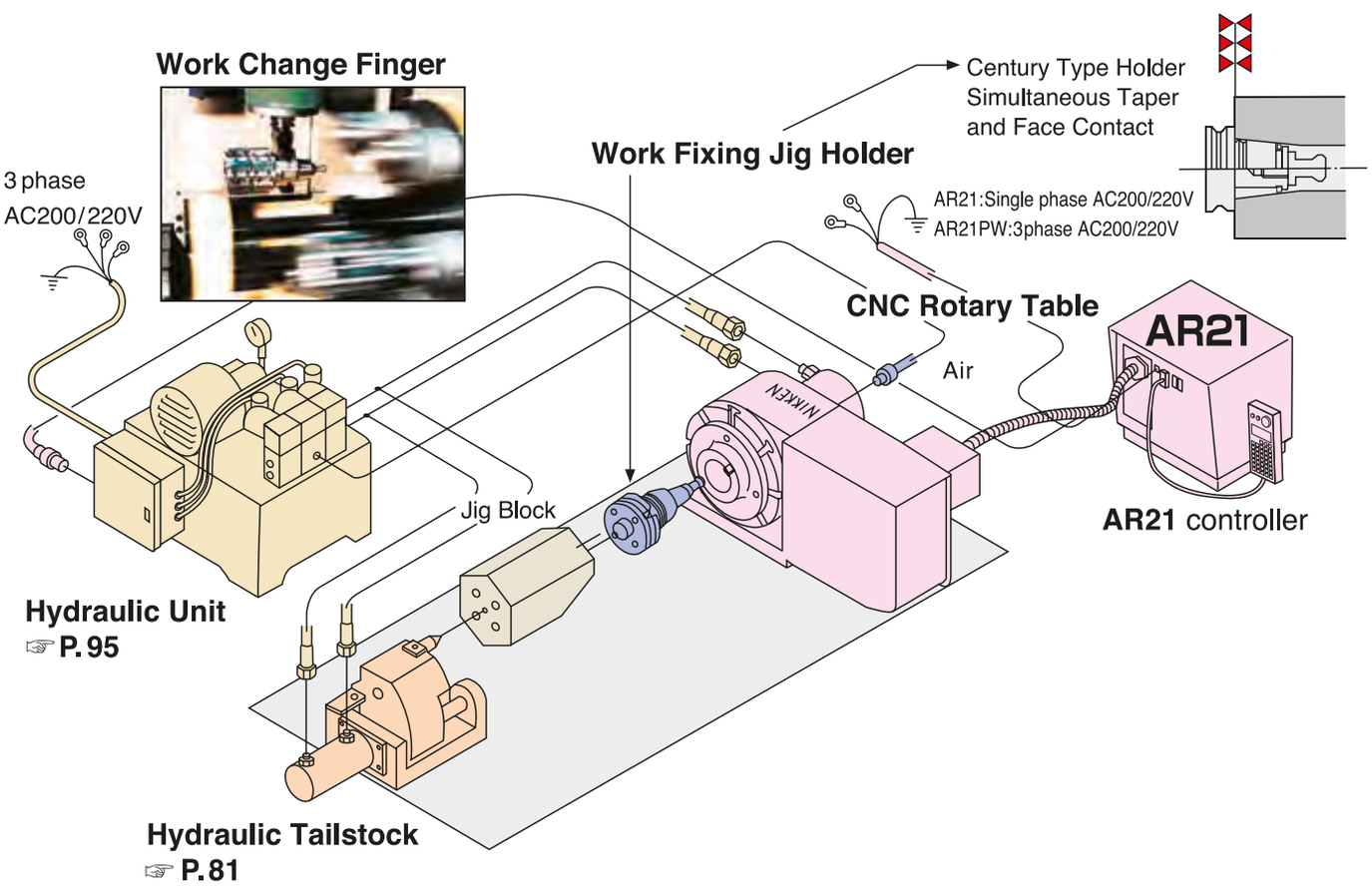
| Table Model | No. of port | Type | Code No. | Remarks |
|---|---|---|---|---|
| CNC321 | 8+1 | Built-in type | RN-CN321SD-8+1-B | 8+1RJ Built-in type |
| CNC401 | 8+1 | Built-in type | RN-CN401SD-8+1-B | 8+1RJ Built-in type |
| CNC503H | 8+1 | Built-in type | RN-CN503HSD-8+1-B | 8+1RJ Built-in type |
| | 12+1 | | RN-CN503HSD-12+1-B | 12+1RJ Built-in type |
| CNC501 | 8+1 | Built-in type | RN-CN501SD-8+1-B | 8+1RJ Built-in type |
| CNC601 | 8+1 | Built-in type | RN-CN601SD-8+1-B | 8+1RJ Built-in type |
| CST100-135 | 4+1 | Cylinder type | RT-CST100SD-4+1-L | 4+1RJ Cylinder type |
| | 4+1 | | RT-CST100SD-4+1-R | |
| TAT-105N | 3+1 | Cylinder type | RT-TA105SD-3+1-L | 3+1RJ Cylinder type |
| | 3+1 | | RT-TA105SD-3+1-R | |
| | 4+1 | | RT-TA105SD-4+1-L | 4+1RJ Cylinder type |
| | 4+1 | | RT-TA105SD-4+1-R | |
| | 6+1 | | RT-TA105SD-6+1-L | 6+1RJ Cylinder type |
| | 6+1 | | RT-TA105SD-6+1-R | |
| TAT-170N | 3+1 | Cylinder type | RT-TA170SD-3+1-L | 3+1RJ Cylinder type |
| | 3+1 | | RT-TA170SD-3+1-R | |
| | 4+1 | | RT-TA170SD-4+1-L | 4+1RJ Cylinder type |
| | 4+1 | | RT-TA170SD-4+1-R | |
| | 6+1 | | RT-TA170SD-6+1-L | 6+1RJ Cylinder type |
| | 6+1 | | RT-TA170SD-6+1-R | |
| TAT-200N | 4+1 | Cylinder type | RT-TA200SD-4+1-L | 4+1RJ Cylinder type |
| | 4+1 | | RT-TA200SD-4+1-R | |
| | 6+1 | | RT-TA200SD-6+1-L | 6+1RJ Cylinder type |
| | 6+1 | | RT-TA200SD-6+1-R | |
| | 8+1 | | RT-TA200SD-8+1-L | 8+1RJ Cylinder type |
| | 8+1 | | RT-TA200SD-8+1-R | |
| TAT-250N | 4+1 | Cylinder type | RT-TA250SD-4+1-L | 4+1RJ Cylinder type |
| | 4+1 | | RT-TA250SD-4+1-R | |
| | 6+1 | | RT-TA250SD-6+1-L | 6+1RJ Cylinder type |
| | 6+1 | | RT-TA250SD-6+1-R | |
| | 8+1 | | RT-TA250SD-8+1-L | 8+1RJ Cylinder type |
| | 8+1 | | RT-TA250SD-8+1-R | |
| 5AX-100 | 3 | Flange Plate type | RN-AX101SD-3+N-A | 3 Flange Plate type |
| | 4 | Cylinder type | RT-AX101SD-4+N-A | 4 Cylinder type |
| 5AX-130 | 3 | Cylinder type | RT-AX130SD-3+N-A | 3 Cylinder type |
| | 4 | | RT-AX130SD-4+N-A | 4 Cylinder type |
| 5AX-201 | 4 | Flange Plate type | RN-AX201SD-4+N-A | 4 Flange Plate type |
| | 6+1 | Cylinder type | RT-AX201SD-6+1-A | 6+1 Cylinder type |
| 5AX-250 | 3 | Flange Plate type | RN-AX250SD-3+N-A | 3 Flange Plate type |
| 5AX-350 | 6 | Flange Plate type | RN-AX350SD-6+N-A | 6 Flange Plate type |
| 5AX-550 | 6 | Flange Plate type | RN-AX550SD-6+N-A | 6 Flange Plate type |

# AWC SYSTEM

NIKKEN

■ Extremely flexible, and can take many kinds of work pieces. Jig Holder is firmly held in the center 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 (optional), and automatic selection of Jig Holder in magazine is possible.

■ AWC magazine, Disc type, Chain type, Horizontal type and Bar Work type are available.

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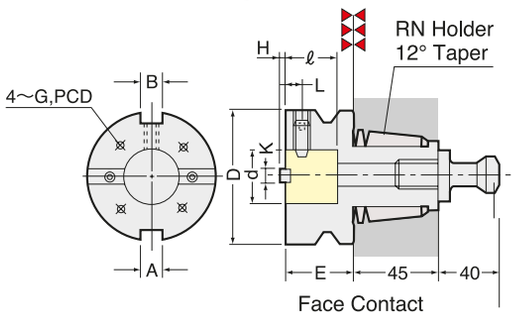
## Work Fixing Jig Holder

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.

☞ Refer to **NC5** tooling system literature for **NC5** models




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

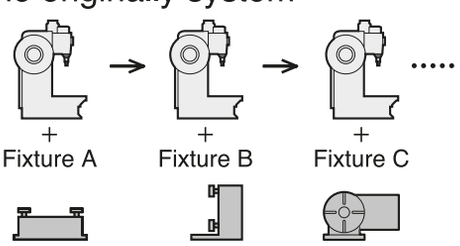
Side Lock type Holder

| Code No. | $D_1$ | d | K | E | H | R | L | M | G | PCD | $A^{0}_{-0.010}$ | B | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **RN40-63×25** | 63 | 25H6 | 10h7 | 40 | 5 | 30 | 15 | M10 | M8 | 48 | 16 | 18 | 1.5kg |
| **RN45-85×32** | 85 | 32H6 | 12h7 | 45 | 5 | 35 | 20 | M12 | M10 | 65 | 18 | 20 | 2.5kg |

Examples of Jig Block (optional)

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

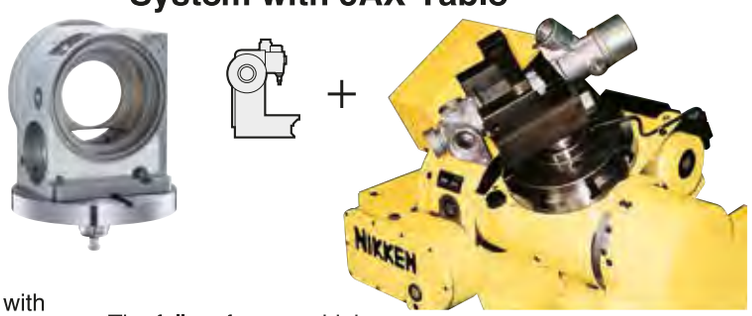
### The originally system




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.

