TOUCH START HEAD

MH-TL01B

OPERATION MANUAL

AMADA®

AA01OM1208900-01

Thank you for purchasing our Touch Start Head **MH-TL01B**.

- 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

Notification of Risk Information

This “Notification of Risk Information” is intended to notify the risk or others related to this machine (Ordinance on Industrial Safety and Health, Article 24-13) so as to promote the execution of risk assessment (Industrial Safety and Health Act, Article 28-2) on the enterprise side for prevention of labor disasters.

The risk map and residual risk table in this chapter include the matters to be described which are specified in the guide (Notification No.132 of the Ministry of Health, Labor and Welfare issued in 2012) related to the promotion of notice of the risk or others on the machine by the transferor of the machine.

This chapter is a part of the operation manual. Accordingly, do not operate the machine with an understanding of only this chapter. Be sure to read through all the operation manual with a good understanding of its contents before operating the machine.

In this “Notification of Risk Information” and the operation manual, “Injury Levels” are classified according to the following definitions.

 WARNING	This indicates the existence of potential hazard which, if not avoided, may result in death or serious injury of a personal.
 CAUTION	This indicates the existence of potential hazard which, if not avoided, may result in a less serious injury of a personal.

(1) Responsibility for Overall Management

The welding power supply exclusively for touch start **MAWA-050A** is required to use this product. Since there are items to be done for **MAWA-050A**, refer to the operation manual for **MAWA-050A**.

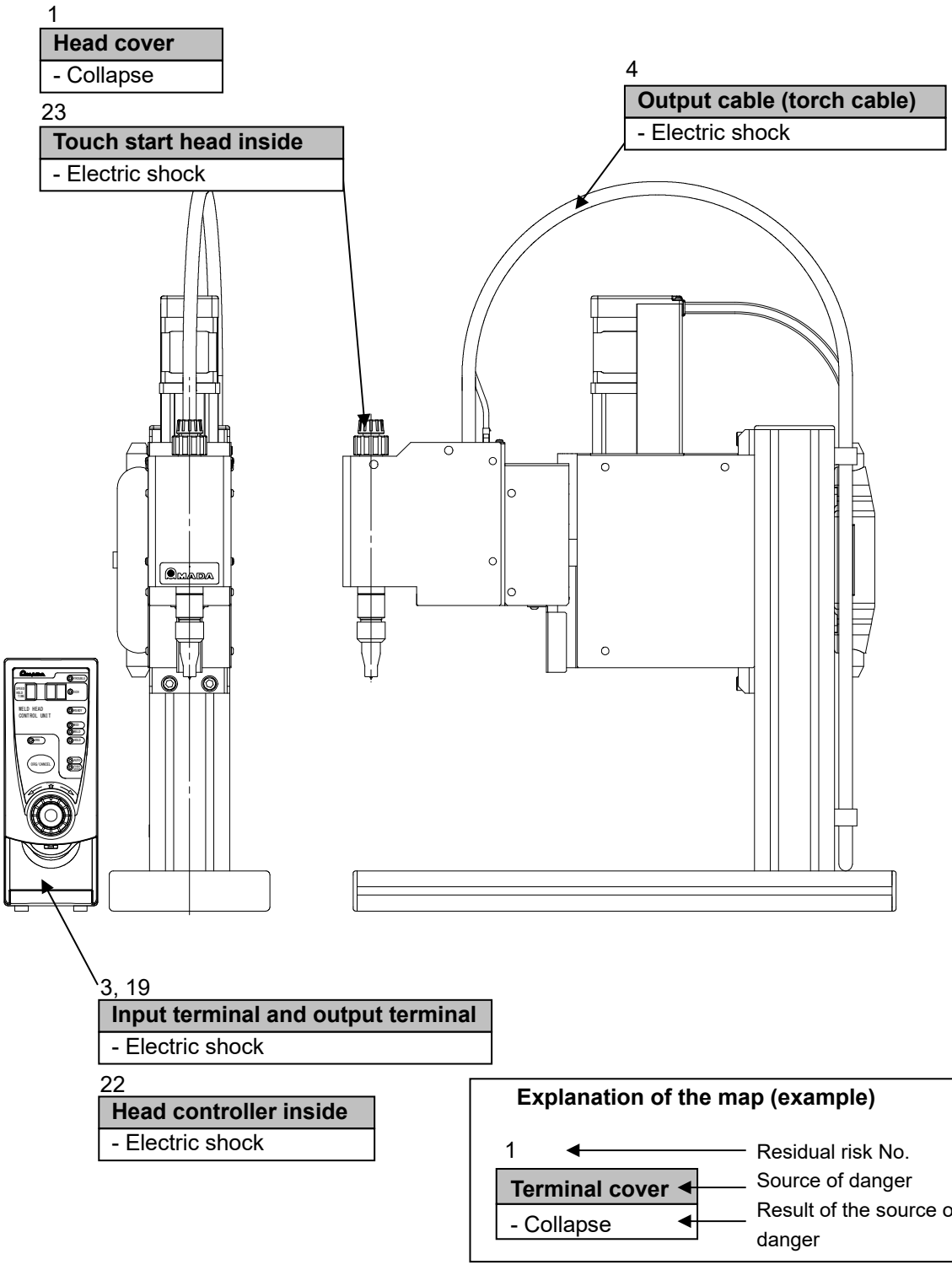
(2) Prohibition of Disassembly, Repair and Modification of the Touch Start Head

A high voltage is applied to the inside of the touch start head. If the case of the touch start head is removed, this may result in a serious accident. Do not operate the machine in the status where the cover of the touch start head is removed.

(3) Map of Residual Risks

For the details of various residual risks, refer to “(4) Table of Residual Risks.”

(3) -1. Map of residual risks of the touch start head unit

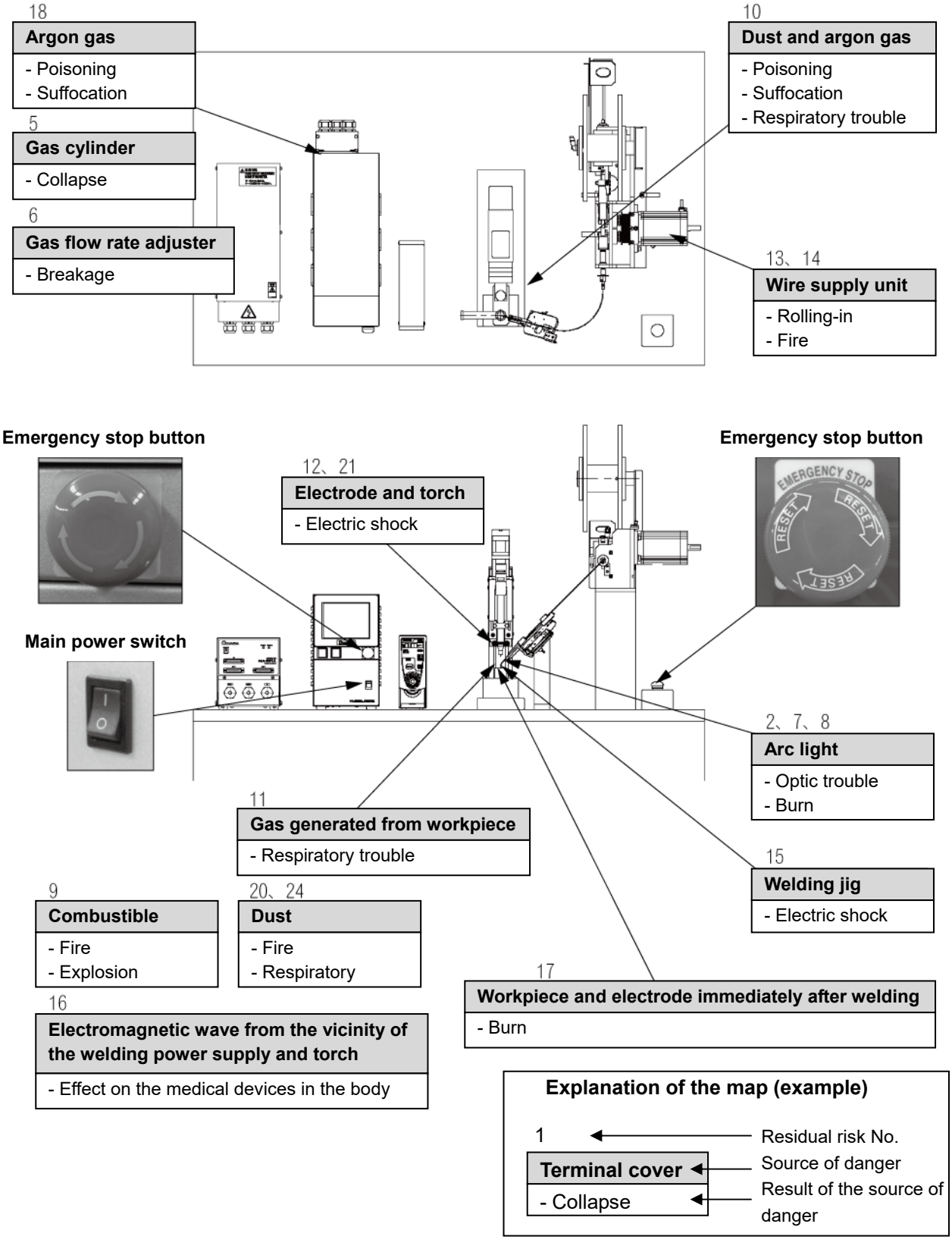


(3) -2. Map of residual risks of the standard system

(Welding power supply + Torch + Torch driving unit + Wire supply unit + Torch selector)

Remarks

- This is supposed on the case where the standard welding machine is incorporated. Execute risk assessment by using the customer's actual specification.



(4) Table of Residual Risks

For concrete positions of residual risks, refer to “(3) Map of Residual Risks.”

(4) -1. Installation

1	⚠ WARNING	Transporting the touch start head
[Source of risk]	Head cover	
[Contents of risk]	If the touch start head is transported by holding such a projection as the head cover, the foot may be collapsed if it is fallen down.	
[Protective measure]	When transporting the touch start head by holding it with hands, hold the bottom of base.	

2	⚠ WARNING	Installing the touch start head
[Source of risk]	Arc light	
[Contents of risk]	In the pulse TIG welding machine, strong arc light will be scattered at welding. If this arc light is caught by eyes, the eyes may be inflamed.	
[Protective measure]	Install a light-shielding partition or light-shielding curtain around the welding machine to mark off the welding work place so that arc light may not be applied to the human eyes directly. (Ordinance on Industrial Safety and Hygiene, Article 325)	

3	⚠ WARNING	Electric wiring
[Source of risk]	Power cable and foot switch cable	
[Contents of risk]	If the cover is deteriorated or damaged, the cable is directly touched, or a metallic part touched with the cable is touched, an electric shock may be caused.	
[Protective measure]	Do not use a deteriorated or damaged cable or plug. Put a cable cover on the moving part or part touched with the human body so that the power cable or foot switch cable may not be damaged.	

4	⚠ WARNING	Electric wiring
[Source of risk]	Output cable (torch cable and grounding cable)	
[Contents of risk]	A large current flows and a high voltage of about 50 kV is applied at a start of welding. If a cable with an insufficient capacity or a cable with a low electric strength is used, a fire or electric shock may be caused.	
[Protective measure]	Use the dedicated torch cable or grounding cable dedicate as the output cable. Fix the cable connecting part securely. Do not extend torch-side cable and workpiece-side cable unnecessarily. The cable length should be 10 mm or less.	

5	⚠ WARNING	Gas piping
[Source of risk]	Gas cylinder	
[Contents of risk]	If the gas cylinder is fallen down, the foot may be collapsed.	
[Protective measure]	Fix the gas cylinder securely on the gas cylinder stand or a structure such as a wall or pillar.	

6	⚠ WARNING	Gas piping
[Source of risk]	Gas flow rate adjuster	
[Contents of risk]	If an inappropriate gas flow rate adjuster is used for the gas cylinder, explosion may be caused.	
[Protective measure]	Entrust the specialist with the gas piping work.	

(4) -2. Machine operation

7	⚠ WARNING	Welding
[Source of risk]	Arc light	
[Contents of risk]	If arc light is directly seen, the eyes may be inflamed.	
[Protective measure]	Before performing welding operations, put on light-shielding glasses or protective mask with light-shielding level No.9 or more. To monitor welding, put on protective glasses with light-shielding level No.9 or more or perform monitoring through a light-shielding curtain. Do not allow any person thoughtlessly to enter an area around the welding machine and welding operation place.	

8	⚠ WARNING	Welding
[Source of risk]	Arc light	
[Contents of risk]	If arc light is directly applied to the skin, the skin may get burnt.	
[Protective measure]	Before performing welding operations, put on protectors such as the leather protective glasses for welding, clothes with long sleeves, foot cover, and leather apron. Do not allow any person thoughtlessly to enter an area around the welding machine and welding operation place.	

9	⚠ WARNING	Welding
[Source of risk]	Combustibles	
[Contents of risk]	If the waste (spatter) to be generated at welding is applied to any combustible, it may catch fire, causing a fire or explosion.	
[Protective measure]	Do not perform welding near combustible gas. Do not put any combustible around the welding operation place. If the waste cannot be removed, put an incombustible cover on it. Install a fire extinguisher in the welding operation place so that even if a fire occurs, it may be extinguished immediately. A fire extinguisher suitable for each target material must be selected for use. Fire extinguishers are classified into a type for common fire, type for oil fire, type for electric fire, and type for special fire (metals, etc.). Prepare a fire extinguisher suitable for a presupposed fire.	

10	⚠ WARNING	Welding
[Source of risk]	Dust and argon gas	
[Contents of risk]	If the area is filled with dust and argon gas, the human body may be badly affected.	
[Protective measure]	Perform ventilation around the welding operation place and the whole factory at all times. Install sealed-up equipment, local exhaust device, etc. and put on a gas mask or dust-proof mask as required.	

11	⚠ WARNING	Welding
[Source of risk]	Gas generated from workpieces	
[Contents of risk]	After a covered steel plate is welded, the human body may be affected by the generated gas.	
[Protective measure]	Perform ventilation around the welding operation place and the whole factory at all times. Install sealed-up equipment, local exhaust device, etc. and put on a gas mask or dust-proof mask as required.	

12	⚠ WARNING	Welding
[Source of risk]	Electrode and torch	
[Contents of risk]	At a start of arc discharge, a high voltage will be generated between the electrode at the end of the torch and a workpiece. If a person touches or approaches the electrode, an electric shock may occur.	
[Protective measure]	Do not touch or approach the electrode portion during welding operations. Do not perform welding by holding the torch with hands.	

13	⚠ CAUTION	At all times
[Source of risk]	Rotary part of the wire supply unit	
[Contents of risk]	If hands, fingers, hairs or clothes are brought near the rotary part of the wire supply unit, they may be rolled into it.	
[Protective measure]	While the power supply of the welding machine is ON, do not bring hands, fingers, hairs, clothes, etc. close to the rotary part.	

14	⚠ CAUTION	At all times
[Source of risk]	Arc discharge of the wire supply unit	
[Contents of risk]	If the wire supply unit and a workpiece are electrically connected, a high voltage may be applied through the wire, thereby causing an arc discharge and a fire in an unexpected place.	
[Protective measure]	Perform insulation between the wire and the workpiece.	

