Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

MOTOMAN INSTRUCTIONS

MOTOMAN-□□□ INSTRUCTIONS
DX100 INSTRUCTIONS
DX100 OPERATOR'S MANUAL
DX100 MAINTENANCE MANUAL

The DX100 operator's manuals above correspond to specific usage. Be sure to use the appropriate manual.
MANDATORY

- This manual explains the various components of the DX100 system and general operations. Read this manual carefully and be sure to understand its contents before handling the DX100.
- General items related to safety are listed in the Chapter 1: Safety of the DX100 Instructions. To ensure correct and safe operation, carefully read the DX100 Instructions before reading this manual.

CAUTION

- Some drawings in this manual are shown with the protective covers or shields removed for clarity. Be sure all covers and shields are replaced before operating this product.
- The drawings and photos in this manual are representative examples and differences may exist between them and the delivered product.
- YASKAWA may modify this model without notice when necessary due to product improvements, modifications, or changes in specifications. If such modification is made, the manual number will also be revised.
- If your copy of the manual is damaged or lost, contact a YASKAWA representative to order a new copy. The representatives are listed on the back cover. Be sure to tell the representative the manual number listed on the front cover.
- YASKAWA is not responsible for incidents arising from unauthorized modification of its products. Unauthorized modification voids your product’s warranty.
NOTES FOR SAFE OPERATION

Read this manual carefully before installation, operation, maintenance, or inspection of the DX100.

In this manual, the Notes for Safe Operation are classified as “WARNING”, “CAUTION”, “MANDATORY”, or “PROHIBITED”.

**WARNING**
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to personnel.

**CAUTION**
Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury to personnel and damage to equipment. It may also be used to alert against unsafe practices.

**MANDATORY**
Always be sure to follow explicitly the items listed under this heading.

**PROHIBITED**
Must never be performed.

Even items described as “CAUTION” may result in a serious accident in some situations. At any rate, be sure to follow these important items.

**NOTE**
To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as “CAUTION” and “WARNING”.
WARNING

• Before operating the manipulator, check that servo power is turned OFF when the emergency stop buttons on the front door of the DX100 and programming pendant are pressed. When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.

Injury or damage to machinery may result if the emergency stop circuit cannot stop the manipulator during an emergency. The manipulator should not be used if the emergency stop buttons do not function.

*Figure 1: Emergency Stop Button*

• Once the emergency stop button is released, clear the cell of all items which could interfere with the operation of the manipulator. Then turn the servo power ON.

Injury may result from unintentional or unexpected manipulator motion.

*Figure 2: Release of Emergency Stop*

• Observe the following precautions when performing teaching operations within the P-point maximum envelope of the manipulator:
  – View the manipulator from the front whenever possible.
  – Always follow the predetermined operating procedure.
  – Keep in mind the emergency response measures against the manipulator’s unexpected motion toward you.
  – Ensure that you have a safe place to retreat in case of emergency.

Improper or unintended manipulator operation may result in injury.

• Confirm that no person is present in the P-point maximum envelope of the manipulator and that you are in a safe location before:
  – Turning ON the DX100 power
  – Moving the manipulator with the programming pendant
  – Running the system in the check mode
  – Performing automatic operations

Injury may result if anyone enters the P-point maximum envelope of the manipulator during operation. Always press an emergency stop button immediately if there is a problem.

The emergency stop buttons are located on the right of the front door of the DX100 and the programming pendant.
CAUTION

- Perform the following inspection procedures prior to conducting manipulator teaching. If problems are found, repair them immediately, and be sure that all other necessary processing has been performed.
  - Check for problems in manipulator movement.
  - Check for damage to insulation and sheathing of external wires.
- Always return the programming pendant to the hook on the DX100 cabinet after use.

The programming pendant can be damaged if it is left in the manipulator’s work area, on the floor, or near fixtures.

- Read and understand the Explanation of the Warning Labels in the DX100 Instructions before operating the manipulator.

Definition of Terms Used Often in This Manual

The MOTOMAN is the YASKAWA industrial robot product.

The MOTOMAN usually consists of the manipulator, the controller, the programming pendant, and supply cables.

In this manual, the equipment is designated as follows:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Manual Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DX100 Controller</td>
<td>DX100</td>
</tr>
<tr>
<td>DX100 Programming Pendant</td>
<td>Programming Pendant</td>
</tr>
<tr>
<td>Cable between the manipulator and the controller</td>
<td>Manipulator Cable</td>
</tr>
</tbody>
</table>
Descriptions of the programming pendant keys, buttons, and displays are shown as follows:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Manual Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming Pendant</td>
<td>Character Keys: The keys which have characters printed on them are denoted with [ ].</td>
</tr>
<tr>
<td></td>
<td>Symbol Keys: The keys which have a symbol printed on them are not denoted with [ ] but depicted with a small picture.</td>
</tr>
<tr>
<td></td>
<td>Axis Keys Numeric Keys: “Axis Keys” and “Numeric Keys” are generic names for the keys for axis operation and number input.</td>
</tr>
<tr>
<td></td>
<td>Keys pressed simultaneously: When two keys are to be pressed simultaneously, the keys are shown with a “+” sign between them, ex. [SHIFT]+[COORD]</td>
</tr>
<tr>
<td></td>
<td>Displays: The menu displayed in the programming pendant is denoted with { }. ex. {JOB}</td>
</tr>
</tbody>
</table>

**Description of the Operation Procedure**

In the explanation of the operation procedure, the expression "Select • • • “ means that the cursor is moved to the object item and the SELECT key is pressed.
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   3.5  MOTOWELD Type: Operation of Customize Window....................................................... 3-4
   3.6  MOTOWELD Type: Operation of Maintenance Window ................................................... 3-6
   3.7  MOTOWELD Type: Operation of Welder Parameter Window........................................... 3-7
   3.8  FroniusTPS Type: Operation of Top Window.................................................................... 3-8
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1 Functional Overview

1.1 Overview

The WELDCOM function serves as a digital interface that communicates via Ethernet with an arc welding power source. The function provides high data rate transmission between DX100 and the welding power source, enables the welding power source parameter to be set from the programming pendant, and monitors graphically welding current and voltage during welding.

- The WELDCOM function can use either of the following four welding power sources for connection.
  - MOTOWELD-EL350-AJ2E (manufactured by YASKAWA) (AJ2E indicates that an Ethernet interface is incorporated.)
  - MOTOWELD-RP500 (manufactured by YASKAWA) (System version: DS2.05.00(□)-00 or newer) (In the case of digital communication mode)
  - MOTOWELD-RL350 (manufactured by YASKAWA) (System version: DS3.50.00(□)-00 or newer) (In the case of digital communication mode)
  - TPS4000 CMT (manufactured by Fronius International GMBH) (Only the model that incorporates the WeldCom interface)

- Programming a job is available using general arc welding commands.
  - ARCSET ASF#( ),
  - ARCON ASF#( ),
  - ARCOF AEF#( )

- Welding conditions are set in a welding start condition file or a welding end condition file specified in an arc welding command.

- The welding start condition file or welding end condition file has the edit window that provides the setting window for a digital interface, enabling users to check or edit parameters to be set in welding power source.

- The parameter to be set in the edit window of the welding condition file is saved in the dedicated condition file, "Welding type file" and "Digital welder condition file", where the data can be loaded and saved with the external memory function.
TCP Speed Function
This is the function only for TPS4000 CMT (Not available for MOTOWELD EL350-AJ2E), welding with bead leg length kept constant by changing the feeding rate according to the welding speed.

(NOTE)

- When using TCP Speed, you must add the ARATION and ARATIOF commands to the welding section for the welding speed to be output in analog.
  Ex. ARATION BV 7.00 SPD 512
- To use TCP Speed, special software must be installed on TPS4000 CMT.
- TCP Speed cannot be used with the TPS of the US specification.
2 Setup

2.1 Setup Flow

Setup the DX100 with the following procedure.

- DX100 system software upgrade
- Setting and confirmation of hardware configuration
- Connection of welding power source and DX100
- System configuration

2.2 DX100 System Software Upgrade

The WELDCOM function is incorporated into the system software version, DS1.40.00(□)-00 or later. If DX100 has a version of earlier than DS1.40 installed, upgrade the version by following the procedure below. DX100 with DS1.40.00(□)-00 or later does not need to be upgraded.

2.2.1 Individual data backup

Save all the individual data including job and condition files to initialize the system after the upgrade. Also, save the system configuration file in the maintenance mode.

