

March 2019

Separate

*Selectable from
Three Torch Types*



Through-Arm

External

TM Manipulators *That Support Both External & Through-Arm Torch Cable Routing*

Payload on Wrist Axis

TS-800, TS-950, TL-1800: 8 kg

TL-2000: 6 kg



External



External

TS Manipulators *with Space Saving*

TL Manipulators *with Long Arm*

TS/TM/TL Series GII

Combination with Full Digital Welding Power Source Achieves Stable and High Quality Welding

Torch type selectable to fit your application!

TM series



Separate Type



Through-Arm Type



External Type

TM
1100
1400
1600
1800
2000

Space saving & high payload!

TS-950

TS series



External Type

Through-Arm Type

TS
800
950

Payload
8 kg
TS-800/950

Long-arm & high payload!

TL series



External Type

TL
1800
2000

Payload
TL-1800: **8 kg**
TL-2000: **6 kg**

Manipulator Lineup (as of March 2019)

	TS series		TM series					TL series	
	800	950	1100	1400	1600	1800	2000	1800	2000
Separate	—	—	○	○	○	○	○	—	—
Through-Arm	○	○	○	○	○	○	○	—	—
External	○	○	○	○	—	—	—	○	○
Payload	8 kg		6 kg		4 kg	6 kg		8 kg	6 kg

A variety of features specialized for arc welding

Feature 1 (TM/TL) Enhanced Basic Performance

Increased Motion Speed

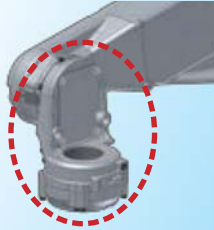
TM-1400: Speed of main 3 axes increased by 22 % on average. (approx. 42°/s more than TA type)

Extended Reach

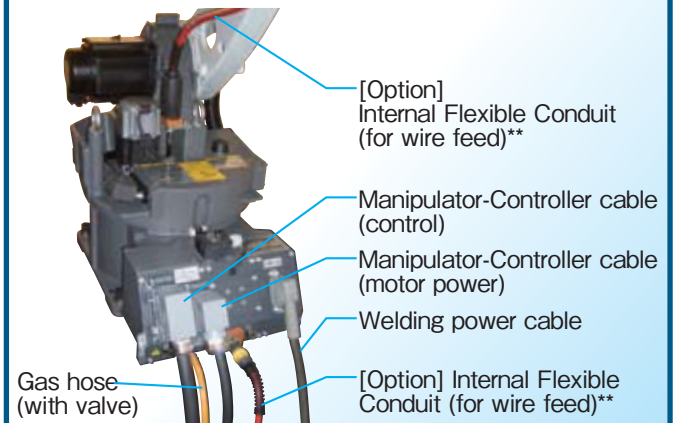
TM-1400: 1 437 mm (63 mm more than TA type)

Feature 2 (TS/TM) Arm Specialized for Welding

Cantilever Structure makes arm compact and improves accessibility to workpieces.



Feature 3 (TM/TL) Structure Specialized for Welding Clean Cable Management!



**For use with drum packing wire only.

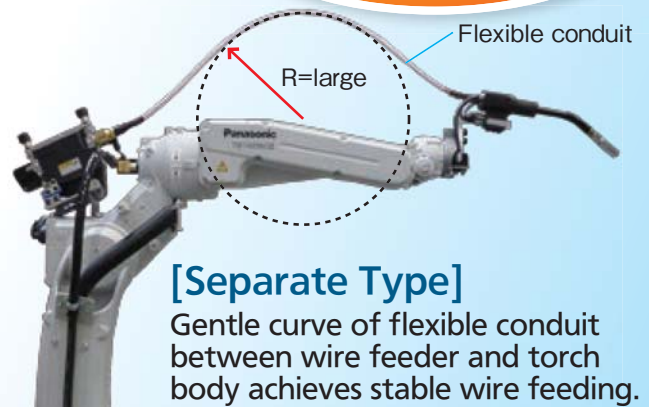
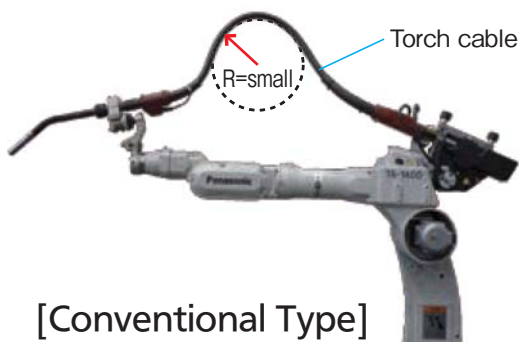
In addition to Through-Arm Type and External Type,

A third choice—Separate Type (TM series)

Revolutionary new type of arc welding robot with advantages of both Through-Arm Type and External Type.

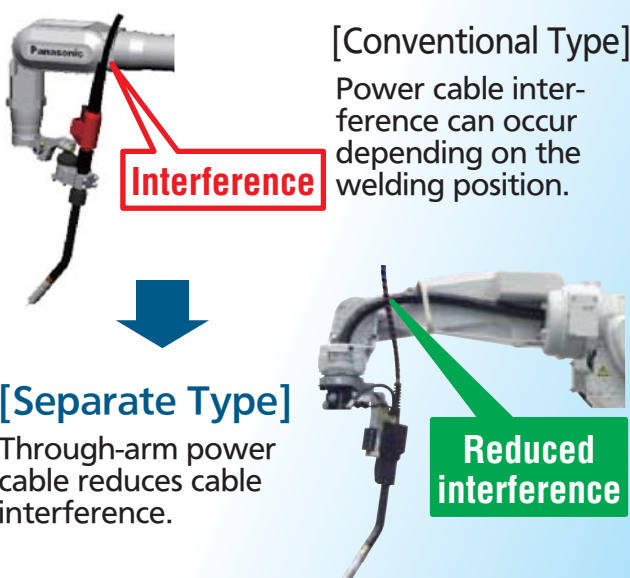


Feature 1 External Flexible Conduit



[Separate Type]
Gentle curve of flexible conduit between wire feeder and torch body achieves stable wire feeding.