15	⚠ CAUTION	Welding
[Source of risk]	Welding jig	
[Contents of risk]	Electrification is performed neat the welding jig. If a person touches such a place, an electric shock may occur.	
[Protective measure]	Perform grounding so as not to allow a workpiece or the welding jig which is electrically connected with a workpiece to be an electrified part. During welding operations or just after welding operations, do not touch the welding jig and area around the welding jig.	

16	⚠ CAUTION	Welding
[Source of risk]	Electromagnetic wage from the welding power supply and torch	
[Contents of risk]	In the case of a person using an electronic medical device such as pace maker and germ eliminating device, the operation of an electronic medical device may be affected by the electromagnetic wave generated during arc discharge.	
[Protective measure]	Those who use any electronic medical device must not approach around the welding machine or welding operation place without a doctor’s permission. If they feel unwell or are out of order, leave the place at once.	

17	⚠ CAUTION	Taking out a workpiece
[Source of risk]	Workpiece and electrode immediately after welding	
[Contents of risk]	Immediately after welding, the workpiece and electrode are still hot. If the welded workpiece is touched with a bare hand or the electrode is touched in taking out a workpiece, this may result in a burn.	
[Protective measure]	Put on leather gloves when handling a workpiece.	

(4) -3. Maintenance

18	⚠ WARNING	Gas piping
[Source of risk]	Argon gas	
[Contents of risk]	In case the argon gas piping work is inappropriate, a gas leak may occur. The welding operation place is filled with argon gas, the human body may be affected badly.	
[Protective measure]	After replacement of a gas cylinder, consult with a gas piping specialist or gas supply company about the gas pressure adjusting operation.	

19	⚠ WARNING	Power inspecting
[Source of risk]	Primary power piping	
[Contents of risk]	When inspecting the primary power wire on the factory side, an electric shock may be caused by touching the charged part by mistake.	
[Protective measure]	Before performing inspection operations, stop the electric power supply and turn off the source power supply on the factory side. Put a notice to notify “Under inspection” to the other operators.	

20	⚠ WARNING	Workshop cleaning
[Source of risk]	Dust	
[Contents of risk]	If dust is inhaled, the human body may be affected. And if dust is accumulated, a fire may occur.	
[Protective measure]	Perform cleaning periodically around the welding operation place and workshop. Perform cleaning by using a method that does not scatter dust, for example, by using a vacuum cleaner or washing with water. When dust is scattered, put on a dust-proof mask.	

21	⚠ WARNING	Electrode replacement
[Source of risk]	Electrode	
[Contents of risk]	If another worker operates the welding power supply by mistake, this may cause an electric shock due to a high voltage to the worker who replaces the electrode. In case a voltage is left by charged electrode, an electric shock may occur.	
[Protective measure]	Before performing electrode replacing operations, turn off the welding power supply. For other workers, “Under electrode replacement” should be indicated. Short-circuit the electrode with the grounding side to discharge a charged status and then start electrode replacing operations.	

22	⚠ WARNING	Head controller maintenance
[Source of risk]	Inside of the head controller	
[Contents of risk]	If the cover is removed and the internal high-voltage portion is touched immediately after the power supply is turned on or off, this may result in a death. Even after the power supply is turned off, the capacitor remains charged for a certain time.	
[Protective measure]	Do not open the cover of the head controller. If a head controller trouble occurs, make contact with us or the distributor.	

23	⚠ WARNING	Touch start head removal
[Source of risk]	Inside of the touch start head	
[Contents of risk]	If the voltage is supplied or the output terminal remains charged when the touch start head is removed, this may cause an electric shock.	
[Protective measure]	Before removing the touch start head, shut off the power to the welding power supply and short-circuit the electrode with the grounding side to discharge the electricity charged in the output terminal. Then, remove the head cover.	

(4) -4. Scrapping

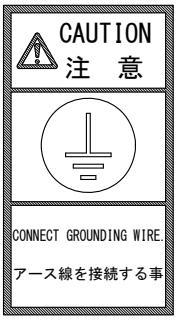
24	⚠ WARNING	Dust scrapping
[Source of risk]	Dust	
[Contents of risk]	If dust is inhaled, the human body may be badly affected.	
[Protective measure]	Classify collected dust according to materials and keep it in a can with a cover so that it may not be scattered. Scrap it as industrial waste. Do not scrap it like general waste.	

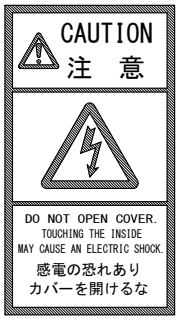
(5) On Disposal

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.

(6) Warning Labels

A warning label is pasted on the head controller for safe use. The pasting place and meaning of each label are as shown below.





Pasting place: Front side of the upper part of the controller

Meaning:

Caution for grounding wire connection

Danger of electric shock

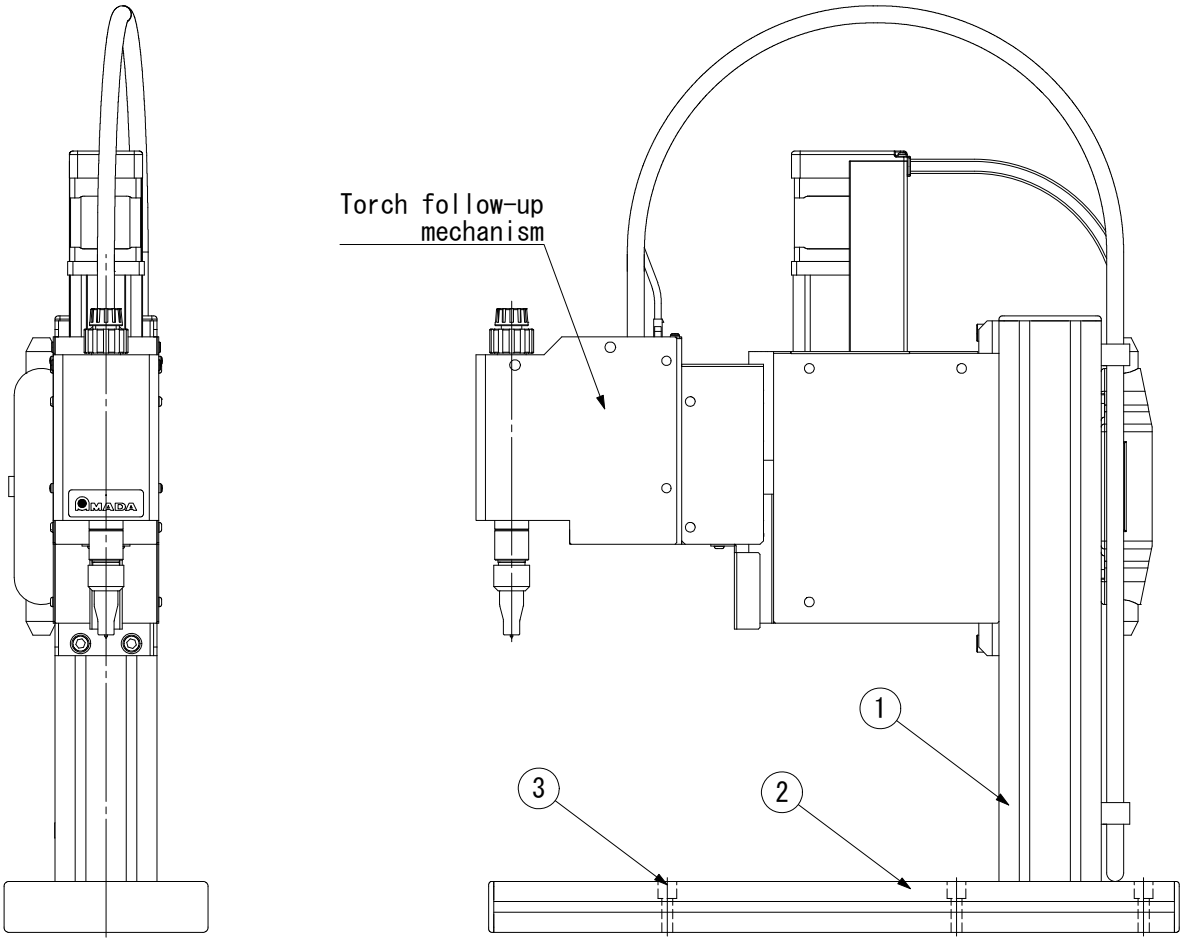
1. Features

- The torch is motor driven exclusively for PULSETIG welding power supply **MAWA-050A** (a model dedicated for touch start).
- Since the touch start head reduces an impact when workpiece contacts the electrode, deformation of workpiece does not occur and the life of electrode can be extended.
- Since this Head is motor driven, the piping for air actuation is not needed, enabling an easy installation.
- You can fit the electrode-force speed to suit your welding work as it is adjustable in eight or four steps.
- Fifteen operating schedules are selectable; they are selectable externally.
- The electrode moves down fast from the start point (stand-by position) to the mid-point (middle-stop position), slowly contacts the workpiece, and then moves to the main weld point[*1].
  Very little shock deforms the workpieces less and extends the electrode life.
  The start point, the mid-point and the main weld point are adjustable arbitrarily.
- The dedicated controller easily sets the electrode position and speed.

*1: The main weld point is the position to output the pulse current (excluding the initial current) of the PULSETIG welding power supply **MAWA-050A**.

2. Name and Functions of Each Section

(1) MH-TL01B

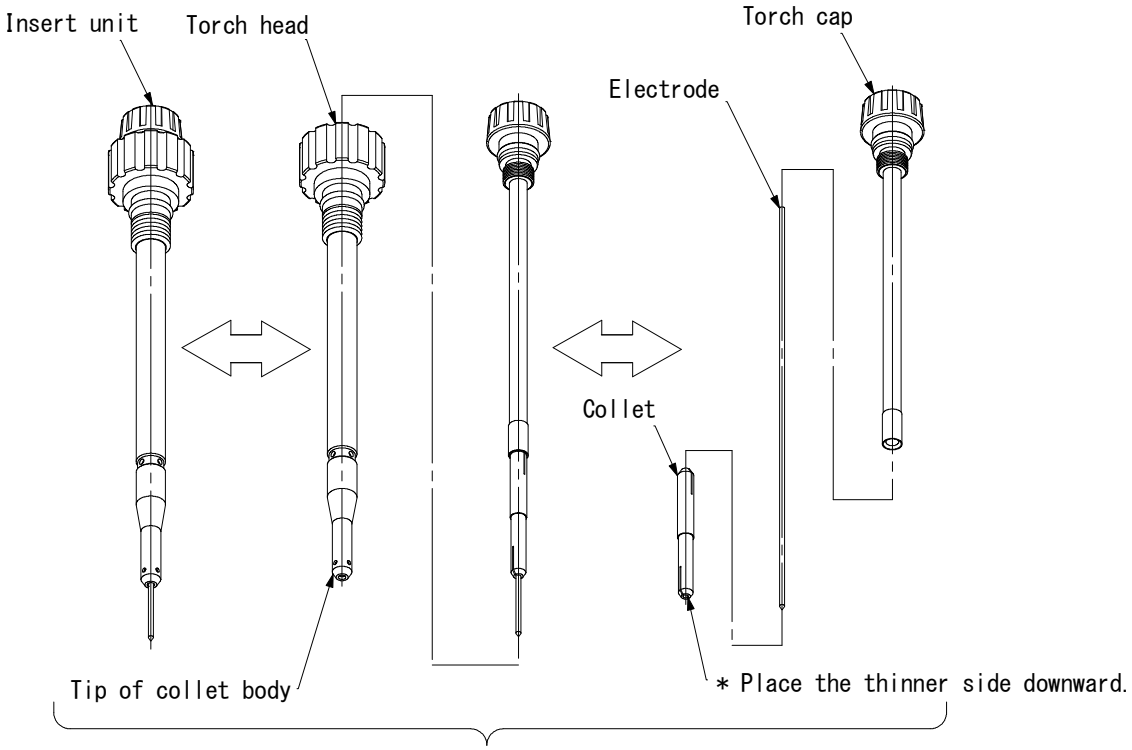


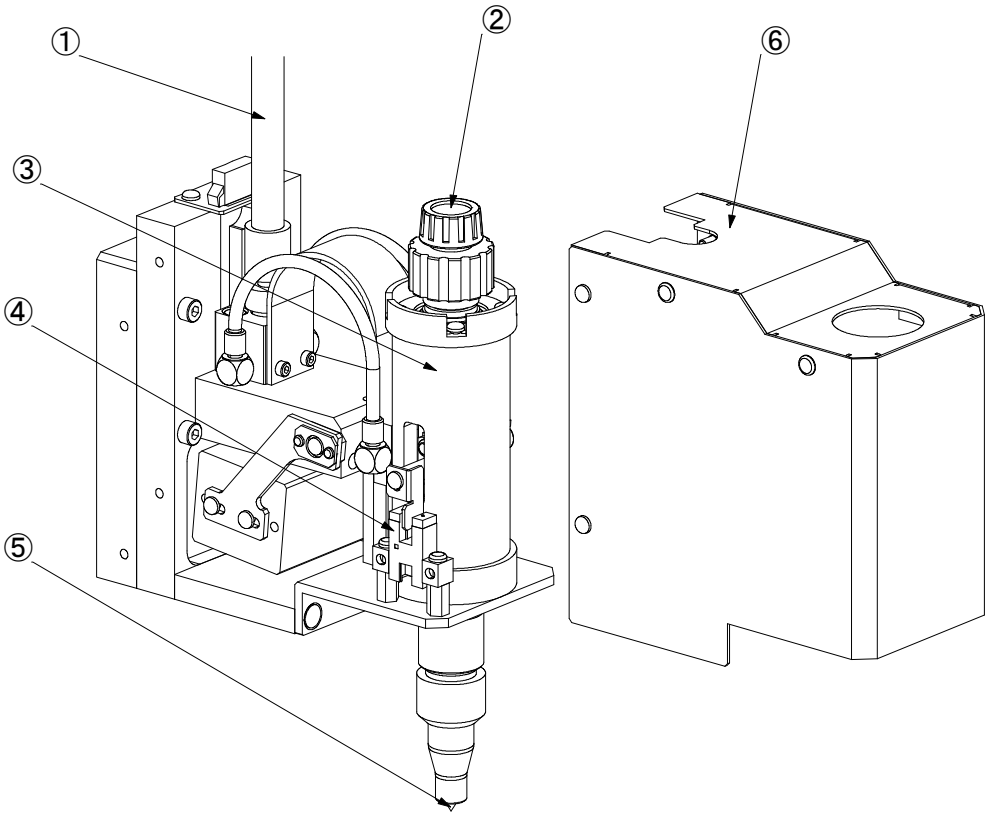
① **Column**
For mounting the driving mechanism, etc.

② **Base**
For the Head.

③ **Base-Mounting Holes**
For mounting the Head to the workbench. Six (6) holes are provided.
φ6.5 mm diameter, φ11 mm spot facing and 10 mm depth.

(2) Torch Follow-Up Mechanism





① Torch Cable

For the welding current and the argon gas supply.
The torch cable is a separately sold item. Select and purchase one from torch cables in **8. (3)**.

