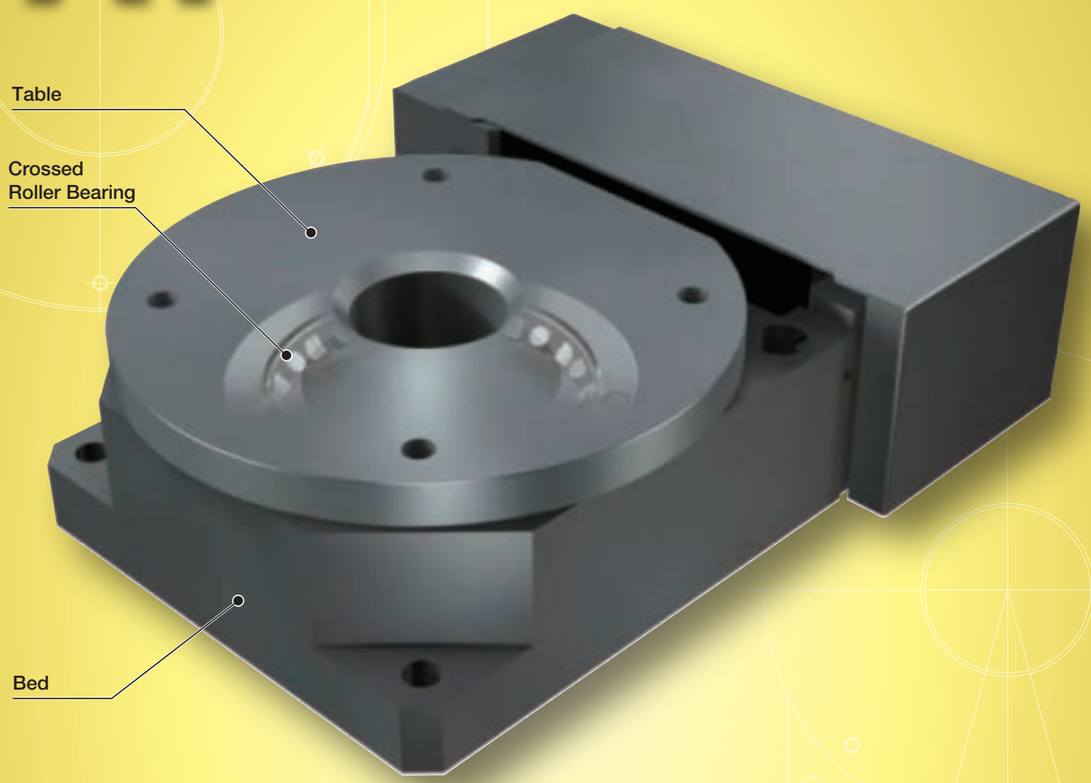
# AT

# AT

Ball screw

Rotation




## Major product specifications

| | |
|---|---|
| Driving method | Precision ball screw |
| Linear motion rolling guide and bearing | Linear Way (ball type)<br>Crossed Roller Bearing |
| Built-in lubrication part | No built-in |
| Material of table and bed | High carbon steel |
| Sensor | Provided as standard |

## Accuracy

unit: sec

| | |
|---|---|
| Positioning repeatability | ±1 |
| Positioning accuracy | – |
| Lost motion | – |
| Parallelism in table motion A | – |
| Parallelism in table motion B | – |
| Attitude accuracy | – |
| Straightness | – |
| Backlash | – |





# Points

### ● Rotary positioning table for converting linear motion to rotary motion

1 This is a positioning table that allows precise angle correction by converting the linear motion to the rotational motion through the rotator mechanism combining the Linear Way and ball screws.High rigidity steel-made table and bed are used and a Crossed Roller Bearing is incorporated in the bearing supporting the table.

### ● Low profile design with high rigidity

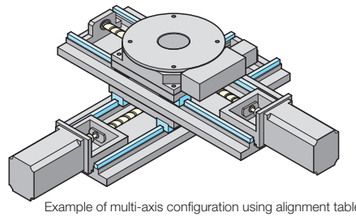
2 Adoption of Crossed Roller Bearing capable of exerting high rigidity in all direction has achieved low profile, high rigidity, and high precision.