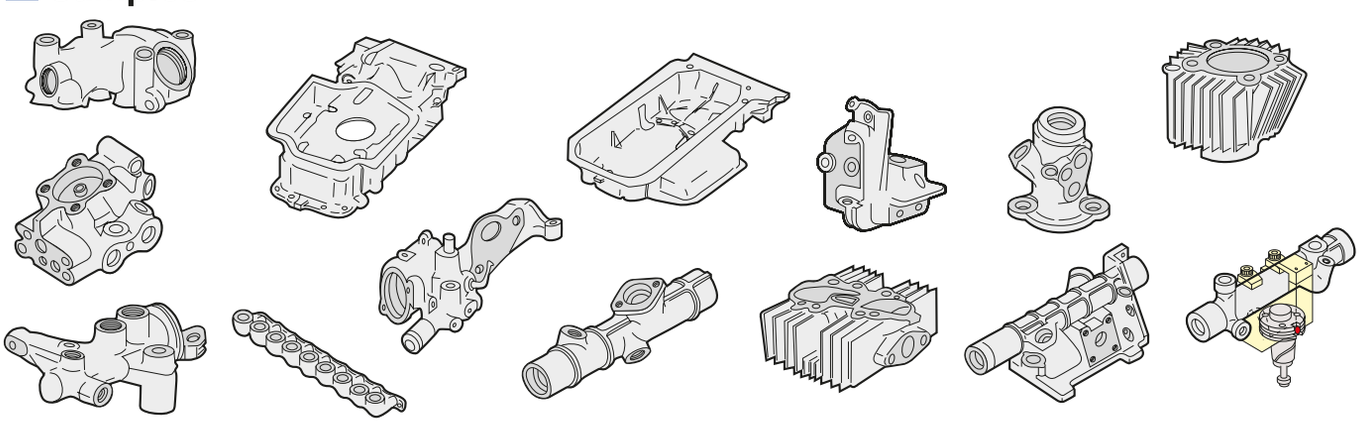
### System with 5AX-Table




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.)

## Samples



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# Special Specification 1

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## 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 clamping, air purge is arranged inside the motor cover as standard.
·In case of the table which with αi21 controller, the hard-wired type connection on the rotary table side and harting connector fitting on the controller side, however, the harting connector fitting on the rotary table side is also available as an option.
·For αi21PW controller, water resistant connector type cables are supplied as standard.

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

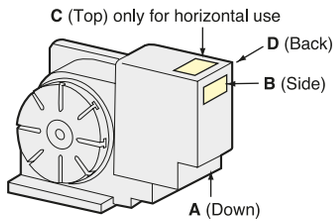
Cable Direct Out type

**Cable with Blade (Option)**
Standard Length: 5m

Harting Connector type

## Position & Direction of Connecting Cable

The standard of the cable connecting direction is **B** or **D.** **A** or **C** is possible on demand.




## Hydraulic Unit

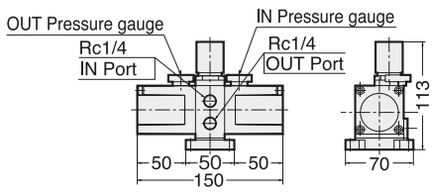
### Specifications

**TCC-150**

MAX.14ℓ/min
MAX.3.5MPa
●AC200～220V, 3 phases, Capacity : 1KVA.
●Solenoid valves and pressure switches depends on your applications.
●Dimension : 400×405×479mm

**TCC-150**

**VBA10A-02G**




## Air Intensifying Booster (Max. Output: 0.7MPa)

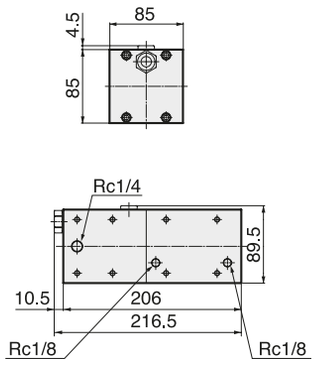
The air pressure can be double by Air Intensifying Booster. This is suitable for tables with the Double Intensifying Clamping System.

## Air Hydraulic Booster

Please order an air hydraulic unit for the machine without hydraulic source.
Applicable for **CNC260, CNC302 : AY0400 / CNC321~CNC803 : NB-AB30-150 / 5AX-201,350 : NB-AB30-75**
Please ask for the layout of the booster.

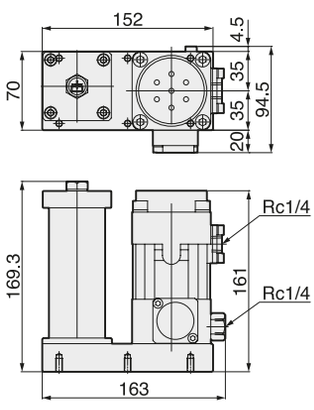
### AY0400

Oil Capacity: 30cc
Input pneumatic Pressure: 0.4～0.5MPa
Output hydraulic Pressure: 2.0～2.5MPa



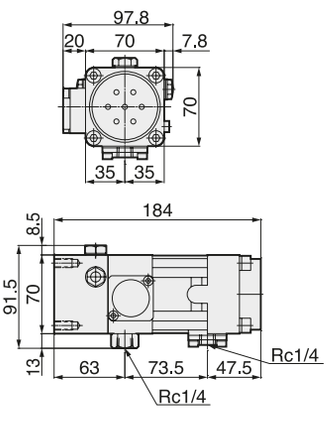

### NB-AB30-150

Oil Capacity: 150cc
Input pneumatic Pressure: 0.41～0.47MPa
Output hydraulic Pressure: 3.5～4.0MPa




### NB-AB30-75

Oil Capacity: 75cc
Input pneumatic Pressure: 0.41～0.47MPa
Output hydraulic Pressure: 3.5～4.0MPa

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# Special Specification 2

NIKKEN

## Air Craft-related Parts Apprication.

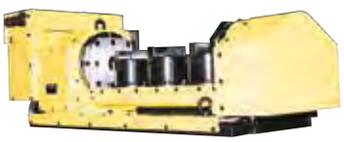
**Synchronous Rotation by CNC401 X 2units**

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

## Automobile Parts Apprication.

**CNC180 + TAT-105N**

**CNC601,3m Jig Block & TAT-501N**



**3 sets of power chucks are used for work clamping.**

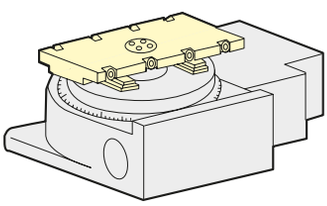
## Energy-related Parts Apprication.


**CNC1800 & Support Branch**
Indexing/ clamping of the turbine disk


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

### 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.



Lifting type Pallet Clamp Unit

### Special Color

Please order with the color sample or Munsell Color No.

Pallet Clamp Unit
with Automatic Coupler

O/P

# Special Specification 3

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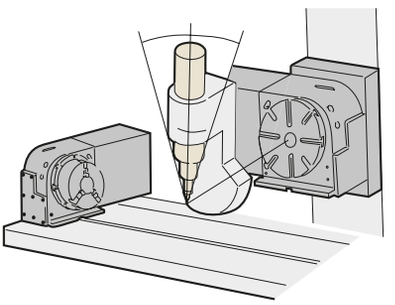
**NIKKEN CNC rotary tables are used in various kinds of world wide applications. Please contact with us with the dimension of your work piece and construction of the jig fixture etc. We will recommend you the best application.**

## 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



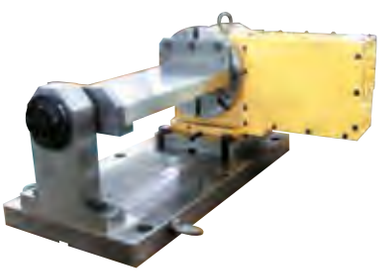
Machining of turbine wheel to use 2 units of CNC rotary tables, one for the swing axis of the HF motor and the other for the rotary axis of the work piece

**5AX-400FA-RJ8-800/150**

**5AX-500MA-RJ10-900/100**

**5AX-321FA**

**CNC180+TAT-105N+CNCZ503**



**CNC180+Special Support Table**

O/P

# Special Specification 4

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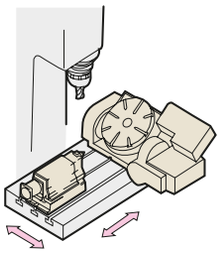
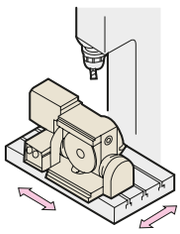
## Example of 5AX Rotary Table location on M/C

There are various ways of arrangement.

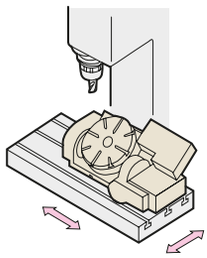
▼ Tail Stock is used together.



