# Better usability for everyone

## Welbee II



DAIHEN Corporation

OTC

# Background of development

Currently, labor shortages and difficulty of finding successors due to the declining working population are becoming major issues in the welding industry as well. As a means of solving this problem, training of young people and active recruitment of people overseas have recently been attempted. Meanwhile, the welding power source has been desired to be easier to use for all welders because it had required experience and specialized knowledge to operate and set welding conditions.

Therefore, the latest model 'Welbee Ⅱ' has improved the front panel or the face of the welding power source so that everyone can use it more easily in multiple languages and set welding conditions with the unique function developed by our welding know-how.

# Welbee Ⅱ Lineup

| Welding Process | P402L, P502L | P402 | P402E, P452E | P322E |
|---|---|---|---|---|
| DC Pulse (DC wave pulse) | Mild steel, Stainless steel, Aluminum, Brazing, Inconel, Titanium | Mild steel, Stainless steel, Aluminum, Brazing, Inconel, Titanium | Mild steel, Stainless steel, Brazing, Inconel, Titanium | Mild steel, Stainless steel |
| CBT-EX (Low Spatter) | Mild steel, Stainless steel | - | - | - |
| DC | Mild steel, Stainless steel, Aluminum, Brazing | Mild steel, Stainless steel, Aluminum, Brazing | Mild steel, Stainless steel, Brazing | Mild steel, Stainless steel |
| MS-MIG | ● | ● | - | - |
| DC Stick | ● | ● | ● | ● |
| DC TIG (touch start) | ● | ● | ● | ● |

# Welbee Ⅱ Evolutionary points

**Essential function**

- ◆Excellent visibility of front panel
- ◆Welding guide for easy setting
- ◆Improved usability of remote controller
- ◆Powered up ! Welbee Ⅱ

**Key points of welding performance ***

- ◆AI-powered smart pulse
- ◆Stable low-slag-wire mode even at high speed
- ◆Excellent stability in thick aluminum


* Only for pulse model.

# Features of new front panel

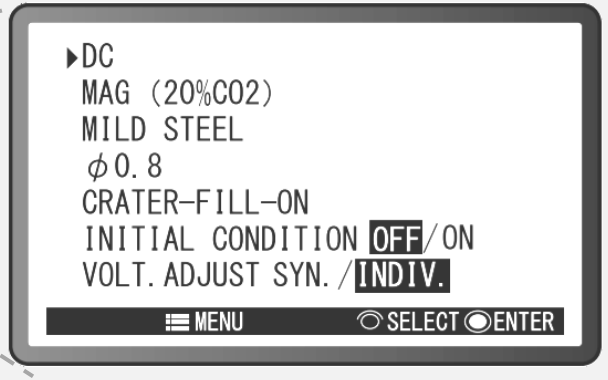
- ◆Equipped with LCD panel
- ◆Simple design
- ◆Intuitive operability