### ● Positioning repeatability of ±1 sec

3 A rotator for converting linear motion to rotary motion is accurately guided by the combination of Linear Way L and precision ball screw, thus achieving the high positioning repeatability of ±1 sec.

### ● Available as multi-axis configured alignment table

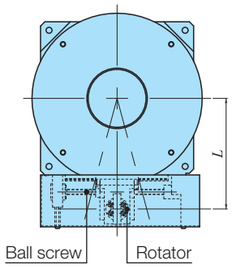
4 Placing this unit on the slide table of Precision Positioning Table LH enables the configuration of low height XY-$\theta$ multi-axis positioning mechanism.



Example of multi-axis configuration using alignment table AT

## Driving mechanism of Alignment Table AT

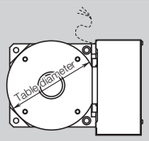
Alignment Table AT is driven by stroking a rotator linked to table's outer periphery by driving of ball screw in a linear direction. In order to adjust the distance L and angle from the center of table varied by rotator movement, linear and rotary motion mechanism that follows according to the table angle is incorporated in the rotator. Therefore, in Alignment Table, even when moving the rotator at a same pitch, the table's rotation angle tends to vary depending on the position, so that even when moving it at a constant speed, the rotation speed does not stay constant.




Distance from the center of table $L$ unit: mm

| Identification number | $L$ |
|---|---|
| AT120 | 100 |
| AT200 | 130 |
| AT300 | 186 |

## Variation

| Shape | Model and size | Table diameter (mm) | Operating angle range (degree) |
|---|---|---|---|
|   | AT120 | 120 | ± 5 |
| | AT200 | 200 | |
| | AT300 | 300 | ±10 |

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

# Identification Number

Example of an Identification Number

| ① | ② | ③ | |
|---|---|---|---|
| AT | 120 | / | AT701 |

① **Model** Page Ⅱ-326

② **Size** Page Ⅱ-326

③ **Designation of motor attachment** Page Ⅱ-326

# Identification Number and Specification

**① Model**

AT: Alignment Table AT

**② Size**

120: Table diameter 120mm
200: Table diameter 200mm
300: Table diameter 300mm

**③ Designation of motor attachment**

As for a motor attachment, select it from the list of Table 1.

- Motor should be prepared by customer.
- Please specify motor attachment applicable to motor for use.
- A coupling shown in Table 2 is temporarily fixed in the main body before shipment, so that final position adjustment should be performed by customer.

***Table 1 Application of motor attachment***

| Models of motor to be used | | | | | Flange size mm | Motor attachment | |
|---|---|---|---|---|---|---|---|
| Type | Manufacturer | Series | Model | Rated output W | | AT120 AT200 | AT300 |
| AC servo motor | YASKAWA ELECTRIC CORPORATION | Σ-V | SGMJV-A5 | 50 | □40 | AT701 | – |
| | | | SGMAV-A5 | | | AT701 | – |
| | | | SGMJV-01 | 100 | | AT701 | AT702 |
| | | | SGMAV-01 | | | AT701 | AT702 |
| | Mitsubishi Electric Corporation | J3 | HF-MP053 | 50 | □40 | AT701 | – |
| | | | HF-KP053 | | | AT701 | – |
| | | | HF-MP13 | 100 | | AT701 | AT702 |
| | | | HF-KP13 | | | AT701 | AT702 |
| | Panasonic Corporation | MINAS A5 | MSMD5A | 50 | □38 | AT703 | – |
| | | | MSME5A | | | AT703 | – |
| | | | MSMD01 | 100 | | AT703 | AT704 |
| | | | MSME01 | | | AT703 | AT704 |
| Stepper motor | ORIENTAL MOTOR Co., Ltd. | α step | AR46 | | □42 | AT705 | – |
| | | | AR66 | | □60 | – | AT706 |
| | | | AR69 | | □60 | – | AT706 |
| | | | AS46 | | □42 | AT707 | – |
| | | | AS66 | | □60 | – | AT708 |
| | | | AS69 | | □60 | – | AT708 |
| | | RK CRK | RK54 · CRK54 | | □42 | AT707 | – |
| | | | RK56 · CRK56 (1) | | □60 | – | AT708 |

Note (1) Applicable to the outer diameter $\phi$8 of motor output shaft.
Remark: For detailed motor specifications, please see respective motor manufacturer's catalog.

