RESISTANCE WELDING HEAD

MH-1H

OPERATION MANUAL

AMADA®

Y03M0360E-04

Thank you for purchasing our Resistance Welding Head **MH-1H**

- 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] For Correct Use

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.

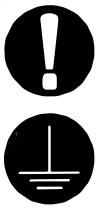
⚠ WARNING

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 equipment 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 Welding Head unnecessarily.
You may receive an electric shock or be burned.
Do not touch the inside of the Welding Head other than for maintenance as described in the operation manual.

Never disassemble, repair or modify the Welding Head.
These actions can cause electric shock and fire. Do not do anything other than the maintenance described in the operation manual.

⚠ 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 is finished.
The welded parts of a workpiece, **electrodes** and **arm** are very hot. Do not touch them; otherwise you may be burnt.

Use proper tools (wire strippers, pressure wire connectors, etc.) for termination of the connecting cables.
Do not cut the wire conductor. A flaw on it can cause fire and electric shock.

Do not damage the cables.
Do not tread on, twist or tense any cable. The connecting cables may be broken, and that can cause electric shock and fire.

Do not use a damaged cable.
A damaged cable can cause electric shock, short circuits and fire. If any part needs to be repaired, consult us or your distributor.

Connect the cables securely.
Insecure connection of a cable can cause fire and electric shock.

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 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. Spatter can burn the skin if they touch the skin.

Wear protective glasses.
If you look at the spatter directly during welding, your eyes may be damaged. If any spatter gets in your eye, you may lose your eyesight.

⚠ CAUTION

Do not splash water on the Welding Head.
Water splashed over the electric parts, can cause electric shock and short circuits.

Keep combustible matter away from the Welding Head.
Spatter can ignite combustible matter. If it is impossible to remove all combustible matter, cover them with non-combustible material.

Do not cover this Welding Head with a blanket, cloth, etc.
Do not cover this Welding Head with a blanket, cloth, etc. while you are using it. The cover may be heated and burn.

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

Maintain and inspect the Welding Head periodically.
Maintain and inspect the Welding Head periodically, and repair any damage nearby before starting operation.

Do not use this Welding Head for any purpose other than welding.
Use of this Welding Head in a manner other than specified can cause electric shock and fire.

Precautions for Handling

- Do not drop or step on this Welding Head.

- Do not install this Welding Head in the following places:

  Damp places (where humidity is 90% or higher), dusty places, places where chemicals are handled, places near a high-frequency noise source, hot or cold places (where temperatures are above 40°C or below 5°C), and places where water will be condensed.

- Use proper tools (wire strippers, pressure wire connector, etc.) for termination of the connecting cables, and take care not to damage the conductors.

- Clean the outside of the Welding Head 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 Head.

- Do not put anything other than a workpiece, e.g. a tool, a screw, etc., between the electrodes. It can cause serious trouble.

- Do not put a screw, a coin, etc., in the Welding Head, since they can cause a malfunction.

- Operate the Welding Head according to the method described in this operation manual.

[2] Introduction

The precision resistance welding head **MH-1H** has the following features.

- Since the weld force of the electrode can be adjusted steplessly, welding conditions can be set finely.
- Since a stable force is applied to the electrode for each weld, constant weld quality is obtained.
- Since the electrode responds to (follows up) penetration quickly, an expulsion or an excessive indentation is not made and the welded surface is clean.
- Since this welding head has a durable structure, reliable and stable weld quality is obtained.
- Since this welding head is small and light, the operator can use it for long hours without fatigue.

[3] Specifications and Accessories

Specifications

Item	MH-1H-00	MH-1H-01	MH-1H-02	MH-1H-03
Electrode weld force	0.5 – 2 kgf (Adjustable steplessly)			
Weld force exeration method	Spring			
Electrode diameter	ϕ5* (Tip: ϕ0.5)	ϕ3* (Tip: ϕ1.5)	ϕ3*	ϕ3*
Electrode stroke	4 mm min.			
Max. throat depth	42 – 48 mm	30 – 36 mm	59 – 65 mm	43 – 49 mm
Allowable welding energy	30Ws (At duty cycle of 2%) (AC and inverter)			
Mass of product	300 g (Only main unit)			
Dimensions	See outline.			

* For the shape of the electrode, see the outline.

