Separate Through-Arm External

Selectable from Three Torch Types

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

Payload on Wrist Axis
TL-1800: 8 kg
TL-2000: 6 kg

TL Manipulators with Long Arm & High Payload
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

**TL series**
- Long-arm & high payload!

**Manipulator Lineup (as of September 2016)**

<table>
<thead>
<tr>
<th></th>
<th>TM series</th>
<th>TL series</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1100</td>
<td>1400</td>
</tr>
<tr>
<td>Separate</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Through-Arm</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>External</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Payload</td>
<td>6 kg</td>
<td>4 kg</td>
</tr>
</tbody>
</table>

**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 (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!
- [Option] Internal Flexible Conduit (for wire feed)**
- Manipulator-Controller cable (control)
- Manipulator-Controller cable (motor power)
- Welding power cable
- Gas hose (with valve)

**For use with drum packing wire only.**
Selectable from Three Torch Types. Focused on Wire Feedability and Reduced Cable Interference.

In addition to Through-Arm Type and External Type,

A third choice—Separate Type

High Wire Feedability
Less Cable Interference

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

Feature 1  External Flexible Conduit

[Conventional Type]
Torch cable

Flexible conduit
(for wire)

[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

Suppresses twist of wire!

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.

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.
**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**

"Weld Navigation" reduces parameter setting time.

**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.

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.

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

**Cooperative Multi-Robot Control**
Allows cooperative control between two robots.
CO₂/MAG/MIG welding robot system selectable to fit your application

Full Digital CO₂/MAG welding machines GZ4 series

(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

Good bead appearance and low spatter even in high speed welding

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

MAG welding (220 A)
- Joint: Fillet  
- Base metal: Mild steel SPCC (t:2.3 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(t:1.5 mm)  
- Weld current: 180 A
- Weld speed: 80 cm/min  
- Wire size: 1.2 mm (Y308Ls)
- Shielding gas: MIG (85 % Ar + 5 % O₂)

Full Digital Controlled Welding Machine

CO₂/MAG/MIG Welding Machine Lineup for High Quality Welds
## Medium/Thick Plate Welding System

### Functions effective for medium/thick plate welding

- **Groove Touch Sensor**
  - YA-1UPST1K01

- **Touch Sensor**
  - YA-1UPST1K04
  - MNU method (for medium/thick plates)
  - Sequence commands

- **Arc Sensor**

- **Thick Plate Welding Function**
  - YA-1UPMB1

- **Medium Plate Welding Function**
  - YA-1UPMC1

- **Flexible Multi-Cooperative Robot Function**
  - External Axis Harmonious Function
  - YA-1UPHA1

- **Other options**


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.

#### 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.

### Diagrams

- Right position
  - Weaving
  - Torch
  - Arc
  - Line to be welded

- Misalignment or distortion
  - Weaving
  - Short arc
  - High current
  - Long arc
  - Low current
  - A deviation of weaving center from joint center changes balance of current changes.
Robotic TIG welding system selectable to fit your application

Model Selection Guide

<table>
<thead>
<tr>
<th>Type</th>
<th>Material</th>
<th>Filler wire dia. (mm)</th>
<th>Welding power source</th>
<th>Robot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autogenous TIG (no filler)</td>
<td>Stainless steel</td>
<td>—</td>
<td>300BZ3</td>
<td>TM-1100</td>
</tr>
<tr>
<td></td>
<td>Stainless steel</td>
<td>—</td>
<td>300BP4 500BP4</td>
<td>TM-1400 TL-1800</td>
</tr>
<tr>
<td>Filler TIG</td>
<td>Stainless steel</td>
<td>(0.9)/1.2/(1.6)</td>
<td>300BZ3</td>
<td>TM-1100</td>
</tr>
<tr>
<td></td>
<td>Stainless steel</td>
<td>(0.9)/1.2/(1.6)</td>
<td>300BP4 500BP4</td>
<td>TM-1400 TL-1800</td>
</tr>
<tr>
<td>Rotary filler TIG</td>
<td>Stainless steel</td>
<td>(0.9)/1.2/(1.6)</td>
<td>300BZ3</td>
<td>TL-1800</td>
</tr>
<tr>
<td></td>
<td>Stainless steel</td>
<td>(0.9)/1.2/(1.6)</td>
<td>300BP4 500BP4</td>
<td>TL-1800</td>
</tr>
</tbody>
</table>

Notes:
- An external axis controller is necessary for rotary filler TIG welding.
- Diameters in [ ] are available with optional parts.

