

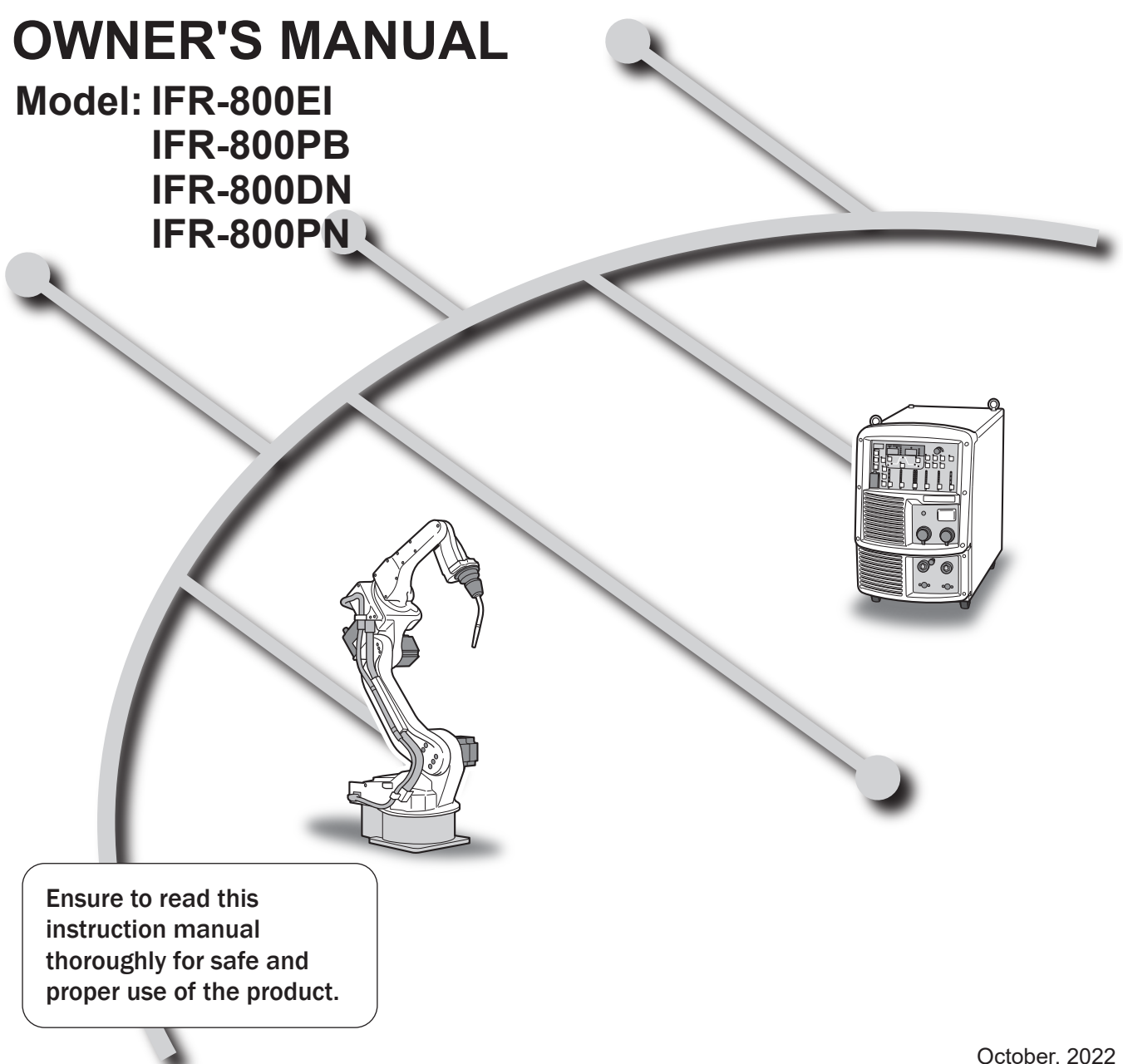


# Welbee Fieldbus Connection Tool

# Welbee Fieldbus Connection Tool

## OWNER'S MANUAL

Model: IFR-800EI  
IFR-800PB  
IFR-800DN  
IFR-800PN



Ensure to read this instruction manual thoroughly for safe and proper use of the product.

# Forward

Thank you for introducing OTC's Welbee Fieldbus Connection Tool.

This Owner's Manual (referred to as "this manual", hereafter) explains the following points for proper use of this connection tool.

- Product Overview
- Installation Procedure
- Reference Materials

Please read this manual and save it in a safe place with the owner's manual of the welding power source and its warranty so that they can be referred to whenever necessary.

# Important Information

## Intended Use of the Product

Welbee Fieldbus Connection Tool is a connection tool to apply a Fieldbus supporting option to our Welbee Inverter.

Fieldbus communication enables the Welbee Inverter to be controlled from the outside.

## Safe Use of the Product

For safe use of the product (referred to as "welding power source", hereafter), ensure to follow the instructions below:

- This manual is intended for workers familiar with the listed terminologies. If this product is going to be operated or serviced by workers not familiar with the terminologies, the customer shall provide such workers with thorough training on operation and safety.
- This equipment and this manual are for use only by persons trained and experienced in the safety operation of welding equipment. Untrained persons must complete the "Special workshop for arc welding".
- For the protection from possible injury or damage with the equipment, be sure to read and follow the safety information in this manual. Do not use the equipment for any purposes not indicated in the manual.
- Make sure that installation, operation, and maintenance of the welding power source and welding machine are performed by qualified personnel with sufficient knowledge and skills.
- If this manual is lost or damaged, immediately contact your dealer.

## Trademarks

- "Anybus" is a registered trademark of HMS Industrial Networks AB.
- "Windows" is a trademark or a registered trademark of Microsoft Corporation in the United States and other countries.

## Service and Support

If you have questions about the welding power source, please contact your dealer or the nearest OTC's Service Center. See the back cover of the owner's manual of the welding power source for the contact numbers and mailing addresses.

When contacting your dealer for service, you are required to provide with the following information:

- Name, address, and telephone number
- Product model, manufacture year, and serial number
- Version numbers of the welding power source software

**We cannot answer questions about the handling and settings of the fieldbus communication master device for connecting to our welding power source.**

# TABLE OF CONTENTS

<b>Important Information</b> .....	i
Intended Use of the Product .....	i
Safe Use of the Product.....	i
Trademarks.....	i
Service and Support .....	i
 <b>CHAPTER 1 SAFETY INFORMATION</b>	
<b>1.1 Warning Symbols</b> .....	1
<b>1.2 Safety Precaution</b> .....	1
1.2.1 Operating precautions .....	1
1.2.2 Precautions for power supply and electric shock..	2
 <b>CHAPTER 2 OVERVIEW</b>	
<b>2.1 Overview of Welbee Fieldbus Connection Tool</b> .....	3
2.1.1 About supporting Fieldbus communication standards .....	3
2.1.2 Configurations of EtherNet/IP connection type.....	3
2.1.3 Configurations of PROFIBUS connection type.....	4
2.1.4 Configurations of DeviceNet connection type.....	5
2.1.5 Configurations of PROFINET connection type.....	6
<b>2.2 Updating the Welding Power Source Software</b> .....	7
 <b>CHAPTER 3 INSTALLATION/ PREPARATION</b>	
<b>3.1 Installation of Welbee Fieldbus Connection Tool</b> .....	8
3.1.1 Installation of EtherNet/IP connection type.....	8
3.1.2 Installation of PROFIBUS connection type .....	16
3.1.3 Installation of DeviceNet connection type.....	18
3.1.4 Installation of PROFINET connection type .....	21
<b>3.2 Unlocking Fieldbus Option</b> .....	22
3.2.1 Installing of Welbee II series.....	24
<b>3.3 Connection of Communication Cable</b> .....	25
<b>3.4 Specifications of Fieldbus Communication</b> .....	26
<b>3.5 Fieldbus Special Functions</b> .....	28
3.5.1 Contents of Fieldbus special functions .....	28
3.5.2 When changing the setting of Fieldbus special functions .....	28
3.5.3 Setting of Welbee II series.....	30
 <b>CHAPTER 4 REFERENCE MATERIALS</b>	
<b>4.1 Communication Errors</b> .....	31
4.1.1 Error codes added to welding power source .....	31
4.1.2 Error codes indicated on Fieldbus communication data.....	31
<b>4.2 Address of Communication Unit</b> .....	32
4.2.1 IP address setting (EtherNet/IP connection type).....	32
4.2.2 Node address setting (PROFIBUS connection type).....	33
4.2.3 Node address setting and communication speed setting (DeviceNet connection type) .....	34
4.2.4 IP address setting (PROFINET connection type) .....	35
<b>4.3 Countermeasures When Communication Has Not Been Established</b> .....	36
4.3.1 When EtherNet/IP communication is not established .....	36
4.3.2 When PROFIBUS communication is not established.....	38
4.3.3 When DeviceNet communication is not established.....	39
4.3.4 When PROFINET communication is not established.....	40



# Chapter 1 Safety Information

## 1.1 Warning Symbols



The following safety warning symbols and signs are used throughout the manual to ensure proper operation of the product and to prevent from various hazards that cause serious injury and damages. Indication and explanation for the symbols are as follows:

Make sure to fully understand the content before beginning operation.

The below symbols are categorized by the degree of possible hazard and damage.

Symbols	Explanation
 <b>WARNING</b>	Gives information regarding possible personal injury or loss of life if the product is used improperly.
 <b>CAUTION</b>	Refers to minor personal injury or possible equipment damage if the product is used improperly.

The below symbols are categorized according to the content to be followed.

Symbols	Explanation
	Instruction: indicates "Instruction" matters to be followed.
	Prohibited: indicates "Prohibited" matters.

## 1.2 Safety Precaution

This section explains the safety precautions regarding operation of the welding power source.

### 1.2.1 Operating precautions

To prevent serious injury or accidents, ensure to follow the instructions below:

#### **WARNING**

- Be sure to read and understand the information in the manual before operating the product. Have only trained and experienced personnel perform operation of welding power source or welding machine.
- Keep your hands, fingers, hairs and clothes away from the rotating cooling fan and the open parts around the cooling fan;
- Be sure to take appropriate measures (e.g., by enclosing a welding machine with a fence) during maintenance and repair work of welding machine so that no person will be allowed unauthorized access near the welding machine or work areas.

 **CAUTION**

- Before installation, wait until the temperature inside the welding power source becomes low.  
The main circuit parts are very hot immediately after welding.  
Touching them accidentally may cause burn injury.

## 1.2.2 Precautions for power supply and electric shock

To prevent electric shock or burn injury, ensure to follow the instructions below:

 **WARNING**

- Do not touch the input and output terminals and the internal live electrical parts of the welding power source.
- Before starting installation, make sure to cut the input power with the disconnect switch in the box connected with the welding power source and wait three minutes or more. The capacitors may be still charged even after the input power is cut. Make sure that there is no charged voltage before starting the work.
- Wear dry insulating gloves for protection. Do not use damaged or wet gloves.
- Tighten all cable connections and insulate them.
- Do not use a cable with insufficient capacity, serious damage or cable without grounding.
- Never touch the parts that are not included in instructions during the work. Otherwise, it may cause electric shock and malfunction of devices.

# Chapter 2 Overview

This section explains the product configurations and operating conditions of Welbee Fieldbus Connection Tool.

## 2.1 Overview of Welbee Fieldbus Connection Tool

Welbee Fieldbus Connection Tool is a Fieldbus connection tool which supports various Fieldbus communication standards. This tool has been developed as a "Fieldbus supporting option" for our welding power source, Welbee Inverter. The Welbee Inverter can be controlled for a welding robot etc. by incorporating the Welbee Inverter in the Fieldbus communication network.

### 2.1.1 About supporting Fieldbus communication standards

Welbee Fieldbus Connection Tool supports the following Fieldbus communication standards. Welbee Fieldbus Connection Tool is divided into the following types depending on the supporting communication standard.

Supporting standards (Communication standard used for Fieldbus)	Type	Product Type
EtherNet/IP	EtherNet/IP connection type	IFR-800EI
PROFIBUS-DP	PROFIBUS connection type	IFR-800PB
DeviceNet	DeviceNet connection type	IFR-800DN
PROFINET	PROFINET connection type	IFR-800PN

#### **TIPS**

- The configurations of Welbee Fieldbus Connection Tool and this manual differ depending on the communication standard adopted by the customer.

### 2.1.2 Configurations of EtherNet/IP connection type

The following shows the product configurations of EtherNet/IP connection type of Welbee Fieldbus Connection Tool.

Product Name	Part No. or Specifications	Q'ty
Communication unit (Anybus Communicator AB7072) (*1)	E2618D00	1 package
Serial communication board	E2618C00	1
Resin spacer for fixing Serial communication board (*2)	WN-05F	2
Screw for fixing Serial communication board (*2)	M2.6 × 6 mm	2
DIN rail for mounting communication unit	P30360Q02	1
Round screw for mounting DIN rail	M4 × 10 mm	2
Communication unit stationary plate	E2560G01	1
Spacer for mounting Communication unit stationary plate	BSB-580E	2
Screw for mounting Communication unit stationary plate	M5 × 10 mm	4
External connection connector (*3)	100-2621	1
Flange	E2618G02	1

Product Name	Part No. or Specifications	Q'ty
Flange fixing screw	M3 × 6 mm	2
Ethernet communication cable (*5)	LC5EL-STP-BL-1	1
	SBXQ0087-01M	1
Serial communication cable	E2618K02	1
24 V power cable (*4)	E2618K01	1
Harness lifter	HL-38-0	1
Cable tie	SKB-1M	3
Sticker (EtherNet/IP)		1
Sticker (Serial number)		1
USB memory for releasing Fieldbus option		1

- \*1: Among the items contained in the package, only the communication unit and 24 V power connector are necessary. However, when changing the IP address of the communication unit, change of the IP address must be executed by using "HMS IPconfig"(the IP address setting tool). (☞ "4.2 Address of Communication Unit")
- \*2: If nothing are installed to the mounting holes of the main control printed board, use the resin spacers (2 pcs).  
If spacers are installed to the mounting holes of the main control printed board, use the screws (2 pcs).
- \*3: Hexagon nuts and O-rings are attached to the external connection connector.
- \*4: When using the welding power source WB-DPS, use "24 V power cable (K8116F00)".
- \*5: One of either LC5EL-STP-BL-1 or SBXQ0087-01M is included.

