Superior Operational Performance and Welding Quality

Maximum Speed Comparison

Improved Manipulator Performance for Shorter Cycle Times

Significant increase to the maximum speeds for the individual manipulator axes allow for even higher productivity than previous models.

Reliable Arc Start Performance for Absolute Welding Quality

The All Series provides a smooth approach to the welding start point, resulting in improved welding quality.

Conventional Method RS Control

Short circuit immediately after arc start causes part of the wire tip to be flicked away, causing insufficient weld metal.

⦾ Combine with a Compact Servo Torch for the “Ultimate Arc Start”, resulting in even higher welding performance.

Welding current: 150A
Welding voltage: 16.5V
Welding speed: 100cm/min
DL350, Compact Servo Torch and RS Control (optional) used

Wire: A4043 / 1.6 mm (0.016"
Wire Feed Rate: 5 m/min (197 IPM)
Base Metal Thickness: A1050/ 3 mm (0.118"
Welding Speed: 50 cm/min (19.7 IPM)
Gas: 100% Ar
RS Control (optional) used
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AII-B4
Simple, Slim Design is Ideal for Arc Welding – the Fastest Robot in the Industry.

Reduced Rear Interference Radius
Rear extension reduced 3.54" (90 mm) from previous model, allowing a more space-saving installation.

Servo Shock Sensor
Interference detection sensitivity improved by 40% (from previous model) and control provided for decreasing the interference force, thus reducing collision damage.

Built-in Cable Storage
Neat cable layout prevents them from getting caught during robot operation.

New Shock Sensor Torch
Liner clamping mechanism reduces deviation of wire position caused by changes in the posture of the robot.
A metal jacket has been added to further strengthen the torch body.

Cantilever Structure
Provides Ease of Maintenance
The cantilever structure of the upper arm allows complete access to the coaxial cable for easy maintenance and service.

Built-in Coaxial Cable
Provides Stable Wire
Built-in power cable reduces wire bending, resulting in smooth, stable wire feeding and improved weld quality.

Easy Teaching with Built-in Power Cable
Interference of the coaxial cable is minimized even with complicated workpiece shapes or fixtures, allowing smoother approaches and teaching for natural welding positions.

Ideal for Offline Teaching
Since coaxial cable is routed inside the arm, cable interference is no longer a factor to consider during offline teaching with a PC. This allows easier adoption of the offline program to the actual workpiece.
Through-arm Cable Design Provides Incredible Welding Performance, Operability and Maintainability for the Ideal Arc Welding Solution.

Two Arm Lengths available: Standard and Long Reach
From small to large workpieces, our robots can meet your application needs.

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**AII-V6**

A Highly Versatile Manipulator for All Welding Applications.

---

**Improved Maintainability**
Robots can now be greased while the torch is mounted. Standardized motors between different robot models reduces the number of service parts.

**Slim Arm Width**
The width of the upper arm has been reduced from 5.51" to 5.28" (139 mm to 134 mm) – easing interference in tight spaces.

**Improved Dustproof and Waterproof Design Equivalent to IP54 (5/6 axes)**
The AII-V6 utilizes a completely sealed structure, preventing droplets in any direction from causing adverse effects.

**Servo Shock Sensor**
Interference detection sensitivity improved by 40% (from previous model) and control provided for easing the interference force, thus reducing collision damage.

**New Shock Sensor Torch**
Liner clamping mechanism reduces deviation of wire position caused by changes in the posture of the robot.

A metal jacket has been added to further strengthen the torch body.

---

**Increased Payload Capacity**
Payload capacity has been increased to 44.1 lbs. (20 kg), providing support for a wider variety of handling applications.
AII-V20

Adaptable to Various Applications. Suitable for handling light articles as well as arc welding applications.

Large Payload Capacity
13.2 lbs. (6 kg) payload capacity supports all welding applications including CO2/MAG, MIG and TIG.

Increased Payload Capacity
Payload capacity has been increased to 44.1 lbs. (20 kg), providing support for a wider variety of handling applications.

Advanced Operational Performance
Highly accurate positional repeatability is ±0.003” (0.07 mm). Wrist allowable moment has been improved by 20% over the previous model – provides high operational performance even when welding thick plates that require weaving.

Ideal for Ceiling Mounting
The working range at the back of the manipulator has been increased for easier ceiling mounting.

Two Arm Lengths available: Standard and Long Reach
From small to large workpieces, our robots can meet your application needs.