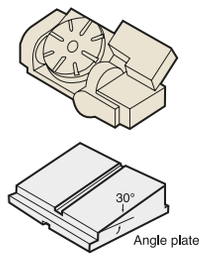
▼ Y axis stroke of the M/C is not enough



▼ Y axis stroke is enough



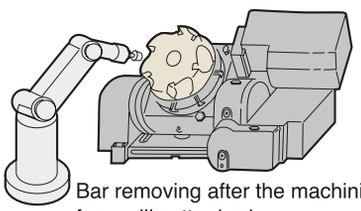
▼ Tilting range is 30-135



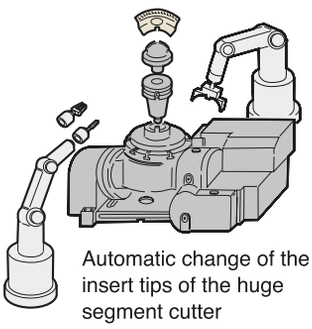

**5AX-300**
Example on the angle base (60°)

## Application of 5AX-Table

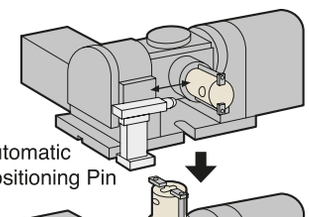
**5AX-500** with square table

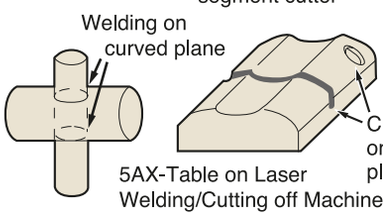


Bar removing after the machining of face mill cutter body

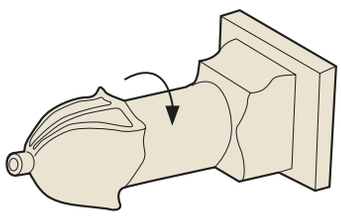


Automatic change of the insert tips of the huge segment cutter



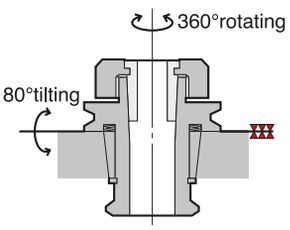

5AX-Table on Laser Welding/Cutting off Machine



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

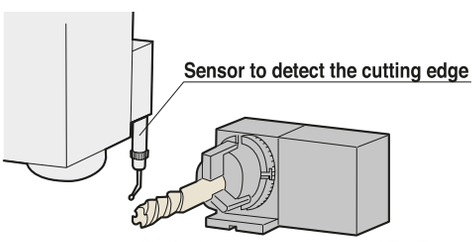
1. The work piece is exchanged by ROBOT, the positioning pin goes forward, then the work piece is clamped at the tilting axis = 90°.
2. The positioning pin goes backward, the tilting axis moves to 0°, then the machining starts.

   The tilting movement is used only for automatic work piece exchange

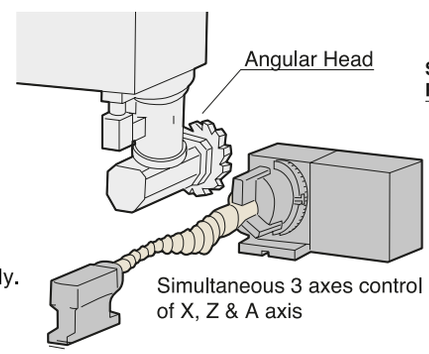



5AX-Multi Spindle Table + Jig Holder with Through Hole

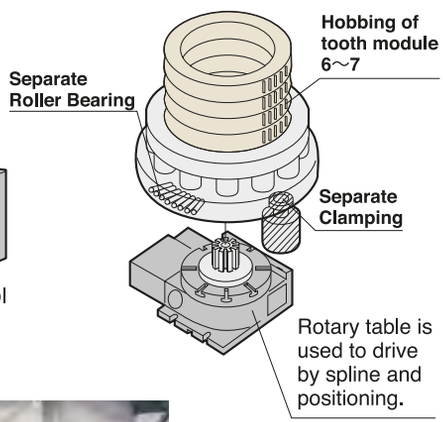
## Other Application



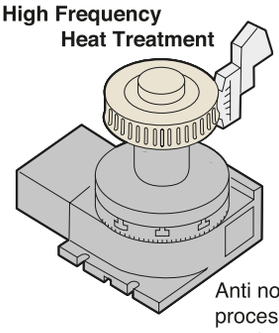

Work piece (Cutter) is exchanged by ROBOT, and the cutting edge will be detected automatically.




Simultaneous 3 axes control of X, Z & A axis




**High Frequency Heat Treatment**

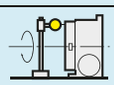
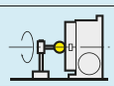
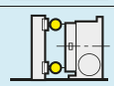
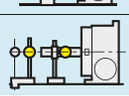
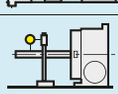


Anti noise process is required.


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

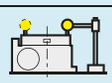
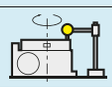
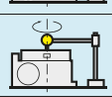
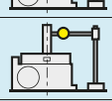
O/P

## CNC Rotary Table only for Vertical Use···Back side motor mounted type ☞ P.21,22、Top side motor mounted type ☞ P.17～P.20

| No. | Measuring Item | Measuring Method | CNC180•202 NCT200 | CNC205 | CNC260 302 | CNC321 401 | CNCB350 450 | CNC501 601 |
|---|---|---|---|---|---|---|---|---|
| 2 | Runout of table surface |  | 0.01mm | 0.01mm | 0.015mm | 0.015mm | 0.015mm | 0.02mm |
| 3 | Concentricity of center bore |  | 0.01mm | 0.01mm | 0.01mm | 0.01mm | 0.01mm | 0.01mm |
| 4 | Squareness of table surface (Minus deviation at upper part is not permitted.) |  | 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.03mm |
| 5 | Parallelism between center line of test bar and key way |  | At 150mm 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.02mm |
| 6 | Parallelism between frame bottom surface and table center line |  | At 150mm 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.03mm |
| 7 | Indexing accuracy | | ±20″ | ±20″ | 20″ | 15″ | 15″ | 15″ |
| 8 | Repeatability | | 4″ | 4″ | 4″ | 4″ | 4″ | 4″ |

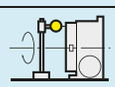
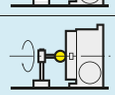
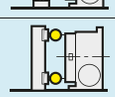
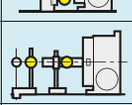
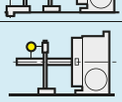
★ For ultra precision option: One rank higher accuracies than the above figures are inspected.
★ Please contact us for the accuracy of the rotary table larger equal to **CNC802** for vertical use.

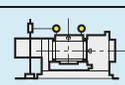
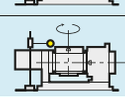
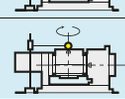
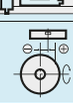
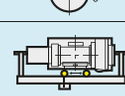
## CNC Rotary Table only for Horizontal Use···Built-in type ☞ P.55

| No. | Measuring Item | Measuring Method | CNC180 202 NCT200 | CNC260 302 | CNC321 401 400H | CNC503H 501 601 | CNC802 1000 | CNC1200 1201 | CNC1600 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Parallelism between table surface and frame bottom surface (Concave) |  | 0.015mm | 0.02mm | 0.02mm | 0.02mm | 0.03mm | 0.04mm | 0.05mm |
| 2 | Runout of table surface at horizontal position |  | 0.01mm | 0.015mm | 0.015mm | 0.015mm | 0.03mm | 0.03mm | 0.04mm |
| 3 | Concentricity of center bore |  | 0.01mm | 0.01mm | 0.01mm | 0.01mm | 0.01mm | 0.01mm＊1 | 0.01mm＊1 |
| 6 | Squareness between frame bottom surface and table center line |  | At 150mm 0.02mm | 0.02mm | 0.02mm | 0.03mm | — | — | — |
| 7 | Indexing accuracy | | ±20″ | 20″ | 15″ | 15″ | 15″ | 15″ | 15″ |
| 8 | Repeatability | | 4″ | 4″ | 4″ | 4″ | 4″ | 4″ | 4″ |

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

## DD Motor ··· ☞P.49～P.54

| No. | Measuring Item | Measuring Method | DD180F-60 | DD251F-150 | DD400F-250 |
|---|---|---|---|---|---|
| 2 | Runout of table surface |  | 0.01mm | 0.01mm | 0.015mm |
| 3 | Concentricity of center bore |  | 0.01mm | 0.01mm | 0.01mm |
| 4 | Squareness of table surface (Minus deviation at upper part is not permitted.) |  | 0.01mm | 0.01mm | 0.02mm |
| 5 | Parallelism between frame bottom surface and table center line |  | At 150mm 0.02mm | 0.02mm | 0.02mm |
| 6 | Parallelism between frame bottom surface and table center line |  | At 150mm 0.02mm | 0.02mm | 0.02mm |
| 7 | Indexing accuracy | | ±10″ | ±10″ | ±10″ |
| 8 | Repeatability | | 4″ | 4″ | 4″ |

| No. | Measuring Item | Measuring Method | 5AX-DD100AF | 5AX-DD200AF2 | 5AX-DD201BF3 |
|---|---|---|---|---|---|
| 1 | Parallelism between table surface andframe bottom at tilting angle 0° (Concave) |  | 0.01mm | 0.01mm | 0.01mm |
| 2 | Deviation of table surface at tilting angle 0° |  | 0.01mm | 0.01mm | 0.01mm |
| 3 | Deviation of table center hole at tilting angle 0° |  | 0.01mm | 0.01mm | 0.01mm |
| 4 | Displacement of center when moving from 0° to 90° at tilting angle 90° |  | 0.015mm | 0.015mm | 0.015mm |
| 5 | Parallelism between table surface and center line of guide key at tilting angle 90° |  | 0.01mm | 0.01mm | 0.01mm |
| 6 | Indexing accuracy of rotary axis | | ±5″ | ±10″ | ±10″ |
| 7 | Repeatability of rotary axis | | 2″ | 4″ | 4″ |
| 8 | Repeatability of tilting axis | Cumulative | ±10″ | ±15″ | ±15″ |
| 9 | Indexing accuracy of tilting axis | —— | ±3″ | 6″ | 6″ |