# Improved visibility

◆Current/voltage display with excellent visibility

Improved by **140%**

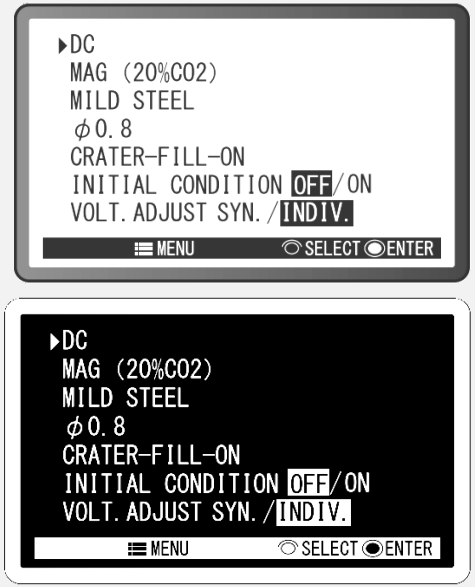

◆Home screen with summarized welding conditions



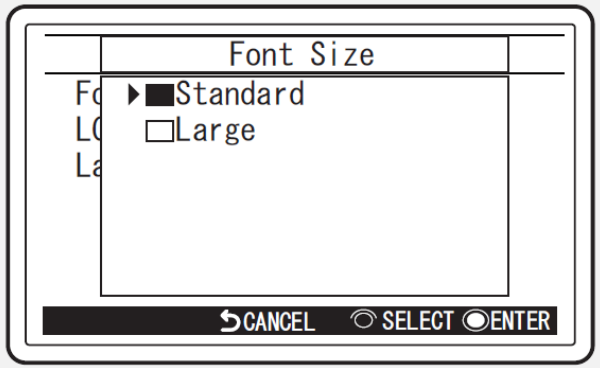

- Bright and large current/voltage display achieves high visibility at any visual angle.
- Welding mode setting completes on the LCD panel.

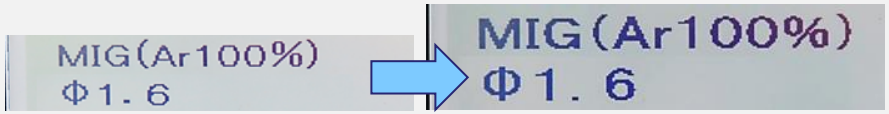
# Customizable LCD panel

## ◆Selection of background color




## ◆ Selection of font size



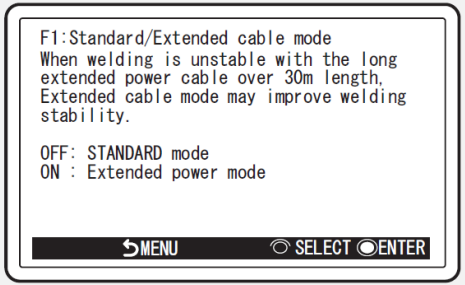




Standard Large

Customizable according to the usage environment and workers.

# Display function unique to LCD panel

◆Detailed display of functions and errors

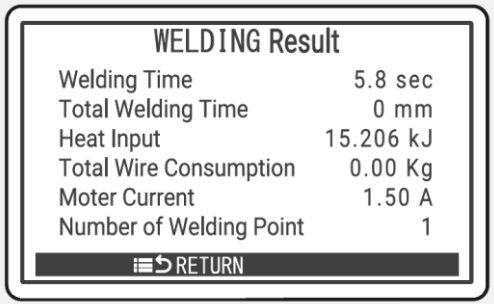



Screen of functions

Display of equipped functions and countermeasures against an error

**⇒ Capable of dealing with on the spot without an instruction manual.**

◆ Automatic display of welding results

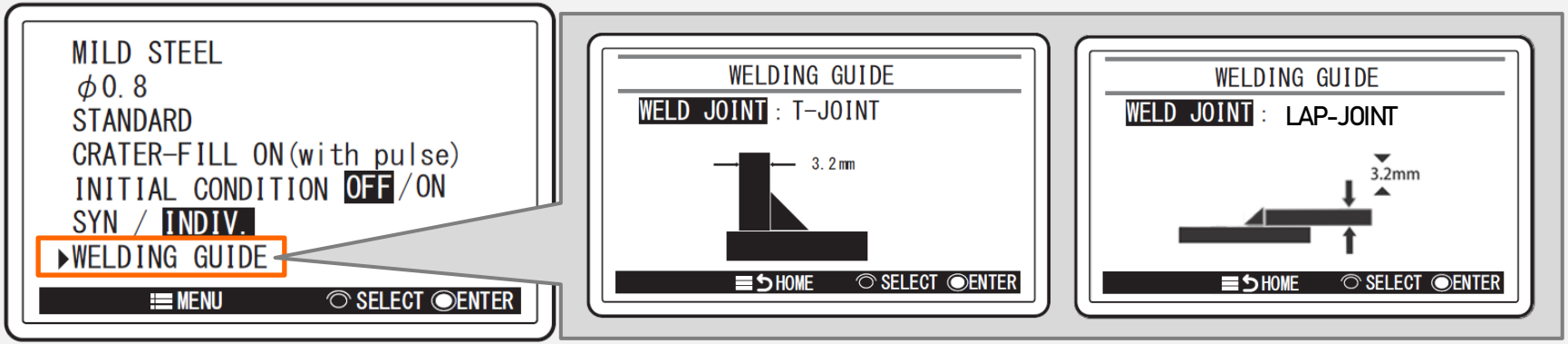



LCD screen after welding

Such records as arc time, wire consumption, and heat input are automatically displayed at the end of welding.

