







# Tabletop Robot Product Series

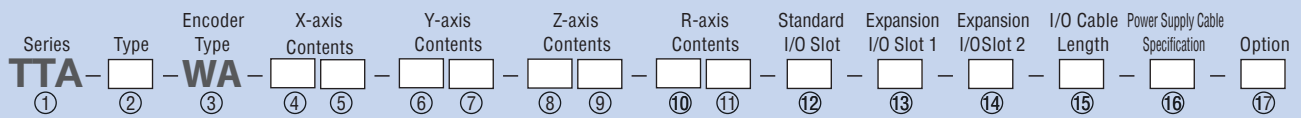
Gate / Cantilever Type with 230 VAC Servo Motor and Built-in Controller

# TTA-S

Product Series		TTA-ASG/CSG*											
External view	Gate type (code "A")												
	A2SLG (global 2-axis low-speed type) [A2SHG (global 2-axis high-speed type)]				A3SLG (global 3-axis low-speed type) [A3SHG (global 3-axis high-speed type)]				A4SLG (global 4-axis low-speed type)** [A4SHG (global 4-axis high-speed type)**]				
													
	Stroke X/Y-axis (mm)	200x200 (with double pillar)	300x300 (with double pillar)	400x400 (with double pillar)	500x500 (with double pillar)	200x200 (with double pillar)	300x300 (with double pillar)	400x400 (with double pillar)	500x500 (with double pillar)	200x200 (with double 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	600 [1000]	600 [1200]		600 [1000]	600 [1200]			600 [1000]	600 [1200]			
	Y-axis	600 [1000]	600 [1200]		600 [800]	600 [1000]	600 [1200]		600 [700]	600 [900]	600 [1050]	600 [1200]	
	Z-axis	—				170 [400]				170 [400]			
	R-axis	—				—				1500 °/s [1500 °/s]			
Max. load capacity (kg)	X-axis	30 [15]		30 [15]		30 [15]		30 [15]		30 [15]			
	Y-axis	20 [11]		—		—		—		—			
	Z-axis	—				15 [7]				15 [7]			
	R-axis	—				—				0.01 kg·m <sup>2</sup> [0.01 kg·m <sup>2</sup> ]**			
Loadable table top surface weight (kg)	20	30	40	50	20	30	40	50	20	30	40	50	
External view		Cantilever type (code "C")											
		C2SLG (global 2-axis low-speed type) [C2SHG (global 2-axis high-speed type)]				C3SLG (global 3-axis low-speed type) [C3SHG (global 3-axis high-speed type)]				C4SLG (global 4-axis low-speed type)** [C4SHG (global 4-axis high-speed type)**]			
													
		Stroke X/Y-axis (mm)	200x150 (with double pillar)	300x250 (with double pillar)	400x350 (with double pillar)	500x450 (with double pillar)	200x150 (with double pillar)	300x250 (with double pillar)	400x350 (with double pillar)	500x450 (with double pillar)	200x150 (with double pillar)	300x250 (with double pillar)	400x350 (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]	600 [900]	600 [1000]		600 [600]	600 [750]	600 [850]	600 [1000]	600 [600]	600 [750]	600 [850]	600 [1000]
	Y-axis	600 [600]	600 [800]	600 [1000]		600 [600]	600 [800]	600 [1000]		600 [600]	600 [800]	600 [1000]	
	Z-axis	—				170 [400]				170 [400]			
	R-axis	—				—				1500 °/s [1500 °/s]			
Max. load capacity (kg)	X-axis	—		—		—		—		—			
	Y-axis	20 [12]		—		—		—		—			
	Z-axis	—				15 [7]				15 [7]			
	R-axis	—				—				0.01 kg·m <sup>2</sup> [0.01 kg·m <sup>2</sup> ]**			
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

NP NPN specific.  
PN PNP specific.