② Torch

For the PULSETIG welding.
By rotating the bigger knob on the torch head counterclockwise, the insert unit can be removed. By rotating the smaller cap counterclockwise with holding the insert unit, it can be disassembled into collet, electrode and torch cap to replace the electrode.

③ Torch Holder

Secures the torch to the follow-up mechanism.

④ Weld-Point Detecting Sensor

Makes sure that electrode makes contact with workpiece at touch start and the detecting dog is raised 1.0 mm.

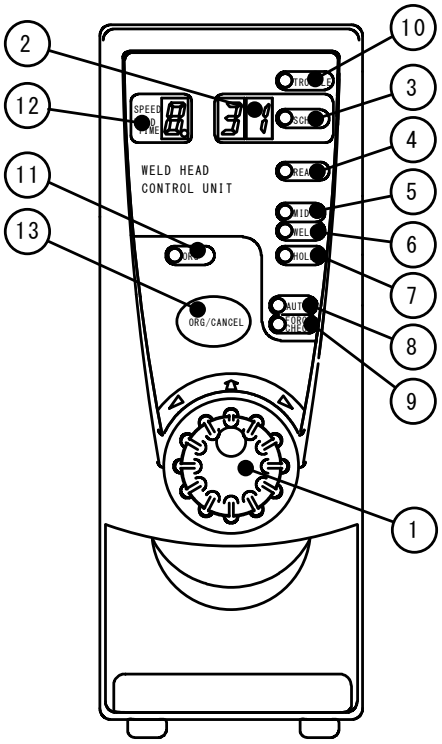
⑤ Electrode

Select a material and a diameter suitable for your use.
The electrode is a separately sold item. Select and purchase one from electrodes in **8. (3)**.

⑥ Cover

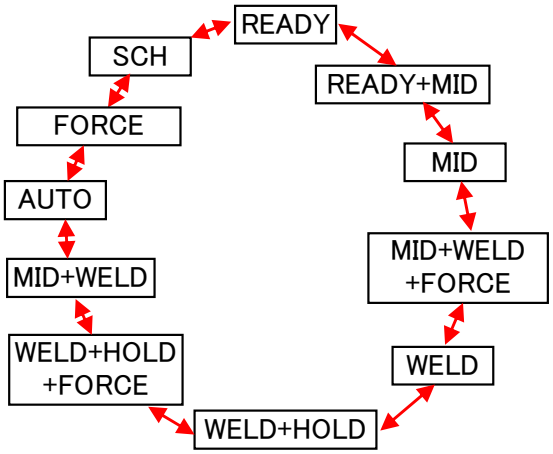
Cover for the torch follow-up mechanism.

(3) Controller Front



① **Operation Button**

Operate the Head by turning the button clockwise/counterclockwise or pressing it. By turning the button, the lamp illumination changes as shown:



② [SCH(Schedule)] Display

Indicates Schedule Numbers.
Also indicates the “distance from Weld Point (Initial Current) to Weld Point (Main Welding)” when lamp lights up simultaneously with other lamps as follows:

Lamp	When illuminated,	When blinking,
② **[SCH (Schedule)] Display**	Schedule Nos. are displayed. (15 combinations of Electrode position, Speed and Hold Time can be registered as Schedule.)	When power supply is applied, zero “0” blinks.
		When trouble occurs, fault code is displayed.
		Schedule No. is being changed.
② **[SCH (Schedule)] Display,** ⑥ **[WELD] Lamp and** ⑦ **[HOLD] Lamp**	Operation button is selecting a function. (**[SCH] Display** does not light up.)	Distance from Weld Point (Initial Current) to Weld Point (Main Welding) is being set. Distance is displayed on **[SCH] Display**.
	Electrode is at Weld Point (Main Welding).	

See the list below for ③ to ⑪

Lamp	When illuminated,	When blinking,
③ **[SCH] Lamp**	Operation button is selecting a function.	Schedule No. is being changed
④ **[READY] Lamp**	Electrode is at Start Point and completed for work.	Start Point is being changed.
	Operation button is selecting a function.	
⑤ **[MID] Lamp**	Electrode is at Mid-Point.	Mid-Point is being changed.
	Operation button is selecting a function.	
⑥ **[Weld] Lamp**	Electrode is at Weld Point (Initial Current).	Lowest point (Downstop Point) is being changed.
	Operation button is selecting a function.	
⑦ **[Hold] Lamp**	Operation button is selecting a function.	
⑧ **[AUTO] Lamp**	Operation button is selecting a function.	Auto-function is setting electrode position and movement.
⑨ **[FORCE CHK] Lamp**	Operation button is selecting a function.	Checking movement is being performed.
⑩ **[TROUBLE] Lamp**	Trouble is occurring.	
⑪ **[ORG] Lamp**	The **[ORG] Lamp** is in no use.	

② [SPEED HOLD TIME] Display

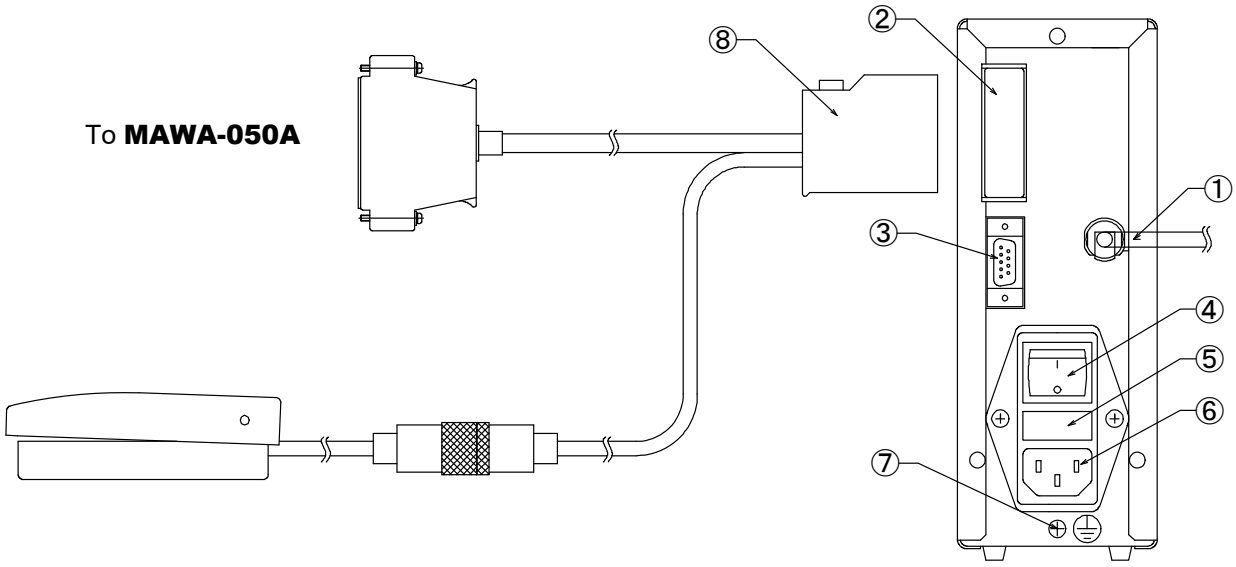
Indicates the “electrode speed” in eight or four steps. The larger number indicates the faster electrode speed.
Also, the lamp lights up simultaneously with other lamps as follows:

Lamp	When illuminated,	When blinking,
⑫ **[SPEED HOLD TIME] Display**	In case of Movement Mode 1 (see **5. (1)**), electrode position is at Start Point and the **Display** shows “A” when setting is not performed.	
④ **[READY] Lamp,** ⑤ **[MID] Lamp and** ⑫ **[SPEED HOLD TIME] Display**	Operation button is selecting a function. (**[SPEED HOLD TIME] Display** does not light up.)	Electrode speed between Start Point and Mid-Point is being set.
	Electrode is moving between Start Point and Mid-Point.	
⑤ **[MID] Lamp,** ⑥ **[WELD] Lamp and** ⑫ **[SPEED HOLD TIME] Display**	Operation button is selecting a function. (**[SPEED HOLD TIME] Display** does not light up.)	Electrode speed from Weld Point (Main Welding) to Mid-Point is being set.
	Electrode is moving to Mid-Point or Weld Point (Initial Current, Main Welding).	
⑤ **[MID] Lamp,** ⑥ **[WELD] Lamp,** ⑨ **[FORCE CHK] Lamp and** ⑫ **[SPEED HOLD TIME] Display**	Operation button is selecting a function. (**[SPEED HOLD TIME] Display** does not light up.)	Electrode speed from Mid-Point to Weld Point (Initial Current) is being set.
⑥ **[WELD] Lamp,** ⑦ **[HOLD] Lamp,** ⑨ **[FORCE CHK] Lamp and** ⑫ **[SPEED HOLD TIME] Display**	Operation button is selecting a function. (**[SPEED HOLD TIME] Display** does not light up.)	Electrode speed from Weld Point (Initial Current) to Weld Point (Main Welding) is being set.

③ [ORG/CANCEL] Button

Interrupts the operation of setting.

(4) Controller Rear



① [MOTOR CONTROL] Cable
Cable for controlling a motor to drive the electrode.

② I/O Connector
For input/output of signals. The foot switch cable is connected to this.

③ Connector for Weld-Point Detecting Sensor
For inputting the weld-point detection signal.

④ Power Switch
Switch for turning on/off power supply of 100 to 240 V AC.

⑤ Fuse Holder
Contains a fuse.

Fuse Rating	250 V, 1A, 5 mm dia. 20 mm length (Delay melting and high breaking capacity type)

⑥ Connector for Power Cable
Connects a power cable (separately sold) to the power supply of 100 to 240 V AC.

⑦ Ground Terminal
Use this terminal when you can not take a ground by using a power cable with a ground wire (separately sold).

⑧ Foot Switch Cable
Operates the Head manually. This is a 2-level foot switch. Connected to the I/O connector.

3. Installation and Connection

(1) Basic Installation and Connection

Before using your Head, install it according to the following procedures.

⚠ WARNING

Connect the grounding cable to the grounding terminal located near the grounding mark.

⚠ CAUTION

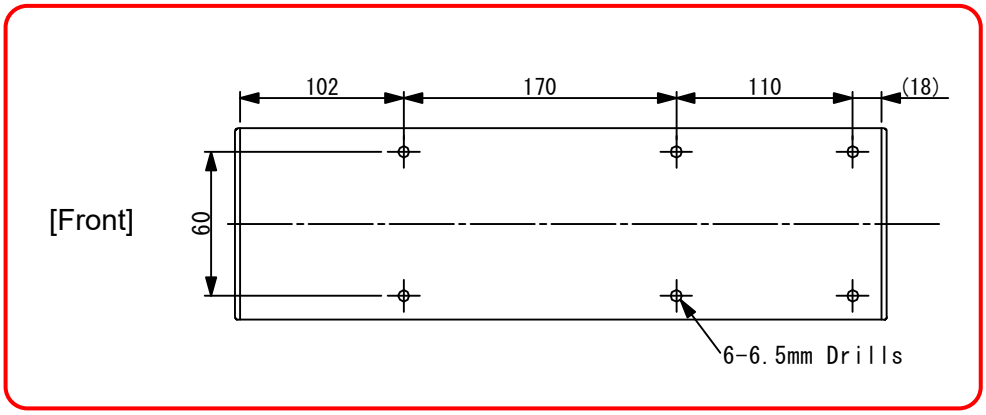
When using, install and fix the Head on firm, level and vibration-free surface.
If you use it with the torch follow-up mechanism inclined or the base not fixed, it may cause injury due to its fall, and degraded weld quality.

① Determining Where to Install

Determine where to install the Head and welding power supply.

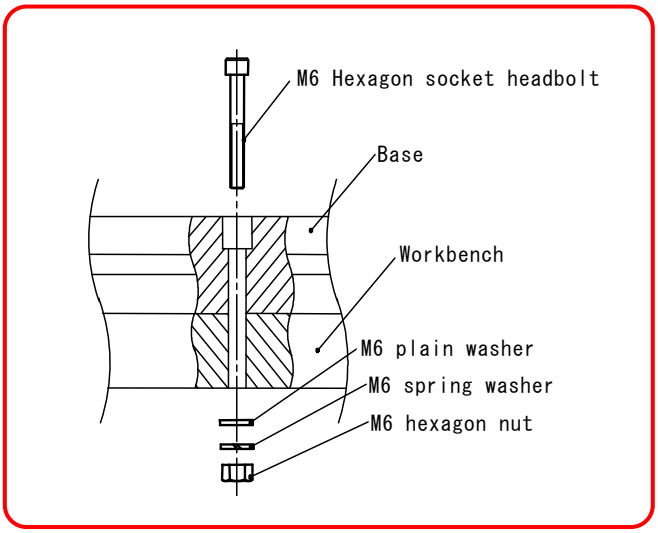
② Drilling Mounting Holes

Drill mounting holes on the workbench to secure the Head, following the drawings below:



③ Installing the Head

Install the Head to the workbench with the hexagon socket head bolts/cross-recessed countersunk head screws, plain washers, spring washers and hexagon nuts (See drawings below). Use a proper tool suitable for the bolts/screw to secure the Head.



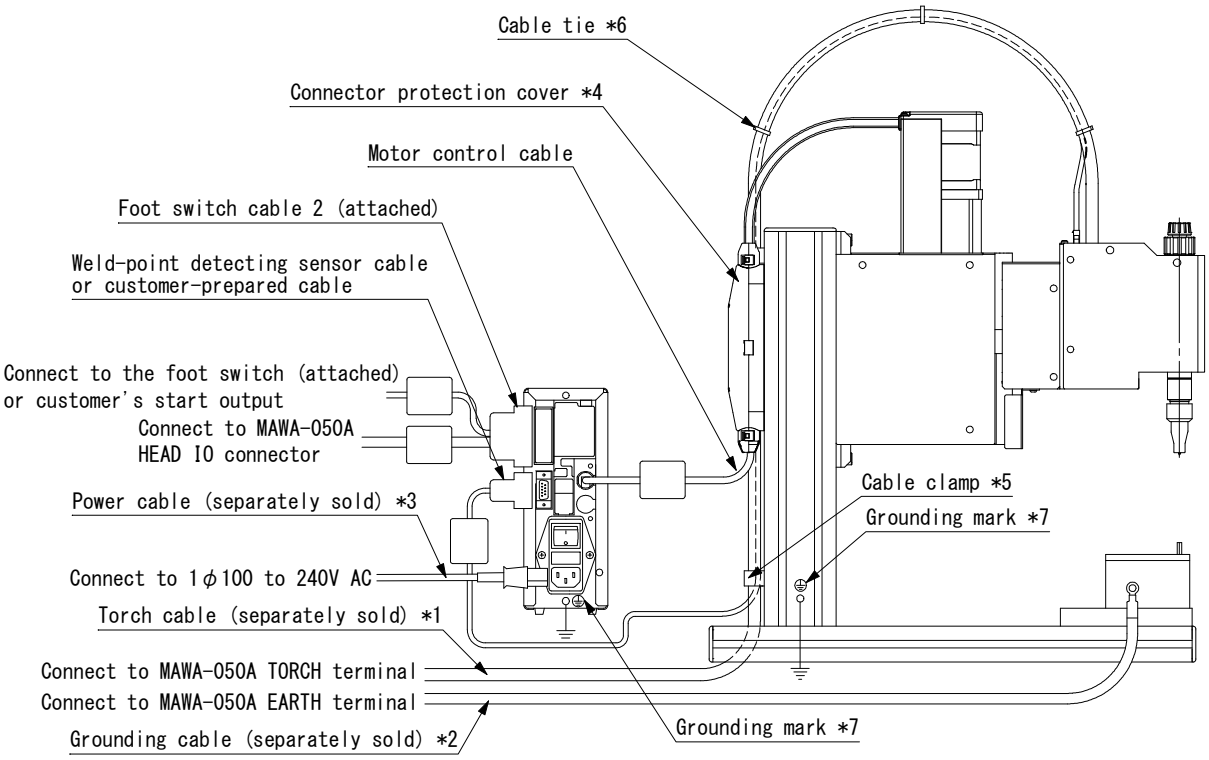
④ Connecting the Controller

Connect the I/O connector (see **4. Interface**).