Accessories

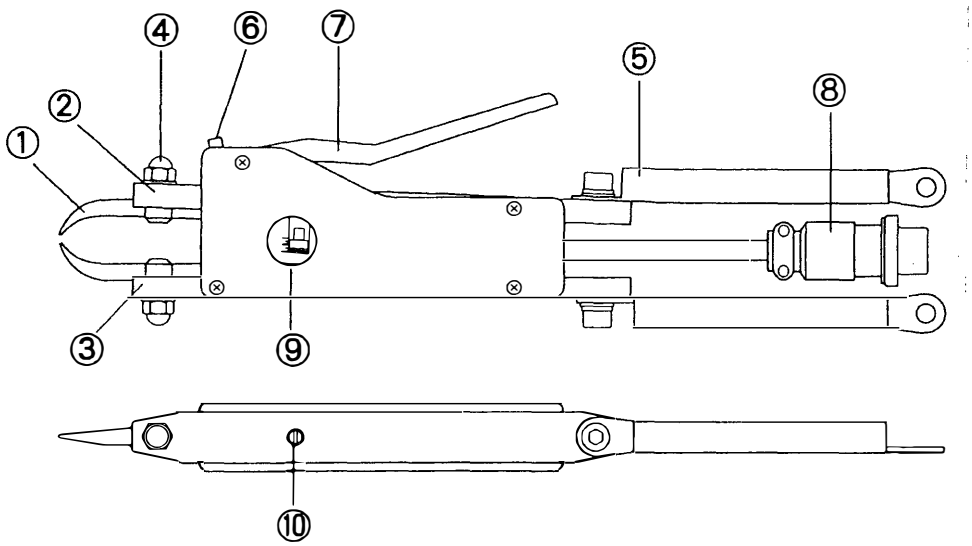
Check that all of the following accessories are supplied.

Accessory name	MH-1H-00		MH-1H-01		MH-1H-02		MH-1H-03	
Electrode	ϕ5 (Tip: ϕ0.5)	4 pcs.	ϕ3 (Tip: ϕ1.5)	4 pcs.	ϕ3	4 pcs.	ϕ3	4 pcs.
Hexagon socket head bolt	M5 x 15	2 pcs.	M5 x 15	2 pcs.	M5 x 15	2 pcs.	M5 x 15	2 pcs.
Spring washer	For M5	2 pcs.	For M5	2 pcs.	For M5	2 pcs.	For M5	2 pcs.
Plain washer	For M5	2 pcs.	For M5	2 pcs.	For M5	2 pcs.	For M5	2 pcs.
Hexagon wrench	–	–	For M4 (Nominal size: 3)	1pc.	For M4 (Nominal size: 3)	1pc.	For M4 (Nominal size: 3)	1pc.
Single-open-end wrench	Width across flats: 8 mm	1 pc.	Width across flats: 8 mm	1 pc.	Width across flats: 8 mm	1 pc.	Width across flats: 8 mm	1 pc.
Flat-head screw-driver	Small	1pc.	Small	1pc.	Small	1pc.	Small	1pc.
Secondary cable	14mm²x1000mm	2 pcs.	14mm²x1000mm	2 pcs.	14mm²x1000mm	2 pcs.	14mm²x1000mm	2 pcs.
Instruction manual	1 copy							

※ Two electrodes are installed to the body when delivered.

[4] Name and Function of Each Section

MH-1H-00



① **Electrode** (Material: CrCu)

These are the electrodes for spot welding.

② **Arm (1)**

This is the conductor for the upper electrode. If pressure is applied, this arm rocks.

③ **Arm (2)**

This is the conductor for the lower electrode.

> **⚠ CAUTION**
>
> The welding current flows through arm 1 and arm 2. Do not place anything metallic such as a watch, tools, etc. around this unit during operation, since it may be broken and can injure you.

④ **Set screw (1)**

This screw secures the electrode or electrode holder.

⑤ **Secondary cable**

This cable connects this unit to the welding controller. Two cables 14mm^2 x 1000mm each are attached.

> **Notice**
>
> If anything metallic such as a screwdriver, wire, etc. touches metallic sections of ① to ⑤ above during operation, it may be welded to this Welding Head. Do not place anything metallic around this unit during operation.

⑥ **Electrode spacing adjustment screw**

This screw is used to adjust the opening of the electrodes.