0	None
2	2m
3	3m
5	5m

Global specification	
A2SLG	2-axis Servo Motor Low-speed Gate Type
A2SHG	2-axis Servo Motor High-speed Gate Type
A3SLG	3-axis Servo Motor Low-speed Gate Type
A3SHG	3-axis Servo Motor High-speed Gate Type
A4SLG	4-axis Servo Motor Low-speed Gate Type (R180 deg. Specification, R360 deg. Specification)
A4SHG	4-axis Servo Motor High-speed Gate Type (R180 deg. Specification, R360 deg. Specification)
C2SLG	2-axis Servo Motor Low-speed Cantilever Type
C2SHG	2-axis Servo Motor High-speed Cantilever Type
C3SLG	3-axis Servo Motor Low-speed Cantilever Type
C3SHG	3-axis Servo Motor High-speed Cantilever Type
C4SLG	4-axis Servo Motor Low-speed Cantilever Type (R180 deg. Specification, R360 deg. Specification)
C4SHG	4-axis Servo Motor High-speed Cantilever Type (R180 deg. Specification, R360 deg. Specification)

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

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.

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

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

X-axis option	
NM	Reversed-home specific.

R-axis option	
ML	Motor reversed to left
MR	Motor reversed to right

\* In case of type selection "A4SLG" or "A4SHG", "ML" or "MR" must be selected. In case of type selection "C4SLG" or "C4SHG", "MR" is only available.

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

\* Equipped with home limit switch

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)
CO	With cover (dedicated for 4-axis specification)
NM	Reversed-home specification

Y-axis height and horizontal position change (Note 1)	H1	Y-axis mounting position height 50mm up
	H2	Y-axis mounting position height 100mm up
	F1	Y-axis mounting position 90mm forward
Installation bracket options	F2	Y-axis mounting position 180mm forward
	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 2)	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 1) The smallest 20-15 servo motor gate type and smallest 20-20 servo motor cantilever type comes with double pillar as standard. Single pillar versions are not available contrary to smallest types of TTA pulse motor model series.

(Note 2) 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 servo motor gate type and smallest 20-20 servo motor cantilever type.

## Selection References

### Table of Load Capacity by Acceleration (X-axis/Y-axis/Z-axis)

Use the tables below to check if the desired payload and acceleration are met.

Type	Axis	Lead Type	Load Capacity (kg)						
			0.1G	0.2G	0.3G	0.4G	0.5G	0.6G	0.7G
TTA-A (Gate type)	X	Low-speed	30	17	10	6	3	—	—
		High-speed	15	15	8	5	3	1.8	1
	Y	Low-speed	20	17	10	6	3	—	—
		High-speed	11	11	8	5	3	1.8	1
	Z	Low-speed	15	12	9	—	—	—	—
		High-speed	7	7	5.5	4	3	—	—
TTA-C (Cantilever type)	X	Low-speed	30	17	—	—	—	—	—
		High-speed	22	17	12	—	—	—	—
	Y	Low-speed	20	15	10	—	—	—	—
		High-speed	12	12	10	—	—	—	—
	Z	Low-speed	15	12	9	—	—	—	—
		High-speed	7	7	5.5	4	3	—	—

Type	Lead Type	Z-axis Load Capacity (kg) by Y-axis Accel.			
		0.1G	0.2G	0.3G	0.4G
TTA-A (Gate type)	Low-speed	15	13	6	2
	High-speed	7	7	4	1
TTA-C (Cantilever type)	Low-speed	15	11	6	—
	High-speed	7	7	6	—

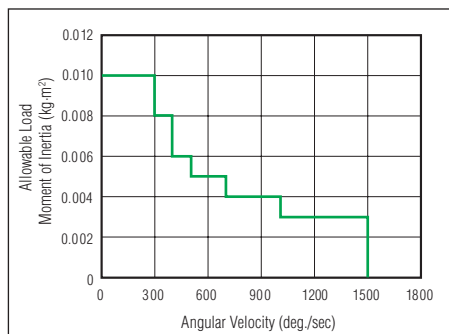
Type	Lead Type	ZR-axis Load Capacity (kg) by Y-axis Accel.			
		0.1G	0.2G	0.3G	0.4G
TTA-A (Gate type)	Low-speed	15	11	4	—
	High-speed	7	7	2	—
TTA-C (Cantilever type)	Low-speed	15	9	4	—
	High-speed	7	7	4	—

