Original instructions

AC WELDING POWER SUPPLY

MEA-100B EU

OPERATION MANUAL

AMADA

Z06OM1200070-10

Thank you for purchasing our AC Welding Power Supply **MEA-100B**.

- This operation manual explains its method of operation and precautions for use.
- Before using, read this operation manual carefully; after reading, save it in a proper place where you can easily access.

Contents

1. Special Precautions

(1) Safety Precautions

Before using, read "Safety Precautions" carefully to understand the correct method of use.

- These precautions are shown for safe use of our products and for prevention of damage or injury to operators or others. Be sure to read each of them, since all of them are important for safety.
- The meaning of the words and symbols is as follows.

⚠ DANGER

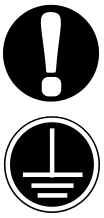
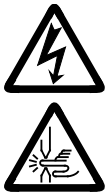
Denotes operations and practices that may imminently result in serious injury or loss of life if not correctly followed.

⚠ WARNING

Denotes operations and practices that may result in serious injury or loss of life if not correctly followed.

⚠ CAUTION

Denotes operations and practices that may result in personal injury or damage to the Power Supply if not correctly followed.

	These symbols denote "prohibition". They are warnings about actions out of the scope of the warranty of the product.
	These symbols denote actions which operators must take.
	Each symbol with a triangle denotes that the content gives notice of DANGER, WARNING or CAUTION to the operator.

⚠ DANGER

Do not touch the inside of the Power Supply unnecessarily

Since very high voltages are applied to the inside of this Power Supply, it is very dangerous to touch it unnecessarily.
Any person other than service personnel, or authorized representatives' personnel must not touch the inside.

Never disassemble, repair or modify the Power Supply

These actions can cause electric shock and fire. Consult us or your distribution for inspection and repair.

Never burn, destroy, cut, crush or chemically decompose the Power Supply

This product incorporates parts containing gallium arsenide (GaAs).

⚠ WARNING

Do not put your hands between the electrodes

When welding, keep your fingers and hands away from the electrodes.

Do not touch any welded part or electrodes during welding and just after welding finished

The welded part of a workpiece, electrodes and arm are very hot.
Do not touch them; otherwise you may be burnt.

Ground this Power Supply

If the Power Supply is not grounded, you may get an electric shock when fault occurs, or electricity leaks.

Apply Single-Phase, 200/220/230/240/380/400/460/480 V AC power supply

Application of a voltage out of the specified range can cause fire and electric shock.

Connect the specified cables securely

Cables of insufficient current capacities and loose connections can cause fire and electric shock.

Do not damage the power cable and connecting cables

Do not tread on, twist or tense any cable. The power cable and connecting cables may be broken, and that can cause electric shock and fire. If any part needs to be repaired or replaced, consult us or your distributor.

Stop the operation if any trouble occurs

Continuous operation after occurrence of a trouble such as burning smell, abnormal sound, abnormal heat, smoke, etc. can cause electric shock and fire. If such a trouble occurs, immediately consult us or your distributor.

Persons with pacemakers must stay clear of the welding machine

A person who uses a pacemaker must not approach the welding machine or walk around the welding shop while the welding machine is in operation, without being permitted by his/her doctor. The welding machine generates a magnetic field and has effects on the operation of the pacemaker while it is turned on.

Protective gear must be worn

Put on protective gear such as protective gloves, long-sleeve jacket, leather apron, etc. Surface flash and expulsion can burn the skin if they touch the skin.

Wear protective glasses

If you look at the surface flash and expulsion directly during welding, your eyes may be damaged. If any surface flash and expulsion gets in your eyes, you may lose your eyesight.

⚠ CAUTION

Do not splash water on the Power Supply

Water splashed over the electric parts can cause electric shock and short circuits.

Use proper tools (wire strippers, pressure wire connectors, etc) for termination of the connecting cables

Do not cut the conductor of wire. A flaw on it can cause fire and electric shock.

Install the Power Supply on firm and level surface

If the Power Supply falls or drops, injury may result.

Do not place a water container on the Power Supply

If water spills, insulation will deteriorate, and this may cause electric leak and fire.

Keep combustible matter away from the welding machine

Surface flash and expulsion can ignite combustible matter. If it is impossible to remove all combustible matter, cover them with non-combustible material.

Do not cover the Power Supply with a blanket, cloth, etc.

If such a cover is used, it may be overheated and burn.

Do not use this Power Supply for purposes other than welding

Use of this Power Supply in a manner other than specified can cause electric shock and fire.

Use ear protectors

Loud noises can damage hearing.

Keep a fire extinguisher nearby

Keep a fire extinguisher in the welding shop in case of fire.

Maintain and inspect the Power Supply periodically

Maintain and inspect the Power Supply periodically, and repair any damage nearby before starting operation.

(2) Precautions for Handling

- When transporting or moving the Power Supply, do not lay it down. Also, handle the Power Supply with care so as not to make an impact such as drop on it.
- Install this Welding Power Supply on a firm, level, horizontal surface. If it is inclined, malfunction may result.
- Do not install this Welding Power Supply in the following:
  - Damp places where humidity is higher than 90%,
  - Hot or cold places where temperatures are above 45°C or below 0°C,
  - Places near a high noise source,
  - Places where chemicals are handled,
  - Places where water will be condensed,
  - Dusty places, and
  - Places at an altitude above 1000 meters.
- Clean the outside of the Welding Power Supply with a soft, dry cloth or one wet with a little water. If it is very dirty, use diluted neutral detergent or alcohol. Do not use paint thinner, benzine, etc., since they can discolor or deform the Welding Power Supply.
- Do not put a screw, a coin, etc., in the Welding Power Supply, since they can cause a malfunction.
- Operate the Welding Power Supply according to the method described in this operation manual.
- Operate the switches and buttons carefully by hand. If they are operated roughly or with the tip of a screwdriver, a pen, etc., this will cause malfunction or damage.
- Operate the switches and buttons one at a time. If two or more of them are operated at a time, the Power Supply may have trouble or may be broken.
- The Power Supply is not equipped with auxiliary power such as an outlet for lighting.
- The welding head, the welding transformer, the secondary cable for connecting the welding head with the welding transformer, and the connecting cable for connecting the welding transformer with the Power Supply are separately needed to use the Power Supply.
- The I/O signal line to start the Power Supply is not attached. Press the crimp-on terminal (terminal block screw, M3) for wiring.
- The cable to supply power to the Power Supply is not attached. Press the crimp-on terminal (terminal block screw, M6) for wiring. For the cable to use, see **3. (2) Option**.
- The cable to connect between the welding transformer and the Power Supply is not attached. Press the crimp-on terminal (terminal block screw, M6) for wiring. For the cable to use, see **3. (2) Option**.

(3) On Disposal

This product incorporates parts containing gallium arsenide (GaAs). At the time of disposal, separate it from general industrial waste or domestic waste and carry out the disposal in accordance with applicable laws and regulations.

2. Features

The **MEA-100B** is a single-phase AC resistance-welding power supply designed for fine spot welding. The control method can be selected from secondary constant-current control and power supply voltage fluctuation compensation control. The **MEA-100B** realizes high quality welding, so it is suitable for small size precise welding.

① Four welding current control systems are currently available for the **MEA-100B**. Select the control system best suited to the particular workpiece.

[Multi-Cycle Welding + Secondary Constant-Current Control]
Returns welding current feedback to the control at each half-cycle, using the toroidal coil. The control makes adjustments based on this feedback to maintain a constant current, compensating for voltage fluctuation and workpiece load variances.

[Multi-Cycle Welding + Power Supply Voltage Fluctuation Compensation Control]
Monitors and compensates for power supply voltage fluctuation to maintain a constant current. Compensation begins from the first half-cycle.

[Single-Cycle Welding + Power Supply Voltage Fluctuation Compensation Control]
Permits the flow of one cycle current only. You can set the first half wave and the second half wave separately. Compensation begins with the first half wave.

[Half-Cycle Welding + Power Supply Voltage Fluctuation Compensation Control]
Permits the flow of one half-cycle current only. The direction of the current is inverted with each current flow.

② **Current Monitor Function Provided**
This function allows you to check the current at every welding. Also, a fault message is displayed when the current range has been preset and the current is out of range.

③ **Automatic Maximum Current Setting**
The highest optimum current is automatically set through test welding. (This setting is then retained in memory even when the power supply is turned off. However, it is reset when another test welding is performed.)

3. Packaging

(1) Accessory

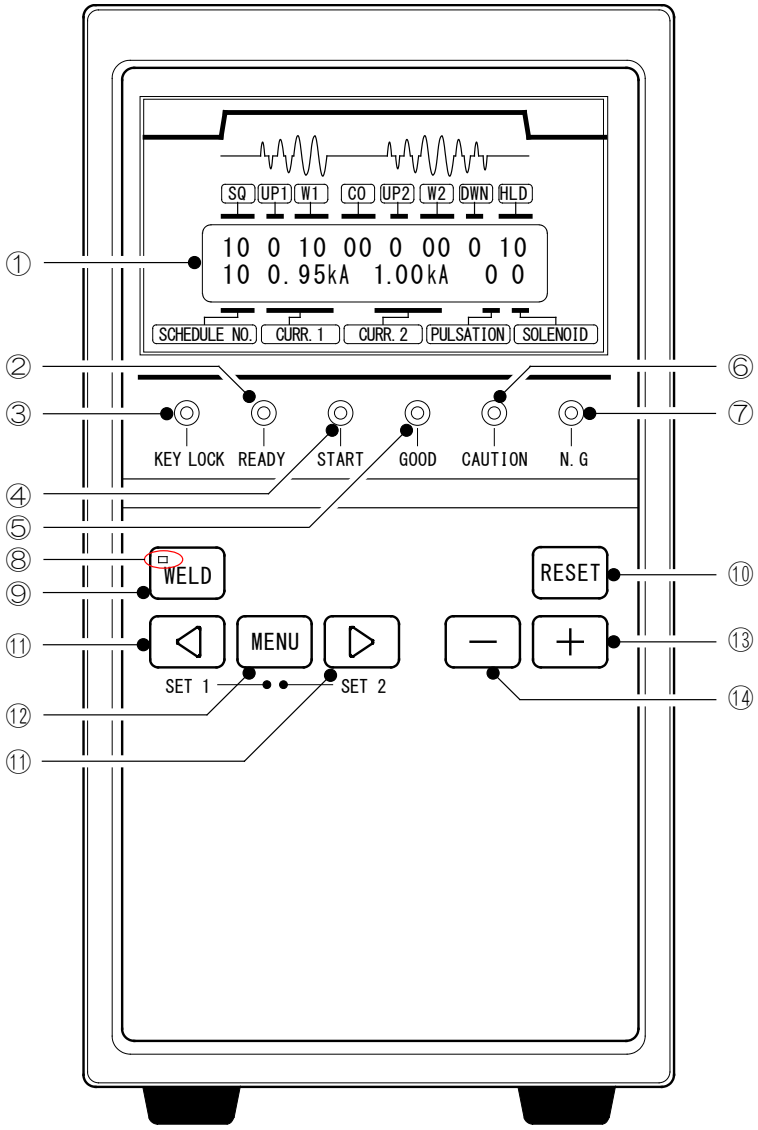
Item	Model No.	Q'ty
Operation manual	AS1200089(OM1200069,OM1200070)	1

(2) Options

Item	Model No.		Description	Item No.
Toroidal coil	**MB-35E-00**		Required for secondary constant-current control or current monitoring.	1001283
Connecting cable (Power cable/ Output cable)	**PK-03294-001** (2 m)		Used to supply power to the **MEA-100B** and connect the **MEA-100B** to the welding transformer. Note: If you provide a cable, select a cable with the following specification. Rated voltage..... 600 V min. Number of cores..... 3 Cross section..... 5.5 mm^2 min. Protection conductor.. 5.5 mm^2 min. Cable diameter..... 18 mm max.	1001699
	PK-03294-002 (5 m)			1001712
	PK-03294-003 (10 m)			1001713
	For China	**PK-03887-001** (2 m)		1001745
		PK-03887-002 (5 m)		1001746
		PK-03887-003 (10 m)		1001747
Start cable	**SK-03273-001** (2 m)		Connects the **MEA-100B** to the welding head.	1001698
	SK-03273-002 (5 m)			1001710
	SK-03273-003 (10 m)			1001711

4. Name and Functions of Each Section

(1) Front Panel



① Display Panel
This LCD panel is used to monitor various **MEA-100B** functions.
Indicates various settings and weld measurement results.

② [READY] Lamp
Lights when the **MEA-100B** is ready to supply a welding current.
This lamp is synchronized with Terminal 12 ([READY]) of the I/O Terminal Strip on the rear panel.
This lamp lights when the following conditions are met:

- The [WELD] lamp on the panel is on.
- The [WELD ON/OFF] signal of the I/O Terminal Strip on the rear panel is on.
- No trouble has occurred.

Also, this lamp is turned off while settings are written in the flash memory after schedules are changed.

③ [KEY LOCK] Lamp
If this lamp is lit, the schedules or other settings cannot be edited. However, you can still change screens and the schedule no. using the [MENU] key, and change functions using NP on the SET2 screen (See 9. (2) ①).

④ [START] Lamp
Indicates the status of Terminal 28 ([START(1ST)]) of the I/O Terminal Strip on the rear panel.
Lights when the start signal is input.

⑤ [GOOD] Lamp
Lights when the current is within the monitor range after welding (See 7. (2)). This lamp is synchronized with Terminals 17 and 18 ([GOOD]) of the I/O Terminal Strip on the rear panel.

⑥ [CAUTION] Lamp
Lights if the items set to 0 on #4–#7 of the SET2 screen are troubled (See 9. (2) ④). Detailed information on the problem is provided on the display panel. The lamp is synchronized with Terminal 10 ([CAUTION]) of the I/O Terminal Strip on the rear panel.

⑦ [N.G] Lamp
Lights if the items set to 1 on #4–#7 of the SET2 screen are troubled (See 9. (2) ④). Detailed information on the problem is provided on the display panel. The lamp is synchronized with Terminals 15 and 16 ([NG]) of the I/O Terminal Strip on the rear panel.

⑧ [WELD] Lamp
This lamp is one of the three conditions to light the [READY] lamp. Lights when the [WELD] key is pressed.
If the lamp is turned off, a sequence test can be performed without a welding current.

⑨ [WELD] Key
Turns on the [WELD] lamp. To turn off the lamp, the key must be pressed for at least a second.

⑩ [RESET] Key
Turns off an [NG] or [CAUTION] output.
The key does not work until the cause of the problem has been rectified.

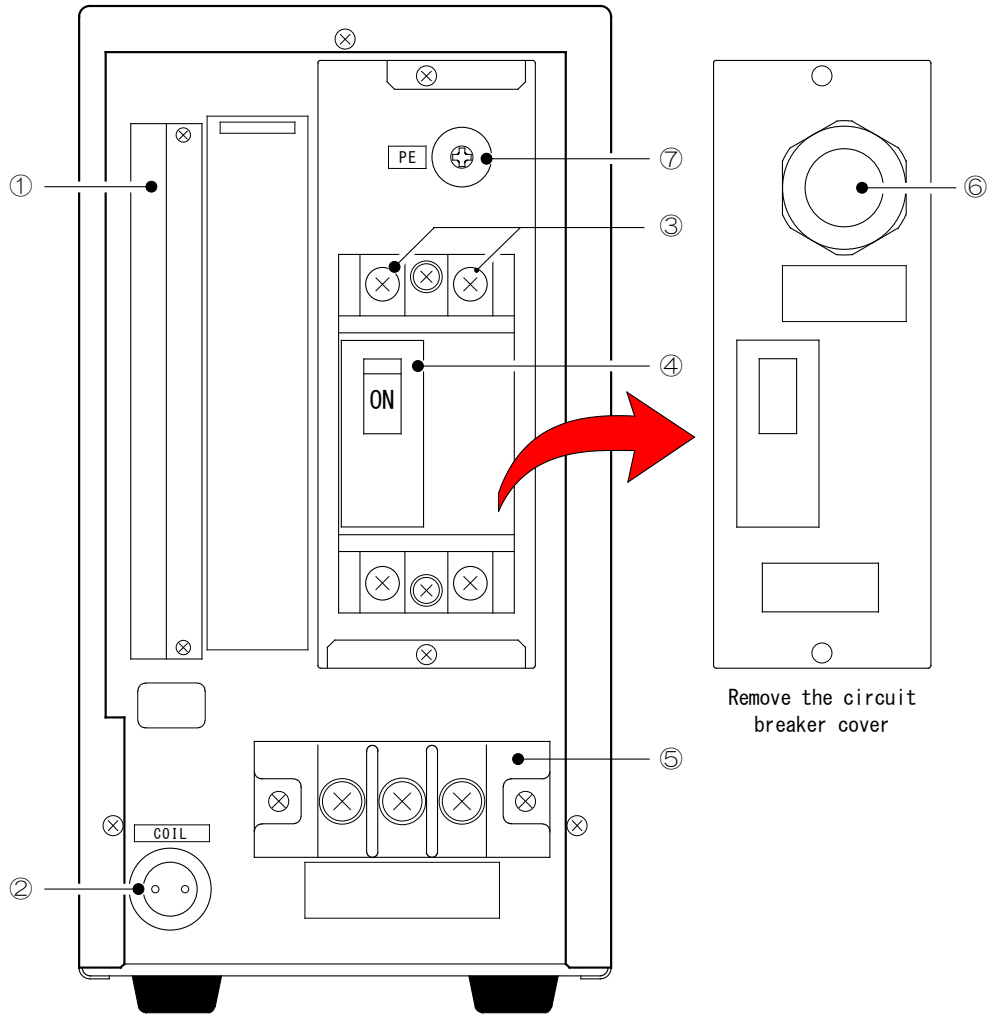
⑪ Cursor Key
Used to move the cursor.

⑫ [MENU] Key
Used to move from the MENU screen to another screen or to return to the MENU screen from the SET screen. For the SET screen, see 6. and 9.
- To move to the SET1 screen, simultaneously press the [◁] key and the [MENU] key. Press both for at least a second.
- To move to the SET2 screen, simultaneously press the [▷] key and the [MENU] key. Press both for at least a second.

⑬ [+] Key
Changes the number selected by the cursor. Press this key repeatedly to increase the value.

⑭ [-] Key
Changes the number selected by the cursor. Press this key repeatedly to decrease the value.

(2) Rear Panel



① I/O Terminal Strip
Terminal strip for signals, including the [START] and [NG] signals.
For details, see **10. Interface**.

② Toroidal Coil Connector
This serves as the input connector for the secondary current detection signal.
Connect the toroidal coil (sold separately) to this connector when the secondary constant-current control is selected, or if the power supply voltage fluctuation compensation control is selected and the welding current monitor is in use.

③ Power Cable Connecting Terminal
Connect the power cable (sold separately) to this terminal for welding. The other end of the power cable is connected to a single-phase power supply for welding. For the power cable, see **3. (2) Options**.

④ Circuit Breaker
Supplies or shuts off power to the **MEA-100B**.
Raise the handle to turn the circuit breaker on and to supply welding power to the **MEA-100B**.
Lower the handle to turn off the circuit breaker and to shut off welding power to the **MEA-100B**.

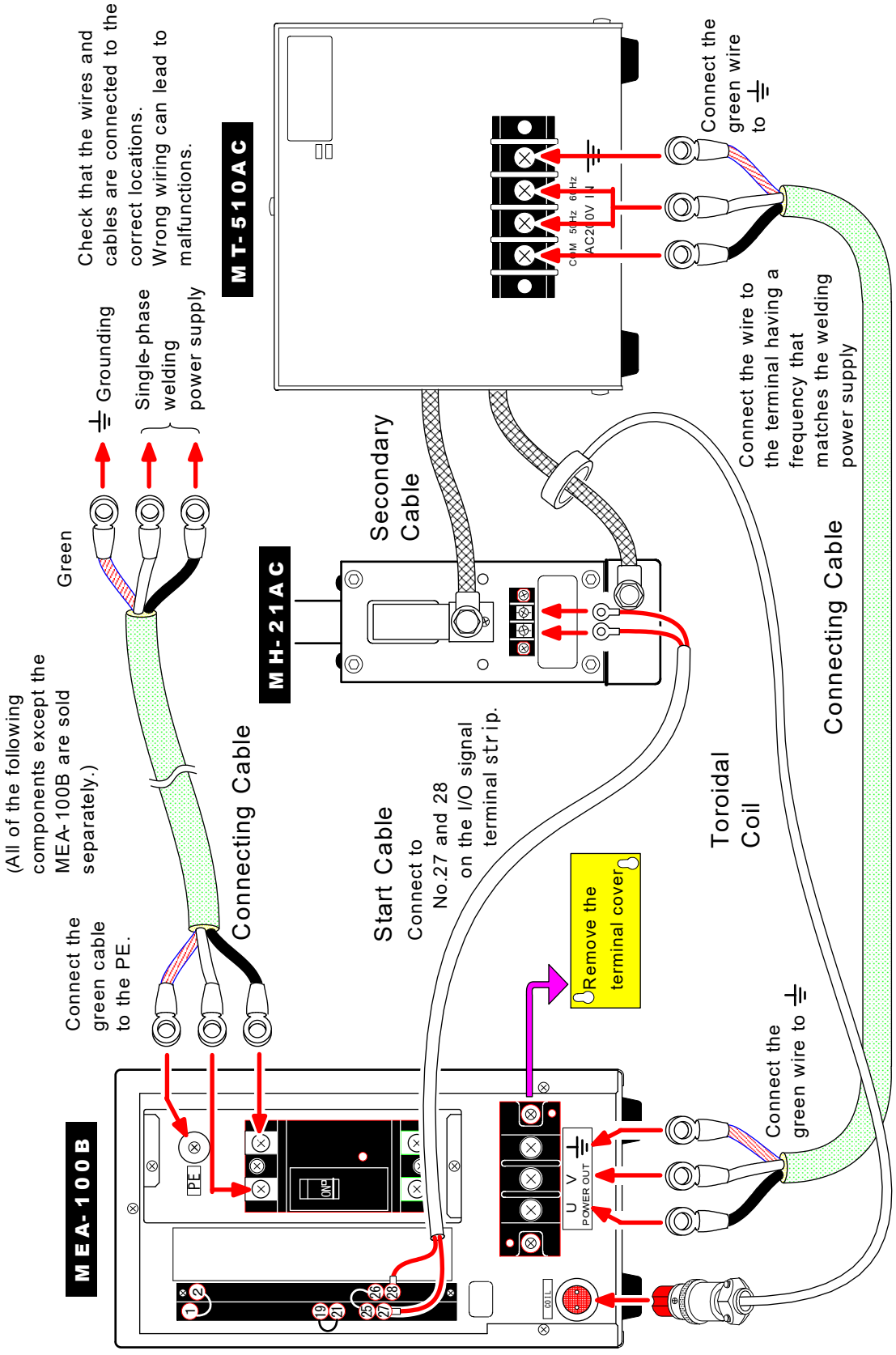
⑤ Output Terminal Block
The output cable (sold separately) is connected to this block.
The other end of the cable is connected to the input terminal of the welding transformer. For the output cable, see **3. (2) Options**.