Increased Payload Capacity
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**AX21**

**Cabinet features Improved Resistance to Heat and Dustproofing and Improved Reliability in Global Environments.**

---

**PC-based management for compatibility with various applications**

The AX21 controller can be used with a wide variety of applications, including arc welding, spot welding and material handling, addressing all kinds of needs in production processes.

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**Controller with Higher Reliability and Maintainability**

Improved cooling efficiency and dustproofing provides reliable use in severe environments, including production lines with high duty cycles and high-temperature and high-humidity areas.

- Easier addition of external axes than previous model.

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**Two-point Tool Length Setting Function**

- Simple one-button tool correction

This process eliminates the need for adjustment with torch gauge, significantly reducing robot down time.

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**Simple and quick maintenance functions**

**Robot Diagnostic Tool**

AX21 features improved maintainability by modularization of parts and simplified cable wiring. Users can check preventive maintenance and abnormality diagnosis with the optional Robot Diagnostic Tool.

**Automatic Calibration Function**

- Torch Deviation is Automatically Detected and Calibrated

A deviation detection program can be run at regular intervals to see if there is any error. If deviation is detected, the calibration program is automatically run for correction.

This prevents weld failure due to deviation, thereby helping reduce weld failure rates.
Fully-equipped with Functions Ensuring Absolute Quality

**Arc Data Monitor Function**

©Welding conditions monitored via teach pendant
Monitor welding current, welding voltage, wire feed load, etc. on the teach pendant. Connecting a DL350 additionally shows spatter suppression rates.

© Increased Sampling Frequency Provides Higher Detection Accuracy
The process is used to detect instantaneous arc outages, arc outages in short tack welding, etc.

**Welding Characteristic Data Automatic Adjustment Function**

Adjustments are made so that the actual welding current/voltage will be output in the conditions as taught by accounting for differences in the welding environment such as changes in wire extension.

**Reduction of Pauses During Welding**

With the previous model, arc outage during welding caused the robot to pause.

AX21 allows automatic restoration of robot operation under predefined conditions, such as the restart position and number of restarts.

Helps reduce system construction costs

**Software PLC Function**

© Software PLC function for decrease of devices
Interface PLC with line control panel, which is provided by user, can be significantly simplified – reducing your system cost.

**Simplified wiring by field network compatibility**

For I/O interface with line control panel, field networks such as DeviceNet and CC-Link can be used on top of relay contacts, allowing wiring cost reduction by simplified wiring and flexible system construction according to the user’s needs.
User-Friendly Teach Pendant Provides Full Control for High Productivity and Optimal Welding Performance.

**Multi-Window Display Function**
Multi-window display function allows display information of up to four windows.

**Function Keys for Simple Operation**
Assign frequently used instructions from simple icon instructions.

**Improved Operability via Dedicated Keys**
Teaching time reduced by dedicated keys, including P, L, C, AS, WS, Input and Output.

**Visual Operation**
Intuitive icon menu is easy to understand.

**3-position Dead Man Switch**

**High-resolution, large color display**
640 x 480 dot VGA TFT LCD display

**Reduced Number of Operations**
Features like our Dedicated Keys, Seam Coordinate System, and Speed Collective Conversion reduce the overall number of key strokes required to program.

**Visualized teaching items**
Teaching items such as welding and weaving conditions are visualized for ultimate ease of setting.

**Visual teaching input assistance**

Further Simplified Teaching

Weaving start instruction teaching screen
User-friendly Operation

Simple & speedy operation functions

☉ Seam coordinate system
Use of seam coordinate system allows movement in the direction of seam or wire extension simply by single-axis operation of the teach pendant.

☉ Editing History Display
Task programs and items of welding condition editing history can be sorted by date/time and program, allowing simple viewing of who edited what.

Management Functions

☉ Weld Failure Management Function
Search and sort functions allow quick, accurate identification of causes of pauses due to weld failure for improved productivity.

Rich functions including:
● Sort by Program  ● Sort by Step

☉ User Inspection Function
Notifies operator of periodic robot inspections or part replacements via teach pendant message display or external output signal, which can be used for preventive maintenance of robot.

Advanced Interface

Touch Panel Teach Pendant

☉ Operate Tooling Switches via the Teach Pendant
Indicators and switches, previously located on the operation panel, can also be assigned to the teaching pendant.

Synchromotion

☉ Operate Tooling Switches via the Teach Pendant
Indicators and switches, previously located on the operation panel, can also be assigned to the teaching pendant.