**⇒ Usable for management of maintenance time and wire replacement.**

# Welding guide function




Home screen

WELDING GUIDE screen

Supports the welding work for a welding beginner and an unusual material

By simply selecting the type of welding joint and plate thickness, the optimum welding current and arc voltage are **set automatically**

* This function cannot be used when connected to a remote controller.

# Multi-function remote controller

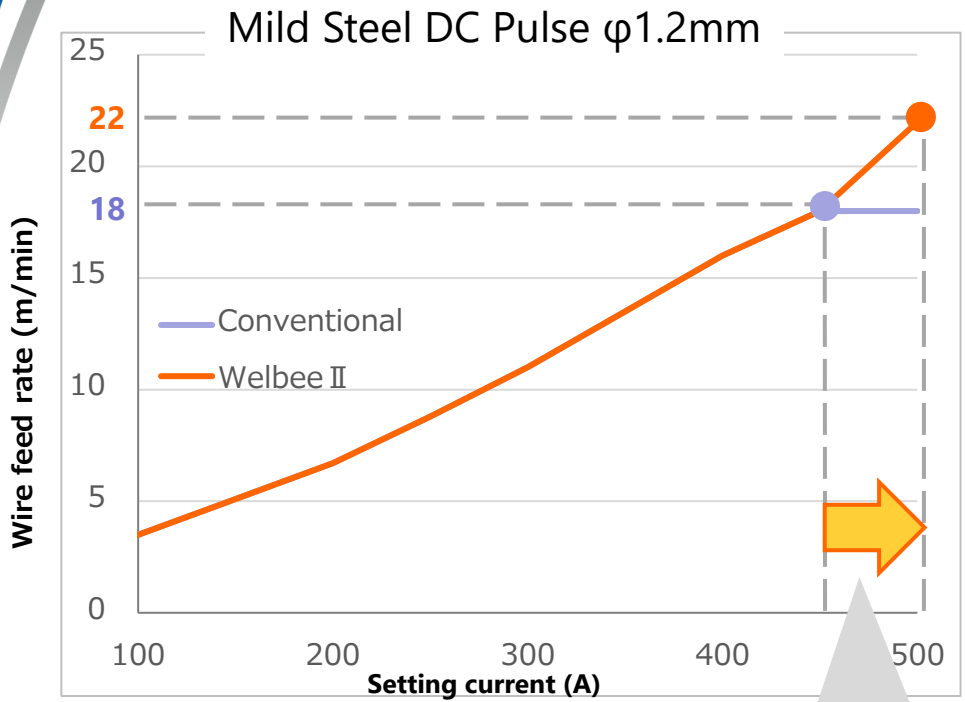
**switching knob**


Functions can be assigned to the switching knob of analog remote controller, enabling various operations at hand.

List of assignable functions

| F2 | Function | | Switching Knob [ 1 ] | Switching Knob [ 2 ] | Switching Knob [ 3 ] |
|---|---|---|---|---|---|
| 1 | Crater setting | | Crater OFF | Crater ON (with pulse) | Crater ON (No pulse) |
| 2 | Gas check | | OFF | OFF | ON |
| 3 | Constant penetration | | OFF | OFF | ON |
| 4 | Tack start | | OFF | OFF | ON |
| 5 | Read out of welding conditions | | OFF | OFF | ON |
| 6 | Welding process | P402L P502L | CBT-EX (DC low spatter) | DC Pulse | DC |
| | | P402 P322E P402E P452E | DC Pulse | DC wave pulse | DC |

# Powered up Welbee Ⅱ




Increased from 450A to **500A**.

