

Tabletop Robot Product Series

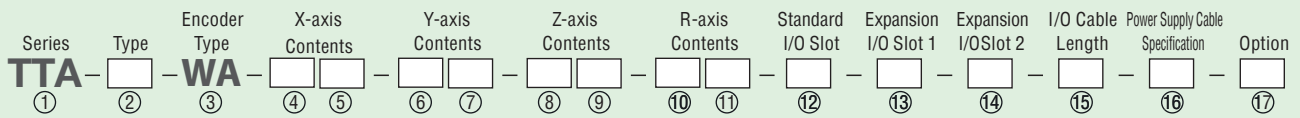
Gate / Cantilever Type with 230 VAC Pulse Motor and Built-in Controller

TTA

| Product Series | | TTA-AG/CG* | | | | | | | | | | | |
|--|--------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---|---------------------------------|---------------------------------|---------------------------------|
| External view | | Gate type (code "A") | | | | | | | | | | | |
| | | A2G (global 2-axis type) | | | | A3G (global 3-axis type) | | | | A4G (global 4-axis type)** | | | |
| Stroke X/Y-axis (mm) | | 200x200 (with single pillar) | 300x300 (with double pillar) | 400x400 (with double pillar) | 500x500 (with double pillar) | 200x200 (with single pillar) | 300x300 (with double pillar) | 400x400 (with double pillar) | 500x500 (with double pillar) | 200x200 (with single pillar) | 300x300 (with double pillar) | 400x400 (with double pillar) | 500x500 (with double pillar) |
| Stroke Z-axis (mm) | | — | | | | 100/150 | | | | 100/150 (Stroke R-axis: ±180/360 deg.) | | | |
| Max. speed (mm/s) | X-axis | 800 | | | | 800 | | | | 800 | | | |
| | Y-axis | 800 | | | | 800 | | | | 800 | | | |
| | Z-axis | — | | | | 400 | | | | 400 | | | |
| | R-axis | — | | | | — | | | | 1000 °/s | | | |
| Max. load capacity (kg) | X-axis | 20 | | | | 20 | | | | 20 | | | |
| | Y-axis | 10 | | | | — | | | | — | | | |
| | Z-axis | — | | | | 6 | | | | 6 | | | |
| | R-axis | — | | | | — | | | | 0.01 kg·m ² *** | | | |
| Loadable table top surface weight (kg) | | 20 | 30 | 40 | 50 | 20 | 30 | 40 | 50 | 20 | 30 | 40 | 50 |
| External view | | Cantilever type (code "C") | | | | | | | | | | | |
| | | C2G (global 2-axis type) | | | | C3G (global 3-axis type) | | | | C4G (global 4-axis type)** | | | |
| Stroke X/Y-axis (mm) | | 200x150 (with single pillar) | 300x250 (with double pillar) | 400x350 (with double pillar) | 500x450 (with double pillar) | 200x150 (with single pillar) | 300x250 (with double pillar) | 400x350 (with double pillar) | 500x450 (with double pillar) | 200x150 (with single pillar) | 300x250 (with double pillar) | 400x350 (with double pillar) | 500x450 (with double pillar) |
| Stroke Z-axis (mm) | | — | | | | 100/150 | | | | 100/150 (Stroke R-axis: ±180/360 deg.) | | | |
| Max. speed (mm/s) | X-axis | 600 | 700 | 800 | — | 600 | 700 | 800 | — | 600 | 700 | 800 | — |
| | Y-axis | 540 | 640 | 800 | — | 540 | 640 | 800 | — | 540 | 640 | 800 | — |
| | Z-axis | — | | | | 400 | | | | 400 | | | |
| | R-axis | — | | | | — | | | | 1000 °/s | | | |
| Max. load capacity (kg) | X-axis | — | | | | — | | | | — | | | |
| | Y-axis | 10 | | | | — | | | | — | | | |
| | Z-axis | — | | | | 6 | | | | 6 | | | |
| | R-axis | — | | | | — | | | | 0.01 kg·m ² *** | | | |
| Loadable table top surface weight (kg) | | 40 | 60 | 80 | 100 | 40 | 60 | 80 | 100 | 40 | 60 | 80 | 100 |