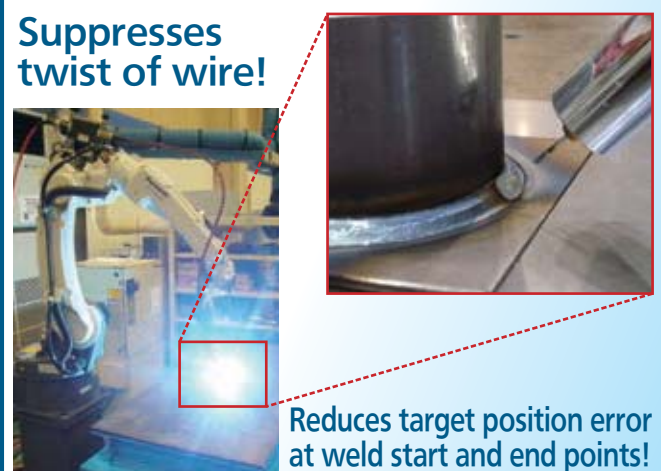
Feature 2 Through-Arm Power Cable



[Conventional Type]
Power cable interference can occur depending on the welding position.

[Separate Type]
Through-arm power cable reduces cable interference.

An example of circumferential welding



New type welding robot achieves even higher quality welds.

GIII controller with high performance

- Faster CPU reduces start-up time to **about 30 seconds.** (50 % reduction from previous model)
- Optional memory allows storing 800,000 teaching points in addition to the standard 40,000 points.



GIII

Teach pendant with enhanced operability

Operating function key



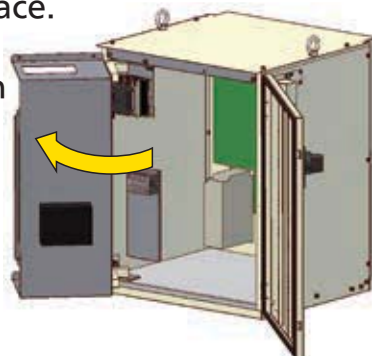
User function key

Same basic operation procedure with G2 Series model
Easy to use Windows based operation

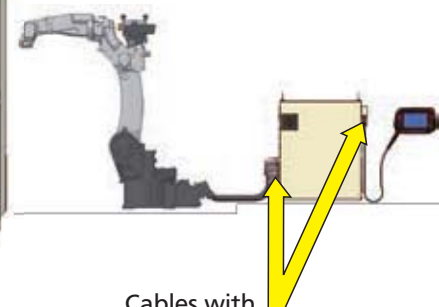
- Light weight design under 1 kg (0.99 kg) giving you less stress during teaching
- Liquid crystal LED back light improving impact resistance
- USB and SD memory interface realizing great expandability
- Increased number of function keys (four to eight), enabling same action with less key strokes during teaching

Improved maintainability

- Swivel rack in the case makes maintenance easy and saves space.
- Cables with connectors on both ends reduce Cable exchange time.



Swivel rack

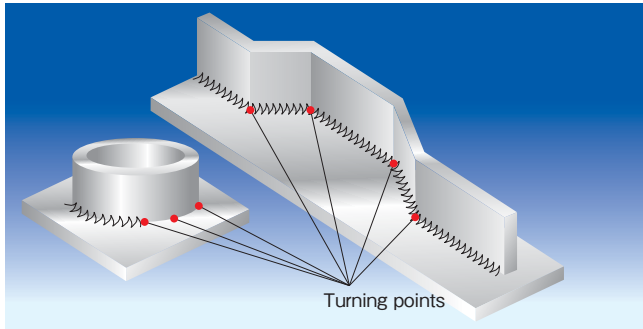


Cables with connector on both ends

Standard Features

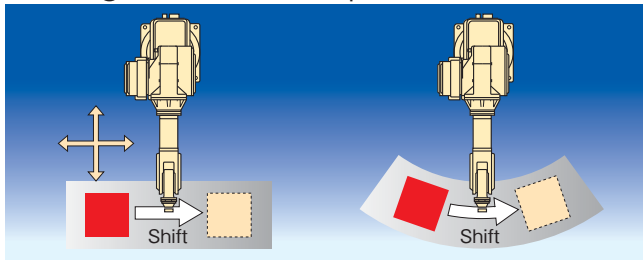
Weaving Function (6 patterns)

You just have to teach the starting point, amplitudes, turning points and ending point. Teaching time will be reduced.



Parallel Shift + RT Axis Rotating

Teaching time of same workpieces is reduced.



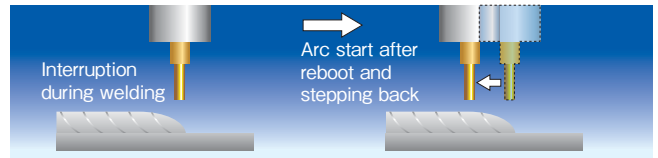
Torch Angle Display (Teach Pendant)



Torch angle is displayed on the screen, making it possible to reduce teaching time and obtain consistent bead appearance.

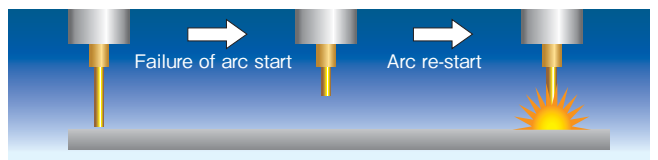
Overlap Function (CO₂/MAG welding)

In case of interruption during welding, the torch is stepped back by reboot and resumes the welding from the welding end point.



Arc Start Retry (CO₂/MAG welding)

Detecting a failure of arc start, the robot automatically starts arc ignition again.



Optional Features

"Weld Navigation" allows easy parameter setting

Easy setting with Teach Pendant



Model: 350GZ4



Note: Screens are subject to change without notice.

Rich welding parameter database developed through our long experience

"Weld Navigation" reduces parameter setting time.

Note: Torch angle and aiming point also calculated

Two Easy Steps:

1. Select weld joint. The figure changes according to the joint.
2. Select plate thicknesses. That's all!

The right parameters automatically

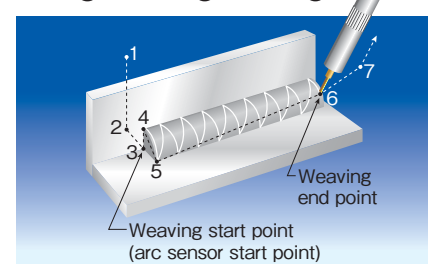
Leg length and weld speed are also adjustable.

Note: Parameters by Weld Navigation are guideline only and do not guarantee welding result.
•Consult us for material and processes available with Weld Navigation.