Multi-Synchromotion
Synchromotion on multiple stations

Twin Synchromotion
Simultaneous synchromotion of two welding robots

Jigless Synchromotion
Synchromotion between material handling and welding robots
Manipulator Working Range

*The figures below show working ranges of P-point with no torch mounted.
AII-V6
Standard

AII-V6 L
Long Reach

P-point Working Range

*The figures below show working ranges of P-point with no torch mounted.
Manipulator Working Range/Specifications

*The figures below show working ranges of P-point with no torch mounted.

### AII-V20

#### Standard

<table>
<thead>
<tr>
<th>Item</th>
<th>AII-B4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Number</td>
<td>Vertical articulated type</td>
</tr>
<tr>
<td>Structure</td>
<td>6</td>
</tr>
<tr>
<td>Number of Axes</td>
<td>8.82 lbs. (4 kg)</td>
</tr>
<tr>
<td>Maximum Payload</td>
<td>±.003&quot; (0.08 mm) (Note 1)</td>
</tr>
<tr>
<td>Capacity</td>
<td>AC Servo Motor</td>
</tr>
<tr>
<td>Positional Repeatability</td>
<td>2550 W</td>
</tr>
<tr>
<td>Driving Capacity</td>
<td>Absolute Encoder</td>
</tr>
<tr>
<td>Installation Method</td>
<td>±170° (±50°) (Note 2)</td>
</tr>
<tr>
<td>Positional Data</td>
<td>3.66 rad/s (210%/s) (3.32 rad/s (180%/s) (Note 2)</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>J1 (Rotation)</td>
</tr>
<tr>
<td>Arm</td>
<td>3.66 rad/s (210%/s)</td>
</tr>
<tr>
<td>J2 (Lower arm)</td>
<td>3.66 rad/s (210%/s)</td>
</tr>
<tr>
<td>J3 (Upper arm)</td>
<td>7.33 rad/s (420%/s)</td>
</tr>
<tr>
<td>J4 (Swing)</td>
<td>7.33 rad/s (420%/s)</td>
</tr>
<tr>
<td>Wrist</td>
<td>J5 (Bending)</td>
</tr>
<tr>
<td>J5 (Bending)</td>
<td>10.50 rad/s (600%/s)</td>
</tr>
<tr>
<td>J6 (Twist)</td>
<td>±205° (Note 5)</td>
</tr>
<tr>
<td>Wrist</td>
<td>3.66 rad/s (210%/s)</td>
</tr>
<tr>
<td>J4 (Swing)</td>
<td>3.66 rad/s (210%/s)</td>
</tr>
<tr>
<td>J5 (Bending)</td>
<td>7.33 rad/s (420%/s)</td>
</tr>
<tr>
<td>J6 (Twist)</td>
<td>7.33 rad/s (420%/s)</td>
</tr>
<tr>
<td>Wrist Allowable Load</td>
<td>J4 (Swing)</td>
</tr>
<tr>
<td>Allowable Moment</td>
<td>10.1 N•m</td>
</tr>
<tr>
<td>J5 (Bending)</td>
<td>10.1 N•m</td>
</tr>
<tr>
<td>J6 (Twist)</td>
<td>2.94 N•m</td>
</tr>
<tr>
<td>Arm Cross-sectional Area</td>
<td>0.38 kg•m²</td>
</tr>
<tr>
<td>Ambient Temperature/Humidity</td>
<td>0.38 kg•m²</td>
</tr>
<tr>
<td>Mass (weight)</td>
<td>0.03 kg•m²</td>
</tr>
<tr>
<td>Upper Arm Maximum Carrying Capacity</td>
<td>2.84 m² × 340°</td>
</tr>
<tr>
<td>Installation Method</td>
<td>0 ~ 45°C, 20 ~ 80% RH (55°C Condensation)</td>
</tr>
<tr>
<td>Origin Return</td>
<td>375 lbs. (170 kg)</td>
</tr>
<tr>
<td>Paint Color</td>
<td>22.05 lbs (10 kg) (Note 3)</td>
</tr>
<tr>
<td>Floor/Ceiling/Wall-mounted</td>
<td>Not Necessary (Note 4)</td>
</tr>
<tr>
<td>Arm: white / Base: blue</td>
<td></td>
</tr>
</tbody>
</table>
Manipulator Working Range/Specifications

**P-point Working Range**

- **19.69” (500 mm)**
- **56.50” (1435 mm)**
- **20.67” (525 mm)**
- **5.91” (150 mm)**
- **29.92” (760 mm)**
- **7.28” (185 mm)**
- **18.39” (467 mm)**
- **52.76” (1340 mm)**