Features of Rotary TIG Filler Unit
- Optimum welding position
- High precision filler wire feed
- Improved workpiece accessibility

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
- TIG Welding Machine Lineup
  - That Offers High Quality Welding

AC/DC TIG welding machine
- 300BP4
- 500BP4

DC TIG welding machine
- 300BZ3
# Dimensions & Work Envelope

**Short Type**  
**TM-1100**

**Standard Type**  
**TM-1400**

**Middle Type**  
**TM-1600**

**Long Type**  
**TM-1800**

---

### Manipulator General Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Short arm</td>
<td>Standard arm</td>
<td>Middle arm</td>
<td>Long arm</td>
<td>Long arm</td>
<td>Long arm</td>
<td>Long arm</td>
</tr>
<tr>
<td>Structure</td>
<td>6 axis articulated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payload</td>
<td>6 kg</td>
<td>4 kg</td>
<td>6 kg</td>
<td>8 kg</td>
<td>6 kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum Reach</td>
<td>1 163 mm</td>
<td>1 437 mm</td>
<td>1 639 mm</td>
<td>1 809 mm</td>
<td>2 011 mm</td>
<td>1 801 mm</td>
<td>1 999 mm</td>
</tr>
<tr>
<td>Minimum Reach</td>
<td>418 mm</td>
<td>404 mm</td>
<td>513 mm</td>
<td>430 mm</td>
<td>550 mm</td>
<td>383 mm</td>
<td>491 mm</td>
</tr>
<tr>
<td>Working Range</td>
<td>745 mm</td>
<td>1 033 mm</td>
<td>1 126 mm</td>
<td>1 379 mm</td>
<td>1 461 mm</td>
<td>1 418 mm</td>
<td>1 508 mm</td>
</tr>
<tr>
<td>Max. Speed (Rotating trunk)</td>
<td>225°/s</td>
<td>210°/s</td>
<td>195°/s</td>
<td>195°/s</td>
<td>197°/s</td>
<td>197°/s</td>
<td>197°/s</td>
</tr>
<tr>
<td>Max. Speed (Upper arm)</td>
<td>225°/s</td>
<td>210°/s</td>
<td>197°/s</td>
<td>197°/s</td>
<td>205°/s</td>
<td>205°/s</td>
<td>205°/s</td>
</tr>
<tr>
<td>Max. Speed (Rotating wrist)</td>
<td>425°/s</td>
<td>425°/s</td>
<td>425°/s</td>
<td>425°/s</td>
<td>425°/s</td>
<td>425°/s</td>
<td>425°/s</td>
</tr>
<tr>
<td>Max. Speed (Bending wrist)</td>
<td>629°/s</td>
<td>629°/s</td>
<td>629°/s</td>
<td>629°/s</td>
<td>629°/s</td>
<td>629°/s</td>
<td>629°/s</td>
</tr>
<tr>
<td>Position Repeatability</td>
<td>±0.08 mm</td>
<td>±0.10 mm</td>
<td>±0.08 mm</td>
<td>±0.15 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motors</td>
<td>Total Power</td>
<td>3 400 W</td>
<td>4 700 W</td>
<td>5 050 W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brakes</td>
<td>All axes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting</td>
<td>Floor / Ceiling*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Weight</td>
<td>156 kg</td>
<td>170 kg</td>
<td>180 kg</td>
<td>215 kg</td>
<td>217 kg</td>
<td>215 kg</td>
<td>216 kg</td>
</tr>
</tbody>
</table>

*Ceiling mount type is factory optional.
**Controller Specifications**

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

---

<sup>1</sup> Protruding portions not included.

<sup>2</sup> Teach pendant and connection cables not included.
Great material handling capability! Coordinated multi-robot movement for flexible system without jig.

### Manipulator General Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>YS-080GIII</th>
<th>HS-220GIII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>6 axis articulated robot</td>
<td>6 axis articulated robot</td>
</tr>
<tr>
<td>Payload</td>
<td>80 kg</td>
<td>220 kg</td>
</tr>
<tr>
<td>RT (Rotating trunk)</td>
<td>±180°</td>
<td>±178°</td>
</tr>
<tr>
<td>UA (Upper arm)</td>
<td>-80° ~ +15°</td>
<td>-65° ~ +80°</td>
</tr>
<tr>
<td>FA (Forearm)</td>
<td>Referenced from Horizontal</td>
<td>Referenced from upper arm</td>
</tr>
<tr>
<td>RW (Rotating wrist)</td>
<td>±360°</td>
<td>±360°</td>
</tr>
<tr>
<td>BW (Bending wrist)</td>
<td>±125°</td>
<td>±128°</td>
</tr>
<tr>
<td>TW (Twisting wrist)</td>
<td>±360°</td>
<td>±360°</td>
</tr>
<tr>
<td>RT (Rotating trunk)</td>
<td>170/s</td>
<td>120/s</td>
</tr>
<tr>
<td>UA (Upper arm)</td>
<td>140/s</td>
<td>105/s</td>
</tr>
<tr>
<td>FA (Forearm)</td>
<td>160/s</td>
<td>110/s</td>
</tr>
<tr>
<td>RW (Rotating wrist)</td>
<td>230/s</td>
<td>145/s</td>
</tr>
<tr>
<td>BW (Bending wrist)</td>
<td>230/s</td>
<td>145/s</td>
</tr>
<tr>
<td>TW (Twisting wrist)</td>
<td>350/s</td>
<td>220/s</td>
</tr>
<tr>
<td>Weight</td>
<td>645 kg</td>
<td>955 kg</td>
</tr>
</tbody>
</table>