***Table 2 Coupling models***

| Motor attachment | Coupling models | Manufacturer | Coupling inertia $J_c$ $\times 10^{-5}$kg · m$^2$ |
|---|---|---|---|
| AT701 | MSTS-16-5×8 | Nabeya Bi-tech Kaisha | 0.084 |
| AT702 | UA-25C-8×8 | Sakai Manufacturing Co., Ltd | 0.290 |
| AT703 | MSTS-16-5×8 | Nabeya Bi-tech Kaisha | 0.084 |
| AT704 | UA-25C-8×8 | Sakai Manufacturing Co., Ltd | 0.290 |
| AT705 | MSTS-16-5×6 | Nabeya Bi-tech Kaisha | 0.084 |
| AT706 | MSTS-25C-8×10 | Nabeya Bi-tech Kaisha | 0.71 |
| AT707 | MSTS-16-5×5 | Nabeya Bi-tech Kaisha | 0.084 |
| AT708 | MSTS-25C-8×8 | Nabeya Bi-tech Kaisha | 0.71 |

Remark: For detailed coupling specification, please see respective manufacturer's catalog.





1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

# Specifications

*Table 3 Specifications of ball screw* unit: mm

| Model and size | Shaft dia. | Overall length |
|---|---|---|
| AT120 | 6 | 103.5 |
| AT200 | 6 | 103.5 |
| AT300 | 10 | 183 |

*Table 4 Specification*

| Item / Size | Ball screw lead mm | Rotator resolution μm | Operating angle rance degree | Positioning repeatability sec. | Table inertia $J_T$ $\times 10^{-5}$kg·m$^2$ | Starting torque $T_S$ N·m |
|---|---|---|---|---|---|---|
| AT120 | 1 | 1(1) | ± 5 | ±1 | 0.012 | 0.03 |
| AT200 | | | | | 0.014 | 0.03 |
| AT300 | 2 | 2(1) | ±10 | | 0.18 | 0.04 |

Note (1) This is a value given when fraction sizes of the motor are 1,000 pulses/rev.

*Table 5 Maximum carrying mass*

| Model and size | Maximum carrying mass kg |
|---|---|
| AT120 | 22 |
| AT200 | 12 |
| AT300 | 44 |

Remark: Applicable in both the horizontal and vertical directions.

# Sensor specification

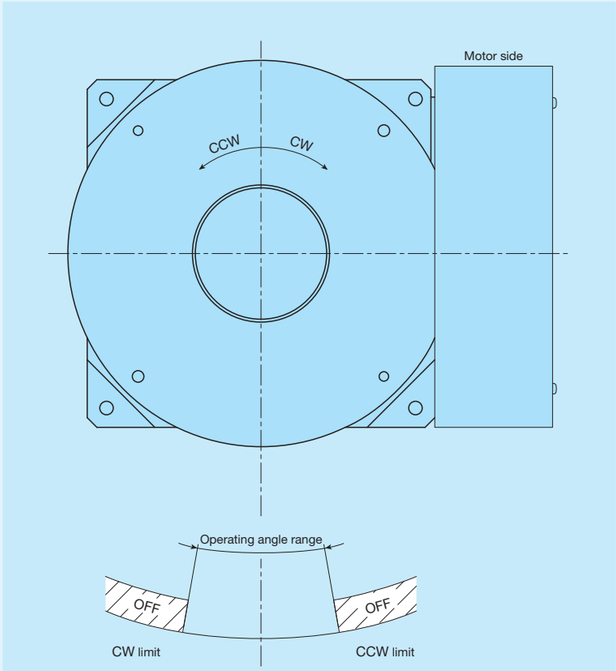



*Fig. 1 Sensor timing chart*

# Example of Combination

## ■ Configuration of XY-θ multi-axis positioning mechanism

Combining the Alignment Table AT with IKO precision positioning table of single-axis specification or multi-axis specification enables you to easily configure the XY-θ multi-axis positioning mechanism. Low assembling height, compactness, and high-precision positioning capability enable the table to be used as alignment table for precision measuring equipment, inspection equipment, and assembling device.