#### NOTE

- The customer must prepare the communication cable to connect the Welbee Inverter and customer's communication equipment. (☞ "3.3 Connection of Communication Cable")
- When installing in the welding power source WB-DPS, "24 V power cable (K8116F00)" is also required. Purchase "24 V power cable (K8116F00)" separately.
- When installing in the welding power source WB-F300P, "Extension Board Mounting Kit (K-5976)" is also required. Purchase "Extension Board Mounting Kit (K-5976)" separately.

### 2.1.3 Configurations of PROFIBUS connection type

The following shows the product configurations of PROFIBUS connection type of Welbee Fieldbus Connection Tool.

Product Name	Part No. or Specifications	Q'ty
Communication unit (Anybus Communicator AB7000) (*1)	E2619D00	1 package
Serial communication board	E2618C00	1
Resin spacers for fixing Serial communication board (*2)	WN-05F	2
Screw for fixing Serial communication board (*2)	M2.6 × 6 mm	2
DIN rail for mounting communication unit	P30360Q02	1
Round screws for mounting DIN rail	M4 × 10 mm	2
Communication unit stationary plate	E2560G01	1
Spacers for mounting communication unit stationary plate	BSB-580E	2
Screws for mounting Communication unit stationary plate	M5 × 10 mm	4
Flange	E2618G02	1



Product Name	Part No. or Specifications	Q'ty
Flange fixing screws	M3 × 6 mm	2
PROFIBUS communication cable (*3)	E2619K03	1
Serial communication cable	E2618K02	1
24 V power cable (*4)	E2618K01	1
Cable ties	SKB-1M	2
Sticker (PROFIBUS)		1
Sticker (Serial number)		1
USB memory for releasing Fieldbus option		1

- \*1: Among the items contained in the package, only the communication unit and 24 V power connector are necessary.
- \*2: If nothing are installed to the mounting holes of the main control printed board, use the resin spacers (2 pcs).  
If spacers are installed to the mounting holes of the main control printed board, use the screws (2 pcs).
- \*3: Hexagon nuts and O-rings are attached to the PROFIBUS communication cable.
- \*4: When using the welding power source WB-DPS, use "24 V power cable (K8116F00)".

#### NOTE

- The customer must prepare the communication cable to connect the Welbee Inverter and customer's communication equipment. (☞ "3.3 Connection of Communication Cable")
- When installing in the welding power source WB-DPS, "24 V power cable (K8116F00)" is also required. Purchase "24 V power cable (K8116F00)" separately.
- When installing in the welding power source WB-F300P, "Extension Board Mounting Kit (K-5976)" is also required. Purchase "Extension Board Mounting Kit (K-5976)" separately.

## 2.1.4 Configurations of DeviceNet connection type

The following shows the product configurations of DeviceNet connection type of Welbee Fieldbus Connection Tool.

Product Name	Part No. or Specifications	Q'ty
Communication unit (Anybus Communicator AB7001) (*1)	E2621D00	1 package
Serial communication board	E2618C00	1
Resin spacers for fixing Serial communication board (*2)	WN-05F	2
Screw for fixing Serial communication board (*2)	M2.6 × 6 mm	2
DIN rail for mounting communication unit	P30360Q02	1
Round screws for mounting DIN rail	M4 × 10 mm	2
Communication unit stationary plate	E2560G01	1
Spacers for mounting communication unit stationary plate	BSB-580E	2
Screws for mounting Communication unit stationary plate	M5 × 10 mm	4
Flange	E2621G02	2
Flange fixing screws	M3 × 6 mm	2
Cable clamp	SR5P-4	1
Serial communication cable	E2618K02	1
24 V power cable (*3)	E2618K01	1
Cable ties	SKB-1M	3

Product Name	Part No. or Specifications	Q'ty
Sticker (DeviceNet)		1
Sticker (Serial number)		1
USB memory for releasing Fieldbus option		1

\*1: Among the items contained in the package, only the communication unit and 24 V power connector are necessary.

\*2: If nothing are installed to the mounting holes of the main control printed board, use the resin spacers (2 pcs).

If spacers are installed to the mounting holes of the main control printed board, use the screws (2 pcs).

\*3: When using the welding power source WB-DPS, use "24 V power cable (K8116F00)".

#### NOTE

- The customer must prepare the communication cable to connect the Welbee Inverter and customer's communication equipment. (☞ "3.3 Connection of Communication Cable")
- When installing in the welding power source WB-DPS, "24 V power cable (K8116F00)" is also required. Purchase "24 V power cable (K8116F00)" separately.
- When installing in the welding power source WB-F300P, "Extension Board Mounting Kit (K-5976)" is also required. Purchase "Extension Board Mounting Kit (K-5976)" separately.

## 2.1.5 Configurations of PROFINET connection type

The following shows the product configurations of PROFINET connection type of Welbee Fieldbus Connection Tool.

Product Name	Part No. or Specifications	Q'ty
Communication unit (Anybus Communicator AB7078) (*1)	E2665D00	1 package
Serial communication board	E2618C00	1
Resin spacers for fixing Serial communication board (*2)	WN-05F	2
Screw for fixing Serial communication board (*2)	M2.6 × 6 mm	2
DIN rail for mounting communication unit	P30360Q02	1
Round screws for mounting DIN rail	M4×10 mm	2
Communication unit stationary plate	E2560G01	1
Spacers for mounting communication unit stationary plate	BSB-580E	2
Screws for mounting Communication unit stationary plate	M5×10 mm	4
External connection connector (*3)	100-2621	1
Flange	E2618G02	2
Flange fixing screw	M3×6 mm	2
Ethernet communication cable (*5)	LC5EL-STP-BL-1	1
	SBXQ0087-01M	1
Serial communication cable	E2618K02	1
24 V power cable (*4)	E2618K01	1
Harness lifter	HL-38-0	1
Cable tie	SKB-1M	3
Sticker (PROFINET)		1
Sticker (Serial number)		1
USB memory for releasing Fieldbus option		1

- \*1: Among the items contained in the package, only the communication unit and 24 V power connector are necessary. However, when changing the IP address of the communication unit, change of the IP address must be executed by using "HMS IPconfig"(the IP address setting tool). (☞ "4.2 Address of Communication Unit")
- \*2: If nothing are installed to the mounting holes of the main control printed board, use the resin spacers (2 pcs).  
If spacers are installed to the mounting holes of the main control printed board, use the screws (2 pcs).
- \*3: Hexagon nuts and O-rings are attached to the external connection connector.
- \*4: When using the welding power source WB-DPS, use "24 V power cable (K8116F00)".
- \*5: One of either LC5EL-STP-BL-1 or SBXQ0087-01M is included.

**NOTE**

- The customer must prepare the communication cable to connect the Welbee Inverter and customer's communication equipment. (☞ "3.3 Connection of Communication Cable")
- When installing in the welding power source WB-DPS, "24 V power cable (K8116F00)" is also required. Purchase "24 V power cable (K8116F00)" separately.
- When installing in the welding power source WB-F300P, "Extension Board Mounting Kit (K-5976)" is also required. Purchase "Extension Board Mounting Kit (K-5976)" separately.

## 2.2 Updating the Welding Power Source Software

Welbee Fieldbus Connection Tool can be used for all Welbee Inverters developed and distributed by OTC. However, you may be required to update the welding power source software depending on the manufacture year and month of your Welbee Inverter. Contact your dealer for details.

**NOTE**

- In the updating of the welding power source software, the internal memory must be initialized once. We recommend the data should be backed up when welding conditions and internal functions (Function) are registered and set.
- For the details of data backup, refer to "7.3 Data Backup (Utilization of data)" in Chapter 7 of the Owner's Manual of the Welbee Inverter.

# Chapter 3 Installation/ Preparation

This section describes the installation of Welbee Fieldbus Connection Tool, unlocking of Fieldbus option, etc.

## 3.1 Installation of Welbee Fieldbus Connection Tool

The following describes how to apply the Fieldbus supporting option to your Welbee Inverter using Welbee Fieldbus Connection Tool.

### 3.1.1 Installation of EtherNet/IP connection type

This section describes the installation procedures of EtherNet/IP connection type.

#### NOTE

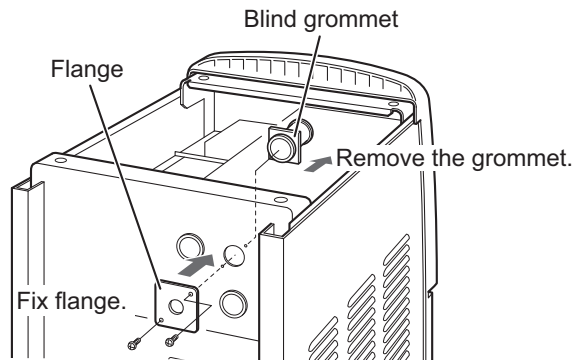
- When installing in the welding power source WB-DPS, "24 V power cable (K8116F00)" is also required. Since the 24 V power cable uses "24 V power cable (K8116F00)", the operations in Step 10 change. Install "24 V power cable (K8116F00)" before the operations in Step 1. Refer to the instruction manual of "24 V power cable (K8116F00)" for details.
- When using the welding power source WB-DPS in parallel operation, connect Welbee Fieldbus Connection Tool to the welding power source WB-DPS (Master) side.
- When installing in the welding power source WB-F300P, "Extension Board Mounting Kit (K-5976)" is also required. Since the communication unit stationary plate in "Extension Board Mounting Kit (K-5976)" is used for the communication unit stationary plate, the operations in Steps 5, 6, 7, 8, and 11 change. Refer to the instruction manual of "Extension Board Mounting Kit (K-5976)" for details.

#### STEP

1. Turn off the power switch on the primary side and shut down the power supply to the Welbee Inverter.
2. Remove the top panel of the Welbee Inverter.

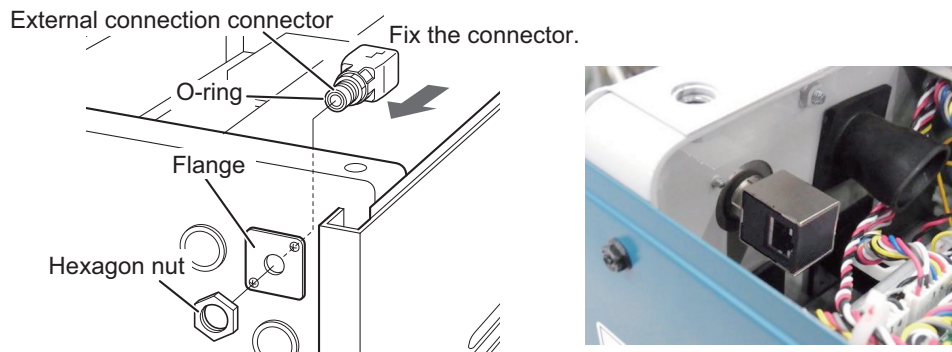
**3. Attach a flange to the external connection port on the rear side of the welding power source.**

- Remove the upper right blind grommet and fit the flange to the external connection port.
- Fix the flange by tightening the flange fixing screws (2 pcs).

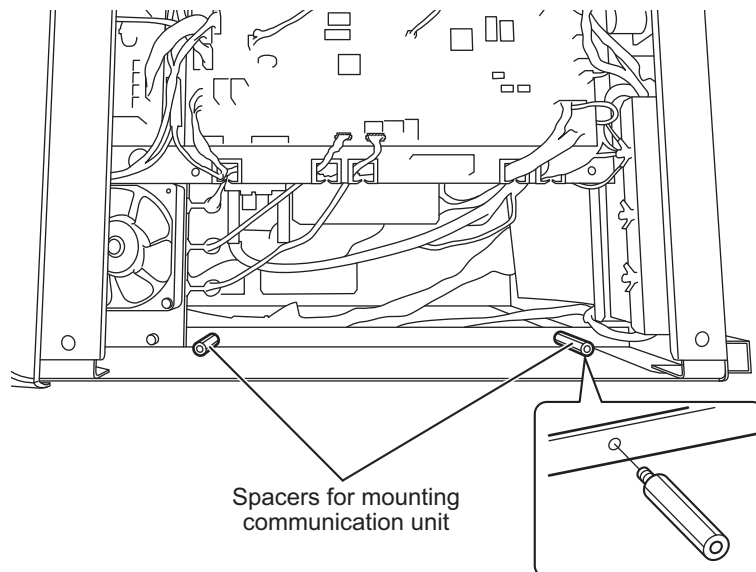


**4. Fix the external connection connector.**

- Pass an external connection connector through the hole of the flange from the inside of the unit, and fix it by tightening with the hexagon nut. (The hexagon nut and O-ring are attached to the external connection connector.)  
 The direction of the external connection connector should be such that the square connector hole faces the left side plate as shown in the photo.

