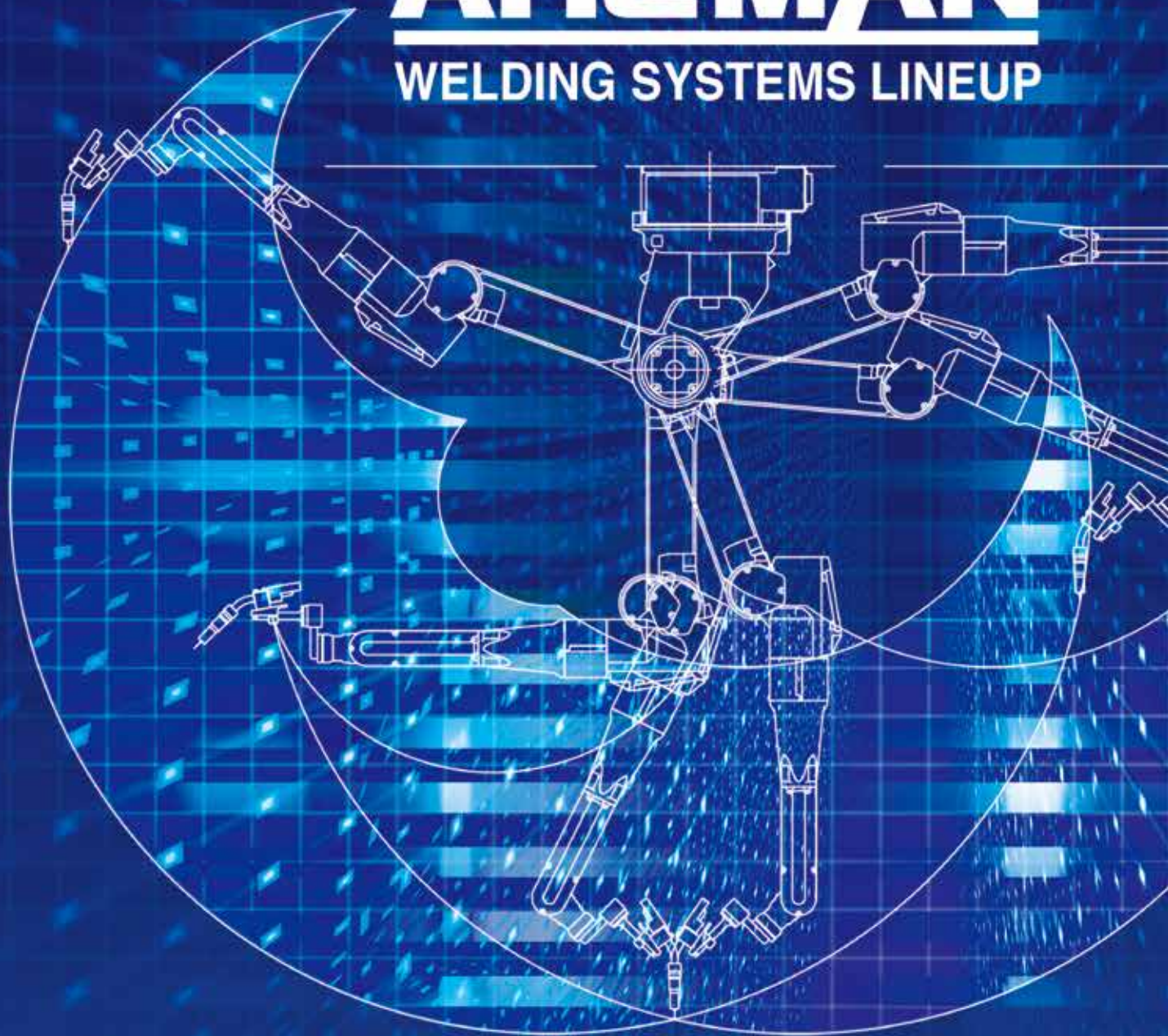


KOBELCO

WELDING ROBOT

ARC MAN™

WELDING SYSTEMS LINEUP



KOBE STEEL, LTD.

WELDING ROBOT
ARCMAN™
WELDING
SYSTEMS
LINEUP



ARCMAN™ improves the quality of welding work.

- Detects changes in conditions during welding work and compensates for these changes in real time.
- Equipped with a weaving function that ensures deep weld penetration.
- Optimal welding conditions for each pass can be set.



ARCMAN™ contributes to the reduction of welding work costs.

- Able to perform both tandem welding or single welding thereby maintaining a high operating ratio
- Able to perform multi-layer welding in each direction thereby shortening the welding time.
- Coordinated motion function (ARCMAN™ Motion) enables working in tandem with the positioner thereby reducing robot teaching time.



CONSTRUCTION MACHINERY

Swing Frame – ①



Arm – ②



Center Frame – ③



Boom – ④



Vertical position weld appearance (Example) ①



Bead appearance (Example) ③

- ① • The operations of the four robots are coordinated in order to achieve a significant reduction in welding time.
- Welding can be performed vertically thus eliminating the need for positioners and workpiece clamping jigs.
- ② • Our groove-width tracking function compensates for variations in groove width during welding and regulates the amount of deposited metal to achieve higher quality welds.