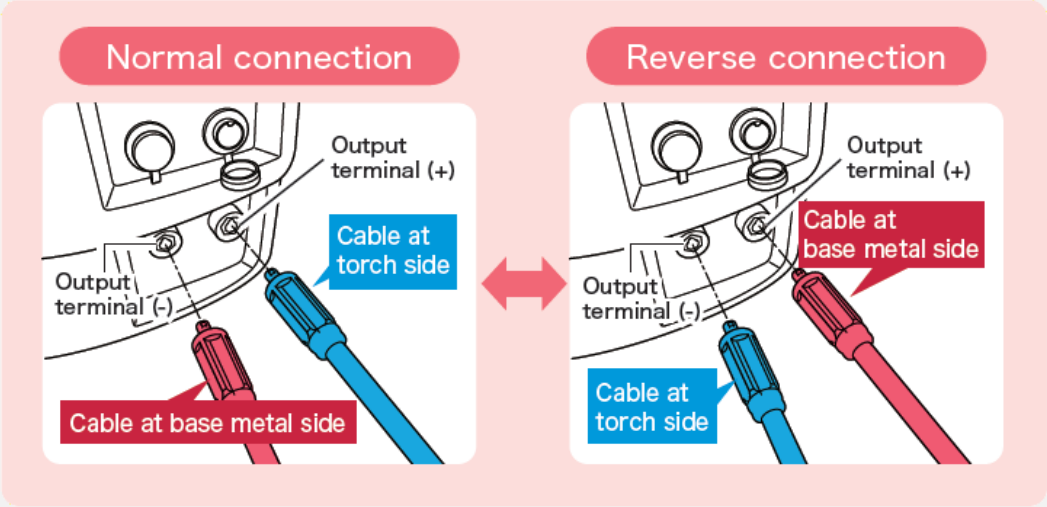
The upper limit of wire feeding speed has been increased from 18 to 22 m/ min.

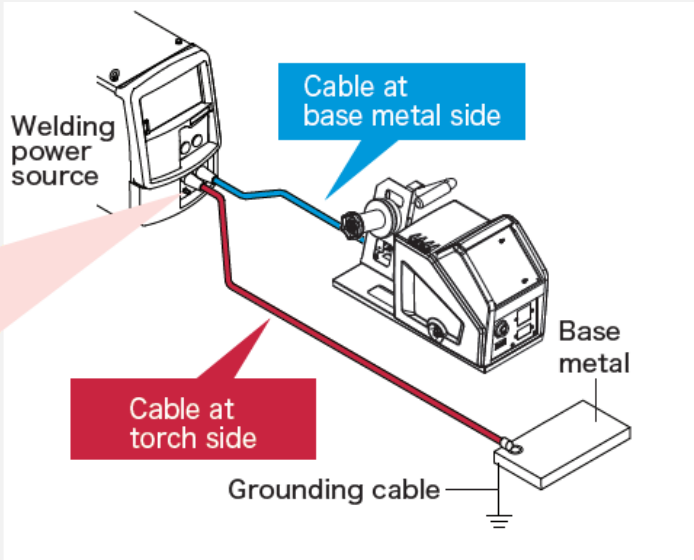
Even with the same wire diameter, it can be used with a higher current value.

DC Pulse φ1.2mm

| | 18 m/min | **22** m/min |
|---|---|---|
| CrNi (2.5%CO2) | 400A | **475A** |
| CrNi Ferr (2.5%CO2) | 400A | **425A** |
| CrNi (2% O2) | 400A | **450A** |
| CrNi Ferr (2% O2) | 400A | **475A** |

# Straight polarity wire can be used




Welding with the electrode negative polarity is possible simply by setting the function and changing the cable connection.
Such a straight polarity (DCEN) wire as used in welding galvanized steel sheets can easily be used as well.