Weld Navigation recalculates weld current and voltage according to the changes.

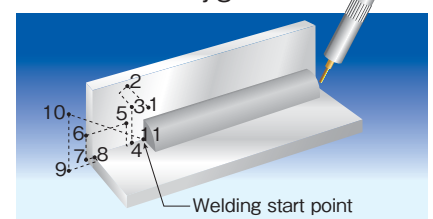
Arc Sensor

The sensor corrects deviation from the taught weld line by detecting weld current changes during weaving welding.



Touch Sensor

The welding wire touches the workpiece and compensates a workpiece position error, which reduces jig costs.



Expansion

Multi-Mechanism Control

Controls maximum 6 groups of robots and external axes in parallel.

Cooperative Multi-Robot Control

Allows cooperative control between two robots.

Units

- Analog I/O Expansion Unit
- Relay Connection Unit
- Terminal Block Conversion Unit
- External Power Input Unit

CO₂/MAG/MIG Robot System (GII)

Combination with Full Digital Welding Power Source Achieves Stable and High Quality Welding


CO₂/MAG/MIG welding robot system selectable to fit your application

Full Digital CO₂/MAG welding machines GZ4 series

TS	TM	TL
800	1100	1800
950	1400	2000
	1600	
	1800	
	2000	

SP-MAG

(Super-imposition Control)



Equipped with TAWERS's SP Control
Praised by Many of Our Customers

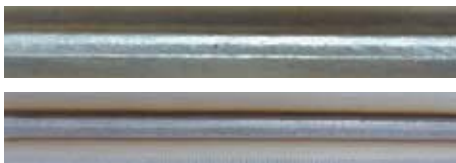
SP-MAG benefits:

- Reduced spatter (Reduced removal work)
- Shorter short-circuit cycle suited for high speed welding
- Shorter arc length for good bead appearance



TM-1400GIII (Separate)

Good bead appearance and low spatter even in high speed welding



MAG welding (220 A)

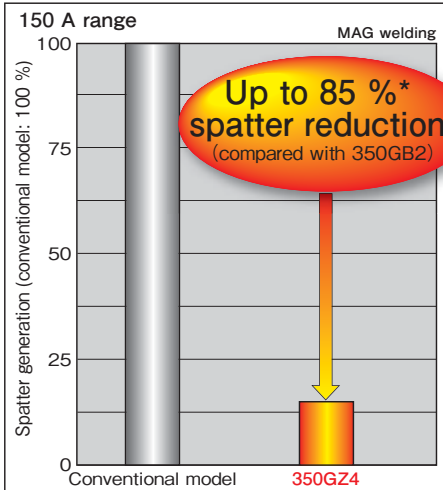
- Joint: Fillet • Base metal: Mild steel SPCC (t2.3 mm) • Weld current: 220 A
- Weld speed: 100 cm/min • Wire size: 1.2 mm (YM-50MT)
- Shielding gas: MAG (80 % Ar + 20 % CO₂)

MIG welding (180 A)

- Joint: Fillet • Base metal: SUS308(t1.5 mm) • Weld current: 180 A
- Weld speed: 80 cm/min • Wire size: 1.2 mm (Y308Lsi)
- Shielding gas: MIG (98 % Ar + 2 % O₂)

Note: Optional parts are necessary to connect GZ4 to robot.

Spatter generation



*UP to 80% spatter reduction from 500GB2 to 500GZ4 in 250 A range



- Joint: Fillet • Base metal: Mild steel SPCC (t2.3 mm) • Weld current: 150 A
- Weld speed: 50 cm/min • Wire size: 1.2 mm (YM-50MT)
- Shielding gas: MAG (80 % Ar + 20 % CO₂)

Full Digital Controlled Welding Machine

FULL DIGITAL

CO₂/MAG/MIG
Welding Machine
Lineup for
High Quality Welds

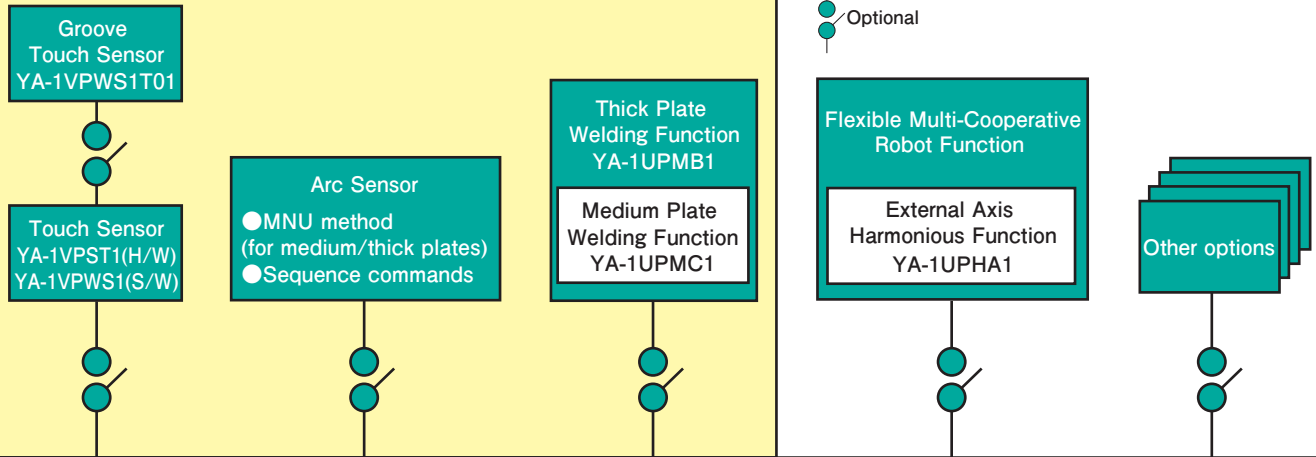


Medium/Thick Plate Welding Robot System (GIII)

Optional Functions Effective for Medium and Thick Plates

Medium/Thick Plate Welding System

Functions effective for medium/thick plate welding



Standard GIII Robot (TS-800/950, TM-1100/1400/1600/1800/2000, TL-1800/2000)

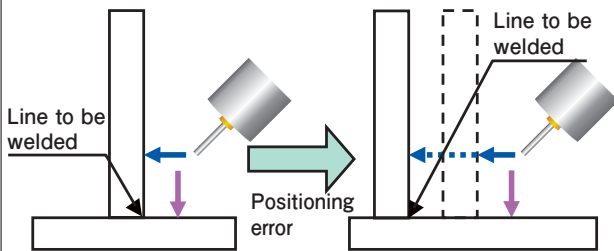
Consult us for details.

