I n April 2016, we started a new business: the sales and delivery of the ARCMAN\textsuperscript{TM} robotic welding systems, power sources, and parts for the North American market. The operation is based at Kobelco Welding of America Inc. (KWAI) located in Houston, Texas.

Although our daily work still consists of trial and error, we are determined to do our best, along with the full cooperation of KWAI staff members, who have a long history and experience in the welding consumable business in the USA.

A new organization, the Robotic & Equipment Division, has been formed at KWAI and will eventually have three staff members. I have been in charge of sales and marketing from the start, while Greg Smith has overseen delivery service since July. An engineer from Japan to be in charge of technical and after service will be stationed here from the second half of 2016.

At the end of August, a robotic system, featuring an ARCMAN\textsuperscript{TM}-MP welding robot and a SENSARC\textsuperscript{TM}-AB500 power source that has had excellent sales results worldwide, together with the new CB type controller that was launched in April, 2016, was installed for live demonstration purposes on the KWAI premises. Because it can cope with both single - and tandem-electrode welding as well as large current MIG welding, diverse work tests and live demonstrations for various customers can be performed. In particular, it enables us to respond to customers involved in welding heavy steel plates, which Kobe Steel’s robotic system particularly excels at.

The targeted industries include construction and agricultural machineries, rolling stock, steel frame fabrication and bridge construction, to which many ARCMAN\textsuperscript{TM} welding robots have been delivered in Japan as well as Asian countries.

Furthermore, Kobe Steel has been developing a new robotic welding system in combination with a new welding consumable aimed exclusively at the North American steel frame fabrication market. We will launch it into the market as soon as it is ready.

While we do understand that the North American market is highly competitive with a number of robot manufacturers, we will do our best to serve our customers by proposing the best - suited total solutions that combine welding robots and consumables with satisfying sales and after services.

We hope that KWT readers will extend your kindest patronage to the new business of robotic welding systems at KWAI.

Reported by:
ichiro(J.D.) Taniguchi,
Sales and Marketing Manager,
Robotic & Equipment Division, KWAI

Focus on welding system business and human resource development

Dear KWT readers! I’d like to express my heartfelt gratitude for your continuous patronage of Kobelco group products.

This year, we have taken steady steps to remain “The world’s most reliable welding solutions company” especially by focusing on the expansion of the welding system business. As the needs for automation and high efficiency continue to increase globally, we have launched a comprehensive welding system business in the USA, by allocating resources for engineering, sales and marketing, as well as a live demonstration robot. This follows on from the sales bases established earlier in China, Korea, ASEAN countries, Europe and India. The industries that the welding system business targets include steel frame fabrication, which we are good at, bridge construction, construction machinery and shipbuilding and will be gradually expanded to others, such as trailer and railway vehicles, harbor cargo cranes and energy related construction work.

The welding system is the key to total welding solutions that contribute to maintaining welding quality and improving the working environment, while also boosting productivity. Therefore, we will bring about higher product quality by pursuing the best combination of new controllers and market-oriented welding consumables as we market the new systems.

Human resource development is also essential in promoting total welding solutions. We have been training sales people to become more familiar with both welding consumables and welding systems so that customers can be sure to rely on them with their inquiries and support needs.

Inside the company, what we think is important for welding solutions is to keep an eye on some aspects not directly related to welding procedures, such as timely fulfillment of deliveries and improvement of packing forms. And outside the company, one example of how we promote safe and efficient welding is that in response to a request from a region, we will hold a short course as well as cooperate with a vocational training school. Dear KWT readers, please let us know your requests through our local sales networks!

It is always our pleasure to be able to see you and exchange opinions at Kobelco booths at the many exhibitions held worldwide. We particularly thank you for your attendance at the exhibition held last April in Osaka, Japan. Next year, the world-largest Essen Fair (held every four years like the Olympics) is going to be held in Germany. We look forward to seeing you there as we’ll be exhibiting the latest technologies and products that will definitely be useful to you.

As for the Olympics held in Rio de Janeiro this year, I believe that you have enjoyed it and cheered your country’s athletes. It will be held in Tokyo four years later, and we will welcome you with O-Mo-Te-Na-Shi hospitality. I look forward to seeing you then!

Koichi (Jay) Sugiyama
General Manager
International Sales & Marketing Section
Welding Business
Kobe Steel Ltd.