⑥ Power Cable Inlet
Pass the power cable through this inlet to connect the cable to the power cable connecting terminal.

⑦ Grounding Terminal
Be sure to ground the **MEA-100B** to prevent electric shock.

5. Connection

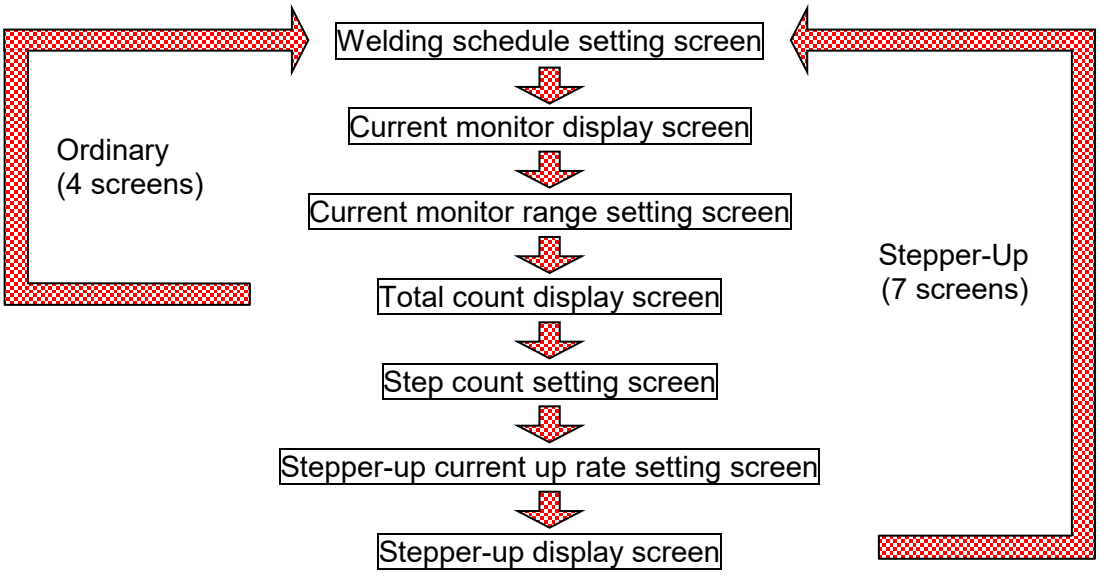
The illustration below shows the **MEA-100B** connected to an **MH-21AC**, our welding head, and **MT-510AC**, our welding transformer.



6. Before the Operation

(1) Screen Configuration

① MENU Screen
Press the [MENU] key to select the desired screen. The screens are cycled like this:



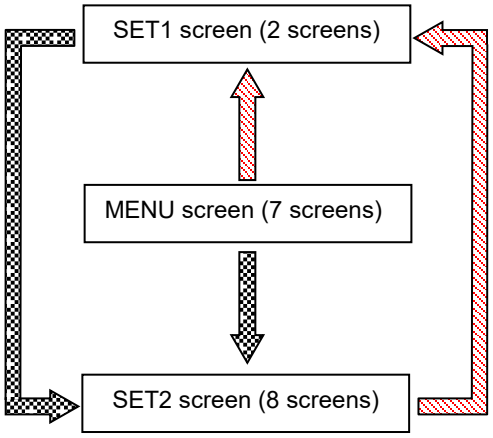
These seven screens are called the MENU screens.

② SET Screen
There is the SET screen for detail settings in addition to the MENU screen. The SET screen is divided into two general screens, the SET1 screen and the SET2 screen.

To display the SET1 screen, press the [MENU] key and the [◁] key simultaneously for at least a second.

To display the SET2 screen, press the [MENU] key and the [▷] key simultaneously for at least a second.

Also, the SET1 screen has #1 and #2 screens, and the SET2 screen has #1 to #8 screens. The number is displayed at the upper left side on the screen (See the circle in figure below.) When screen is switched to the SET screen, the #1 screen is always displayed first.

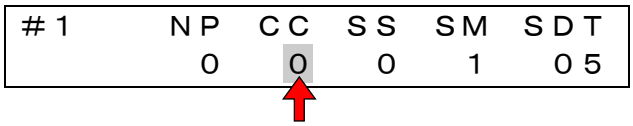


For details of the SET1 screen, see 6. (3) and (4).
For details of the SET2 screen, see **9. Detail Settings**.

(2) Control Method and Welding Current Cycle Settings

Follow the procedure described below and set the control method and welding current cycle according to the specific application after the **MEA-100B** is installed.
(Secondary constant-current control is factory-set on shipment.)

① To display the SET2 screen, press the [MENU] key and the [▷] key simultaneously for at least a second. (For details of the SET2 screen, see **9. Detail Settings**.)



② Change the value under CC (arrow above) to select a desired control method and welding current cycle.

Setting	Control Method	Welding Current Cycle
0	Secondary constant-current control	Multi-cycle welding
1	Power supply voltage fluctuation compensation control	Multi-cycle welding
2	Power supply voltage fluctuation compensation control	Single-cycle welding
3	Power supply voltage fluctuation compensation control	Half-cycle welding

③ After changing, press the [MENU] key to go to the welding schedule setting screen.

Caution: Read 9. (2) ① carefully before modifying any of the above settings other than CC.

(3) Maximum Current Setting

The maximum current is set in one of two ways described below:

A: To set the maximum current of the welding machine directly

① To display the SET1 screen, press the [MENU] key and the [◁] key simultaneously for at least a second. When screen is switched to the SET screen, the #1 screen is always displayed first.

② Move the cursor to ▮ and set the maximum current of the welding machine. Setting range is 0.5 to 9.9 kA.

Caution: When the value is set to lower than 0.5, "***" will be displayed and the the maximum current will be set automatically.
For details, see next page.

B: To set the maximum current automatically, from the measurement of actual welding

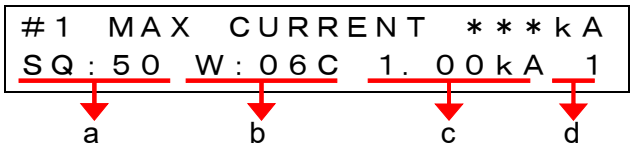
If the maximum current of the welding machine is unknown, set the maximum current automatically with the automatic setting function.

Caution: The value set by the automatic setting function is an approximation. Sometimes the value is differrent from an actual maximum current. Do not use this function other than the setting of the maximum current.

① Connect the toroidal coil (sold separately) to the **MEA-100B**.

② To display the #1 of the SET1 screens, press the [MENU] key and the [◁] key simultaneously for at least a second.

③ Decrease the value of ▒ below 0.5 kA to indicate "***kA", the automatic maximum current setting function is enabled.



④ The initial settings are shown above. Edit the settings according to the specific welding machine in use.

	Description	Setting Range
a	Squeeze time. The set squeeze time must be longer than the actual squeeze time. (HLD (hold time) will equal SQ (squeeze time).)	00–99 cycles
b	Weld time. The set weld time must be the actual weld time.	01–99 cycles
c	The set current must be 60% to 90% of the actual welding current in order to prevent the damage to the **MEA-100B** caused by overcurrent.	0.20–9.99 kA
d	Weld Force number. Select the welding machine for which you want to set the maximum current automatically.	SOL1 SOL2

⑤ Close Terminal 28 ([START(1ST)]) of the I/O Terminal Strip on the rear panel.

⑥ After test welding is complete, the display will revert to the screen shown in ②. The screen shows the maximum current set automatically.

⑦ If the display does not revert to the screen, repeat test welding until the screen returns. (To measure the maximum current, welding must be performed for 6 cycles.)

Caution: Moving to another screen during the automatic maximum current setting will interrupt the setting process.

(4) Contrast Setting

Adjusts the LCD contrast.

① To display the SET1 screen, press the [MENU] key and the [◁] key simultaneously for at least a second.

② Move the cursor to ▒ and change to the #2 screen.
The #2 LCD CONTRAST screen is displayed.

③ Change the value indicated by arrow to select one of 16 contrast levels.
The lower the value is, the darker the LCD is.

④ '<<>>' at the bottom line indicates the current contrast level.

7. Basic Operation

(1) Supplying Power

Turn on the circuit breaker on the rear panel to supply power to the **MEA-100B**. During the startup self-diagnostics, the LCD screen displays the model number and software version. If the self-diagnostics completes without errors, the MENU screen is displayed.

Caution: Check that the display screen and lamps are turned on normally.

An error prompt is displayed if a "trouble" arises.
The screen last displayed before power was turned off is displayed on the display panel.

Attention: Do not turn on the circuit breaker while pressing a key on the panel. Do not press a key within 2 seconds after power is turned on. For example, pressing the [RESET] key during this period will return all welding schedule data to their default settings.

(2) Writing in the Flash Memory

ATTENTION

The Power Supply writes data into the flash memory on the control board when a setting is changed. The [READY] lamp on the front panel and the external READY signal are turned off during writing. Check that the [READY] lamp is turned on to start welding.
It takes about 1 second at longest to change a setting in the flash memory. During that time, do not turn off the power.
Also, the flash memory has the rewriting limit (30,000 times). If the limit is exceeded, the set data may not be stored normally. Be careful when changing settings frequently with the RS-485 bi-directional communication.

The **MEA-100B** does not have the key to establish setting like “ENTER.” By either of the following procedures, settings can be written and stored in the flash memory.

After changing the set value with the [+] key or [-] key,
- move to the next setting item with the cursor key (Settings cannot be stored just by digit shift.)
- move to the next screen with the [MENU] key, or
- do nothing for 3 seconds or longer.

When the setting is stored in the flash memory, the [READY] lamp on the front panel or the external READY signal is turned off for a moment. Wait until the READY is turned on after off to start the sequence or turn off the power supply.

(3) Welding Schedule and Current Monitor Range Setting

The welding schedule and the current monitor range can be set with the four types of the control method.
Press the [◁] or [▷] key to move the cursor to the setting you want to edit. Change the set value with the [+] or [-] key.

Welding Schedule Setting

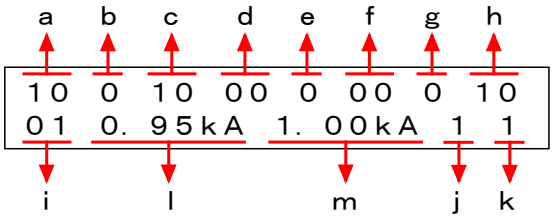
Press the [MENU] key to go to the Welding Schedule Setting screen.
Set the schedule for the welding machine being used. The **MEA-100B** can save 31 schedules.
This screen displays different data, according to the welding and control methods selected.

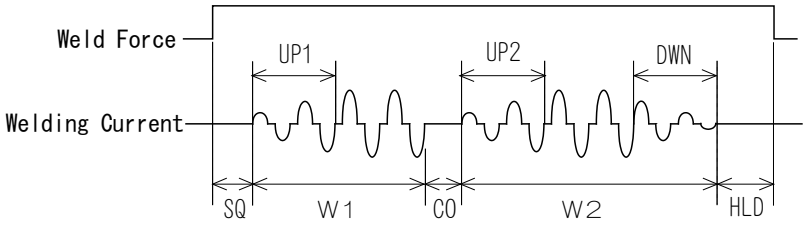
Current Monitor Range Setting

Press the [MENU] key to go to the Current Monitor Range Setting screen.
Set the current range of the good welding as the monitor upper limit and lower limit. When the current is out of the range, the error signal is output.

① Secondary Constant-Current Control at Multi-Cycle Welding

Welding Schedule Setting



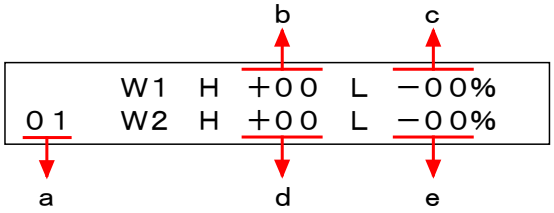


	Item	Setting Range/Display
a	Squeeze (SQ)	00–99 cycles
b	Upslope 1 (UP1)	0–9 cycles (UP1 is included in W1.)
c	Weld 1 (W1)	00–99 cycles
d	Cool (CO)	00–99 cycles
e	Upslope 2 (UP2)	0–9 cycles (UP2 is included in W2.)
f	Weld 2 (W2)	00–99 cycles
g	Downslope (DWN)	0–9 cycles (DWN is included in W2.)
h	Hold (HLD)	00–99 cycles
i	Schedule Number (SCHEDULE NO.)	01–31 schedules
j	Pulsation (PULSATION)	1–9 times
k	Weld Force Number (SOLENOID)	1, 2
l	Weld Current 1 (CURR.1) *	0.20–9.99 kA
m	Weld Current 2 (CURR.2) *	0.20–9.99 kA

*: When the secondary constant-current control is used, the current must not exceed the maximum current setting. If it exceeds the maximum current, the fault code [E14: CURR SETTING ERR] is given at start signal input. (For details, see **12. Troubleshooting**.)

Current Monitor Range Setting

On the basis of the current set for the welding schedule, set the allowable ranges in percent.
Set the ranges for W1 and W2 for each schedule.



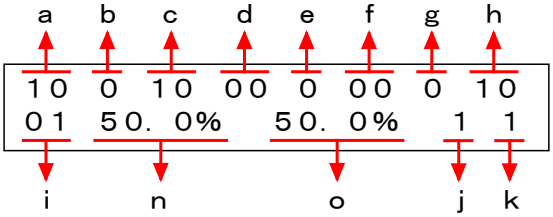
	Item	Setting Range/Display
a	Schedule Number (SCHEDULE NO.)	01–31 schedules
b	Weld 1 allowable upper limit (W1 H)	00 (*), +01%– +49%
c	Weld 1 allowable lower limit (W1 L)	00 (*), -01%– -49%
d	Weld 2 allowable upper limit (W2 H)	00 (*), +01%– +49%
e	Weld 2 allowable lower limit (W2 L)	00 (*), -01%– -49%

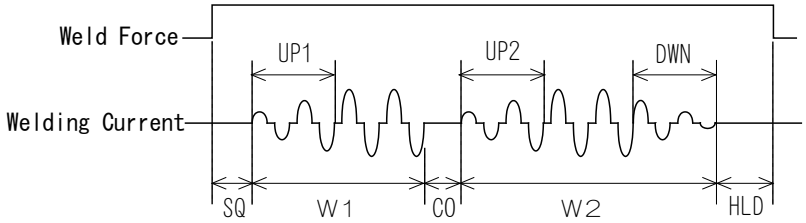
(*) When set to 00, the current is not monitored.

② Power Supply Voltage Fluctuation Compensation Control at Multi-Cycle Welding

Welding Schedule Setting

Set the welding current (n, o) in a percentage to the maximum current expressed as 100% (For the maximum current, see 6. (3).)

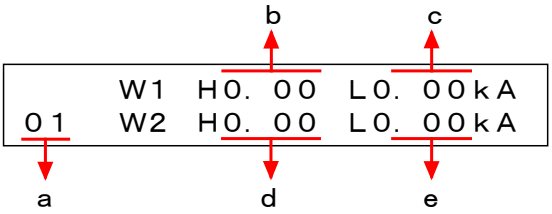




	Item	Setting Range/Display
a–k	Same as ① Secondary Constant-Current Control at Multi-Cycle Welding **Welding Schedule Setting**	
n	Weld Current 1 (CURR.1)	10.0%–99.9%
o	Weld Current 2 (CURR.2)	10.0%–99.9%

Current Monitor Range Setting

Set the upper and lower limits in current value.
Set the limits for W1 and W2 for each schedule.



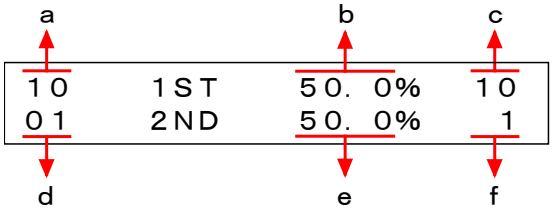
	Item	Setting Range/Display
a	Schedule Number (SCHEDULE NO.)	01–31 schedules
b	Weld 1 upper limit (W1 H)	0.00 (*), 0.01–9.99 kA
c	Weld 1 lower limit (W1 L)	0.00 (*), 0.01–9.99 kA
d	Weld 2 upper limit (W2 H)	0.00 (*), 0.01–9.99 kA
e	Weld 2 lower limit (W2 L)	0.00 (*), 0.01–9.99 kA

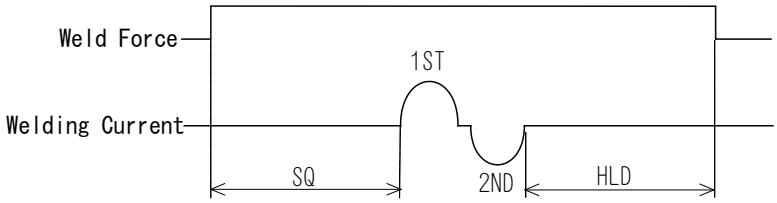
(*) When set to 0.00, the current is not monitored.

③ Single-Cycle Welding

Welding Schedule Setting

Set the welding current (b, e) in a percentage to the maximum current expressed as 100% (For the maximum current, see 6. (3).)

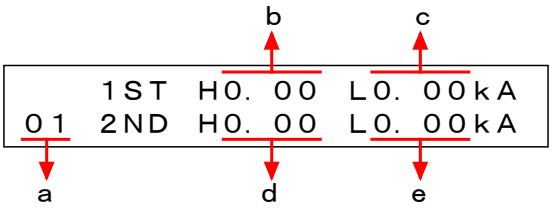




	Item	Setting Range/Display
a	Squeeze (SQ)	00–99 cycles
b	1st half cycle current (1ST)	10.0%–99.9%
c	Hold (HLD)	00–99 cycles
d	Schedule Number (SCHEDULE NO.)	01–31 schedules
e	2nd half cycle current (2ND)	10.0%–99.9%
f	Weld Force Number (SOLENOID)	1, 2

Current Monitor Range Setting

Set the upper and lower limits in current value.
Set the limits for 1ST and 2ND for each schedule.



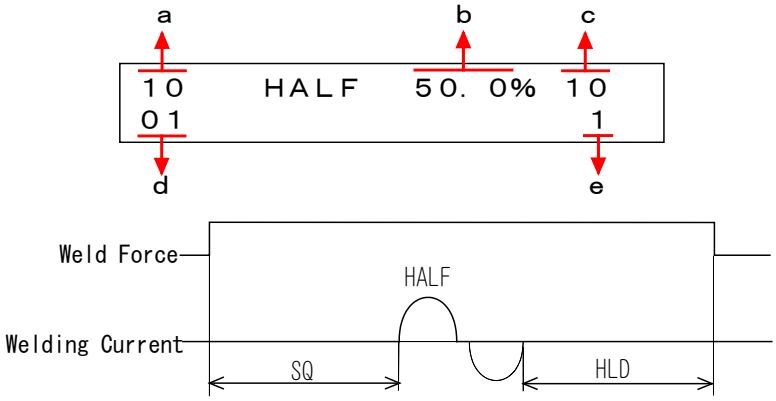
	Item	Setting Range/Display
a	Schedule Number (SCHEDULE NO.)	01–31 schedules
b	1ST upper limit (1ST H)	0.00 (*), 0.01–9.99 kA
c	1ST lower limit (1ST L)	0.00 (*), 0.01–9.99 kA
d	2ND upper limit (2ND H)	0.00 (*), 0.01–9.99 kA
e	2ND lower limit (2ND L)	0.00 (*), 0.01–9.99 kA

(*) When set to 0.00, the current is not monitored.

④ Half-Cycle Welding

Welding Schedule Setting

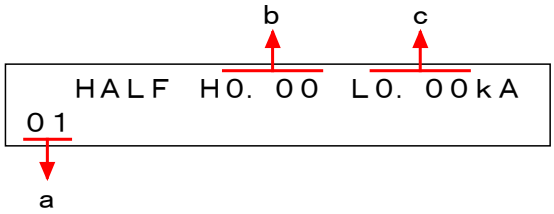
Set the welding current (b) in a percentage to the maximum current expressed as 100% (For the maximum current, see 6. (3).)



	Item	Setting Range/Display
a	Squeeze (SQ)	00–99 cycles
b	Weld Current (HALF)	10.0%–99.9%
c	Hold (HLD)	00–99 cycles
d	Schedule Number (SCHEDULE NO.)	01–31 schedules
e	Weld Force Number (SOLENOID)	1, 2

Current Monitor Range Setting

Set the upper and lower limits in current value.
Set the limits for each schedule.



	Item	Setting Range/Display
a	Schedule Number (SCHEDULE NO.)	01–31 schedules
b	HALF upper limit (HALF H)	0.00 (*), 0.01–9.99 kA
c	HALF lower limit (HALF L)	0.00 (*), 0.01–9.99 kA

(*) When set to 0.00, the current is not monitored.

(4) Ready for Welding (Turning on the [READY] Lamp)

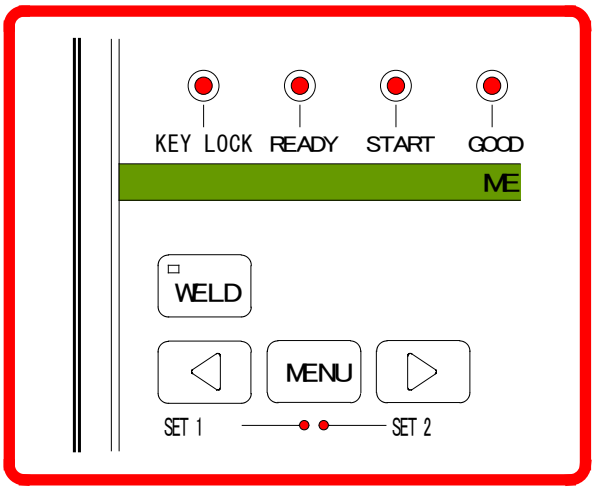
By following steps ① to ③ below, the [READY] lamp lights and the **MEA-100B** is brought into the READY state (to flow the welding current).

① If any fault occurs, rectify the fault and then clear fault output. (For clear of fault outputs, see **12. Troubleshooting**.)

② Press the [WELD] key on the panel. The [WELD] lamp (green) lights and the **MEA-100B** is brought into ready state for WELD ON.

③ Close Terminals 25 and 26 ([WELD ON/OFF]) on the rear panel I/O terminal strip. (For details, see 10. (2).)

Press and hold down the [WELD] key for at least a second or open Terminals 25 and 26 on the rear panel I/O terminal strip to cancel the welding READY state. The [WELD] lamp and the [READY] lamp are turned off.



(5) Selecting Welding Schedule Number [SCH]

① 31-Schedule Input from External

Without parity

Select #1–#31 schedules by combining schedule signals [SCH.1], [SCH.2], [SCH.4], [SCH.8], and [SCH.16].
When no schedule is input (all signal circuits are opened), the **MEA-100B** operates with schedule #1.