# Welbee Ⅱ Evolutionary points

## Essential functions

- ◆Excellent visibility of front panel
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## Key points of welding performance *

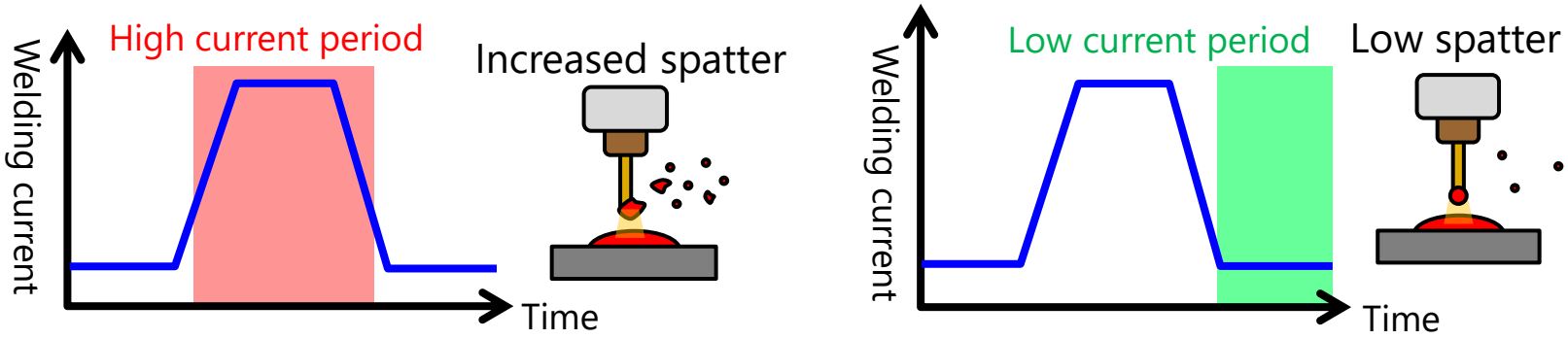
- ◆AI-powered smart pulse
- ◆Stable low-slag-wire mode even at high speed
- ◆Excellent stability in thick aluminum


* Only for pulse model.

# Smart pulse (Automatic pulse adjustment)

## Challenges of high speed welding

Increase the travel speed → Undercut occurs → Decrease the voltage setting to prevent undercut. However, this measure causes a shorter arc length, thereby resulting in higher tendency of short circuiting. Since short-circuiting in the high current period increases spatter, it is necessary to adjust so that a short-circuit occurs in the low current period.




High skill and experience are required to adjust the timing of short circuit.

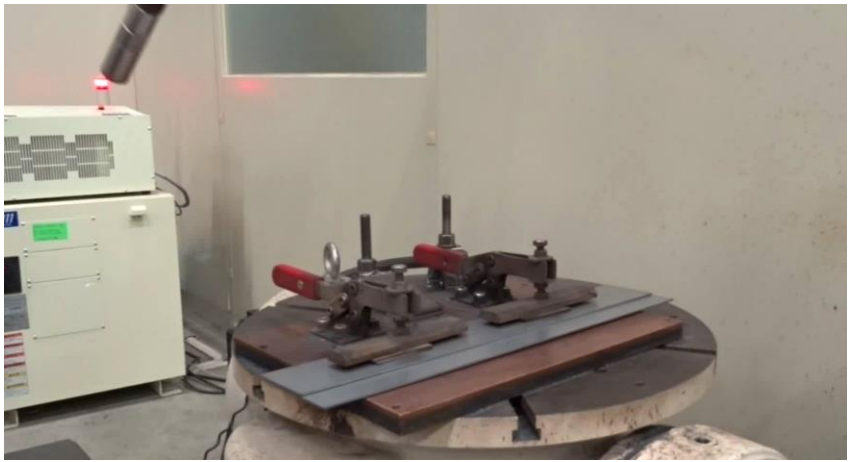
**In smart pulse, AI automatically adjusts the waveform to suppress spatter occurrence.**