# Accuracy Standard

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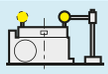
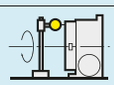
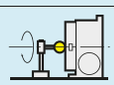
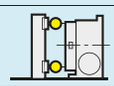
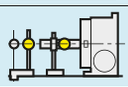
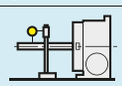
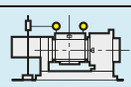
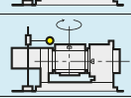
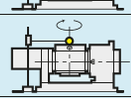
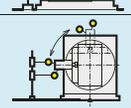
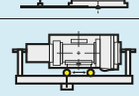
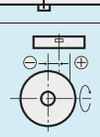
## CNC Rotary Table for both of Vertival and Horizontal Use

| No. | Measuring Item | Measuring Method | CNC105 | CNC180•202 NCT200 | CNC260 302 | CNC321 401 | CNCB350 450 | CNC501 601 | CNC 803 1003 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Parallelism between table surface and frame bottom surface (Concave) |  | 0.015mm | 0.015mm | 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.03mm |
| 2 | Runout of table surface |  | 0.01mm | 0.01mm | 0.015mm | 0.015mm | 0.015mm | 0.02mm | 0.03mm |
| 3 | Concentricity of center bore |  | 0.01mm | 0.01mm | 0.01mm | 0.01mm | 0.01mm | 0.01mm | 0.01mm |
| 4 | Squareness of table surface (Minus deviation at upper part is not permitted.) |  | 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.03mm | 0.04mm |
| 5 | Parallelism between center line of test bar and key way |  | At 150mm 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.02mm |
| 6 | Parallelism between frame bottom surface and table center line |  | At 150mm 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.03mm | 0.03mm |
| 7 | Indexing accuracy | | ±30″ | ±20″ | 20″ | 15″ | 15″ | 15″ | 15″ |
| 8 | Repeatability | | 4″ | 4″ | 4″ | 4″ | 4″ | 4″ | 4″ |

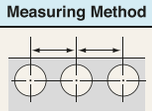
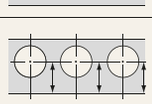
★ For ultra precision option: One rank higher accuracies than the above figures are inspected.
★ Please contact us for the accuracy of the rotary table larger equal to **CNC802** for both of vertical and horizontal use.

## NST, 5AX- Tilting Rotary Table

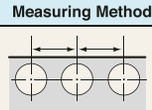
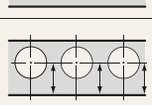
| No. | Measuring Item | Measuring Method | NST250 300 | NST500 | 5AX100 130 | 5AX-201 | 5AX-250 | 5AX-230 350 | 5AX-500 | 5AX-800 | 5AX-1200 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Parallelism between table surface and frame bottom at tilting angle 0° (Concave) |  | 0.02mm | 0.02mm | 0.015mm | 0.015mm | 0.02mm | 0.02mm | 0.03mm | 0.04mm | 0.05mm |
| 2 | Deviation of table surface at tilting angle 0° |  | 0.02mm | 0.02mm | 0.01mm | 0.01mm | 0.02mm | 0.02mm | 0.02mm | 0.03mm | 0.04mm |
| 3 | Deviation of table center hole at tilting angle 0° |  | 0.01mm | 0.01mm | 0.01mm | 0.01mm | 0.01mm | 0.01mm | 0.01mm | 0.01mm | 0.01mm *1 |
| 4 | Deviation of center line of rotary axis at tilting angle 90° |  | 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.02mm | 0.03mm | 0.04mm | 0.05mm |
| 5 | Parallelism between table surface and center line of guide key at tilting angle 90° |  | 0.02mm | 0.02mm | 0.015mm | 0.015mm | 0.02mm | 0.02mm | — | — | — |
| 6 | Displacement of center when moving from 0° to 90° at tilting angle 90° |  | 0.02mm | 0.02mm | 0.01mm | 0.015mm | 0.015mm | 0.015mm | — | — | — |
| 7 | Indexing accuracy of rotary axis | | Cumulative 20" | 20″ | ±30″ | ±15″ | Cumulative 20" | 20″ | 20″ | 20″ | 20″ |
| 8 | Repeatability of rotary axis | | 4″ | 4″ | 4″ | 4″ | 4″ | 4″ | 4″ | 4″ | 4″ |
| 9 | Indexing accuracy of tilting axis | Cumulative | 60″ | 60″ | 60″ | 60″ | 60″ | 60″ | 60″ | 60″ | 60″ |
| 10 | Repeatability of tilting axis | — | — | — | ±6″ | ±6″ | ±6″ | ±6″ | ±6″ | ±6″ | ±6″ |

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

## Mulit-Spindle CNC Rotary Table ···☞P.25

| No. | Measuring Item | Measuring Method | Accuracy |
|---|---|---|---|
| 1 | Pitch between Spindles |  | Within ±0.02mm from nominal pitch |
| 2 | Center Hight of Spindle |  | Within ±0.02mm |

## Mulit-Spindle Tilting Rotary Table ··· ☞P.47

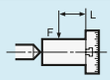
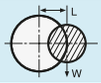
| No. | Measuring Item | Measuring Method | Accuracy |
|---|---|---|---|
| 1 | Pitch between Spindles |  | Within ±0.02mm from nominal pitch |
| 2 | Center Hight of Spindle |  | Within ±0.02mm |

★How to mount the above tables on your M/C, please contact us.

# Description of Specifications

NIKKEN

## Specification

| Item ／ Code No. | | | CNC260<br>CNCZ260 |
|---|---|---|---|
| Diameter of Table | | ϕmm | 260 |
| Diameter of Spindle Hole | | ϕmm | ϕ80H7 |
| Centre Height | | mm | 170 |
| Width of T Slot | | mm | $12^{+0.018}_{0}$ |
| Clamping System | | Air 0.5MPa<br>Hyd. 3.5MPa | Air／Hyd. |
| Clamping Torque | | N·m | 588／1568 |
| Table Inertia at motor Shaft | | $(\frac{GD^2}{4})$ kg·m²×10⁻³ | 0.33 |
| Servo Motor | | r/min | αiF4·3000 |
| MIN. Increment | | | 0.001° |
| Rotation Speed | | r/min | 16.6(33.3) |
| Total Reduction Ratio | | | 1/120(1/60) |
| Indexing Accuracy | | sec | 20 |
| Net Weight | | kg | 115 |
| MAX. Work Load on the Table | Vertical  | kg | 175 |
| | Horizontal  | kg | 350 |
| MAX. Thrust Load applicable on the Table |  | N | 42480 |
| |  | FXL N·m | 1442 |
| |  | FXL N·m | 2320 |
| Guide Line of MAX. Unbalancing Load |  | N·m | 60 |
| MAX. Work Inertia | Vertical  | $(\frac{GD^2}{4})$ kg·m² | 3.2(1.6) |
| Driving Torque |  | N·m | 192(153) |

**Code No.**
**CNC**:Standard
**CNCZ**:High Speed Z Series
The worm wheels and worm screws on **CNC** and **CNCZ** models are different and not interchangeable.

**Table Diameter**
Please make sure that the work inertia should be within the specified tolerance when the fixture or the work piece is larger than the rotary table diameter.

**Through Hole Diameter**
All model have MAX. through hole.

**Clamping System**
For the changing from the hydraulic brake system to the air brake system, please refer to 6-5)Supplying pneumatic or hydraulic pressure for brake and venting air.

The values are according to pneumatic 0.5 MPa / hydraulic 3.5 MPa

**Servo Motor**
Nikken determine the MAX. table rotation speed with the best motor rotation from the motor acceleration characteristics and the practical load test. Normally, we select the motor rotation speed of 1,500r/min or 2,000r/min. It is possible to increase the rotary table rotation speed to increase the motor rotation speed dependant of each application. Please contact with us for the details.
FANUC αi series motor can be rotated faster speed than the recommended speed.
αiF1 , αiF4 : 3,000r/min　　αiF12 : 2,000r/min

**MAX. Work Load**
The figure becomes double when the rotary table is used with tail stock or support table.

**MAX. Applicable Thrust Load**
This is a applicable figure for the(dynamic)cutting thrust force with cutting tools, e.g. drill, at the rotary table horizontal use.

**Worm Wheel Strength**
This is the strength of the worm wheel without brake. It is applied against dynamic cutting thrust.

The figure shows the strength of the bearings on the rotary table spindle and the applicable(dynamic) cutting thrust with center support.

**MAX. Unbalancing Load**
The guide line of MAX unbalancing load means the unbalancing load, which the rotary table is used with support table in vertical application. The guide line figure will be different according to the servo motor, please refer ☞ **P.57** for more detail.

**Driving Torque**
This figure shows the rotation torque at the MAX. rotation speed after acceleration.

## SI Unit & Gravity Unit

SI is the abbreviation of “Systeme International d'Unites”.

| Item | SI Unit | Gravity Unit | Conversion |
|---|---|---|---|
| Clamping torque | N·m | kgf·m | 1kgf·m=9.8N·m |
| Table Inertia at Motor Shaft * | $(\frac{GD^2}{4})$kg·m²×10⁻³ | kg cm sec² | 1kg cm sec²=10.2×$(\frac{GD^2}{4})$kg·m² |
| MAX. Motor Rotation Speed | r/min | rpm | 1rpm=1r/min |
| MAX. Table Rotation Speed | | | |
| MAX. Thrust Load applicable on the Table | N | kgf | 1kgf=9.8N |
| | N·m | kgf·m | 1kgf·m=9.8N·m |
| MAX. Work Inertia * | $(\frac{GD^2}{4})$kg·m² | kg cm sec² | 1kg cm sec²=10.2×$(\frac{GD^2}{4})$kg·m² |
| Driving Torque | N·m | kgf·m | 1kgf·m=9.8N·m |
| Air/Hydraulic Pressure | MPa | kgf／cm² | 1kgf／cm²=0.098MPa |

* The unit of inertia is expressed in GD².