- Tracking the groove width also reduces the number of sensing points required.
- ③ • Tandem welding reduces the cycle time by about 40% compared to single welding.
- Controlling the welding conditions for the leading and trailing wires is easy and ensures that the weld bead surface is smooth and there is sufficient weld penetration.
- This is a simple configuration featuring a long arm ARCMAN™ robot without a slider.
- ④ • High efficiency is achieved with a drop-axis positioner which positions the work in the optimum welding position for inclined welding seams using an overhead-suspended tandem welding robot configuration.
- This configurations reduces the working space needed and can be used for both small and large assemblies.

BRIDGES AND WATER GATES

Bridge and Water Gates – ⑤



Twin Gantry Type System for Bridge Panel – ⑥



- ⑤ • This configuration employs a long arm robot with a compact carriage which can handle the welding of main girders having widths up to 3m.
- Two-dimensional CAD data can be converted to three-dimensional data to enable teaching data to be created automatically using proprietary software.

- ⑥ • A pair of robots mounted in opposing positions to achieve a highly-efficient twin welding configuration. Good-shaped weld beads can be achieved even for box welding.
- Functions for monitor-less operation to enable continuous automatic welding.

Bead appearance (Typical)

Shipbuilding

Large Assembly Welding System – ⑦



ARC MAN™ A30

- ⑦ • Automatic vertical upward welding within the confined space of a ship's hull block made possible by a miniature ARCMAN™ robot mounted on a robot-carry.
- By integrating the data from 3D models with our automatic programming software "SMART TEACHING™" manual programming is not required.
- 30% improvement in welding speed over conventional vertical upward welding wire whilst keeping the weldability of horizontal fillet welding using FAMILIARC™ DW-100R special FCW and new control features.



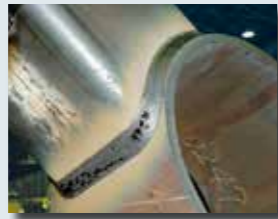
Examples of ARCMAN™ being applied for production

RAILROAD CARS

Truck Part - ①



- High quality good-shaped weld beads can be achieved with three-dimensional welding seams using a see-saw type positioner with coordinated control function and groove-width tracking function.



Vertical position weld appearance (Example)

Truck Frame



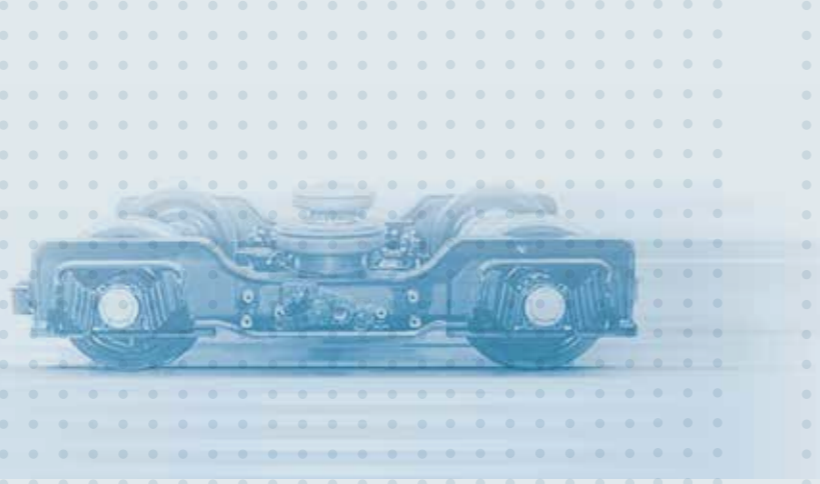
Bead appearance (Example)

- The vertical motion axis of a drop-axis positioner enable the elevation of the work to be set lower.
- ARCMAN™ Off-line Teaching System can efficiently generate teaching data for complicated assemblies.

Truck Part - ②



ARC MAN™ MP with drop-axis two-motion axis positioner (rotation and tilt)