2.2.2 System Upgrade

Upgrade the version to DS1.40.00(□)-00 or later. (For detailed information of the system software upgrade procedure, see "DX100 Upgrade Procedure" part number: 161409-1CD).
2.3 Setting and Confirmation of Hardware Configuration

2.3.1 Removing Unnecessary EW Board

The WELDCOM is connected to the welding power source using the digital interface via Ethernet communication. This does not require the EW board (YEW01, XEW02, etc.) for an analog interface, so remove the EW board.

2.3.2 Station Number when EW Board is Left

A digital interface requires a virtual EW module, not an actual EW board. The virtual EW module also has a station number. If leaving an EW board unremoved for other welding power sources, set the actual EW board station number so that it does not duplicate the virtual EW module station number.

(Setting Example)

- **Replacing welding power source of analog interface with that of digital interface**
  ⇒ Remove the actual EW board, which will be unnecessary. (The station number of the virtual EW module is set at the time of configuration.)

- **When connecting welding power source of analog interface as Welder 1, and digital interface as Welder 2**
  ⇒ To use the welding power source of the analog interface as Welder 1, set the EW board station number to the smallest number. After that, set the virtual EW module station number at the time of configuration.
2.3 Setting and Confirmation of Hardware Configuration

- When connecting welding power source of digital interface as Welder 1, and analog interface as Welder 2
  ⇒ Because the virtual EW module station number is set to the smallest number at the time of configuration, set the EW board station number to the second or later number.

- When using Welder 1 and 3 as the welding power sources of two analog interfaces, and connecting the welding power source of digital interface as Welder 2 between the Welder 1 and 3.
  ⇒ Because the virtual EW module station number is set to the second smallest number at the time of configuration, set the EW board station numbers as follows:
    - EW board station number for Welder 1: Smallest number (EX.: 01)
    - EW board station number for Welder 3: The third or later number (EX.: 03)
  At the time of configuration, one or more numbers are left unused between those set for Welder 1 and 3 so that the virtual EW module station number can be set to a number between the numbers already set.

- When applying digital interface to welder and using EW board as general analog output board
  ⇒ Because the EW board is automatically set as welding application due to the configuration restrictions, set the arc application to Arc + Arc. Specifically, set as follows:
    - Set the application setting of [Initialization] to "Arc + Arc", and set Arc 2 as not for use.
    - In [OPTION FUNCTION - WELDCOM FUNC.], set Arc 1 to digital interface.
2.4 Connection of Welding Power Source and DX100

2.4.1 Standard Connection (When connecting one welding power source of digital interface to DX100)

- Connect a LAN cable to YCP01 for LAN (CN104).

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Use the LAN cable that comes with our arc welding robot package MOTOPAC. (The system may not properly work with a LAN cable other than this, and we are not responsible for any problems that may occur.)</td>
</tr>
<tr>
<td>• LAN cable included in MOTOPAC:</td>
</tr>
<tr>
<td>Model</td>
</tr>
<tr>
<td>Motoweld type: YEDEC-KTLAN-OI-<em>/1 (</em>: Length)</td>
</tr>
<tr>
<td>Fronius TPS type: YEDEC-KT-LAN-<strong>M (</strong>: Length)</td>
</tr>
</tbody>
</table>

When preparing a LAN cable other than the cable above

- You can use either cross cable or straight cable.
- Use a cable with the connector that has a metal cover for noise suppression and with the cable shield grounded to the metal cover.
2.4.2 When Connecting to DX100 the Multiple Welding Power Sources of Digital Interfaces and also Other Devices with Data Transmission Function using Ethernet Function

As shown in the following figure, connect the LAN cable to YCP01 for LAN (CN104) using a switching hub.

(You can use either cross cable or straight cable.)

CAUTION

- Use the industrial switching hub that we recommend. (The system may not properly work with a hub other than this, and we are not responsible for any problems that may occur.)

- Our recommended switching hub: Model EDS-205 (manufactured by MOXA)
2.5 System Configuration

The following figure illustrates the configuration procedure outline. The following and later pages explain the detailed procedure of each setting. Note that the initialization processing after system upgrade is omitted.

Start

Did you upgrade system software?

Yes

[Initialization] entry
Language, model, I/O module, ...
Initialization processing of each item:

[SETUP] entry

For Fronius welding power source, change the "ARC WELDING" setting from "STANDARD" to "ENHANCED"

[2.5.2] Setting of Optional Function
"Network Function"

[2.5.3] Setting of Optional Function
"WELDCOM Function"

[2.5.4] Detailed Setting of
Welding Power Source

[2.5.5] I/O Module Setting Check
after Adding Virtual EW Module

End

No

[SETUP] entry

[2.5.1] I/O Module Setting Check
after Changing EW Board
Station Number Setting
2.5.1 I/O Module Setting Check after Changing EW Board Station Number Setting

The EW board removal and station number change performed in the Section 2.3 “Setting and Confirmation of Hardware Configuration” on page 2-2 changes the I/O module setting. The setting changes must be recognized with [Setting] in the maintenance mode.

1. Start the DX100 while pressing [MAIN MENU]
   – Start the DX100 in maintenance mode.
2. Select {SYSTEM} → {SECURITY} → "MANAGEMENT MODE".
   – A password must be entered after selecting "MANAGEMENT MODE".
3. Select {SYSTEM} → {SETUP} → "IO MODULE".
   
4. Press the [Enter] key to check the I/O module connection status.
   – If no EW board is connected, the board column displays "NONE" as follows.

5. A confirmation dialog box appears. Select "YES".
2.5 System Configuration

2.5.2 Setting of Optional Function “Network Function”

The WELDCOM function uses the network function (optional function). Set the network function by following the procedure below.

1. Select (SYSTEM) → (SETUP) → “OPTION FUNCTION”, and then “DETAIL” of “NETWORK”.

2. Change the setting of "DEVICE" from "NOT USED" to "Ethernet", and select "DETAIL" of "HOST SETUP".
   - Set the Network (Ethernet) function to enable.

3. After setting "IP ADDRESS SETTING" to "MANUAL SETTING", change "IP ADDRESS" to "192.168.255.200".
   • Set “SUBNET MASK” to “255.255.255.0”.
   • Set “DEFAULT GATEWAY” to “0.0.0.0”.

4. After the setting above is completed, press the [Enter] key. When a confirmation dialog appears, select “Yes” to confirm the setting.
2.5.3 Setting of Optional Function “WELDCOM Function”

Set the WELDCOM function by following the procedure below.

1. Select {SYSTEM} → {SETUP} → "OPTION FUNCTION", and then "DETAIL" of "WELDCOM FUNC. (ARC DIGITAL I/F)".

* If "WELDCOM FUNC. (...)" is not displayed, the system software version may be old (earlier than DS1.40.00-00) or the function parameter may be disabled. Contact your Yaskawa representative.

2. The WELDER SETUP window appears.

When multiple applications (welders) are set, you can navigate among welder numbers with the upper or lower cursor.

- When the application setting is arc and no actual EW board exists, only one line is displayed with *** for the items.

<Explanation of each item>

- The window displays as many lines as the number of applications.
- ST#: The station number of EW module corresponding to the welders
- TYPE: Kind of EW module (EX: XEW02, XEW01-1, etc.)
- <Second board>: Displayed when two EW boards are used in the enhanced mode.
- DIGITAL I/F TYPE: Displays the type of welding power source connected. (Either MOTOWELD or Fronius TPS)
3. On the number of welder where you want to set a digital interface, press the [Select] key to select a digital interface type.

![Digital Interface Selection](image)

4. After specifying the digital interface above, pressing the [Enter] key displays the confirmation dialog for initializing the related files. Select “Yes” to confirm the initialization.

![Initialization Confirmation](image)

### 2.5.4 Detailed Setting of Welding Power Source

After setting the digital interface in the WELDER SETUP window and initializing the related files, [Type] shows VEW01, indicating that the virtual EW module for the digital interface has been assigned. Perform detailed setting for each welding power source by following the procedure below.

Set the each welding power source by following the procedure below.

1. VEW01 (Virtual EW module) has been assigned. Move the cursor to the “DETAIL” in the far right, and press the [Select] key.
   - VEW01 for the digital interface has been assigned.

![Power Source Selection](image)

2. The WELDCOM function works with the default detailed settings. You do not especially need to make settings. Press the [Enter] key to confirm the setting.

3. To see the welding currents and voltages obtained and the error codes in the concurrent IO ladder, specify the M register address of output destination accordingly.