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# Recommended lubricating Oil and Quantity

NIKKEN

## Recommended oil

| Oil Maker | Code No. |
|---|---|
| Idemistu Kosan | Super Multi Oil 100 |
| JX Nippon Oil & Energy | SUPER MULPUS DX 100 |
| Cosmo Oil Lubricants | Cosmo New Mighty Super 100 |
| Showa Shell Sekiyu | Shell Morlina S2 BA100 |
| EMG Marketing | Mobil DTE Heavy |

## Required oil quantity for CNC rotary table

| Table Model | Main Body(cc) | Gear Box(cc) |
|---|---|---|
| CNC(Z)105 | 110 | Grease |
| CNC(Z)180, 202 | 500 | Grease |
| NCT200(E) | 400 | Grease |
| CNC205 | 200 | Grease |
| CNC(Z)260, 302 | 700 | 300 |
| CNCB350 | 1,300 | 600 |
| CNC(Z)321, 401 | 2,000 | 700 |
| CNC(Z)401H | 2,000 | — |
| CNCB450 | 2,000 | 500 |
| CNC(Z)501, 601, CNC801 | 7,000 | 1,500 |
| CNC(Z)503 | 5,000 | — |
| CNCB630 | 6,000 | 1,500 |
| CNC802 | 14,500 | 2,500 |
| CNC803 | 15,000 | 2,000 |
| CNC1200 | 18,000 | |
| CNC1201 | 26,000 | |
| CNC1600 | 60,000 | |
| CNC(Z)180B, 202B | 500 | Grease |
| CNC(Z)260B, 302B | 700 | 1,200 |
| CNC(Z)321B, 401B | 2,000 | 1,000 |
| CNC180T, 202T | 1,500 | |
| CNC(Z)260T, 302T | 1,500 | |
| CNC(Z)321T, 401T | 4,000 | |
| CNCB450T | 5,500 | |
| CNC(Z)501T, 601T | 8,000 | |
| CNC100-2W | 540 | Grease |
| CNC100-3W | 720 | Grease |
| CNC100-4W | 900 | Grease |
| NST250 | 1,300 | Grease |
| NST300 | 1,800 | Grease |
| NST450, 500 | 10,000 | Grease |
| NSVZ180 | 500 | Grease |
| NSVZ300 | 1,500 | Grease |
| NSVX400 | 3,000 | |
| NSVX500 | 3,000 | |
| NSVX400T | 5,000 | |
| TAT-105N,170N | 60 | |
| TAT-200N,250N | Grease | |
| TAT-321N,401N | Grease | |

## Required oil quantity for 5AX rotary table

| Table Model | Axis | Main Body(cc) | Gear Box(cc) |
|---|---|---|---|
| 5AX-100 | Rotary | 300 | Grease |
| | Tilting | 300 | Grease |
| 5AX-130 | Rotary | 350 | Grease |
| | Tilting | 400 | Grease |
| 5AX-150 | Rotary | 450 | Grease |
| | Tilting | 500 | Grease |
| 5AX-201 | Rotary | 400 | Grease |
| | Tilting | 300 | Grease |
| 5AX-250 | Rotary | 800 | |
| | Tilting | 600 | Grease |
| 5AX-230 | Rotary | 700 | Grease |
| | Tilting | 800 | 400 |
| 5AX-350 | Rotary | 2,000 | |
| | Tilting | 800 | 300 |
| 5AX-T(N)400 | Rotary | 14,000 | |
| | Tilting | 4,000 | |
| 5AX-B450(T) | Rotary | 7,000(9,000)*1 | |
| | Tilting | 3,000(5,500)*2 | 1,000( – )*2 |
| 5AX-550 | Rotary | 2,000 | Grease |
| | Tilting | 2,000 | 800 |
| 5AX-800 | Rotary | 8,000 | |
| | Tilting | 4,000 | 2,000 |
| 5AX-2MT-105 | Rotary | 700 | Grease |
| | Tilting | 400 | Grease |
| 5AX-2MT-170 | Rotary | 2,000 | |
| | Tilting | 700 | 300 |
| 5AX-2MT-200 | Rotary | 2,000 | |
| | Tilting | 2,000 | 1,000 |
| 5AX-4MT-120 | Rotary | 2,000 | Grease |
| | Tilting | 700 | 300 |

*1 Rotary body working diameter: ϕ850mm *2 Tilting body: T-type

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# Assessment

NIKKEN

**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

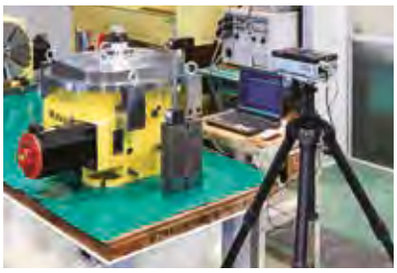
**Emission**

**Immunity**

## Water Proof Test

Declaration of Incorporation (EU)

## Accuracy Measurement



**Indexing Accuracy Measurement by Laser**

**5AX-230 on 3 Dimensional Measuring Machine**

**Accuracy measurement with large 3 Dimensional Measuring Machine**

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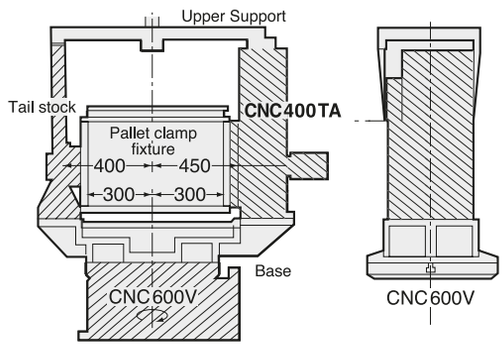
# Load Calculation / Indexing Time Comparison / Duraility

## Conditions of CNC Rotary Table when being used to CNC Special Purpose Machine

Not only indexing accuracy, the following conditions must be also 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 ①～⑤ elements, and calculate as per the list shown at right hand side.

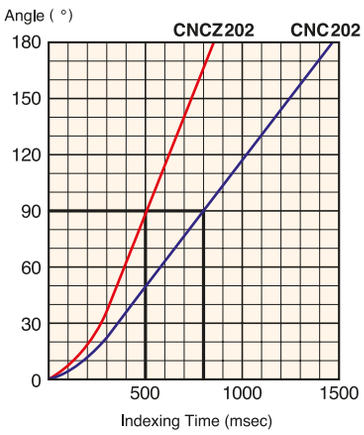
| No. | Shape | Quantity | Approx. Weight (Kg) | Approx. $GD^2$ $(GD^2/4)Kgm^2$ |
|---|---|---|---|---|
| ① | CNC400T Eccentricity: 450mm | 1 | 260 | 59 |
| ② | Tailstock Eccentricity: 120mm | 1 | 80 | 14 |
| ③ | Base | 1 | 11 | 10 |
| ④ | Upper Support Parts | 1 | 30 | 2 |
| ⑤ | Pallet Clamp Fixture Eccentricity: 120mm | 1 | 80 | 6 |
| Total | | | 560 | 91 |

## ② Indexing Time Comparison

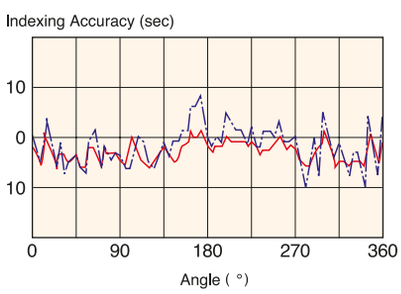
Indexing Time = Acceleration Time + Rapid Positioning Time + Deceleration Time.
MAX. moving angle is 180°. Therefore, not only rapid positioning time, but also acceleration/deceleration characteristics is very important. The graph at right hand side shows that **CNCZ202** (high speed), with it's excellent 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.

| Item | Rapid Positioning Speed | Acceleration/Deceleration Time Constant |
|---|---|---|
| ——— | 44.4min$^{-1}$ | 150msec |
| ——— | 22.2min$^{-1}$ | 100msec |




| Item | Using Years | Indexing accuracy |
|---|---|---|
| ——— | At installation | Cumulated 10sec |
| – – – | After 7 years | Cumulated 17sec |




## 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.

**Worm System after 7 years used.**

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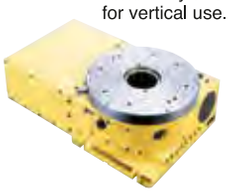
# Technical Information

NIKKEN

## Specification of the rotary table to be used on the special purpose machines.

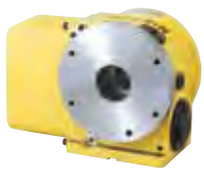
1. Custom made on the Table Face Plate
   - Drilled hole, tapped hole, or dwell pin hole etc.
   - Without T-slot or with T-slot
   - Additional process at center hole
2. The location of the Oil Sight Grass, Oil Supply Port and Drain Port can be changed.
3. How to be mounted on the Machine
   - U-groove
   - Additional tapped holes on the backside
   - Shift the guide key position
4. Modification of the Motor Cover
5. Rotary Joint ☞ P.89
6. Built-In Pallet Clamping System ☞ P.96
7. Special Color ☞ P.96
   - Please order with the color sample or Munsell Color No.