OTHER MACHINERY PARTS

Press Machine/Frame

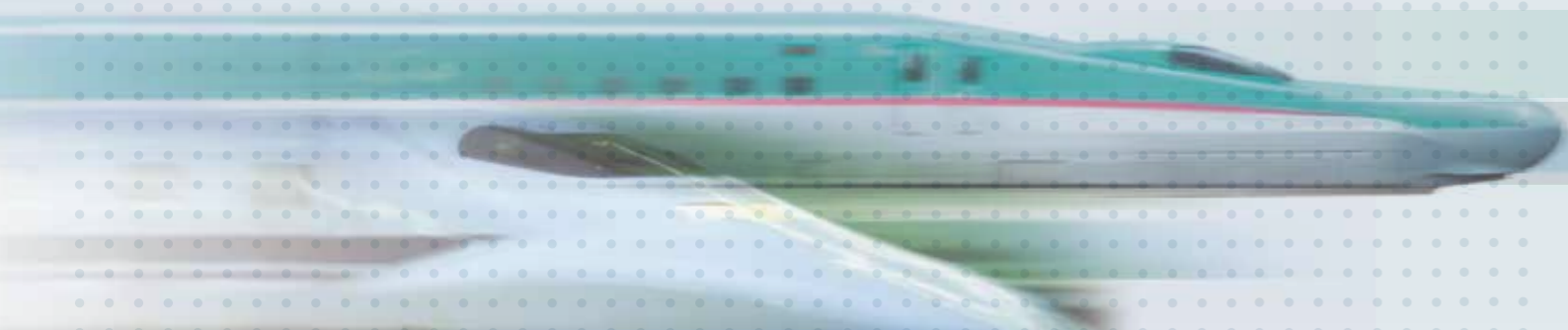
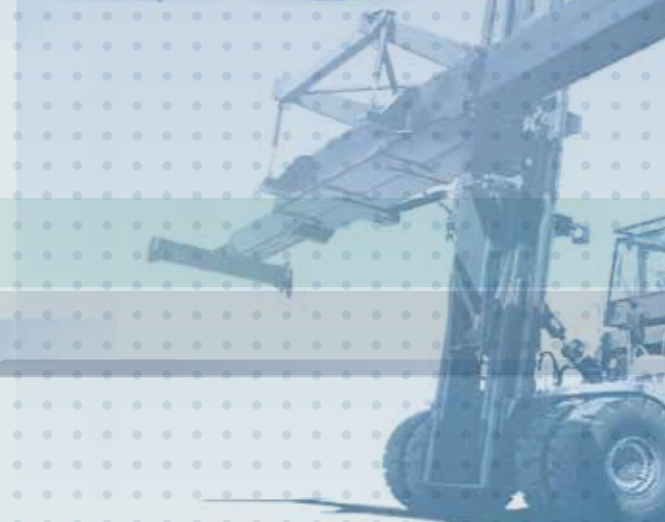
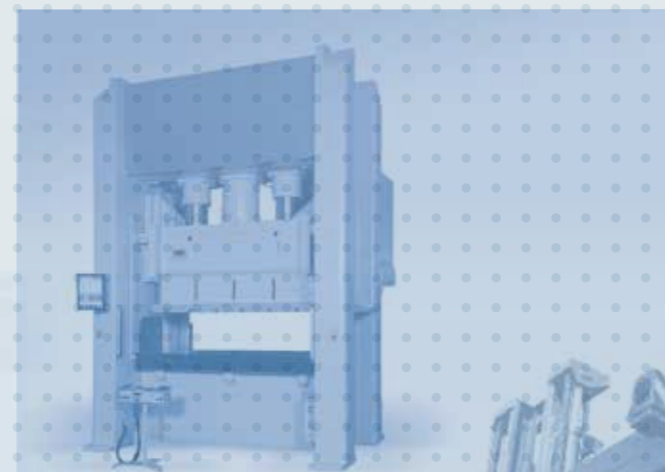
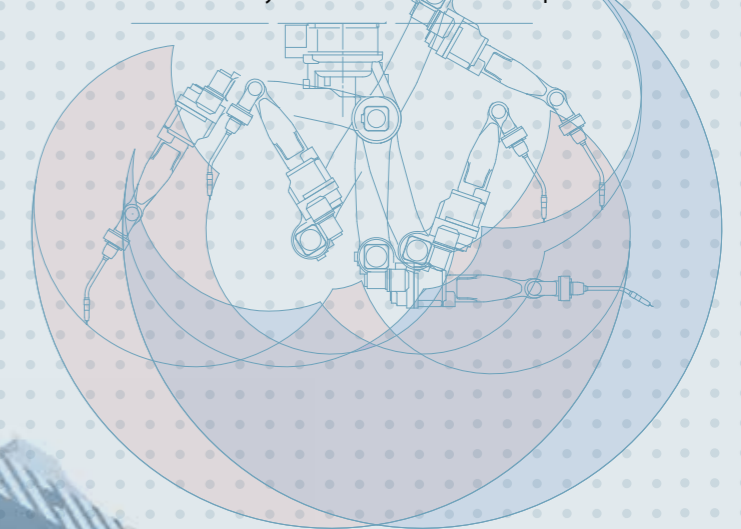


- Utilizing three-dimensional CAD data, ARCMAN™ Off-line Teaching System can easily generate teaching programs for assemblies with specific and diversified designs.
- Our compact tandem torch enables multi-pass welding of weld grooves up to a maximum depth of 80mm thereby significantly reducing welding time.