   - Selecting “DETAIL” displays the following DETAILED SETUP window.

   ![Detailed Setup Window](image)

   - The DETAILED SETUP window varies depending on a welding power source type.
2 Setup
2.5 System Configuration

<MOTOWELD type>

<table>
<thead>
<tr>
<th>POWER SOURCE IP ADDRESS</th>
<th>192.168.255.210</th>
</tr>
</thead>
<tbody>
<tr>
<td>REGISTER ADDR: VOLT. COMMAND</td>
<td>150</td>
</tr>
<tr>
<td>REGISTER ADDR: CURR. COMMAND</td>
<td>151</td>
</tr>
<tr>
<td>REGISTER ADDR: SAMPLING VOLT.</td>
<td>152</td>
</tr>
<tr>
<td>REGISTER ADDR: SAMPLING CURR.</td>
<td>153</td>
</tr>
<tr>
<td>REGISTER ADDR: SAMPLING W.F.S.</td>
<td></td>
</tr>
<tr>
<td>REGISTER ADDR: FEEDER MTR. CURR.</td>
<td></td>
</tr>
<tr>
<td>REGISTER ADDR: SHORT-CIRCUIT CNT.</td>
<td></td>
</tr>
<tr>
<td>REGISTER ADDR: ERROR CODE</td>
<td></td>
</tr>
<tr>
<td>REGISTER ADDR: WELDER USER FILE#</td>
<td>154</td>
</tr>
</tbody>
</table>

<Fronius TPS type>

<table>
<thead>
<tr>
<th>POWER SOURCE IP ADDRESS</th>
<th>192.168.255.210</th>
</tr>
</thead>
<tbody>
<tr>
<td>REGISTER ADDR: VOLT. COMMAND</td>
<td>150</td>
</tr>
<tr>
<td>REGISTER ADDR: CURR. COMMAND</td>
<td>151</td>
</tr>
<tr>
<td>REGISTER ADDR: SAMPLING VOLT.</td>
<td>152</td>
</tr>
<tr>
<td>REGISTER ADDR: SAMPLING CURR.</td>
<td>153</td>
</tr>
<tr>
<td>REGISTER ADDR: SAMPLING W.F.S.</td>
<td></td>
</tr>
<tr>
<td>REGISTER ADDR: FEEDER MTR. CURR.</td>
<td></td>
</tr>
<tr>
<td>REGISTER ADDR: SHORT-CIRCUIT CNT.</td>
<td></td>
</tr>
<tr>
<td>REGISTER ADDR: MAIN ERROR CODE</td>
<td></td>
</tr>
<tr>
<td>REGISTER ADDR: SUB ERROR CODE</td>
<td></td>
</tr>
<tr>
<td>REGISTER ADDR: OPERATION MODE</td>
<td>156</td>
</tr>
<tr>
<td>REGISTER ADDR: TPS JOB#</td>
<td>155</td>
</tr>
<tr>
<td>REGISTER ADDR: PROGRAM#</td>
<td>154</td>
</tr>
</tbody>
</table>

4. A confirmation dialog box appears. Select "YES".

2.5.5 I/O Module Setting Check after Adding Virtual EW Module

Once the digital interface setting is confirmed, the virtual EW module VEW01 is added as an I/O module.

The following explains the final checking process, not the setting procedure, to add VEW01 as an I/O module at the time of completion of the WELDCOM function setting.
1. In the WELDER SETUP and the DETAILED SETUP window, when the settings are completed, the IO MODULE setting window automatically appears.

   - The virtual EW module, VEW01, is displayed.

2. Press [ENTER].

   A confirmation dialog box appears. Select "YES".

   - The window goes back to the OPTION FUNCTION window.

   The DX100 setup is now completed.

Turn off the main power and restart the system in the normal mode.

### 2.5.6 Optional parameters for Fronius TPS

- AXP91 : Extension of Job mode

0: normal (initial setting)

1: extended (It can set Job numbers from 0 to 999 in case of using RCU5000i)
2  Setup
2.5  System Configuration

-AxP92 : Status flag input register
The register in AxP92 shows stats flag of power source.
Bit0: Communicaton ready
Bit1: Power source ready
Bit2: Arc stable
Bit3: Process active
Bit4: Main current signal
Bit5: Torch collision protection
Bit6: Wire stick control
Bit7: Wire available

-AxP93: Control flag input register
It can control the control flag of power source via the register in AxP93.
Bit7: Welding simulation
Bit9: Master selection Twin
Bit10~15 : reserved (Please do not change)

-AxP96: TPS panel type
It can change the “Program No. setting” display.
0: auto (initial setting)
1: Standard
2: CMT
3: US
5: CMT-L

-RS380: Timeout Lifecycle of power source
It can change the Timeout Lifecycle.
Unit: 10 ms
Range: 5 (50 ms) ~ 30 (300 ms)
If it is out of range, it will be 100 ms.
3 Operation of Welding Condition File Edit Window

3.1 Overview
The WELDCOM function can set and obtain the parameter of the welding power source in the edit window of an arc start condition file or an arc end condition file.

3.2 Display of Welding Condition File Edit Window
1. Select {ARC WELDING} under the main menu.
2. Select {ARC START COND.} or {ARC END COND.}.

Fig. 3-1: E.g.) Edit window for arc start condition

3.3 MOTOWELD Type: Operation of Top Window
1. Display the {OTHER} tab of the welding condition file to specify the number of a welder’s user file to be used.
2. Display the {OTHER} tab of the welding condition file, and press the {Welder setting} button.
3. Operation of Welding Condition File Edit Window

3.3 MOTOWELD Type: Operation of Top Window

3. Move the cursor to the welder’s user file number specified in 1.
   – Select welder’s user file.

   ![Screen capture of MOTOWELD window](image)

4. Select {Weld type}.
   – Register a welding type in the welder’s user file selected.
     →Go to the [Weld type] window.

5. Select {Customize}.
   – Change the parameter of the welder’s user file selected.
     →Go to the [Customize] window.

6. Select {Maintenance}.
3.4 MOTOWELD Type: Operation of Weld type Window

1. At the top window, select a welder's user file, and select the (Weld type) button.

2. Select welding condition.
   - Select a value for "Wire type, Diameter, Shield Gas, and Pulse".

3. Select a welding type to be used, and press the (SAVE) button.
3.5 **MOTOWELD Type: Operation of Customize Window**

1. At the top window, select the (Customize) button.
   - Change the parameter of the welder’s user file selected.
2. Select {Start/End}.
   - Change the parameter. For details on the parameters, see the user manual of the welding power source.

![Customize Window Diagram](image1)

3. Select {Short}.
   - Change the parameter. For details on the parameters, see the user manual of the welding power source.

![Customize Window Diagram](image2)
4. Select {End}.
   - Change the parameter. For details on the parameters, see the user manual of the welding power source.

5. Select {Curr. Character}.
   - Change the parameter. For details on the parameters, see the user manual of the welding power source.

6. Select {SAVE}.
   - Apply the parameters changed.
3.6 MOTOWELD Type: Operation of Maintenance Window

1. At the top window, select the {Maintenance} button.
2. Select {Maintenance}.

(1) {All write(DX100->welder)}: Send the parameters at a time to the welding power source.
(1) {All read(welder->DX100)}: Receive the parameters at a time from the welding power source.
(2) [CPU ver., DSP ver., DB ver.]: The versions of software and database in the welding power source are displayed.
3.7 MOTOWELD Type: Operation of Welder Parameter Window

1. At the top window, select the {Welder prm.} button.

2. Select {Gas/Wire}.
   – Change the common parameter (C parameter).
   • For details on the C parameters, see the user manual of the welding power source.

3. Select {Other}.
   – Change the common parameter (C parameter).
   • For details on the C parameters, see the user manual of the welding power source.

4. Select {Other2}.
   – Change the common parameter (C parameter).
   • For details on the C parameters, see the user manual of the welding power source.
3.8 FroniusTPS Type: Operation of Top Window

1. Display the {OTHER} tab of the welding condition file to specify the number of a welder’s user file to be used.

   ![Image of ARC START COND window]

   - Set a welding program in the welder’s user file selected.
     → Go to the [Program No. setting] window.

2. Display the {OTHER} tab of the welding condition file, and press the (Welder setting) button.

   ![Image of ARC START COND window]

3. Select welder’s user file.

   ![Image of Fronius user file]

4. Select {Program No. setting}.
   - Set a welding program in the welder’s user file selected.
     → Go to the [Program No. setting] window.