*Table 5 Configuration example of multi-axis positioning mechanism*

| Appearance of multi-axis positioning mechanism | Models of IKO precision positioning tables combined with Alignment Table AT | | | Stroke length mm | |
|---|---|---|---|---|---|
| | | | | X-axis | Y-axis |
| | Precision Positioning Table TS/CT | Single-axis specification | TS125/125 | 50 | |
| | | | TS125/220 | 120 | |
| | | | TS220/220 | 120 | |
| | | | TS220/310 | 180 | |
| | | | TS260/350 | 250 | |
| | | Two-axis specification | CT125/125 | 50 | 50 |
| | | | CT220/220 | 120 | 120 |
| | | | CT260/350 | 150 | 250 |
| | | | CT350/350 | 250 | 250 |
| | | Single-axis specification | TSLH120M | 100, 150 | |
| | | | | 200 | |
| | | | | 250 | |
| | | | | 300 | |
| | | | TSLH220M | 150 | |
| | | | | 200, 250, 300 | |
| | | | | 400 | |
| | | | TSLH320M | 300 | |
| | | | | 400, 500 | |
| | | | TSLH420M | 500 | |
| | | | | 600 | |
| | | | | 800 | |
| | Precision Positioning Table LH | Two-axis specification | CTLH120M | 100 | 100 |
| | | | | 200 | 100 |
| | | | | 200 | 200 |
| | | | | 300 | 200 |
| | | | | 300 | 300 |
| | | | CTLH220M | 200 | 200 |
| | | | | 300 | 200 |
| | | | | 300 | 300 |
| | | | | 400 | 300 |
| | | | | 400 | 400 |
| | | | CTLH320M | 300 | 300 |
| | | | | 400 | 300 |
| | | | | 400 | 400 |
| | | | | 500 | 400 |
| | | | | 500 | 500 |