Forklift Parts/Mast Supports

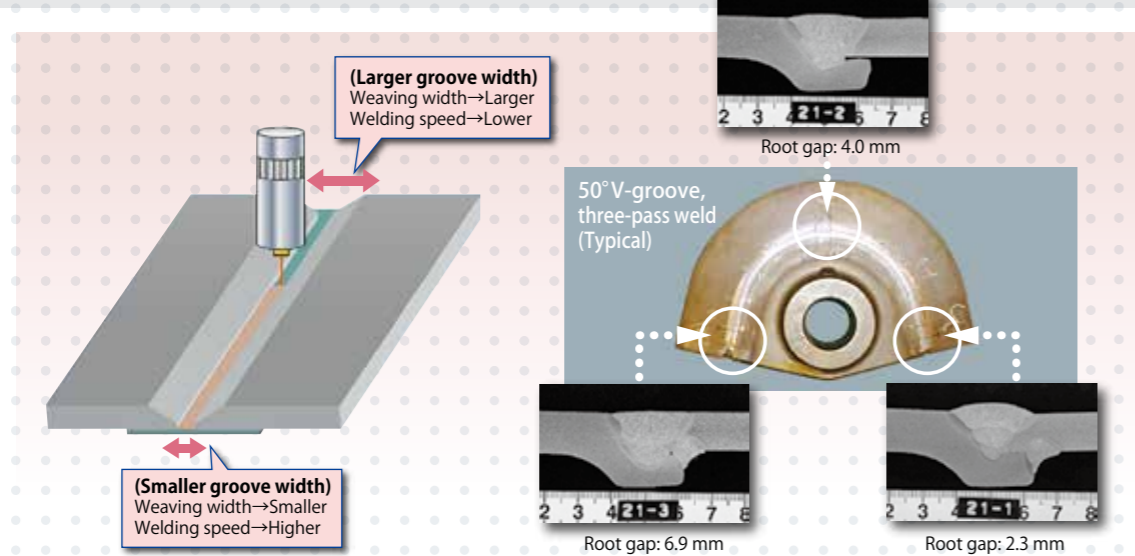


- This configuration enables higher operational efficiency of a single wire system using a pair of opposing positioners.
- The operator can operate the positioners semi-automatically to complete a residual welding seam whilst the assembly is still mounted on the positioner.



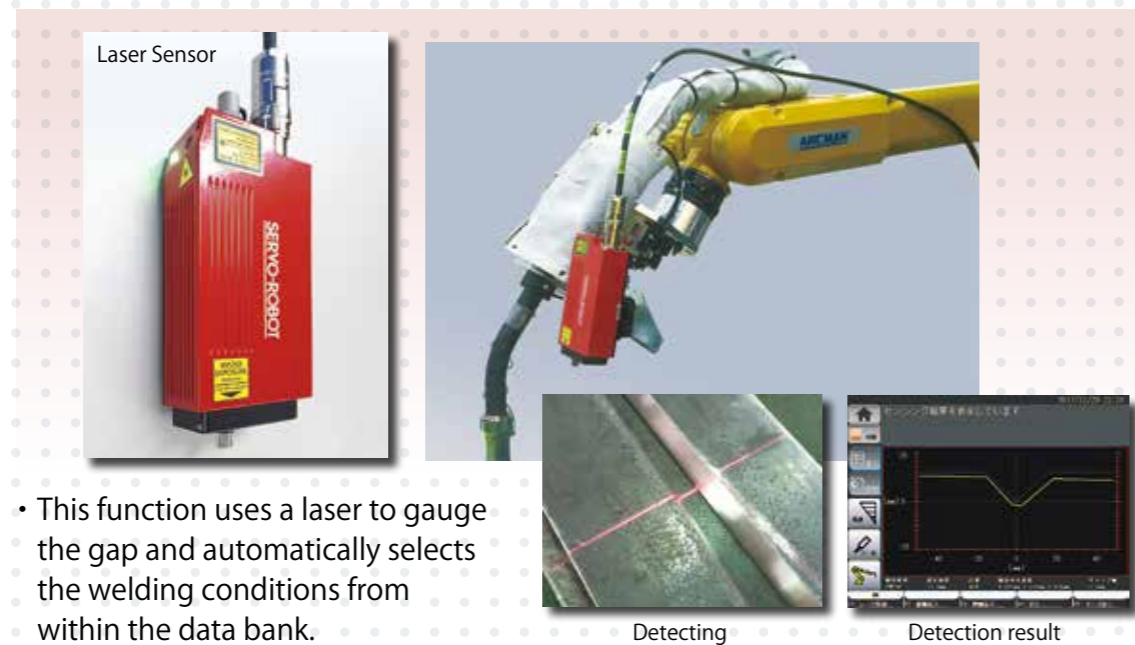
ARCMAN™ improves the quality of welding work.