Connect the connector for weld-point detecting sensor and MOTOR CONTROL connector.

Lastly, connect the Power Cable to the 100–240 V AC, 50/60 Hz outlet.

(2) Example Installation



*1 Select one from torch cables in 8.(3) Separately Sold items.
*2 Select one from grounding cables from options for MAWA-050A.
*3 Select one from power cables in 8.(3) Separately Sold items.
*4 Protective cover for the relay connector of the motor control cable.
*5 Secure the torch cable and the weld-point detecting sensor cable.
*6 Bundle the torch cable and the weld-point detecting sensor cable by such as a cable tie.
*7 Connect the grounding cable to the grounding terminal located near the grounding mark.

⚠ CAUTION

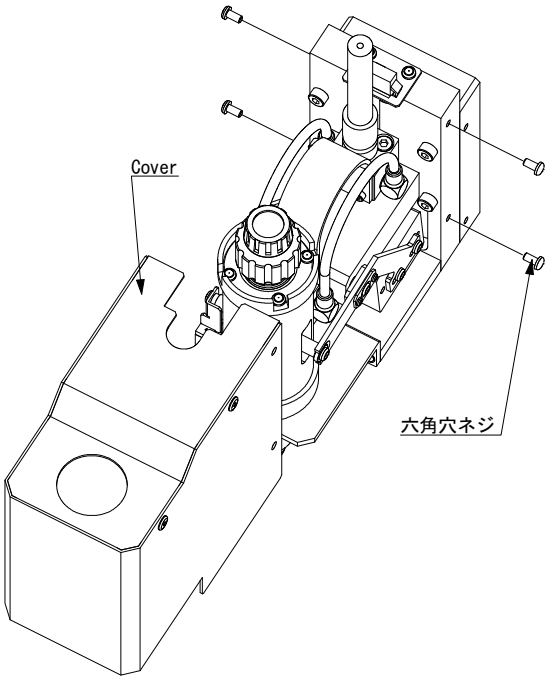
Secure the weld-point detecting sensor cable and the torch cable with clamps.
Note that a load is not applied on cables when the torch follow-up mechanism portion is operated.

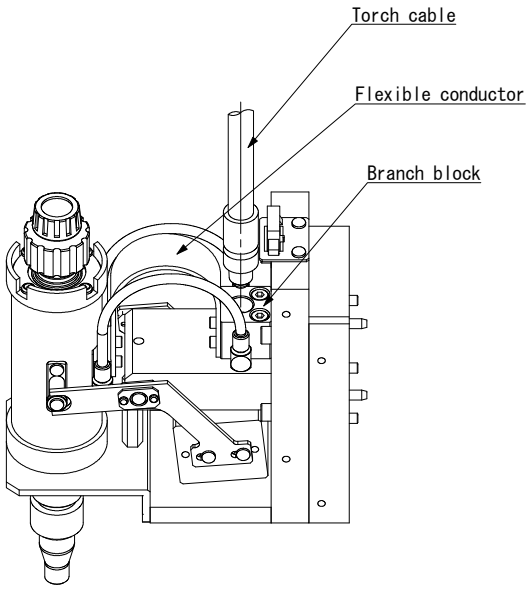
(3) Connection of the Torch Cable

Before using your Head, connect the torch cable according to the following procedures.

⚠ CAUTION

When connecting or fixing the torch cable, do not bend the flexible conductor.
If you bend the flexible conductor, it may cause degraded weld quality.





Remove four hexagon socket head screw for mounting the cover with a hexagon wrench (2 mm).

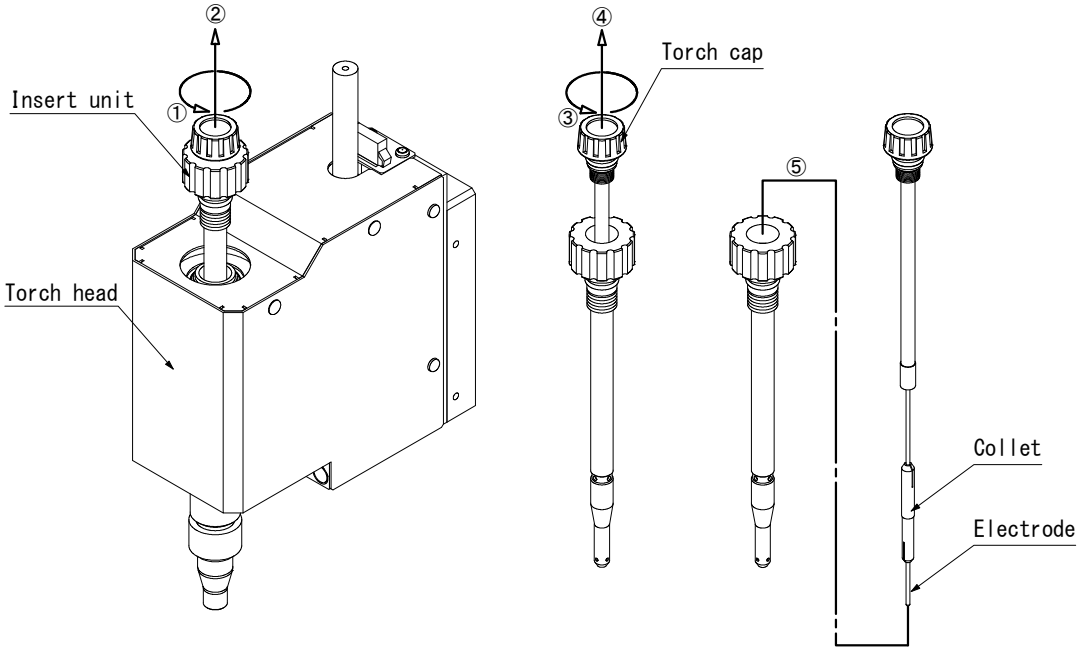
Remove the cover with lifting the cover up above the knob on the torch.

Rotate and connect the torch cable after inserting the hexagon head bolt at the end of the torch cable into the screw hole of the branch block, and then additionally tighten it with single-open-end wrench (12 mm) to fix it.

Mount the removed cover and fix it with four hexagon socket head screw.

As sown in **3. (2) Example Installation**, secure the weld-point detecting sensor cable and the torch cable with clamps. Note that a load is not applied on cables when the torch follow-up mechanism portion is operated.

(4) Replacement of Electrode



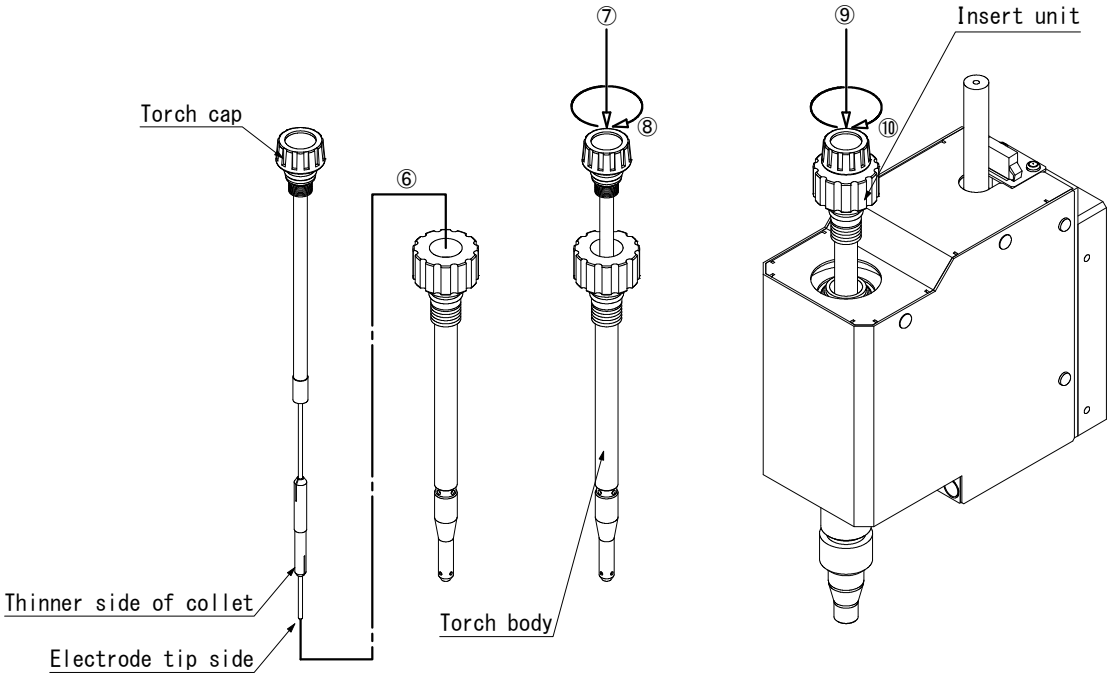
① Rotate the bigger knob on the torch head counterclockwise to detach the insert unit.

② Lift up the detached insert unit to remove it.

③ Rotate the smaller knob on the torch cap counterclockwise with holding the insert unit to detach the torch cap.

④ Lift up the detached torch cap to remove it from the insert unit.

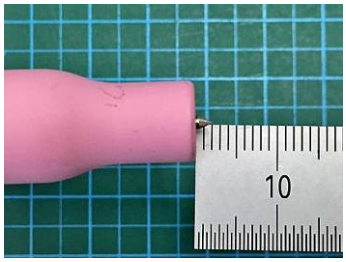
⑤ The electrode can be separated from the collet by removing the torch cap and it can be replaced.



⑥ Combine the electrode and collet so that the thinner side of the collet faces toward the electrode tip, and insert the electrode end into the torch cap.

⑦ Combine the torch cap, collet and electrode, and insert them into the torch body.

⑧ The electrode can be fixed by rotating the torch cap clockwise and holding the collet down. When the electrode is fixed in a state that it is protruded by 21 mm at this time, it will be protruded by 2 mm from the nozzle in the final form.

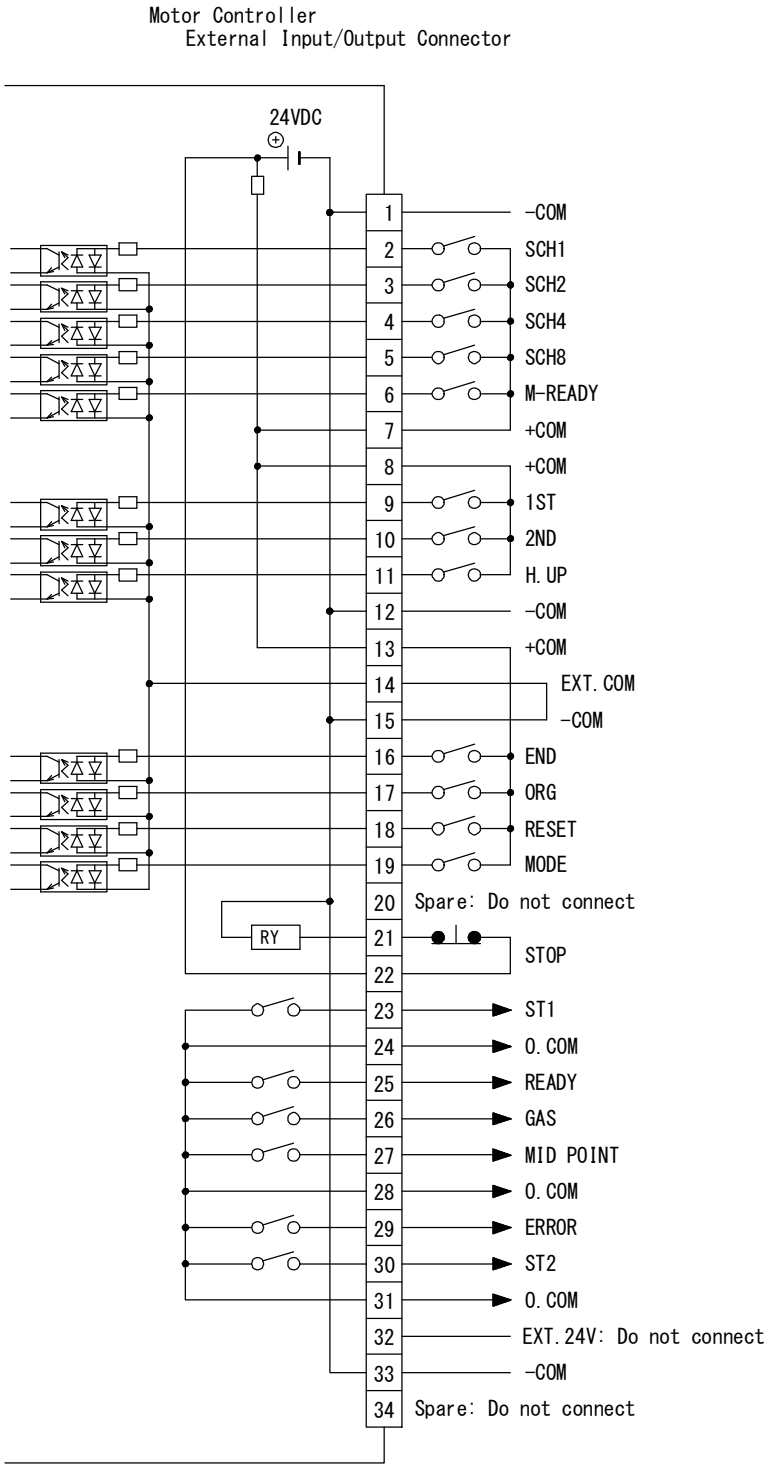


⑨ Install the electrode-fixed insert unit on the torch head.

⑩ Fix the insert unit by rotating the knob on the insert unit clockwise. The replacement of the electrode is now complete.