Examples

How Touch Sensor works

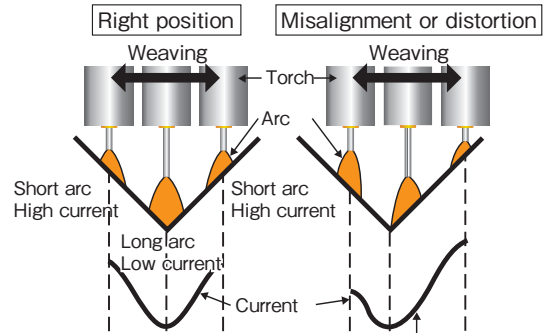
Touches base metal and determines line to be welded.

Detects positioning error and determines line to be welded again.



How Arc Sensor works

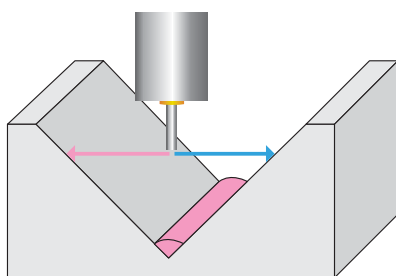
Detects misalignment or distortion and compensates it.



A deviation of weaving center from joint center changes balance of current changes.

Groove Touch Sensor Function

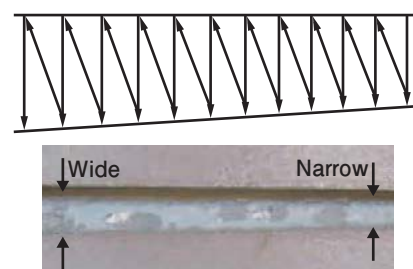
Senses groove width and center, and compensates misalignment.



Variable Weaving Function Thick Plate Welding Function (YA-1UPMB1)

Supports changes of groove width.

Controls deposited metal amount and maintains uniform bead height.



TIG Robot System (GIII)

High Quality Welding
in Combination with
Full Digital Welding Power Source

Robotic TIG welding system selectable to fit your application

Model Selection Guide

Type	Material	Filler wire dia. (mm)	Welding power source	Robot
Autogenous TIG (no filler)	Stainless steel	—	300BZ3	TS-800 TS-950
	Stainless steel Aluminum	—	300BP4 500BP4	TM-1100 TM-1400 TL-1800
Filler TIG	Stainless steel	1.2	300BZ3	TS-800 TS-950
	Stainless steel Aluminum	1.2	300BP4 500BP4	TM-1100 TM-1400 TL-1800
Rotary filler TIG	Stainless steel	1.2	300BZ3	TL-1800
	Stainless steel Aluminum	1.2	300BP4 500BP4	

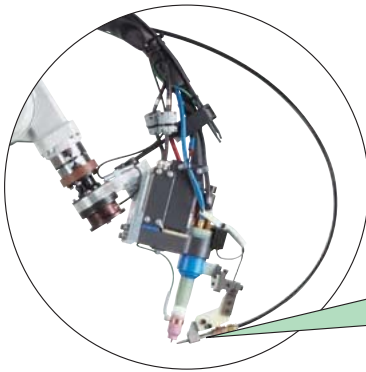
Notes:

- An external axis controller is necessary for rotary filler TIG welding.



Rotary filler TIG Welding Robot System
TL-1800GIII

Features of Rotary TIG Filler Unit



- Optimum welding position
- High precision filler wire feed
- Improved workpiece accessibility

Filler wire tip position is adjustable in all directions.

TIG welding torch lineup



YT-TCT201
• Air-cooled
• 35 % duty cycle at 200 A



YT-TCT401
• Water-cooled
• 60 % duty cycle at 400 A

Full Digital Controlled Welding Machine

Full Digital

TIG Welding Machine Lineup That Offers High Quality Welding

AC/DC TIG welding machine



300BP4



500BP4

DC TIG welding machine



300BZ3

Small Type Arc Welding Robots

TS Series

Payload:
8 kg
TS-800/950



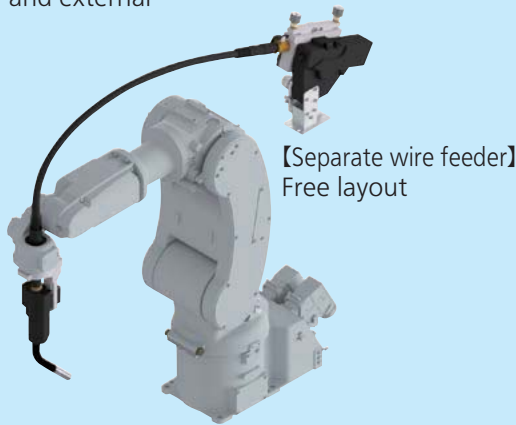
TS-800

TS-950

Various welding styles

【TW axis: Hollow arm】

Torch type selectable between through-arm and external



【Separate wire feeder】
Free layout

Improve small work productivity

●Space saving

48 % smaller footprint

(example of one customer, compared with our TM-1100)

Floor/Wall/Ceiling mount

(Ceiling mount type is special specification.)

●High speed despite 8 kg payload

Maximum motion speed: 540°/s

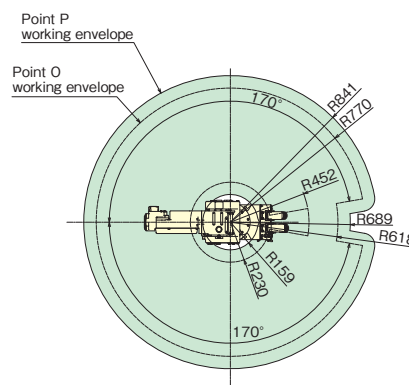
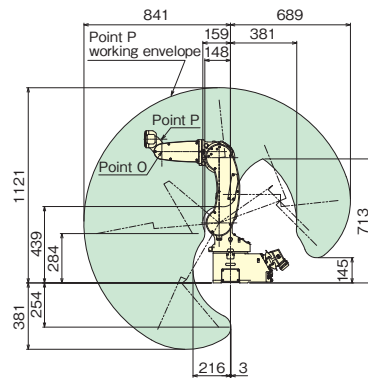
(average for all axes)

