## Tabletop Robot Product Series

**Gate / Cantilever Type with 230 VAC Pulse Motor and Built-in Controller**

### Product Overview

#### Gate type (code “A”)

- **A2G (global 2-axis type)**
- **A3G (global 3-axis type)**
- **A4G (global 4-axis type)**

#### Stroke

<table>
<thead>
<tr>
<th>Stroke</th>
<th>X/Y-axis (mm)</th>
<th>Z-axis (mm)</th>
<th>R-axis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gate type</strong></td>
<td>200x200 (with single pillar)</td>
<td>100/150 (Stroke R-axis: ±180/360 deg.)</td>
<td>100/150</td>
</tr>
<tr>
<td><strong>Cantilever type</strong></td>
<td>200x150 (with single pillar)</td>
<td>20/100/150</td>
<td>1000 °/s</td>
</tr>
</tbody>
</table>

#### Max. speed (mm/s)

<table>
<thead>
<tr>
<th>Max. speed</th>
<th>X-axis</th>
<th>Y-axis</th>
<th>Z-axis</th>
<th>R-axis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gate type</strong></td>
<td>800</td>
<td>800</td>
<td>400</td>
<td>1000 °/s</td>
</tr>
</tbody>
</table>
| **Cantilever type** | 20 | 20 | 6 | 0.01 kg-m² **

#### Max. load capacity (kg)

<table>
<thead>
<tr>
<th>Max. load capacity</th>
<th>X-axis</th>
<th>Y-axis</th>
<th>Z-axis</th>
<th>R-axis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gate type</strong></td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td><strong>Cantilever type</strong></td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
</tbody>
</table>

#### Loadable table top surface weight (kg)

<table>
<thead>
<tr>
<th>Loadable table top surface weight (kg)</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gate type</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cantilever type</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Global version (code “G”) with safety category specification. **4-axis type with ZR rotary axis. ***Allowable load moment of inertia at velocity of 300 °/s or less.*
### Explanation of Model Name

**Global specification**

- TTA-A Series
- TTA-C Series
- WA Battery-less absolute

<table>
<thead>
<tr>
<th>Encoder Type</th>
<th>X-axis Contents</th>
<th>Y-axis Contents</th>
<th>Z-axis Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA</td>
<td>3-axis Pulse Motor Gate Type</td>
<td>3-axis Pulse Motor Gate Type</td>
<td>2-axis Pulse Motor Gate Type</td>
</tr>
<tr>
<td>A4G</td>
<td>4-axis Pulse Motor Gate Type (R180 deg. Specification, R360 deg. Specification)</td>
<td>4-axis Pulse Motor Gate Type (R180 deg. Specification, R360 deg. Specification)</td>
<td>4-axis Pulse Motor Gate Type (R180 deg. Specification, R360 deg. Specification)</td>
</tr>
<tr>
<td>C4G</td>
<td>2-axis Pulse Motor Cantilever Type</td>
<td>2-axis Pulse Motor Cantilever Type</td>
<td>2-axis Pulse Motor Cantilever Type</td>
</tr>
</tbody>
</table>

**Power Supply Cable**

- TTA-A Series
- TTA-C Series
- Power supply cable for 230 VAC (2m) (Ring tongue terminal on end)

**Encoder Type**

- WA

**X-axis stroke**

- 20 200mm
- 30 300mm
- 40 400mm
- 50 500mm

**X-axis option**

- NM Reversed-home specific

**Y-axis stroke**

- 20 200mm
- 30 300mm
- 40 400mm
- 50 500mm

**Y-axis option**

- NM Reversed-home specific

**Z-axis stroke**

- 10 100mm
- 15 150mm

**Z-axis option**

- B Brake (Standard equipment)
- CD With cover (dedicated for 4-axis specification)
- NM Reversed-home specific

**R-axis option**

- ML Motor reversed to left
- MR Motor reversed to right

- 180 ±180 deg.
- 36L ±360 deg. (*)

**R-axis stroke**

- 10 180 deg.
- 36L ±360 deg. (*)

- Equipped with home limit switch

**Series**

- TTA
- WA

**Type**

- A2G
- A3G
- A4G
- C2G
- C4G

**Additional switches (number/color/type entry)**

- 1~4/B~Y/L~LC

**Operation part option**

- OS Detachable operation console

**Note**

- For space reasons both operation part options “OS” (detachable console) and “1~4/B~Y/L~LC” (number, color and type of additional switches) cannot be selected together for the smallest 20-15 pulse motor gate type and smallest 20-20 pulse motor cantilever type.
Correlation Diagram of Load Capacity by Speed (X-axis/Y-axis/Z-axis)

Use the diagrams below to check if the desired payload and speed are met.

