

Tabletop Robot Product Series

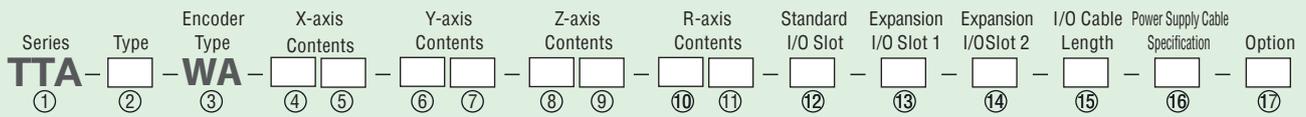
Gate / Cantilever Type with 230 VAC Pulse Motor and Built-in Controller

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)
Side slot options	FT6	Foot bracket equipped specification (6 pcs)
	SLT0	Side slot 180mm installation specification
Side plate options	SLT	Individual stroke side slot installation specification
	PTH	Installation side plate (with hole)
Operation part option (Note)	PTN	Installation side plate (without hole)
	OS	Detachable operation console
ZR-axis position change option	1-4/B-Y/L-LC	Additional switches (number/color/type entry)
	FZ	ZR-axis attached position 64.5mm forward

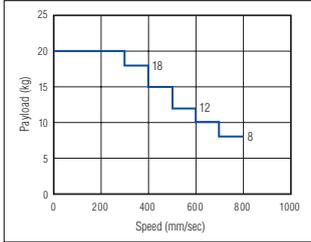
(Note) For space reasons both operation part options "OS" (detachable console) and "1~4/B-Y/L-LC" (number, color and type of additional switches) cannot be selected together for the smallest 20-15 pulse motor gate type and smallest 20-20 pulse motor cantilever type.

Selection References

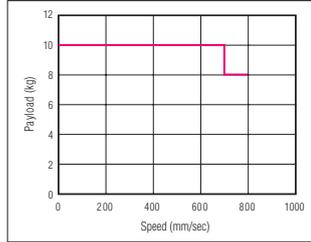
Correlation Diagram of Load Capacity by Speed (X-axis/Y-axis/Z-axis)

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

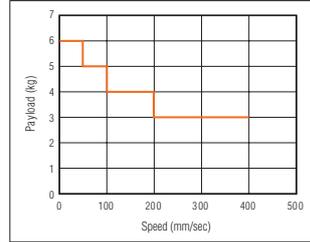
TTA-A Series: X-axis



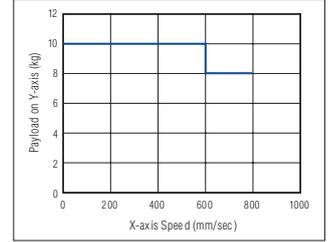
TTA-A Series: Y-axis



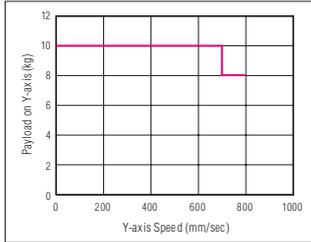
TTA-A Series: Z-axis



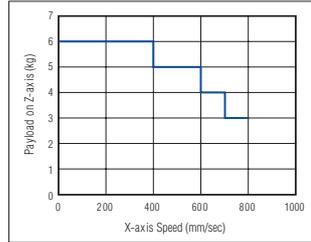
TTA-C2: X-axis



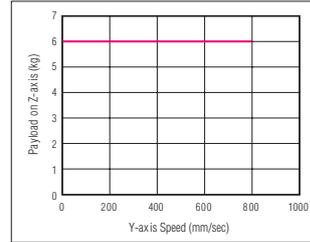
TTA-C2: Y-axis



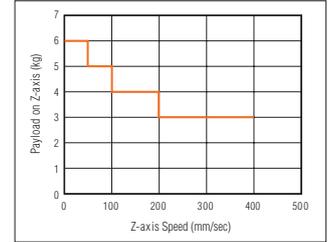
TTA-C3/C4: X-axis



TTA-C3/C4: Y-axis



TTA-C3/C4: Z-axis



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

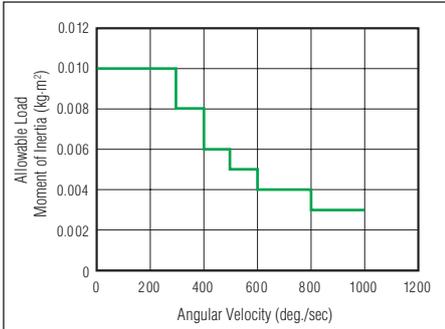
TTA-A Series: Payload and acceleration/deceleration

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)



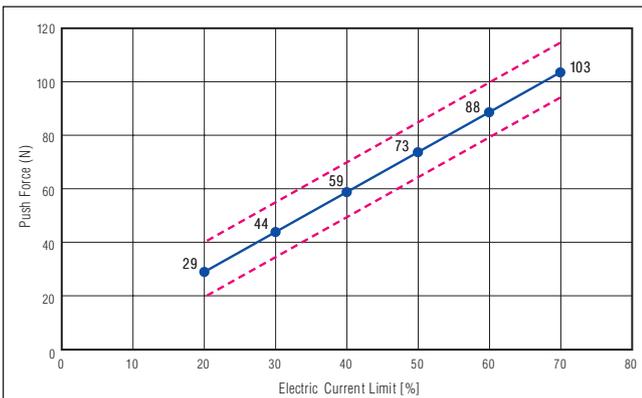
Allowable Load Moment of Inertia	Angular Velocity	Acceleration/deceleration
0.010kg·m ²	100deg./sec	1000deg./sec ²
0.010kg·m ²	200deg./sec	1000deg./sec ²
0.010kg·m ²	300deg./sec	1000deg./sec ²
0.008kg·m ²	400deg./sec	1778deg./sec ²
0.006kg·m ²	500deg./sec	2778deg./sec ²
0.005kg·m ²	600deg./sec	4000deg./sec 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

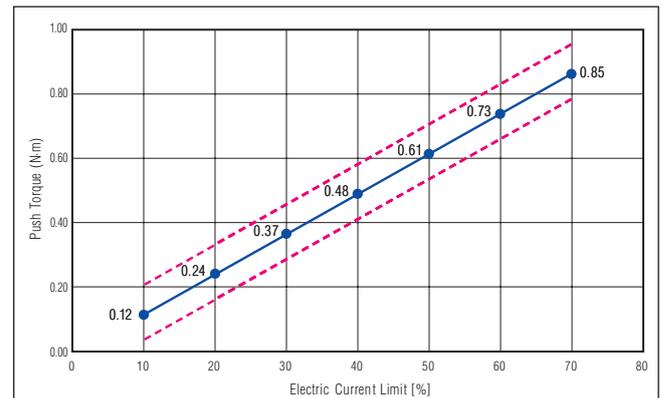
In the case of push-motion operation, the push force can be changed freely by changing the electric current limit of the controller (only for TTA-A Series). Take the push force graph below (Z-axis) as a reference. Contact IAI if it is required to have push control on the rotary axis. Take the push torque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

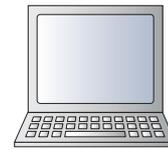


5m/3m

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

Dummy Plug

Model: DP-2 (*3)



PC Software (Option)

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

(*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)



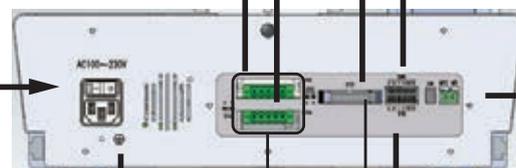
I/O Flat Cable (Accessory)

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