5. Select {Param setting}.
   - Change the parameter setting of the welder’s user file selected.
     → Go to the [Param. setting] window.
3.9 FroniusTPS Type: Operation of Program No. setting Window

1. At the top window, select a welder's user file, and select the {Program No. setting} button.

2. Select welding condition.
   - Select a value for "Diameter, Wire(Gas), and Operating mode".

3. Press {SAVE}.

3.10 FroniusTPS Type: Operation of Param. setting Window

1. At the top window, select the {Param. setting} button.
   - Change the parameter of the welder's user file selected.

2. Select {Gas/Wire}.

   (1) Gas preflow: Pre-flow that the robot performs as approaching the welding start point.

   (2) Gas postflow: Specify the time period of gas release performed at the end of the welding.
3.10 Fronius TPS Type: Operation of Param. setting Window

(3) SFI: Select from “AUTO”, “MANUAL”, or “OFF”. Feeding rate when the wire is approaching the base material at the touch start.

3. Select {Synchropulse}.

– Change the welding parameters for changing the feeding rate or arc length in low-cycle pulses at the time of welding. For details, see the user manual of the welding power source.

4. Select {SAVE}.

– Apply the parameters changed.
4.1 Job Preparation for Welding

1. Select (Job) under the main menu to create a job.
2. Select (INFORM) → (DEVICE), and then select (ARCON), (ARCSET), and (ARCOF).
   - For the ARCON and ARCSET instructions, specify a welding start condition file in the tag.
   - For the ARCOF instruction, specify a welding end condition file in the tag.

An example of a simple welding job

NOP
MOVJ VJ=30.00
MOVJ VJ=5.00
ARCON ASF#(1)
MOVL
ARCSET ASF#(10) ACOND=1
MOVL
ARCOF AEF#(5)
MOVJ VJ=50.00
MOVJ VJ=50.00
END

3. When using a Fronius TPS-type welding power source, edit the welding condition file so that the conditions are specified by using the following physical quantity, not by welding current instruction or welding voltage instruction.
   • WFS: Wire feeding amount (m/min)
   The range varies depending on a welding type.
   • Arc Length: Arc length correction (%)
   Set the value in the -30% to +30% range.
   • CORR3: Correction 3
   Set the value in the -5.0% to +5.0% range.
   • CORR4: Correction 4
   Set the value in the -0.2% to +0.2% range.
## 5 Alarm and Error

### 5.1 Alarm

<table>
<thead>
<tr>
<th>Alarm Number</th>
<th>Alarm Name</th>
<th>Sub Code</th>
<th>Meaning</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| 1            | no Prg     | Sub code [1**] shows the error code of Fronius power source
1: main error code
**: sub error code | Select a pre-programmed program
Confirm the Fronius's manual |
| 2            | ts1        | Sub code [2**] shows the error code of Fronius power source
2: main error code
**: sub error code | Allow the machine to cool
Confirm the Fronius's manual |
| 3            | ts2        | Sub code [3**] shows the error code of Fronius power source
3: main error code
**: sub error code | Allow the machine to cool
Confirm the Fronius's manual |
| 4            | ts3        | Sub code [4**] shows the error code of Fronius power source
4: main error code
**: sub error code | Allow the machine to cool
Confirm the Fronius's manual |
| 5            | tp1        | Sub code [5**] shows the error code of Fronius power source
5: main error code
**: sub error code | Allow the machine to cool
Confirm the Fronius's manual |
| 6            | tp2        | Sub code [6**] shows the error code of Fronius power source
6: main error code
**: sub error code | Allow the machine to cool
Confirm the Fronius's manual |
| 7            | tp3        | Sub code [7**] shows the error code of Fronius power source
7: main error code
**: sub error code | Allow the machine to cool
Confirm the Fronius's manual |
| 8            | tp4        | Sub code [8**] shows the error code of Fronius power source
8: main error code
**: sub error code | Allow the machine to cool
Confirm the Fronius's manual |
| 9            | tp5        | Sub code [9**] shows the error code of Fronius power source
9: main error code
**: sub error code | Allow the machine to cool
Confirm the Fronius's manual |
| 10           | tp6        | Sub code [10**] shows the error code of Fronius power source
10: main error code
**: sub error code | Allow the machine to cool
Confirm the Fronius's manual |
| 11           | Errtf1     | Sub code [11**] shows the error code of Fronius power source
11: main error code
**: sub error code | Change the thermosensor on the sec. side
Confirm the Fronius's manual |
| 12           | Errtf2     | Sub code [12**] shows the error code of Fronius power source
12: main error code
**: sub error code | Change the thermosensor on the prim. side
Confirm the Fronius's manual |
### 5.1 Alarm

<table>
<thead>
<tr>
<th>Alarm Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Errt3</td>
<td>Sub code [3**] shows the error code of Fronius power source</td>
</tr>
<tr>
<td></td>
<td>Main error code ** sub error code</td>
</tr>
<tr>
<td></td>
<td>Check cable tree of temperature sensors</td>
</tr>
<tr>
<td></td>
<td>Confirm the Fronius's manual</td>
</tr>
<tr>
<td>Errt4</td>
<td>Sub code [4**] shows the error code of Fronius power source</td>
</tr>
<tr>
<td></td>
<td>Main error code ** sub error code</td>
</tr>
<tr>
<td></td>
<td>Only for MagicWave power source</td>
</tr>
<tr>
<td></td>
<td>Confirm the Fronius's manual</td>
</tr>
<tr>
<td>Errt5</td>
<td>Sub code [5**] shows the error code of Fronius power source</td>
</tr>
<tr>
<td></td>
<td>Main error code ** sub error code</td>
</tr>
<tr>
<td></td>
<td>Check cable tree of temperature sensors</td>
</tr>
<tr>
<td></td>
<td>Confirm the Fronius's manual</td>
</tr>
<tr>
<td>Errt6</td>
<td>Sub code [6**] shows the error code of Fronius power source</td>
</tr>
<tr>
<td></td>
<td>Main error code ** sub error code</td>
</tr>
<tr>
<td></td>
<td>Change BPS pc-board</td>
</tr>
<tr>
<td></td>
<td>Confirm the Fronius's manual</td>
</tr>
<tr>
<td>DSP05</td>
<td>Sub code [7**] shows the error code of Fronius power source</td>
</tr>
<tr>
<td></td>
<td>Main error code ** sub error code</td>
</tr>
<tr>
<td></td>
<td>Update firmware, otherwise change the UST board</td>
</tr>
<tr>
<td></td>
<td>Confirm the Fronius’s manual</td>
</tr>
<tr>
<td>ErrPS</td>
<td>Sub code [8**] shows the error code of Fronius power source</td>
</tr>
<tr>
<td></td>
<td>Main error code ** sub error code</td>
</tr>
<tr>
<td></td>
<td>Update firmware, otherwise change the UST board or otherwise change the BPS board</td>
</tr>
<tr>
<td></td>
<td>Confirm the Fronius’s manual</td>
</tr>
<tr>
<td>Err P</td>
<td>Sub code [9**] shows the error code of Fronius power source</td>
</tr>
<tr>
<td></td>
<td>Main error code ** sub error code</td>
</tr>
<tr>
<td></td>
<td>Change the BPS board</td>
</tr>
<tr>
<td></td>
<td>Change the secondary diode</td>
</tr>
<tr>
<td></td>
<td>Change the welding transformer</td>
</tr>
<tr>
<td></td>
<td>Confirm the Fronius’s manual</td>
</tr>
<tr>
<td>DSPE0x</td>
<td>Sub code [10**] shows the error code of Fronius power source</td>
</tr>
<tr>
<td></td>
<td>Main error code ** sub error code</td>
</tr>
<tr>
<td></td>
<td>Update firmware, otherwise change the UST board</td>
</tr>
<tr>
<td></td>
<td>Confirm the Fronius’s manual</td>
</tr>
<tr>
<td>DSPExx</td>
<td>Sub code [11**] shows the error code of Fronius power source</td>
</tr>
<tr>
<td></td>
<td>Main error code ** sub error code</td>
</tr>
<tr>
<td></td>
<td>Update firmware, otherwise change the UST board</td>
</tr>
<tr>
<td></td>
<td>Confirm the Fronius’s manual</td>
</tr>
<tr>
<td>EnEPF</td>
<td>Sub code [12**] shows the error code of Fronius power source</td>
</tr>
<tr>
<td></td>
<td>Main error code ** sub error code</td>
</tr>
<tr>
<td></td>
<td>Update firmware, otherwise change the UST board</td>
</tr>
<tr>
<td></td>
<td>Confirm the Fronius’s manual</td>
</tr>
<tr>
<td>Err23.x</td>
<td>Sub code [13**] shows the error code of Fronius power source</td>
</tr>
<tr>
<td></td>
<td>Main error code ** sub error code</td>
</tr>
<tr>
<td></td>
<td>Update firmware, otherwise change the UST board</td>
</tr>
<tr>
<td></td>
<td>Confirm the Fronius’s manual</td>
</tr>
<tr>
<td>Err24.x</td>
<td>Sub code [14**] shows the error code of Fronius power source</td>
</tr>
<tr>
<td></td>
<td>Main error code ** sub error code</td>
</tr>
<tr>
<td></td>
<td>Update firmware, otherwise change the UST board</td>
</tr>
<tr>
<td></td>
<td>Confirm the Fronius’s manual</td>
</tr>
</tbody>
</table>
## 5.1 Alarm