With parity

To use the parity function, set SS on the SET2 #1 screen to 1. (See 9. (2) ①.)
Parity check is odd parity. When starting, combine schedule signals [SCH.1], [SCH.2], [SCH.4], [SCH.8], [SCH.16], and [Parity] so that the number of them becomes odd. When the total number of the signals is even, the fault code [E02: START PARITY] is given.

Schedule No. #	SCH.1	SCH.2	SCH.4	SCH.8	SCH.16	Parity
1						○
1	○					
2		○				
3	○	○				○
4			○			
5	○		○			○
6		○	○			○
7	○	○	○			
8				○		
9	○			○		○
10		○		○		○
11	○	○		○		
12			○	○		○
13	○		○	○		
14		○	○	○		
15	○	○	○	○		○
16					○	
17	○				○	○
18		○			○	○
19	○	○			○	
20			○		○	○
21	○		○		○	
22		○	○		○	
23	○	○	○		○	○
24				○	○	○
25	○			○	○	
26		○		○	○	
27	○	○		○	○	○
28			○	○	○	
29	○		○	○	○	○
30		○	○	○	○	○
31	○	○	○	○	○	

② 5-Schedule Input from External

To select 5-schedule input, set SS on the SET2 #1 screen to 2. (See 9. (2) ①.)
If no schedule is input (all the signal circuits are opened), the **MEA-100B** operates with schedule #1.
If the schedules are input under 2 or more numbers at a time, the schedule under the lower SCHEDULE number is used.

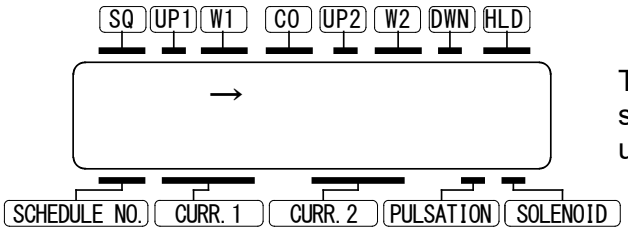
Schedule No. #	SCH.1	SCH.2	SCH.4	SCH.8	SCH.16
1					
1	○				
2		○			
4			○		
8				○	
16					○

③ 31-Schedule Input from Panel Operation

Display the Welding Schedule Setting screen, the Current Monitor Display screen or the Current Monitor Range Setting screen and then input the schedule number you use directly.

(6) Welding Start

When the start signal is input to the I/O terminal strip, the [START] lamp lights and the welding sequence starts.
During the welding sequence, the operation currently underway is indicated by an arrow as shown below.



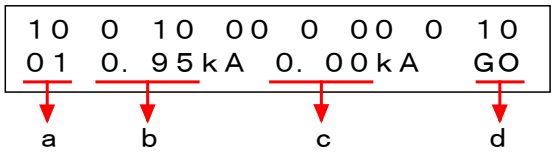
The screen is displayed as shown at left when W1 is underway.

(7) Welding (Current) End

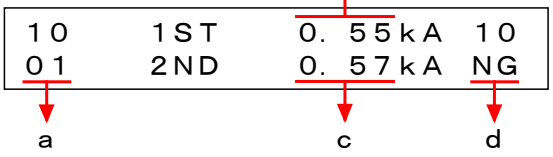
① If the welding is initiated while the welding schedule setting screen is displayed, the screen indicates the measured currents (b and c) and the determination of the welding result (d). (See figure below.)
② The End signal and the determination of the welding result (Normal (GOOD) signal, Caution (CAUTION) signal and Trouble (NG) signal) are output from the I/O terminal strip.

[GOOD]	This signal is output when the measured value falls within the monitor range, or no determination is made.
[CAUTION] or [NG]	These signals are output when the measured value falls beyond the monitor range, or an error has occurred. You can select one output signal of Caution (CAUTION) signal and Trouble (NG) signal.

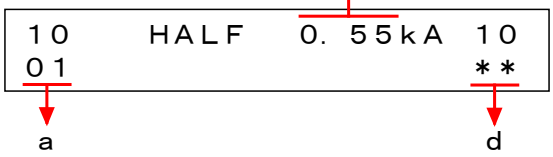
Screen of Multi-Cycle Welding



Screen of Single-Cycle Welding



Screen of Half-Cycle Welding



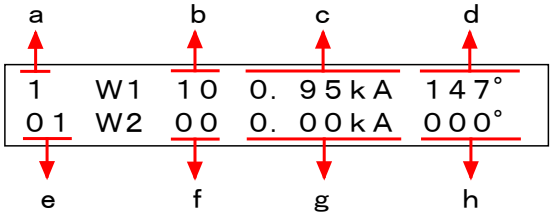
	Item		Setting Range/Display
a	Schedule Number (SCHEDULE NO.)		Indicates the number of the schedule used for the welding.
b	Monitored current	(CURR.1)	Average effective flowing current during W1 in multi-cycle welding
		(1ST)	Effective flowing current during the 1ST half-cycle in single-cycle welding
		(HALF)	Effective flowing current in half-cycle welding
c	Monitored current	(CURR.2)	Average effective flowing current during W2 in multi-cycle welding
		(2ND)	Effective flowing current during the 2ND half-cycle in single-cycle welding
d	Determination		GO: The measured value falls within the monitor range (the upper/lower limits in the determination range). NG: The measured value falls outside the monitor range (the upper/lower limits in the determination range). **: No determination is made.

Switching off power clears the monitored currents and the determination.
NB: Press any key to move to the welding schedule setting screen.

(8) Current Monitor Display Screen

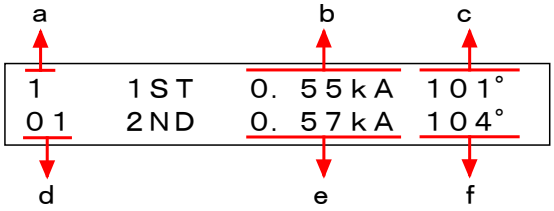
The current monitor display screen indicates the welding currents, the weld time and the conduction angle.
Press the [MENU] key to go to the current monitor display screen.
(Switching off power clears the monitored currents.)

① Multi-Cycle Welding



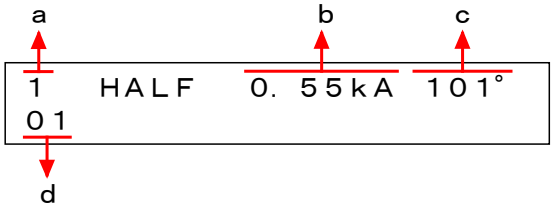
	Item	Setting Range/Display
a	Weld force number	Indicates the weld force number used for welding.
b	W1 weld time	Indicates the monitored weld time of W1.
c	W1 current	Indicates the average effective current during W1.
d	W1 conduction angle	Indicates the monitored average conduction angle of W1.
e	Schedule Number	Indicates the number of the schedule used for welding.
f	W2 weld time	Indicates the monitored weld time of W2.
g	W2 current	Indicates the average effective current during W2.
h	W2 conduction angle	Indicates the monitored average conduction angle of W2.

② Single-Cycle Welding



	Item	Setting Range/Display
a	Weld force number	Indicates the weld force number used for welding.
b	1ST current	Indicates the effective current in the 1ST half-cycle.
c	1ST conduction angle	Indicates the monitored conduction angle in the 1ST half-cycle.
d	Schedule Number	Indicates the number of the schedule used for welding.
e	2ND current	Indicates the effective current in the 2ND half-cycle.
f	2ND conduction angle	Indicates the monitored conduction angle in the 2ND half-cycle.

③ Half-Cycle Welding



	Item	Setting Range/Display
a	Weld force number	Indicates the weld force number used for welding.
b	HALF current	Indicates the effective current in the half-cycle.
c	HALF conduction angle	Indicates the monitored conduction angle in the half-cycle.
d	Schedule Number	Indicates the number of the schedule used for welding.

(9) Displaying and Resetting Total Count

The total count indicates the number of times welding performed.
The count is increased by one after welding is completed. The count is not increased in the event of an error.
However, regarding the following four faults, the way of counting is changed according to the output when the fault occurs (Trouble signal or Caution signal).
(See **12. Troubleshooting** for details of faults, and 9. (2) ④ for the output signal when the fault occurs.)

[E07 : FULL WAVE] or [E08 : STEP END]

The count is increased when the output is set to either Trouble signal (NG) or Caution signal (CAUTION).

[E05 : LOW CURRENT] or [E06 : HIGH CURRENT]

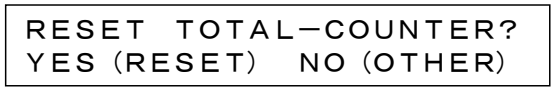
The count is increased when the output is set to Caution signal (CAUTION).

① Total Count Display Screen

The part indicated by an arrow is the present total count.

② How to Reset the Total Counter

Press the [RESET] key on the total count display screen to go to the reset screen as shown below.



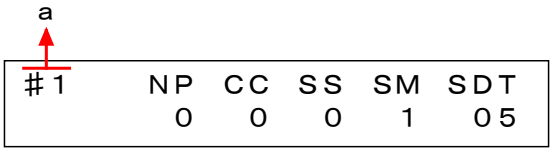
- To reset, press the [RESET] key on the reset screen.
  The completion message is displayed for 2 seconds, and then the display reverts to the total count display screen.
- To cancel a reset, press any key other than the [RESET] key. The display reverts to the total count display screen.

8. Stepper-Up Function

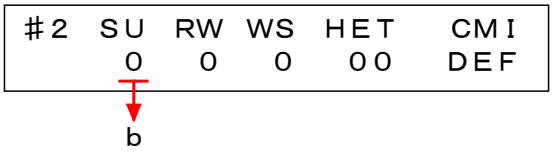
The stepper-up (-down) function lets you increase or decrease the welding current when the weld count reaches the set value.
Increasing the welding current automatically according to wear of the electrode can extend the life of the electrode. (Stepper-up)
Use this function for fusing in which the welding current must be reduced to accommodate increased temperatures within an electrode or workpieces. (Stepper-down)

(1) Turning on the Stepper-Up Function

① Press the [MENU] key and the [▷] key simultaneously for at least a second. This displays the SET2 screen shown below.



② Move the cursor to "a" above. Press the [+] key to go to the #2 screen.



③ Move the cursor to "b" above. Press the [+] key to change the setting to 1.

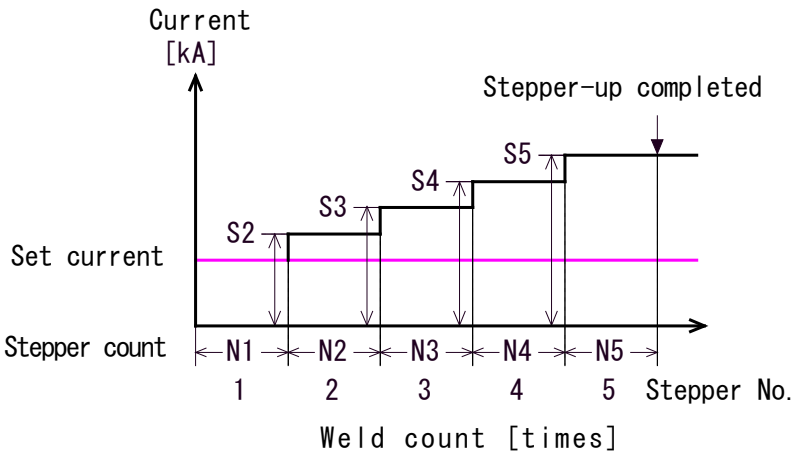
1	The stepper up function	ON
0	The stepper up function	OFF

④ Press the [MENU] key to return to the MENU screen.

(2) Stepper Count and Current Settings

The stepper-up (-down) function is performed when the weld count reaches the set value.

Stepper-Up Operation Chart

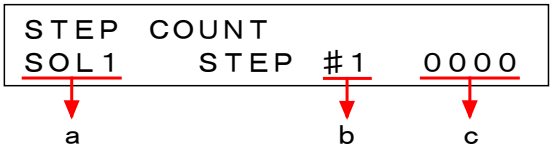


N1–5: Stepper count
S2–5: Stepper-up (-down) rate

ATTENTION
Check the Weld Force No. ([SOL]) before changing this setting.

Setting Stepper Count

① Press the [MENU] key to move to the Stepper Count Setting Screen.



② Press the [▷] key to move the cursor to "a" above and select the welding head from SOL1 and SOL2.

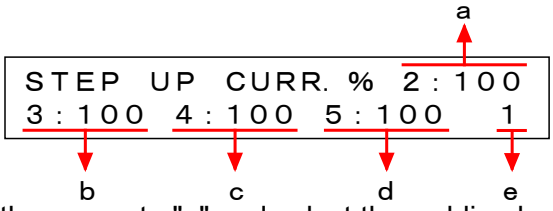
③ Move the cursor to "b" and select the stepper number.
There are 5 stepper numbers, #1 (stepper 1) to #5 (stepper 5).

④ Move the cursor to "c" and set the stepper counts (the weld counts) for each stepper number.
There are 5 stepper numbers, #1 (stepper 1) to #5 (stepper 5).

(3) Stepper-Up (-Down) Rate Setting

ATTENTION
Set the value of “the welding current x the stepper-up rate” so that it does not exceed the following value: • The set maximum current (6. (3)) in the secondary constant-current control • 99.9% in the power supply voltage fluctuation compensation control When the value over the maximum current is set, the fault code [E09: STEPUP RATE TROUBLE] is given at the input of the start signal. (For faults, see 12.)

① Press the [MENU] key to go to the Stepper-Up Rate Setting Screen.



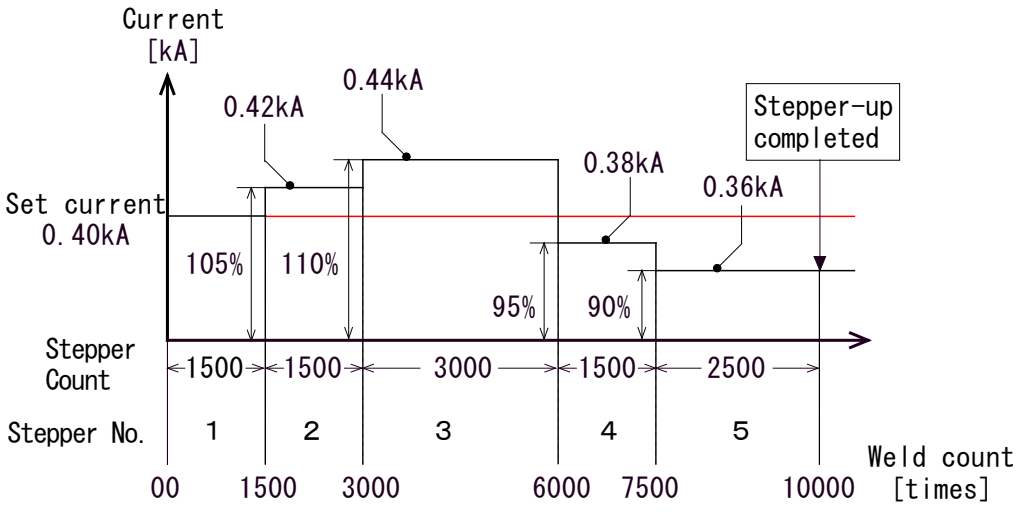
② Move the cursor to "e" and select the welding head from SOL1 and SOL2.

③ Move the cursor to "a"–"d" and set the stepper-up rates for steppers 2–5.
Set the rate in a percentage to the set value of the welding current expressed as 100% (See 7. (2)). Setting range is 50% to 150%.

a: Up rate for Stepper 2 b: Up rate for Stepper 3
c: Up rate for Stepper 4 d: Up rate for Stepper 5

<Setting Example>
Welding current: 0.40 kA

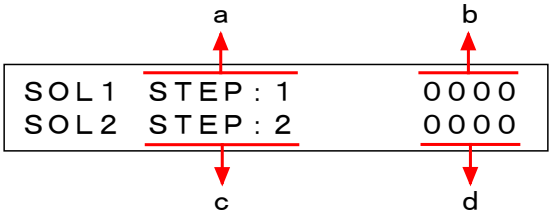
Stepper No.	Stepper-Up (-Down) Rate	Stepper Count
1	-	1500
2	105%	1500
3	110%	3000
4	95%	1500
5	90%	2500



(4) Checking the Stepper-Up Status

Use this screen to check the currently operating stepper number and the weld count for each weld force number (solenoid). (This is not a total count from stepper 1.)

① Press the [MENU] key to go to the Stepper-Up Status Display Screen.

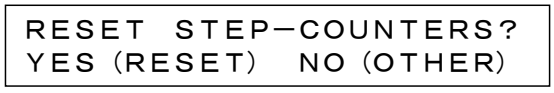


	Display
a	SOL1 stepper number
b	Weld count for the SOL1 stepper number shown at "a"
c	SOL2 stepper number
d	Weld count for the SOL2 stepper number shown at "c"

(5) Resetting the Stepper Count

Resetting the stepper counter returns the stepper number to "1" and the stepper counter to "0000" regardless of the current weld count.
(Both the weld force number 1 (SOL1) and 2 (SOL2) are reset.)

① On the stepper-up status display screen, press the [RESET] key to go to the reset screen.



② On the reset screen, press the [RESET] key to reset the stepper number and the weld count.
To cancel the reset, press any key other than the [RESET] key. The display reverts to the stepper-up status display screen.

③ If the reset is done properly, the completion message is displayed for 2 seconds before switching to the stepper-up status display screen.

9. Detail Settings (SET2 Screen)

Various functions of the **MEA-100B** can be set on the SET2 screen.
The **MEA-100B** is factory-set to a set of standard settings. For most applications, no editing of these settings is required.
If the settings need to be edited, read this chapter carefully before attempting to do so.

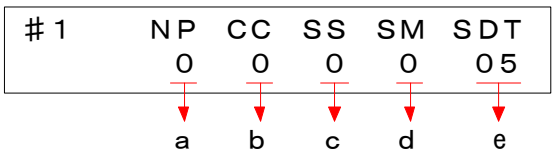
(1) Displaying the SET2 Screen

To display the SET2 screen, press the [MENU] key and the [▷] key simultaneously for at least a second.
There are 8 screens in the SET2 screen (#1 to #8).
Move the cursor to the number on the upper-right part of the screen and press the [+] or [-] key to select the screen number (#1 to #8).
To return to the MENU screen, press the [MENU] key.

(2) Settings on the SET2 Screen

Screen No.	Settings
#1	① Key lock ② Control method ③ Schedule number selection ④ Start signal input ⑤ Start stabilizing time
#2	① Stepper-up ② Re-weld ③ Weld skip ④ End signal output time ⑤ Current monitor neglecting cycle
#3	① No-current detecting level ② No-current neglecting cycle
#4–7	Fault signal attribute setting screen
#8	① Communication system ② Communication speed ③ Device number

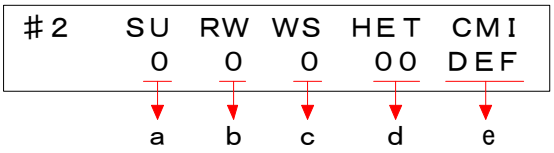
① #1 Screen



	Display	Function	Setting	Initial Setting
a	**NP**	Disables editing	0: Enables normal key operations 1: Disables setting or editing	0
b	**CC**	Selects a control method and welding current cycle	0: Secondary constant-current control + multi-cycle welding 1: Power supply voltage fluctuation compensation control + multi-cycle welding 2: Power supply voltage fluctuation compensation control + single-cycle welding 3: Power supply voltage fluctuation compensation control + half-cycle welding	0

	Display	Function	Setting	Initial Setting
c	**SS**	Selects a setting method of the schedule number	0: 31 schedules from the input terminal without parity 1: 31 schedules from the input terminal with parity 2: 5 schedules from the input terminal 3: 31 schedules from the panel	0
d	**SM**	Relation between the welding sequence and the start signal	0: Halts the welding sequence, if the start signal circuit is opened before HOLD. 1: Continues the welding sequence to completion, even if the start signal circuit is opened after WELD1 starts. 2: Continues the welding sequence to completion once the sequence has started, even if the start signal circuit is opened. 3: Performs the welding sequence in 2-stage start mode. (See 11. (2) ⑤.)	0
e	**SDT**	Sets the start stabilizing time at start signal	01: Sets the stabilizing time to 1 ms. 05: Sets the stabilizing time to 5 ms. 10: Sets the stabilizing time to 10 ms. 20: Sets the stabilizing time to 20 ms.	05

② #2 Screen



(WS and CMI are not indicated if single-cycle or half-cycle welding is selected.)

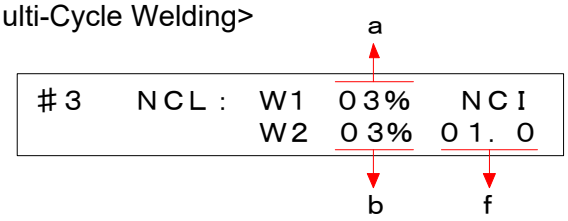
	Display	Function	Setting	Initial Setting
a	**SU**	Sets the Stepper-up function	0: Stepper-up function OFF 1: Stepper-up operation ON	0
b	**RW**	Sets re-welding at the low welding current or the no-current	0: No re-welding carried out. 1: Performs re-welding.	0
c	**WS**	Determines how the **MEA-100B** functions when the WELD SKIP signal is input (*)	0: Skips to the next sequence. (Skips to COOL (CO) if WELD1 (W1) is underway.) 1: Skips to HOLD (HLD).	0
d	**HET**	Sets the End signal output time	00: [When the Start signal is input] Until the START input circuit is opened, with a minimum of 10 ms. [When the Start signal is not input] 10 ms 01: 10 ms 20: 200 ms	00

	Display	Function	Setting	Initial Setting
e	**CMI**	Sets the Current monitor cycle (Ignores downslopes regardless of the setting)	DEF: Ignores errors in the first 1.0 cycle and upslopes. 00.0: Detects errors from the start in all cycles. 00.5: Ignores errors in the first half-cycle. 01.0: Ignores errors in the first full cycle. ↓ (The setting can be changed every half-cycle.) 10.0: Ignores errors in the first 10.0 cycles.	DEF

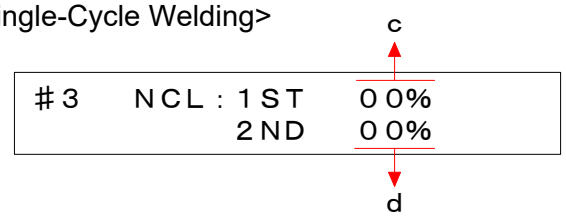
(*) Skips to the next sequence at the time of the WELD SKIP signal is turned from on to off in the sequence. If the WELD SKIP signal is turned off, it does not skip to the next sequence.

③ #3 Screen
This screen indicates different data according to the welding and control methods selected.