When rotary table is used for horizontal use, there is no portion of the table body to be clamped for vertical use.



**CNC401 without T slot for horizontal use**

**CNC302T without T slot**



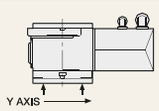
**CNC202L without T slot**

## ⚠ Selection of the CNC rotary table

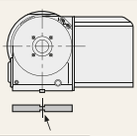
- The support table is basically used in case of vertical application.
- The machining operation is generally light cut on aluminium materials, however, if the fixture or the component is large size, please make sure that the fixture inertia is within the MAX. work inertia.
- If the unbalance load is 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. ☞ P.57
- In case of the unbalance load is large,
  -The high speed Z series rotary table is not suitable, please use standard rotary table.
  -Please installing the balance cylinder or counter balance.
  -Please advise us the details of the component, fig 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 the details.

## ⚠ Check point for trunnion fixture

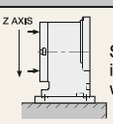
①When installing the table onto the sub-base, measure and check as follows.




Parallelism between table & sub-base is recommended within 0.01mm

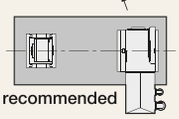


Difference between table center and sub-base center is recommended within 0.02mm

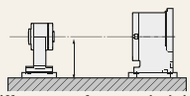



Squareness of table is recommended within 0.02mm

②Install the table & support table onto the M/C as follows.

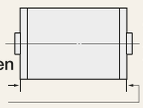


Center lines are recommended within 0.02mm



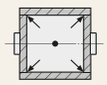
Difference of center height is recommended within 0.01mm

③Trunion fixture is recommended to be aligned as follows.



Squareness between center line & these faces is important

Center of both side are recommended within 0.01mm

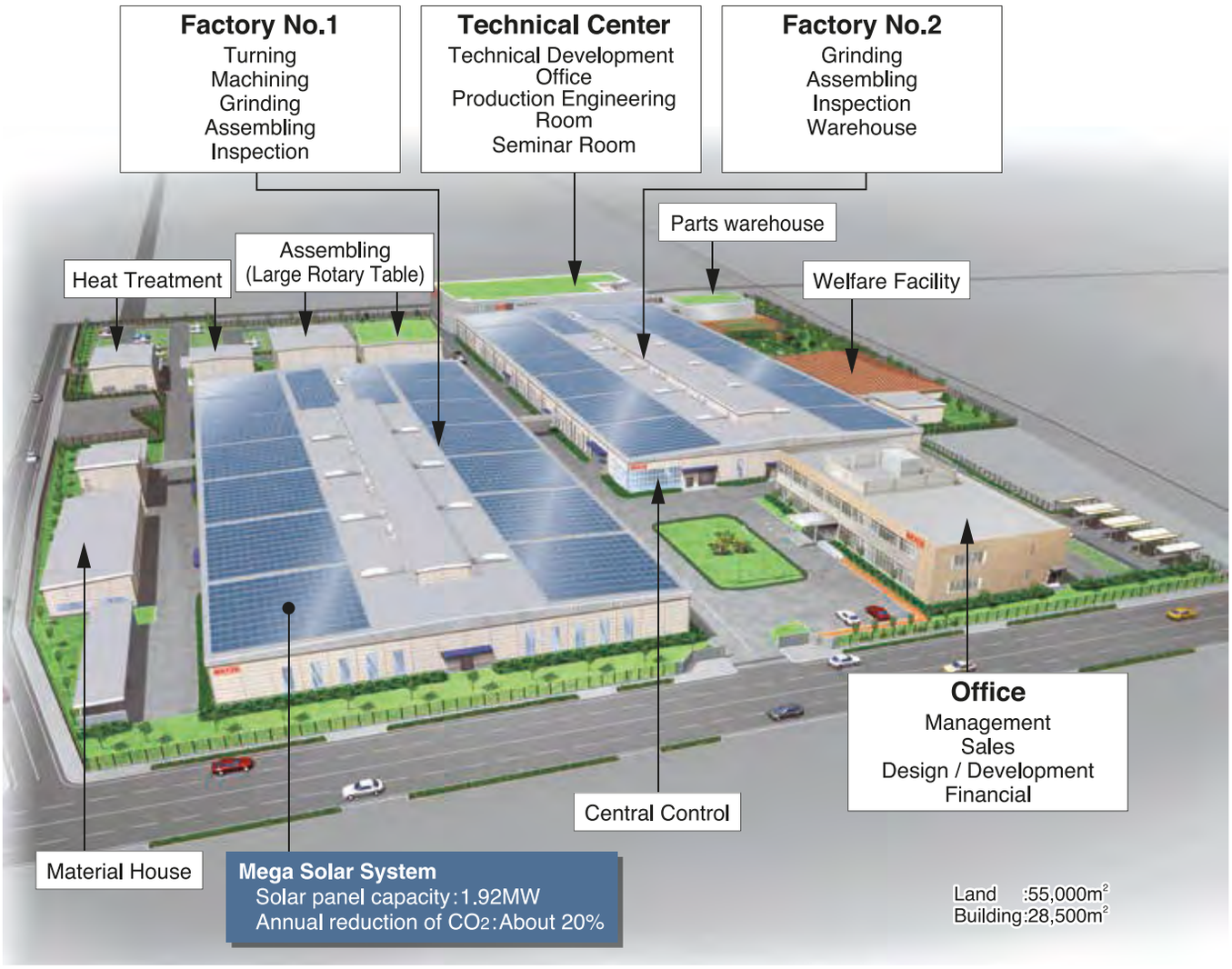


Squareness is important

## ⚠ 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: 5°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 tanks (if used), 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 tailstock 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. ☞ P.104
- Never modify the table by yourself without previous agreement of NIKKEN
- Never to 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.
- Always stop using the table if unusual noises are heard or the slackness or defection of work piece and jig fixture are found. Irrepanable damage may be happened. Please contact with your distributor for repair.

# Headquarter




## 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.

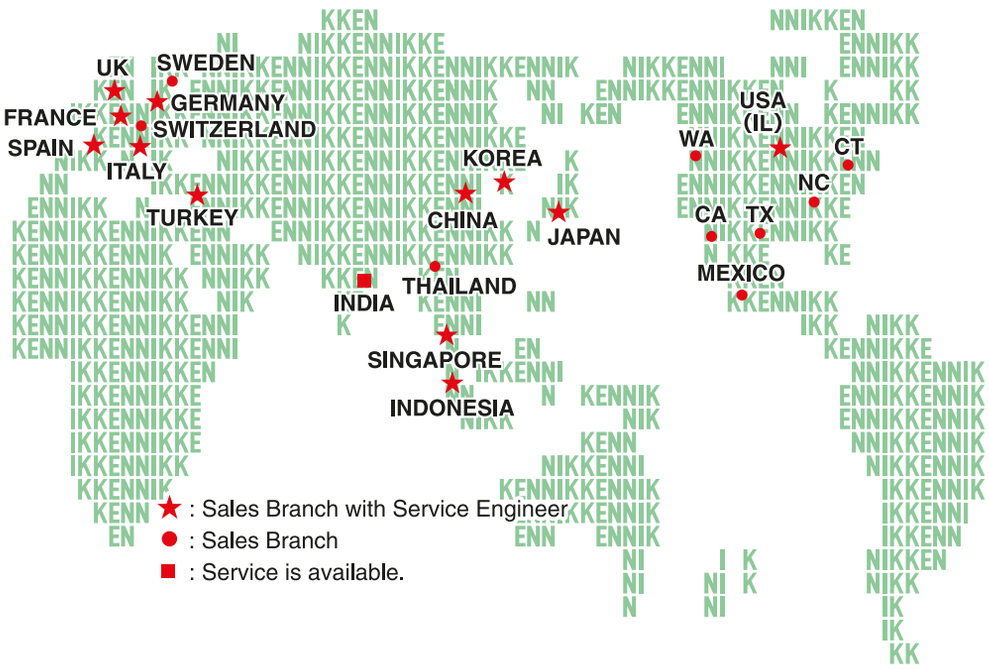
## Ion Nitriding

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 Skill Reamers.

# NIKKEN SERVICE NET WORK

NIKKEN

There are overseas Sales Branches in 15 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.




LYNDEX-NIKKEN (U.S.A.)

NIKKEN EUROPE & NIKKEN U.K (UK)


NIKKEN DEUTSCHLAND (GERMANY)

HERRAMIENTAS LYNDEX-NIKKEN (MEXICO)

PROCOMO-NIKKEN (FRANCE)


KOREA NIKKEN (KOREA)


NIKKEN SCANDINAVIA (SWEDEN)


VEGA INTERNATIONAL (ITALY)

OLASA (SPAIN)


CUTTING TOOL (SPAIN)


NIKKEN CHINA (CHINA)


NIKKEN TURKEY (TURKEY)


SIAM NIKKEN (THAILAND)

NIKKEN ASIA (SINGAPORE)

NIKKEN INDONESIA (INDONESIA)

## Discontinuation of CNC rotary table repair work

We have been repairing our CNC rotary tables that are no longer manufactured. However, more than 20 years have passed since the discontinuation of the following models, and it has become difficult to obtain maintenance parts. Therefore, we will basically discontinue repair work as of April 2022.
These CNC rotary tables are also out of date in terms of repid positioning speed and other mechanical specifications. As a replacement, please select a CNC rotary table with the latest functions from this catalogue.