Type	Lead Type	Y-axis Load Capacity (kg) by X-axis Accel.			
		0.1G	0.2G	0.3G	0.4G
TTA-C (Cantilever type)	Low-speed	20	7	—	—
		High-speed	12	7	2
	Lead Type	Z-axis Load Capacity (kg) by X-axis Accel.			
		0.1G	0.2G	0.3G	0.4G
	Low-speed	15	3	—	—
		High-speed	7	3	—
	Lead Type	ZR-axis Load Capacity (kg) by X-axis Accel.			
		0.1G	0.2G	0.3G	0.4G
	Low-speed	15	1	—	—
		High-speed	7	1	—

### 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)



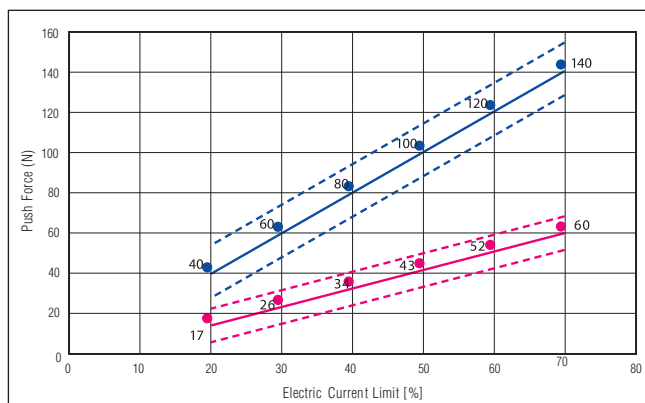
Allowable Load Moment of Inertia	Angular Velocity	Acceleration/deceleration
0.010kg·m <sup>2</sup>	300deg./sec	490deg./sec <sup>2</sup>
0.008kg·m <sup>2</sup>	400deg./sec	980deg./sec <sup>2</sup>
0.006kg·m <sup>2</sup>	500deg./sec	1960deg./sec <sup>2</sup>
0.005kg·m <sup>2</sup>	700deg./sec	4900deg./sec <sup>2</sup>
0.004kg·m <sup>2</sup>	1000deg./sec	9800deg./sec <sup>2</sup>
0.003kg·m <sup>2</sup>	1500deg./sec	14700deg./sec <sup>2</sup>

(Note) Convert to G when setting to a teaching tool such as PC compatible software. (1G=9800deg./sec<sup>2</sup>).

### Correlation Graph of Push Force and Electric Current Limit

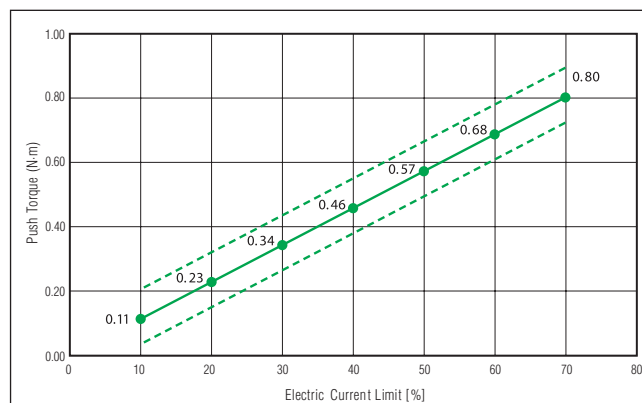
In the case of push-motion operation, the push force can be changed freely by changing the electric current limit of the controller (only for TTA-A Series). Take the push force graph below (Z-axis) as a reference. Contact IAI if it is required to have push control on the rotary axis. Take the push torque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

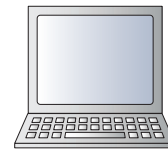
5m

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)



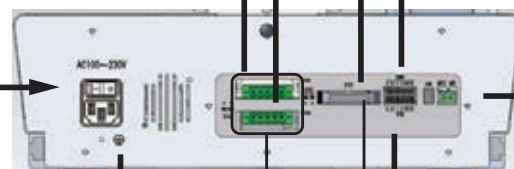
#### I/O Flat Cable (Accessory)

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	AC servo 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