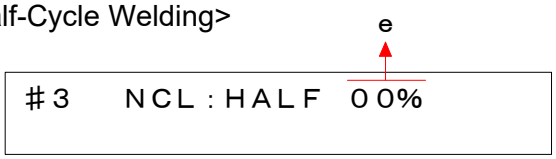
<Screen for Multi-Cycle Welding>



<Screen for Single-Cycle Welding>



<Screen for Half-Cycle Welding>



	Display	Function	Operation	Initial Setting
a	**(*2) NCL W1**	Sets the no-current detecting level for W1	00%: Ignores no-current. 01%–10%: Set as a percentage of the maximum current.	(*1) 03/00
b	**(*2) NCL W2**	Sets the no-current detecting level for W2	00%: Ignores no-current. 01%–10%: Set as a percentage of the maximum current.	(*1) 03/00
c	**NCL 1ST**	Sets the no-current detecting level for 1ST	00%: Ignores no-current. 01%–10%: Set as a percentage of the maximum current.	00
d	**NCL 2ND**	Sets the no-current detecting level for 2ND	00%: Ignores no-current. 01%–10%: Set as a percentage of the maximum current.	00
e	**NCL HALF**	Sets the no-current detecting level for HALF	00%: Ignores no-current. 01%–10%: Set as a percentage of the maximum current.	00
f	**(*2) NCI**	Sets the no-current neglecting cycle	00.0: Detects the no-current in all cycles. 00.5: Ignores the no-current in the first half-cycle. 01.0: Ignores the no-current in the first full cycle. ↓ (The setting is changeable every half-cycle.) 10.0: Ignores the no-current in the first 10.0 cycles.	01.0

(*1) The settings of NCL W1 and W2 are different depending on the selected control, the secondary constant-current control and the power supply voltage fluctuation compensation control. Change the setting of CC in #1 screen to set them for each method of control. The factory settings on shipment are as follows:

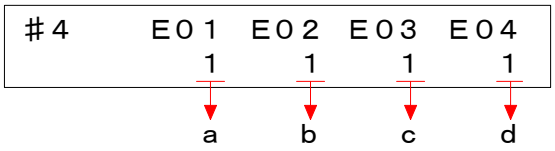
The secondary constant-current control: 03
The power supply voltage fluctuation compensation control: 00

(*2) When the secondary constant-current control is used, check that the toroidal coil is set properly.
If the toroidal coil is broken or missing, the current is not detected even if it flows actually, therefore the **MEA-100B** tries to flow large current forcedly. As the result, the welding machine is overloaded and may be damaged.

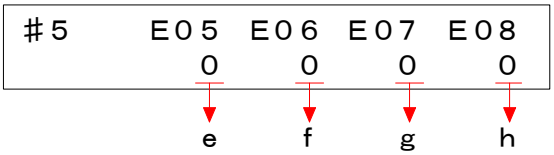
④ #4–#7 Screens

Select a signal output when the fault occurs from three signals, Trouble signal, Caution signal and No Trouble-Caution signal.
Welding does not start at Trouble signal output even if the start signal is input.
The next welding starts at Caution signal output when the start signal is input.
The next welding starts at No Trouble-Caution signal output when the start signal is input; however, any signal is not output even when fault occurs.

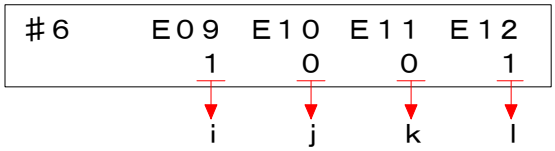
<#4 Screen>



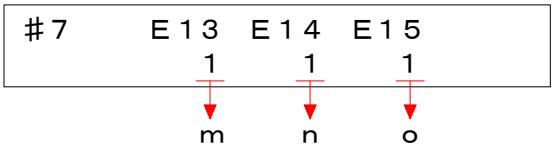
<#5 Screen>



<#6 Screen>



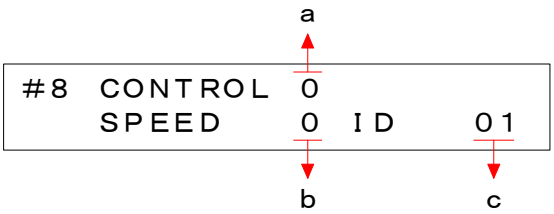
<#7 Screen>



	Fault Code	Display and Description	Setting	Definition	Initial Setting
a	**E01**	CONTROLLER FAULT Controls trouble	1	Trouble (not changeable)	1
b	**E02**	START PARITY Result of start parity check is even.	0 1	Caution Trouble	1
c	**E03**	SCR OVERHEATING Thyristor overheating	1	Trouble (not changeable)	1
d	**E04**	NO CURRENT Welding current is not detected. (No current)	0 1	Caution Trouble	1
e	**E05**	LOW CURRENT Welding current is below monitor lower limit.	0 1	Caution Trouble	0
f	**E06**	HIGH CURRENT Welding current is beyond monitor upper limit.	0 1	Caution Trouble	0
g	**E07**	FULL WAVE Conduction angle exceeds 175° (Fullwave)	0 1 2	Caution Trouble No Trouble-Caution	0
h	**E08**	STEP END Stepper-up completed	0 1	Caution Trouble	0

	Fault Code	Display and Description	Setting	Definition	Initial Setting
i	**E09**	STEPUP RATE TROUBLE Stepper-up rate error	1	Trouble (not changeable)	1
j	**E10**	COUNT MEMORY ERROR Count data stored in memory damaged	0 1	Caution Trouble	0
k	**E11**	CYCLE TROUBLE Start signal is turned off in welding and then sequence is interrupted. (Weld cycle trouble)	0 1	Caution Trouble	0
l	**E12**	SCR SHORT Thyristor damaged	1	Trouble (not changeable)	1
m	**E13**	MEMORY TROUBLE Error is detected during self-diagnostics.	1	Trouble (not changeable)	1
n	**E14**	CURRENT SETTING ERR Set current exceeds the maximum current.	1	Trouble (not changeable)	1
o	**E15**	WELD ABORT Weld halted	1	Trouble (not changeable)	1

⑤ #8 Screen



	Display	Function	Setting	Initial Setting
a	**CONTROL**	Communication mode	0: No communication 1: Communication in one-way communication (storing data in the SRAM) (*) 2: Communication in two-way communication (storing data in the flash memory) (*)	0
b	**SPEED**	Communication speed	0: Communication at 9600 bps 1: Communication at 19200 bps 2: Communication at 38400 bps	0
c	**ID**	Device number	Sets the device number. The setting range is 01 to 31.	01

(*)
There are two ways to change schedules with the RS-485 bi-directional communication.
- Storing data in the SRAM (The CONTROL setting is 2.)
- Storing data in the flash memory (The CONTROL setting is 3.)

The rewriting limit in the flash memory of the **MEA-100B** is 30,000 times. To rewrite schedules frequently in the bi-directional communication, set CONTROL to 2. If the rewriting limit is exceeded, data may not be stored normally.
For storage in the SRAM, there is no rewriting limit, but if two weeks or more passes after the **MEA-100B** is powered off, data in the memory may be lost. Therefore, the schedule data at the time of restarting up after power off is always the data stored in the flash memory even if CONTROL is set to 2. Note that the data is different from the data written with the bi-directional communication.
When storing data in the SRAM with the bi-directional communication, be sure to use the schedule data after sending it at the time of power on.
When schedules are set from the panel, data is written and stored in the flash memory even if CONTROL is set to 2. (See **7. (2) Writing in the Flash Memory**.)

10. Interface

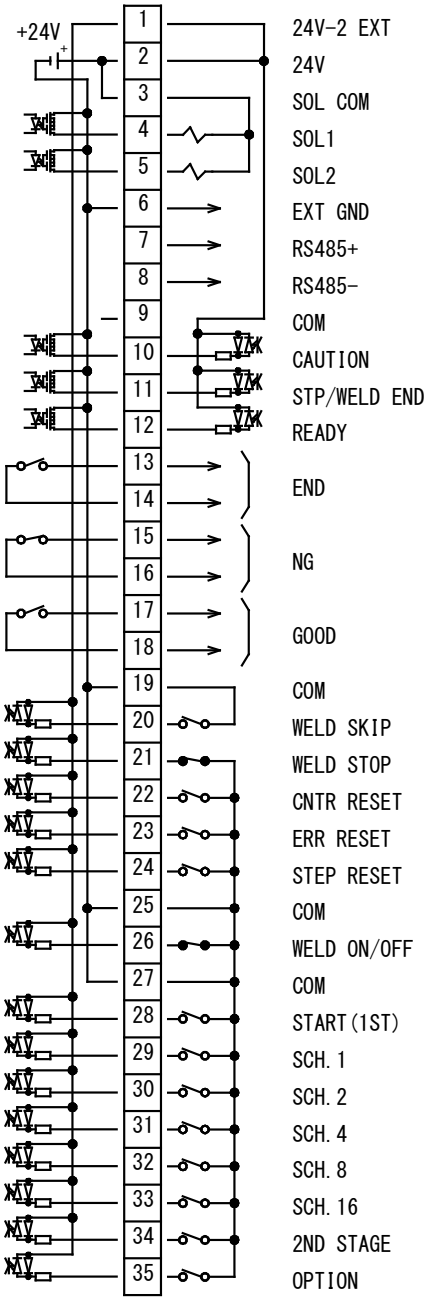
Input and output signals are through the I/O terminal strip on the rear panel.

(1) Connection of External I/O Signals

Also see (B) and (C) in **13. (3) Model No.-Spec Reference Table**.
Shown below are the connections when [SOL1], [SOL2], [CAUTION], [STP/WELD END], and [READY] are photo-MOS relay outputs.

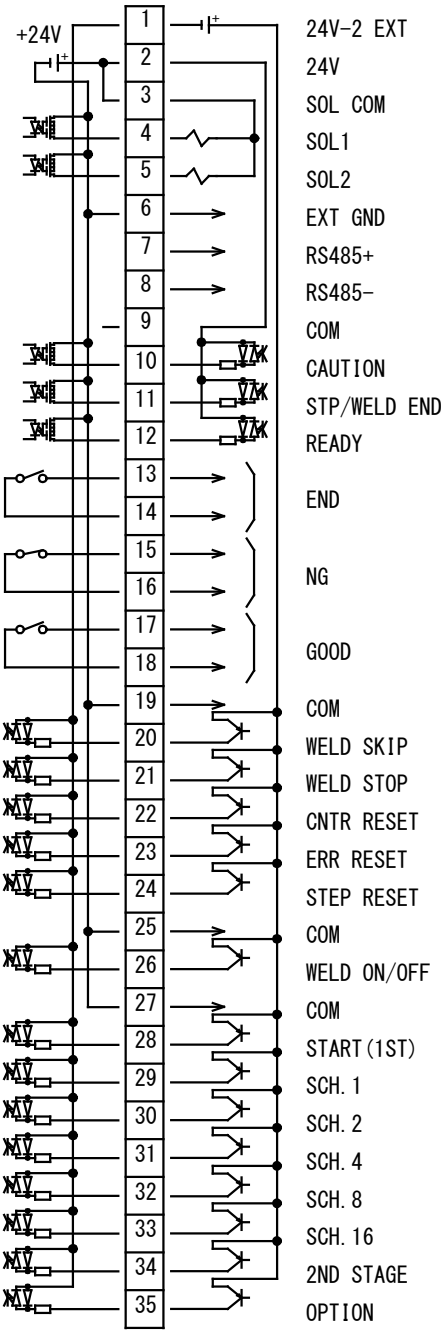
① When external I/O are contacts

I/O terminal strip



② When external I/O are PNP transistors (It is the way in which the voltage is output.)

I/O terminal strip



(2) Explanation on the External I/O Terminals

Terminal No.	Description
1 [24V-2 EXT]	• If the **MEA-100B** is connected to a contact or NPN open collector output-type device (when using the built-in power supply), connect this terminal to terminal 2. • If the **MEA-100B** is connected to a NPN open collector output (when using an external power supply) or PNP current output-type device, connect this terminal to a 24 V DC external power supply.
2 [24V]	The output terminal for 24 V DC power generated in the **MEA-100B**. Before shipment, this terminal is connected with a jumper wire to terminal 1. This power supply is for external input signals only. Do not use for any other purpose.
3 [SOL COM] *	• Photo-MOS relay output: Common terminal of power supply for solenoid. Outputs 24 V DC power. • Relay output: Common terminal of contact output for solenoid
4 [SOL1] *	Output terminal for Weld Force 1. • Photo-MOS relay output: 24 V DC, 0.1 A • Relay output: 24 V DC, or 250 V AC or less, 0.5 A
5 [SOL2] *	Output terminal for Weld Force 2. • Photo-MOS relay output: 24 V DC, 0.1A • Relay output: 24 V DC, or 250 V AC or less, 0.5 A
6 [EXT GND]	Terminal for EXT GND. Connect this terminal to the shielded wire of the RS-485 signal cable.
7 [RS485+] 8 [RS485-]	Terminals for RS485+ and RS485-. Connect this terminal to the RS-485 signal cable.
9 [COM] *	Common terminals when using the Photo-MOS relay output with the external power supply.
10 [CAUTION] *	Output terminal for [CAUTION] signal. When a "caution" fault occurs, this circuit is closed. (Preset the fault signal attribute so that the caution signal can be output when the fault occurs. For details, see 9. (2) ④.) The circuit is opened when [ERR RESET] is closed. • Photo-MOS relay output: 24 V DC, 0.1 A
11 [STP/WELD END] *	Output terminal for Step End [STP END] and Weld End [WELD END] signals • The Stepper-up function is ON (SU:1) Stepper-up end signal is output The circuit is closed upon completion of the stepper-up operation. • The Stepper-up function is OFF (SU:0) Welding end signal is output The circuit is closed upon completion of welding within a welding sequence. Note: For timing details, see **11. Timing Chart**. • Photo-MOS relay output: 24 V DC, 0.1 A
12 [READY] *	Output terminal for [READY] signal. The circuit is closed when the **MEA-100B** is ready for welding. The READY signal is turned off until transmission of the confirmation data is completed after data is received in the bi-directional communication. (See 14. (7).) • Photo-MOS relay output: 24 V DC, 0.1 A

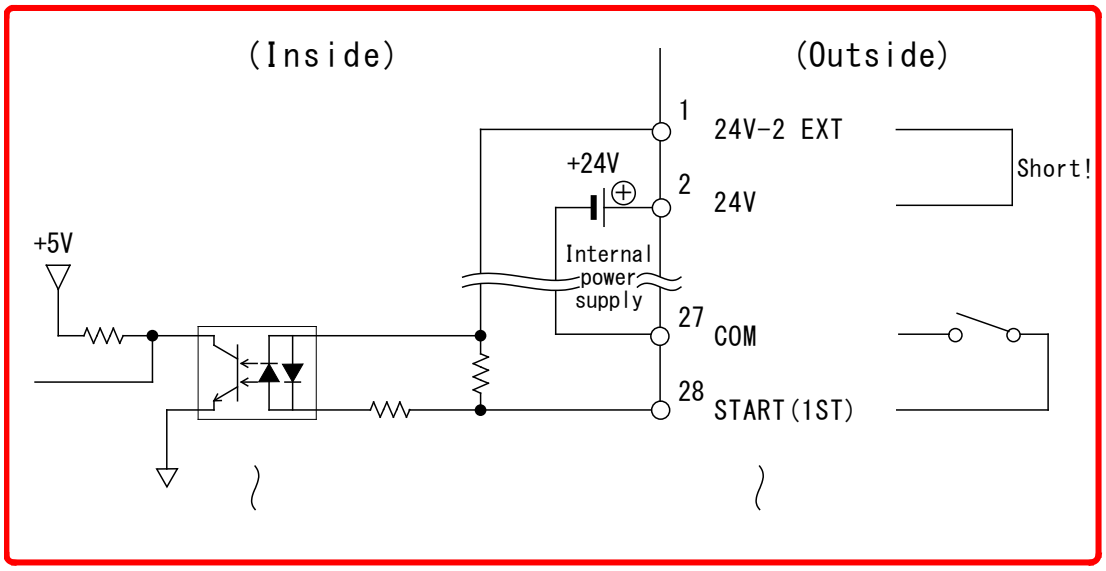
* See (B) and (C) in **13. (3) Model No.-Spec Reference Table**.

Terminal No.	Description
13-14 [END]	Output terminal for End [END] signal. The signal is output upon completion of the welding sequence. Note: For timing details, see **11. Timing Chart**. • Relay contact output: 24 V DC, or 250 V AC or less, 0.5 A
15-16 [NG]	Output terminal for trouble [NG] signal. The circuit is opened when a trouble occurs. (Preset the fault signal attribute so that the trouble signal can be output when the fault occurs. For details, see 9. (2) ④.) The circuit is closed when [ERR RESET] is input. Note: When the power supply of the **MEA-100B** is off, the circuit is opened. • Relay contact output: 24 V DC, or 250 V AC or less, 0.5 A
17-18 [GOOD]	Output terminal for Normal End [GOOD] signal. The circuit is closed if the current falls within the monitor range, or if the current monitor function is not used after the welding sequence has been completed. • Relay contact output: 24 V DC, or 250 V AC or less, 0.5 A
19 [COM]	Common terminal for input.
20 [WELD SKIP]	Input terminal for [WELD SKIP] signal. If this circuit is closed, the stage within the welding sequence are skipped. The specific operation depends on the weld skip (WS) setting, as shown below: • WS: 0 → Skips to the next stage of the sequence. (If WELD1 is underway, skips to COOL. If WELD2 is underway, skips to HOLD.) • WS: 1 → Skips to HOLD.
21 [WELD STOP]	Input terminal for [STOP] signal. If this circuit is opened, the welding sequence including the welding operation is immediately halted. [E15: WELD ABORT] is given if the circuit is open during welding or when the start signal is input. (See **12. Troubleshooting**.)
22 [CNTR RESET]	Input terminal for Counter Reset [CNTR RESET] signal. If this circuit is closed, the total count is reset.
23 [ERR RESET]	Input terminal for trouble reset [ERR RESET] signal. Closing this circuit clears [NG] and [CAUTION] outputs. Note that the outputs are cleared only if the cause of the original fault has been rectified.
24 [STEP RESET]	Input terminal for [STEP RESET] signal. Closing this circuit resets the stepper number and the stepper count.
25 [COM]	Common terminal for input signals.
26 [WELD ON/OFF]	Input terminal for [WELD ON/OFF] signal. Opened → WELD OFF (Shuts off the welding current.) Closed → WELD ON (Flows the welding current.) For the welding current to flow, the [WELD] key on the front panel must also be ON.

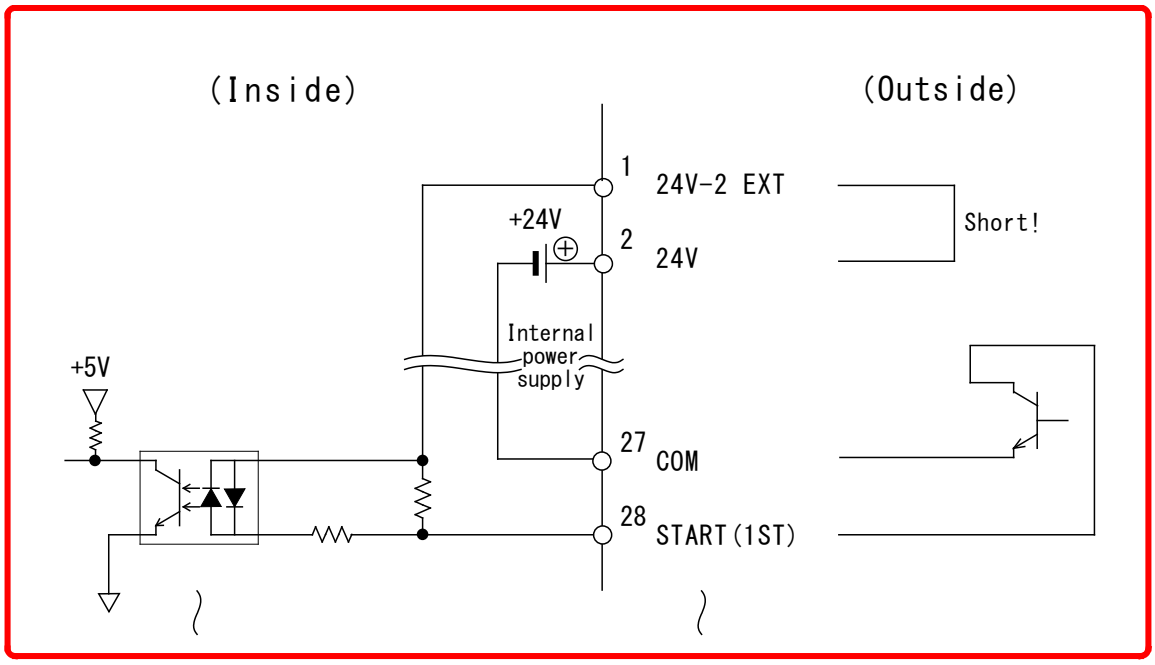
<table>
<tr><th>Terminal No.</th><th>Description</th></tr>
<tr><td>27
[COM]</td><td>Common terminal for input signals.</td></tr>
<tr><td>28
[START
(1ST)]</td><td>Input terminal for [START] signal and 1ST STAGE signal.
This circuit must be closed to supply a welding current in [READY] mode.
The specific operation depends on [SM] setting of the #1 screen in the SET2 screen, as shown below (See 9. (2) ①):
• SM: 0–2 → Welding starts upon confirmation of input of the start signal.
• SM: 3 → The 2-stage start mode is selected. When the 1ST STAGE signal is input, the Weld Force signal is output. Welding begins on input of the 2ND STAGE signal.
Note: For timing details, see 11. Timing Chart.</td></tr>
<tr><td>29 [SCH.1]
30 [SCH.2]
31 [SCH.4]
32 [SCH.8]
33 [SCH.16]</td><td>Input terminal for [SCH] signal.
The specific operation depends on [SS] setting of the #1 screen in the SET2 screen, as shown below. (For [SCH] signal, see 7. (4).)
• SS: 0–1 → Sum of the SCH numbers corresponding to the closed terminals is taken as the selected schedule number.
• SS: 2 → The SCH number corresponding to the closed terminals is taken as the selected schedule number.
• SS: 3 → The schedule numbers are set using keys on the panel. These terminals are disabled.
Note: For timing details, see 11. Timing Chart.
Note: Schedule 1 is selected if no external schedule signals are input.</td></tr>
<tr><td>34
[2ND
STAGE]</td><td>Input terminal for 2ND STAGE and parity signals.
The specific operation depends on the start mode setting (SM) and the start bit setting [SS], as shown below (See 9. (2) ①):
<table>
<tr><th>SM</th><th>SS</th><th>Settings</th></tr>
<tr><td>3</td><td>0, 2, 3</td><td>The 2-stage start mode is selected. When the 1ST STAGE signal is input, the solenoid is output. Welding begins on input of the 2ND STAGE signal.</td></tr>
<tr><td>0–2</td><td>1</td><td>The parity check mode is selected. Welding is initiated by a binary number with odd parity check (See 7. (4)).</td></tr>
</table>
Note: For timing details, see 11. Timing Chart.</td></tr>
<tr><td>35
[OPTION]</td><td>Extension terminal
Do not connect to this terminal.</td></tr>
</table>

(3) Connection of Input Signals

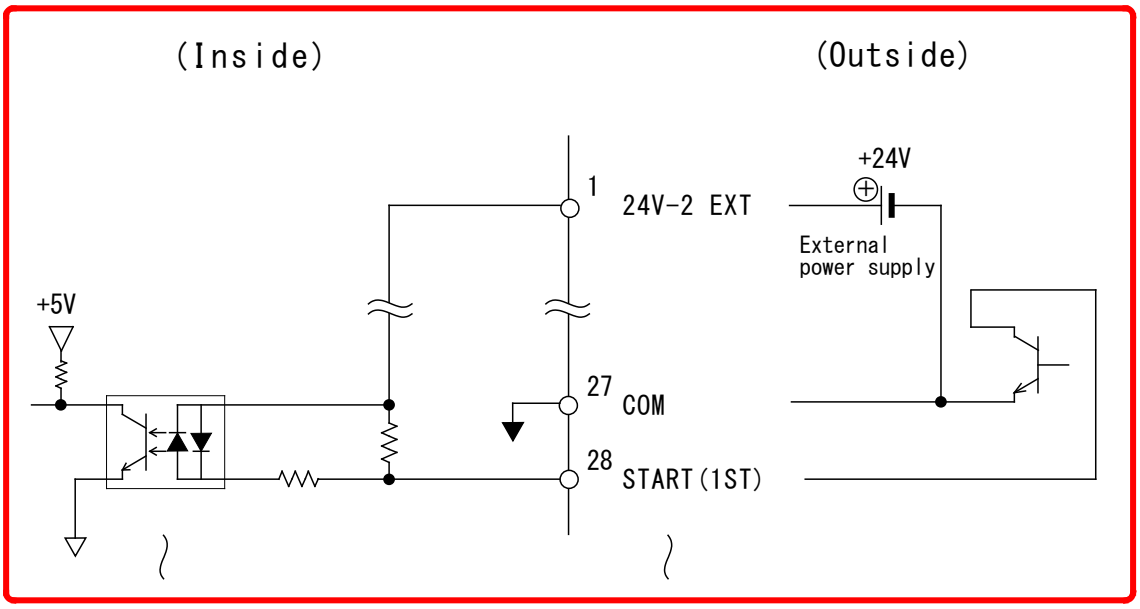
① Connection to Contact Input Device
Use a jumper wire to connect terminals 1 and 2.