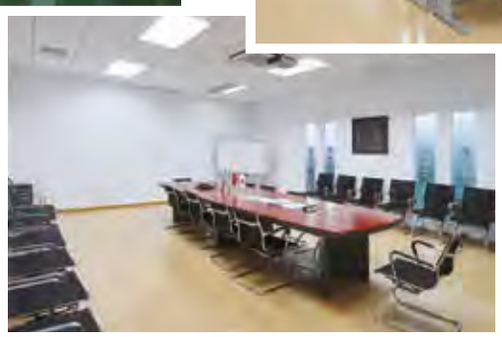
**Table model**

●CNC100, 150, 170, 201, 230, 320, 320V, 400V, 500V, 600V, 800V ●5AX-120, 170, 200 ●NSV250

# NIKKEN CHINA

New Nikken China facility was moved to Qinzhou Road, Shanghai on 2014. JAN due to the business expansion in China. 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.

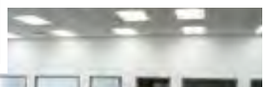
Chinese engineer well trained in Japan is engaged in the service of our products. Different types of the NC controller for the CNC rotary table are provided for the trial running after repair. The most important spare parts are stocked. It is possible to stock the special spare parts of the custom-made 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)

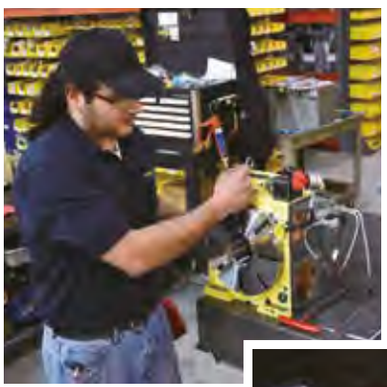
As North America's leading supplier of machine tool accessories, LYNDEX-NIKKEN is a wholly-owned subsidiary of NIKKEN Kosakusho Works., Ltd. - Japan. Backed by over a half century of experience, LYNDEX-NIKKEN sets the standard for high quality and high technology with a complete line of superior toolholders 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 machining applications and to 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 America headquarters is centrally located near Chicago, Illinois. Our 50,000 sq ft. facility houses 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:

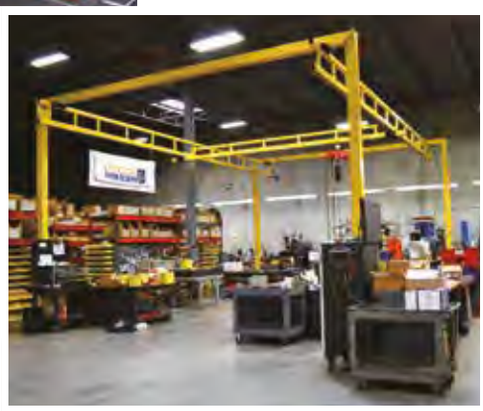


### Products

**- 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.



### Service & Support

- Dedicated application and engineering support staff
- Support for entire product line covering 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

# NIKKEN EUROPE (NIKKEN UK)

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.

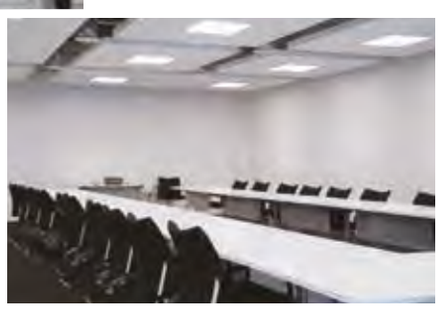
In addition to carrying out the functions of NIKKEN UK in the United Kingdom (UK), we employ forty staff members and engineers. At the end of 2015, NICE (NIKKEN Innovation Centre Europe) opened in the AMRC manufacturing technology park, where it provides support to customers working with difficult-to-machine materials, particularly in the aviation and energy industries.


**Product Inventory**

NIKKEN Euro Centre facilities has a warehouse space of 13,000m$^2$. 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.

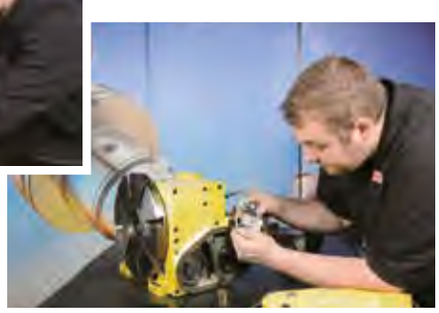
**Our Technical Support and Training Section provides our existing customers and potential customers access to:**

- 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 (NIKKEN GERMANY)

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. In the beginning based in Russelsheim, which is a town made famous by the manufacturing complex of Opel, the company was 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 had 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 from NEU-ULM naw.

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-NIKKEN (NIKKEN FRANCE)

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 center, 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.

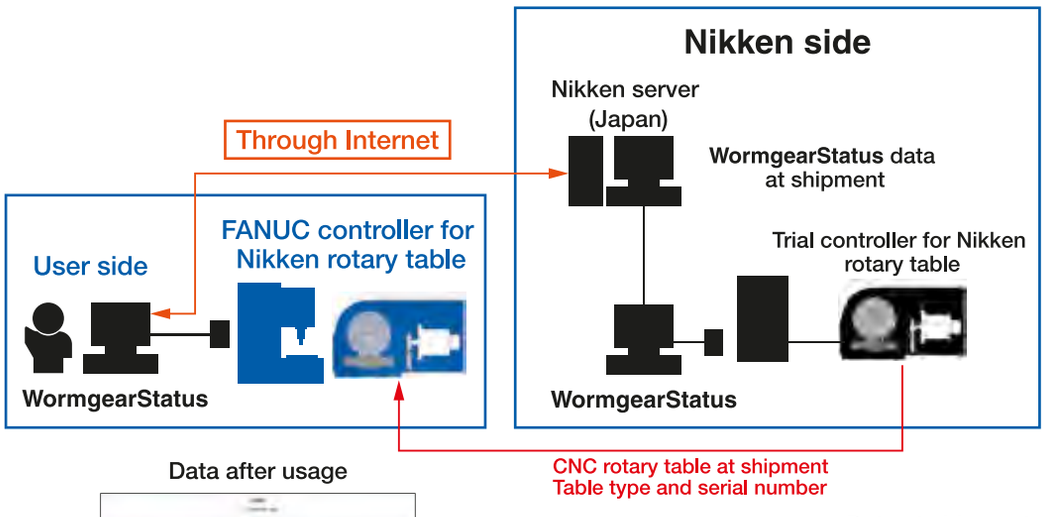
The stocks of a large number of standard products are always on hand, enabling the products that customers need to be delivered in the shortest possible time. The NIKKEN Euro Centre and PROCOMO-NIKKEN retain constant and close contact; together they take on the challenge of how to machine products in 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.

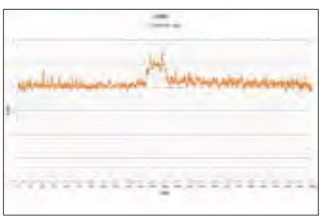
Independent optimization system for Industry – 4.0

# WormgearStatus / BacklashStatus

From March 2020, the **WormgearStatus** data are collected at shipment for all CNC rotary tables with FANUC motor. As a result, the **WormgearStatus** service and **BacklashStatus** service are available as optional paid services. Please refer the contents of these services below.
If you would like these service, please contact us. The actual expenses for transportation and accommodation are required separately.
The key items are the CNC rotary table type and serial number. It is necessary to write the control program for **WormgearStatus** / **BacklashStatus** to the user's FANUC NC controllers.

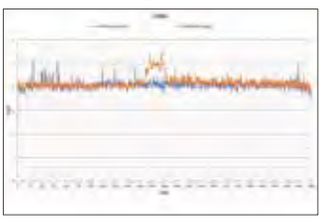



Data after usage

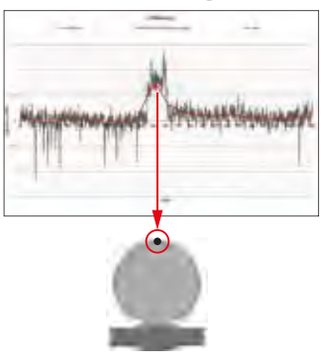


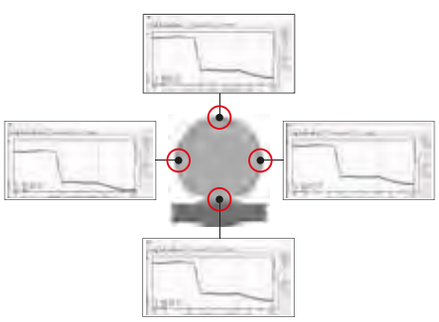
Data at shipment

Comparison



Estimation of the gear wear





## ■WormgearStatus service JAPAN, USA, EU, China: PAT.P

**WormgearStatus** data is the torque data, when the full stroke of a CNC rotary table (example: rotary axis: 0 ˚ to 360 ˚, tilting axis: 0 ˚ to 105 ˚) is rotated at 360 deg/min. **WormgearStatus** data at shipment is collected and stored according to the CNC rotary table type and serial number in the Nikken server in Japan. **WormgearStatus** data after usage will be collected locally and compared with the data at shipment, then estimate the gear wear position.

## ■BacklashStatus service JAPAN: PAT, USA, EU, China: PAT.P

**BacklashStatus** will be checked the backlash amount without manual intervention to the position, where gear wear is estimated ;

1) The angles, that is estimated as the gear wear position by **WormgearStatus**, will be checked.
2) For the CNC rotary tables on NC single purpose machine, the angles to be positioned are fixed and always same positions. In this case, enter these angles to be checked, and activate **BacklashStatus**.
3) If required, backlash compensation function and pitch error compensation function can be utilized without manual intervention for better positioning accuracy.

**WormgearStatus** / **BacklashStatus** uses FANUC Servo Guide.
**WormgearStatus** / **BacklashStatus** is a registered trademark in Japan.