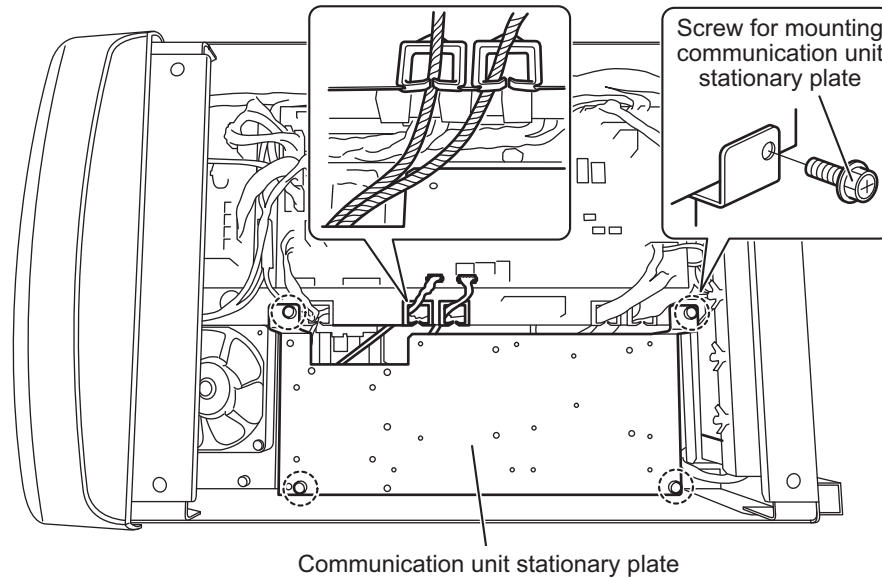


**5. Set the spacers (2 pcs) for mounting the communication unit stationary plate to the screw holes.**

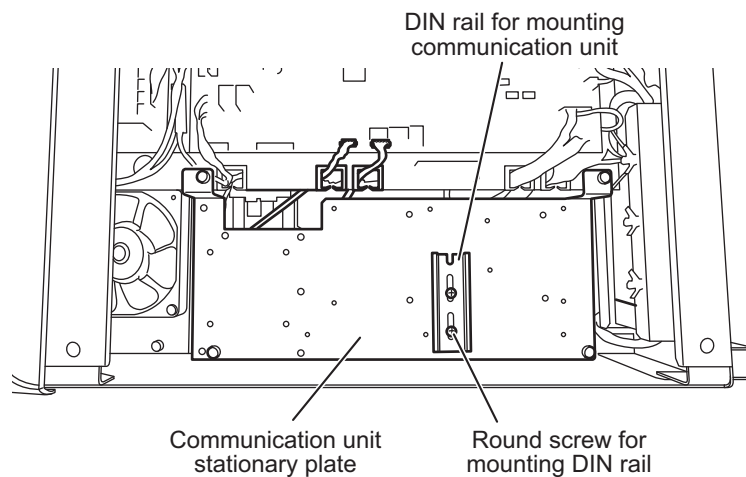


**6. Place the communication unit stationary plate.**

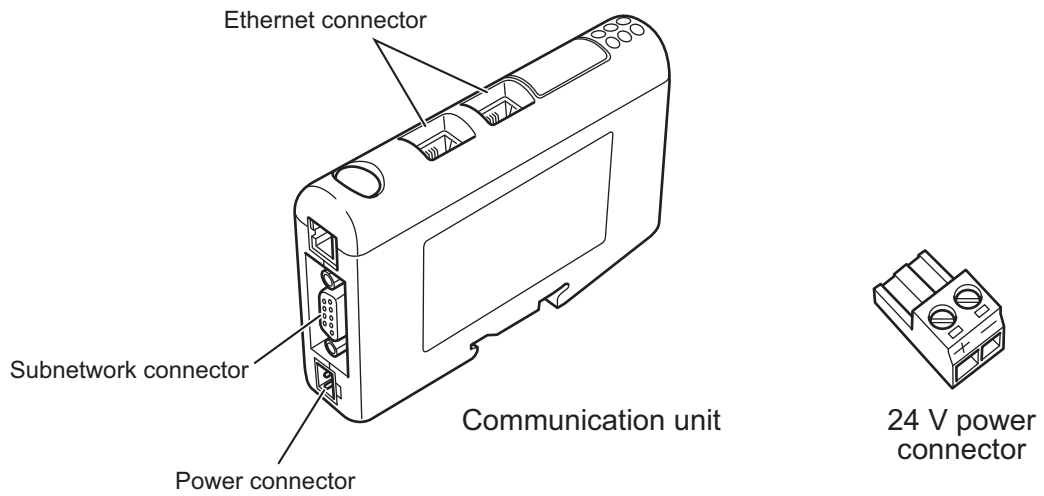
- Place the communication unit stationary plate so that its screw holes match the spacers for mounting the communication unit stationary plate.
- If cables are caught by the communication unit stationary plate, move the cables to the notches.

**7. Tighten the screws (4 pcs) for mounting the communication unit stationary plate to fix the communication unit stationary plate.****8. Install the DIN rail for mounting the communication unit to the communication unit stationary plate.**

- Fit the long hole of the DIN rail for mounting the communication unit on the screw holes.
- Tighten the round screws (2 pcs) for mounting the DIN rail to fix the DIN rail.

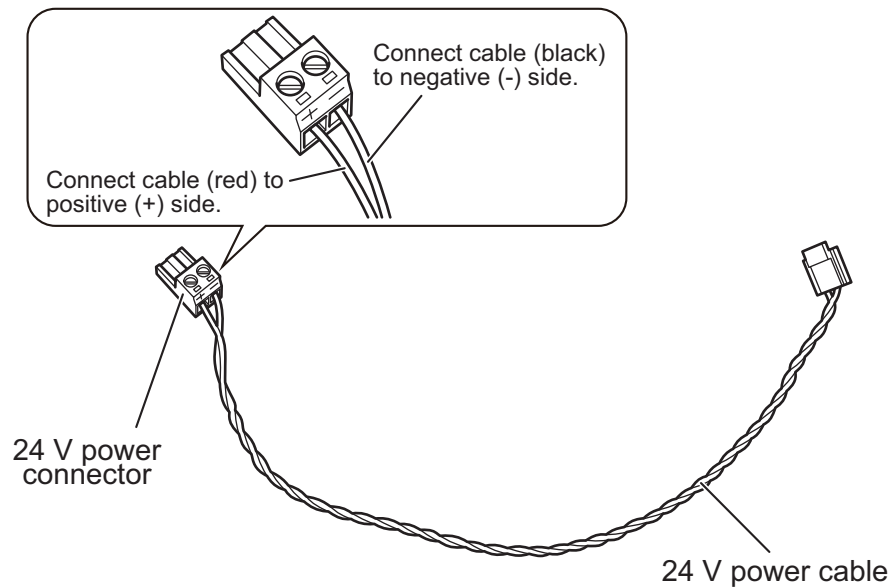


9. Remove the communication unit and the 24 V power connector from the Anybus Communicator EtherNet/IP AB7072 package.



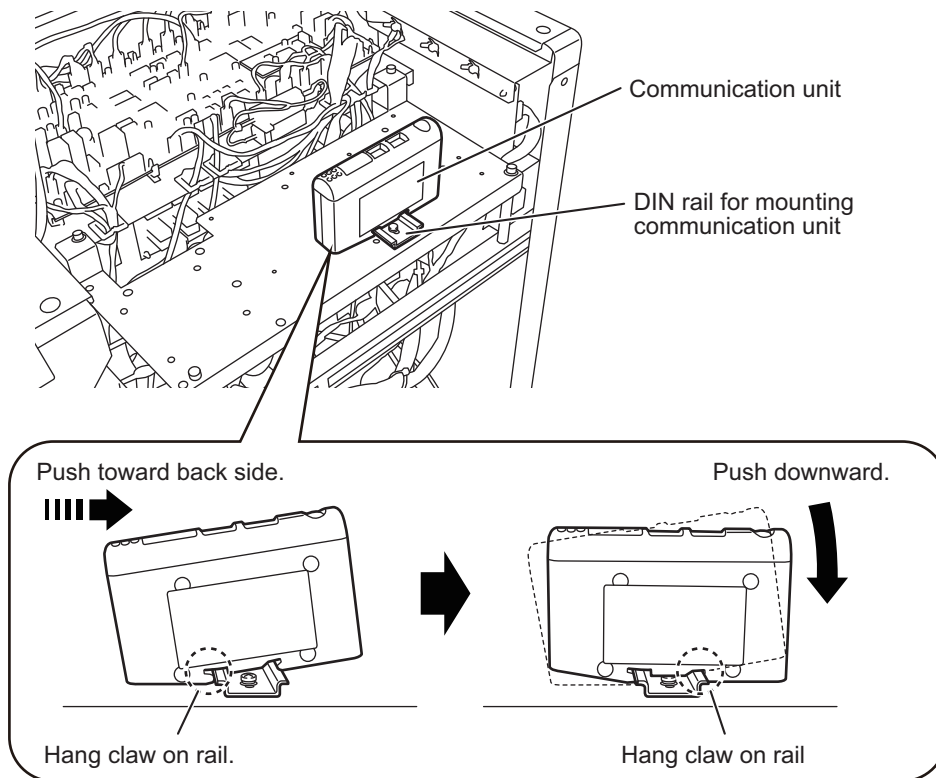
10. Connect the 24 V power cable to the 24 V power connector.

- Connect the cable (red) to the positive (+) side and the cable (black) to the negative (-) side.



**11. Install the communication unit to the DIN rail for mounting the communication unit.**

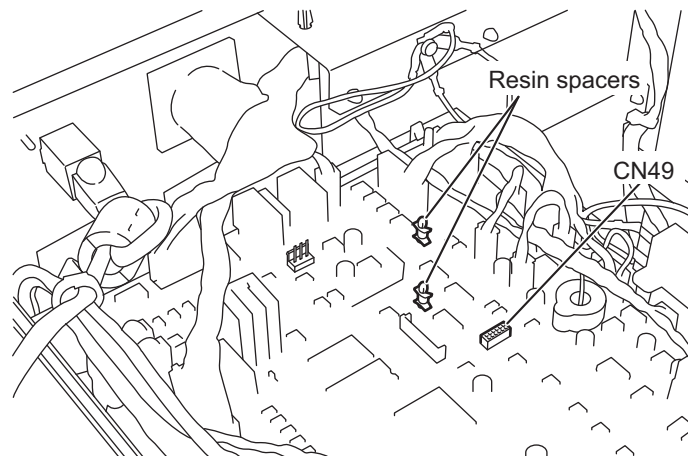
- Set the communication unit so that its connector faces the rear side of the welding power source.
- Set the communication unit between two round screws for mounting the DIN rail.
- Hang the groove at the bottom of the communication unit on one side of the rail on the front side of the welding power source. A spring is mounted in the groove.
- Holding the top of the communication unit by hand, push it backward of the welding power source and then downward. The groove at the bottom of the communication unit is put on the rail on the other side.



After installing the communication unit, install the serial communication board.

**12. Install the resin spacers (2 pcs) to the mounting holes of the main control printed circuit board.**

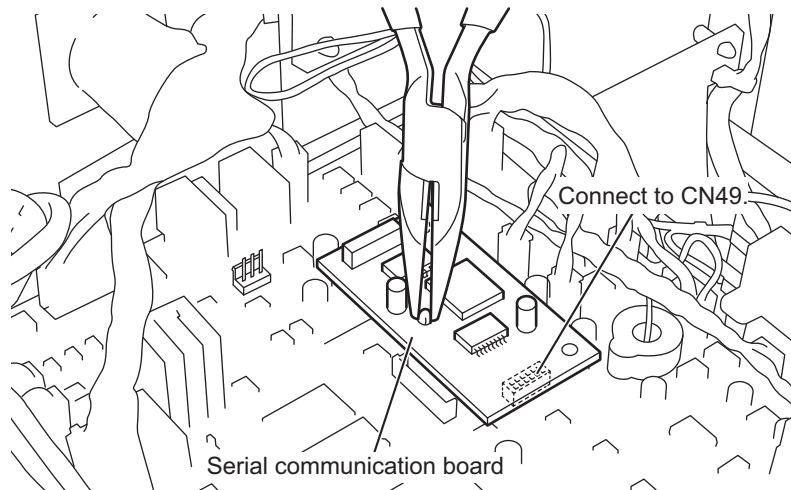
- Main control printed circuit board is different depending on the model type of the Welbee Inverter.
- If spacer are installed to the mounting holes of the main control printed circuit board, please skip this step.