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Koichi (Jay) Sugiyama
General Manager
International Sales & Marketing Section
Welding Business
Kobe Steel Ltd.
The new “CB type” controller for the ARCMAN robotic welding system

1. Preface

A new controller, called the “CB type,” for the ARCMAN® series robotic arc welding system has recently been developed by Kobe Steel under the concept that “welding can be carried out from start to finish anywhere in the world.”

How well a robotic welding system performs often depends on the controller, which controls the movement of the robots and peripheral equipment and also has functions that preserve and edit welding procedure data. For welding work comprised of medium and heavy plate thicknesses, such as steel frame and bridge construction, construction machinery and rolling stock, it is necessary to perform multi-pass welding involving repeated instances of overlap welding over long periods of time. The ARCMAN® series robot enables high quality welding due to a well-designed system that utilizes arc sensor as well as vibration control technologies, and, thus, is able to trace any work distortions caused by welding heat.

However, since 2005 when the conventional “CA type” controller was developed, requirements for welding quality and efficiency have tightened, leading us to develop a robot with more complex movements, and a larger capacity for storing and using welding procedure data and history.

The CB type controller, therefore, features high performances as well as simplified programs that respond to the needs of more advanced automated welding. Because teaching can be a time-consuming process, particularly for welding large-sized structures, the pendant has been redesigned to allow easy and comfortable teaching of the robot. Figure 1 shows the CB type controller with the redesigned teaching pendant.

Table 1 shows the main specifications of the CB type controller and new teaching pendant for the controller. See Tables 2 and 3 for a comparison of specifications between the conventional CA type and CB type controllers and their teaching pendants, respectively.

2. Features of the CB type controller

2.1 High performance required for medium and heavy-thick plate welding

Compared with the conventional type, the controlling capacity of the CB type controller is three times higher or more, thanks to faster computing speed and a more accurate arc sensor, and this is expected to increase more in the future.

The internal memory has drastically increased, both in terms of the number of teaching programs it can store (from no. 999 to no. 9,999) as well as the size of the data bank (welding parameter file).

The CB type controller can cope with small lot sizes of various kinds, because while the teaching programs have been subdivided, the optimum welding parameters can be preserved in the controller.

Sensing time has been reduced by 20% (based on an internal test result), while the accuracy of the touch sensing function has been improved, by utilizing a high-grade of model-based control technology. Finally, the CB type controller responds to customer needs by improving productivity with shorter tact time.

2.2 Good operability

The teaching pendant (see Figure 2) has been designed to be light in weight, to have an easily viewable screen and to maintain excellent operability and responsiveness. These are the factors that customers rate most highly.

Figure 2 shows how the remote function keys for robot movements are arranged in a cross pattern that matches the key locations with the directions of robot movement, improving operability during inching and reducing operation error.

2.3 High functions that meet diverse welding demands

2.3.1 Efficient horizontal fillet welding

A new back-and-forth weaving pattern along with conventional right-left weaving (see Figure 5), used in combination with a function that sets arc voltage at both vertical and flat member sides independently, enables a robot to achieve 6 mm leg length with a 1.2 mm dia. solid wire, current as high as 450 amperes, and 700 mm/min speed, while maintaining high quality welds without undercut or overlap. Such work can be applied to welding of small-sized construction machinery, agricultural machinery and truck beds.

While similar horizontal fillet welding can be carried out by the conventional ARCMAN® series robotic welding systems by utilizing the arc sensor function, slower welding speeds are required (applicable leg length from 4 to 8 mm).

2.3.2 More automatic welding functions

The CB type controller comes pre-installed with more than 350 welding parameters and pass-sequence patterns that have been proven useful in actual welding. Therefore, even beginners can safely set up welding parameters. Since users may also add their own parameters, they can build up know-how that can expand to other robotic welding systems.
The new controller can store 20 times the number of robot movements and welding result logs than the conventional one. And it greatly improves productivity by preventing moment stops and by incorporating AP-SUPPORT™, which is the production support software developed by Kobe Steel that visualizes causes of production failure. This system greatly contributes in promoting informatization and visualization in the manufacturing industries.