Groove-Width Tracking



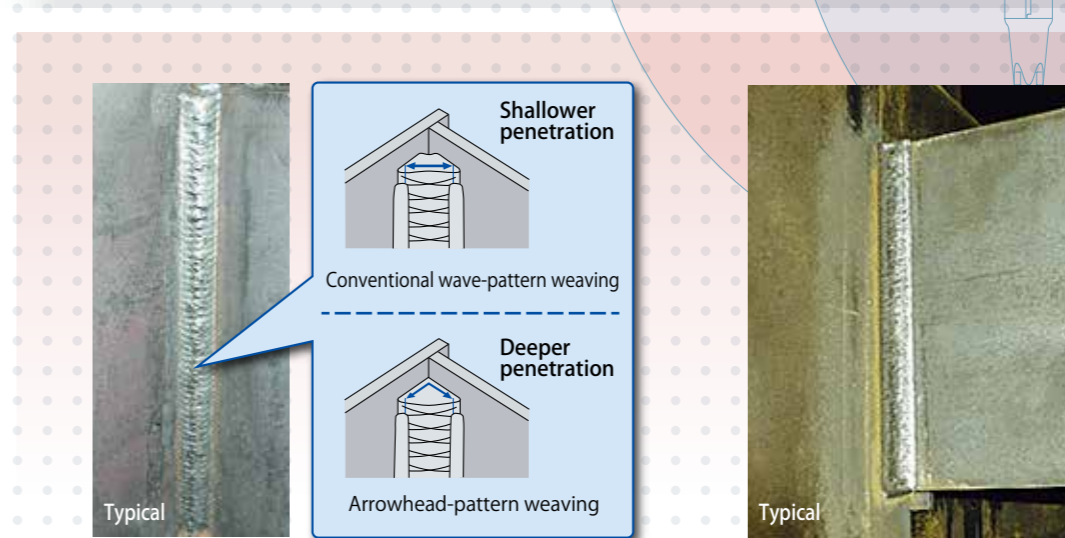
- The weaving width and welding speed can be corrected based on the real time groove width variations detected. This reduces the number of sensing points thereby contributing to cycle time reduction.
- The height of weld reinforcements can be made uniform and the bead width of the cover pass can be regulated.

Laser Root-Gap Detection System



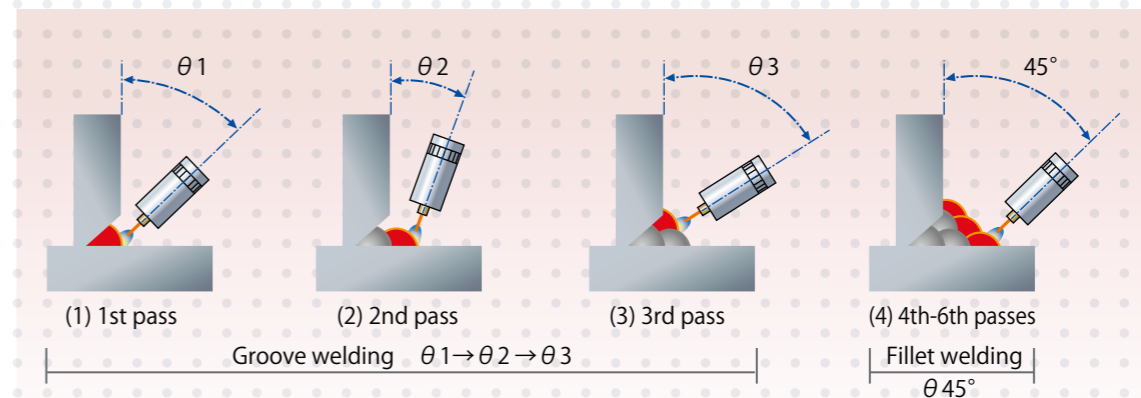
- This function uses a laser to gauge the gap and automatically selects the welding conditions from within the data bank.
- This function enables the number of weld pass, the necessity to change the aiming position of wire and whether it would be possible to weld based on the measurements of the gap.

Arrowhead-Pattern Weaving Function



- Applicable for vertical-up welding.
- Can be used together with the arc sensor.
- Applicable also for second passes and beyond in multi-pass welding.

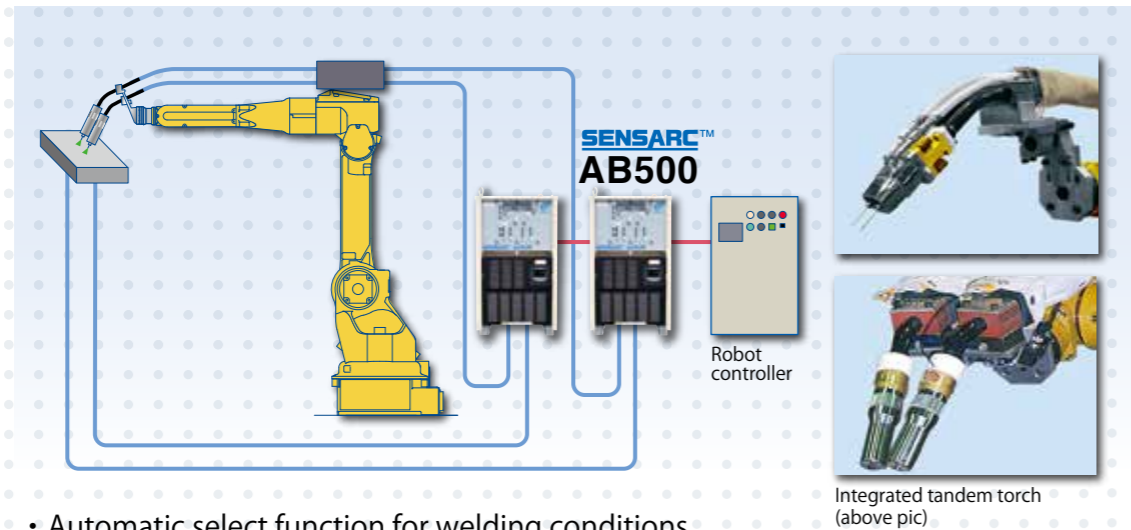
Data Bank Function and Pass-by-Pass Torch Angle Setting Function



- Up to 499 types of unique welding conditions can be registered.
- With this function, teaching will be for the weld start and weld end points only. The optimum torch angle can be set for each weld pass.
- Applicable also for tandem welding.