**13. Connect the communication connector (rear side) of the serial connection board to CN49.**

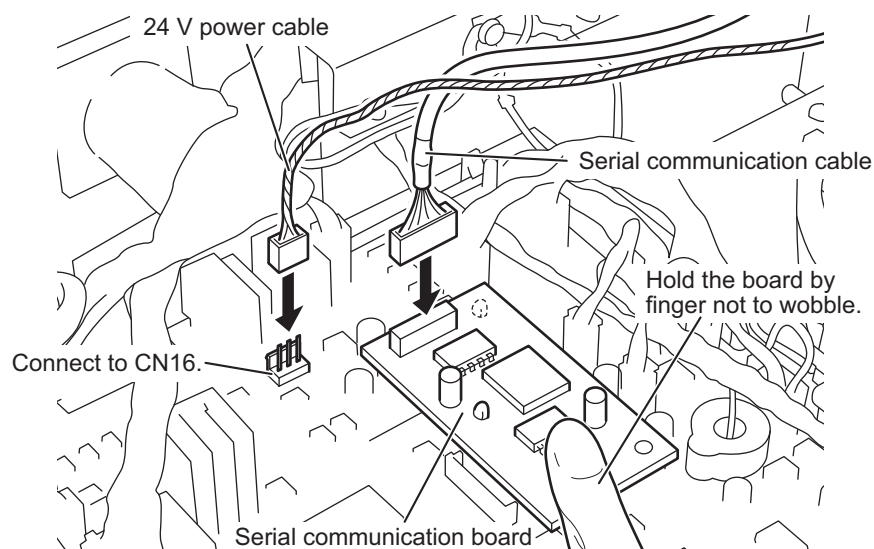
- If installed the resin spacers (2 pcs), connect to CN49 by passing the resin spacer through the mounting hole of the serial communication board. The communication connector can be easily connected when the resin spacer head is lightly pinched with pliers, etc.
- If spacers are on the mounting hole, connect to CN49 by passing the resin spacer through the mounting hole of the serial communication board.



**14. Connect the 24 V power cable with CN16.**

**15. Connect the serial communication cable with the serial communication board.**

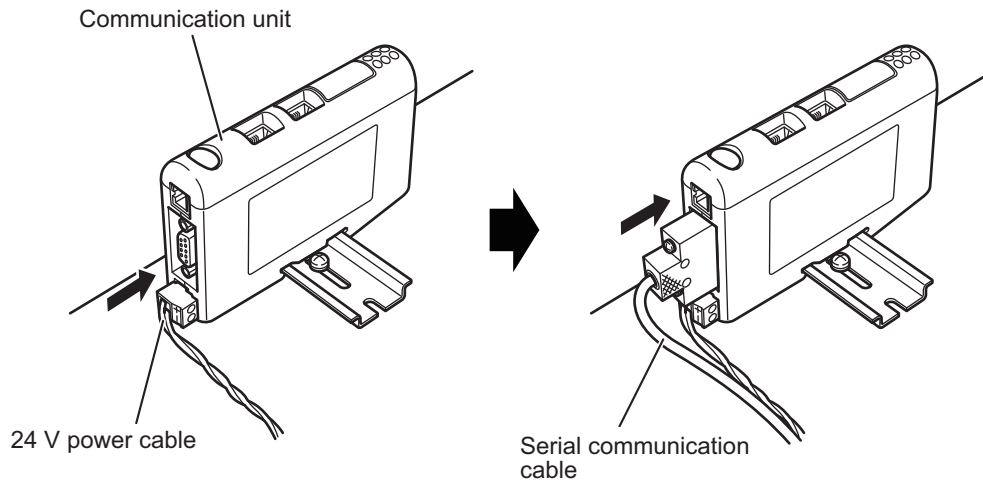
- Connect the serial communication cable with serial communication board by holding with finger. (This is to prevent falling off the serial communication board from main control print circuit board CN49.)



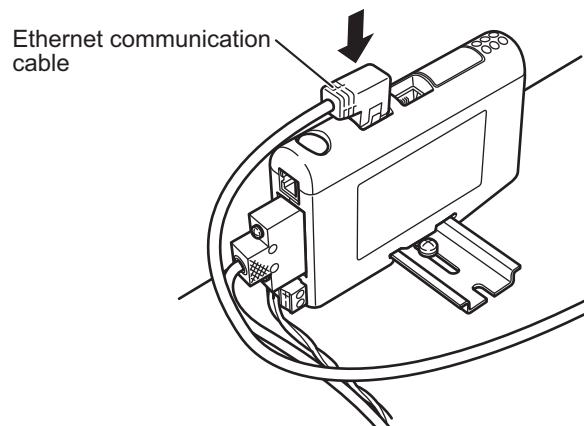
**NOTE**

- After connecting serial communication cable, make sure to confirm that the serial communication board did not come off from the main control print circuit board.

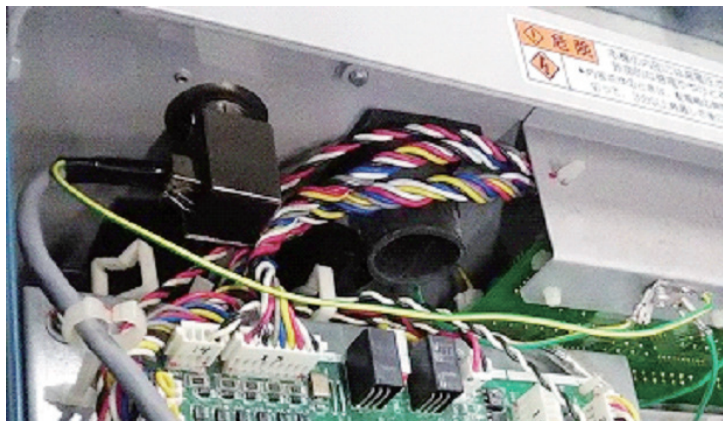
**16. Connect the 24 V power cable with the power connector of the communication unit.**

**17. Connect the serial communication cable with the subnetwork connector of the communication unit.****18. Connect the Ethernet communication cable with the Ethernet connector of the communication unit.**

- There are two Ethernet connectors. Connect as shown below.
- If Ethernet communication cable is SBXQ0087-01M, connect the connector without the ground wire to the communication unit.

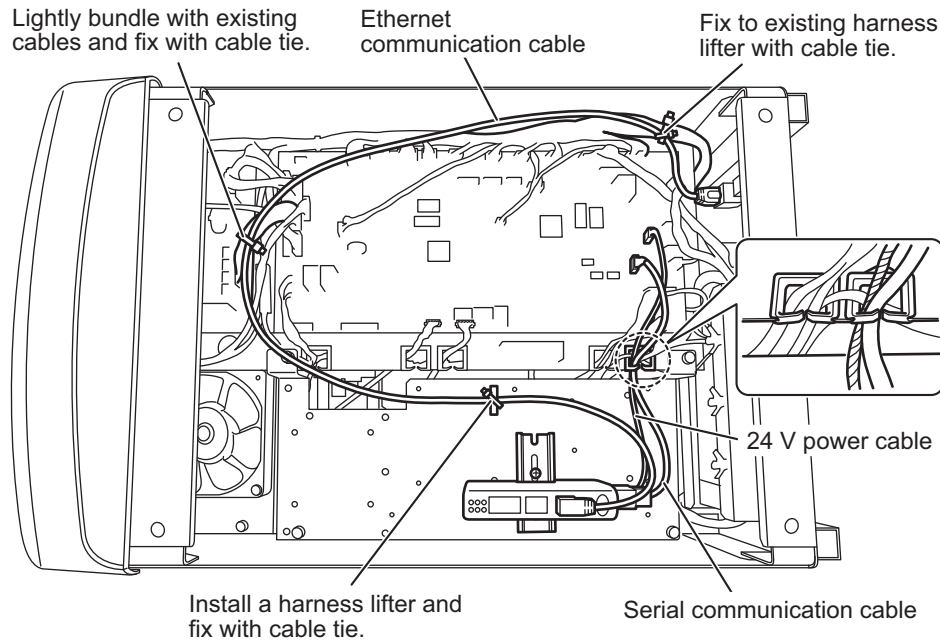
**19. Connect the Ethernet communication cable with the external connection connector.**

- If Ethernet communication cable is SBXQ0087-01M, connect the connector without the ground wire to the communication unit.



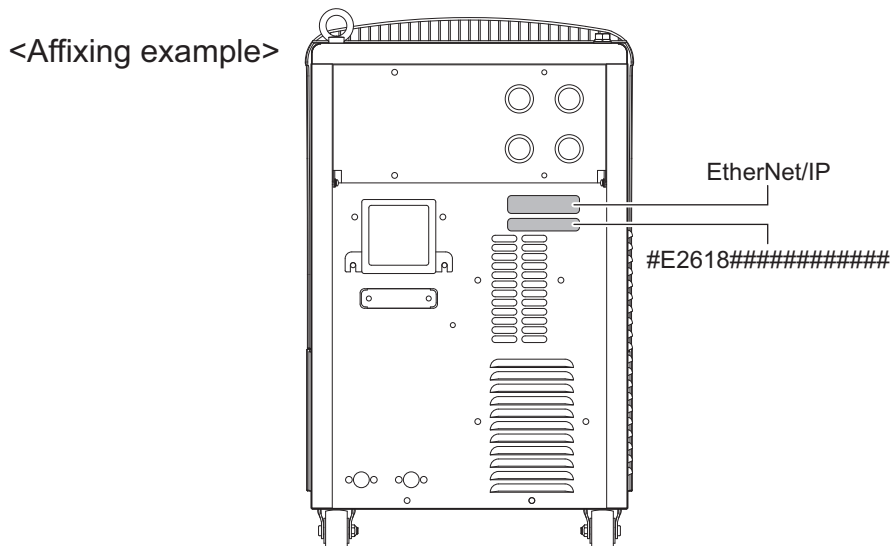
20. Draw each connected cable not to contact the printed circuit board, and then fix with other cables on the control board with the cable ties.

- Pass the 24 V power cable and the serial communication cable through the notch.
- Install the harness lifters to the communication unit stationary plate.
- Fix the Ethernet communication cable to the harness lifters and other cables on the control board with the cable ties.



21. Reinstall all the removed covers.

22. Affix the sticker showing "Fieldbus option" and serial number sticker at a position easy to see on the welding power source.



Installation of Welbee Fieldbus Connection Tool is complete by the operations above. Next, unlock the Fieldbus option. (☞ "3.2 Unlocking Fieldbus Option")

### 3.1.2 Installation of PROFIBUS connection type

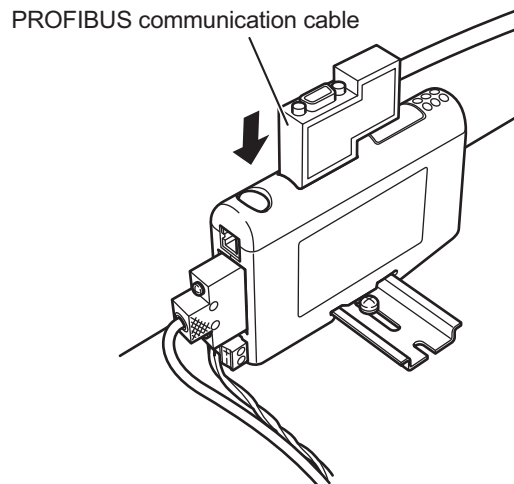
This section explains the procedures for installing the PROFIBUS connection type.

#### STEP

1. Perform the operations same as those in Steps 1 to 3 and Steps 5 to 17 of "3.1.1 Installation of EtherNet/IP connection type".

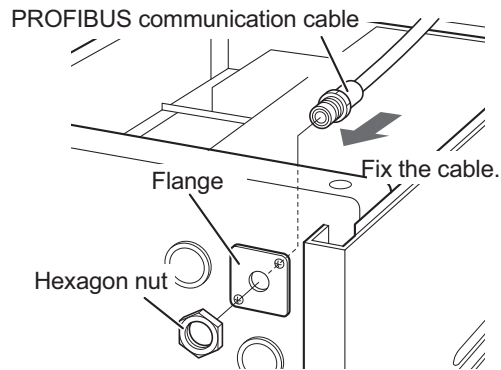
#### NOTE

- The communication unit described in Steps 9, 11, and 17 of "3.1.1 Installation of EtherNet/IP connection type" is the communication unit of EtherNet/IP connection type. Its shape is slightly different from the communication unit used for the PROFIBUS connection type.
  - When installing in the welding power source WB-DPS, "24 V power cable (K8116F00)" is also required. Since the 24 V power cable uses "24 V power cable (K8116F00)", the operations in Step 10 change. Install "24 V power cable (K8116F00)" before the operations in Step 1. Refer to the instruction manual of "24 V power cable (K8116F00)" for details.
  - When using the welding power source WB-DPS in parallel operation, connect Welbee Fieldbus Connection Tool to the welding power source WB-DPS (Master) side.
  - When installing in the welding power source WB-F300P, "Extension Board Mounting Kit (K-5976)" is also required. Since the communication unit stationary plate in "Extension Board Mounting Kit (K-5976)" is used for the communication unit stationary plate, the operations in Steps 5, 6, 7, 8, and 11 change. Refer to the instruction manual of "Extension Board Mounting Kit (K-5976)" for details.
2. Connect the PROFIBUS communication cable with the PROFIBUS connector of the communication unit.