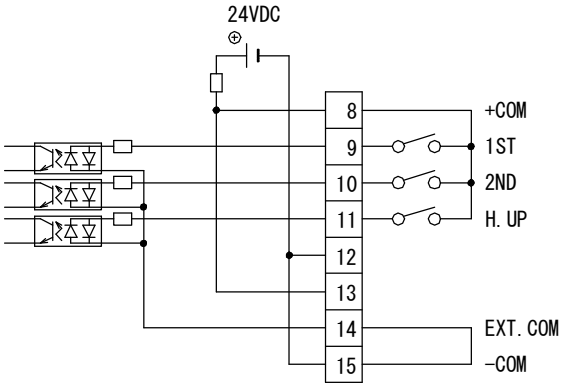
4. Interface

(1) Connection Diagram of External Input/Output Signal

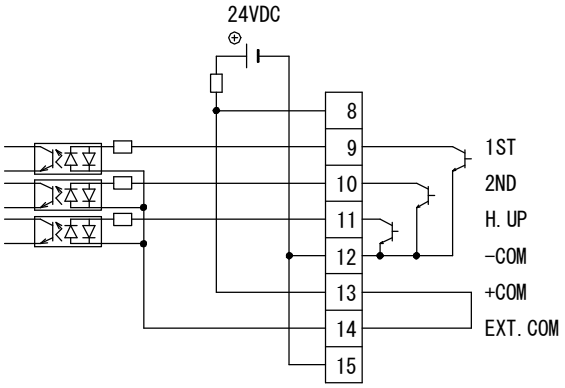


[Example of Connection]

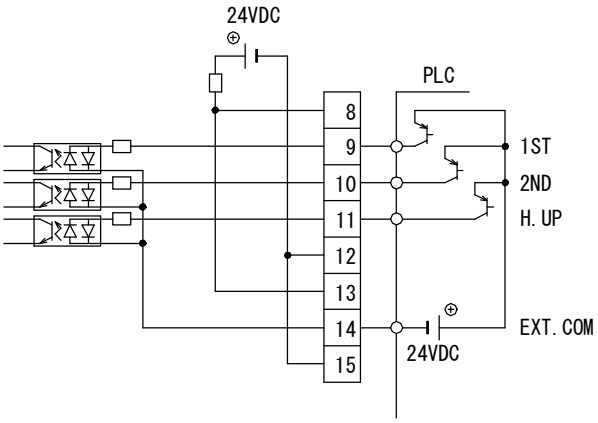
・When contacts are used as input terminal of I/O connector



・When NPN transistor (sink type) on PLC is used as input terminal of I/O connector



・When PNP transistor (source type) on PLC is used as input terminal of I/O connector

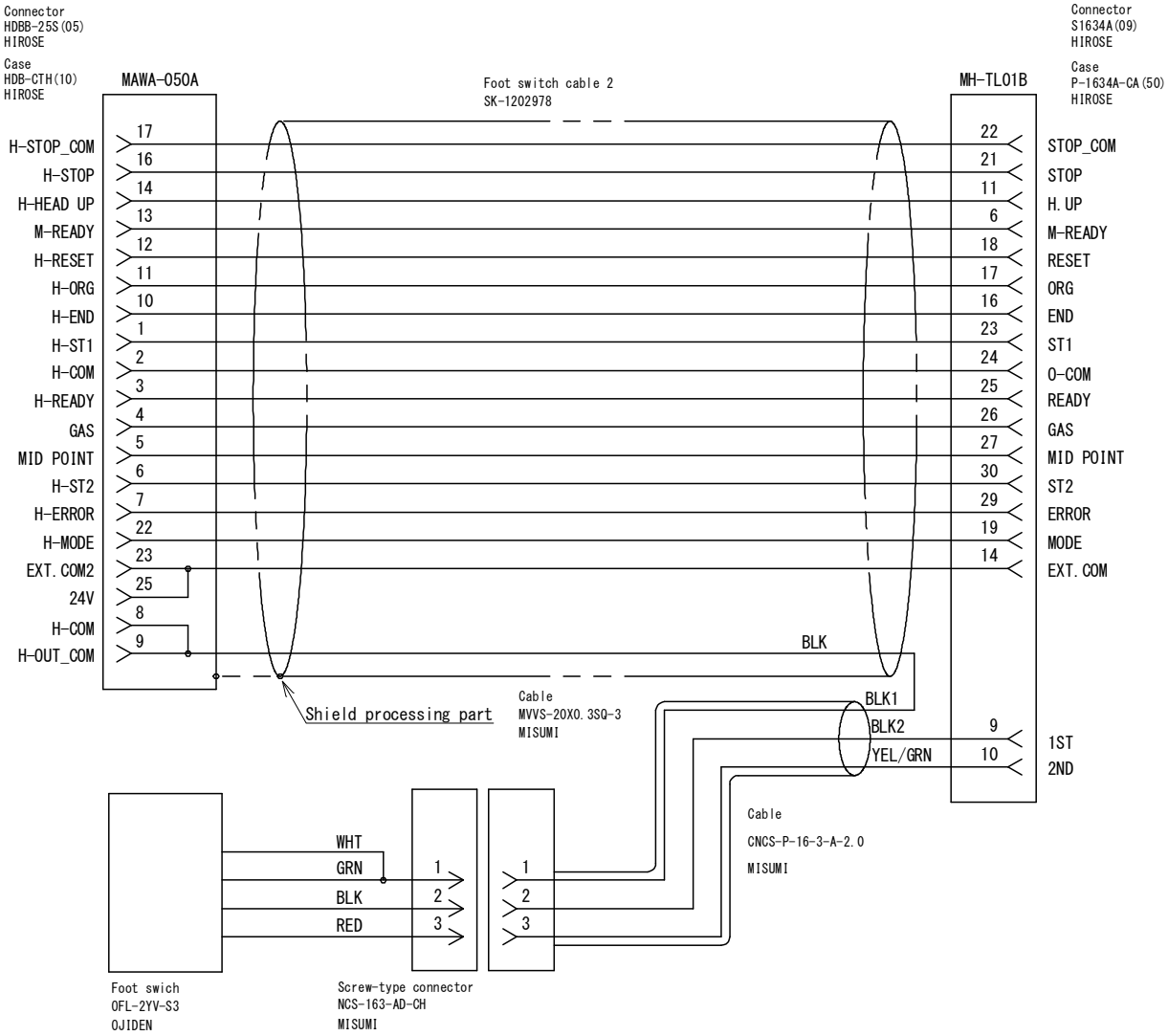


(2) Connection Diagram of MAWA-050A

MH-TL01B can be connected to the PULSETIG welding power supply **MAWA-050A** with the attached foot switch cable 2 (SK-1202978).

> **⚠ CAUTION**
>
> When using the attached foot switch cable 2, turn on this product after turning on **MAWA-050A**.
> If this product is turned on first, the [STOP]-Pin for an emergency stop of the motor is not detected and the error (fault code “6”) will occur.

Connection diagram of the foot switch cable 2 (SK-1202978)



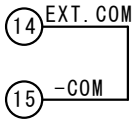
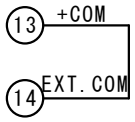
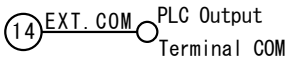
(3) Explanation of External Input/Output Signal

Each pin on external I/O signal is described.
Input signal is explained as contact input.

Pin No.	Name	I/O	Description
1	-COM		Connected to [GND] (0V) internally at factory shipment.
2	SCH1	Input	Select a schedule number, referred to as **SCH No.** below, indicating a combination of the circuit-closed pins among Pins, No. 2, 3, 4 and 5 (See table below.). The schedule number selected by I/O Connector has priority over the schedule number set on **MH-TL01B**. Before selecting the schedule number by the operation button on **MH-TL01B**, open the circuits of all the Pins of No. 2, 3, 4 and 5 in I/O Connector. Input [SCH] signal at least 2 ms before inputting the start-up signal. During in operation, the schedule number cannot be changed.
3	SCH2		
4	SCH4		
5	SCH8		

Pin No. / SCH No.	5	4	3	2
1				●
2			●	
3			●	●
4		●		
5		●		●
6		●	●	
7		●	●	●
8	●			
9	●			●
10	●		●	
11	●		●	●
12	●	●		
13	●	●		●
14	●	●	●	
15	●	●	●	●

The mark ● denotes the circuit-closed pin.

Pin No.	Name	I/O	Description
6	M-READY	Input	Input pin for READY of **MAWA-050A**.
7	+COM		Output pins for 24 V DC through 100Ω internal resistor.
8			
9	1ST	Input	Input pin for start-up signal. When [1ST] is closed, electrode moves from Start Point to Mid-Point. When [2ND] is closed after [1ST] was closed, electrode moves from Mid-Point to Weld Point. Although only [2ND] is closed, electrode does not move.
10	2ND		
11	H.UP	Input	Input pin for head up. When [H.UP] signal is closed, electrode moves from Weld Point (Initial Current) to Weld Point (Main Welding).
12	-COM		Connected to [GND] (0V) internally at factory shipment.
13	+COM		Output pins for 24 V DC through 100Ω internal resistor.
14	EXT.COM		According to the usage, connect pins as follows. ▪ When contact is used as input signal of I/O Connector, connect Pins 14 and 15. (In the 2-level foot switch which is Accessories, Pins 14 and 15 are connected at factory shipment.)  ▪ When NPN transistor (sink type) on PLC is used as input signal of I/O Connector, connect Pins 13 and 14. COM terminal of PLC connects to —COM terminal, that is, Pins 1, 12 and 15.  ▪ When PNP transistor (source type) on PLC is used as input signal of I/O connector, connect Pin 14 to COM terminal of PLC. 
15	-COM		Connected to [GND] (0V) internally at factory shipment.
16	END	Input	Input pin for [END] signal from welding power supply. If Pin 16 is closed, input signal of [2ND] cannot be accepted.

Pin No.	Name	I/O	Description
17	ORG	Input	Input pin for Start Point resuming signal. When the circuit of Pin 17 becomes closed, the electrode resumes Start Point. (In case that the motor finishes moving back to Original Point, the electrode does not move.)
18	RESET		Input pin for [RESET] signal. If a trouble occurs, rectify the trouble and close the circuit of the Pin to turn off [NG] signal. (See Chapter 7 for fault codes.) Close at least for 2 ms. Pin 18 does not work while the circuit of Pin 18 is closed.
19	MODE		Input pin for mode. When Pin 19 is closed, the fine weld mode is selected. When Pin 19 is open, the auto mode is selected. (See ② and ③ in **8. (4) Timing Chart**.)
20			Spare pin: Do not connect.
21	STOP	Output	Output pin for an emergency stop of the motor. When the circuit between Pins 21 and 22 is opened, the motor carries out emergency stop. Usually, close it by an electric wire or switch whose capacity is more than 24 V DC, 20 mA. Since power supply to the motor is cut off, the force follow-up mechanism may lower to the maximum stroke position by its own weight.
22			
23	ST1		Pin for outputting the initial current start signal to the welding power supply. The Pin becomes closed when the electrode has arrived at Weld Point (Initial Current). Contact capacity is 24 V DC, 20 mA.
24	O.COM		Common terminal to [ST1], [READY], [GAS], [ERROR], and [ST2]
25	READY		Output pin for completion signal of being ready for work. The Pin becomes closed at Start Point. In an emergency of **MH-TL01B**, the Pin becomes opened.
26	GAS		Pin for outputting the gas output start signal to the welding power supply. The Pin becomes closed when the electrode star moving from Mid-Point to Weld Point (Initial Current). Contact capacity is 24 V DC, 20 mA.
27	MID POINT		Output pin for completion signal of arriving at Mid-Point. When the electrode is at Mid-Point, the Pin becomes closed.
28	O.COM		Common terminal to [ST1], [READY], [GAS], ERROR], and [ST2]
29	ERROR	Output	Output pin for a trouble signal. When a trouble occurs in **MH-TL01B**, the Pin becomes opened until it is reset.
30	ST2		Pin for outputting the main welding start signal to the welding power supply. In the auto mode, the Pin becomes closed when the electrode has arrived at Weld Point (Main Welding). In the fine weld mode, the Pin becomes closed when the electrode rises from Weld Point (Initial Current) and the weld point detecting sensor signal becomes open. Contact capacity is 24 V DC, 20 mA.
31	O.COM		Common terminal to [ST1], [READY], [GAS], [ERROR], and [ST2]

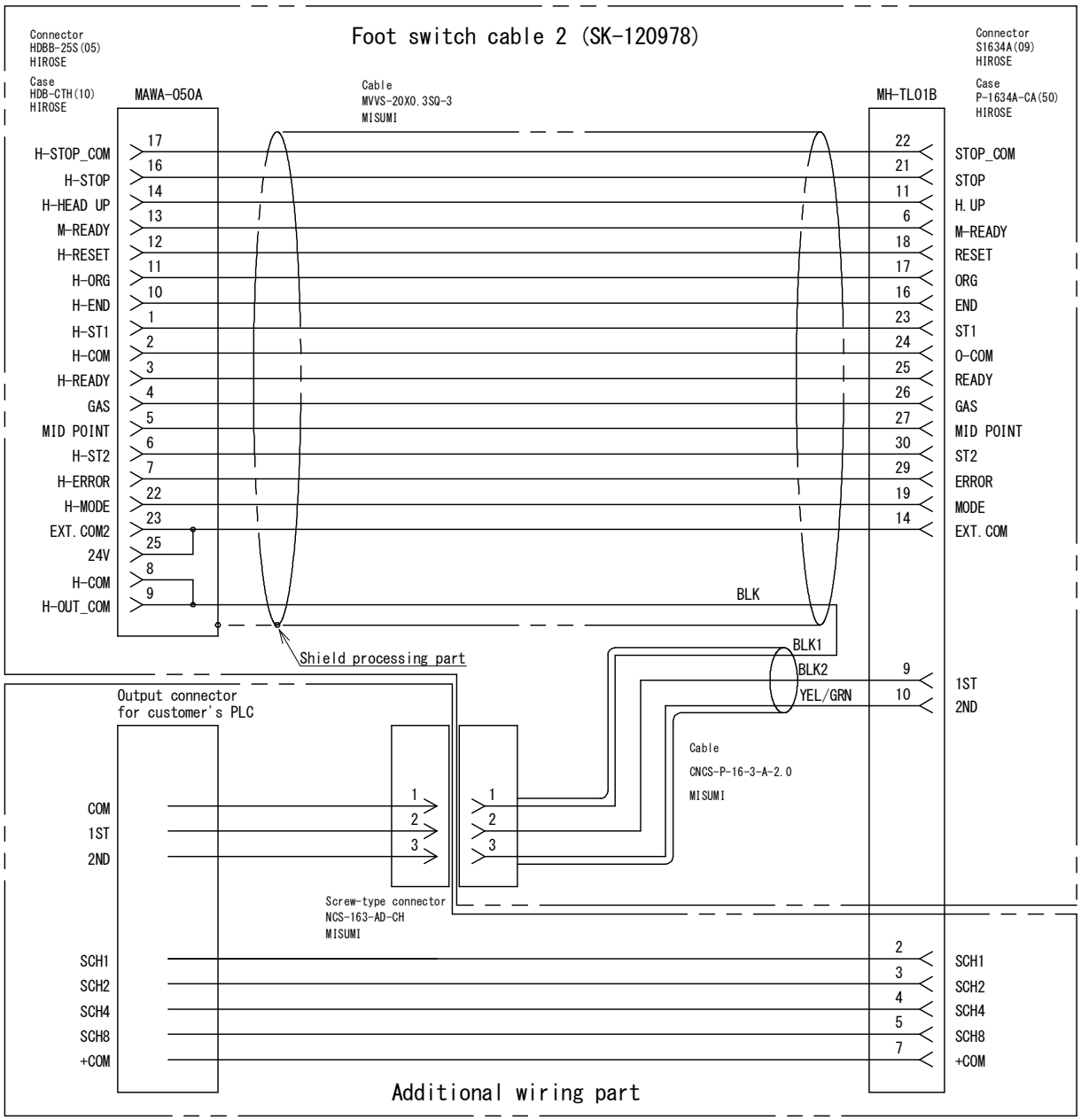
Pin No.	Name	I/O	Description
32	EXT.24V		Do not connect to the Pin for [EXT. 24 V].
33	-COM		Connected to [GND] (0V) internally at factory shipment.
34			Spare pin: Do not connect.