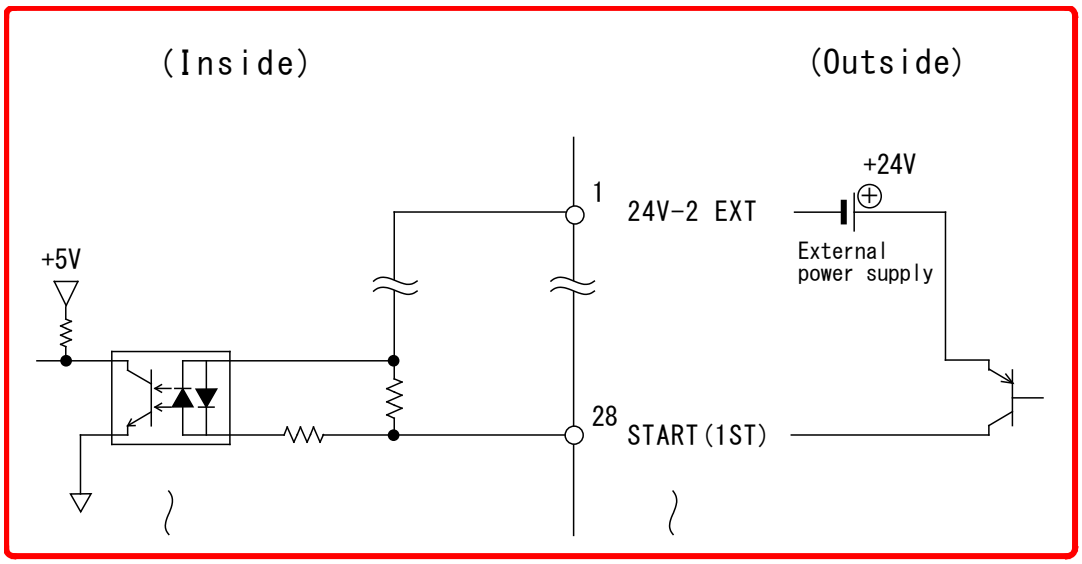
② Connection to NPN Open Collector Output Device (when using the internal power supply)
To use the internal +24 V power supply, connect terminals 1 and 2 with a jumper wire.



③ Connection to NPN Open Collector Output Device (when using the external power supply)
Connect terminal 1 to the "+" terminal of the external 24 V DC power supply.



④ Connection to PNP Current Output Type Device
Connect terminal 1 to the "-" terminal of the external 24 V DC power supply.

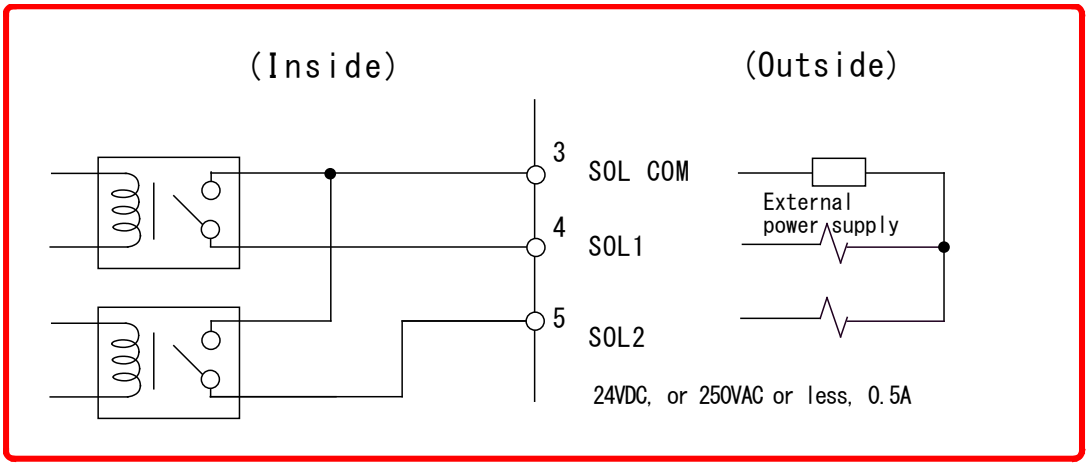


(4) Connection of Output Signals

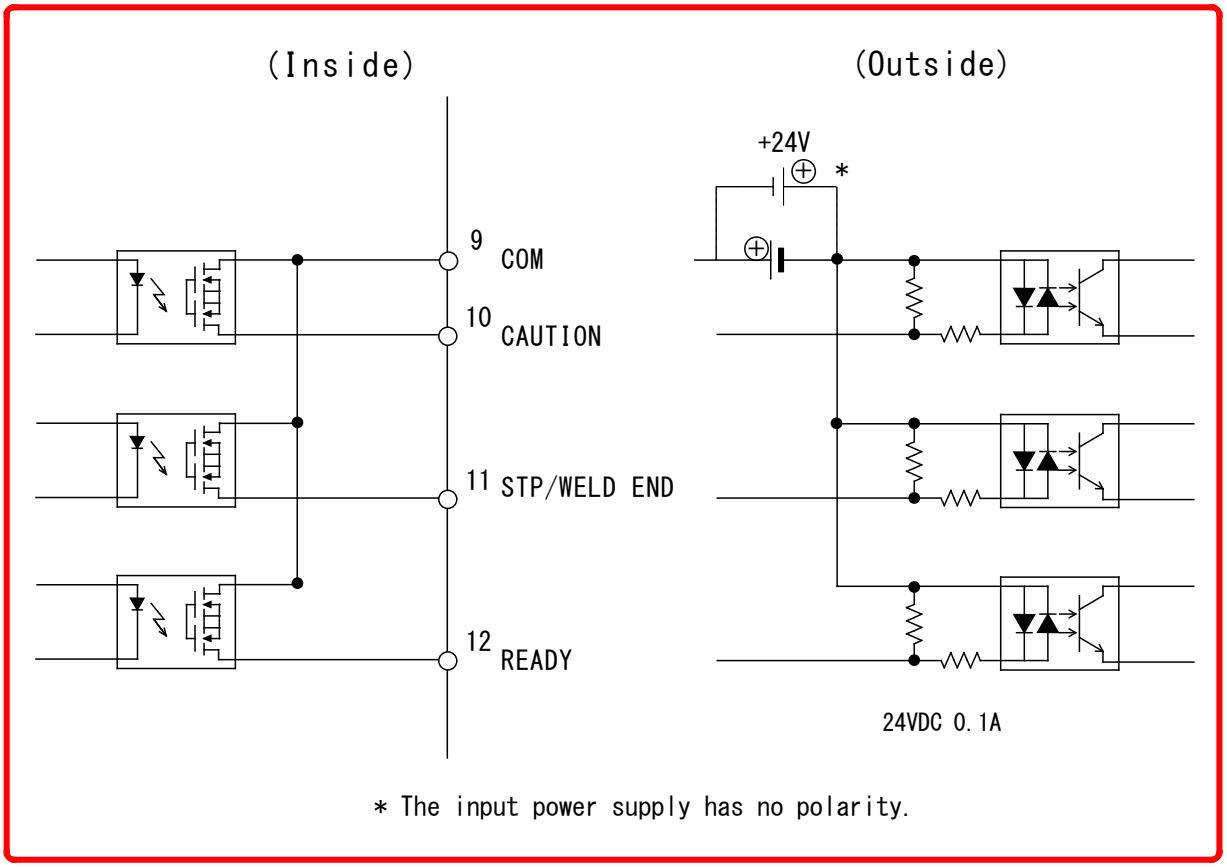
Make connections as follows when (B) is Relay output and (C) is External power supply in **13. (3) Model No.-Spec Reference Table**.

① Connection of SOL1 and SOL2

[Relay Output]

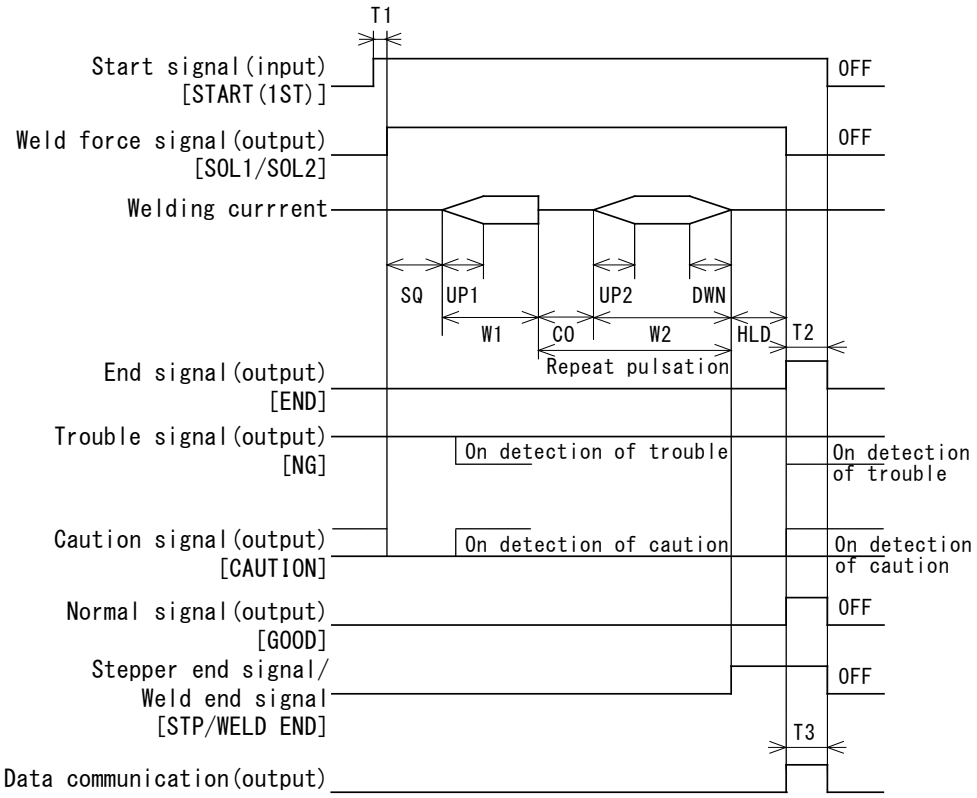


② Connection of CAUTION, STP/WELD END, and READY with the external power supply



11. Timing Chart

(1) Basic Weld Cycle Timing Chart



SQ: Squeeze	UP1: Upslope 1	W1: Weld 1	CO: Cool
UP2: Upslope 2	W2: Weld 2	DWN: Downslope	HLD: Hold

T1: Time required to start weld force after input of the start signal
The maximum setting is the synchronizing time 30 ms (50 Hz) or 25 ms (60 Hz) + start stabilizing time (SDT).

Example
When the start stabilizing time is set to 1ms (SDT: 01), with a commercial frequency of 50 Hz, the maximum T1 will be as follows: 30 ms + 1 ms = 31 ms max.

T2: Depends on the setting of End signal output time (For the setting of HET, see 9. (2) ②).

00	If the duration of the start signal is more than 10 ms, Hold End signal is output until the start signal circuit is opened. If the start signal is less than 10 ms or not input, then Hold End signal is output for 10 ms.
01	Output for 10 ms whether or not the start signal circuit is open.
20	Output for 200 ms whether or not the start signal circuit is open.

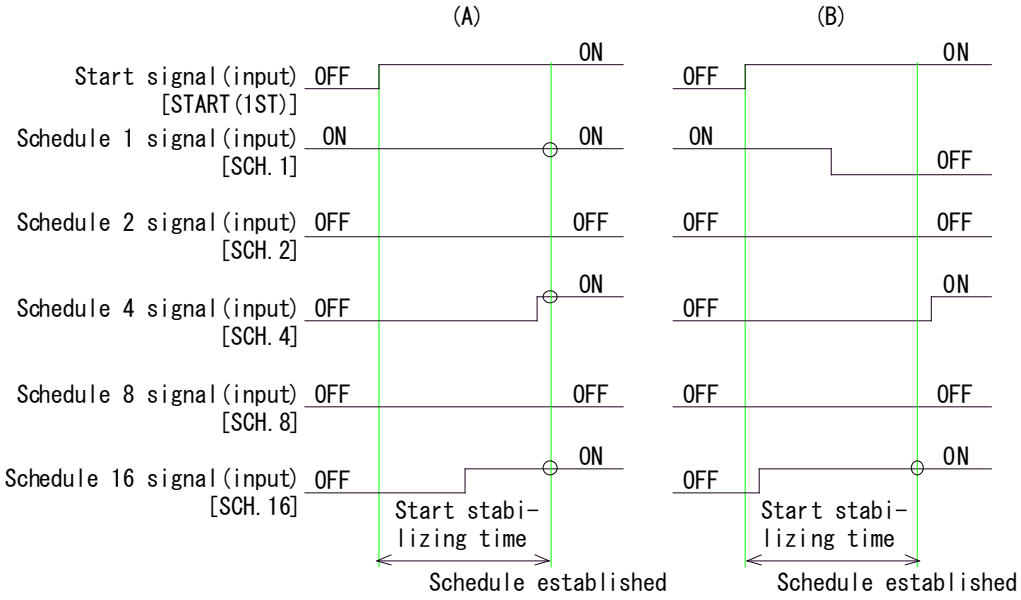
Note: The Weld End signal is output when the stepper-up function (SU) is not used. (For the setting of SU, see 9. (2) ②.)

T3: Depends on the communication setting (For the setting of COM, see 9. (2) ⑤).

0	Without communication	-
1	With communication (9600 bps)	At normal: 68 ms max. At trouble/caution: 80 ms max.
2	With communication (19200 bps)	At normal: 34 ms max. At trouble/caution: 40 ms max.
3	With communication (38400 bps)	At normal: 17 ms max. At trouble/caution: 20 ms max.

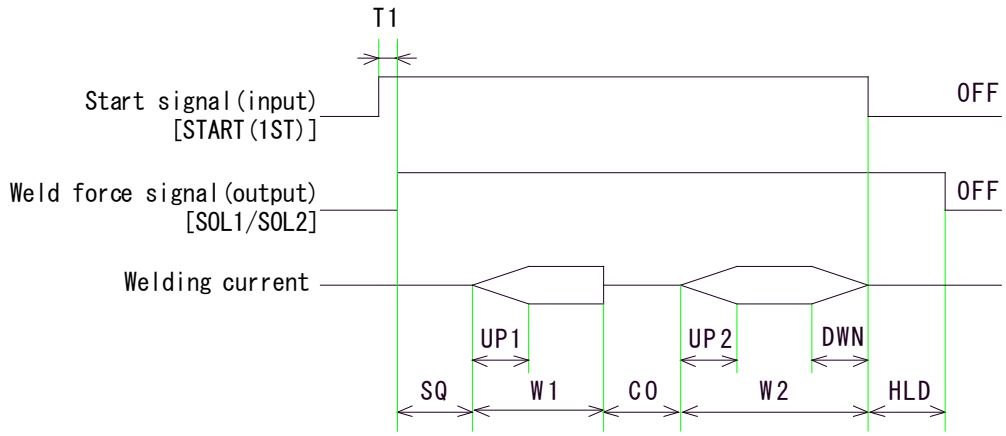
(2) Start Signal Timing Chart

① Establishing a Welding Schedule
The welding schedule is established when the start signal is input and the start stabilizing time (SDT) has elapsed. For information on making settings, see 9. (2) ①.



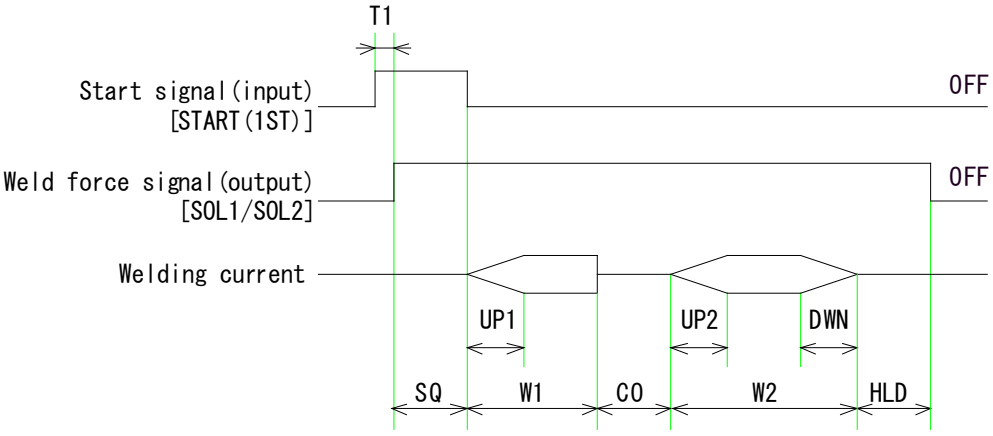
In the case of (A) above; since schedule 1, 4 and 16 are ON, welding is performed using set data of schedule 21.
In the case of (B); since only schedule 16 is ON, welding is performed using set data of schedule 16. Schedule 1 and schedule 4 are not included, since they are OFF when the schedule is established.

② SM on the SET2 screen is set to 0 (For the setting of SM, see 9. (2) ①)
The welding sequence is halted if input of the start signal is stopped during SQ.
The welding sequence is halted and [E11: CYCLE TROUBLE] is given if input of the start signal is stopped between W1 and W2 of the welding sequence. (For the fault code, see **12. Troubleshooting**.)
The welding sequence will continue to the end during HLD, even if input of the start signal is stopped.



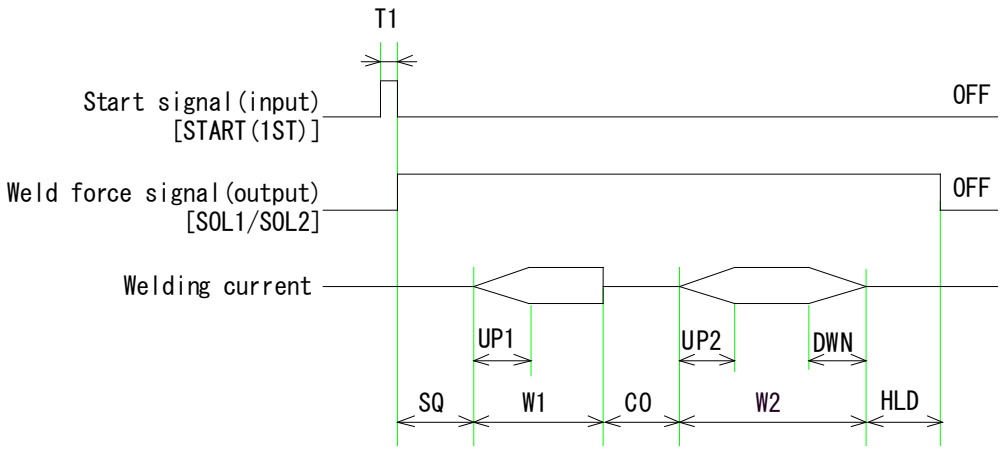
T1: Time required to start weld force after input of the start signal

③ SM on the SET2 screen is set to 1 (For the setting of SM, see 9. (2) ①)
The welding sequence runs to completion, even if input of the start signal is stopped after starting W1.



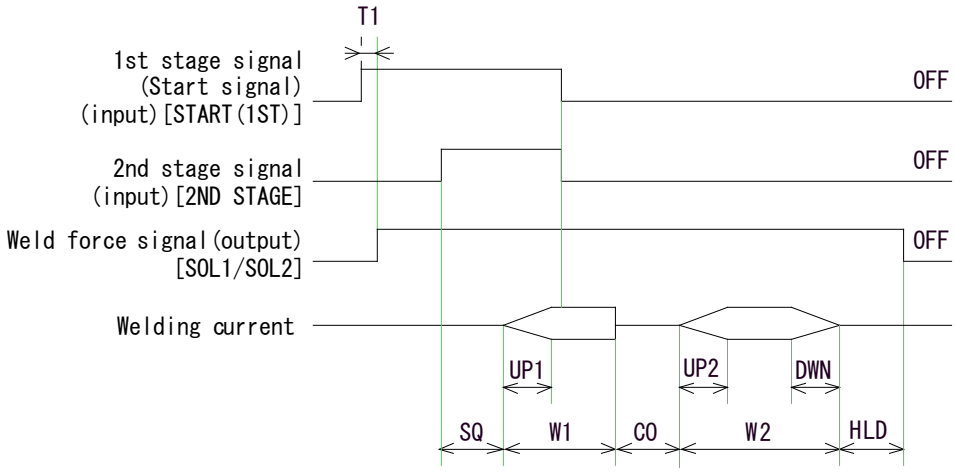
T1: Time required to start weld force after input of the start signal

④ SM on the SET2 screen is set to 2 (For the setting of SM, see 9. (2) ①)
Once the start signal is accepted, the welding sequence runs until completion, even if input of the start signal is stopped.