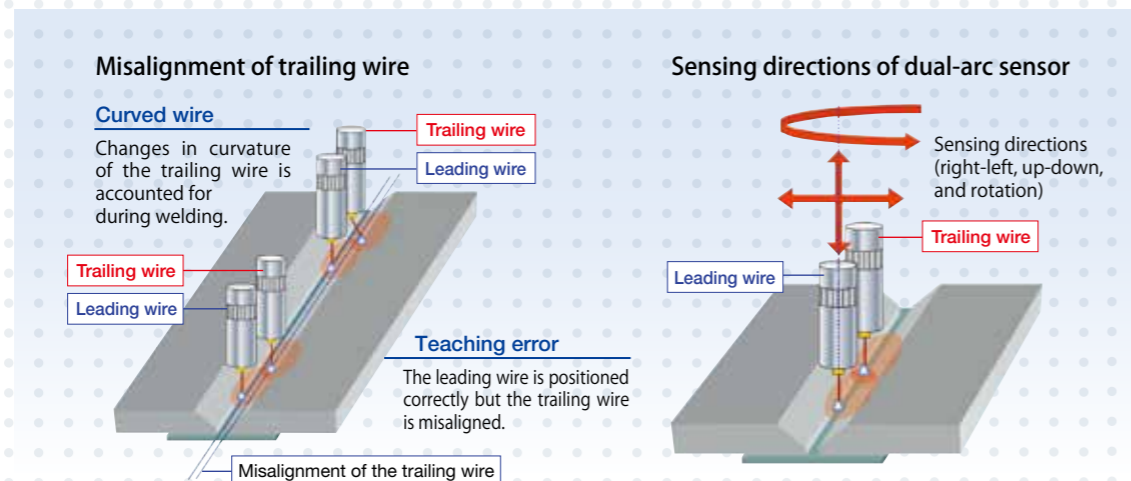
ARCMAN™ contributes to the reduction of welding work costs.

■ Tandem Arc Welding System



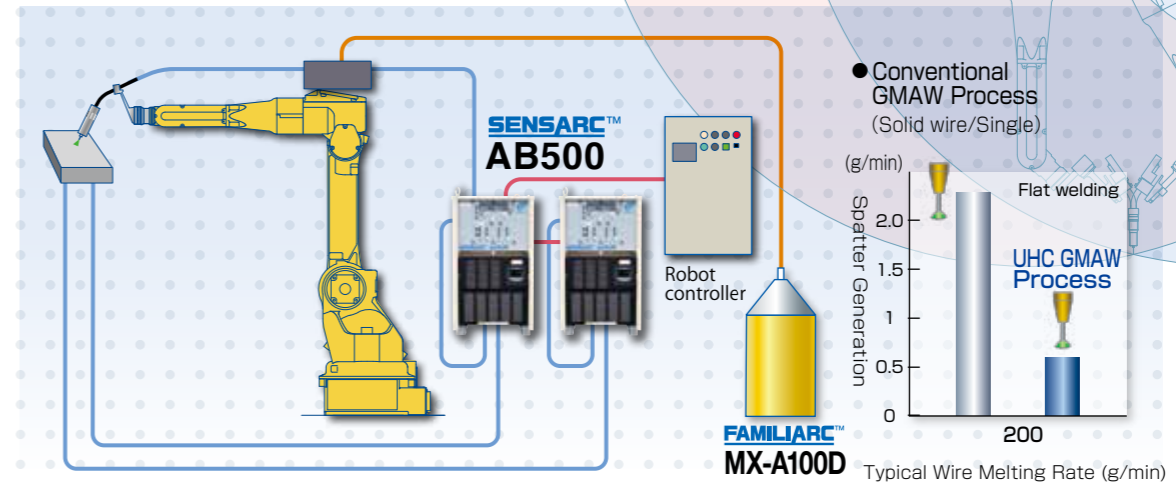
- Automatic select function for welding conditions
Once the type of groove, plate thickness, or target leg length are set, this function will automatically select the optimum welding parameters.
- Data bank for welding conditions
Welding conditions for the leading and trailing wires can be verified, edited and stored via the data bank screen.

■ Dual-arc sensor function



- The dual arc sensor detects the difference in the amperage of the leading and the trailing wires and adjusts the alignment of the leading wire as well as correct the misalignment of the trailing wire during welding. The arc sensor will function in the same way even when the leading and trailing wires are reversed. This significantly improves the weld quality and reduces the need for repair welding.

■ Ultra High Current GMAW Welding Process



- 700A-100% output possible with two SENSARC™ AB500 parallelly connected.
- High deposition rate close to that of tandem welding achievable using single wire.
- Through optimum control and use of our FAMILIARC™ MX-A100D special FCAW, droplet transfer is extremely stable even under ultra high current conditions (UHC) resulting in less fume, lower spatter and excellent resistance to porosity defects.
- Possible to attain deep penetration welds.