(4) Example Connection of Customer Side

When switching the schedule number of the touch start head and starting welding by a customer's PLC, it is required to add a wire to the attached foot switch cable 2 (SK-1202978) used for connecting to the PULSETIG welding power supply **MAWA-050A** or prepare a cable dedicated to a customer

⚠ CAUTION

When using the internal power supply of **MAWA-050A** as the external input/output, turn on this product after turning on **MAWA-050A**.
If this product is turned on first, the [STOP]-Pin for an emergency stop of the motor is not detected and the error (fault code "6") will occur.



5. Operation

(1) Getting Started

① 2-Level Foot Switch

It is of 2-level type. The switch of the first level is External Input [1ST]. The switch of the second level is External Input [2ND].
These two switches allow a variety of operations.

② Position of Electrode

The **MH-TL01B** Electrode has six (6) positions to stop.

Position	Description
Original Point	The position where the electrode has completely returned.
Start Point	A little bit farther position from Original Point. It can be set arbitrarily. [READY] Lamp lights up when the electrode is at this position.
Mid-Point	Just before the position where the electrode contacts workpiece. It can be set arbitrarily. [MID] Lamp lights up when the electrode is at this position.
Weld Point (Initial Current)	The position where the electrode contacts workpiece. [WELD] Lamp lights up when the electrode is at this position. Initial current start signal is output and initial current flows.
Weld Point (Main Welding)	The position where the electrode rises from Weld Point (Initial Current). [WELD] and [HOLD] Lamps light up when the electrode is at this position. Main welding start signal is output and welding current flows.
Downstop Point	A little bit beyond the position from Weld Point (Initial Current). It can be set arbitrarily.

③ Movement Mode of Electrode

Movement	Mode 0	Mode 1
For setting Position or measuring Weld Force	Performed by External Input [1ST] or [2ND]	Performed by External Input [1ST]/[2ND] or pressing the operation button.
For resuming Start Point of motor	Performed by External Input [1ST] or [ORG]	Performed by External Input [1ST]/[ORG] or pressing [ORG/CANCEL] button.
Electrode is pressed on the way other than from Mid-Point to Weld Point.	Error indicated and READY kept closed (ON)	Error indicated, the power supply to motor turned off, and READY opened (OFF) *1

In **Mode 1**, when the electrode is at Start Point and no setting is performed, then, “A” is shown on [SPEED HOLD TIME] Display.

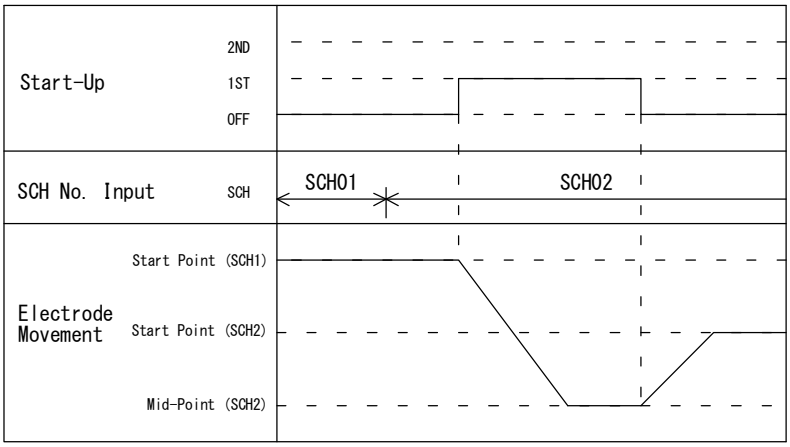
*1: The operation ready signal (READY) becomes like ① in **8. (4) Timing Chart**.

④ Attention on Movement

・Change of Schedule No.

Only the change of Schedule No. does not allow the electrode to move. External Output [START POINT] continues to hold the signal of the previous position.

In case that Start Point of changed Schedule No. differs from the one of the last Schedule No., once make the electrode move to Mid-Point to attain the new Start Point.



・In case of continuous operations across several Schedule Numbers, set each Start Point so as to keep them always the same.

・When the weld point is detected on the way other than moving from Mid-Point to Weld Point, then the fault code “E” is displayed.

In case of **Mode 0**,

When a trouble occurs at the side of released weld force, that is, between Mid-Point and Start Point, open External Input [1ST] to make the electrode move to Start Point.

When a trouble occurs at the side of increased weld force, that is, between Start Point and Original Point, open External Input [1ST] to make the electrode move to Original Point (to the direction of released weld force).

In case of **Mode 1**,

The supplying of power to the motor is turned off to stop.

・When a trouble occurs in **MAWA-050A**, the operation of **MH-TL01B** may stop at Weld Point (Initial Current) and Weld Point (Main Welding). In this case, press [ORG/CANCEL] button with External Inputs [1ST] and [2ND] closed and open External Inputs [1ST] and [2ND]. The electrode moves to Start Point.

(2) Mode Setting

① Setting

Turn on the power while pushing the operation button. The character of “SEt” blinks on [SCH(SCHEDULE)] Display and [SPEED HOLD TIME] Display.

Continue to press the button until blinking changes into lighting-up.

Depress the operation button, and “0” blinks on [SPEED HOLD TIME] Display. Rotate the operation button, and indication changes as follows.

- 0…means “change of Mode”
- 1…means “change of [ERROR] signal output”
- 2…means “change of correction value for distance from Weld Point (Initial Current) to Weld Point (Main Welding)”
- 3…means “change of detection time of the weld point detecting sensor
- E…means “end”

② Changing

Press the operation button while “0” blinks on [SPEED HOLD TIME] Display.

Mode No. blinks on [SCH(SCHEDULE)] display. Rotate the operation button to select “0” or “1”.

Press the operation button to fix Mode No.

Finally, be sure to perform the step ⑥.

③ Change of ERROR Signal Output

Press the operation button while “1” blinks on [SPEED HOLD TIME] Display.

Mode No. blinks on [SCH(SCHEDULE)] Display. Rotate the operation button to select “0” or “1”.

- 0…means “circuit opened in case of error”
- 1…means “circuit closed in case of error”

Press the operation button to fix.

Finally, be sure to perform the step ⑥.

④ Change of Correction Value for Distance from Weld Point (Initial Current) to Weld Point (Main Welding)

Press the operation button while “2” blinks on [SPEED HOLD TIME] Display.

The correction value blinks on [SCH(SCHEDULE)] Display. Rotate the operation button to input the correction value.

- The setting range of correction value is 0.0 to 5.0 mm.
- The distance from when the electrode makes contacts with the workpiece till when it stops.
- The setting is not required when the floating lock is used.

Press the operation button to fix.

Finally, be sure to perform the step ⑥.

⑤ Change of Detection Time of the Weld Point Detecting Sensor

Press the operation button while “3” blinks on [SPEED HOLD TIME] Display.

The correction value blinks on [SCH(SCHEDULE)] Display. Rotate the operation button to input the correction value.

- The setting range of correction value is 0.2 to 5.0 ms.
- The time to output the start 2 (ST2) (to move to the main welding) after the weld point detecting sensor is turned off (the torch is detached) and the set time (weld point detection time) is passed.

Press the operation button to fix.

Finally, be sure to perform the step ⑥.

⑥ End of Setting

Rotate the operation button to select “E”. Press the operation button to fix.

Confirm “End” on [SCH(SCHEDULE)] and [SPEED HOLD TIME] Display, which means the completion of setting.

Turn off the power.

Mode setting list

[SPEED HOLD TIME] display	Setting item	Setting value	Setting contents	Initial setting
0	Movement mode	0	**Mode 0** 1. Starts moving by External Input [1ST]/[2ND]. 2. Starts resuming to Start Point by External Input [1ST]/[2ND]. 3. Indicates error and keeps the circuit of READY closed (ON) when the weld point detecting sensor is turned ON on the way other than from Mid-Point to Weld Point.	1
		1	**Mode 1** 1. Starts moving by External Input [1ST]/[2ND] or pressing the operation button. 2. Starts resuming to Start Point by External Input [1ST]/[ORG] or pressing [ORG/CANCEL] button. 3. Indicates error, turns off the power supply to motor, and opens (OFF) the circuit of READY when the weld point detecting sensor is turned ON on the way other than from Mid-Point to Weld Point.	
1	ERROR signal output	0	Circuit opened (OFF) in case of error (ERROR)	1
		1	Circuit closed (ON) in case of error (ERROR)	
2	Setting of the main welding start point	0.0 to 5.0 mm	Sets the moving distance (mm) from when the electrode rises after the initial current and the weld point detecting sensor becomes OFF till when it stops.	0.0

[SPEED HOLD TIME] display	Setting item	Setting value	Setting contents	Initial setting
3	Change of detection time of the weld point detecting sensor	0.2 to 5.0 ms	Sets the time till the detection of the weld point detecting sensor is settled.	1.0
E	End of setting	-	By pressing the operation button after “E” is shown on [SPEED HOLD TIME] display, “End” is shown on [SCH] display and [SPEED HOLD TIME] display, and setting is complete. (Each setting can be changed after the power supply is turned off and then turned on again.)	-

(3) Applying Power and Moving to Start Point

Plug the power cable to the outlet or turn on the power switch.

Zero “0” blinks on [SCH] Display of the front panel.

Close the circuit of External Input [1ST] or [ORG], and the electrode, after it once returns back to Original Point, moves to Start Point.
If the circuit of External Input [1ST] or [ORG] is opened while electrode is moving, the electrode stops there.
When the circuit of External Input [1ST] or [ORG] is closed again, the electrode begins to move.

When the electrode reaches Start Point, [READY] Lamp lights up and the preparation is completed.
Note that Original Point and Start Point are at the same position when the shipping package is opened and the power is supplied for the first time.

In case of **Mode 1**, it works by pressing [ORG/CANCEL] button in addition to the use of External Input.

(4) Auto-Setting of Electrode Position

Before setting the electrode position by auto-setting function, perform the setting described in ⑦ **Setting Distance from Weld Point (Initial Current) to Weld Point (Main Welding)** in **(5) Manual Setting of Electrode Position**.

The electrode position can be set automatically by means of the auto-setting function. Turn the operation button to light up [AUTO] Lamp.

Press the operation button for 1 second, and [AUTO] Lamp blinks.

Close External Input [1ST], and the electrode moves to Original Point.

Open External Input [1ST] when the electrode stops with beeps.
(Beeps are given when the package is opened and the power is supplied for the first time, because Original Point and Start Point are at the same position.)

A numeral blinks on [SCH] Display. Turn the operation button to change Schedule No.

When Schedule No. is determined, press the operation button.
The blinking numeral on [SCH] Display changes to the illuminated one.

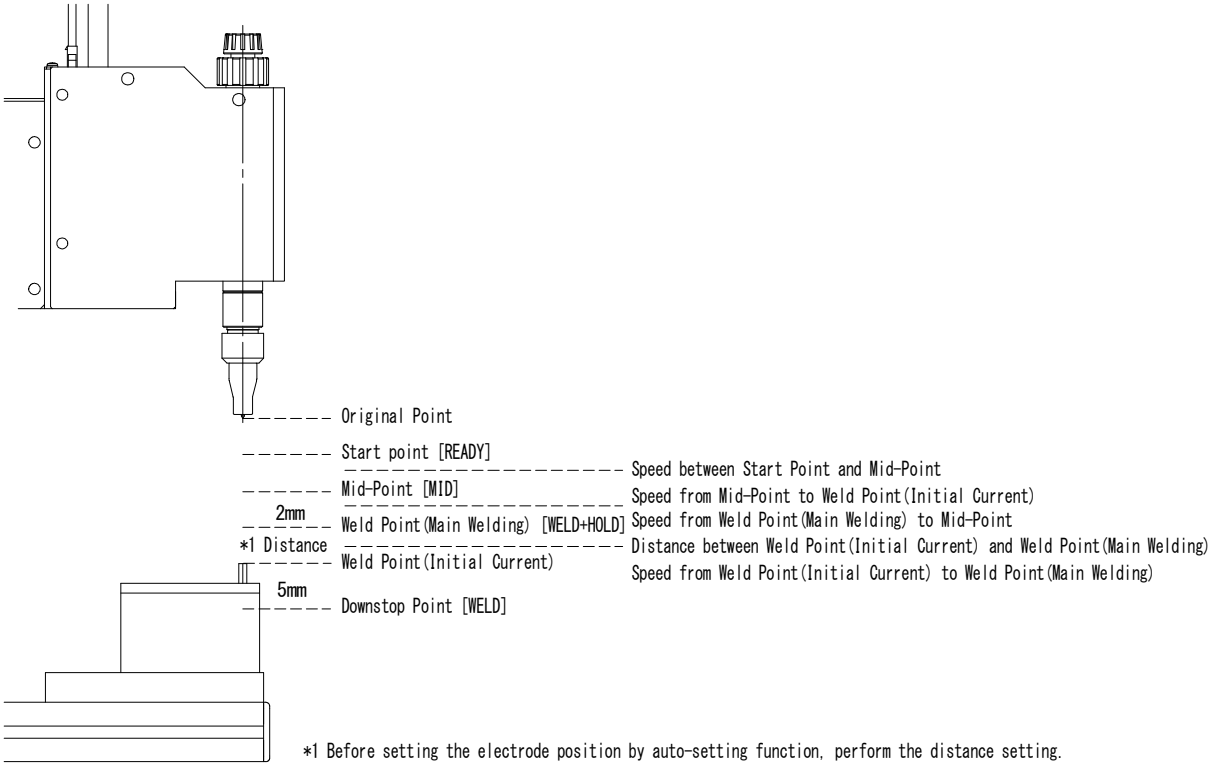
Place the workpiece.

Close External Inputs [1ST] and [2ND] to make the electrode move forward. Hold External Inputs [1ST] and [2ND] closed. The electrode makes contact with the workpiece and beeps are given.
When the application of the electrode force is completed, the electrode returns to the position before Original Point with beeps.

Open External Inputs [1ST] and [2ND] to complete the auto-setting with a beep.
The position where the electrode stops is Start Point.

The electrode positions determined by the auto-setting are as follows:

Electrode Position	Description
Original Point	Position where the electrode has completely returned.
Start Point	Between Weld Point (Initial Current) and Original Point.
Mid-Point	2 mm before the distance from Weld Point (Initial Current) to Weld Point (Main Welding).
Downstop Point	5 mm beyond Weld Point (Initial Current).



The electrode speed is not set automatically. The previous setting is valid. Change this setting manually.

In case of **Mode 1**, it works by pressing the operation button in addition to the use of External Input. When using the operation button, press the operation button again, because the electrode stops after pressing the workpiece.

(5) Manual Setting of Electrode Position

① Selecting Schedule No.

Turn the operation button to light up [SCH] Lamp.