T1: Time required to start weld force after input of the start signal

⑤ SM on the SET2 screen is set to 3 (2-stage start)
(For the setting of SM, see 9. (2) ①)
The welding sequence is performed in 2-stage start mode.
The Weld Force signal is output when the 1st stage signal is input. Welding begins when the 2nd stage signal is input.
The welding sequence runs to completion, even if input of the start signal is stopped after starting W1.



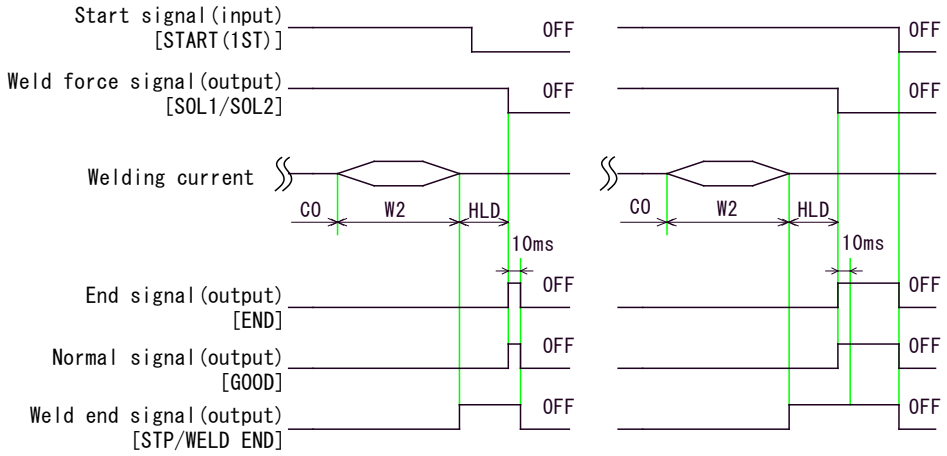
T1: Time required to start weld force after input of the 1st stage signal

(3) End, Normal End and Weld End Signals Timing Chart

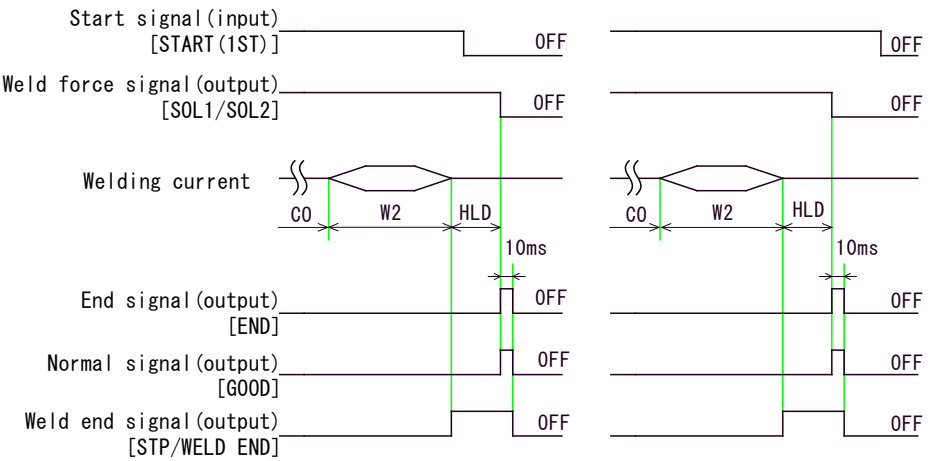
The output time for End, Normal and Weld End signals depends on the setting for the End signal output time (HET).

End signal	Outputs upon completion of the welding sequence. The output time is the time set for HET (See 9. (2) ②).
Normal signal	Outputs upon completion of the welding sequence when the result of the upper-lower limit judgment of the monitor function is normal, or no judgment is made. The output time is the same as that of End signal.
Weld End signal	Outputs when the stepper-up function is not used. Output until the End circuit is opened after completion of welding. Note: When only WELD1 is performed, this is output after completion of WELD1.

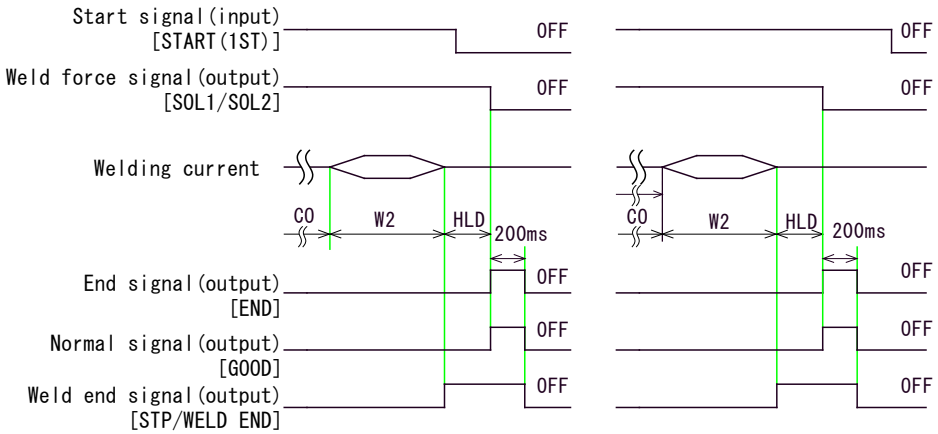
① End Signal Output Time (HET) is set to 00
Output for 10 ms or until start signal is turned off, depending on whether the start signal circuit is opened or closed. It continues to be output as long as the start signal circuit is closed.



② End Signal Output Time (HET) is set to 01
Output for 10 ms whether or not the start signal circuit is open.

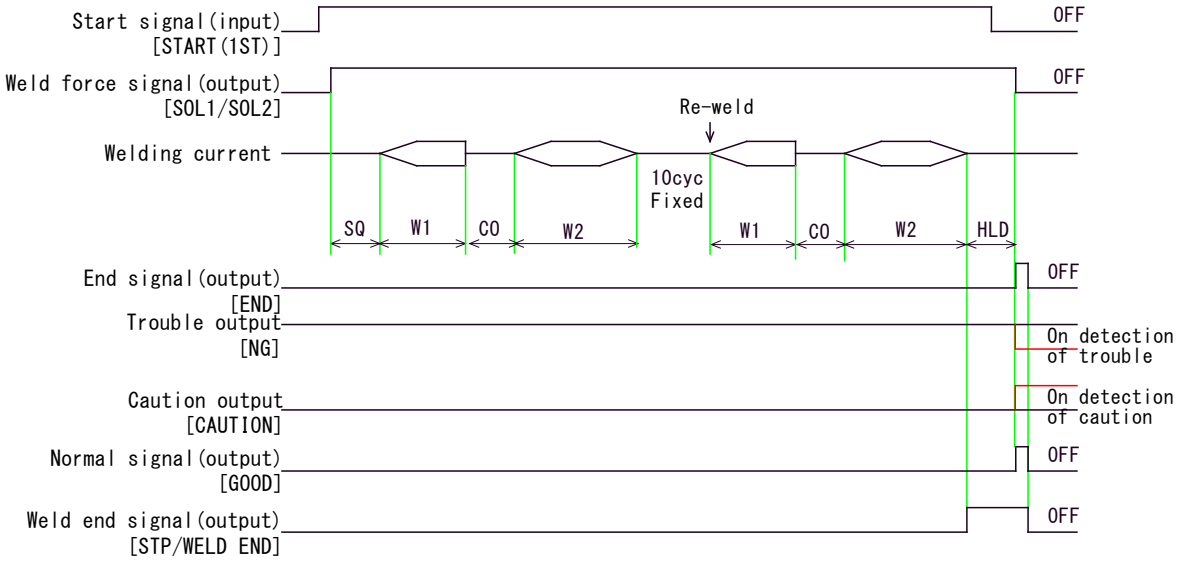


③ End Signal Output Time (HET) is set to 20
Output for 200 ms whether or not the start signal circuit is open.



(4) Re-Weld Timing Chart

When RW is set to 1 (re-weld) on the #2 screen of the SET2 screen, the re-weld is performed when [E04: NO CURRENT] or [E05: LOW CURRENT] is detected. (See **12. Troubleshooting**.)
The time to start re-weld is 10 cycles (fixed).

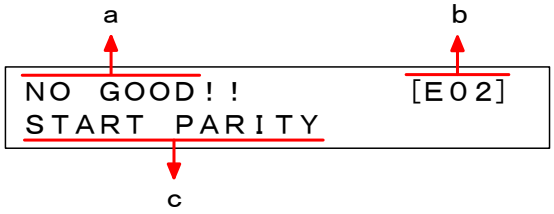


- The current for the re-weld is 5% higher than the set current.
- During the re-weld, only the lower limit judgment is performed.

12. Troubleshooting

If a fault occurs, the LCD panel displays a message and the trouble or caution signal is output.
To clear the outputs, rectify the cause of fault and then input the trouble reset signal (close [ERR RESET]) or press the [RESET] key on the front panel.

Trouble/Caution Screen



	Message
a	In the case of "trouble" faults, **NO GOOD** is displayed. In the event of "caution" faults, **CAUTION** is displayed.
b	The fault code is displayed. (E01–E15)
c	The "trouble" or "caution" name is displayed.

Welding does not start when trouble signal is output, even if the start signal is input.
The next welding starts when the caution signal is output, if the start signal is input.

① E01

Message	CONTROLLER FAULT [C]
Time of detection	Any time during operation
Cause of fault	The letter in [ ] at the end of the message indicates the cause of fault. • "C" is displayed when the **MEA-100B** fails to monitor the frequency of the welding power supply. • A letter other than "C" is displayed when the CPU malfunctions.
Measures	Input the error reset signal. If the fault occurs repeatedly, the welding power supply may be unstable or the **MEA-100B** has some problem. Contact us or your distributor for inspection of the welding power supply and repairs.
Output signal	Outputs the trouble [NG] signal when the fault occurs.

② E02

Message	START PARITY
Time of detection	When the start signal is accepted.
Cause of fault	The number of schedule signals (including the parity signals) is even.
Measures	Set the schedule signals and the parity signals for odd parity check. (See 7. (4).)
Output signal	Outputs the trouble [NG] signal or the caution [CAUTION] signal when the error arises.

③ E03

Message	SCR OVERHEATING
Time of detection	Any time except during the welding sequence.
Cause of fault	The **MEA-100B** is overheated.
Measures	① Switch off the **MEA-100B** and leave it to stand to let it cool down. ② If the **MEA-100B** has cooled down, turn on [ERR RESET]. ③ The duty cycle may be too high. Make sure that the **MEA-100B** is used at the adequate duty cycle and within the specified operating temperature range.
Output signal	Outputs the trouble [NG] signal when the fault occurs.

④ E04

Message	NO CURRENT
Time of detection	During welding
Cause of fault	The monitored current is below the specified current.
Measures	① Check if a wire is not broken in the toroidal coil cable, the cable connecting the **MEA-100B** to the transformer, or the wire of the secondary side of the transformer. Check if an insulating material is caught between the welding electrodes. ② Adjust the no-current detecting level (SET2 #3: NCL). (See 9. (2) ③.)
Output signal	Outputs the trouble [NG] signal or the caution [CAUTION] signal when the fault occurs.

⑤ E05

Message	LOW CURRENT
Time of detection	During welding
Cause of fault	The current is below the monitor lower limit.
Measures	Check the welded workpiece, the welding machine and the welding power supply voltage.
Output signal	Outputs the trouble [NG] signal or the caution [CAUTION] signal, and the hold end [END] signal when the welding sequence is complete.

⑥ E06

Message	HIGH CURRENT
Time of detection	During welding
Cause of fault	The current is beyond the monitor upper limit.
Measures	Check the welded workpiece, the welding machine and the welding power supply voltage.
Output signal	Outputs the trouble [NG] signal or the caution [CAUTION] signal, and the hold end [END] signal when the welding sequence is complete.

⑦ E07

Message	FULL WAVE
Time of detection	During welding
Cause of fault	The monitored conduction angle exceeds 175° during operation with the power supply voltage fluctuation compensation control. This fault may occur when it occurred for 3 times or more in the multi-cycle welding. Note: This fault does not occur when the secondary constant-current control is selected.
Measures	Check the welding power supply voltage.
Output signal	Outputs the trouble [NG] signal or the caution [CAUTION] signal, and the hold end [END] signal when the welding sequence is complete. When the [CAUTION] is selected for Fullwave, the normal end [GOOD] signal is output, too.

⑧ E08

Message	STEP END
Time of detection	At the end of the welding sequence.
Cause of fault	The stepper-up operation is complete.
Measures	Input the [STEP RESET] signal, reset the stepper count, or change the stepper number.
Output signal	Outputs the trouble [NG] signal or the caution [CAUTION] signal together with the hold end [END] signal, the step end [STP/WELD END] signal and the normal end [GOOD] signal when the welding sequence is complete.

⑨ E09

Message	STEPUP RATE TROUBLE
Time of detection	When the start signal is accepted.
Cause of fault	The stepper-up current rate exceeds the setting range during the stepper-up operation.
Measures	Edit the current up rate so that it falls within the setting range. • During the secondary constant-current control, set the current up rate so that the stepped-up current does not exceed the set maximum current. • During the power supply voltage fluctuation compensation control, the current up rate must not exceed 99.9%.
Output signal	Outputs the trouble [NG] signal when the fault arises.

⑩ E10

Message	COUNT MEMORY ERROR
Time of detection	When the power is turned on.
Cause of fault	The count data stored in memory is damaged.
Measures	Memory was erased because period for retaining memory of count data elapsed over specified period. The period for retaining the memory of count data is approximately 10 days since the day when a power supply is turned off at latest.
Output signal	Outputs the trouble [NG] signal or the caution [CAUTION] signal when the fault occurs.

⑪ E11

Message	CYCLE TROUBLE
Time of detection	During the welding sequence.
Cause of fault	The start signal is turned off during welding when SM is set to 0 on the SET2 #1 screen.
Measures	Turn on [ERR RESET].
Output signal	Outputs the trouble [NG] signal or the caution [CAUTION] signal when the fault occurs.

⑫ E12

Message	SCR SHORT
Time of detection	During the squeeze.
Cause of fault	The thyristor short-circuit current is detected during the squeeze. Note: The short-circuit current is not detected when the toroidal coil is not connected to the **MEA-100B**.
Measures	The thyristor may be broken. Contact us or your distributor for repairs.
Output signal	Outputs the trouble [NG] signal when the fault occurs.

⑬ E13

Message	MEMORY TROUBLE
Time of detection	When the power is turned on.
Cause of fault	An error is found in the schedule or other settings.
Measures	Turn on [ERR RESET] and then check the schedule and other settings. Correct settings.
Output signal	Outputs the trouble [NG] signal when the error arises.

⑭ E14

Message	CURRENT SETTING ERR
Time of detection	When the start signal is input.
Cause of fault	The current exceeding the maximum current is tried to be set during operation with the secondary constant-current control. Note: This error does not occur when the power supply voltage fluctuation compensation control is selected.
Measures	Edit the current setting so that it falls within the setting range (less than the maximum current).
Output signal	Outputs the trouble [NG] signal when the error arises.

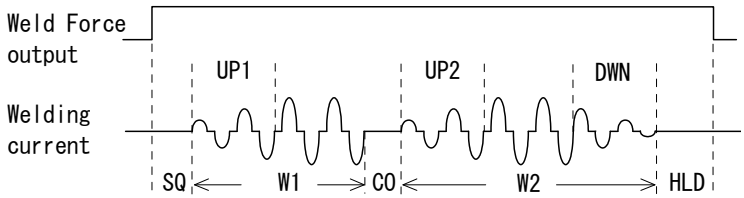
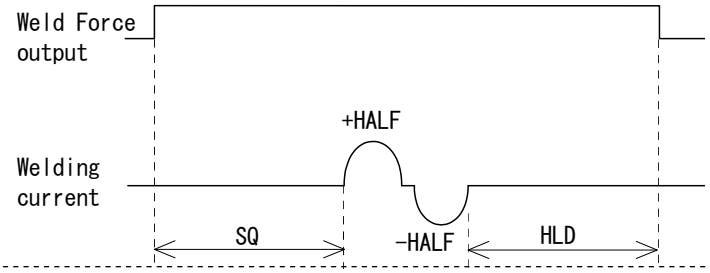
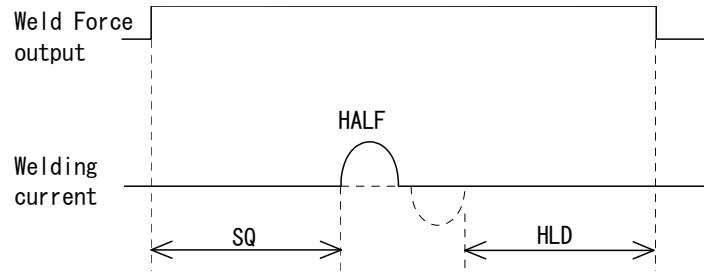
⑮ E15

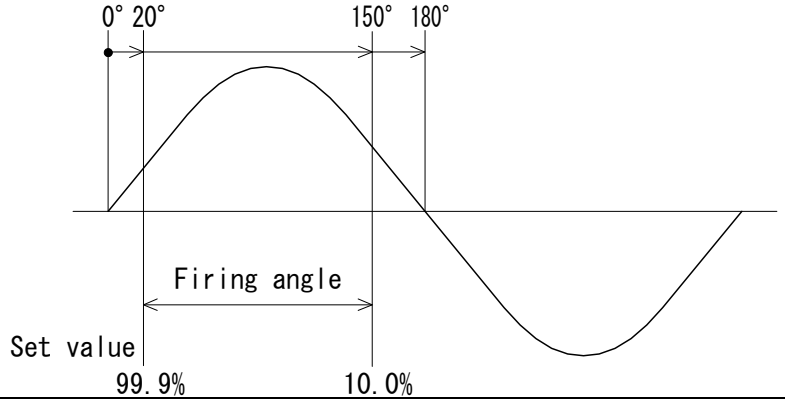
Message	WELD ABORT
Time of detection	During the welding sequence.
Cause of fault	The [WELD STOP] signal is turned off.
Measures	Input the [WELD STOP] signal and turn on [ERR RESET].
Output signal	Outputs the trouble [NG] signal when the fault occurs.

13. Specifications

(1) Specifications

Item	Specifications
Power Supply	Single phase 200V/220V/230V/240V/380V/400V/460V/480V AC (Voltage is selectable but factory-fixed on shipment.) +13%, -20%, 50/60 Hz
Maximum Output Capacity	60 kVA (Duty cycle: 1.3% when 200 V AC is input) 66 kVA (Duty cycle: 1.3% when 220 V AC is input) 68 kVA (Duty cycle: 2% when 380 V AC is input) 72 kVA (Duty cycle: 2% when 400 V AC is input) 86 kVA (Duty cycle: 2% when 480 V AC is input) Note: For duty cycle, see **13. (2) Duty Cycle**.
Control Method	① Secondary constant-current control ② Power supply voltage fluctuation compensation control
Welding Current Control	① Multi-cycle welding ② Single-cycle welding ③ Half-cycle welding
Firing Angle Control Range	20°–150°
Control Speed	Half cycle
Welding Current Accuracy	• Secondary constant-current control (when the current is set to the maximum value) Supply voltage fluctuation Resistance load fluctuation * Inductive load fluctuation * (Power factor angle fluctuation) } within ±2% for a fluctuation of ±10% (* Fluctuation from our standard load)
	• Power supply voltage fluctuation compensation control (when the current is set to the maximum value) Supply voltage fluctuation .... within ±3% for a fluctuation of ±10% (within 20%–80% of the set current when using a welding machine with a power factor of 0.85–0.95)
Current Control Interval	• Secondary constant-current control: All cycles excluding the first half cycle • Power supply voltage fluctuation compensation control: All cycles
Number of Selectable Schedules	31 schedules

Item	Specifications
Weld Timer Setting Range	• Multi-cycle welding a. Squeeze (SQ): 00–99 cycles b. Upslope1 (UP1): 0–9 cycles c. Weld1 (W1): 00–99 cycles d. Cool (CO): 00–99 cycles e. Upslope2 (UP2): 0–9 cycles f. Weld2 (W2): 00–99 cycles g. Downslope (DWN): 0–9 cycles h. Hold (HLD): 00–99 cycles 
	• Single-cycle welding a. Squeeze (SQ): 00–99 cycles b. First half wave (+HALF): 0.5 cycles c. Second half wave (-HALF): 0.5 cycles d. Hold (HLD): 00–99 cycles 
	• Half-cycle welding a. Squeeze (SQ): 00–99 cycles b. Half cycle (HALF): 0.5 cycles c. Hold (HLD): 00–99 cycles 
Pulsation (PL)	1–9 times (multi-cycle welding)
Maximum Current Setting Range (1 schedule)	0.5–9.9 kA (in 0.1 kA increment) Set to the maximum secondary current of the welding machine being used. An automatic setting function is provided.