Dimensions & Work Envelope

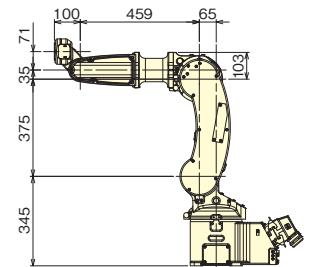
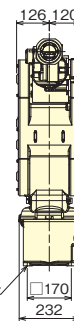
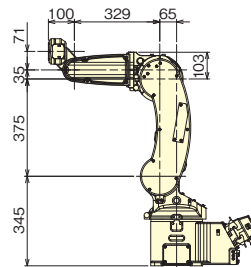
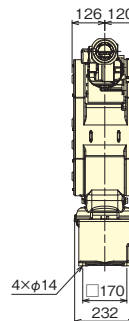
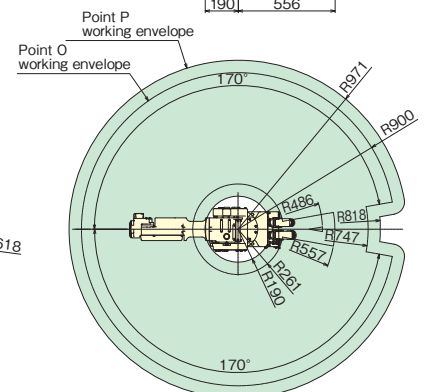
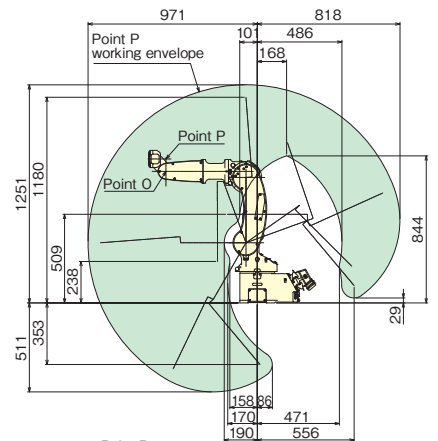
For working envelope of point O, consult us.

(Unit: mm)

Short Type TS-800



Short Type TS-950



Manipulator General Specifications

Model	TS-800	TS-950
Type	Short arm	Short arm
Structure	6 axis articulated	
Payload	8 kg	
Maximum Reach	841 mm	971 mm
Minimum Reach	159 mm	190 mm
Working Range	682 mm	781 mm
Max. Motion Speed	RT (Rotating Trunk)	326°/s
	UA (Upper Arm)	326°/s
	FA (Forearm)	510°/s
	RW (Rotating Wrist)	518°/s
	BW (Bending Wrist)	518°/s
	TW (Twisting Wrist)	1 040°/s
Position Repeatability	±0.05 mm	
Motors	Total Power	2 100 W
	Brakes	All axes
Mounting	Floor/Ceiling*1/Wall*2	
Weight	55 kg	56 kg

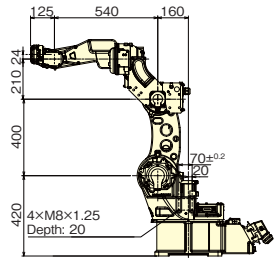
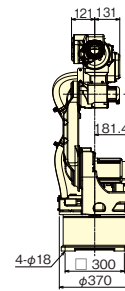
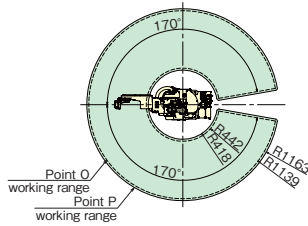
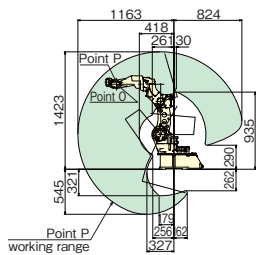
*1: Ceiling mount type is factory optional.

*2: •Setting by service personnel is necessary. •Working range of RT axis is limited.

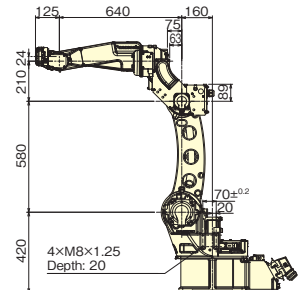
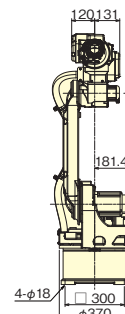
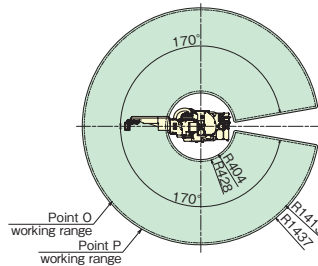
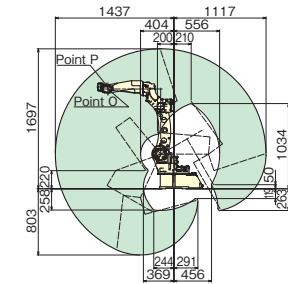
Dimensions & Work Envelope

(Unit: mm)

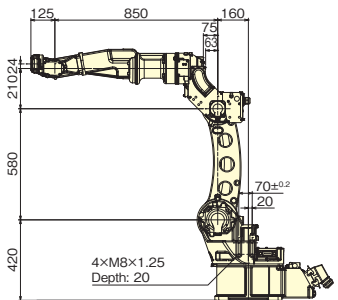
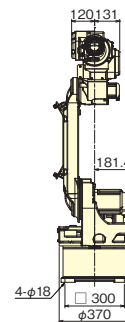
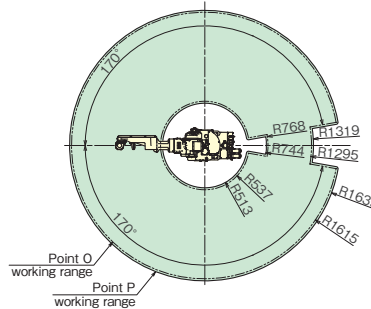
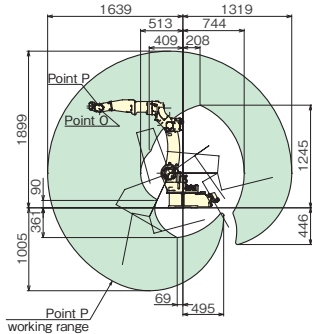
Short Type TM-1100