*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



WA Battery-less absolute

| Global specification | |
|----------------------|--|
| A2G | 2-axis Pulse Motor Gate Type |
| A3G | 3-axis Pulse Motor Gate Type |
| A4G | 4-axis Pulse Motor Gate Type (R180 deg. Specification, R360 deg. Specification) |
| C2G | 2-axis Pulse Motor Cantilever Type |
| C3G | 3-axis Pulse Motor Cantilever Type |
| C4G | 4-axis Pulse Motor Cantilever Type (R180 deg. Specification, R360 deg. Specification) |

(Note) The global specification types apply for CE marking and Safety Category B to 3.

| X-axis stroke | |
|---------------|-------|
| 20 | 200mm |
| 30 | 300mm |
| 40 | 400mm |
| 50 | 500mm |

| X-axis option | |
|---------------|-------------------------|
| NM | Reversed-home specific. |

| Y-axis stroke | TTA-A Series | TTA-C Series |
|---------------|--------------|--------------|
| 20 | 200mm | 15 150mm |
| 30 | 300mm | 25 250mm |
| 40 | 400mm | 35 350mm |
| 50 | 500mm | 45 450mm |

| Y-axis option | |
|---------------|-------------------------|
| NM | Reversed-home specific. |

| Z-axis stroke | |
|---------------|-------|
| 10 | 100mm |
| 15 | 150mm |

| Z-axis option | |
|---------------|---|
| B | Brake (Standard equipment) |
| CO | With cover (dedicated for 4-axis specification) |
| NM | Reversed-home specification |

| | |
|----|---------------|
| NP | NPN specific. |
| PN | PNP specific. |

| | |
|-----|---|
| E | Not used |
| NP | Expansion PIO board (NPN specification) |
| PN | Expansion PIO board (PNP specification) |
| DV | DeviceNet connect. board |
| CC | CC-Link connection board |
| PR | PROFIBUS-DP connect. board |
| EP | EtherNet/IP connect. board (*) |
| EC | EtherCAT connection board |
| IA | IA-NET connection board (**) |
| SE1 | Expansion SIO board (RS232C) |
| SE2 | Expansion SIO board (RS485) |

* Two pieces of EtherNet/IP cannot be selected to the expansion I/O slot. If there are two expansion I/O slots, expansion I/O Slot 2 can only be selected.

** Only one unit of IA-NET can be mounted on either of the expansion I/O slots.

| | |
|---|------|
| 0 | None |
| 2 | 2m |
| 3 | 3m |
| 5 | 5m |

| PU | |
|----|---|
| | Mating plug (No cable) |
| 2 | Power supply cable for 230 VAC (2m) (Ring tongue terminal on end) |

R-axis option

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

* In case of type selection "A4G", "ML" or "MR" must be selected. In case of type selection "C4G", "MR" is only available.

| R-axis stroke | |
|---------------|---------------|
| 18 | ±180 deg. |
| 36L | ±360 deg. (*) |

* Equipped with home limit switch

| | | |
|--|--------------|--|
| Y-axis height and horizontal position change and additional option | H1 | Y-axis mounting position height 50mm up |
| | H2 | Y-axis mounting position height 100mm up |
| | F1 | Y-axis mounting position 90mm forward |
| | F2 | Y-axis mounting position 180mm forward |
| Installation bracket options | AP | Additional pillar for 20-15 and 20-20 types |
| | FT4 | Foot bracket equipped specification (4 pcs) |
| | FT6 | Foot bracket equipped specification (6 pcs) |
| Side slot options | SLT0 | Side slot 180mm installation specification |
| | SLT | Individual stroke side slot installation specification |
| Side plate options | PTH | Installation side plate (with hole) |
| | PTN | Installation side plate (without hole) |
| Operation part option (Note) | OS | Detachable operation console |
| | 1-4/B-Y/L-LC | Additional switches (number/color/type entry) |
| ZR-axis position change option | FZ | ZR-axis attached position 64.5mm forward |

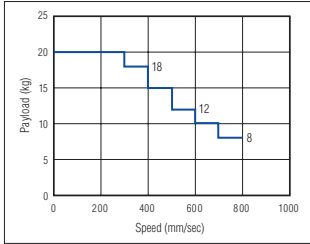
(Note) For space reasons both operation part options "OS" (detachable console) and "1~4/B-Y/L-LC" (number, color and type of additional switches) cannot be selected together for the smallest 20-15 pulse motor gate type and smallest 20-20 pulse motor cantilever type.