AT

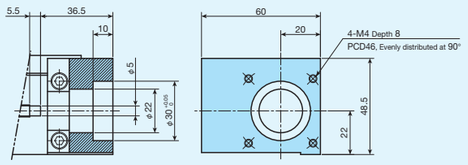


1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

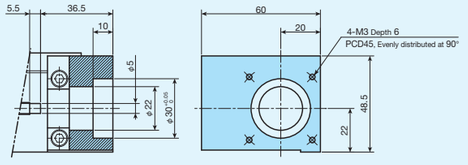
# Dimensions of Motor Attachment

## AT120, AT200

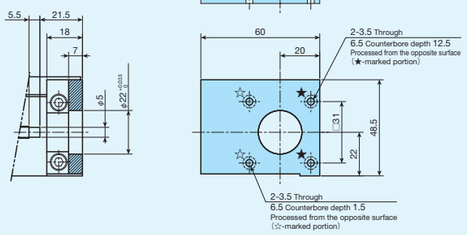
AT701




AT703

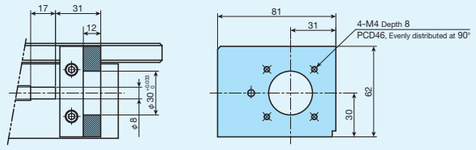



AT705
AT707

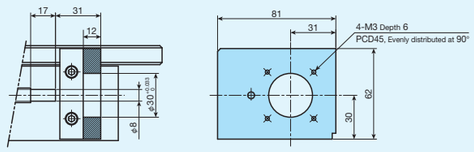



## AT300

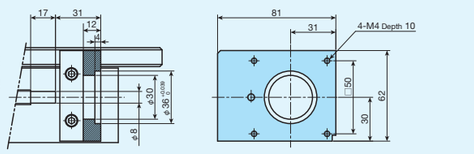
AT702




AT704



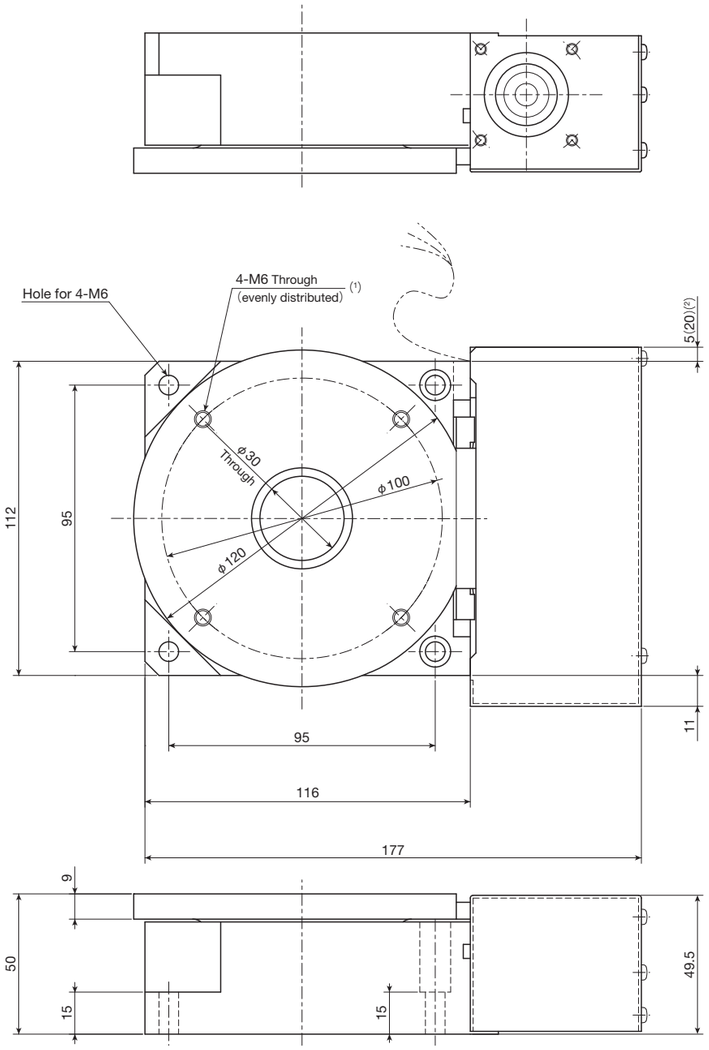

AT706
AT708






# IKO Alignment Table AT

## AT120



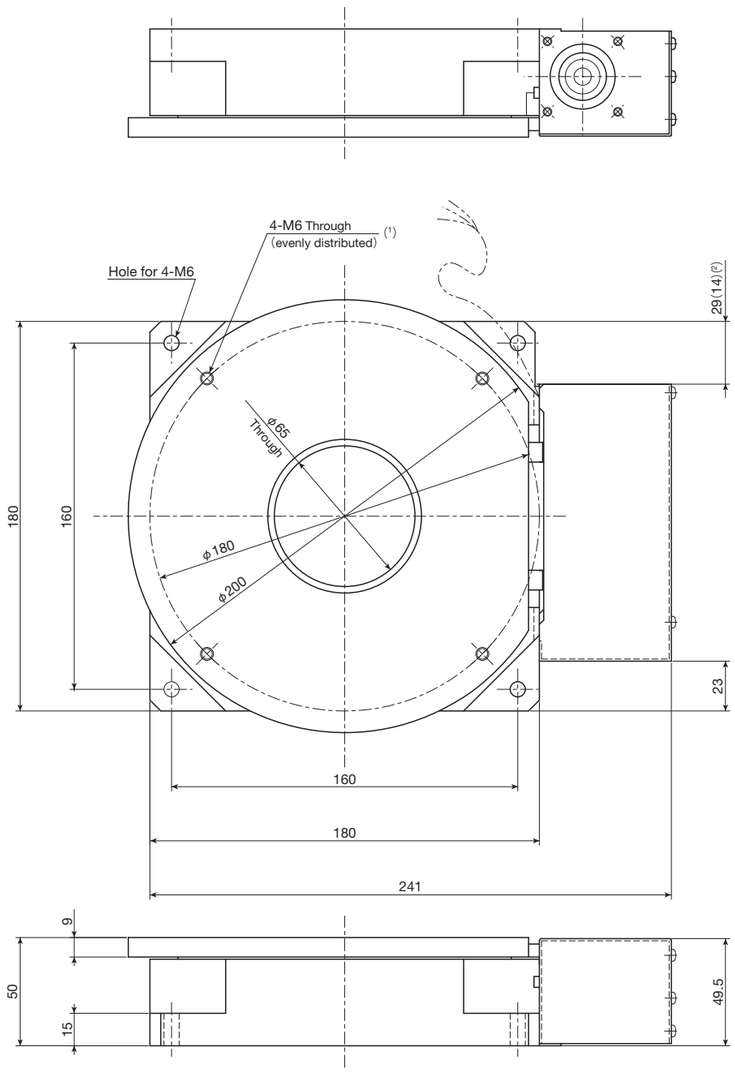

mass: 4.4kg

Notes (1) Too deep insertion depth of the mounting bolt may affect the rotation performance of the table, so never insert a bolt longer than the depth of the through hole.