⑦ **Weld force lever**

If this lever is operated, arm (1) rocks to exert force on the workpiece.

⑧ **Start cable**

This cable is connected to the start mechanism terminal of the welding controller. It does not have polarity.

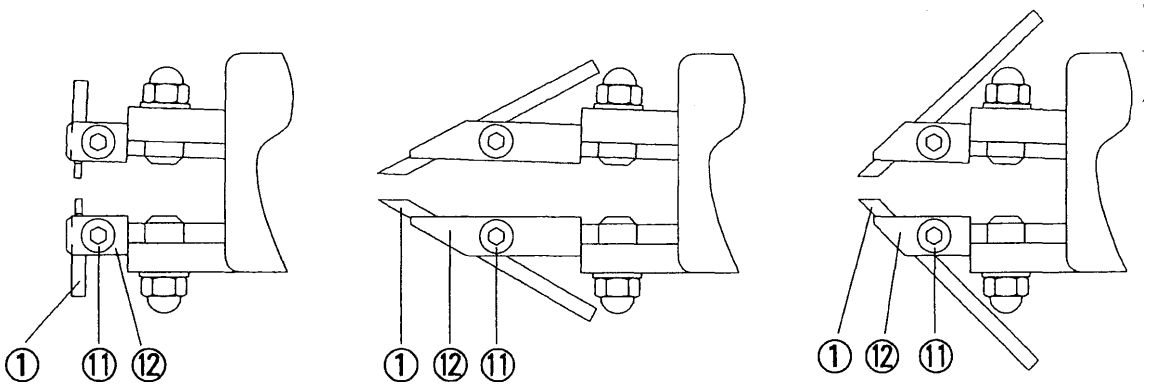
⑨ **Weld force scale**

This is used to check the weld force.

⑩ **Weld force adjustment screw**

This screw is used to adjust the weld force.