P400LⅡ P500LⅡ P400Ⅱ P400EⅡ P450EⅡ

# Smart pulse
## –Comparison of spatter generation amount-

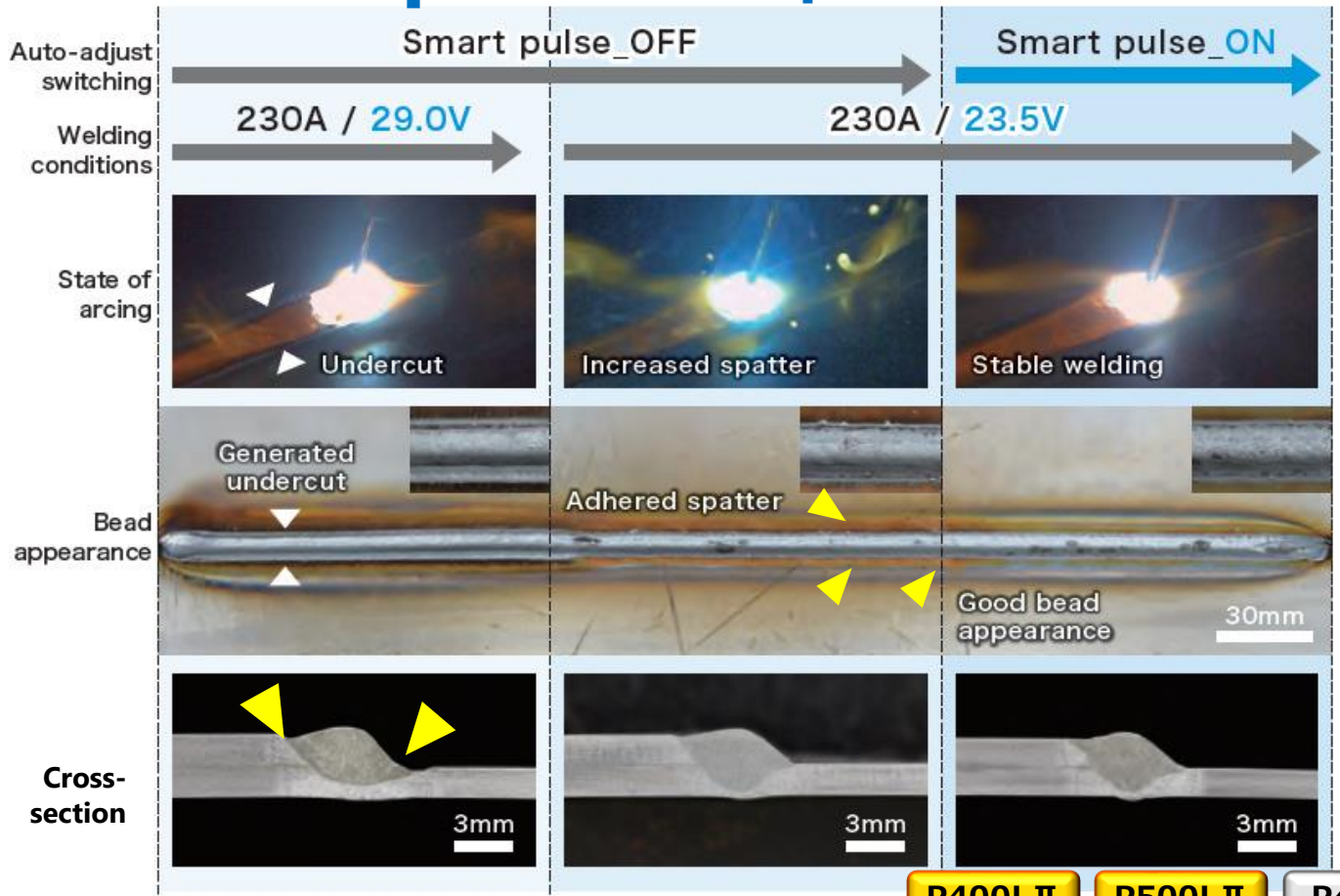
Without smart pulse



**With smart pulse**

| | | |
|---|---|---|
| **Details of welding conditions** | Shielding gas：20%$CO_2$-Ar | Set voltage ：**24.5V** |
| Welding mode ：MAG pulse | Base metal ：SPCC/2.3mmt | Travel speed ：**110cm/min** |
| Welding wire ：YM-28S(φ1.2) | Set current：250A | |