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Description</th>
<th>Sub Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4270</td>
<td>MOTOWELD NO WELDING TYPE</td>
<td>602</td>
<td>Sub Code: MOTOWELD’s Err Code. Select a correct welding process in the using the welding user file.</td>
</tr>
<tr>
<td>4271</td>
<td>MOTOWELD VOLTDETECTOR WIRE ERROR</td>
<td>702</td>
<td>Sub Code: MOTOWELD’s Err Code. 0) Check if the voltage detection wire is connected. Check if the voltage detection line or the short-circuit cap is connected to the CON7 of the MOTOWELD. 1) Check that the contact tip does not contact the work piece to be welded.</td>
</tr>
<tr>
<td>4272</td>
<td>MOTOWELD SAFETY CIRCUIT ERROR</td>
<td>101</td>
<td>Sub Code: MOTOWELD’s Err Code. Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>4273</td>
<td>MOTOWELD IGBT SHORT CIRCUIT</td>
<td>104</td>
<td>Sub Code: MOTOWELD’s Err Code. Replace the IGBT device (Part code AJ0EL3870). Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>4274</td>
<td>MOTOWELD VOLTAGE DETECTOR ERROR</td>
<td>110</td>
<td>Sub Code: MOTOWELD’s Err Code. Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>4275</td>
<td>MOTOWELD AUX. CIRCUIT O.V. CURRENT</td>
<td>111</td>
<td>Sub Code: MOTOWELD’s Err Code. The board may be broken. Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>4276</td>
<td>MOTOWELD DSP ADC ERROR</td>
<td>119</td>
<td>Sub Code: MOTOWELD’s Err Code. Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>4277</td>
<td>MOTOWELD OUTSIDE OF CURR SETTINGS H)</td>
<td>790</td>
<td>Sub Code: MOTOWELD’s Err Code. 0) Check if the selection of motor is correct or confirm the settings of C parameter C09. 1) Check that the welding wire does not slip, or the wire is fed as instructed by the feeding command.</td>
</tr>
<tr>
<td>4278</td>
<td>MOTOWELD OUTSIDE OF CURR SETTINGS L)</td>
<td>791</td>
<td>Sub Code: MOTOWELD’s Err Code. 0) Check if the selection of motor is correct or confirm the settings of C parameter C09. 1) Check that the welding wire does not slip, or the wire is fed as instructed by the feeding command.</td>
</tr>
<tr>
<td>4279</td>
<td>MOTOWELD MOMENTARY OVER-CURRENT</td>
<td>108</td>
<td>Sub Code: MOTOWELD’s Err Code. 0) Check that short-circuit or the earth grounded of the output cable. 1) May be power circuit broken. Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>4281</td>
<td>MOTOWELD +15V POWER SUPPLY ERROR</td>
<td>704</td>
<td>Sub Code: MOTOWELD’s Err Code. Replace the switching power supply unit. Service parts code AJ0E35055)</td>
</tr>
<tr>
<td>4282</td>
<td>MOTOWELD POWER SUPPLY ERROR</td>
<td>705</td>
<td>Sub Code: MOTOWELD’s Err Code. Replace the switching power supply unit. Service parts code AJ0E35055)</td>
</tr>
<tr>
<td>Code</td>
<td>Error Code</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>-Stop-</td>
<td>Deactivate the -Stop- by input -RobotReady- and activate briefly -SourceErrorReset-</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>NoH2O</td>
<td>Check the coolant level (if appropriate) the coolant return-flow rate. If necessary, clean the coolant filter. Rate-of-flow watchdog may be defective.</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>ErrLic</td>
<td>Confirm the Fronius' manual</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>unknown</td>
<td>OR NOT IN USE</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>unknown</td>
<td>OR NOT IN USE</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>unknown</td>
<td>OR NOT IN USE</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>unknown</td>
<td>OR NOT IN USE</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>unknown</td>
<td>OR NOT IN USE</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>unknown</td>
<td>OR NOT IN USE</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>unknown</td>
<td>OR NOT IN USE</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>unknown</td>
<td>OR NOT IN USE</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Err049</td>
<td>Check the mains power supply and check all 3 phases.</td>
<td></td>
</tr>
</tbody>
</table>
| 50   | Err050     | Disconnect NT60 or change/check NT24/UST/BPS/Intermediate circuit capacitors.
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Error Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>Error 51</td>
<td>Sub code [51**] shows the error code of Fronius power source. Mains voltage too low or NT 24 defective. Confirm the Fronius's manual.</td>
</tr>
<tr>
<td>52</td>
<td>Error 52</td>
<td>Sub code [52**] shows the error code of Fronius power source. Mains voltage too high or NT 24 defective. Confirm the Fronius's manual.</td>
</tr>
<tr>
<td>53</td>
<td>Error PE</td>
<td>Sub code [53**] shows the error code of Fronius power source. Low-resistance connection between secondary and machine housing. Find out the cause. Confirm the Fronius's manual.</td>
</tr>
<tr>
<td>54</td>
<td>Error 54</td>
<td>Sub code [54**] shows the error code of Fronius power source. Main error code. ** sub error code. Increase the bbc (burn-back control). Switch off &quot;Wire stick&quot; in the set-up menu. After the end of welding, make sure that the wire does not collide with the workpiece when the torch is retracted. Confirm the Fronius's manual.</td>
</tr>
<tr>
<td>55</td>
<td>No Bin</td>
<td>Sub code [55**] shows the error code of Fronius power source. Main error code. ** sub error code. Set a lower Ito value. Keep the torch stand-off distance smaller before ignition. Confirm the Fronius's manual.</td>
</tr>
<tr>
<td>56</td>
<td>Error 56</td>
<td>Sub code [56**] shows the error code of Fronius power source. Main error code. ** sub error code. Check how much wire is left on the spool. If necessary, change the spool. Confirm the Fronius's manual.</td>
</tr>
<tr>
<td>57</td>
<td>No Gas</td>
<td>Sub code [57**] shows the error code of Fronius power source. Main error code. ** sub error code. Check what volume of gas is still available. Confirm the Fronius's manual.</td>
</tr>
<tr>
<td>58</td>
<td>No Arc</td>
<td>Sub code [58**] shows the error code of Fronius power source. Main error code. ** sub error code. Check the seam. Confirm the Fronius's manual.</td>
</tr>
<tr>
<td>59</td>
<td>Error 59</td>
<td>Sub code [59**] shows the error code of Fronius power source. Main error code. ** sub error code. Confirm the Fronius's manual.</td>
</tr>
<tr>
<td>60</td>
<td>Error 60</td>
<td>Sub code [60**] shows the error code of Fronius power source. Main error code. ** sub error code. Confirm the Fronius's manual.</td>
</tr>
<tr>
<td>61</td>
<td>Error Arc</td>
<td>Sub code [61**] shows the error code of Fronius power source. Main error code. ** sub error code. Confirm the Fronius's manual.</td>
</tr>
<tr>
<td>62</td>
<td>Error 62</td>
<td>Sub code [62**] shows the error code of Fronius power source. Main error code. ** sub error code. Allow the machine to cool. Confirm the Fronius's manual.</td>
</tr>
<tr>
<td>63</td>
<td>Error EF</td>
<td>Sub code [63**] shows the error code of Fronius power source. Main error code. ** sub error code. Check interface configuration. Confirm the Fronius's manual.</td>
</tr>
</tbody>
</table>
## 5 Alarm and Error