Teaching programs and welding parameters in the CB type controller provide full backward compatibility to conventional type controllers. Therefore, customers who have already been utilizing the ARCMAN™ series welding systems can update to the latest model in the shortest time.
In this article, the features of the newly developed CB type controller were discussed, together with an example of welding results.

It is expected that welding procedure technology will develop in parallel with further developments of robotic welding systems including controllers, welding power sources and peripheral equipment, leading to the total welding solutions that Kobe Steel always pursues.

Table 1: Main specifications

<table>
<thead>
<tr>
<th>CB type controller</th>
<th>CB type teaching pendant</th>
<th>Conventional pendant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid crystal display</td>
<td>Color touch panel, 640 x 480 (pixels), 5.7 inch</td>
<td>Black &amp; white, 320 x 240 (pixels), 5.7 inch</td>
</tr>
<tr>
<td>Emergency stop</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Enable</td>
<td>2 Nos. max (right-hand side optional)</td>
<td>1 No.</td>
</tr>
<tr>
<td>Switch</td>
<td>Sens “ON”</td>
<td>Nil</td>
</tr>
<tr>
<td></td>
<td>Arc “OK/OK?”</td>
<td>Nil (Key sheet: Yes)</td>
</tr>
<tr>
<td></td>
<td>Pause</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Forward verification on rear side</td>
<td>Yes</td>
</tr>
<tr>
<td>No. of keys</td>
<td>57</td>
<td>53</td>
</tr>
<tr>
<td>Cable connection</td>
<td>Connector connection</td>
<td>Connected directly to printed circuits</td>
</tr>
<tr>
<td>Key durability</td>
<td>Coating &amp; protective sheet</td>
<td>No</td>
</tr>
<tr>
<td>External memory</td>
<td>SD</td>
<td>CF</td>
</tr>
<tr>
<td>Weight</td>
<td>0.95 kg</td>
<td>1.1 kg</td>
</tr>
</tbody>
</table>

Table 2: Comparison of specifications between CB type and conventional (CA type) teaching pendant

<table>
<thead>
<tr>
<th>CB type controller</th>
<th>Conventional type</th>
</tr>
</thead>
<tbody>
<tr>
<td>External dimension (mm)</td>
<td>600 x 950 x 400D</td>
</tr>
<tr>
<td>Operating condition</td>
<td>Temp: 0-45°C, Humidity: 20-90%</td>
</tr>
<tr>
<td>Power source</td>
<td>AC200V / 220V, 3 phase; 50 / 60Hz</td>
</tr>
<tr>
<td>Protective glass</td>
<td>IPS4 (IP40 for fan protection)</td>
</tr>
<tr>
<td>No. of axes to be controlled</td>
<td>18 axes</td>
</tr>
<tr>
<td>No. of built-in axes</td>
<td>3 axes max.; Total 3.6 kw or less (Slider: 3 axes / Positioner: 2 axes)</td>
</tr>
<tr>
<td>Generic Ext./I/O</td>
<td>Standard input: 8 points (5.6 max.); Standard output: 18 points (13 max.)</td>
</tr>
<tr>
<td></td>
<td>Analog I/O: Can be connected.</td>
</tr>
<tr>
<td>No. of built-in axes</td>
<td>Program: up to #999; Data bank: up to #999</td>
</tr>
</tbody>
</table>

Table 3: Comparison of specifications between CB type and conventional (CA type) teaching pendant

3. Postscript

In this article, the features of the newly developed CB type controller were discussed, together with an example of welding results.

It is expected that welding procedure technology will develop in parallel with further developments of robotic welding systems including controllers, welding power sources and peripheral equipment, leading to the total welding solutions that Kobe Steel always pursues.

On June 3, 2016, the KOBELCO Technical Seminar was held at the Marriott Hotel Convention Center in Riyadh, Saudi Arabia. Four years have passed since the last seminars were held in three other Saudi cities, Jeddah, Jubail and Dammam.

The capital of Saudi Arabia, Riyadh is located at the center of the kingdom and has a population of more than 7 million (out of Saudi Arabia’s total population of over 30 million).

Kobe Steel has been selling a wide range of welding consumables for everything from carbon to high alloy steels to Saudi Arabia thanks to the support of many loyal customers.