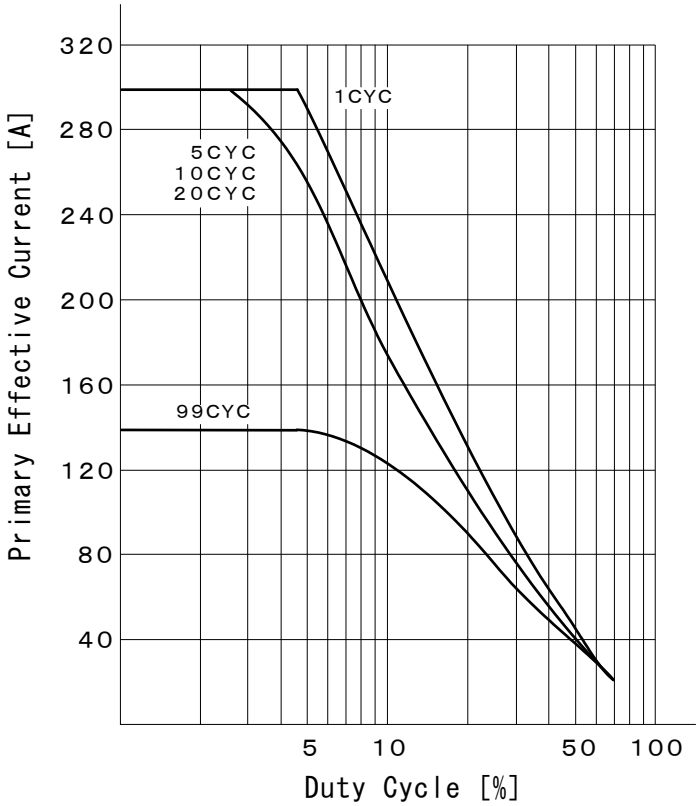
Item	Specifications
Current Setting Range	• Secondary constant-current control 0.20–9.99 kA (in 10 A increment) • Power supply voltage fluctuation compensation control 10.0%–99.9% (in 0.1% increment) 
Current Monitoring (31 schedules)	• Secondary constant-current control Upper limit setting: +1%– +49% Lower limit setting: -1%– -49% (If set to 00, current monitoring is turned off.) • Power supply voltage fluctuation compensation control Upper limit setting: 0.01–9.99 kA (in 10 A increment) Lower limit setting: 0.01–9.99 kA (in 10 A increment) (If set to 0.00 kA, current monitoring is turned off.)
Current Monitor Cycle Setting	• Multi-cycle welding — Select one of the following: ① Weld1 ② Weld2 ③ Weld1 and Weld2 ④ No check **[Selection of the monitor range]** ① Welding cycle except the first cycle or upslope and downslope ② Welding cycle except the beginning of the welding to current monitoring cycle (0–10 cycles in 0.5-cycle increment) and downslope • Single-cycle welding — Select one of the following: ① First half cycle ② Second half cycle ③ First and second half cycles ④ No check • Half-cycle welding — Select one of the following: ① Half cycle ② No check
Measurement Item (31 schedules)	• Current: 0.00–9.99 kA • Conduction angle: 000°–180° • Welding cycle: 00–99 cycles

Item	Specifications	
No-Current Detection (1 schedule)	Detects when connecting the toroidal coil. The setting of the detecting level (Common to W1, W2, 1ST, 2ND and HALF) 01%–10% (If set to 00, the no-current detection is not performed.)	
No-Current Detecting Position (1 schedule)	• Multi-cycle welding — Select one of the following: ① Weld1 ③ Weld1 and Weld2 ② Weld2 ④ No check **[Selection of the monitor range]** Welding cycle except the beginning of the welding to the no-current neglecting cycle (0–10 cycles in 0.5-cycle increment)	
	• Single-cycle welding — Select one of the following: ① First half cycle ③ First and second half cycles ② Second half cycle ④ No check	
	• Half-cycle welding — Select one of the following: ① Half cycle ② No check	
Stepper-up (2 schedules; SOL1 and SOL2)	• Stepper No.: Stepper 1–5 • Stepper-up rate: 50%–150% (in 1% increment) of the set current for Stepper 1 • Stepper-up weld count: 0–9999	
Production Counter	0–99999999	
Control Input Signal	**SCH.1, 2, 4, 8, 16**	Schedule (1–31 schedules represented by binary numbers)
	START(1ST)	Start input (1st stage)
	2ND STAGE	Parity (2nd stage)
	WELD ON/OFF	Turns welding on/off
	STEP RESET	Resets the stepper-up counter
	ERR RESET	Resets fault signal output
	CNTR RESET	Resets the production counter
	WELD STOP	Halts welding
	WELD SKIP	Skips a stage of the welding sequence
Control Output Signal	**GOOD**	Normal signal
	NG	Trouble signal
	END	End signal
	READY	Ready signal
	STP/WELD END	Stepper-up end/welding end signal
	CAUTION	Caution signal
Weld Force Output	SOL1, SOL2 valve output	

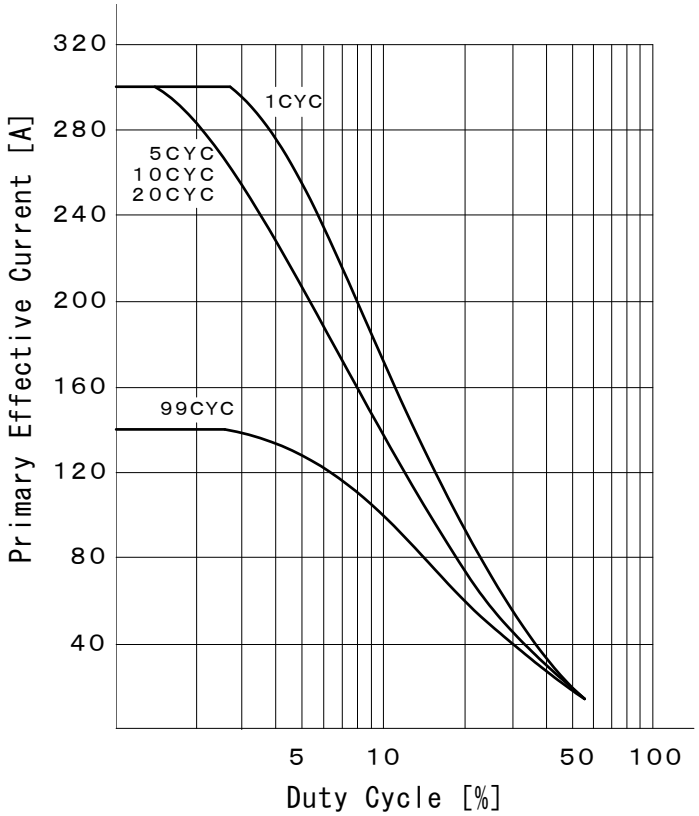
Item	Specifications
Other Functions	① Selection of Way to input Start Signal • No self-sustaining function • Self-sustaining from **W1** • Self-sustaining • 2-stage Start Mode ② Selection of Way to change Schedule No. • 31-Schedule No. Input without Parity • 31-Schedule No. Input with Parity • 5-Schedule No. Input • 31-Schedule No. Input from Panel ③ Selection of Start Stabilizing Time • 1 ms, 5 ms, 10 ms, 20 ms ④ ON/OFF of Re-Welding ⑤ Selection of End Signal Output Time • 10 ms + Start Signal Input Time • 10 ms, 200 ms ⑥ ON/OFF of Schedule No. Change ⑦ Selection of WELD SKIP Signal • Skips to the next sequence. (Skips to **CO** if **W1** is underway.) • Skips to **HLD**.
Trouble Detection Items	① Controller fault ② Start parity error ③ SCR overheating ④ No current ⑤ Low welding current ⑥ High welding current ⑦ Full wave ⑧ Stepper-up end ⑨ Stepper-up rate error ⑩ Count memory error ⑪ Weld cycle trouble ⑫ Thyristor shorted ⑬ Self-diagnostics error ⑭ Current setting error ⑮ Weld interrupt trouble
Operating Environment	• Temperature: 0°–45°C • Humidity: 90% or less (no condensation) • Altitude: 1000 meters or lower Caution: Use this product in the environment without conductive dust. If conductive dust enters in the product, this may result in a failure, electric shock, or fire. When using this product in this environment, make contact with us.
Storage Environment	Temperature -10°–55°C and dew condensation not allowed
Heat-Resistant Class	E
Case Protection	IP20
Power Consumption	15 W or less in standby
Outline Dimensions	269 (H) × 142 (W) × 418 (D) mm
Mass	6.5 kg

(2) Duty Cycle

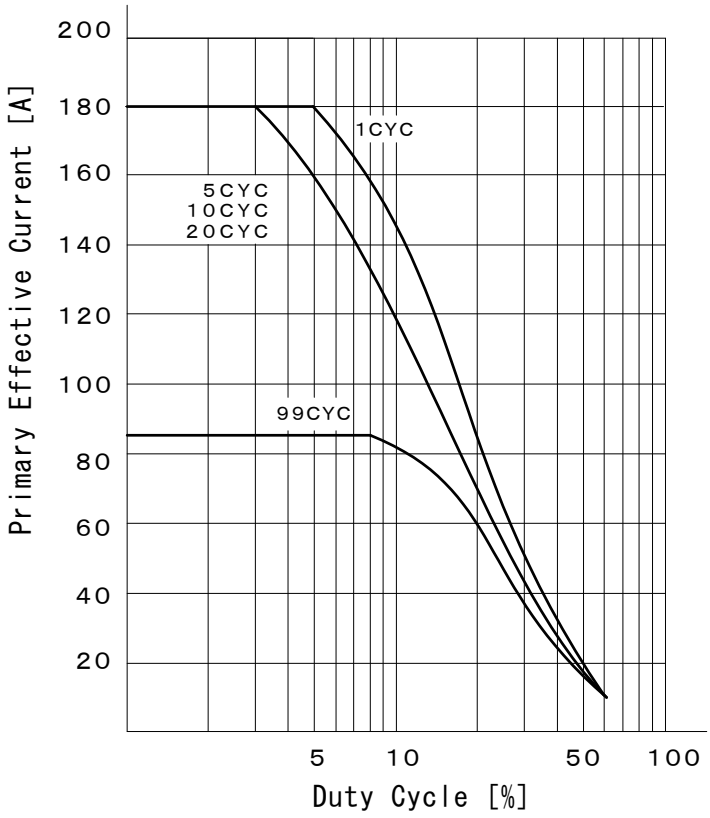
① Power supply 200 V, Ambient temperature 35°C



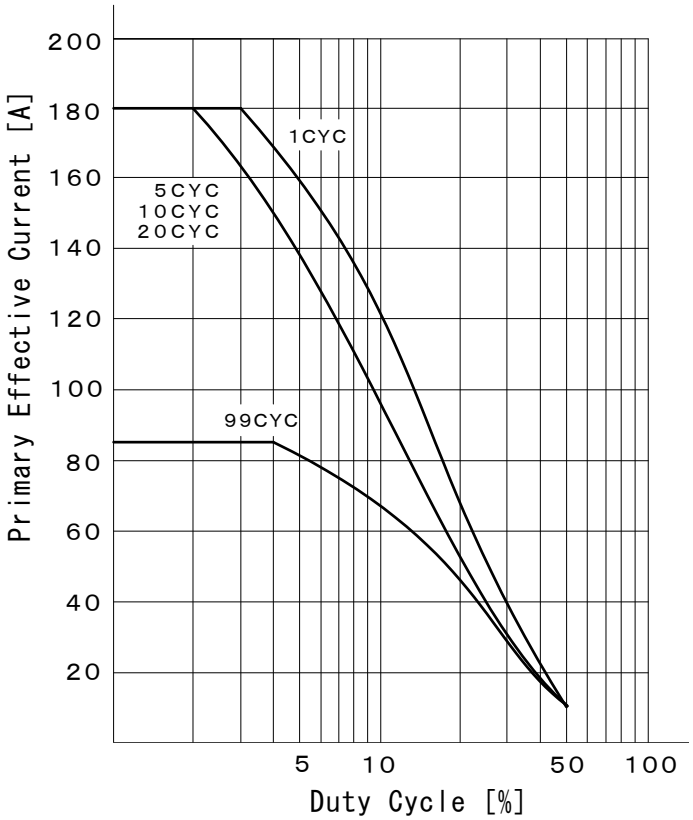
② Power supply 200 V, Ambient temperature 45°C



③ Power supply 400 V, Ambient temperature 35°C



④ Power supply 400 V, Ambient temperature 45°C



(3) Model No.-Spec Reference Table

Sub-number MEA-100B-	(A)	(B)	(C)	(D)
	Power Supply Voltage	Solenoid Output	Power supply used for [CAUTION], [STP/WELD END] and [READY]	CE Marking
00-00	220V	Photo-MOS relay output	Internal power supply	Not applicable
00-10	200V	Photo-MOS relay output	Internal power supply	Not applicable
00-11	200V	Relay output	Internal power supply	Not applicable
00-12	220V	Relay output	Internal power supply	Not applicable
00-15	230V	Photo-MOS relay output	Internal power supply	Not applicable
00-17	240V	Photo-MOS relay output	Internal power supply	Not applicable
00-29	220V	Photo-MOS relay output	Internal power supply	Not applicable
00-30	220V	Photo-MOS relay output	External power supply	Not applicable
00-40	380V	Photo-MOS relay output	Internal power supply	Not applicable
00-46	480V	Relay output	Internal power supply	Not applicable
00-48	400V	Photo-MOS relay output	Internal power supply	Not applicable
00-49	400V	Photo-MOS relay output	Internal power supply	Applicable
00-50	220V	Photo-MOS relay output	Internal power supply	Applicable

(4) Board List for Maintenance

For repair or replacement, contact us.

Board	Solenoid Output	Power supply used for [CAUTION], [STP/WELD END] and [READY]
ME-3053-00S1	Photo-MOS relay output	Internal power supply
ME-3053-01S1	Relay output	Internal power supply
ME-3053-02S1	Photo-MOS relay output	External power supply

14. External Communication Function

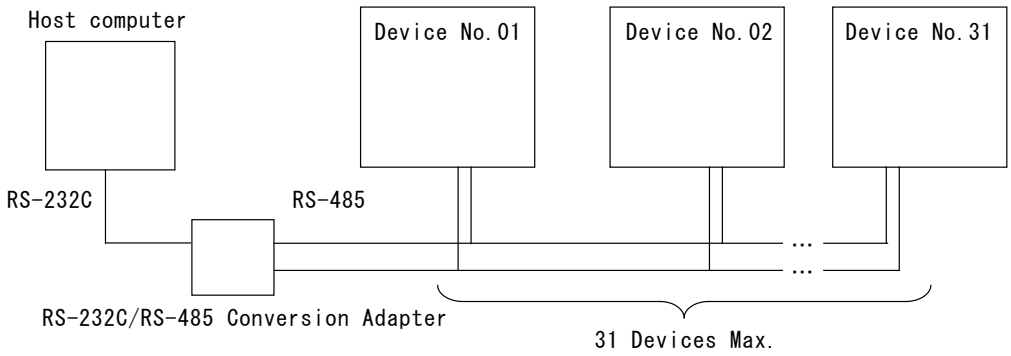
(1) Introduction

MEA-100B can be used to set schedules from an externally-connected personal computer (abbreviated as PC) or to read monitored data and several kind of status data.
Prepare the program and its development environment for controlling the Power Supply on the customer side.

(2) Data Transmission

Item	Content
Transmission mode	RS-485, Asynchronous, Half-duplex
Transmission rate	Select either of the followings at the SET2 #8 screen: 9600, 19200, 38400 bps
Data format	Start bit: 1, Data bit: 8, Stop bit: 1, Parity bit: Even
Character code	ASCII
Checksum data	None
Connector	I/O terminal strip 6: EXT GND, 7: RS485+, 8: RS485-

(3) Configuration



(Note 1) When controlling two or more devices with one host computer, register the device No. for each device.

(Note 2) Do not assign one number to more than one device. Also, do not send data simultaneously from two or more devices in the single-directional communication mode. Otherwise, data collision and inappropriate system operations may result.

(Note 3) The RS-232C/RS-485 conversion adapter is not included in the accessories. It is required to prepare the adapter at customer's side. When the switching time from RS-232C mode to RS-485 mode is slow, data may not be sent correctly. Use a conversion adapter whose switching time is 1 ms or less.

(4) Protocol

① Single-directional Communication Mode

1) Monitor Data (sent after each welding)

Data strings:

!01 01 :0,10,1.20,050,20,2.10,110,1,0000,1,0000,00005555 [CR][LF]
A B C D E F G H I J K L M N

Item	Contents	Character string	Range
A	Device No.	nn	01 to 31
B	Schedule No.	nn	01 to 31
C	Control Mode	n,	0: Secondary constant-current control + multi-cycle welding 1: Power supply voltage fluctuation compensation control + multi-cycle welding 2: Power supply voltage fluctuation compensation control + single-cycle welding 3: Power supply voltage fluctuation compensation control + half-cycle welding
D	WELD1 Time	nn,	00 to 99 (CYC) -- for Single-Cycle and Half-Cycle Control
E	WELD1 Current	n.nn,	0.00 to 9.99 (kA)
F	WELD1 Conduction Angle	nnn,	000 to 180 (°)
G	WELD2 Time	nn,	00 to 99 (CYC) -- for Single-Cycle and Half-Cycle Control
H	WELD2 Current	n.nn,	0.00 to 9.99 (kA) -.-- for Half-Cycle Control
I	WELD2 Conduction Angle	nnn,	000 to 180 (°) --- for Half-Cycle Control
J	SOL1 Stepper No.	n,	1 to 5
K	SOL1 Stepper Count	nnnn,	0000 to 9999
L	SOL2 Stepper No.	n,	1 to 5
M	SOL2 Stepper Count	nnnn,	0000 to 9999
N	Total Count	nnnnnnnn	00000000 to 99999999

2) Error Data

Data strings:

!01 01:E03,04,05,06,07,08,09,10[CR][LF]
A B C D E F G H I J

Item	Contents	Character string	Range
A	Device No.	nn	01 to 31
B	Schedule No.	nn,	01 to 31
C*1	Error code 1	nnn,	E01 to E15
D*1	Error code 2	nn,	01 to 15
E*1	Error code 3	nn,	01 to 15
F*1	Error code 4	nn,	01 to 15
G*1	Error code 5	nn,	01 to 15
H*1	Error code 6	nn,	01 to 15
I*1	Error code 7	nn,	01 to 15
J*1	Error code 8	nn	01 to 15

*1 The number of error codes is of eight max. In the case of only one error code, the error codes D to J are omitted.
"E" is affixed only to Error code 1.

*2 Error codes are transmitted when errors are detected.
For E05 to E08, however, the error is transmitted after the monitored data is transmitted.

② Bi-directional Communication Mode

Reading of data	Code: # Device No. R Schedule No. S Screen No. *

Host

#	ID1	ID2	R	SH1	SH2	S	SC1	SC2	*	CR	LF

MEA-100B

!	ID1	ID2	SH1	SH2	S	SC1	SC2	:	Data	CR	LF

1) ID1 and ID2 are device numbers.
2) SH1 and SH2 are schedule numbers.
3) SC1 and SC2 are screen numbers.
   ① Screen 01 (SCHEDULE data) Specific data in accordance with Schedule No. (Schedule No.: 01 to 31)
   ② Screen 02 (Upper/lower setting data) Specific data in accordance with Schedule No. (Schedule No.: 01 to 31)
   ③ Screen 03 (Stepper data) Common data (Schedule No.: 00)
   ④ Screen 04 (SYSTEM data) Common data (Schedule No.: 00)
   ⑤ Screen 05 (Monitor data) Specific data in accordance with Schedule No. (Schedule No.: 01 to 31)
   ⑥ Screen 06 (Error data) Common data (Schedule No.: 00)

Setting of data	Code: # Device No. W Schedule No. S Screen No. Data

Host

#	ID1	ID2	W	SH1	SH2	S	SC1	SC2	:	Data	CR	LF

MEA-100B

!	ID1	ID2	SH1	SH2	S	SC1	SC2	:	Data	CR	LF

1) ID1 and ID2 are device numbers.
2) SH1 and SH2 are schedule numbers.
3) SC1 and SC2 are screen numbers.
   ① Screen 01 (SCHEDULE data) Specific data in accordance with Schedule No. (Schedule No.: 01 to 31)
   ② Screen 02 (Upper/lower setting data) Specific data in accordance with Schedule No. (Schedule No.: 01 to 31)
   ③ Screen 03 (Stepper data) Common data (Schedule No.: 00)
   ④ Screen 04 (SYSTEM data) Common data (Schedule No.: 00)
   ⑤ Screen 06 (Error data) Common data (Schedule No.: 00)

(5) Data Code Table

① Screen 01 (SCHEDULE data) Specific data in accordance with Schedule No. (Schedule No.: 01 to 31)

Item	Contents	Character string	Range
1	[SQ] Squeeze	nn,	00 to 99 (CYC)
2	[UP1] Upslope 1	n,	0 to 9 (CYC)
3	[W1] Weld 1	nn,	00 to 99 (CYC)
4	[CO] Cool	nn,	00 to 99 (CYC)
5	[UP2] Upslope 2		0 to 9 (CYC)
6	[W2] Weld 2	nn,	00 to 99 (CYC)
7	[DWN] Downslope	n,	0 to 9 (CYC)
8	[HLD] Hold	nn,	00 to 99 (CYC)
9	[CURR.1] Current 1	n.nn,	0.20 to 9.99 (kA) (CC:0)
		nn.n,	10.0 to 99.9 (%) (CC:1)
10	[CURR.2] Current 2	n.nn,	0.20 to 9.99 (kA) (CC:0)
		nn.n,	10.0 to 99.9 (%) (CC:1)
11	[1ST] First half wave current	nn.n,	10.0 to 99.9 (%) (CC:2)
12	[2ND] Second half wave current	nn.n,	10.0 to 99.9 (%) (CC:2)
13	[HALF] Weld current	nn.n,	10.0 to 99.9 (%) (CC:3)
14	[PULSATION] Pulsation	n,	1 to 9
15	[SOLENOID] Weld force output	n	1, 2

② Screen 02 (Upper/lower setting data) Specific data in accordance with Schedule No. (Schedule No.: 01 to 31)

Item	Contents	Character string	Range
1	[W1 H] Weld 1 Current Upper Limit	nn,	00 to 49 (%)
		n.nn,	0.00 to 9.99 (kA)
2	[W1 L] Weld 1 Current Lower Limit	nn,	00 to 49 (%)
		n.nn,	0.00 to 9.99 (kA)
3	[W2 H] Weld 2 Current Upper Limit	nn,	00 to 49 (%)
		n.nn,	0.00 to 9.99 (kA)
4	[W2 L] Weld 2 Current Lower Limit	nn,	00 to 49 (%)
		n.nn,	0.00 to 9.99 (kA)
5	[1ST H] Weld 1 Current Upper Limit	n.nn,	0.00 to 9.99 (kA)
6	[1ST L] Weld 1 Current Lower Limit	n.nn,	0.00 to 9.99 (kA)
7	[2ND H] Weld 2 Current Upper Limit	n.nn,	0.00 to 9.99 (kA)
8	[2ND L] Weld 2 Current Lower Limit	n.nn,	0.00 to 9.99 (kA)
9	[HALF H] Weld Current Upper Limit	n.nn,	0.00 to 9.99 (kA)
10	[HALF L] Weld Current Lower Limit	n.nn	0.00 to 9.99 (kA)

③ Screen 03 (Stepper data) Common data (Schedule No.: 00)

Item	Contents	Character string	Range
1	SOL1 STEP1 Count	nnnn,	0000 to 9999
2	SOL1 STEP2 Count	nnnn,	0000 to 9999
3	SOL1 STEP2 Stepper Rate	nnn,	050 to 150 (%)
4	SOL1 STEP3 Count	nnnn,	0000 to 9999
5	SOL1 STEP3 Stepper Rate	nnn,	050 to 150 (%)
6	SOL1 STEP4 Count	nnnn,	0000 to 9999
7	SOL1 STEP4 Stepper Rate	nnn,	050 to 150 (%)
8	SOL1 STEP5 Count	nnnn,	0000 to 9999
9	SOL1 STEP5 Stepper Rate	nnn,	050 to 150 (%)
10	SOL2 STEP1 Count	nnnn,	0000 to 9999
11	SOL2 STEP2 Count	nnnn,	0000 to 9999
12	SOL2 STEP2 Stepper Rate	nnn,	050 to 150 (%)
13	SOL2 STEP3 Count	nnnn,	0000 to 9999
14	SOL2 STEP3 Stepper Rate	nnn,	050 to 150 (%)
15	SOL2 STEP4 Count	nnnn,	0000 to 9999
16	SOL2 STEP4 Stepper Rate	nnn,	050 to 150 (%)
17	SOL2 STEP5 Count	nnnn,	0000 to 9999
18	SOL2 STEP5 Stepper Rate	nnn	050 to 150 (%)