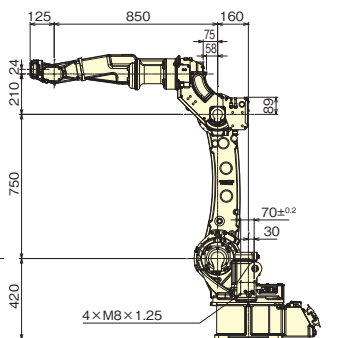
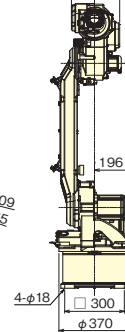
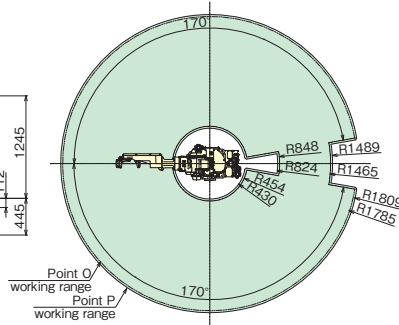
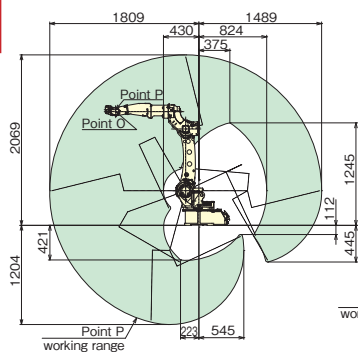
Standard Type TM-1400



Middle Type TM-1600



Long Type TM-1800



Manipulator General Specifications

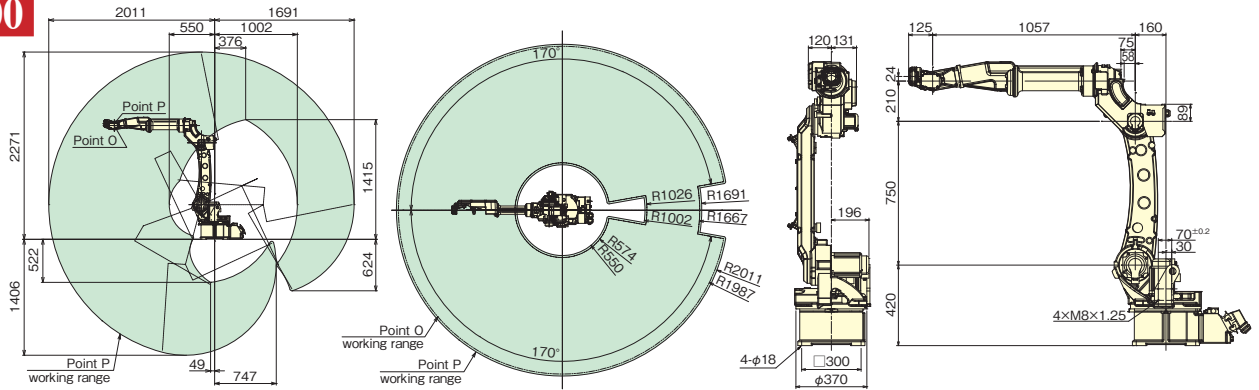
Model	TM-1100	TM-1400	TM-1600	TM-1800	TM-2000	TL-1800	TL-2000	
Type	Short arm	Standard arm	Middle arm	Long arm	Long arm	Long arm	Long arm	
Structure	6 axis articulated							
Payload	6 kg		4 kg	6 kg		8 kg	6 kg	
Maximum Reach	1 163 mm	1 437 mm	1 639 mm	1 809 mm	2 011 mm	1 801 mm	1 999 mm	
Minimum Reach	418 mm	404 mm	513 mm	430 mm	550 mm	383 mm	491 mm	
Working Range	745 mm	1 033 mm	1 126 mm	1 379 mm	1 461 mm	1 418 mm	1 508 mm	
Max. Motion Speed	RT (Rotating trunk)	225°/s		210°/s	195°/s		195°/s	
	UA (Upper arm)	225°/s		210°/s	197°/s		197°/s	
	FA (Forearm)	225°/s		215°/s	205°/s		205°/s	
	RW (Rotating wrist)	425°/s		425°/s	425°/s		385°/s	
	BW (Bending wrist)	425°/s		425°/s	425°/s		375°/s	
TW (Twisting wrist)	629°/s		629°/s	629°/s		624°/s		
Position Repeatability	±0.08 mm				±0.10 mm		±0.08 mm	±0.15 mm
Motors	Total Power	3 400 W		4 700 W		5 050 W		
	Brakes	All axes						
Mounting	Floor / Ceiling*							
Weight	156 kg	170 kg	180 kg	215 kg	217 kg	215 kg	216 kg	

9 *Ceiling mount type is factory optional.

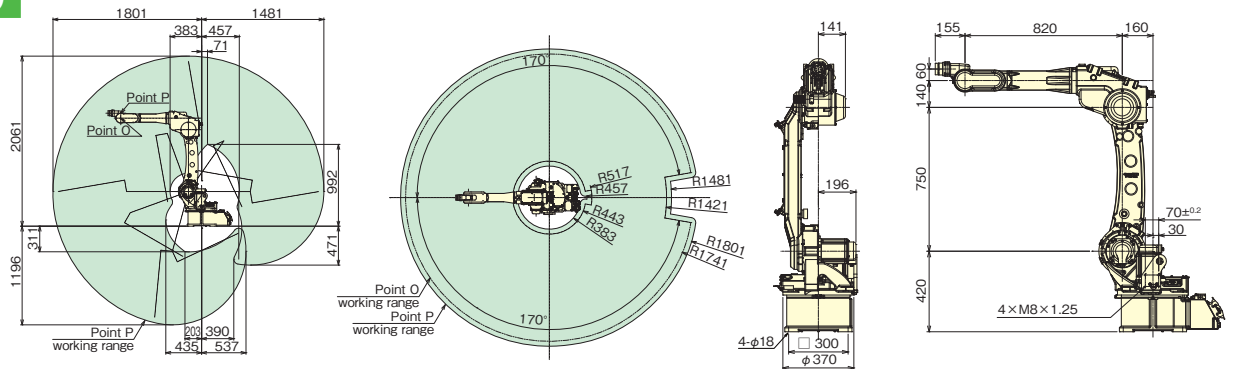
Dimensions & Work Envelope

(Unit: mm)