MH-1H-01 **MH-1H-02** **MH-1H-03**



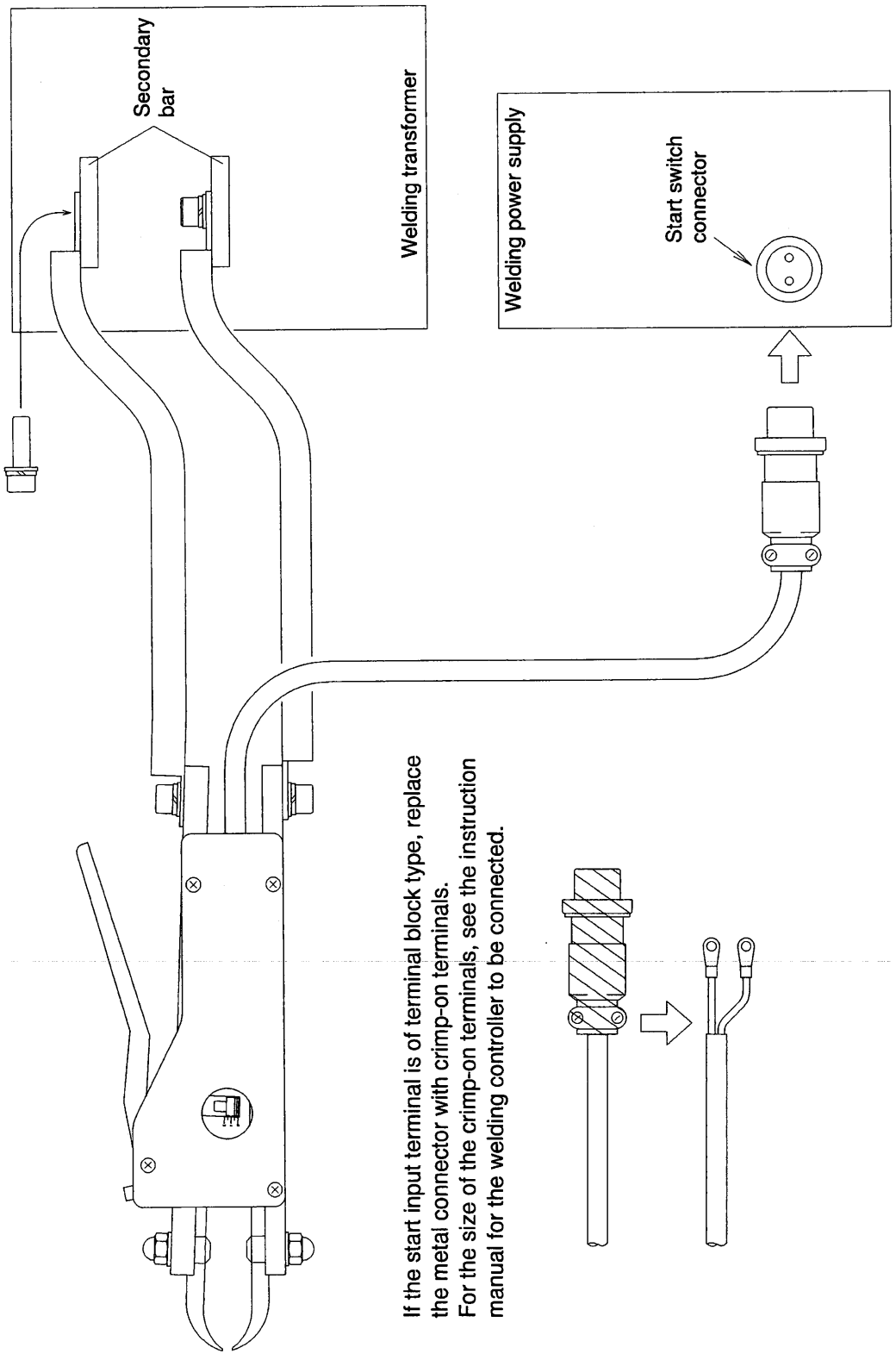
⑪ **Set screw (2)**

This screw secures the electrode to the electrode holder.

⑫ **Electrode holder**

This holder secures the electrode.

[5] Connection of Welding Power Supply and Welding Transformer



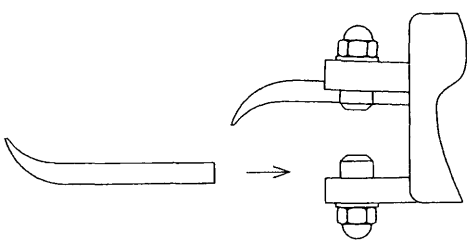
[6] User's Maintenance

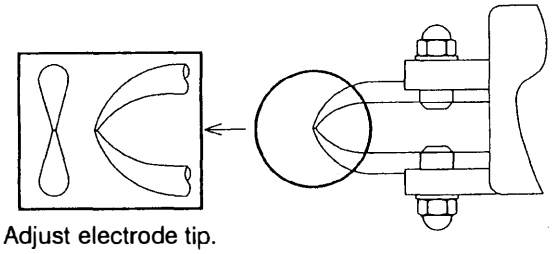
1. Replacement of electrodes

When replacing the electrodes, observe the following procedures:

Caution

If arm (1) rocks while the electrodes are replaced, it can be broken or can injure you. When replacing the electrodes, be sure to turn off power supply of the welding controller.





Adjust electrode tip.

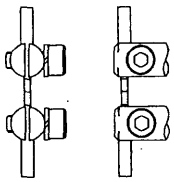
① Loosen set screw (1) and pull out the electrode.

② Match the replacement electrode to the groove of the arm and insert it in the set screw.

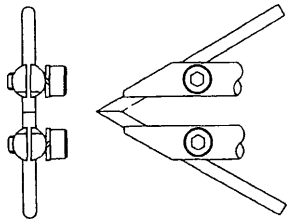
③ Tighten the set screw lightly and apply weld force, then adjust the electrode tip.

④ Retighten the set screw.

Electrode of **MH-1H-01**



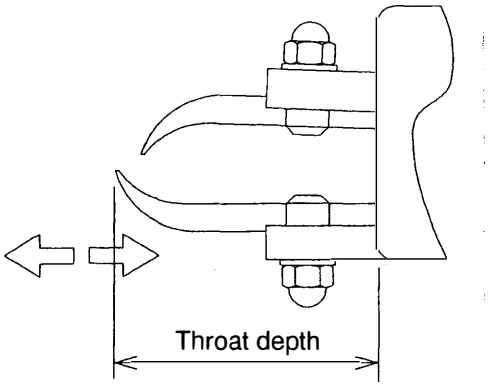
Electrode of **MH-1H-02** and **MH-1H-03**



- In the case of **MH-1H-01**, **MH-1H-02** and **MH-1H-03**, loosen set screw (2) and replace the electrode. After replacing the electrode, adjust its tip.