**Working Range**

<table>
<thead>
<tr>
<th>Specification</th>
<th>AII-B4L</th>
<th>AII-V6</th>
<th>AII-V6L</th>
<th>AII-V20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Speed</td>
<td>3.66 rad/s (210°/s)</td>
<td>3.66 rad/s (210°/s)</td>
<td>3.66 rad/s (210°/s)</td>
<td>3.49 rad/s (200°/s)</td>
</tr>
<tr>
<td>Wrist Allowable Load</td>
<td>10.82 rad/s (620°/s)</td>
<td>11.8 N•m</td>
<td>11.8 N•m</td>
<td>11.8 N•m</td>
</tr>
<tr>
<td>Upper Arm Maximum Carrying Capacity</td>
<td>2.94 m² × 340°</td>
<td>9.8 N•m</td>
<td>9.8 N•m</td>
<td>9.8 N•m</td>
</tr>
<tr>
<td>Ambient Temperature/Humidity</td>
<td>-155° ~ +100°</td>
<td>-170° ~ +190°</td>
<td>±170° (±50°) (Note 2)</td>
<td>±170° (±50°) (Note 2)</td>
</tr>
<tr>
<td>Installation Method</td>
<td>3.05 rad/s (175°/s) (Note 2)</td>
<td>3.14 rad/s (180°/s)</td>
<td>±155°</td>
<td>±155°</td>
</tr>
<tr>
<td>Positional Repeatability</td>
<td>3.40 rad/s (195°/s)</td>
<td>3.40 rad/s (195°/s)</td>
<td>3.40 rad/s (195°/s)</td>
<td>3.49 rad/s (200°/s)</td>
</tr>
<tr>
<td></td>
<td>(3.32 rad/s (180°/s))</td>
<td>(3.32 rad/s (180°/s))</td>
<td>(3.32 rad/s (180°/s))</td>
<td>(3.32 rad/s (180°/s))</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
1. Measured value obtained after sufficient repetition of automatic operation for stabilizing conditions of manipulator operation with upper arm maximum carrying capacity.
2. The value shown in ( ) indicates wall-mounted conditions.
3. When the output flange of the wrist axis is loaded with maximum payload capacity.
4. The value shown in ( ) indicates wall-mounted conditions.
5. Working range of J6 axis may be restricted by the position of J5 axis.
6. Working range of J2 axis may be restricted when wall-mounted.
7. Working range of J3 axis is restricted to ±170° to ±205° for floor-mounted welding applications.
8. These specifications are subject to change without prior notice.
Basic Configuration

<table>
<thead>
<tr>
<th>Number and Part Name</th>
<th>Model</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Manipulator</strong></td>
<td>AI-V6</td>
<td></td>
</tr>
<tr>
<td>06:60; NV61</td>
<td>1. Standard C: Welding cable equipment option</td>
<td></td>
</tr>
<tr>
<td>06:60; NV61</td>
<td>2. Japanese: R: Overseas(English)</td>
<td></td>
</tr>
<tr>
<td>06:60; NV61</td>
<td>3. Forced C: Ceiling mounted W: Wall-mounted</td>
<td></td>
</tr>
<tr>
<td>06:60; NV61</td>
<td>4. Japanese C: UL compliant</td>
<td></td>
</tr>
<tr>
<td><strong>2. Controller</strong></td>
<td>AX21</td>
<td></td>
</tr>
<tr>
<td>06:60; AX21</td>
<td>1. Japanese: C: CE certified U: UL certified W: CE/UL certified</td>
<td></td>
</tr>
<tr>
<td>06:60; AX21</td>
<td>2. NV6, NB4 (type of connected manipulator)</td>
<td></td>
</tr>
<tr>
<td>06:60; AX21</td>
<td>3. No external axis 1: 1 external axis 2: 2 external axes (type of connected manipulator)</td>
<td></td>
</tr>
<tr>
<td><strong>3. Teach pendant</strong></td>
<td>A2TPDNSN</td>
<td></td>
</tr>
<tr>
<td><strong>4. Operation Box</strong></td>
<td>AXOP</td>
<td></td>
</tr>
<tr>
<td><strong>5. Control cable 1/2</strong></td>
<td>A2RB</td>
<td></td>
</tr>
</tbody>
</table>

**CO2/MAG Welding Torches**

**Shock Sensor Torch**

Best selling CO2/MAG torch compatible with built-in shock sensor

**Forced Pressurized Power Feeding Torch (TCC Torch)**

Improved welding quality due to stabilized power fed wire.

**Compact Servo Torch**

AC servo motor provides stable wire feeding for high accuracy and high quality.

Inverter Series

True digital welding machines designed meet all of your robotic arc welding needs