■ Coordinated Motion Function (ARCMAN™ Motion)



- This function synchronizes and coordinates the movement of the robot and the positioner to maintain a constant welding speed and correct positioning of the work.
- Maintaining the welding groove of the work in the optimal position during welding improves and stabilizes the weld quality.

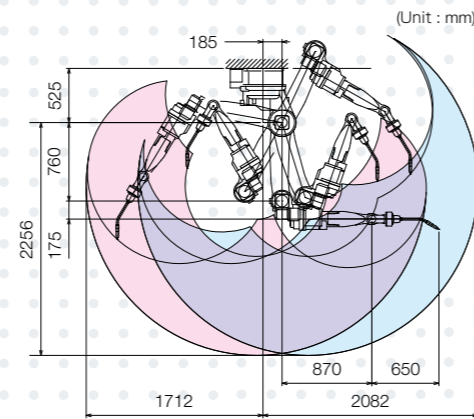


ARCMAN™ Series

Model: ARCMAN™ GS

Features:

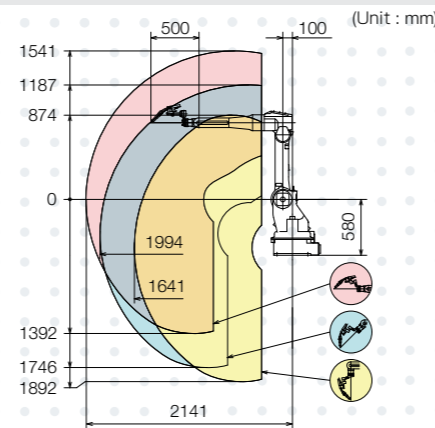
- Cable-in-arm model.
- Two individual models with enclosed cable.
- The 1st model with cables enclosed in the upper arm offers the greatest range of motion in its class.
- The 2nd model with cables enclosed in the wrist can perform both single and tandem welding by switching the welding torch.



Model: ARCMAN™ MP

Features:

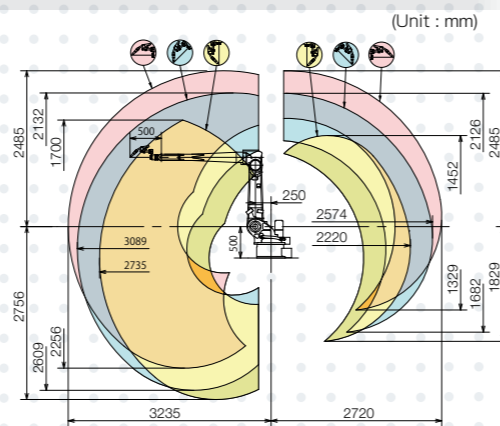
- Standard and most versatile state-of-the-art welding technologies.



Model: ARCMAN™ A80

Features:

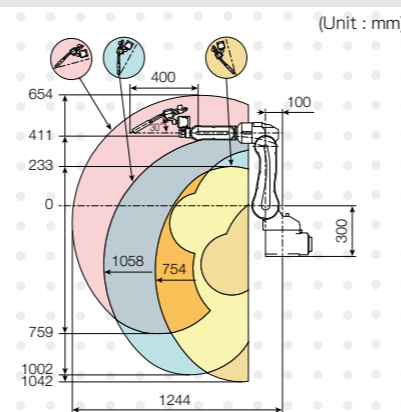
- Due to its long reach and extensive range of motions, the need for a slider could be eliminated or the size of the slider significantly reduced.



Model: ARCMAN™ A30

Features:

- Extremely compact size to cover cramped work areas in conjunction with a slider.



CONTROLLERS

CB-Type Controller



Specifications For CB-Type Controller

External dimensions	600W x 950H x 400D (mm)
Operating conditions	Temperature 0~45°C, Humidity 20~90%
Power supply	AC200V/220V, 3-phase, 50/60Hz
No. of controlled axes	Eighteen (18)
No. of built-in axes	Max. 3 axes, Total : 3.6kW of below (slider 3 axes, positioner 2 axes)
External input/output	Max. 48 ports (input & output)
Internal memory	Programs: upto 9,999; Databank: upto 9,999 entries
Connected devices	Robot : ARCMAN™ MP, GS, A80, A30/A30S Power source : SENSARC™ AB500 and CS500MK2

Specifications of Teaching Pendant

LCD	5.7" Color touch panel, 640 x 480 dots resolution
Cable connection	By connector
External memory	SD memory card
Mass	0.95kg (previous model : 1.1kg)
Language	Japanese, English, Chinese, Korean

Teaching Pendant



- Usability is further improved whilst retaining functionality of the previous model
- Input by way of icons and touch panel is intuitive and easy even for beginners
- More comfortable for operator to hold and manipulate because the pendant is the lightest in its class.



- The function keys of each axis are arranged in a cross to make operation more intuitive.
- Function keys for 3 axes were added to make it easier to operate the axes for the peripherals.