2. Throat depth

Adjust the throat depth according to the following procedure.



① Loosen set screw (1).

② Slide the electrode or electrode holder (See the arrows in the figure at left) to adjust the throat depth.

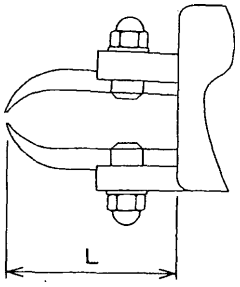
③ Adjust the upper and lower electrodes so that their tips will touch each other when weld force is applied.

④ Tighten set screw (1) to fix the electrode or electrode holder.

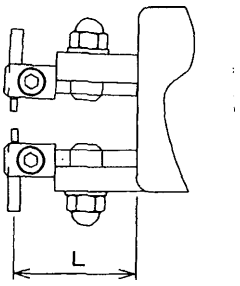
Adjust the throat depth (Dimension L in the figures below) in the following range.

Model	Throat depth (Dimension L)
MH-1H-00	42 – 48 mm
MH-1H-01	30 – 36 mm
MH-1H-02	59 – 65 mm
MH-1H-03	43 – 49 mm

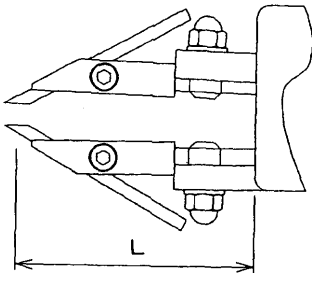
MH-1H-00



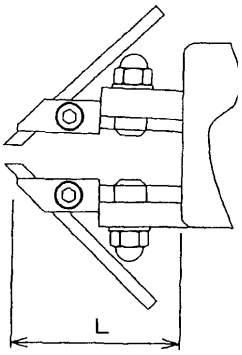
MH-1H-01



MH-1H-02



MH-1H-03

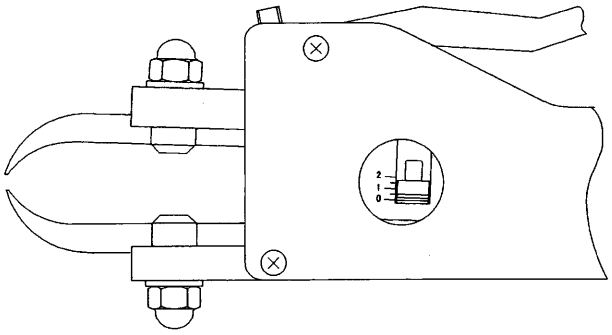


3. Adjustment of weld force

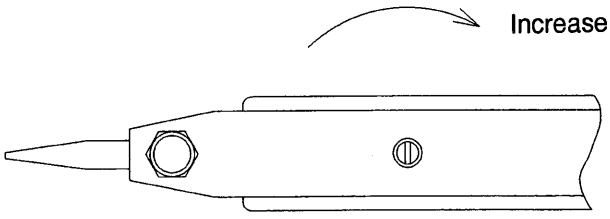
Insert the attached flat-head screwdriver or another small-sized flat-head screwdriver in the hole on the bottom of this head, and turn the weld force adjustment screw.
For the relationship between the weld force scale and the actual weld force, see the "weld force conversion graph".

Notice

The weld force conversion graph indicates the theoretical values. When measuring the actual pressure, use a pressure gauge or a spring balance.



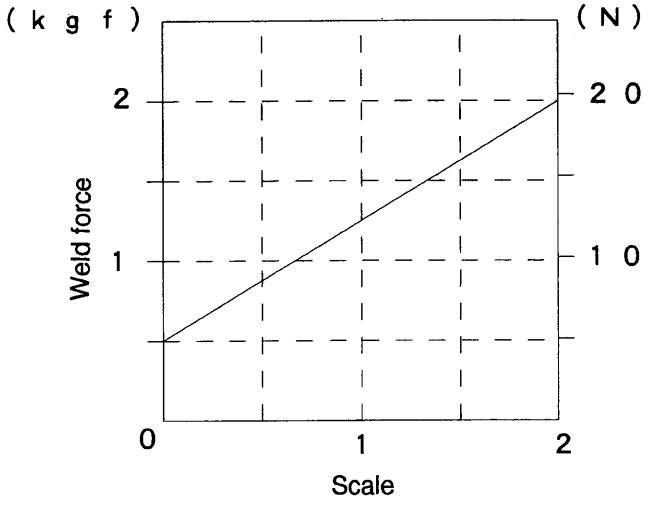
Adjust the red line of the pointer to a desired division of the scale.