Selection References

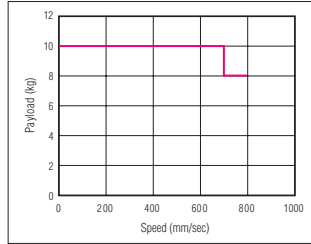
Correlation Diagram of Load Capacity by Speed (X-axis/Y-axis/Z-axis)

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

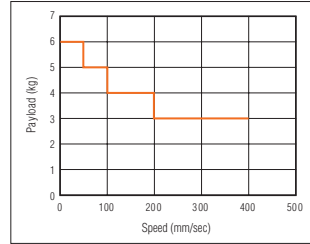
TTA-A Series: X-axis



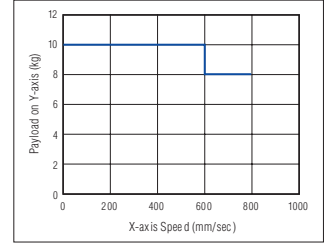
TTA-A Series: Y-axis



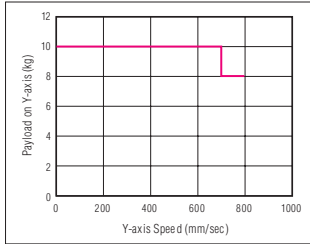
TTA-A Series: Z-axis



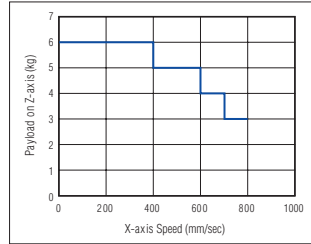
TTA-C2: X-axis



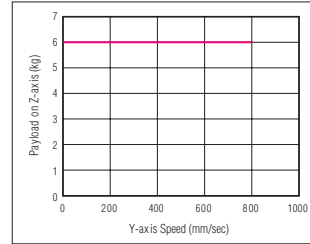
TTA-C2: Y-axis



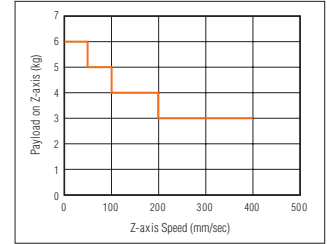
TTA-C3/C4: X-axis



TTA-C3/C4: Y-axis



TTA-C3/C4: Z-axis



• Set the acceleration/deceleration to 0.2G at max.

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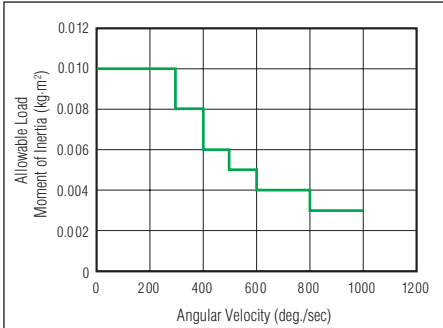
TTA-A Series: Payload and acceleration/deceleration

| Payload | 20kg | 18kg | 15kg | 12kg | 10kg | 8kg |
|---------------------------|--------------|------|--------------|------|--------------|-----|
| Acceleration/deceleration | 0.2G or less | | 0.3G or less | | 0.4G or less | |

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

R-axis

Allowable load moment of inertia, angular velocity, angular acceleration and deceleration (R)