SOFTWARE

ARCMAN™ Off-line Teaching System

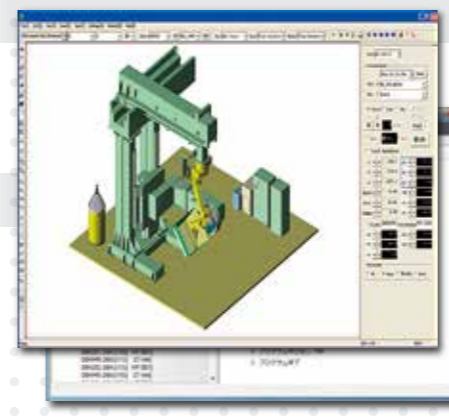
Features:

- Software for retrieving data from different work model.
- Errors in teaching data can be detected.

AP-SUPPORT™ (ARCMAN™ Production Support System)

Features:

- Software program for productivity, weld quality and takt time improvement.
- Help identify possible causes of stoppage problems.
- Automatically records information such as operation data.





WELDING POWER SOURCES



SENSARC™

AB500 (designed for robotic welding)
High-performance digitally-controlled welding power source.

- Suitable for medium to thick plate welding under various welding modes.
- Digital control makes maintenance easier.
- Equipped with our REGARC™ Technology for extra-low spatter CO2 welding process.



SENSARC™

CS500MK2
High-performance CO2/MAG welding power source.

- Unsurpassed performance with instant arc starting.
- Excellent high-speed welding capability.
- Stable arc in low to high current ranges.



SUPPLEMENTARY EQUIPMENT

Automatic nozzle-changing device



Nozzle-cleaning device



Automatic slag-removal device



Plasma cutting torch



We invite you to check for the latest information on our homepage.

KOBE STEEL, LTD.

<http://www.kobelco.co.jp/english/welding/>

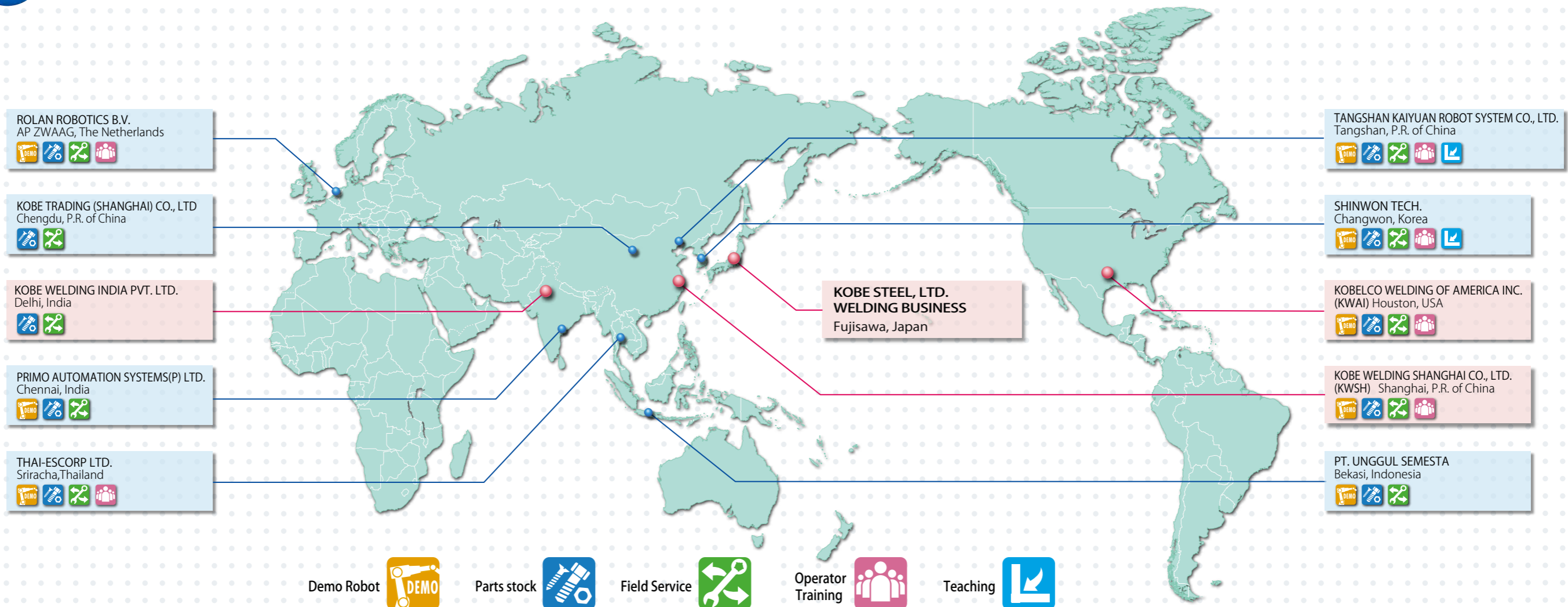


KOBELCO WELDING

<http://www.kobelco-welding.jp/>



GLOBAL NETWORK





WELDING SYSTEMS LINEUP

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