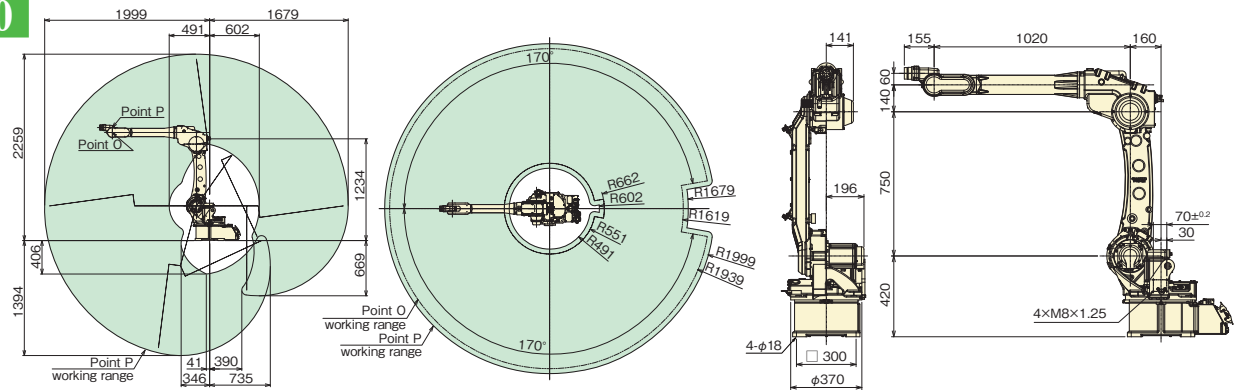
Long Type TM-2000



Long Type TL-1800

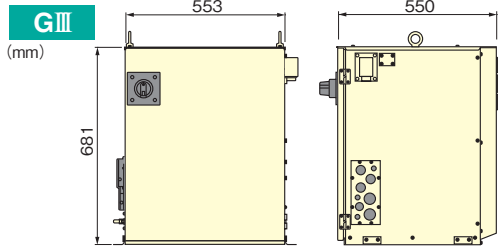


Long Type TL-2000

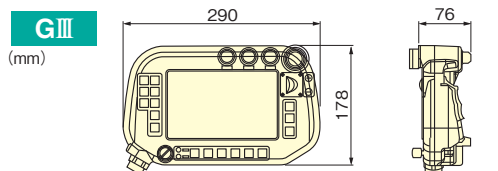


Controller Specifications

Controller



Teach pendant



Model	GIII
Dimensions*1	W 553 mm x D 550 mm x H 681 mm
Weight*2	60 kg
Memory Capacity	40 000 points
Position Control	Software servo control
External Memory	Teach Pendant: one SD memory card slot, Two USB 2.0 ports (USB 2.0 Hi-Speed not supported)
Control Axes	6 axes simultaneously (Max.27 axes)
Input and Output	Input: 40 points (Optionally expandable up to 2048 points) Output: 40 points (Optionally expandable up to 2048 points)
Input Power	3 phase, 200/220 VAC±20 V, 3 kVA, 50/60 Hz

*1: Protruding portions not included.

*2: Teach pendant and connection cables not included.

Large Robot Series (GIII Controller)

**Great material handling capability!
Coordinated multi-robot movement
for flexible system without jig.**

● **Coordinated movement with WGIII/GIII robot(s)**



Allows to build flexible system without jig.

Maximum configuration:
·Arc welding robot x 2
·Large robot x 1

● **GIII controller for large robots**

Same operation, maintenance and options as conventional robots



YS-080GIII

HS-220GIII

■ **Manipulator General Specifications**

Model	YS-080GIII	HS-220GIII		
Type	6 axis articulated robot			
Payload	80 kg	220 kg		
Working Range	RT (Rotating trunk)	±180°	±178°	
	UA (Upper arm)	-80° ~ +155°	-65° ~ +80°	
	FA (Forearm)	Referenced from Horizontal	-140° ~ +230°	-130° ~ +230°
		Referenced from upper arm	-80° ~ +180°	-73° ~ +190°
	RW (Rotating wrist)	±360°	±360°	
	BW (Bending wrist)	±125°	±128°	
	TW (Twisting wrist)	±360°	±360°	
Max. Motion Speed	RT (Rotating trunk)	170°/s	120°/s	
	UA (Upper arm)	140°/s	105°/s	
	FA (Forearm)	160°/s	110°/s	
	RW (Rotating wrist)	230°/s	145°/s	
	BW (Bending wrist)	230°/s	145°/s	
TW (Twisting wrist)	350°/s	220°/s		
Weight	645 kg	955 kg		

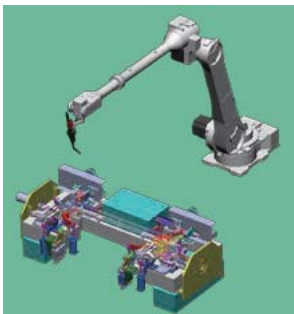
3m ARM WELDING ROBOT

● **Conventional technologies “GIII controller & Wire feeder” are adopted**

High quality welding in combination with Full Digital welding power source

● **Realize the simple system (External axis is unnecessary)**

● **Suitable for larger work (application example)**



for Beam axle type suspension system
【Maximum Reach for Welding : 3 281 mm】



GIII-HH020L

■ **Manipulator General Specifications**

Model	HH020L	
Payload	20 kg	
Structure	6 axis articulated	
Working Range	RT (Rotating trunk)	±180°
	UA (Upper arm)	+180° ~ -65°
	FA (Forearm)	+260° ~ -160°
	RW (Rotating wrist)	±195°
	BW (Bending wrist)	±135°
Max. Motion Speed	TW (Twisting wrist)	±360°
	RT (Rotating trunk)	175°/s
	UA (Upper arm)	175°/s
	FA (Forearm)	180°/s
Speed	RW (Rotating wrist)	360°/s
	BW (Bending wrist)	380°/s
	TW (Twisting wrist)	600°/s
Position Repeatability	±0.15 mm	
Maximum Reach	3 281 mm	
Weight (Approx.)	535 kg	

Tilt-Rotate Positioners High-Speed Type R Series



Two types available:
300 kg and
500 kg payload

- 1.8 times faster maximum speed compared with the conventional models.
- Smallest-in-class footprint of 780 × 500 mm. (300 kg payload model)
- Easier installation with three selectable cable outlet positions.