### 5.1 Alarm

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Action</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>64</td>
<td>Errtf8 Sub code[64**] shows the error code of Fronius power source</td>
<td>Change the thermosensor of the cooling unit</td>
<td>Confirm the Fronius manual</td>
</tr>
<tr>
<td></td>
<td>64 main error code ** sub error code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>hotH20 Sub code[65**] shows the error code of Fronius power source</td>
<td>Cool down the cooling liquid</td>
<td>Confirm the Fronius manual</td>
</tr>
<tr>
<td></td>
<td>65 main error code ** sub error code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>lJo Sub code[66**] shows the error code of Fronius power source</td>
<td>Allow the JobMaster torch to cool</td>
<td>Confirm the Fronius manual</td>
</tr>
<tr>
<td></td>
<td>66 main error code ** sub error code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>67</td>
<td>ErrJo Sub code[67**] shows the error code of Fronius power source</td>
<td>Change JobMaster pc-board</td>
<td>Confirm the Fronius manual</td>
</tr>
<tr>
<td></td>
<td>67 main error code ** sub error code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>Err068 Sub code[68**] shows the error code of Fronius power source</td>
<td>Confirm the Fronius manual</td>
<td></td>
</tr>
<tr>
<td></td>
<td>68 main error code ** sub error code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>Err069 Sub code[69**] shows the error code of Fronius power source</td>
<td>New welding start</td>
<td>Confirm the Fronius manual</td>
</tr>
<tr>
<td></td>
<td>69 main error code ** sub error code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>Err70 Sub code[70**] shows the error code of Fronius power source</td>
<td>Check gas</td>
<td>Confirm the Fronius manual</td>
</tr>
<tr>
<td></td>
<td>70 main error code ** sub error code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>Err71 Sub code[71**] shows the error code of Fronius power source</td>
<td>Check the welding seam</td>
<td>Confirm the Fronius manual</td>
</tr>
<tr>
<td></td>
<td>71 main error code ** sub error code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>ErrG &amp; Sub code[72**] shows the error code of Fronius power source</td>
<td>Check LHSB connection</td>
<td>Confirm the Fronius manual</td>
</tr>
<tr>
<td></td>
<td>72 main error code ** sub error code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>hotlost Sub code[73**] shows the error code of Fronius power source</td>
<td>Check the connection between UST and RCU and the firmware</td>
<td>Confirm the Fronius manual</td>
</tr>
<tr>
<td></td>
<td>73 main error code ** sub error code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>Touch Sub code[74**] shows the error code of Fronius power source</td>
<td>Touch sensing mode activated - no error</td>
<td>Confirm the Fronius manual</td>
</tr>
<tr>
<td></td>
<td>74 main error code ** sub error code</td>
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<td>75</td>
<td>Err75 Sub code[75**] shows the error code of Fronius power source</td>
<td>Confirm the Fronius manual</td>
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<td>75 main error code ** sub error code</td>
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<td>76</td>
<td>unknown Sub code[76**] shows the error code of Fronius power source</td>
<td>OR NOT IN USE</td>
<td>Confirm the Fronius manual</td>
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<td>76 main error code ** sub error code</td>
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## 5.1 Alarm

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Error Code</th>
<th>Main Error Code</th>
<th>Sub Error Code</th>
<th>Action</th>
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<tbody>
<tr>
<td>77</td>
<td>Err77</td>
<td>Sub code [77**] shows the error code of Fronius power source</td>
<td>77</td>
<td>**</td>
<td>Check the wire feeding alignment if it is smooth</td>
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<td>78</td>
<td>E-Stop</td>
<td>Sub code [78**] shows the error code of Fronius power source</td>
<td>78</td>
<td>**</td>
<td>Close the Safety circuit and activate the Error reset</td>
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<td>79</td>
<td>Err00</td>
<td>Sub code [79**] shows the error code of Fronius power source</td>
<td>79</td>
<td>**</td>
<td>Confirm the Fronius's manual</td>
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<td>80</td>
<td>Err080</td>
<td>Sub code [80**] shows the error code of Fronius power source</td>
<td>80</td>
<td>**</td>
<td>Check the connection hose pack between power source and wire feeder</td>
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<td>81</td>
<td>E7 hot</td>
<td>Sub code [81**] shows the error code of Fronius power source</td>
<td>81</td>
<td>**</td>
<td>Allow the machine to cool</td>
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<td>82</td>
<td>ErrEHF</td>
<td>Sub code [82**] shows the error code of Fronius power source</td>
<td>82</td>
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<td>Allow the external HF to cool down</td>
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<td>83</td>
<td>PHASE</td>
<td>Sub code [83**] shows the error code of Fronius power source</td>
<td>83</td>
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<td>Check the mains supply cable of the power source</td>
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<td>Sub code [100**] shows the error code of Fronius power source</td>
<td>100</td>
<td>**</td>
<td>Update firmware, otherwise change the UST board</td>
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<td>PrE #</td>
<td>Sub code [101**] shows the error code of Fronius power source</td>
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<td>Sub code [102**] shows the error code of Fronius power source</td>
<td>102</td>
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<td>87</td>
<td>UndOp</td>
<td>Sub code [103**] shows the error code of Fronius power source</td>
<td>103</td>
<td>**</td>
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<td>88</td>
<td>UndOp</td>
<td>Sub code [104**] shows the error code of Fronius power source</td>
<td>104</td>
<td>**</td>
<td>Update firmware, otherwise change the UST board</td>
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<td>Sub code [105**] shows the error code of Fronius power source</td>
<td>105</td>
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<td>Sub code [106**] shows the error code of Fronius power source</td>
<td>106</td>
<td>**</td>
<td>Update firmware, otherwise change the UST board</td>
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<td>91</td>
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<td>Sub code [107**] shows the error code of Fronius power source</td>
<td>107</td>
<td>**</td>
<td>Update firmware, otherwise change the UST board</td>
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<td>92</td>
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<td>Sub code [108**] shows the error code of Fronius power source</td>
<td>108</td>
<td>**</td>
<td>Update firmware, otherwise change the UST board</td>
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<td>93</td>
<td>UndOp</td>
<td>Sub code [109**] shows the error code of Fronius power source</td>
<td>109</td>
<td>**</td>
<td>Update firmware, otherwise change the UST board</td>
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<td>94</td>
<td>UndOp</td>
<td>Sub code [110**] shows the error code of Fronius power source</td>
<td>110</td>
<td>**</td>
<td>Update firmware, otherwise change the UST board</td>
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<td>Sub code [111**] shows the error code of Fronius power source</td>
<td>111</td>
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<td>Sub code [112**] shows the error code of Fronius power source</td>
<td>112</td>
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<td>Sub code [113**] shows the error code of Fronius power source</td>
<td>113</td>
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<td>Sub code [114**] shows the error code of Fronius power source</td>
<td>114</td>
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<td>Update firmware, otherwise change the UST board</td>
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<td>99</td>
<td>unknown</td>
<td>Sub code [--**] shows the error code of Fronius power source</td>
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<td>**</td>
<td>OR NOT IN USE</td>
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4290 TPS ERROR