Press the operation button for 1 second. [SCH] Lamp and [SCH] Display blink.

Turn the operation button clockwise and counterclockwise to select a numeral (1 to 31) on [SCH] Display.

After selecting Schedule No., press the operation button.

Press [ORG/CANCEL] button to interrupt the operation.

② Setting Start Point

Turn the operation button to light up [READY] Lamp.

Press the operation button for 1 second, and [READY] Lamp lights up.

Close External Input [1ST].
The electrode moves to Start Point with beeps. (When the electrode has been at Start Point, only beeps are given.)

Open External Input [1ST].

Turn the operation button clockwise and counterclockwise to make the electrode move forward and backward in 0.1 mm-increment/decrement.

Press the operation button until the electrode reaches the desired position. [READY] Lamp blinks fast.

Close External Input [1ST]. The Start Point setting is completed with beeps.

When you want to interrupt the operation,

Press [ORG/CANCEL] button, and [READY] Lamp blinks fast.

Close External Input [1ST].
The electrode returns to the previous position with beeps.

In case of **Mode 1**, it works by pressing the operation button in addition to External Input.

Note) Be sure to set Start Point before Mid-Point.

③ Changing Moving Speed between Start Point and Mid-Point

Turn the operation button to light up both [READY] and [MID] Lamps.

Press the operation button for 1 second. [READY] and [MID] Lamps blink.

The number of blinking [SPEED HOLD TIME] Lamp indicates the current speed setting. Turn the operation button clockwise and counterclockwise to change the number of the blinking lamp. Select your desired speed.

No.	Moving Speed (mm/s)	Note
1	40	Min.
2	60	
3	80	
4	100	
5	120	
6	140	
7	160	
8	200	Max.

After setting the speed, close and thereafter open External Input [1ST]. Check the speed of the electrode that moves forward and backward.

Press the operation button when your desired speed is determined.

Press [ORG/CANCEL] button to interrupt.

④ Setting Mid-Point

Turn the operation button to light up [MID] Lamp.

Press the operation button for 1 second. [MID] Lamp blinks.

Close External Input [1ST] to make the electrode move to Mid-Point with beeps.

Open External Input [1ST].

Turn the operation button clockwise and counterclockwise to make the electrode move forward and backward in 0.1 mm-increment/decrement.

Press the operation button when the electrode reaches the desired position. [MID] Lamp blinks fast.

Close External Input [1ST]. The electrode moves to Start Point with beeps to complete Mid-Point setting.

When you want to interrupt the operation,

Press [ORG/CANCEL] button, and [MID] Lamp blinks fast.

Close External Input [1ST].
The electrode returns to the previous position with beeps.

In case of **Mode 1**, it works by pressing the operation button in addition to External Input.

Note) Be sure to set Mid-Point beyond Weld Point (Main Welding) and before Start Point.

⑤ Setting Moving Speed from Mid-Point to Weld Point (Initial Current)

Turn the operation button to light up all of [MID], [WELD] and [FORCE CHK] Lamps.

Press the operation button for 1 second. [MID], [WELD] and [FORCE CHK] Lamps blink.

The number of the blinking [SPEED HOLD TIME] Lamp indicates the current speed setting. Turn the operation button clockwise and counterclockwise to change the number of the blinking lamp. Select your desired speed.

No.	Moving Speed (mm/s)	Note
1	1	Min.
2	2	
3	3	
4	4	Max.

After setting the speed, close and thereafter open External Inputs both [1ST] and [2ND]. Check the speed of the electrode that moves forward and backward.

Press the operation button when your desired speed is determined.

Press [ORG/CANCEL] button to interrupt.

⑥ Setting Downstop Point

Turn the operation button to light up [WELD] Lamp.

Press the operation button for 1 second. [WELD] Lamp blinks.

Close External Input [2ND] and [1ST] to make the electrode move to Downstop Point with beeps.

Open External Inputs [2ND] and [1ST].

Turn the operation button clockwise and counterclockwise to make the electrode move forward and backward in 0.1 mm-increment/decrement.

Press the operation button when the electrode reaches the desired position. [WELD] Lamp blinks fast.

[In case that the electrode cannot move beyond Weld Point because of a workpiece]
Turn the operation button until the electrode stops, then press the operation button.
Downstop Point is set 5 mm beyond Weld Point and [WELD] Lamp blinks fast.

Close External Input [1ST]. The electrode moves to Start Point with beeps to complete Weld Point setting.

When you want to interrupt the operation,

Press [ORG/CANCEL] button, and [WELD] Lamp blinks fast.

Close External Input [1ST].
The electrode returns to the previous position with beeps.

In case of **Mode 1**, it works by pressing the operation button in addition to External Input.

Note) Be sure to set Downstop Point beyond Weld Point (Initial Current).

⑦ Setting Distance from Weld Point (Initial Current) to Weld Point (Main Welding)

Turn the operation button to light up both [WELD] and [HOLD] Lamps.

Press the operation button for 1 second. [WELD] and [HOLD] Lamps blink.

The number of the blinking [SCH] Lamp indicates the current distance setting.
Turn the operation button clockwise and counterclockwise to change the number of the blinking lamp. Select your desired distance. The setting range is 0.1 to 9.9 mm.

Press the operation button when your desired distance is indicated.

Press [ORG/CANCEL] button to interrupt.

Note) Be sure to set the distance so that Weld Point (Main Welding) is beyond Mid-Point.

⑧ Setting Moving Speed from Weld Point (Initial Current) to Weld Point (Main Welding)

Turn the operation button to light up all of [WELD], [HOLD] and [FORCE] Lamps.

Press the operation button for 1 second. [WELD], [HOLD] and [FORCE] Lamps blink.

The number of the blinking [SPEED HOLD TIME] Lamp indicates the current speed setting.
Turn the operation button clockwise and counterclockwise to change the number of the blinking lamp. Select your desired speed.

No.	Moving Speed (mm/s)	Note
1	40	Min.
2	60	
3	80	
4	100	
5	120	
6	140	
7	160	
8	200	Max.

Press the operation button when your desired Hold Time is determined.

Press [ORG/CANCEL] button to interrupt.

⑨ Setting Moving Speed from Weld Point to Mid-Point

Turn the operation button to light up both [MID] and [WELD] Lamps.

Press the operation button for 1 second. [MID] and [WELD] Lamps blink.

The number of the blinking [SPEED HOLD TIME] Lamp indicates the current speed setting.
Turn the operation button clockwise and counterclockwise to change the number of the blinking lamp. Select your desired speed.

No.	Moving Speed (mm/s)	Note
1	40	Min.
2	60	
3	80	
4	100	
5	120	
6	140	
7	160	
8	200	Max.

After selecting the number, close and thereafter open External Inputs both [1ST] and [2ND]. Check the speed, observing the electrode that moves forward and backward.

Press the operation button when your desired speed is determined.

Press [ORG/CANCEL] button to interrupt.

(6) Welding Work

① Close External Input [1ST]. The operation ready signal becomes open and the electrode moves to Mid-Point.

② Close External Input [2ND] and [1ST]. The gas output start signal becomes closed and the electrode moves to Weld Point (Initial Current).

③ When the electrode contacts the workpiece, the electrode stops, and the floating lock signal and the initial current start signal are closed.
When the initial current start signal is once output, the weld force of the electrode is maintained although External Inputs [2ND] and [1ST] are open.
(When the end signal is output from the welding power supply, the weld force is released.)

④ When the head up signal input, the electrode moves to Weld Point (Main Welding).

⑤ When the electrode has arrived at Weld Point (Main Welding), the main welding start signal is closed.

⑥ When the end signal is closed from the welding power supply. The gas output start signal, the initial current start signal and the main welding signal are open, and the electrode moves to Mid-Point.

⑦ When the electrode has arrived at Mid-Point, the floating lock signal is closed.
When External Input [1ST] is closed, the electrode stops at Mid-Point, and the welding work can be restarted with the step ②.
When External Input [1ST] is closed, the electrode moves to Start Point.

⑧ After confirming that External Inputs [1ST] and [2ND] are open, close the operation ready signal.

(7) Checking Set Position

Turn the operation button to light up [FORCE CHK] Lamp.

Press the operation button for 1 second.
[FORCE CHK] Lamp blinks and [READY] Lamp lights up.

Close External Input [1ST] or press the operating button to move the electrode.
The electrode moves in order of Start Point → Mid-Point → Weld Point (Initial Current) → Weld Point (Main Welding) → Mid-Point → Start Point.
For electrode position and lamp indication, refer to **(3) Controller Front** in **2. Name and Functions of Each Section**.

When the electrode returns to Start Point, the electrode stops with beeps.

When you want to interrupt the operation,

Press [ORG/CANCEL] button. [FORCE CHK] Lamp blinks fast.

Close External Output [1ST] or press the operation button.
The electrode returns to the previous position with beeps.

6. Fault Indications

When a trouble occurs at the apparatus, [TROUBLE] Lamp lights up and a fault code is shown on [SCH] Display. Closing External Input [RESET] or continuing to press the operation button can reset the fault signal.

Fault Code	Trouble Content	Corrective Measures
E (Movement Mode 0)	Weld point is detected on the way to return to Start Point	Close External Input [1ST] again to make the electrode move to Original Point. Rectify the cause of the trouble. Thereafter, reset the fault signal and close External Input [1ST]. [TROUBLE] output is released.
	Weld point is detected before Mid-Point	Close External Input [1ST] and [2ND] to make the electrode return to Start Point. Rectify the cause of a trouble. Thereafter, reset the fault signal and close External Input [1ST]. [TROUBLE] output is released.
E (Movement Mode 1)	Weld point is detected on the way to return to Start Point or applied before Mid-Point	After rectifying the cause of a trouble, reset the fault signal and resume Start Point.
1	Fault occurred in controller memory	Some settings have been lost. You must re-set again. Turn on the power while pressing [ORG/CANCEL] button to clear all the settings.
2	Fault occurred in memory's R/W-function in controller	Turn off the power and thereafter, turn it on again. If the trouble continues, repair is needed. Consult us.
3	Fault occurred in controller CPU	After turning off the power or resetting the fault signal, resume Start Point. If the trouble continues, repair is needed. Consult us.
4	Fault occurred in electrode-driving motor	After turning off the power or resetting the fault signal, resume Start Point. If the trouble continues, repair is needed. Consult us.
5	Fault occurred in the control signal of electrode-driving motor	After turning off the power, check the connector conduction between the controller and motor. If the trouble continues, repair is needed. Consult us.
6	[STOP]-Pin circuit is opened	Close the circuit of [STOP]-Pin. Resume Start Point after resetting the fault signal or turn on the power the power to the Head subsequent to **MAWA-050A** after turning off the power. When the circuit of [STOP]-Pin is opened after resetting the fault signal, the force follow-up mechanism may lower to the maximum stroke position by its own weight. Be careful when returning the electrode.

7. User's Maintenance

(1) Adjusting the Motor-Driven Portion Position

ATTENTION

- Make sure that the tool used for adjustment fits the screw size.
  Upon completion of adjustment, tighten the screws firmly. There should be no looseness or rattling.
- The Holder is made of soft material. When tightening a screw, take care not to damage it.
- When a caution is given that denotes "Unplug the Power Cable from the outlet", strictly observe it to avoid an electric shock.

Unplug the Power Cable from the outlet.

↓

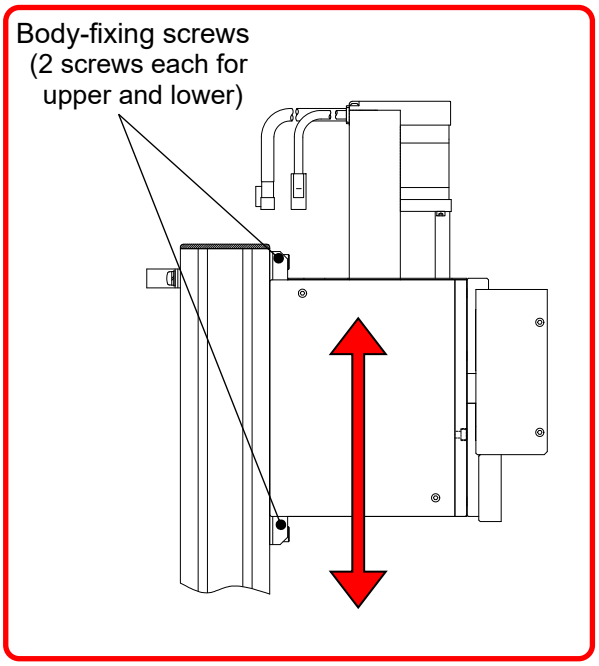
Loosen the Body-Fixing Screw.

↓

Move the motor-driven portion up and down to adjust the mounting height.

↓

When the position is determined, tighten the Body-Fixing Screw firmly.



⚠ CAUTION

If you loosen the Body-Fixing Screw without supporting the motor-driven portion, the portion falls down, which could result in injury and/or damage to the electrode.
Be sure to hold or support the motor-driven portion when you loosen the Body-Fixing Screw.

8. Specifications

(1) Product Specifications

Follow-Up Mechanism Type		For PULSETIG welding touch start
Mounting to PLC etc.		Mountable
Controller		Separately installed
Electrode-Driving Method		Servomotor
Stroke		50 mm max.
Electrode-Lifting-Up Amount		0.1 to 9.9 mm (in units of 0.1 mm)
Electrode Force		0.6 N (60 g) min. *1
Applicable Welding Method		Dedicated to touch start
Number of Welding Schedules		15 Schedules (selectable externally)
Electrode Speed		Between Start Point and Mid-Point : 8 Speeds (Selectable for each Schedule) Weld Point (Initial Current) to Weld Point (Main Welding) : 8 Speeds (Selectable for each Schedule) Weld Point (Main Welding) to Mid-Point : 8 Speeds (Selectable for each Schedule) Mid-Point to Weld Point (Initial Current) : 4 Speeds (Selectable for each Schedule)
Power Supply Voltage		100–240 V AC ±10%, 50/60 Hz, 70 VA
Operating Conditions		Temperature: 5°–40°C Humidity: 85% or less (No condensation)
Mass	**Body**	Approx. 8 kg
	Controller	Approx. 3 kg

*1: The electrode-lifting-up amount increases or decreases according to the head descending speed when the electrode makes contact with the workpiece.