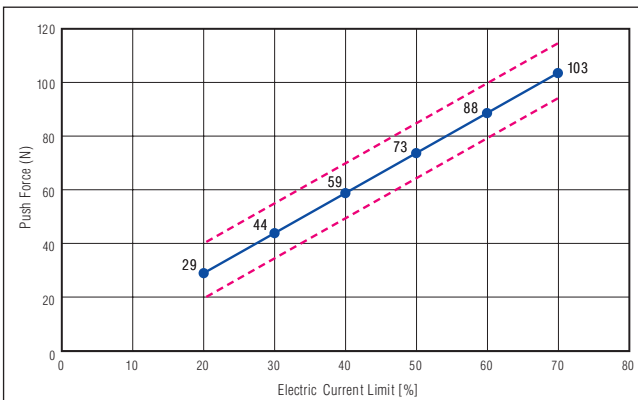
| Allowable Load Moment of Inertia | Angular Velocity | Acceleration/deceleration |
|----------------------------------|------------------|----------------------------|
| 0.010kg·m ² | 100deg./sec | 1000deg./sec ² |
| 0.010kg·m ² | 200deg./sec | 1000deg./sec ² |
| 0.010kg·m ² | 300deg./sec | 1000deg./sec ² |
| 0.008kg·m ² | 400deg./sec | 1778deg./sec ² |
| 0.006kg·m ² | 500deg./sec | 2778deg./sec ² |
| 0.005kg·m ² | 600deg./sec | 4000deg./sec ² |
| 0.004kg·m ² | 700deg./sec | 5444deg./sec ² |
| 0.004kg·m ² | 800deg./sec | 7111deg./sec ² |
| 0.003kg·m ² | 900deg./sec | 9000deg./sec ² |
| 0.003kg·m ² | 1000deg./sec | 11111deg./sec ² |

(Note) 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

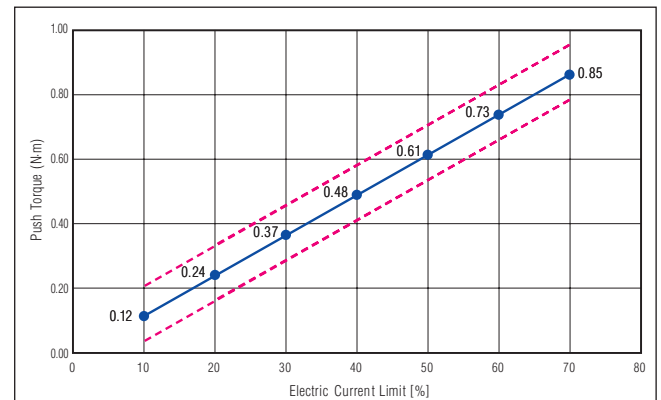
In the case of push-motion operation, the push force can be changed freely by changing the electric current limit of the controller (only for TTA-A Series). Take the push force graph below (Z-axis) as a reference. Contact IAI if it is required to have push control on the rotary axis. Take the push torque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

Z-axis



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

R-axis



* 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: TB-02-S
(Standard specification) (*1)



(*1) For a safety category compliant system with deadman switch specific type TB-02D-S see TB-02 brochure.

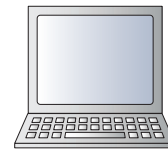
5m

TP Connection Cable
Model: CB-TB1-X002



5m/3m

PC Connection Cable
(Supplied with the PC Software)
Model: CB-ST-E1MW050 (5m)
CB-ST-A1MW050 (5m)
CB-SEL-USB030 (3m)



PC Software (Option)

Model: IA-101-X-MW
IA-101-XA-MW (*2)
IA-101-TTA-USB (*3)
IA-101-TTA-USBMW

Dummy Plug

Model: DP-2 (*3)

(*2) Safety category compliant system with safety circuit emergency stop connector type IA-101-XA-MW including PC cable CB-ST-A1MW050.
(*3) Enclosed in global specification and PC software (IA-101-TTA-USB).

Back Panel Wiring Layout

Variety of Field Networks (Options)



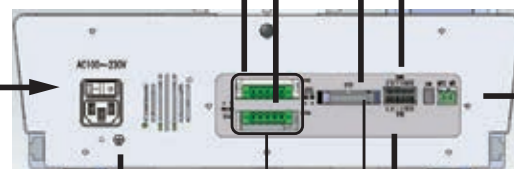
I/O Flat Cable (Accessory)

Model: CB-PAC-PIO020

2m

100 to 230 VAC
Select from those below for the power supply cable

- Only with plug on main unit side
- Power supply cable for 230 VAC (2m)



Protective Grounding

Expansion I/O Slots

Standard I/O Service Power Supply connector



Emergency Stop Switch



Electromagnetic Relay



Enable Switch

Controller Specification

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