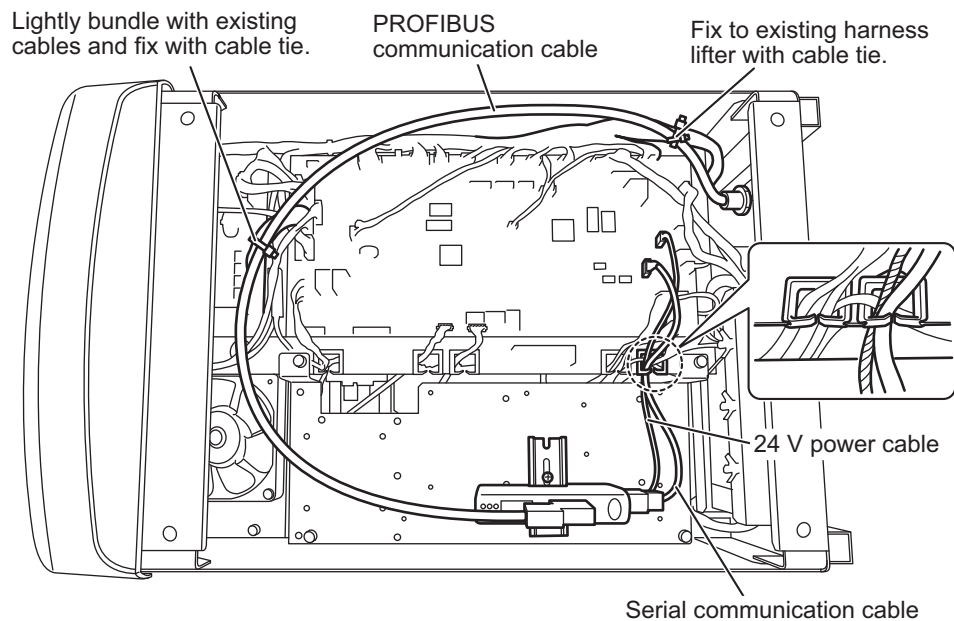
**3. Fix an end of the PROFIBUS communication cable to the external connection port on the rear side of the welding power source.**

- Pass the PROFIBUS communication cable through the hole of the flange from the inside of the unit, and fix it by tighten with the hexagon nut. (The hexagon nut is attached to the PROFIBUS communication cable.)



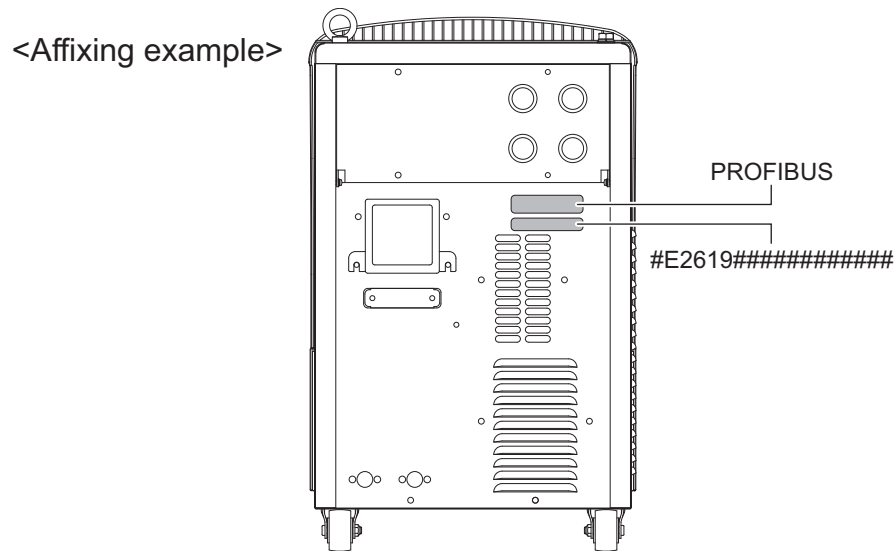
**4. Draw each connected cable not to contact the printed circuit board, and then fix with other cables on the control board with the cable ties.**

- Pass the 24 V power cable and the serial communication cable through the notch.
- Fix the PROFIBUS communication cable to the harness lifters and other cables on the control board with the cable ties.



**5. Reinstall all the removed covers.**

6. Affix the sticker showing "Fieldbus option" and serial number sticker at a position easy to see on the welding power source.



Installation of Welbee Fieldbus Connection Tool is complete by the operations above. Next, unlock the Fieldbus option. (☞ "3.2 Unlocking Fieldbus Option").

### 3.1.3 Installation of DeviceNet connection type

This section explains the procedures for installing the DeviceNet connection type.

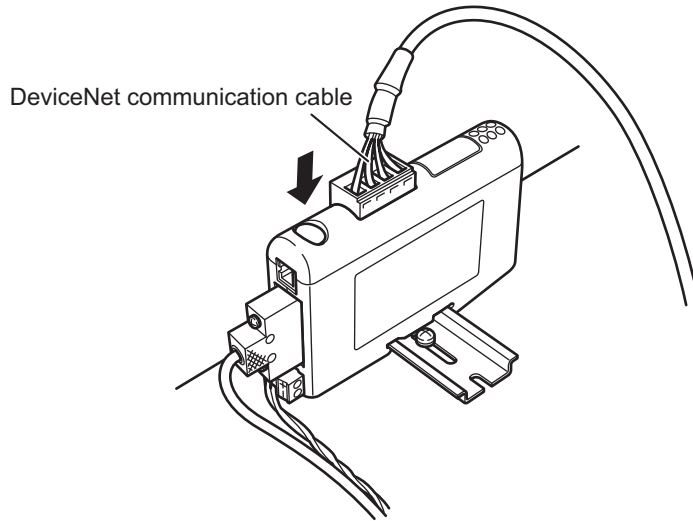
#### STEP

1. Perform the operations same as those in Steps 1 to 2 and Steps 5 to 17 of "3.1.1 Installation of EtherNet/IP connection type".

#### NOTE

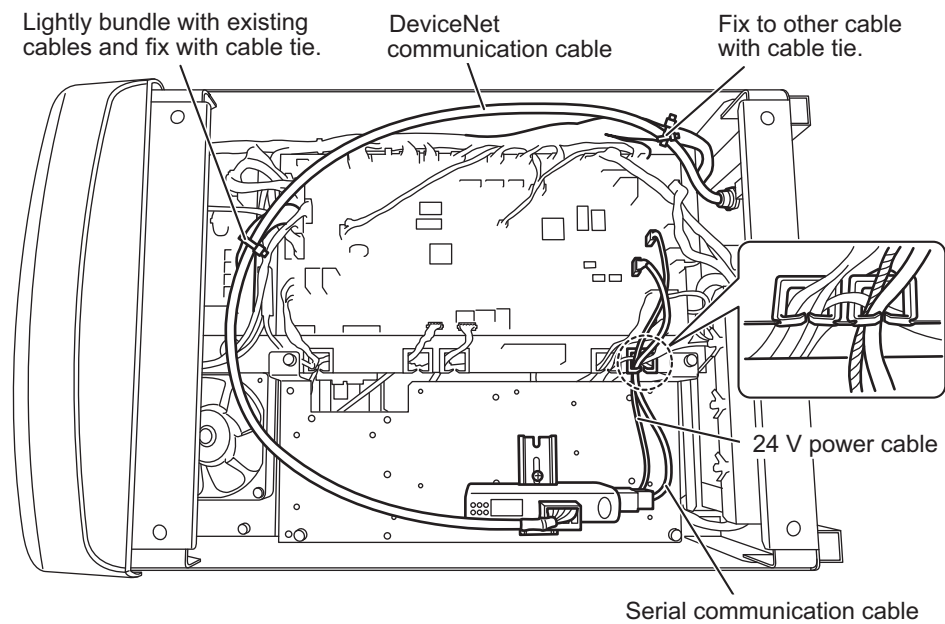
- For the installation of the DeviceNet connection type, the DeviceNet communication cable is connected, drawn into the welding power source.
- The communication unit described in Steps 9, 11, and 17 of "3.1.1 Installation of EtherNet/IP connection type" is the communication unit of EtherNet/IP connection type. Its shape is slightly different from the communication unit used for the DeviceNet connection type.
- When installing in the welding power source WB-DPS, "24 V power cable (K8116F00)" is also required. Since the 24 V power cable uses "24 V power cable (K8116F00)", the operations in Step 10 change. Install "24 V power cable (K8116F00)" before the operations in Step 1. Refer to the instruction manual of "24 V power cable (K8116F00)" for details.
- When using the welding power source WB-DPS in parallel operation, connect Welbee Fieldbus Connection Tool to the welding power source WB-DPS (Master) side.
- When installing in the welding power source WB-F300P, "Extension Board Mounting Kit (K-5976)" is also required. Since the communication unit stationary plate in "Extension Board Mounting Kit (K-5976)" is used for the communication unit stationary plate, the operations in Steps 5, 6, 7, 8, and 11 change. Refer to the instruction manual of "Extension Board Mounting Kit (K-5976)" for details.

2. Connect the DeviceNet communication cable with the DeviceNet connector of the communication unit.

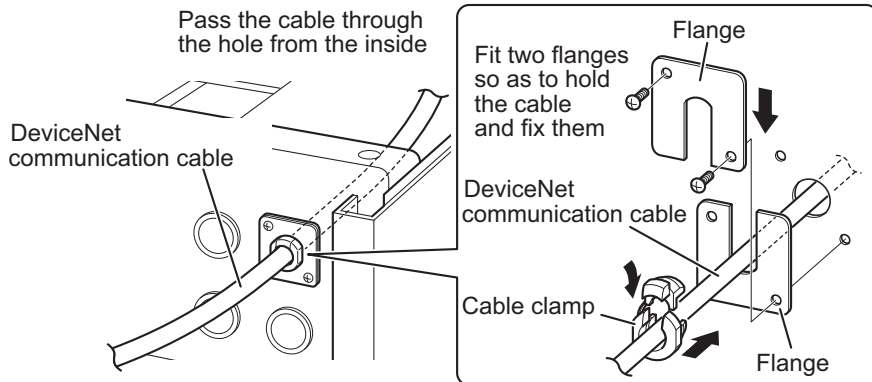


3. Draw each connected cable not to contact the printed circuit board, and then fix with other cables on the control board with the cable ties.

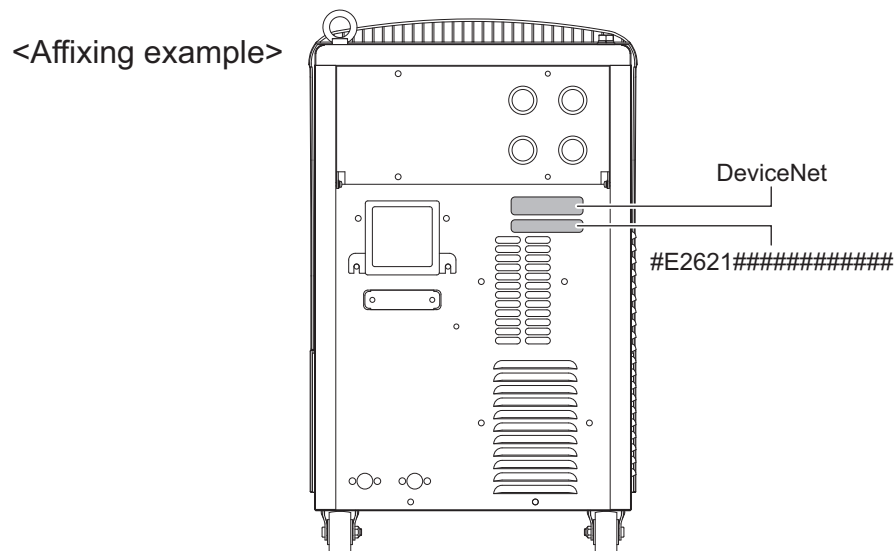
- Pass the 24 V power cable and the serial communication cable through the notch.
- Fix the DeviceNet communication cable to other cables on the control board with the cable ties.



4. Connect the DeviceNet communication cable to the external connection port on the rear of the welding power source.
  - Pass the DeviceNet communication cable through the hole from the inside of the welding power source.
  - Fit two flanges so as to hold the communication cable and fix them to the back plate.
  - Set the cable clamp on the communication cable and push it into the hole of the flange for fixation.
  - Fix the flange by tightening the flange fixing screws (2 pcs).



5. Reinstall all the removed covers.
6. Affix the sticker showing "Fieldbus option" and serial number sticker at a position easy to see on the welding power source.



Installation of Welbee Fieldbus Connection Tool is complete by the operations above. Next, unlock the Fieldbus option. (☞ "3.2 Unlocking Fieldbus Option").



### 3.1.4 Installation of PROFINET connection type

This section explains the procedures for installing the PROFINET connection type.

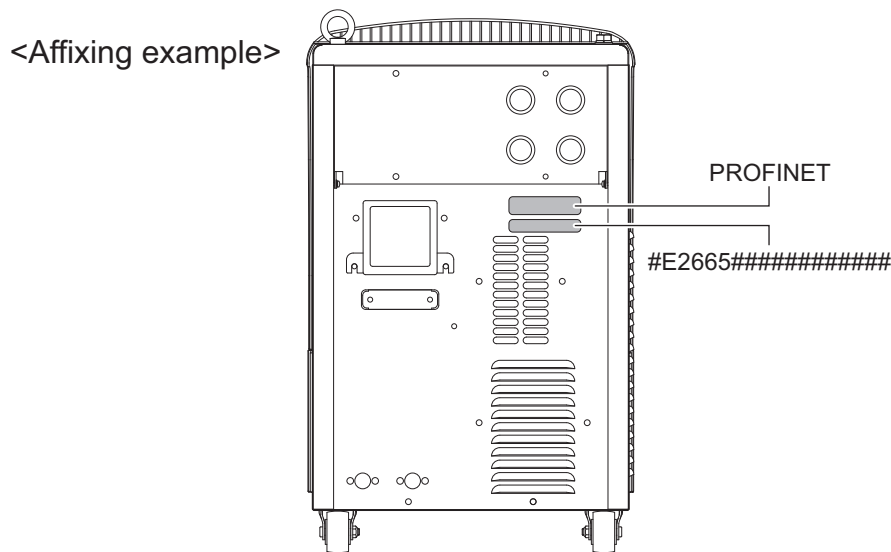
**STEP**

1. Perform the operations same as those in Steps 1 to 21 of "3.1.1 Installation of EtherNet/IP connection type".

**NOTE**

- When installing in the welding power source WB-DPS, "24 V power cable (K8116F00)" is also required. Since the 24 V power cable uses "24 V power cable (K8116F00)", the operations in Step 10 change. Install "24 V power cable (K8116F00)" before the operations in Step 1. Refer to the instruction manual of "24 V power cable (K8116F00)" for details.
- When using the welding power source WB-DPS in parallel operation, connect Welbee Fieldbus Connection Tool to the welding power source WB-DPS (Master) side.
- When installing in the welding power source WB-F300P, "Extension Board Mounting Kit (K-5976)" is also required. Since the communication unit stationary plate in "Extension Board Mounting Kit (K-5976)" is used for the communication unit stationary plate, the operations in Steps 5, 6, 7, 8, and 11 change. Refer to the instruction manual of "Extension Board Mounting Kit (K-5976)" for details.