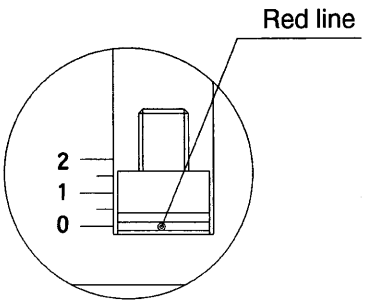


Increase weld force.

Decrease weld force.

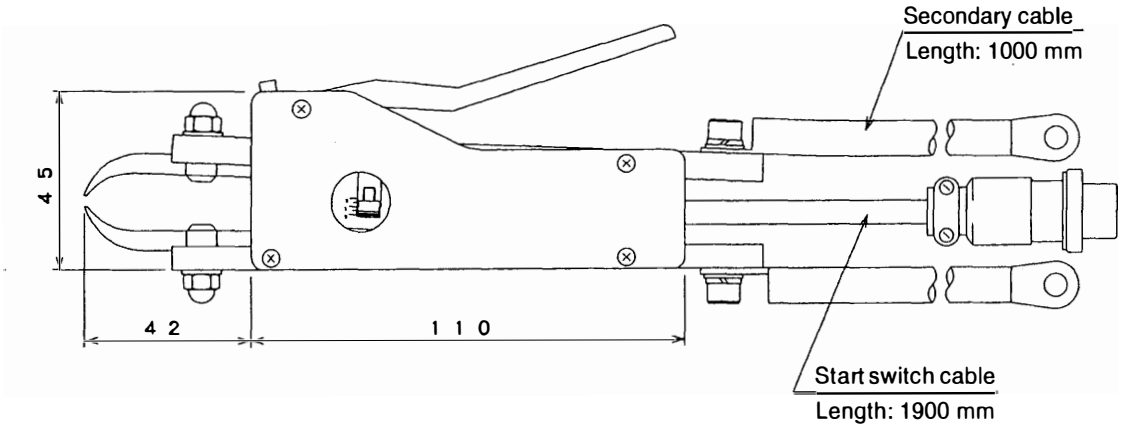
Weld force conversion graph





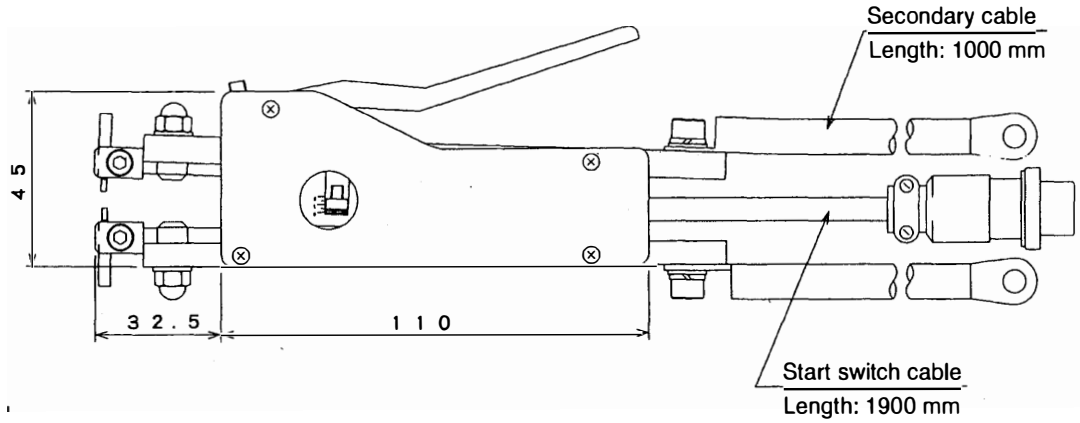
[7] Outline

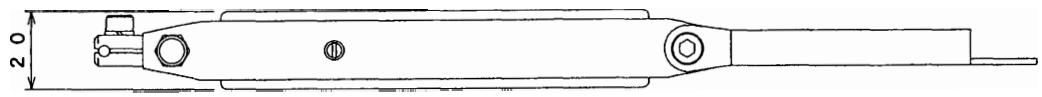
MH-1H-00



(Unit: mm)