④ Screen 04 (SYSTEM data) Common data (Schedule No.: 00)

Item	Contents	Character string	Range
1	[MAX CURR] Maximum current	n.n,	0.5 to 9.9 (kA)
2	[LCD CONTRAST] Contrast	nn,	01 to 16
3	[NP] Key lock	n,	0: Unlock 1: Lock
4	[CC] Control method and welding current cycle	n,	0: Secondary constant-current control + multi-cycle welding 1: Power supply voltage fluctuation compensation control + multi-cycle welding 2: Power supply voltage fluctuation compensation control + single-cycle welding 3: Power supply voltage fluctuation compensation control + half-cycle welding
5	[SS] Setting method of the schedule number	n,	0: 31 schedules from the input terminal without parity 1: 31 schedules from the input terminal with parity 2: 5 schedules from the input terminal 3: 31 schedules from the panel
6	[SM] Self-sustaining of the start signal and the welding sequence	n,	0: Self-sustaining from HLD time 1: Self-sustaining from W1 time 2: Self-sustaining from SQ time 3: 2-stage start mode
7	[SDT] Start stabilizing time at start signal	nn,	01: 1 ms 05: 5 ms 10: 10 ms 20: 20 ms
8	[SU] Stepper-up function	n,	0: OFF 1: ON
9	[RW] ON/OFF of re-weld	n,	0: OFF 1: ON
10	[WS] Determines how the **MEA-100B** functions when the WELD2 SKIP signal is input	n,	0: Skips to the next sequence (Skips to COOL (CO) if WELD1 (W1) is underway) 1: Skips to HOLD (HLD)
11	[HET] End signal output time	nn,	00: Until the START input circuit is opened, with a minimum of 10 ms 01: 10 ms 20: 200 ms
12	[CMI] Current monitor neglecting cycle	␣DEF,	␣DEF: 1.0 cycle and upslopes (␣ indicates space)
		nn.n,	00.0 to 10.0 (CYC) (in 0.5 increment)
13	[NCL] No-current detecting level CC:0 W1	nn,	00 to 10 (%)
14	[NCL] No-current detecting level CC:0 W2	nn,	00 to 10 (%)
15	[NCL] No-current detecting level CC:1 W1	nn,	00 to 10 (%)
16	[NCL] No-current detecting level CC:1 W2	nn,	00 to 10 (%)

Item	Contents	Character string	Range
17	[NCL] No-current detecting level CC:2 1ST	nn,	00 to 10 (%)
18	[NCL] No-current detecting level CC:2 2ND	nn,	00 to 10 (%)
19	[NCL] No-current detecting level CC:3 HALF	nn,	00 to 10 (%)
20	[NCI] No-current neglecting cycle	nn.n,	00.0 to 10.0 (CYC) (in 0.5 increment)
21	[START PARITY] #4 screen E02	n,	0: Caution 1: Trouble
22	[NO CURRENT] #4 screen E04	n,	0: Caution 1: Trouble
23	[LOW CURRENT] #5 screen E05	n,	0: Caution 1: Trouble
24	[HIGH CURRENT] #5 screen E06	n,	0: Caution 1: Trouble
25	[FULL WAVE] #5 screen E07	n,	0: Caution 1: Trouble 2: No Trouble-Caution
26	[STEP END] #5 screen E08	n,	0: Caution 1: Trouble
27	[CYCLE TROUBLE] #6 screen E11	n	0: Caution 1: Trouble

⑤ Screen 05 (Monitor data) Specific data in accordance with Schedule No. (Schedule No.: 01 to 31)

Item	Contents	Character string	Range
1	WELD1 Time	nn,	00 to 99 (CYC)
2	WELD1 Current	n.nn,	0.00 to 9.99 (kA)
3	WELD1 Conduction Angle	nnn,	000 to 180 (°)
4	WELD2 Time	nn,	00 to 99 (CYC)
5	WELD2 Current	n.nn,	0.00 to 9.99 (kA)
6	WELD2 Conduction Angle	nnn,	000 to 180 (°)
7	Valve1 Stepper No.	n,	1 to 5
8	Valve1 Stepper Count	nnnn,	0000 to 9999
9	Valve2 Stepper No.	n,	1 to 5
10	Valve2 Stepper Count	nnnn,	0000 to 9999
11	Total Count	nnnnnnnn	00000000 to 99999999

⑥ Screen 06 (Error data) Common data (Schedule No.: 00)

- Error data confirmation (Data reading only)

Item	Contents	Character string	Range
1	Error code 1	nnn,	E01 to E15
2	Error code 2	nn,	01 to 15
3	Error code 3	nn,	01 to 15
4	Error code 4	nn,	01 to 15
5	Error code 5	nn,	01 to 15

Item	Contents	Character string	Range
6	Error code 6	nn,	01 to 15
7	Error code 7	nn,	01 to 15
8	Error code 8	nn	01 to 15

The number of error codes is of eight max. In the case of only one error code, the items 2 to 8 are omitted.

- Error reset (Data setting only)

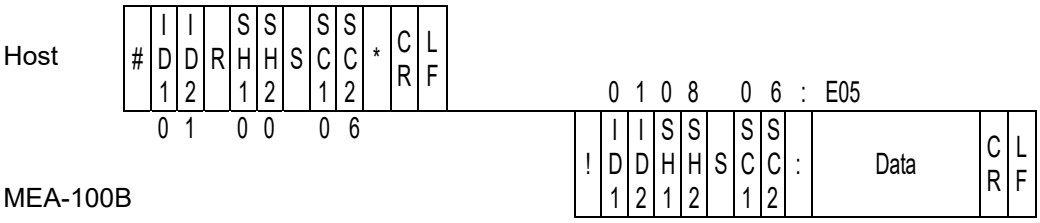
Item	Contents	Character string	Range
1	Error reset	nnn	E00

“00” (no error data) is returned.
If an error cannot be reset, an error code “Enn” is returned.

(6) Communication Example

Reading of trouble	Code: # Device No. R Schedule No. S Screen No. *

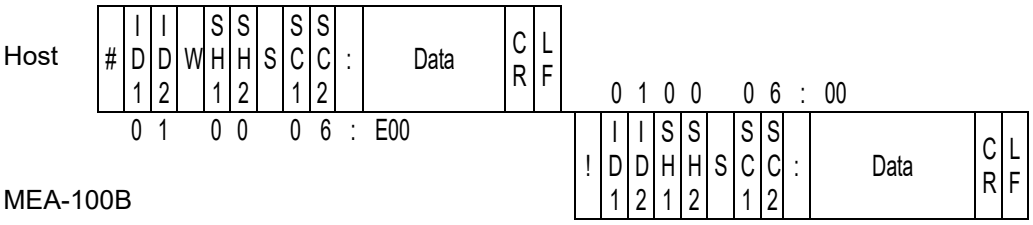
Example: Read all troubled data in the specified device, No. 01. (Schedule No. is "08" and LOW CURRENT are occurring.)



1) ID1 and ID2 are device numbers "01."
2) On the host side, SH1 and SH2 are schedule numbers "00."
   On the **MEA-100B**, SH1 and SH2 are those of the last welding "08."
3) SC1 and SC2 are screen numbers "06."
4) In no trouble, data of "00" is returned.

Error reset	Code: # Device No. W Schedule No. S Screen No. Data

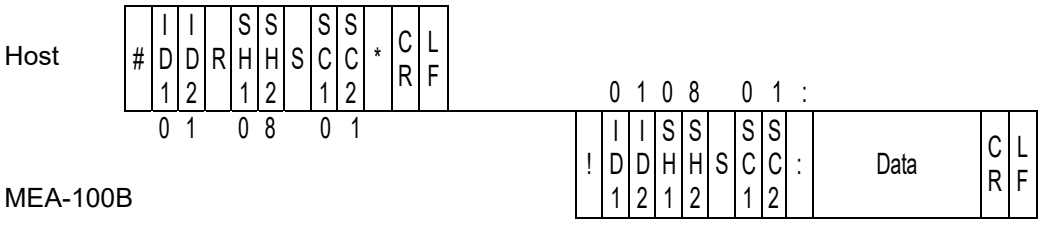
Example: Resets the trouble of the specified device, No. 01.



1) ID1 and ID2 are device numbers "01."
2) SH1 and SH2 are schedule numbers "00."
3) SC1 and SC2 are screen numbers "06."
4) "00" (no trouble) is returned as a confirmation data. If an error cannot be reset, an error code "Enn" is returned.

Reading of data	Code: # Device No. R Schedule No. S Screen No. *

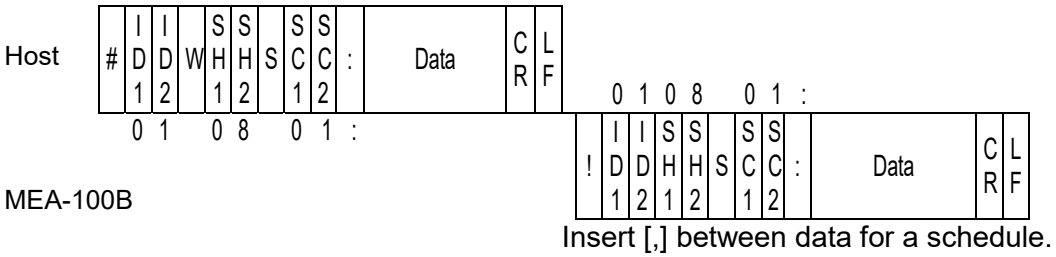
Example: Read all data of Screen No. “01” of Schedule No. “08” of the specified device No. 01.



1) ID1 and ID2 are device numbers “01.”
2) SH1 and SH2 are schedule numbers “08.”
3) SC1 and SC2 are screen numbers “01.”
4) For the data order, see **(5) Data Code Table**.

Setting of data	Code: # Device No. W Schedule No. S Screen No. Data

Example: Write data for a schedule of Screen No. “01” of Schedule No. “08” of the specified device No. 01.



Insert [,] between data for a schedule.

1) ID1 and ID2 are device numbers “01.”
2) SH1 and SH2 are schedule numbers “08.”
3) SC1 and SC2 are screen numbers “01.”
4) For the data order, see **(5) Data Code Table**.
5) The set data is returned as a confirmation data. When data which is outside the range is set, previous data is returned. Perform the next start after checking that there is no problem in the sent confirmation data.

(7) Timing Chart for Bi-directional Communication

To write settings in the bi-directional communication, be careful of followings.

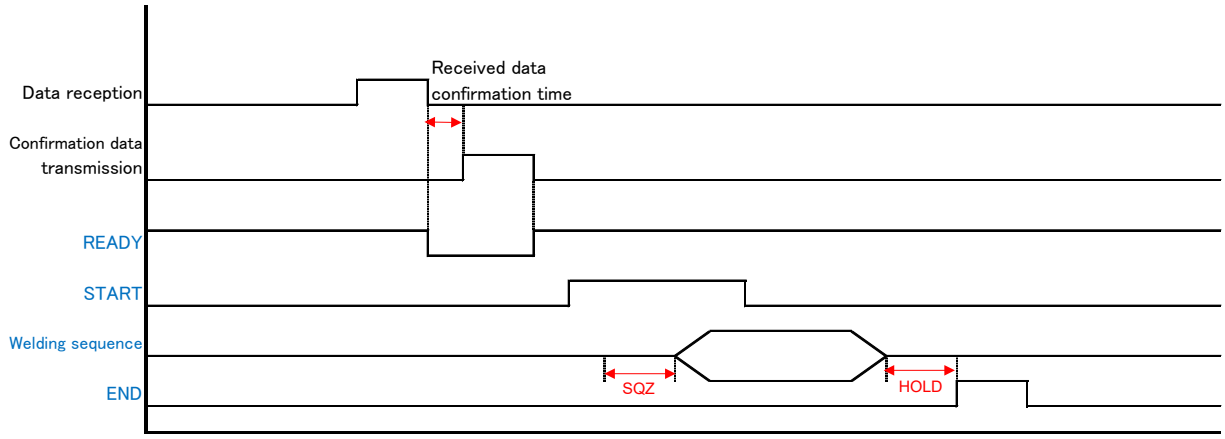
1) Data is checked if it is within a correct range after received by the **MEA-100B**. When correct, the received data is transmitted as it is. During that time, the READY signal is turned off.

2) When the start signal is input while data is transmitted to the **MEA-100B**, data is checked and transmitted after the END signal is output and the READY signal is turned off so as to given priority to the welding sequence. In this case, the sequence is executed with the previous welding schedule.

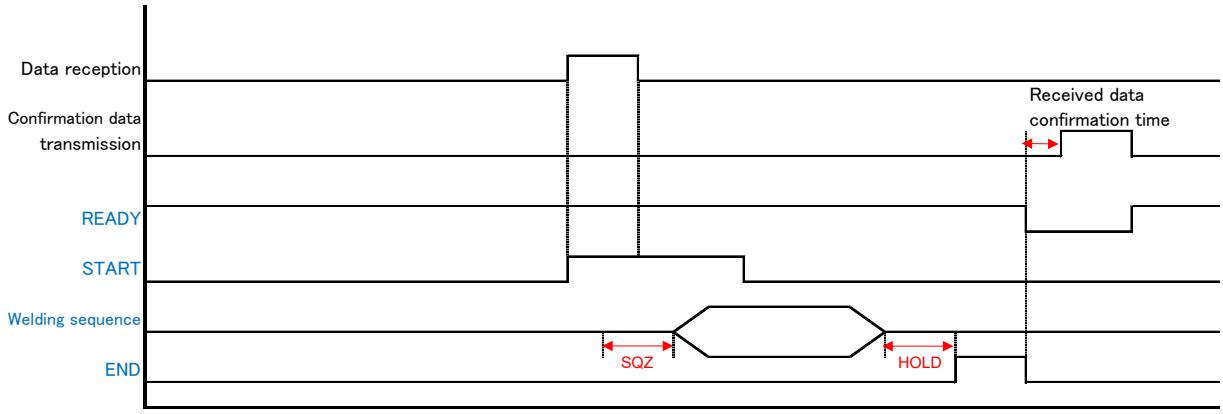
3) When changing schedules in the bi-directional communication, wait until the READY signal is turned on after transmitting data from the host computer side, and then move to the next sequence.

4) Items 1) to 3) above are applied when CONTROL is set to 2. When writing data in the flash memory (when setting CONTROL to 3), the writing time is added and the time until the READY signal is turned off is extended.

Normal sequence in bi- directional communication



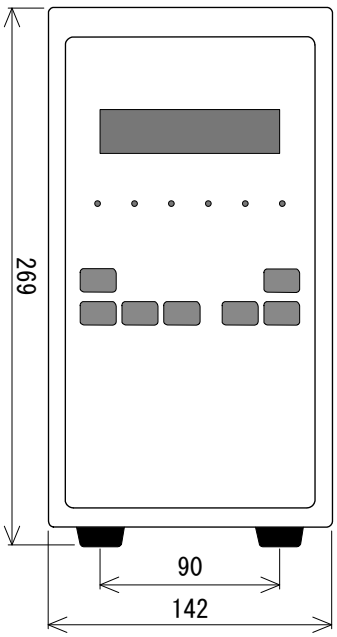
When welding starts during communication



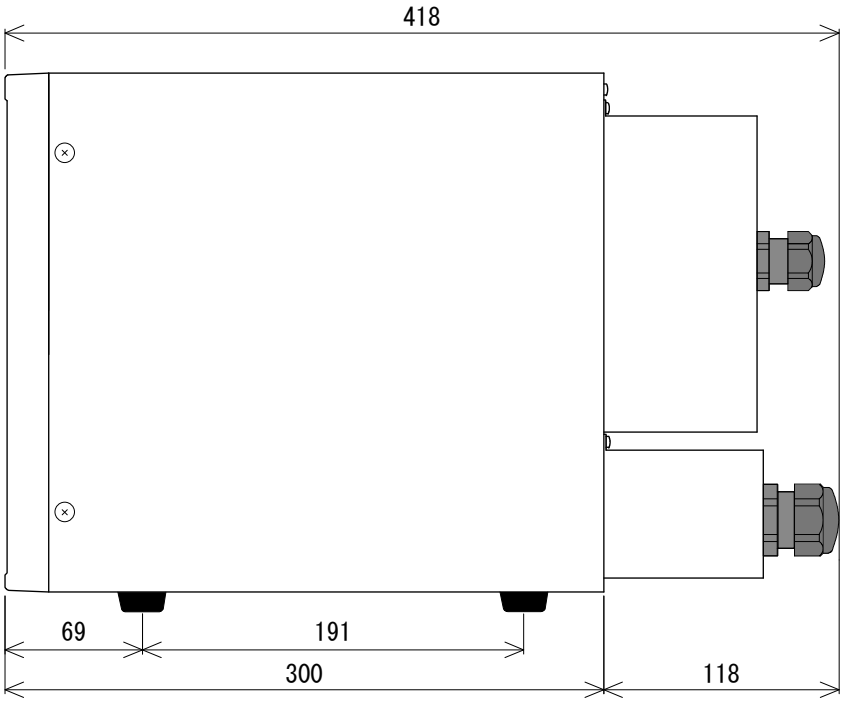
15. Outline Drawing

(Dimensions in mm)

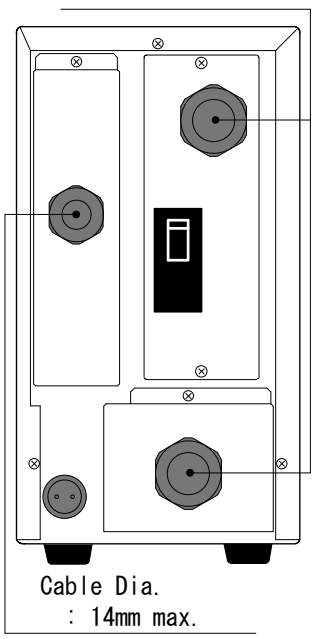
Front



Side



Rear



16. Schedule Table

	Item \ SCH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Welding Condi-tions	SQ	00–99 CYC														
	UP1	0–9 CYC														
	W1	00–99 CYC														
	CO	00–99 CYC														
	UP2	0–9 CYC														
	W2	00–99 CYC														
	DWN	0–9 CYC														
	HLD	00–99 CYC														
	PULSATION	1–9														
	SOLENOID	1, 2														
	CURR. 1	0.20–9.99 kA or 10.0%–99.9%														
	CURR. 2	0.20–9.99 kA or 10.0%–99.9%														
	1ST	10.0%–99.9%														
	2ND	10.0%–99.9%														
	HALF	10.0%–99.9%														
Current Monitor Upper-Lower Limit Judg-ment	W1 H	00, +01%– +49% or 0.00, 0.20–9.99 kA														
	W1 L	00, -01%– -49% or 0.00, 0.20–9.99 kA														
	W2 H	00, +01%– +49% or 0.00, 0.20–9.99 kA														
	W2 L	00, -01%– -49% or 0.00, 0.20–9.99 kA														
	1ST H	0.00, 0.20–9.99 kA														
	1ST L	0.00, 0.20–9.99 kA														
	2ND H	0.00, 0.20–9.99 kA														
	2ND L	0.00, 0.20–9.99 kA														
	HALF H	0.00, 0.20–9.99 kA														
	HALF L	0.00, 0.20–9.99 kA														

	Item \ SCH	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Welding Condi-tions	SQ																
	UP1																
	W1																
	CO																
	UP2																
	W2																
	DWN																
	HLD																
	PULSATION																
	SOLENOID																
	CURR. 1																
	CURR. 2																
	1ST																
	2ND																
	HALF																
Current Monitor Upper-Lower Limit Judg-ment	W1 H																
	W1 L																
	W2 H																
	W2 L																
	1ST H																
	1ST L																
	2ND H																
	2ND L																
	HALF H																
	HALF L																

			Count 0000–9999	Stepper-Up (-Down) Rate 050%–150%
Stepper-Up	SOL1	STEP1		
		STEP2		
		STEP3		
		STEP4		
		STEP5		
	SOL2	STEP1		
		STEP2		
		STEP3		
		STEP4		
		STEP5		

	Screen	Item		Range	Setting
Detail Setting	SET1 #1	MAX CURR		0.5–9.9 kA	
	SET1 #2	LCD CONTRAST		01–16	
	SET2 #1	NP		0–1	
		CC		0–3	
		SS		0–3	
		SM		0–3	
		SDT		01, 05, 10, 20	
	SET2 #2	SU		0–1	
		RW		0–1	
		WS		0–1	
		HET		0–1	
		CMI		DEF, 0–10.0 CYC	
	SET2 #3	NCL			
		CC:0	W1	00%–10%	
			W2	00%–10%	
		CC:1	W1	00%–10%	
			W2	00%–10%	
		CC:2	1ST	00%–10%	
			2ND	00%–10%	
		CC:3	HALF	00%–10%	
		NCI		00.0–10.0 CYC	
	SET2 #4	E01		1	1
		E02		0–1	
		E03		1	1
		E04		0–1	
	SET2 #5	E05		0–1	
		E06		0–1	
		E07		0–2	
		E08		0–1	
	SET2 #6	E09		1	1
		E10		0–1	
		E11		0–1	
		E12		1	1
	SET2 #7	E13		1	1
		E14		1	1
		E15		1	1
	SET2 #8	CONTROL		0–3	
		SPEED		0–2	
		ID		01–31	

CE

AMADA WELD TECH CO., LTD.

EU Declaration of Conformity

The company/manufacturer: **AMADA WELD TECH CO., LTD.**
95-3, Futatsuka, Noda-City, 278-0016 JAPAN

Herewith declares in his own sole responsibility conformity of the product

Designation: **AC Welding Power Supply**

Types/Serial Number, etc.:
MEA-100B-00-49
MEA-100B-03-19
MEA-100B-00-50

With applicable regulations below

EC Directive:
Low Voltage Directive 2014/35/EU
EMC Directive 2014/30/EU
RoHS Directive 2011/65/EU , (EU)2015 / 863

Harmonized European/International Standards applied:
ISO 12100 : 2010 , ISO 13849-1 : 2015
IEC 60204-1 : 2016
IEC 62135-1 : 2015 / COR1 : 2016 , IEC 62135-2 : 2020

Importer Distributor in EU:
(please place distributor/importer stamp here)

AMADA WELD TECH GmbH
Lindberghstrasse 1, DE-82178 Puchheim, GERMANY
Tel: + 49 8983 9403 - 0

Division:

2021.5.18

Noda-City/Japan 2021-05-18
Place and Date

AMADA WELD TECH CO., LTD.

T. Jingu

Toshiaki Jingu / General Manager Quality Guarantee Department
Name/Signature/Position

Note: This Declaration certifies conformity with the above mentioned Directive(s), but gives no assurances of properties within the meaning of the Law concerning product liability and ProdSG. It becomes invalid if any technical or other modification are carried out without manufacturers consent.

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