2. Affix the sticker showing "Fieldbus option" and serial number sticker at a position easy to see on the welding power source.



Installation of Welbee Fieldbus Connection Tool is complete by the operations above. Next, unlock the Fieldbus option. (☞ "3.2 Unlocking Fieldbus Option").

## 3.2 Unlocking Fieldbus Option

To use the Fieldbus supporting option, unlocking the Fieldbus option is necessary. This section describes the procedures to unlock the Fieldbus option.

### NOTE

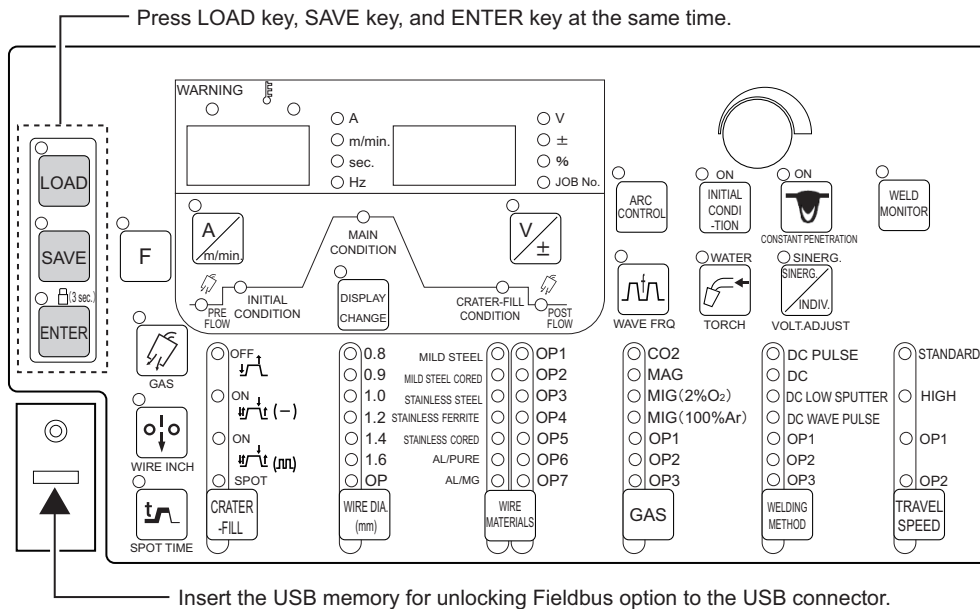
- The unlocking procedure includes the operations to reset the welding conditions registered to the memory and the settings of internal functions of the welding power source to the initial values (as shown in Step 8 below). If you want to use the welding conditions registered to the memory and the settings of internal functions, backup those data on an USB memory in advance. For details of backup and importing of the backup data, refer to "7.3 Data Backup (Utilization of data)" in Chapter 7 of the Welbee Inverter Owner's Manual.

### TIPS

- Fieldbus special functions are added, accompanied to the unlocking of Fieldbus option. Refer to "3.5 Fieldbus Special Functions" for the details of the Fieldbus special functions.

### STEP

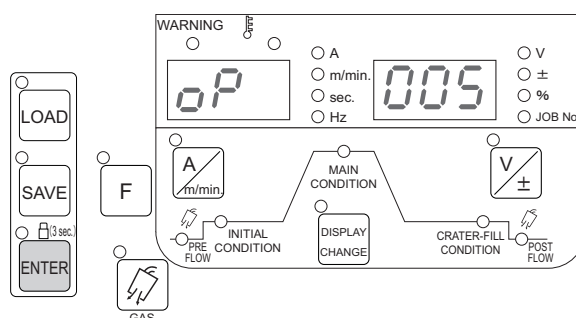
- Turn off the power of the Welbee Inverter.
- Insert the USB memory for unlocking the Fieldbus option to the USB connector on the operation panel of the Welbee Inverter.
- While pressing the LOAD key, the SAVE key, and the ENTER key at the same time, turn on the power of the Welbee Inverter.
  - Hold the LOAD key, the SAVE key, and the ENTER key pressed without releasing them immediately.



- If "oP" and "005" are displayed on the digital meters, release your fingers from three keys you pressed in Step 3.

5. Confirm that "005" is flashing on the right digital meter, and press the ENTER key.

⇒ The display of "005" changes from flashing to lighting.

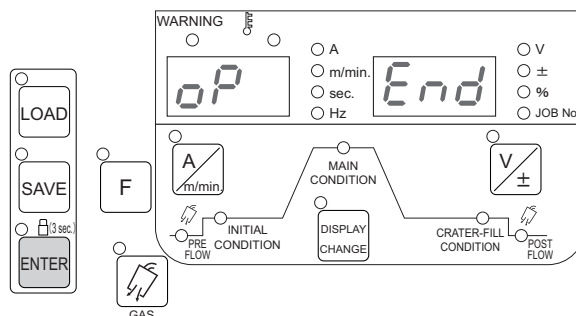


6. Press the ENTER key again.

⇒ Unlocking of the Fieldbus option is executed.

⇒ "oP\_" and "\_\_\_" on the digital meters flash during the unlocking process.

⇒ "oP" and "End" will be displayed on the digital meters when the unlocking process is complete.



**NOTE**

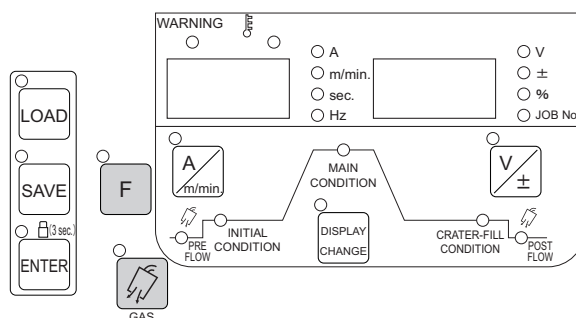
- If "oP" and "End" are not displayed even after 10 minutes or more have passed after the startup of the unlocking process, the process may have failed. In such a case, turn off the power of the Welbee Inverter and perform the operation again from the beginning.

7. After unlocking is complete, turn off the power of the Welbee Inverter and remove the USB memory for unlocking the Fieldbus option.

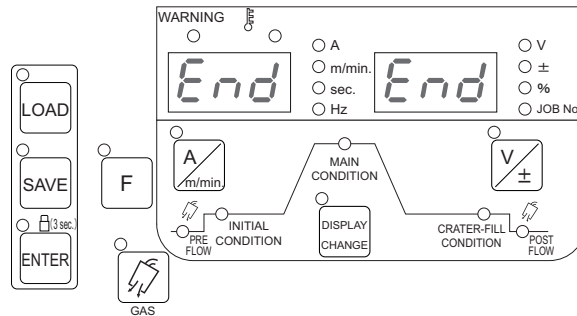
- By performing the operation in the following step 8, the welding conditions registered to the memory and the settings of internal functions will be reset to the initial values. Backup the data as necessary.

8. Turn on the power of the Welbee Inverter while the F (Function) key and the GAS CHECK key are pressed at the same time.

- Hold the F (Function) key and the GAS CHECK key pressed without releasing them immediately.



9. After "End" and "End" are displayed on the digital meters, release your fingers from two keys you pressed in Step 8.



10. Turn off the power of the Welbee Inverter.

### TIPS

- When the power supply of the Welbee Inverter is turned on again, "HE" and "LLO" are displayed on the left and right digital meters for about one second and the indication changes to "FLd" and "bUS"

Unlocking of the Fieldbus option is complete by the operations above. Next, connect the communication cable (☞ "3.3 Connection of Communication Cable").

## 3.2.1 Installing of Welbee II series

### STEP

1. With the power switch off, insert the included USB memory to the USB port on the front panel.
2. While holding "Inching", "GAS CHECK" and "Air cooled" keys, turn on the power switch.
3. After "oP 005" is displayed on the digital meter, release all keys. Then, press "Air cooled" key. The digital meter indication on the right side changes from blinking to lighting.
4. Again, press "Air cooled" key. Program installation starts. During installation, the following indications appear on the digital meter in this order.  
⇒ "oP " blinks
5. After "oP End" is displayed on the digital meter, turn off the power switch. Remove the USB memory.

### NOTE

- If "oP End" is not displayed 10 minutes after starting of writing, there is a possibility of the writing failure. In this case, turn off the power switch and restart from step 1.

6. While holding "Inching" key and "Swich(left)" key, turn on the power switch.
7. After "End End" is displayed on the digital meter, release the key and turn off the power switch.  
⇒ Software installation completes.

### 3.3 Connection of Communication Cable

Connect the Welbee Inverter and the master device with the communication cable. The communication cable must be prepared by the customer. The following shows the specifications of the receptacle for connecting the Welbee Inverter communication cable.

#### TIPS

- The housing of the receptacle for connecting the Welbee Inverter communication cable is designed to be grounded to the case earth of the Welbee Inverter.

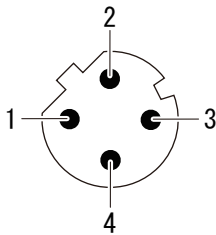
#### NOTE

- STP cable, when used, must be grounded at its both ends. (If only one end is grounded, it may be likely to receive the influence of electromagnetic noise.)
- EtherNet/IP connection type, PROFINET connection type

Alias: Industrial Ethernet M12 connector

Specifications: IEC 61076-2-101, M12, 4 pin, D-coding, Female

Pin allocation:



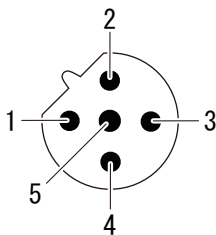
Pin	Signal
1	+TX
2	+RX
3	-TX
4	-RX
Housing	Shield

- PROFIBUS connection type

Alias: PROFIBUS M12 connector

Specifications: IEC 61076-2-101, M12, 5 pin, B-coding, Female

Pin allocation:



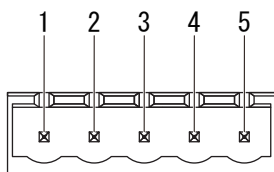
Pin	Signal
1	—
2	A Line (Green)
3	—
4	B Line (Red)
5	—
Housing	Shield

- DeviceNet connection type

Alias: DeviceNet connector

Use the PHOENIX CONTACT product, MSTB 2,5/5-ST-5,08 AU or equivalent for the communication cable connector.

Pin allocation:



Pin	Signal
1	V-
2	CAN L
3	Shield
4	CAN H
5	V+

**STEP**

1. Turn off the power of the Welbee Inverter and the master device.
2. Connect the Welbee Inverter and the master device with the communication cable.
  - Connect the communication cable to the connector on the rear side of the Welbee Inverter and the communication port of the master device.

### 3.4 Specifications of Fieldbus Communication

Make the setting to establish the Fieldbus communication with the Welbee Inverter on the customer's communication equipment.

- Function specifications providing method

Materials (Function specifications) as to the necessary parameters and communication data are provided by the following means.

Web site	The newest function specifications can be downloaded from the following Web site (URL). <a href="http://www.daihen.co.jp/products/welder/software/">http://www.daihen.co.jp/products/welder/software/</a>
Fieldbus option unlocking USB memory	The function specifications file is stored in "Fieldbus option unlocking USB memory". However, check the Web site above for the newest version since the function specifications may be updated.
Providing method of Fieldbus configuration file (EDS, GDS)	<p>Please use the Fieldbus configuration file of communication unit (EDS, GDS) as necessary when setting up the communication equipment.</p> <p>Download the latest file from the HMS Industrial Networks website. The URL below is as of October 5, 2022.</p> <ul style="list-style-type: none"> <li>• EDS file for IFR-800EI (AB7072) <a href="https://www.anybus.com/ja/technical-support/pages/files-and-documentation?ordercode=AB7072">https://www.anybus.com/ja/technical-support/pages/files-and-documentation?ordercode=AB7072</a></li> <li>• GSD file for IFR-800PB (AB7000) <a href="https://www.anybus.com/ja/technical-support/pages/files-and-documentation?ordercode=AB7000">https://www.anybus.com/ja/technical-support/pages/files-and-documentation?ordercode=AB7000</a></li> <li>• EDS file for IFR-800DN (AB7001) <a href="https://www.anybus.com/ja/technical-support/pages/files-and-documentation?ordercode=AB7001">https://www.anybus.com/ja/technical-support/pages/files-and-documentation?ordercode=AB7001</a></li> <li>• GSD file for IFR-800PN (AB7078) <a href="https://www.anybus.com/ja/technical-support/pages/files-and-documentation?ordercode=AB7078">https://www.anybus.com/ja/technical-support/pages/files-and-documentation?ordercode=AB7078</a></li> </ul>

- Functional restrictions in Fieldbus communication

The following functions of the following welding power source are restricted when the Fieldbus communication is set "Enable"

Restricted functions	Contents of restrictions
Switchover of [Auto/Semi-Auto mode]	The set value of Internal function F4 is fixed to "2" (Automated machine 2).
Initial condition, Crater condition, Arc spot	The functions of Initial condition, Crater condition, Arc spot and Adjusting current by torch switch cannot be used. (Refer to "6.6.3 Crater setting" and "6.6.4 Arc spot setting" in the Welbee Inverter Owner's Manual for the corresponding functions.) Only when the function of "Special crater sequence" is enabled, the function of "Initial condition" and "Crater condition" can be set.
Welding result control function	Welding result control function (Refer to "7.2 Welding Result Control Function" in Welbee Inverter Owner's Manual.) cannot be used.
Shielded metal arc welding, Simple TIG welding	These welding modes cannot be used with the welding power source supporting the shielded metal arc welding (welding rod) or the consumable electrode type arc welding power source (CO <sub>2</sub> /MAG/MIG welding power source).