### Specifications

<table>
<thead>
<tr>
<th>Name</th>
<th>YS-080GIII</th>
<th>HS-220GIII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>YA-1RJC62</td>
<td>YA-1RJC72</td>
</tr>
<tr>
<td>Applicable Robot</td>
<td>Panasonic robots TM/TL series with GIII/WG controller</td>
<td>Panasonic robots TM/TL series with GIII/WG controller</td>
</tr>
<tr>
<td>Payload</td>
<td>300 kg</td>
<td>500 kg</td>
</tr>
<tr>
<td>Max. Speed</td>
<td>Rotation</td>
<td>190.0°/s (31 r/min)</td>
</tr>
<tr>
<td></td>
<td>Tilt</td>
<td>125.5°/s (20 r/min)</td>
</tr>
<tr>
<td>Operating Range</td>
<td>Rotation</td>
<td>-3600° to +3600° (with multi-rotation data reset function)</td>
</tr>
<tr>
<td></td>
<td>Tilt</td>
<td>-</td>
</tr>
<tr>
<td>Allowable Moment</td>
<td>Rotation</td>
<td>323 N·m</td>
</tr>
<tr>
<td></td>
<td>Tilt</td>
<td>882 N·m</td>
</tr>
<tr>
<td>Position Repeatability</td>
<td>±0.05 mm (R=250 mm)</td>
<td>±0.05 mm (R=250 mm)</td>
</tr>
<tr>
<td>Hollow Shaft Diameter</td>
<td>55 mm</td>
<td>55 mm</td>
</tr>
<tr>
<td>Allowable Welding Current</td>
<td>500 A @ 60 % duty cycle</td>
<td>500 A @ 60 % duty cycle</td>
</tr>
<tr>
<td>Weight</td>
<td>285 kg</td>
<td>285 kg</td>
</tr>
<tr>
<td>Applicable Welding Process</td>
<td>CO2/MAG/MIG/TIG</td>
<td>CO2/MAG/MIG/TIG</td>
</tr>
<tr>
<td>External Axis Controller Type</td>
<td>Internal/Internal</td>
<td>Internal/Internal</td>
</tr>
</tbody>
</table>

### Specifications

<table>
<thead>
<tr>
<th>Name</th>
<th>YS-080GIII</th>
<th>HS-220GIII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>YA-1RJB12</td>
<td>YA-1RJB22</td>
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<tr>
<td>Applicable Robot</td>
<td>Panasonic robots TM/TL series with GIII/WG controller</td>
<td>Panasonic robots TM/TL series with GIII/WG controller</td>
</tr>
<tr>
<td>Payload</td>
<td>250 kg</td>
<td>500 kg</td>
</tr>
<tr>
<td>Max. Rotational Speed</td>
<td>190°/s (31.6 r/min)</td>
<td>120°/s (20 r/min)</td>
</tr>
<tr>
<td>Operating Range</td>
<td>-3600° to +3600° (with multi-rotation data reset function)</td>
<td>-135° to +135°</td>
</tr>
<tr>
<td>Allowable Torque</td>
<td>196 N·m</td>
<td>490 N·m</td>
</tr>
<tr>
<td>Allowable Moment</td>
<td>1 470 N·m</td>
<td>1 470 N·m</td>
</tr>
<tr>
<td>Position Repeatability</td>
<td>±0.05 mm (R=250)</td>
<td>±0.05 mm (R=250)</td>
</tr>
<tr>
<td>Hollow Shaft Diameter</td>
<td>55 mm</td>
<td>55 mm</td>
</tr>
<tr>
<td>Brakes</td>
<td>Provided</td>
<td>Provided</td>
</tr>
<tr>
<td>Allowable Welding Current</td>
<td>500 A @ 60 % duty cycle</td>
<td>500 A @ 60 % duty cycle</td>
</tr>
<tr>
<td>Weight</td>
<td>125 kg</td>
<td>255 kg</td>
</tr>
<tr>
<td>Applicable Welding Process</td>
<td>CO2/MAG/MIG/TIG</td>
<td>CO2/MAG/MIG/TIG</td>
</tr>
<tr>
<td>External Axis Controller Type</td>
<td>Internal/Internal</td>
<td>Internal/Internal</td>
</tr>
</tbody>
</table>
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.

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TEL: 81-6-6866-8505 FAX: 81-6-6866-0709

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http://www.panasonicfa.com

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TEL:49-2131-60899-0 FAX:49-2131-60899-200
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TEL:662-693-3421 FAX:662-693-3427

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