# Smart pulse –Comparison of weld bead appearance-




**Details of welding conditions**
Travel speed : **150cm/min**
Welding mode : MAG pulse
Welding wire : YM-28S (φ1.2)
Shielding gas : 20%CO2-Ar
Base metal : Spcc (1.6mmt)
Wore extension : 15mm
Push angle : 10°
Torch angle : 30°
Type of joint : Lap joint

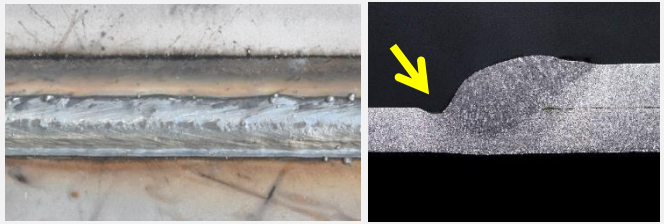
By using the smart pulse in the welding condition where undercut is restricted, spatter can also be restricted.



P400LⅡ P500LⅡ P400Ⅱ P400EⅡ P450EⅡ

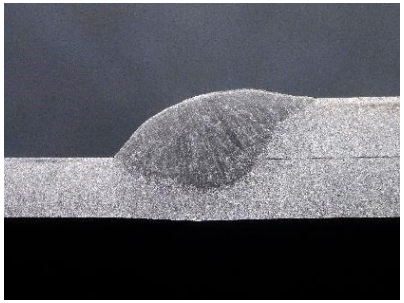
# Low-slag wire mode (Optional)

If the slag on a weld bead peels off after painting, the rust prevention performance will deteriorate, so a slag removal process is required before painting. Low-slag wires with low Si content that feature less slag generation attract attention, but the stabilization during high-speed welding has been an issue.



**bead meandering, undercut, and large spatter adhesion…**

## ◆Low-slag wire mode



The dedicated waveform specialized for low-slag wires provides a stable arc even during high-speed welding, realizing efficient welding with a low-slag wire.

Welding condition　Welding wire : Low-slag wire, **Travel speed：130cm/min,** Welding current：270A, Welding voltage：27.8V, Shielding gas : 20%$CO_2$-Ar, Base metal：Galvanized steel sheet GA 45g/$m^2$ (2.3mmt)

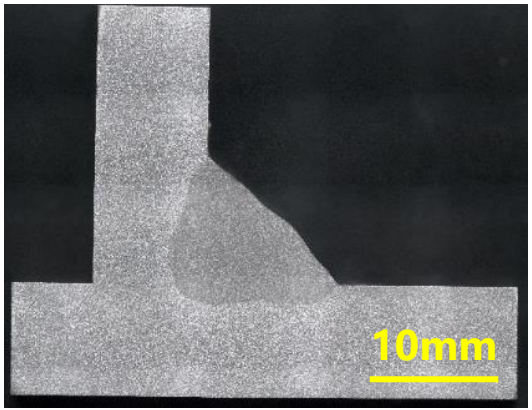
# MS-MIG aluminum welding

MS-MIG mode suppresses the influence of environmental effects such as heat and humidity in the medium and high current ranges. It achieves a stable arc with constant welding current and arc length.

**It results in a beautiful weld bead with uniform penetration and good alignment**

*Applicable wire: Hard aluminum wire with a diameter of 1.6 mm only.
The recommended current value for this mode is 230 to 300A.
It is recommended to use pulse welding for currents below 200A.