## 3.5 Fieldbus Special Functions

Fieldbus special functions are added when the Fieldbus option is unlocked.

### 3.5.1 Contents of Fieldbus special functions

No.	Function Name	Setting Range	Initial Value	Contents
1	Fieldbus setting	0/1	1	Sets Use/No Use of the Fieldbus 0 : No use of Fieldbus 1 : Use of Fieldbus
2	Operation Panel Setting	OFF/ON	OFF	Sets Capable/Incapable of setting change from the operation panel when using the Fieldbus. OFF: Setting change is always incapable from operation panel. (Indication always can be changed.) ON: Setting change is capable when "Setting change permission" of the Fieldbus communication data is OFF. (Indication always can be changed.)
3	Watchdog monitor	-	-	Watchdog signal on the Fieldbus communication is displayed by "0" and "1" on the right digital meter. Setting cannot be made.
4	Watchdog function	OFF/ON	ON	Sets the watchdog function. OFF: ineffective (Do not send watchdog signal) ON: effective (Send watchdog signal)

### 3.5.2 When changing the setting of Fieldbus special functions

Change the setting of the added Fieldbus special functions in the following procedures, if necessary.

#### NOTE

- When "Fieldbus setting" (b1) is set to "0" or "Operation panel setting" (b2) is set "ON", the internal function No. (F1) may blink on the left digital meter immediately after "F" (Internal function) key is long-pressed. Press "Execute" key next to switch the indication to the Fieldbus special function No. (b1).

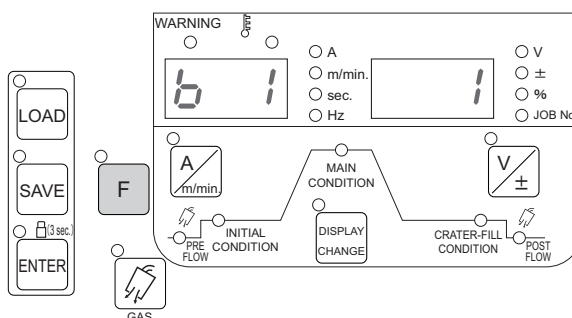
#### STEP

1. Turn on the power of the Welbee Inverter.



2. Hold "F" (internal function) key pressed for one second or more.

- ⇒ Function No."b1" of the Fieldbus special functions blinks on the left digital meter.
- ⇒ The set value corresponding to the function No. is displayed on the right digital meter.

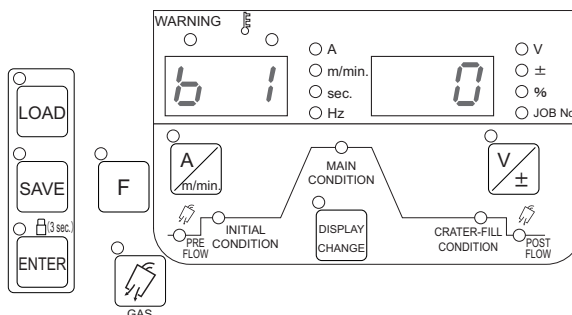


3. Select a target function No. by turning the parameter adjusting knob while the function No. on the left digital meter blinks.

- ⇒ Function numbers "b1", "b2", ... switch over every time the parameter adjusting knob is turned.

4. Press "F" (Internal function) key when a target function number is displayed on the left digital meter.

5. Turn the parameter adjustment knob to change the setting value.

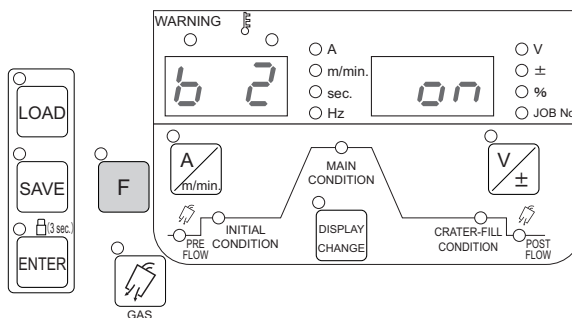


**NOTE**

- The indication above on the digital meter is just an operation example for reference.

6. Hold "F" (Internal function) key pressed for one second or more after the setting is complete.

- ⇒ The set data is stored.
- ⇒ The initial setting is complete by the operations above and normal indication is restored.



**NOTE**

- The indication above on the digital meter is just an operation example for reference.

7. Turn the power of the Welbee Inverter off.

### 3.5.3 Setting of Welbee II series

#### STEP

1. Turn on the power of the Welbee.
2. Pressing Unit key on the welding power source front panel during the internal function display will change to the Fieldbus special functions "b\*\*".
  - ⇒ Function No."b1" of the Fieldbus special functions blinks on the left digital meter.
  - ⇒ The set value corresponding to the function No. is displayed on the right digital meter.
3. Select a target function No. by turning the parameter adjusting knob while the function No. on the
4. left digital meter blinks.
  - ⇒ Function numbers "b1", "b2", ... switch over every time the parameter adjusting knob is turned.
5. Press "F" (Internal function) key when a target function number is displayed on the left digital meter.
6. Turn the parameter adjustment knob to change the setting value.
7. Hold "Back" key pressed for one second or more after the setting is complete.
  - ⇒ The set data is stored.
  - ⇒ The initial setting is complete by the operations above and normal indication is restored.

# Chapter 4 Reference Materials

## 4.1 Communication Errors

This section explains the error codes in the Fieldbus communication.

### 4.1.1 Error codes added to welding power source

When the Fieldbus supporting option is introduced to the Welbee Inverter by using Welbee Fieldbus Connection Tool, the following error code is added to the Welbee Inverter system. Take measures by following the instructions on the table below when an error has occurred.

Error code		Probable cause	Countermeasures/Error reset method
E-	920	Reception of watchdog was interrupted in the Fieldbus communication.	<ul style="list-style-type: none"> <li>Restart sending when the sending of watchdog from the master device is interrupted.</li> <li>Confirm that there is no disconnection of the communication path nor the influence by the electromagnetic noise when interruption of the Fieldbus communication by the master device is observed. (Welbee Inverter cannot detect any disconnection of the Fieldbus communication.)</li> <li>If there is no abnormality on the master device side, the communication error might have occurred on the Welbee Inverter side. In such a case, Error code "1002" is issued in the Fieldbus communication data. If this error occurs frequently, contact your dealer.</li> </ul>
E-	921	An error has occurred in the data sending from Welbee Inverter in the Fieldbus communication.	<ul style="list-style-type: none"> <li>Contact your dealer.</li> </ul>
E-	922	Communication was not established between the main control PC board and the communication unit at the startup of the welding power source.	<ul style="list-style-type: none"> <li>Confirm that the communication unit and the serial communication board are correctly connected.</li> </ul>

### 4.1.2 Error codes indicated on Fieldbus communication data

The following table describes the error codes indicated on the Fieldbus communication data.

Error code	Contents
0	Shows No error, During operation stop, or During error reset.
1-999	Same as the error code "E-***" listed in "9.2 Countermeasures when error has occurred" in Welbee Inverter Owner's Manual.
1001	Watchdog error
1002	Reception error from the communication unit installed in the welding power source
1003	Reception error warning from communication unit installed in the welding power source (Issued when the error is reset immediately after it has occurred.)
1004	Transmission error from the welding power source control unit to the communication unit
1101	Welding mode warning (Issued when the specified welding mode does not exist.)
1102	Welding condition memory No. warning (Issued when a memory number outside the range is specified or a number at which no welding condition is saved is tried to be read out.)

Error code	Contents
1103	Welding mode switching warning during welding (Issued when not permitted welding mode is specified during welding. The warning is automatically reset after welding is complete.)
1111	Warning issued when any one of welding start, inching, retraction, gas discharge, or welding detection is already set ON when watchdog is activated or error is reset (The warning is reset when all the items are set OFF.)

## 4.2 Address of Communication Unit

This section explains the address setting of the communication unit for each connection type.

### 4.2.1 IP address setting (EtherNet/IP connection type)

The IP address of the Welbee Inverter in EtherNet/IP communication (the IP address of the communication unit) is set to "192.168.0.2". The IP address can be changed by using "HMS IPconfig" (an IP address setting tool), if necessary.

The installer of "HMS IPconfig" is obtained from the following web site (URL).

URL (As of October 5, 2022):

<https://www.anybus.com/technical-support/resources/downloads-and-documentation?ordercode=AB7072>

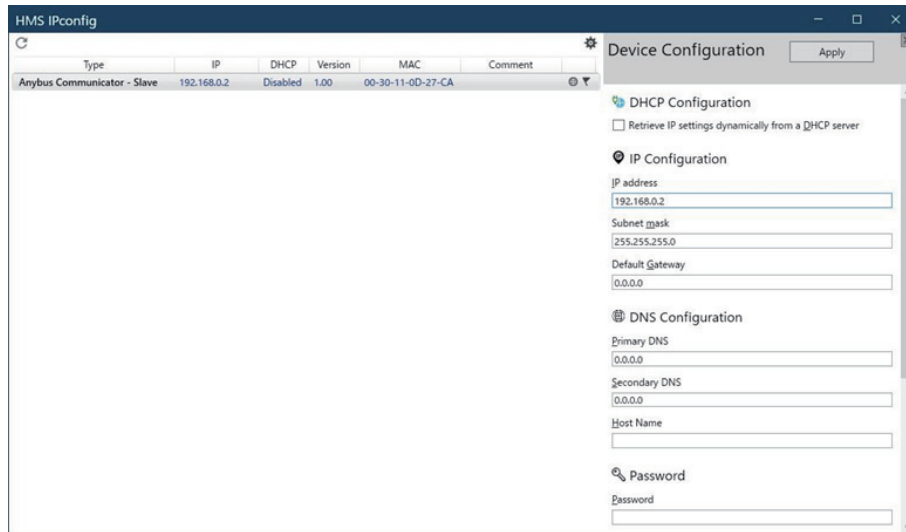
#### NOTE

- Use a Windows PC furnished with an Ethernet port in order to install "HMS IPconfig".

#### STEP

1. Install "HMS IPconfig" in the PC.
  - Install "HMS IPconfig" obtained from above website into the PC.
2. Turn off the power of the Welbee Inverter.
3. Connect the Welbee Inverter with the PC in which "HMS IPconfig" is installed by a LAN cable.
4. Turn on the power of the Welbee Inverter.
5. Start "HMS IPconfig".
  - ⇒ The communication unit mounted in the Welbee Inverter is searched.

## 6. Change the IP address as intended.



## 7. After changing the IP address, click on "Exit" button to close "HMS IPconfig".

### 4.2.2 Node address setting (PROFIBUS connection type)

The Node address of Welbee Inverter (Node address of the communication unit) on PROFIBUS communication is set to "77".

If necessary, change the Node address by operating the configuration switch of the communication unit.

#### CAUTION

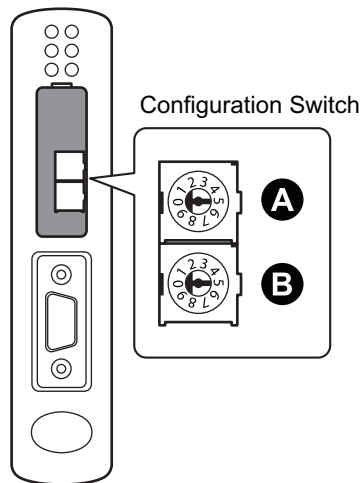
- Before operating the configuration switch, be sure to turn off the power of the Welbee Inverter and the communication equipment.
- Never touch any internal board, etc. other than the configuration switch and the communication unit.

#### STEP

1. Turn off the power of the Welbee Inverter.
2. Remove the top panel of the Welbee Inverter.
3. Remove the hatch on top of the communication unit.

#### 4. Change the Node address by turning the configuration switch (Rotary switches A, B)

⇒ Rotary switch A sets the value of "1" digit and Rotary switch B sets the value of "10" digit.



#### **TIPS**

- To set the Node address to "52", match Rotary switch B to "5" and Rotary switch A to "2".

5. Close the hatch on top of the communication unit.

6. Close the top panel of the Welbee Inverter.

### 4.2.3 Node address setting and communication speed setting (DeviceNet connection type)

The node address of the Welbee Inverter in DeviceNet communication (node address of the communication unit) is set to "1" and the communication speed is set to "500kbps".

If necessary, change the Node address and communication speed by operating the configuration switch of the communication unit.