(2) Accessories

Item	Model No.	Q'ty
Operation manual CD-ROM	AS1208898(OM1208899+OM1208900)	1
Foot switch cable 2	SK-1202978	1

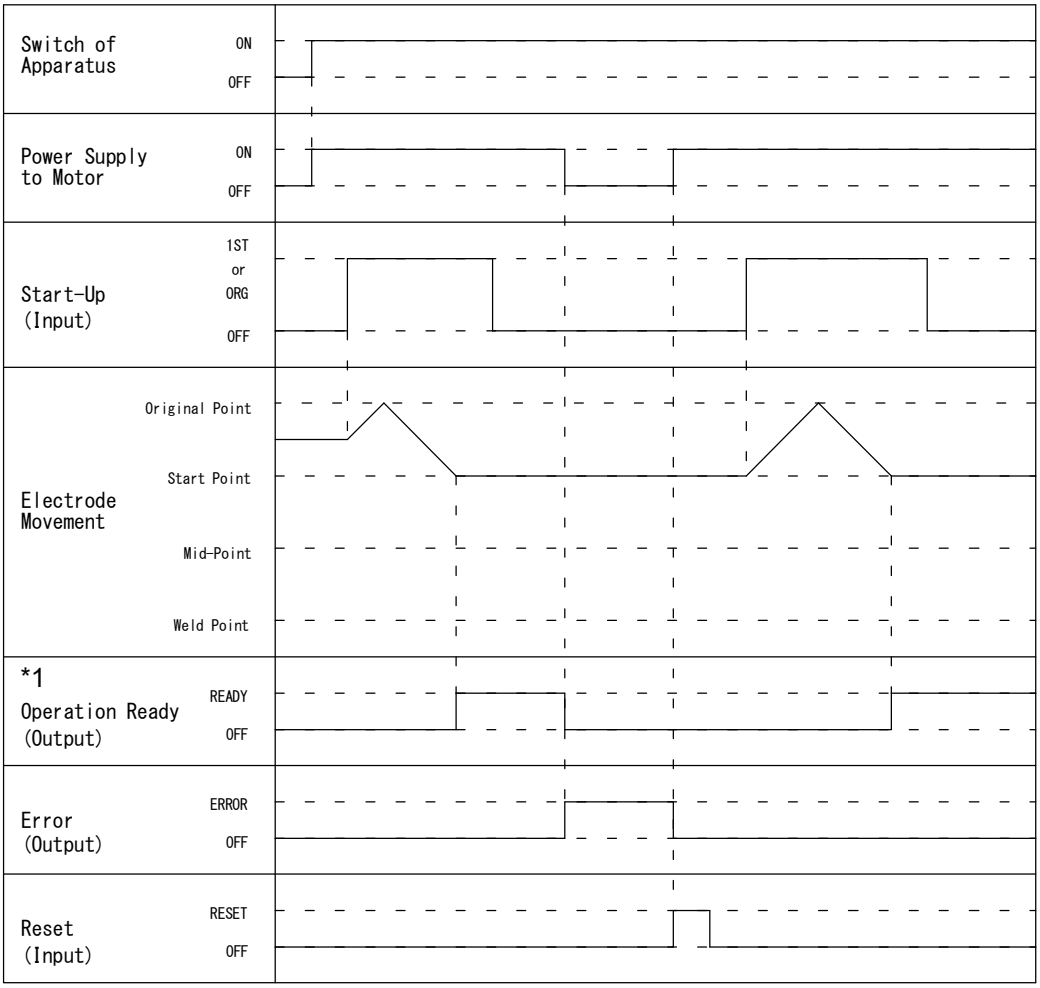
(3) Separately Sold Items

Item	Model No.
Power cable*1	KP-35 KS-16A SVT#18x3 B-TYPE (3-pin plug, for 100–120V AC)
	KP244 VCTF3*1.25 KS16D 3M gray (Japan, for 200V AC)
	CEE3P-W-1.8 (Round plug, for 200–240V AC)
	GBP-F-GBSS-3 (China, for 10A-250V)
3-pin/2-pin conversion adapter for power cable	KPR-24(SB)-B (for 100–120V AC)
Torch cable	MB0909180-C-2 (2 m)
	MB0909180-C-3 (3 m)
	MB0909180-C-4 (4 m)
Electrode (φ1.6)	018321 (with lanthanum 1.5%, Tungsten electrode)
	Lanthanum φ1.6 mm (with lanthanum 2%)
	TEC lanthanum φ1.6×150

*1: Exclusively for the **MH-TL01B**. Do not use for other devices.

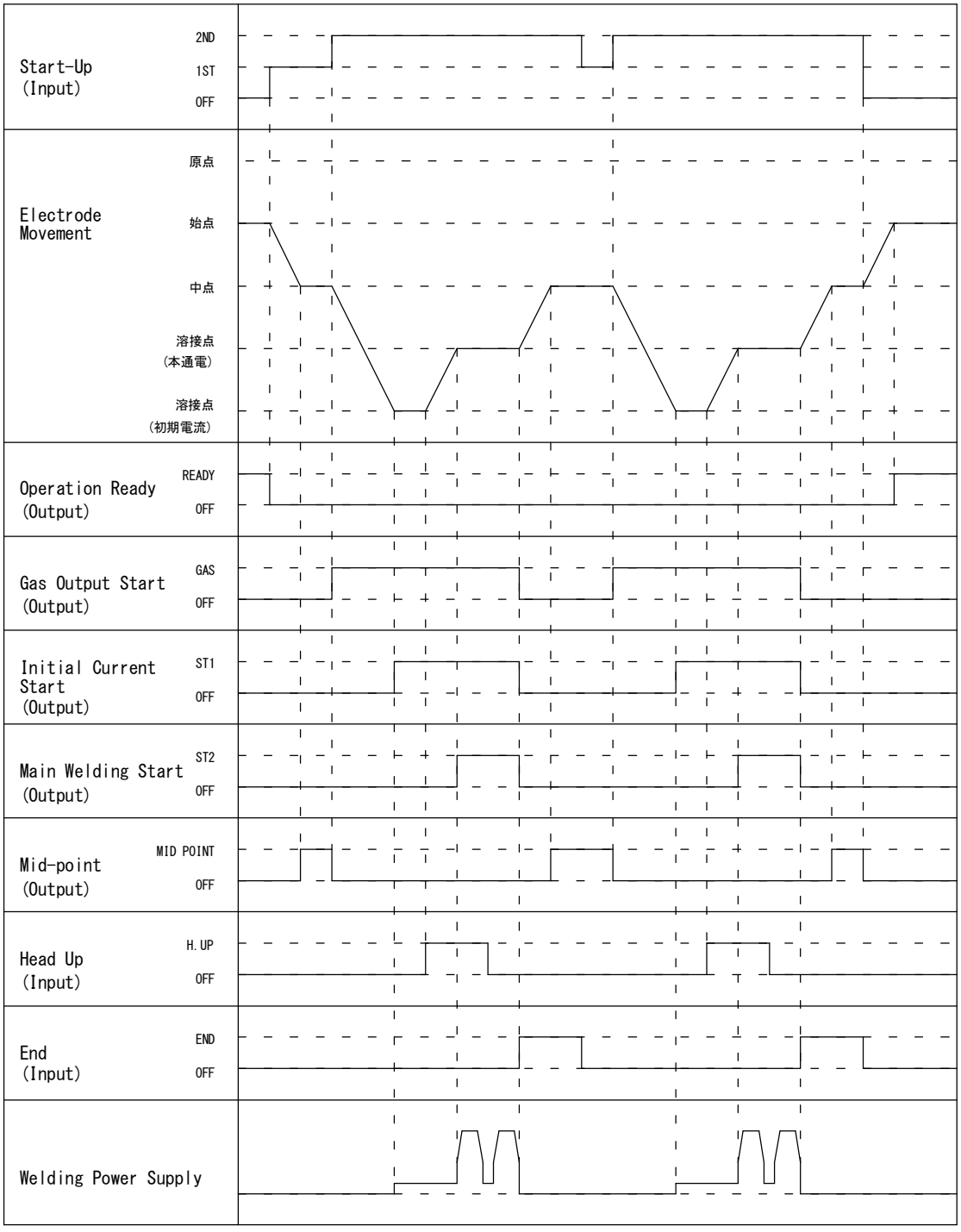
(4) Timing Chart

① Power ON and Error occurring

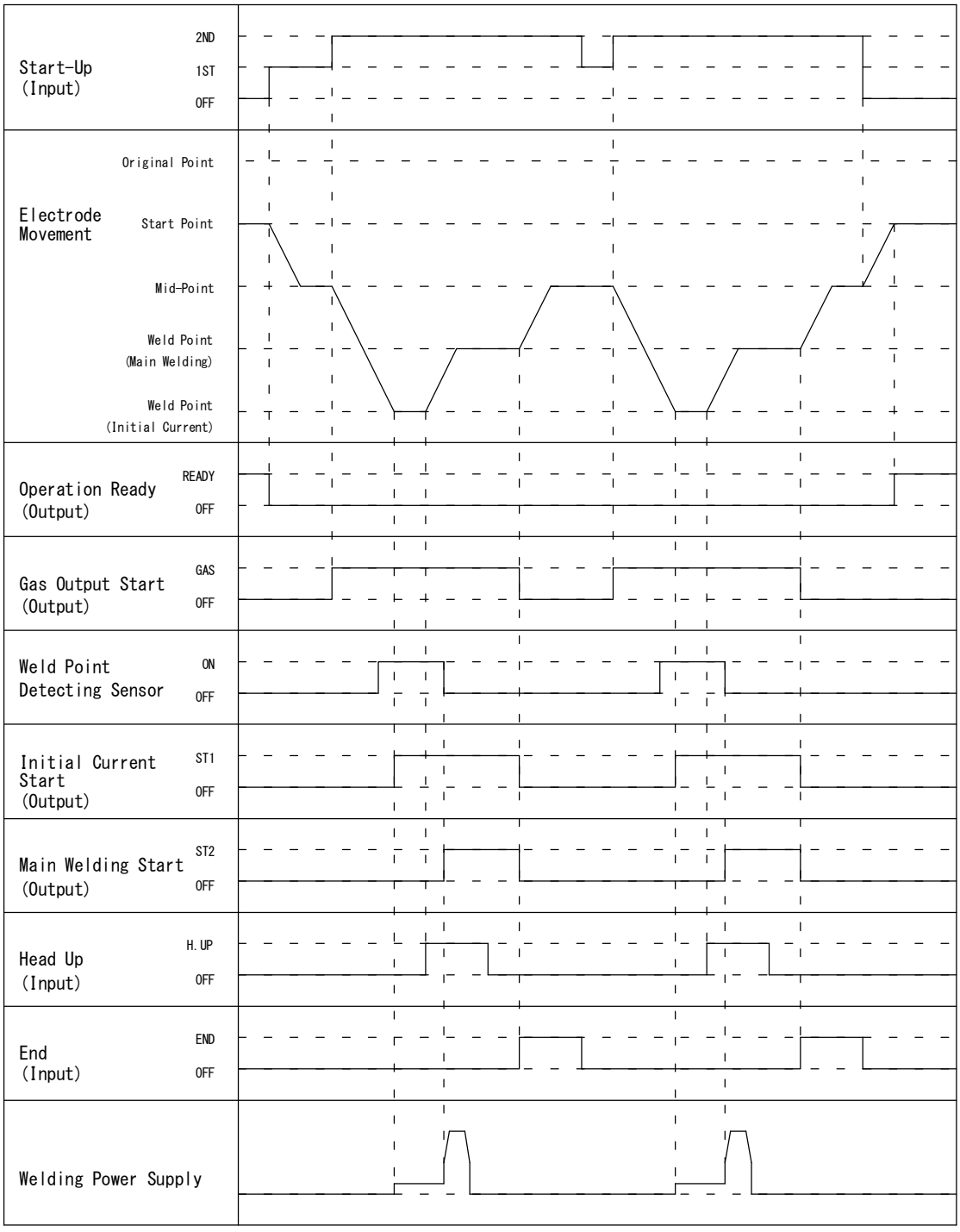


*1: The timing chart of Operation Ready (READY) is when the movement mode is set to Mode 1 in **5. (1)** ③.

② Operating (in case of the auto mode (Mode input OFF))



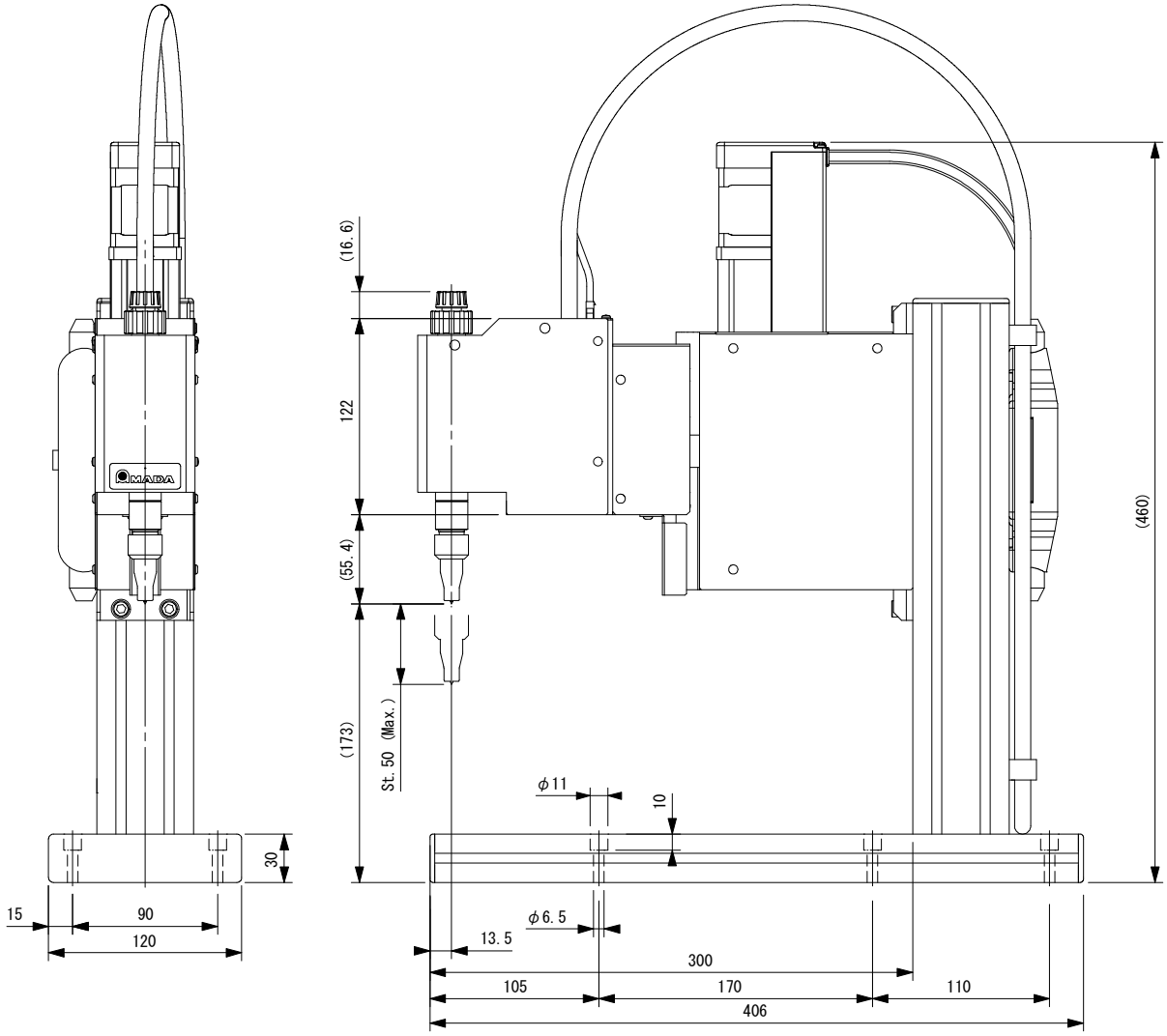
③ Operating (in case of the fine weld mode (Mode input ON))



9. Outline Drawings

(1) MH-TL01B

(Dimensions in mm)



(2) Controller

(Dimensions in mm)