Bead appearance




Weld cross-section

Welding conditions
Welding current：280A
Travel Speed：40cm/min
Plate thickness：10mmt
Welding wire
：Hard aluminum (φ1.6mm)

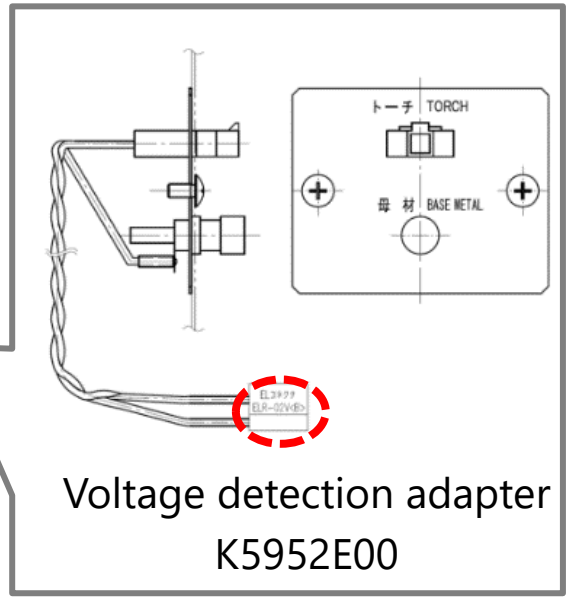
P400LⅡ P500LⅡ P400Ⅱ


Welbee II

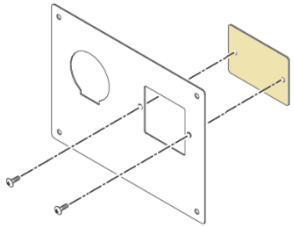
# How to use wire feeder with CBT-EX

Before using the wire feeder (CM-7403, CMW-7403), attach the voltage detection adapter (K5952E00) for wire feeder.

CM(W)-7403




Voltage detection adapter
K5952E00

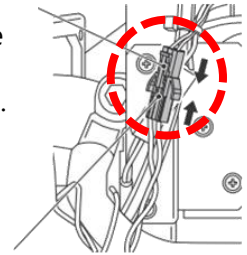


Wiring can be completed simply by removing the cover, attaching the adapter, and then inserting the connector.

CN25

Connector: Black
Wire: Gray, Orange

* Insert firmly until the end.
Voltage detection adapter



CN45

Connector: Black
Wire: Gray, Orange

# How to use analog remote controllers

For using the conventional analog remote controller (K5416Z00) with Welbee II, the conversion cable (K8116E00) is required.

| | Conversion cable (K8116E00) | Welbee | Welbee Ⅱ |
|---|---|---|---|
| Conventional  K5416Z00 | Without | ○ | × Wire inching cannot be done |
| | With | × Wire inching cannot be done | ○ |
| New type  K5804S00 | Without | × Switching knob cannot be used | ○ |
| | With | It is dangerous to set the switching knob at [2] because wire inching is continued; therefore, be sure not to use this combination. | |

*No combination will cause failure of welding power source.

# Note

- The individual software for Welbee and Welbee II series are not compatible.

- The individual front panel of Welbee and Welbee II series are not compatible.

# Calibration mode is installed in all the models

**Current issues**

Since the dedicated inspection device is required for calibration, it is necessary to remove the welding power source installed on the welding line and send it to OTC.

⇒ **This process may require you to shut down the production line.**

Dedicated inspection device

**With output calibration mode**

Since calibration is possible without a dedicated device, users themselves or service personnel can visit the welding site and perform the calibration work without moving the power source.

⇒ **Downtime can be reduced because it is no need to stop the production line.**

# Calibration mode is installed in all the models

| | Conventional display adjustment [F86-89] | | | **Calibration mode [F39-42]** | | |
|---|---|---|---|---|---|---|
| | Before | | After | Before | | After |
| Set current | 350A | **F87：-5** | 350A | 350A | **F40：+5** | 350A |
| Displayed current | 350A | | **345A** | 350A | | 350A |
| Measured current | 345A | | 345A | 345A | | **350A** |

■ Display adjustment function

Changing the set value only corrects the display; the output welding current / voltage does not change.

■ **Calibration mode**

Changing the set value corrects **the output welding current / voltage**.

Preparations Calibrated voltmeter/ammeter, a resistance load, and 38 $mm^2$ or larger cable