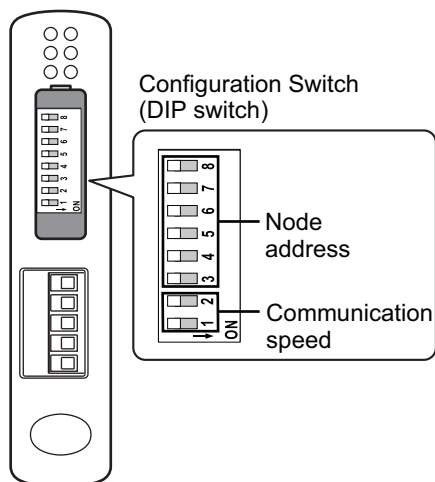
#### **CAUTION**

- Before operating the configuration switch, be sure to turn off the power of the Welbee Inverter and the communication equipment.
- Never touch any internal board, etc. other than the configuration switch and the communication unit.

#### **STEP**

1. Turn off the power of the Welbee Inverter.
2. Remove the top panel of the Welbee Inverter.
3. Remove the hatch on top of the communication unit.

- Change the Node address and communication speed by turning the configuration switch (DIP switch)



Communication speed	Switch 1	Switch 2
125k	OFF	OFF
250k	OFF	ON
500k	ON	OFF
(reserved)	ON	ON

Node address	Switch 3	Switch 4	Switch 5	Switch 6	Switch 7	Switch 8
0	OFF	OFF	OFF	OFF	OFF	OFF
1	OFF	OFF	OFF	OFF	OFF	ON
2	OFF	OFF	OFF	OFF	ON	OFF
3 - 62	...	...	...	...	...	...
63	ON	ON	ON	ON	ON	ON

- Close the hatch on top of the communication unit.
- Close the top panel of the Welbee Inverter.

#### 4.2.4 IP address setting (PROFINET connection type)

The IP address of the Welbee Inverter in PROFINET communication (the IP address of the communication unit) is set to "192.168.0.2".

The IP address can be changed by using "HMS IPconfig" (an IP address setting tool), if necessary.

The installer of "HMS IPconfig" is obtained from the following web site (URL).

URL (As of October 5, 2022):

<https://www.anybus.com/technical-support/resources/downloads-and-documentation?ordercode=AB7078>

#### NOTE

- Use a Windows PC furnished with an Ethernet port in order to install "HMS IPconfig".

#### STEP

- Perform the operations same as those steps of "4.2.1 Installation of IP address setting (EtherNet/IP connection type).

## 4.3 Countermeasures When Communication Has Not Been Established

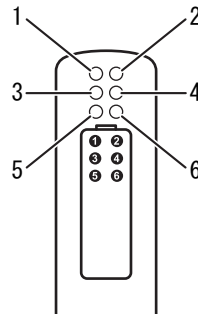
This section describes the countermeasures when communication is not established for each connection type.

### 4.3.1 When EtherNet/IP communication is not established

When the EtherNet/IP communication cannot be established between the master device and Welbee Inverter, remove the top panel of Welbee Inverter, and execute the following confirmation while observing the LED indication of the communication unit.

#### CAUTION

- Never touch any internal wiring board, etc. of the Welbee Inverter.



- **Check item 1: Operation check of communication unit**

Start the Welbee Inverter, and confirm the operation of the communication unit.

LED No.(Status)	State	Check Item and Countermeasure
6 (Device Status)	Flash in green	LED flashes in green during operation. Proceed with the confirmation of other LED indication.
	Off	No power is supplied to the communication unit. Confirm the connection, etc. of the 24 V power cable. (☞ "3.1 Installation of Welbee Fieldbus Connection Tool")
	States other than above	Contact your dealer.
5 (Subnet Status)	ON in green	Communication has been established between the communication unit and Welbee Inverter. Proceed with Check item 2.
	Flash in green	Re-start the Welbee Inverter. If the error cannot be reset, contact your dealer.
	ON in red	Contact your dealer.



• **Check item 2: Check for connection to the network**

Confirm the connection to the network before establishing the EtherNet/IP communication with the master device under the condition where the Welbee Inverter is connected with the Ethernet network. Since there are two Ethernet connectors, confirm by the LED (3 or 4) corresponding to the Ethernet connector being used.

LED No. (Status)	State	Check Item and Countermeasure
3 (Link/Activity 1) or 4 (Link/Activity 2)	ON in green	Communication to the Ethernet network has been established. Proceed with the confirmation of other LED indication.
	Off	Communication to the Ethernet network has not been established. Check the connection state.
1 (Module Status) 2 (Network Status)	Flash in green	Both the LEDs 1 and 2 flash in green when the connection to the Ethernet network has been established when the EtherNet/IP communication has not been established. Proceed with Check item 3.
	2 is OFF.	Confirm that no invalid IP address is set. (☞ "4.2 Address of Communication Unit")
	2 is ON in red.	Duplication of the IP Address is detected. Check the setting of the IP address.
	1 is ON or flashes in red.	Contact your dealer.

• **Check item 3: Check for the establishment of EtherNet/IP communication**

Confirm that the EtherNet/IP communication has been established between the master device and the Welbee Inverter.

LED No. (Status)	State	Check Item and Countermeasure
1 (Module Status) 2 (Network Status)	ON in green	Both the LEDs 1 and 2 are ON in green when the EtherNet/IP communication with the master device has been established. Proceed with Check item 4.
	States other than above	Check the communication setting on the master device side.

• **Check item 4: Confirmation of watchdog transmission and reception**

Transmit watchdog from the master device and confirm its result.

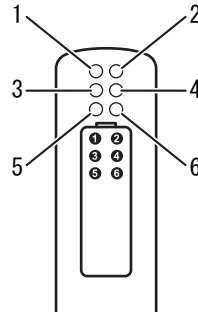
State	Check Item and Countermeasure
Error code "E-920" is issued in the Welbee Inverter though there is a response to the watchdog.	Confirm that the transmission cycle of watchdog is correct. Error code "E-920" is issued when the watchdog bit does not change for 1 second.
Watchdog is not returned.	Restart the Welbee Inverter and confirm that the indication on the digital meters changes from "HE" "LLO" to "FLd" "bUS" and then normal indication. Also, confirm that E-922 error code is not displayed immediately after that. If "FLd" "bUS" is not displayed, set the Fieldbus setting of Function to "Use". (☞ "3.5.2 When changing the setting of Fieldbus special functions") When E-922 error code is displayed, the communication between the communication unit and the Welbee Inverter is faulty. Confirm that the communication unit and the serial communication board are correctly connected. Confirm the setting of the master device if there is no problem with the items above.

### 4.3.2 When PROFIBUS communication is not established

When the PROFIBUS communication cannot be established between the master device and Welbee Inverter, remove the top panel of Welbee Inverter, and execute the following confirmation while observing the LED indication of the communication unit.

**CAUTION**

- Never touch any internal wiring board, etc. of the Welbee Inverter.



- **Check item 1: Operation check of communication unit**

Check item 1 is the same as that in the EtherNet/IP communication. Refer to Check item 1 in “4.3.1 When EtherNet/IP communication is not established”.

- **Check item 2: Check for the establishment of PROFIBUS communication**

Confirm that the PROFIBUS communication has been established between the master device and the Welbee Inverter.

LED No.(Status)	State	Check Item and Countermeasure
1(Fieldbus Online)	1 is ON in green.	PROFIBUS communication has been established with the master device. Proceed with Check item 3.
2(Fieldbus Offline)	2 is ON in red	PROFIBUS communication has not been established. Check the connection of the communication cable and the communication setting on the master device side.

- **Check item 3: Confirmation of watchdog transmission and reception**

Transmit watchdog from the master device and confirm its result.

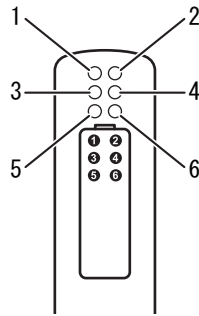
State	Check Item and Countermeasure
Error code "E-920" is issued in the Welbee Inverter though there is a response to the watchdog.	Confirm that the transmission cycle of watchdog is correct. Error code "E-920" is issued when the watchdog bit does not change for 1 second.
Watchdog is not returned.	Restart the Welbee Inverter and confirm that the indication on the digital meters changes from "HE" "LLO" to "FLd" "bUS" and then normal indication. Also, confirm that E-922 error code is not displayed immediately after that. If "FLd" "bUS" is not displayed, set the Fieldbus setting of Function to "Use". (☞ "3.5.2 When changing the setting of Fieldbus special functions") When E-922 error code is displayed, the communication between the communication unit and the Welbee Inverter is faulty. Confirm that the communication unit and the serial communication board are correctly connected. Confirm the setting of the master device if there is no problem with the items above.

### 4.3.3 When DeviceNet communication is not established

When the DeviceNet communication cannot be established between the master device and Welbee Inverter, remove the top panel of Welbee Inverter, and execute the following confirmation while observing the LED indication of the communication unit.

**CAUTION**

- Never touch any internal wiring board, etc. of the Welbee Inverter.



- **Check item 1: Operation check of communication unit**

Check item 1 is the same as that in the EtherNet/IP communication. Refer to Check item 1 in “4.3.1 When EtherNet/IP communication is not established”.

- **Check item 2: Check for the establishment of DeviceNet communication**

Confirm that the DeviceNet communication has been established between the master device and the Welbee Inverter.

LED No.(Status)	State	Check Item and Countermeasure
1(Fieldbus Online)	1 is ON in green.	DeviceNet communication has been established with the master device. Proceed with Check item 3.
2(Fieldbus Offline)	2 is ON in red	DeviceNet communication has not been established. Check the connection of the communication cable and the communication setting on the master device side.

- **Check item 3: Confirmation of watchdog transmission and reception**

Transmit watchdog from the master device and confirm its result.

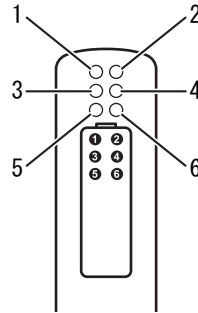
State	Check Item and Countermeasure
Error code "E-920" is issued in the Welbee Inverter though there is a response to the watchdog.	Confirm that the transmission cycle of watchdog is correct. Error code "E-920" is issued when the watchdog bit does not change for 1 second.
Watchdog is not returned.	Restart the Welbee Inverter and confirm that the indication on the digital meters changes from "HE" "LLO" to "FLd" "bUS" and then normal indication. Also, confirm that E-922 error code is not displayed immediately after that. If "FLd" "bUS" is not displayed, set the Fieldbus setting of Function to "Use". (☞ "3.5.2 When changing the setting of Fieldbus special functions") When E-922 error code is displayed, the communication between the communication unit and the Welbee Inverter is faulty. Confirm that the communication unit and the serial communication board are correctly connected. Confirm the setting of the master device if there is no problem with the items above.

### 4.3.4 When PROFINET communication is not established

When the PROFINET communication cannot be established between the master device and Welbee Inverter, remove the top panel of Welbee Inverter, and execute the following confirmation while observing the LED indication of the communication unit.

**CAUTION**

- Never touch any internal wiring board, etc. of the Welbee Inverter.



- Check item 1: Operation check of communication unit

Check item 1 is the same as that in the EtherNet/IP communication. Refer to Check item 1 in “4.3.1 When EtherNet/IP communication is not established”.

- Check item 2: Check for connection to the network

Confirm the connection to the network before establishing the PROFINET communication with the master device under the condition where the Welbee Inverter is connected with the Ethernet network. Since there are two Ethernet connectors, confirm by the LED (3 or 4) corresponding to the Ethernet connector being used.

LED No. (Status)	State	Check Item and Countermeasure
3 (Link/Activity 1) or 4 (Link/Activity 2)	ON in green	Communication to the Ethernet network has been established. Proceed with the confirmation of other LED indication.
	Off	Communication to the Ethernet network has not been established. Check the connection state.
1 (Network Status) 2 (Module Status)	ON in green	Both the LEDs 1 and 2 flash in green when the connection to the Ethernet network has been established when the EtherNet/IP communication has not been established. Proceed with Check item 3.
	2 is OFF	Confirm that no invalid IP address is set. (☞ "4.2 Address of Communication Unit")
	ON in red or flashes in red.	Contact your dealer.

- Check item 3: Check for the establishment of PROFINET communication

Confirm that the PROFINET communication has been established between the master device and the Welbee Inverter.

LED No.(Status)	State	Check Item and Countermeasure
1(Network Status) 2(Module Status)	1 is ON in green	Both the LEDs 1 and 2 are ON in green when the PROFINET communication with the master device has been established. Proceed with Check item 4.
	States other than above	Check the communication setting on the master device side.

- Check item 4: Confirmation of watchdog transmission and reception

Transmit watchdog from the master device and confirm its result.

State	Check Item and Countermeasure
Error code "E-920" is issued in the Welbee Inverter though there is a response to the watchdog.	Confirm that the transmission cycle of watchdog is correct. Error code "E-920" is issued when the watchdog bit does not change for 1 second.
Watchdog is not returned.	Restart the Welbee Inverter and confirm that the indication on the digital meters when startup changes from "HE" "LLO" to "FLd" "bUS" and then normal indication. If "FLd" "bUS" is not displayed, set the Fieldbus setting of Function to "Use". (☞ "3.5.2 When changing the setting of Fieldbus special functions") When E-922 error code is displayed, the communication between the communication unit and the Welbee Inverter is faulty. Confirm that the communication unit and the serial communication board are correctly connected. Confirm the setting of the master device if there is no problem with the items above.