<table>
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<tr>
<th>Code</th>
<th>Description</th>
<th>Error Code</th>
<th>Main Error Code</th>
<th>Sub Error Code</th>
<th>Action</th>
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<tbody>
<tr>
<td>100</td>
<td>UndOp</td>
<td>Sub code [100**] shows the error code of Fronius power source</td>
<td>100</td>
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<td>Update firmware, otherwise change the UST board</td>
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<td>101</td>
<td>PrE #</td>
<td>Sub code [101**] shows the error code of Fronius power source</td>
<td>101</td>
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<td>Update firmware, otherwise change the UST board</td>
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<td>102</td>
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<td>Sub code [102**] shows the error code of Fronius power source</td>
<td>102</td>
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<td>Sub code [103**] shows the error code of Fronius power source</td>
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<td>Update firmware, otherwise change the UST board</td>
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<td>Error 105</td>
<td>106</td>
<td>STKOVL</td>
<td>107</td>
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<td>Sub code 105 shows the error code of Fronius power source</td>
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<td>Sub code 107 shows the error code of Fronius power source</td>
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<td>Sub code 108 shows the error code of Fronius power source</td>
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<td>106 main error code</td>
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<td>Update firmware, otherwise change the UST board, Confirm the Fronius manual</td>
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<td>Update firmware, otherwise change the UST board, Confirm the Fronius manual</td>
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<td>Update firmware, otherwise change the UST board, Confirm the Fronius manual</td>
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<td>150 main error code</td>
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<td>** sub error code</td>
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<td></td>
<td>Check the power supply of the power source, Confirm the Fronius manual</td>
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<td>OR NOT IN USE</td>
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<td>Confirm the Fronius manual</td>
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<td>Confirm the Fronius manual</td>
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<td>149</td>
<td>unknown 149</td>
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<td>Sub code [---**] shows the error code of Fronius power source</td>
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<td>--- main error code</td>
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<td>** sub error code</td>
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<td>OR NOT IN USE</td>
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<td>Confirm the Fronius manual</td>
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<td>Code</td>
<td>Description</td>
<td>Sub Code</td>
<td>Error Code</td>
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<td>4241</td>
<td>MOTOWELD SYSTEM RESET</td>
<td>302</td>
<td>MOTOWELD's Err Code</td>
<td>When finish system reset, Shut down the welding power source.</td>
<td></td>
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<tr>
<td>4242</td>
<td>MOTOWELD INPUT OVER-CURRENT</td>
<td>107</td>
<td>MOTOWELD's Err Code</td>
<td>1) Check if the output cable is short-circuited or grounded. 2) The power circuit may be broken. Contact your Yaskawa representative.</td>
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<tr>
<td>4243</td>
<td>MOTOWELD OUTPUT OVER-CURRENT</td>
<td>701</td>
<td>MOTOWELD's Err Code</td>
<td>Confirm the following content: 1) Check that the torch cable or power cable is not grounded? 2) Check that the contact tip does not contact the welding work piece? 3) Check that the encoder cable is not damaged? 4) Check if the screws of the connector t</td>
<td></td>
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<tr>
<td>4244</td>
<td>MOTOWELD INPUT OVER-VOLTAGE</td>
<td>1</td>
<td>MOTOWELD's Err Code</td>
<td>Confirm the input voltage.</td>
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<tr>
<td>4245</td>
<td>MOTOWELD EXCESSIVE TEMPERATURE</td>
<td></td>
<td>MOTOWELD's Err Code</td>
<td>Confirm the following content: 1) Check the ambient temperature (40 degrees centigrade or less) and operational ratio (60%). 2) Check if there are dust, dirt, and clogging on the dust protective filter. Clean or replace the dust protective filter if necessary. 3) In case of RL350, Ch</td>
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<tr>
<td>4246</td>
<td>MOTOWELD INPUT UNDER-VOLTAGE</td>
<td>2</td>
<td>MOTOWELD's Err Code</td>
<td>Confirm the input voltage.</td>
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<tr>
<td>4247</td>
<td>MOTOWELD WATER UNDER-FLOW</td>
<td>703</td>
<td>MOTOWELD's Err Code</td>
<td>Fill up the cooling water. 2) Check the circuit of cooling water.</td>
<td></td>
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<tr>
<td>4248</td>
<td>MOTOWELD DIGITAL I/F ERROR</td>
<td>401</td>
<td>MOTOWELD's Err Code</td>
<td>Confirm the following content: 1) The LAN cable has not damaged. 2) The Ethernet protocol address setting is correct. Check that C parameter of the welding power source and RS parameter of the robot controller.) 3) Welding power source &amp; turn on.</td>
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<tr>
<td>4249</td>
<td>MOTOWELD DIGITAL I/F NODE ERROR</td>
<td>402</td>
<td>MOTOWELD's Err Code</td>
<td>Check the Node of the each welded power sources and robot controller.</td>
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<td>4250</td>
<td>MOTOWELD DIGITAL I/F ERROR</td>
<td>403</td>
<td>MOTOWELD's Err Code</td>
<td>Confirm the following content: 1) LAN cable is not damaged. 2) Protocol type of the VEW01 is correct. Is MOTOWELD type?</td>
<td></td>
</tr>
<tr>
<td>4251</td>
<td>MOTOWELD DIGITAL I/F FILE# ERROR</td>
<td>404</td>
<td>MOTOWELD's Err Code</td>
<td>Set the user file number 1...16.</td>
<td></td>
</tr>
</tbody>
</table>
## 5 Alarm and Error

### 5.1 Alarm

<table>
<thead>
<tr>
<th>Code</th>
<th>Error Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4252</td>
<td>Digital I/F Chip Error</td>
<td>Replace the main board Pr(MB) - 024. Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>4253</td>
<td>MOTOWELD MACHINE TYPE ERROR 1</td>
<td>The setting of hardware or software may not be performed correctly. Contact your YASKAWA representative.</td>
</tr>
<tr>
<td>4254</td>
<td>MOTOWELD MACHINE TYPE ERROR 2</td>
<td>The setting of hardware or software may not be performed correctly. Contact your YASKAWA representative.</td>
</tr>
<tr>
<td>4255</td>
<td>MOTOWELD MACHINE TYPE ERROR 3</td>
<td>The setting of hardware or software may not be performed correctly. Contact your YASKAWA representative.</td>
</tr>
<tr>
<td>4256</td>
<td>MOTOWELD MACHINE TYPE ERROR 4</td>
<td>The setting of hardware or software may not be performed correctly. Contact your YASKAWA representative.</td>
</tr>
<tr>
<td>4257</td>
<td>PANEL SW SETTING ERROR</td>
<td>Sub Code: MOTOWELD's Err Code. (1) Check the dip switch setting of PR CR - 002R1 board. (2) PR CR - 002R1 board may be broken. Contact your YASKAWA representative.</td>
</tr>
<tr>
<td>4258</td>
<td>MOTOWELD FEEDER ERROR</td>
<td>Sub Code: MOTOWELD's Err Code. Confirm the following content. (1) The encoder cable be not damaged? (2) Isn't there loosening of the screw of the encoder cable connection terminal block? When there are a disconnection of the encoder cable or loosening of the screw, the wire feeding speed.</td>
</tr>
<tr>
<td>4259</td>
<td>MOTOWELD MOTOR OVERCURRENT</td>
<td>Sub Code: MOTOWELD's Err Code. Check if the feeder motor type. (1) Check the C parameter for feeder motor is correct. (2) Check the dip switch SW700 on the Main board Pr(MB).</td>
</tr>
<tr>
<td>4260</td>
<td>MOTOWELD CPU ERROR 1</td>
<td>Sub Code: MOTOWELD's Err Code. The board may be broken. Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>4261</td>
<td>MOTOWELD CPU ERROR 2</td>
<td>Sub Code: MOTOWELD's Err Code. The board may be broken. Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>4262</td>
<td>MOTOWELD MEMORY ERROR 1</td>
<td>Sub Code: MOTOWELD's Err Code. The data may not have been correctly saved when the welding conditions are recorded because of a power failure, etc. Reset the system after saving the changed parameters. See the manual of MOTOWELD &quot;4.2.10 System Reset&quot; If the error occurs again, the bo</td>
</tr>
<tr>
<td>4263</td>
<td>MOTOWELD MEMORY ERROR 2</td>
<td>Sub Code: MOTOWELD's Err Code. The data may not have been correctly saved when the welding conditions are recorded because of a power failure, etc. Reset the system after saving the changed parameters. See the manual of MOTOWELD &quot;4.2.10 System Reset&quot; If the error occurs again, the bo</td>
</tr>
<tr>
<td>4264</td>
<td>MOTOWELD MEMORY ERROR 3</td>
<td>Sub Code: MOTOWELD's Err Code. The data may not have been correctly saved when the welding conditions are recorded because of a power failure, etc. Reset the system after saving the changed parameters. See the manual of MOTOWELD &quot;4.2.10 System Reset&quot; If the error occurs again, the bo</td>
</tr>
<tr>
<td>4265</td>
<td>MOTOWELD MEMORY ERROR 4</td>
<td>Sub Code: MOTOWELD's Err Code. The data may not have been correctly saved when the welding conditions are recorded because of a power failure, etc. Reset the system after saving the changed parameters. See the manual of MOTOWELD &quot;4.2.10 System Reset&quot; If the error occurs again, the bo</td>
</tr>
<tr>
<td>4266</td>
<td>MOTOWELD MEMORY ERRORS</td>
<td>Sub Code: MOTOWELD's Err Code. The data may not have been correctly saved when the welding conditions are recorded because of a power failure, etc. Reset the system after saving the changed parameters. See the manual of MOTOWELD &quot;4.2.10 System Reset&quot; If the error occurs again, the bo</td>
</tr>
<tr>
<td>4267</td>
<td>MOTOWELD MEMORY ERROR 6</td>
<td>Sub Code: MOTOWELD's Err Code. The data may not have been correctly saved when the welding conditions are recorded because of a power failure, etc. Reset the system after saving the changed parameters. See the manual of MOTOWELD &quot;4.2.10 System Reset&quot; If the error occurs again, the bo</td>
</tr>
</tbody>
</table>
### 5.1 Alarm