In this seminar, two engineers from Japan and one engineer from Singapore, introduced Kobelco products that have drawn interest in the market to nearly 200 Kobelco agents and end users. The seminar provided a good opportunity for Kobelco fans to get together and share experiences. Afterwards, the dinner party allowed mutual relationships to deepen further.

The engineer from Kobelco Welding Asia Pacific Pte., Ltd. (KWAP) presented his company’s products, like RB-26, Dammam.

Among the presentations, what attracted the most interest were DC-SAW, which was recently introduced in the region, pipe welding consumables selected for particular welding processes and duplex stainless steel consumables that are applicable in sea water desalination plants.

The seminar convinced us that we have to cultivate the Saudi Arabian market with new and distinctive products, listen to the users, and set up opportunities for KOBELCO fans to contact us through seminars and/or exhibitions.

Reported by
Shunji Oki,
Manager, International Sales and Marketing Section,
Sales and Marketing Department, The Welding Business
From June 14 to 17, 2016, the 21st Beijing Essen Welding and Cutting Fair attracted 974 exhibitors and 23,333 visitors from more than 60 countries and regions at the New China International Exhibition Center in Beijing, China.

As compared with the last fair held in Shanghai in 2015, the number of visitors decreased about 47% due, perhaps, to increasing economic stagnation around the world, especially in China, and a delay in the upgrading of transportation and infrastructure systems in Beijing. Nevertheless, China continues to rank as the world’s largest market of steels and welding consumables, which is why competition among welding-related manufacturers in this market has been so fierce over the past several years.

Furthermore, the Chinese Ministry of Industry and Information Technology (MIIT) has recently established a national project known as “Made-In-China 2025” in order to encourage greater efficiency and lower production costs. As a result, even fabricators who utilize our products have started applying the new guidelines and are looking to reduce their material and labor costs and upgrade to automated welding. Under such situations, the booth organized by Kobe Steel, with the support of Kobe Welding of Shanghai Co., Ltd. (KWSH), had two purposes: to respond to our customers’ needs for high efficiency and stable quality with Kobelco welding consumables and robotic welding systems as well as to maintain the presence and market share of the KOBELCO brand in China.

Our information panels and displays of state-of-the-art products and bead samples focused on products for automotive, construction machinery, chemical plants, offshore structures and shipbuilding. Those, as well as a video presentation of the ARCMAN™ robotic welding systems, drew much interest from the many visitors to the Kobelco booth.

With the Chinese market attracting worldwide attention, we aim to become the “Asian number one brand,” in line with our mid-term management plan in The Welding Business. However, in order to realize this goal, it is clear that we must not only maintain but also expand our market share.

As “The world’s most reliable welding solutions company” we will reinforce our sales competitiveness and technical service capabilities, together with our sales partners in the Chinese market, by fully utilizing the networks of the China-Shinyokai (Kobe Steel’s Welding-Related Partners’ Association in China) as well as sales agents in order to further expand the sales of Kobelco products.

Reported by
Kazuma Tanabe,
International Sales and Marketing Section, Welding Business

The 21st Beijing Essen Welding & Cutting Fair

The 2016 Beijing Essen Fair

Metaltech Malaysia 2016

The 22nd Metaltech, Malaysia’s largest exhibition for the metalworking and machine tool industries, was held at the Putra World Trade Center in Kuala Lumpur from May 25 to 28, 2016. Inside the 35,000m² exhibition hall, about 1,400 companies displayed their products and welcomed almost 27,000 visitors from all over the world.

It was the first time for Kobelco Welding Asia Pacific (KWAP) and Kobe Welding (Malaysia) Sdn. Bhd. (KWM) to exhibit at this event. The joint exhibit targeted users and projects mainly in the oil-drilling rig industries, highlighting such new products as DC-SAW, DW-71T1, LB-55U, LB-8018, TG-S7052, TG-S7053, KOBE-350R and KOBE-600R.

Among the various displays, what attracted the most attention were the vacuum-packed LB-52NS covered electrodes that were displayed inside a water tank.

Many customers visited the Kobelco booth, and we could exchange name cards and market information with them.

I believe we successfully promoted the Kobelco brand even though so many welding-related companies exhibited their products. And we will continue to publicize up-to-date information regarding our welding consumables and technologies throughout the world, in order to realize “The world’s most reliable welding solutions company”

Reported by
Shogo Matsuura,
Sales and Marketing Planning Manager, KWAP