# Check Sheet for the Technical Specifications of CNC ROTARY TABLE NIKKEN

Last user name〔　　〕 Destination country〔　　〕

CE mark ☐ Necessary ☐ Not Necessary

1. Machine tool builder〔　　〕

2. Machine model〔　　〕

3. T-slot width〔　　〕/ pitch〔　　〕/ number of slots〔　　〕

4. How to install the rotary table ☐Vertical and Horizontal ☐Vertical only ☐Horizontal only

5. Control method ☐Additional axis
☐AR21 or EZ controller (use M-signal)
Rotary axis〔　　W〕
Tilting axis〔　　W〕(5AX only)

6. Numerical Control〔Manufacturer :　　〕〔Model :　　〕

7. Servomotor ☐Servomotor included ☐Servomotor supplied (expected date to be supplied: MM/DD) ☐Servomotor not included

8. Servomotor model :〔　　〕

9. Clamping System ☐ Pneumatic〔　　MPa〕 ☐Hydraulic〔　　MPa〕 ☐Booster

10. Voltage of the solenoid ☐AC100V ☐DC24V ☐Unidentified (confirmed with the drawing for approval)

11. Clamping circuit of the solenoid ☐OFF:Clamp ☐ON:Clamp ☐Unidentified (confirmed with the drawing for approval)

12. Direction of the cable comes out ☐Side ☐Back ☐Top ☐Other〔　　〕

13. Cable connection method ☐Cannon plug ☐Direct out ☐Other〔　　〕

14. External wiring cable ☐Necessary ☐Not necessary

15. Specified color ☐NIKKEN yellow ☐Others〔Munsell Symbol number:　　〕

16. T-slots of table plate ☐Necessary ☐Not necessary

17. Language of instruction Manual ☐Japanese ☐English

18. Accessories ☐Tailstock ☐Scroll chuck ☐Power chuck

19. Option ☐High precise indexing ☐Rotary joint ☐AWC SYSTEM

Notices〔　　〕

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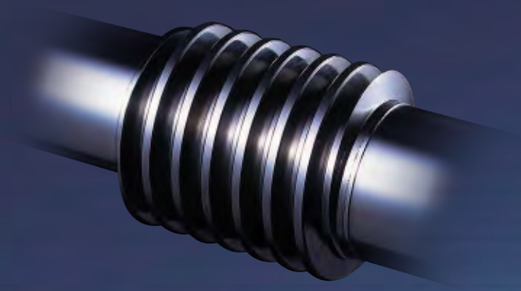
not to over load.






# NIKKEN KOSAKUSHO WORKS, LTD. OSAKA, JAPAN.

5-1, 1-chome, Minamishinden, Daito-shi, Osaka-fu, Japan. Telephone：072-869-5820 Telefax：072-869-6220

| | |
|---|---|
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| **UK** | **NIKKEN KOSAKUSHO EUROPE LTD.**<br>Precision House, Barbot Hall Industrial Estate,<br>Rotherham, South Yorkshire, S61 4RL<br>Tel.+44-(0)-1709-366306 Fax.+44-(0)-1709-376683 |
| **GERMANY** | **NIKKEN DEUTSCHLAND GMBH**<br>CARL-ZEISS-STRASSE 11 NEU-ULM 89231<br>Tel.+49-731-963397-0 Fax.+49-731-963397-60 |
| **SWITZERLAND** | **NIKKEN SWITZERLAND AG**<br>CHAMBERSTRASSE 44, CH-6331 HUNENBERG<br>Tel.+41-(0)41-748-5000 Fax.+41-(0)41-748-5001 |
| **ITALY** | **VEGA INTERNATIONAL TOOLS S.P.A**<br>Via Asti N・9 10026-Santena(TORINO)<br>Tel.+39-011-9497911 Fax.+39-011-9456380 |
| **SCANDINAVIA**<br>SWEDEN | **NIKKEN SCANDINAVIA AB**<br>Malmövägen 14 331 42 Värnamo Sweden<br>Tel.+46-(0)-303-440-600 Fax.+46-(0)-303-58177 |
| **SPAIN & PORTUGAL** | **CUTTING TOOL S.L**<br>Portuetxe 16, Barrio Igarra<br>E-20018 Donostia-san Sebastian<br>Tel.+34-(0)-902-820090 Fax.+34-(0)-902-820099<br>**UTILLAJES OLASA,S.L.**<br>Tel.+34-(0)-943-107177 |
| **TURKEY** | **NIKKEN KESICI TAKIMLAR SAN. VE ULUSLARARASI TIC. A. S**<br>E5 Uzeri Kucukyali Yanyol Irmak Sok.<br>Kucukyali Sanayi Sitesi A Blok No:5 Maltepe 34852 Istanbul<br>Tel.+90-(0)-216-518-1010 Fax.+90-(0)-216-366-1414 |
| **KOREA** | **KOREA NIKKEN LTD.**<br>90B-11L, Namdong Industrial Complex, 170,<br>Namdong-Daero, Namdong-Gu, Incheon, Korea 405-819<br>Tel.+82-(0)-32-763-4461 Fax.+82-(0)-32-763-4464 |
| **P.R.CHINA** | **SHANGHAI ZHONG YAN TRADING CO., LTD.**<br>Building 1/f, #54, No.1089 Qinzhou Rd. (N),<br>Shanghai, China<br>Tel.+86-(0)-216210-2506 Fax.+86-(0)-216210-2083 |
| **SINGAPORE** | **NIKKEN KOSAKUSHO ASIA PTE, LTD.**<br>186,Woodlands Industrial Park E5 #04-01<br>M Singapore 757515<br>Tel.+65-6362-7980 Fax.+65-6362-7980 |
| **THAILAND** | **SIAM NIKKEN Co., LTD.**<br>127 Moo5 Gauwungsai-Bangturie Road Tambon Tanokkard<br>Ampher Muangnakhonpathom Nakhonpathom 73000 Thailand<br>Tel.+66(02)178-0503 Fax.+66(02)178-0504 |
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**e-mail : export@nikken-kosakusho.co.jp**


Please give your order to the following agent.

D.QC.1

Specifications are subject to change without notice.

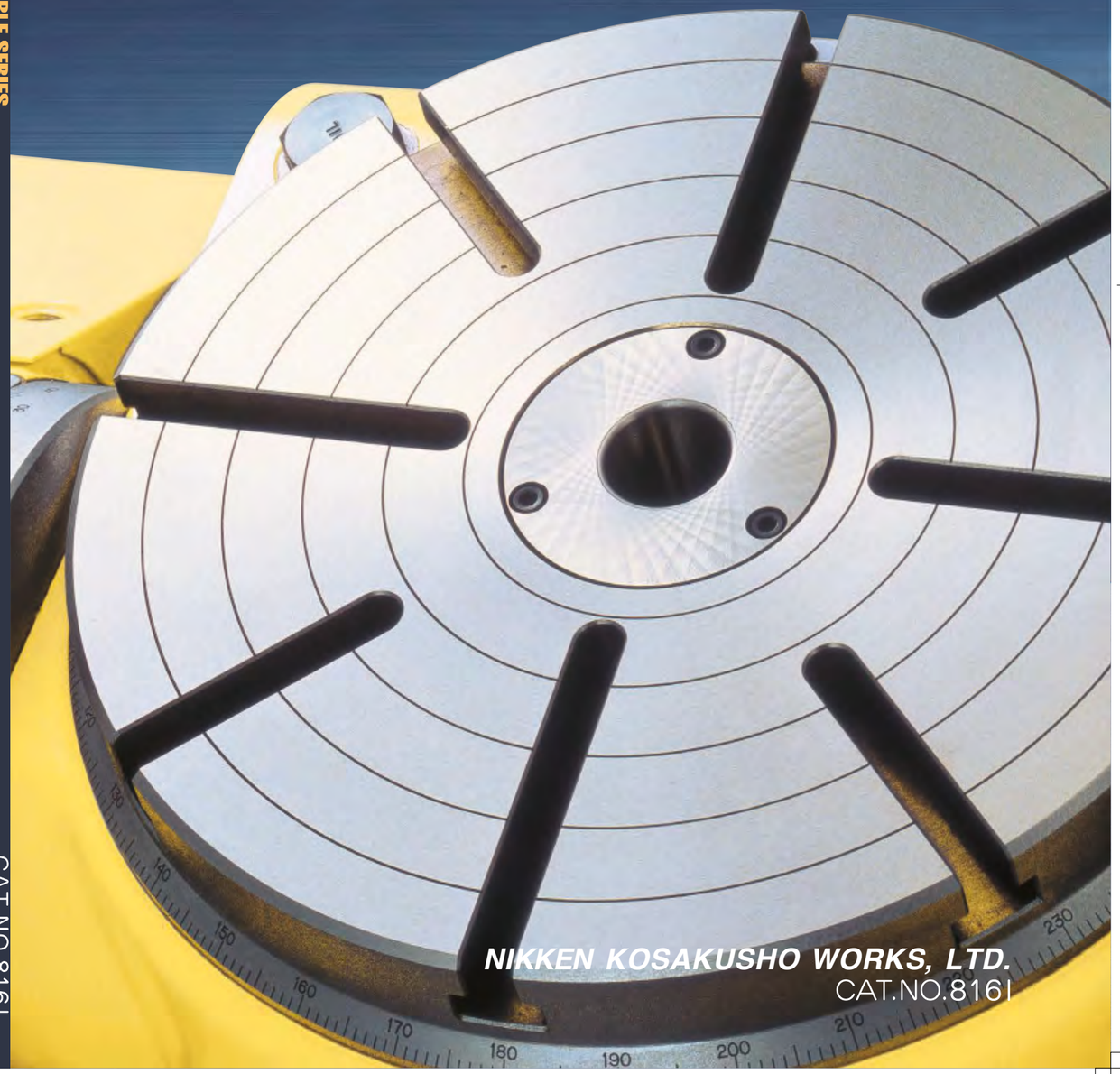
NIKKEN

CNC ROTARY TABLE SERIES

CAT.NO.816I

NIKKEN

# CNC ROTARY TABLE SERIES

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