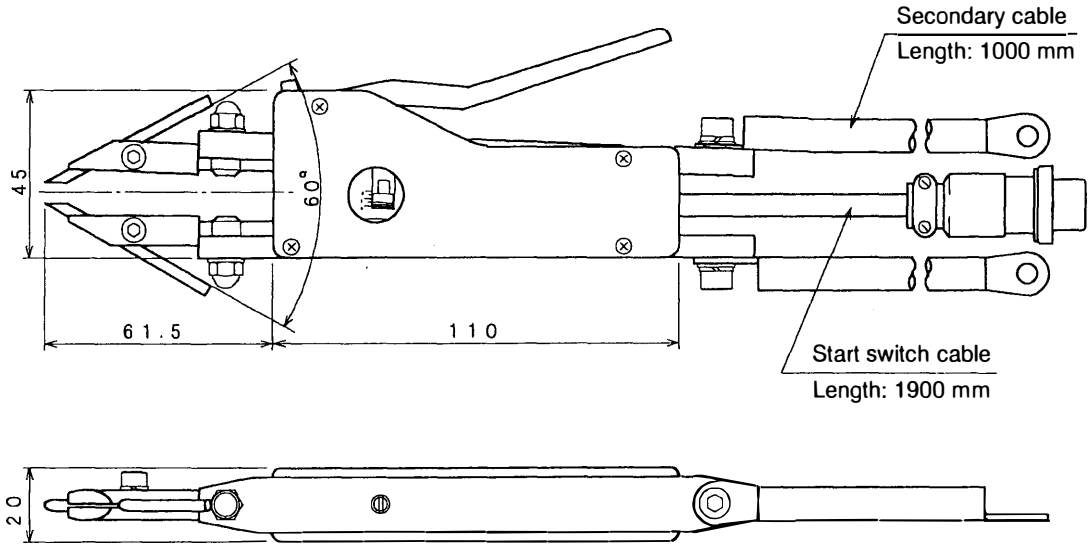
MH-1H-01





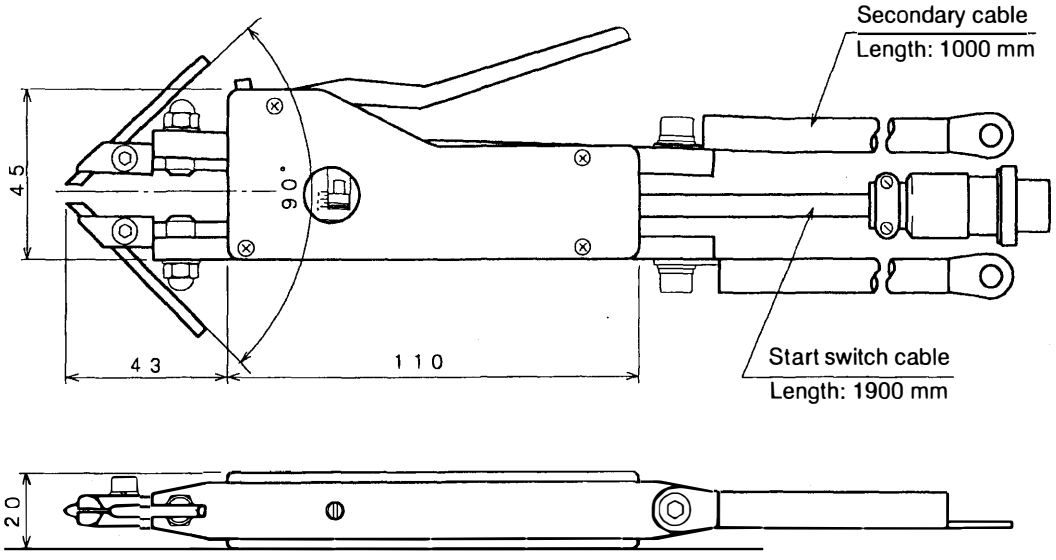
(Unit: mm)

MH-1H-02



(Unit: mm)

MH-1H-03



(Unit: mm)