Correlation Graph for Allowable Load Moment of Inertia and Angular Velocity (R-axis)

<table>
<thead>
<tr>
<th>Allowable Load Moment of Inertia</th>
<th>Angular Velocity</th>
<th>Acceleration/deceleration</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.010kg m²</td>
<td>1000deg./sec</td>
<td>1000deg./sec²</td>
</tr>
<tr>
<td>0.010kg m²</td>
<td>2000deg./sec</td>
<td>2000deg./sec²</td>
</tr>
<tr>
<td>0.010kg m²</td>
<td>3000deg./sec</td>
<td>3000deg./sec²</td>
</tr>
<tr>
<td>0.008kg m²</td>
<td>4000deg./sec</td>
<td>4000deg./sec²</td>
</tr>
<tr>
<td>0.006kg m²</td>
<td>5000deg./sec</td>
<td>5000deg./sec²</td>
</tr>
<tr>
<td>0.005kg m²</td>
<td>6000deg./sec</td>
<td>6000deg./sec²</td>
</tr>
<tr>
<td>0.004kg m²</td>
<td>7000deg./sec</td>
<td>7000deg./sec²</td>
</tr>
<tr>
<td>0.004kg m²</td>
<td>8000deg./sec</td>
<td>8000deg./sec²</td>
</tr>
<tr>
<td>0.003kg m²</td>
<td>9000deg./sec</td>
<td>9000deg./sec²</td>
</tr>
<tr>
<td>0.003kg m²</td>
<td>10000deg./sec</td>
<td>10000deg./sec²</td>
</tr>
</tbody>
</table>

(Notes) Convert to G when setting to a teaching tool such as PC compatible software. (1G=9800deg./sec²).

Correlation Graph of Push Force and Electric Current Limit

In the case of push-motion operation, the push force can be changed freely by changing the electric current limit of the controller (only for TTA-A Series). Take the push force graph below (Z-axis) as a reference. Contact IAI if it is required to have push control on the rotary axis. Take the push torque graph below (R-axis) as a reference.

* The push force may vary by ±10% of the maximum push force.

* There is dispersion of ±10% (range of red dotted lines) to the maximum for the pressing force.
System Configuration

Front Panel Wiring Layout

Teaching Pendant
Option
Model: TBB-02-S
(Standard specification) (*1)

5m/3m
PC Connection Cable
(Supplied with the PC Software)
Model: CB-ST-11MW050 (5m)
CB-ST-11MW050 (5m)
CB-SEL-USB030 (3m)

PC Software
Option
Model: IA-101-X-MW
IA-101-X-MW (*2)
IA-101-TTA-USB (*3)
IA-101-TTA-USBMW

5m
TP Connection Cable
Model: CB-TB1-X002

Dummy Plug
Model: DP-2 (*3)

Back Panel Wiring Layout

Variety of Field Networks (Options)

DeviceNet
EtherCAT
EtherNet/IP

PLC

I/O Flat Cable (Accessory)
Model: CB-PAC-PIO020

2m

Emergency Stop Switch

Electromagnetic Relay

Enable Switch

Controller Specification

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor type / Applicable encoder</td>
<td>Pulse motor / Battery-less absolute encoder</td>
</tr>
<tr>
<td>Power-supply voltage / frequency</td>
<td>100 to 230 VAC ±10% (Single-phase) / 50 or 60 Hz ±5%</td>
</tr>
<tr>
<td>Motor power capacity 2-axis type / 3-axis type / 4-axis type</td>
<td>Rated 182 VA, max. 352 VA / Rated 215 VA, max. 470 VA / Rated 248 VA, max. 588 VA</td>
</tr>
<tr>
<td>Number of program steps / positions / programs / multi-tasking programs</td>
<td>9999 / 30000 / 255 / 16</td>
</tr>
<tr>
<td>Operation mode</td>
<td>Serial communication, Program</td>
</tr>
<tr>
<td>SIO interface</td>
<td>RS232 (Baud rate: 9.6, 19.2, 38.4, 57.6, 76.8, 115.2 kbps), USB (Live wire insertion/removal)</td>
</tr>
<tr>
<td>Standard I/O interface: Inputs / Outputs / Load voltage / Isolation method</td>
<td>16 points IN / 16 points OUT / 24 VDC ±10% / Photocoupler isolation</td>
</tr>
<tr>
<td>Conforming expansion I/O interfaces</td>
<td>Expansion PIO NPN/PNP spec. (16 IN / 16 OUT), CC-Link, DeviceNet, PROFIBUS-DP, EtherNet/IP, EtherCAT</td>
</tr>
<tr>
<td>Calendar (clock) function: Retention time / Charge time</td>
<td>Approx. 10 days / Approx. 100 hours</td>
</tr>
<tr>
<td>Protective functions / Protection class</td>
<td>Monitoring of overcurrent, fan speed drop, etc. / IP20</td>
</tr>
</tbody>
</table>