<table>
<thead>
<tr>
<th>Code</th>
<th>Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5268</td>
<td>MOTOWELD MEMORY ERROR 7</td>
<td>Sub Code: MOTOWELD's Err Code. The data may not have been correctly saved when the welding conditions are recorded because of a power failure, etc. Reset the system after saving the changed parameters. See the manual of MOTOWELD &quot;4.2.10 System Reset&quot;. If the error occurs again, refer to the MOTOWELD manual.</td>
</tr>
<tr>
<td>5269</td>
<td>MOTOWELD STARTING SIGNAL ERROR</td>
<td>Sub Code: MOTOWELD's Err Code. Check again the operation timing or signal cable connections. The same error may occur at momentary power failure.</td>
</tr>
<tr>
<td>5270</td>
<td>MOTOWELD NO WELDING TYPE</td>
<td>Sub Code: MOTOWELD's Err Code. Select a correct welding process in the using the welding user file.</td>
</tr>
<tr>
<td>5271</td>
<td>MOTOWELD VOL TD DE TECT ERROR TW RE</td>
<td>Sub Code: MOTOWELD's Err Code. Check if the voltage detection wire is connected. Check if the voltage detection line or the short-circuit cap is connected to the CON7 of the MOTOWELD. Check that the contact tip does not contact the work piece to be welded. Set the contact tip so a</td>
</tr>
<tr>
<td>5272</td>
<td>MOTOWELD SAFETY-CIRCUIT ERROR</td>
<td>Sub Code: MOTOWELD's Err Code. Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>5273</td>
<td>MOTOWELD IGBT SHORT CIRCUIT</td>
<td>Sub Code: MOTOWELD's Err Code. Replace the IGBT device (Part code A0E3870). Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>5274</td>
<td>MOTOWELD VOLTAGE DETECTOR ERROR</td>
<td>Sub Code: MOTOWELD's Err Code. Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>5275</td>
<td>MOTOWELD AUX. CIRCUIT OV. CURRENT</td>
<td>Sub Code: MOTOWELD's Err Code. The board may be broken. Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>5276</td>
<td>MOTOWELD DSP ADC ERROR</td>
<td>Sub Code: MOTOWELD's Err Code.</td>
</tr>
<tr>
<td>5277</td>
<td>MOTOWELD OUTSIDE OF CURRSETTING (H)</td>
<td>Sub Code: MOTOWELD's Err Code. Check if the selection of motor is correct or confirm the settings of parameter C09. Check that the welding wire does not slip, or the wire is fed as instructed by the feeding command. Check that the wire stick out is not excessively short or.</td>
</tr>
<tr>
<td>5278</td>
<td>MOTOWELD OUTSIDE OF CURRSETTING (L)</td>
<td>Sub Code: MOTOWELD's Err Code. Check if the selection of motor is correct or confirm the settings of parameter C09. Check that the welding wire does not slip, or the wire is fed as instructed by the feeding command. Check that the wire stick out is not excessively short or.</td>
</tr>
<tr>
<td>5279</td>
<td>MOTOWELD MOMENTARY OVER-CURR</td>
<td>Sub Code: MOTOWELD's Err Code. Check that short-circuit or earth grounded of the output cable. May be power circuit broken. Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>5280</td>
<td>MOTOWELD OVER-VOLTAGE</td>
<td>Sub Code: MOTOWELD's Err Code. Contact your Yaskawa representative.</td>
</tr>
<tr>
<td>5281</td>
<td>MOTOWELD +15V POWER SUPPLY ERROR</td>
<td>Sub Code: MOTOWELD's Err Code. Replace the switching power supply unit. Service parts code A0E35055)</td>
</tr>
<tr>
<td>5282</td>
<td>MOTOWELD POWER SUPPLY ERROR</td>
<td>Sub Code: MOTOWELD's Err Code. Replace the switching power supply unit. Service parts code A0E35055)</td>
</tr>
</tbody>
</table>
### 5.1 Alarm

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>4283</td>
<td>Illegal Weld Type</td>
<td>Check the connection between front panel and main board.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the status of dip switch (SW301) on the front panel.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace the front panel.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace the main board.</td>
</tr>
<tr>
<td>4284</td>
<td>Software Multifunction</td>
<td>Check the connection between front panel and main board.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the status of dip switch (SW301) on the front panel.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace the front panel.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace the main board.</td>
</tr>
<tr>
<td>4285</td>
<td>Machine Setting Error</td>
<td>Check the connection between front panel and main board.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the status of dip switch (SW301) on the front panel.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace the front panel.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace the main board.</td>
</tr>
<tr>
<td>4286</td>
<td>Current Class Error</td>
<td>Confirm the power source class which of 350A or 500A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Switch a status of dip switch (SW600) which of 350A or 500A.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change the software which for correct current class.</td>
</tr>
</tbody>
</table>
## 5.2 Error

<table>
<thead>
<tr>
<th>Error No.</th>
<th>Message</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1110</td>
<td>TPS: SELECTED UNREGISTERED PROGRAM</td>
<td>A welding program unprepared for the welding power source was selected.</td>
<td>Select again a welding program.</td>
</tr>
<tr>
<td>1111</td>
<td>TPS: FEEDING SYSTEM FAILURE</td>
<td>A wire was clogged or so in the feeding system, leading to improper feeding.  For the CMT welding power source, the possibilities are high that the wire buckled in the wire buffer and this caused a problem with the sensor in the buffer.</td>
<td>• The most problems automatically solve when inching retract is performed on the wire for a short time at the time of error reset.  • If the problem persists, try to perform manual wire inching or wire retract.  • Adjust manually the sensor of the wire buffer to the proper position.  • If the problem frequently occurs, first check the feeding system for abnormally high feeding load, and replace parts as needed.</td>
</tr>
<tr>
<td>1112</td>
<td>TPS: ABNORMAL WATER FLOW</td>
<td>The water flow sensor was activated.</td>
<td>Check if water flows. If water flows and the error still occurs, replace the sensor because the sensor possibly has failed.</td>
</tr>
</tbody>
</table>

## 5.3 Message

<table>
<thead>
<tr>
<th>Message</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPS: TOUCH SENSOR IN OPERATION</td>
<td>The touch sensor was activated and the status flag bit turned ON.</td>
<td>This is only a notification. It does not indicate any problem.</td>
</tr>
<tr>
<td>TPS: ARC IGNITION FAILURE</td>
<td>When welding started, timeout occurred while waiting for arc to be generated that produces current flow. An insulator such as slag prevented current from flowing, thus arc was not generated. Or the wire took long time to contact the base material, being determined as arc ignition failure.</td>
<td>Remove the slag or other objects at the wire tip or in the base material. For CO2 welding especially, because slag tends to prevent conduction, take some action whenever possible so that welding starts from other than welding bead edge. Adjust the crater conditions for welding ending time so that some short length of wire comes out from the chip (so that the wire can immediately contact the base material).</td>
</tr>
<tr>
<td>TPS: ROBOT NOT READY</td>
<td>The welding power source received the notification that the &quot;Robot ready&quot; bit turned OFF, which was sent from the robot side, and issued the error.</td>
<td>Check if the digital interface type of VEW01 is FroniusTPS.</td>
</tr>
<tr>
<td>WELDING POWER SOURCE: Ethernet COMMUNICATION ERROR</td>
<td>The Ethernet communication was disconnected.</td>
<td>Check if the LAN cable is connected. If using a HUB, check if the HUB is turned ON.</td>
</tr>
<tr>
<td>TPS: WELDING POWER SOURCE NOT READY</td>
<td>The welding power source notified that it is not ready for welding.</td>
<td>This phenomenon may temporarily occur when the welding power source is turned ON or OFF, but it has no problem. However, if the error persists, restart the welding power source.</td>
</tr>
<tr>
<td>TPS: OUTSIDE THE RANGE OF FEEDING AMOUNT</td>
<td>Welding is performed with the feeding amount exceeding the maximum value set for welding programs.</td>
<td>When welding with the TCP speed function, decrease the welding rate to reduce the feeding amount.</td>
</tr>
</tbody>
</table>
Specifications are subject to change without notice for ongoing product modifications and improvements.