Specifications

Name		Positioner unit	
Model		YA-1RJC62	YA-1RJC72
Applicable Robot		Panasonic robots TM/TL series with GIII/WGIII controller	
Payload		300 kg	500 kg
Max. Speed	Rotation	190.0°/s (31 r/min)	165.0°/s (27 r/min)
	Tilt	125.5°/s (20 r/min)	90.0°/s (15 r/min)
Operating Range	Rotation	-3 600° to +3 600° (with multi-rotation data reset function)	
	Tilt	-135° to +135°	
Allowable Moment	Rotation	323 N·m	392 N·m
	Tilt	882 N·m	1 274 N·m
Position Repeatability		±0.05 mm (R=250 mm)	
Hollow Shaft Diameter		55 mm	
Allowable Welding Current		500 A @ 60 % duty cycle	
Weight		285 kg	
Applicable Welding Process		CO ₂ /MAG/MIG/TIG	
External Axis Controller Type		Internal/External	

Single-axis positioners

Payload:
250/500 kg



RJB 12/22

Payload:
1000 kg

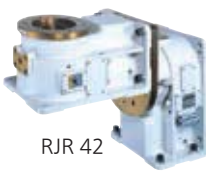


RJB 32

Specifications

Name		Positioner unit		
Model		YA-1RJB12	YA-1RJB22	YA-1RJB32
Applicable Robot		Panasonic robots TM/TL series with GIII/WGIII controller		
Payload		250 kg	500 kg	1 000 kg
Max. Rotational Speed		190°/s (31.6 r/min)	120°/s (20 r/min)	120°/s (20 r/min)
Operating Range		-3 600° to +3 600° (with multi-rotation data reset function)		
Allowable Torque		196 N·m	490 N·m	1 470 N·m
Allowable Moment		1 470 N·m	1 470 N·m	6 125 N·m
Position Repeatability		±0.05 mm (R=250)		
Hollow Shaft Diameter		55 mm	55 mm	75 mm
Brakes		Provided		
Allowable Welding Current		500 A @ 60 % duty cycle		
Weight		125 kg		255 kg
Applicable Welding Process		CO ₂ /MAG/MIG/TIG		
External Axis Controller Type		Internal/External		External

Side mount 2-axis positioners



RJR 42



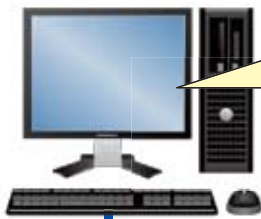
RJR 52

Production Management Function Real-Time Monitoring on PC.

Effective for Monitoring Robot Operation and Production Progress.

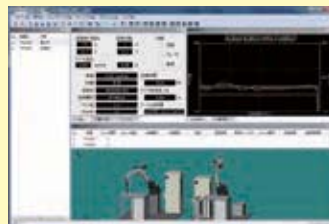


installation
CD



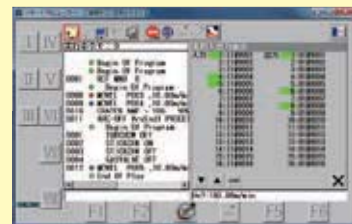
HUB

LAN



Robot operation monitoring

Monitors robot movement and welding waveform in real time, which allows to improve welding posture and conditions.



Remote TP Viewer

Monitors Teach Pendant (TP) screen in real time, which allows to share information away from welding site.

Notes:

- An optional license is necessary for each robot.
- The network environment and devices (including PC) must be prepared by the customer.
- Up to 10 robots can be connected to one PC.
- It is not possible to connect to the external network (e.g., connection from factory LAN to the Internet).
- WGIII, WGHIII, and GIII controllers of software version 20.00 or later are applicable. (TIG is not supported.)

FA Technical Centers

Feel the excellent performance of TAWERS



● Other FATC : Wuhan, Queretaro, Bowin, Jakarta, Hanoi, Detroit, Columbus

Process Development



Process verification prior to system installation.

- Case Examples:
- New factory weld processing
 - Improvement of existing processes
 - Develop new welding solutions

Consulting



Welding and Robot College

We support development of highly skilled welding operators.

- Workshops:
- Robot
 - MAG/MIG
 - TIG
 - Special training

Professional staff offer technical solutions.

- Qualifications:
- Welding coordination personnels (including first class)
 - JIS qualified welding operators
 - Metal materials inspectors
 - International welding license holders



We provide products that are friendly to the environment.

As an earth-friendly company, Panasonic Corporation discourages the use of hazardous substances in our products. The products of Panasonic Corporation comply with the European RoHS directive.

⚠ Safety precautions ● Before attempting to use any welding product always read the manual to ensure correct use.

Panasonic Corporation
Process Automation Business Division, Business Innovation Center
1-1,3-chome,Inazu-cho,Toyonaka,OSAKA 561-0854 **Japan**
TEL: 81-6-6866-8505 FAX: 81-6-6866-0709

Panasonic Smart Factory Solutions Co., Ltd.
Thermal Fabrication System Business Unit
<http://www.panasonic.com/jp/company/psfs.html>

Panasonic Welding Systems (Tangshan) Co., Ltd.
No.9 Qingnan Rd.,Tangshan New & Hi-Tech Industrial Park,
063020 Hebei, **China**
TEL:86-315-320-6060 FAX:86-315-320-6070
<http://pwst.panasonic.cn>

Panasonic Welding Systems India
Industrial Plot No.1, Village Bid Dadri, Jhajjar - 124103,
Haryana, **India**

Panasonic System Solutions Company of North America
1701 Golf Road, Suite 3-1200 Rolling Meadows, IL 60008 **USA**
TEL:1-847-637-9700 FAX:1-847-637-9601
<http://www.panasonicfa.com>

Panasonic Industry Europe GmbH
Jagenbergstr 11a, D-41468 Neuss **Germany**
TEL:49-2131-60899-0 FAX:49-2131-60899-200
<http://eu.industrial.panasonic.com/>

Panasonic Industrial Devices Sales(Thailand) Co., Ltd.
252/133 Muang Thai-Phatra Complex Building, 31st Fl.
Rachadaphisek Rd., Huaykwang, Bangkok 10320 **Thailand**
TEL:662-693-3421 FAX:662-693-3427

●Specifications are subject to change without notice.

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