(2) The dimension in ( ) is applicable to AT701 and AT703.

AT

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

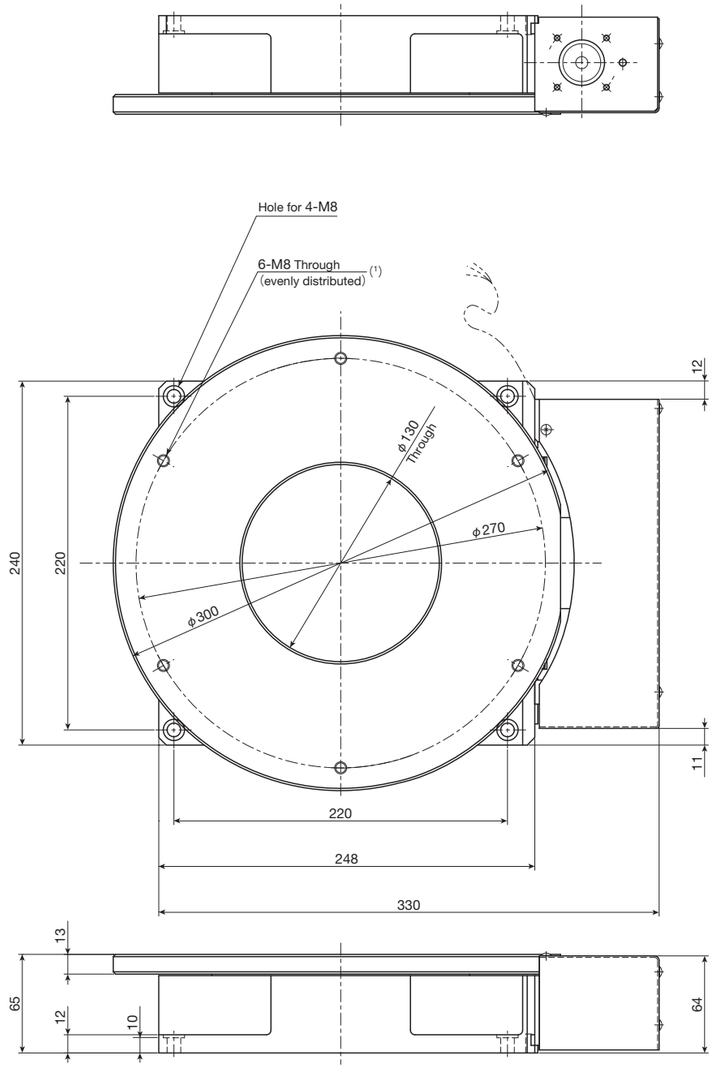
## AT200




mass: 9.9kg

Notes (1) Too deep insertion depth of the mounting bolt may affect the rotation performance of the table, so never insert a bolt longer than the depth of the through hole.
(2) The dimension in ( ) is applicable to AT701 and AT703.

## AT300




mass: 21.0kg

Note (1) Too deep insertion depth of the mounting bolt may affect the rotation performance of the table, so never insert a bolt longer than the depth of the through hole.

AT



1N=0.102kgf=0.2248lbs.
1mm=0.03937inch