



WEL-HANDY MINI STRONG OPERATION MANUAL



For every person who will be engaged in operation and maintenance supervision, It is recommended to read through this manual before any operations, so as to permit optimum operation of this machine.

KOIKE SANZO KOGYO CO.,LTD.

INTRODUCTION

Thank you very much for purchasing this product. Read this instruction manual thoroughly to ensure correct, safe and effective use of the machine. Read the manual first to understand how to operate and maintain the machine. Cooperation between colleagues in the workplace is essential for safe, smooth operation.

Make sure you read, understand and take all the necessary safety precautions.














SAFETY PRECAUTIONS

This product is designed to be safe, but it can cause serious accidents if not operated correctly. Those who operate and repair this machine must read this manual thoroughly before operating, inspecting and maintaining the machine. Keep the manual near the machine so that anyone who operates the machine can refer to it if necessary.

- Do not use the machine carelessly without following the instructions in the manual.
- Do not use the machine until you have thoroughly understood the explanations in the manual.
- For safety, leave the installation, maintenance, inspection, and repair of the machine to a trained person who has thorough knowledge about welding machines or to a qualified operator.
- For safety, leave the operation of the machine to a person with complete knowledge of the instruction manual and sufficient skill.
- For safety education, make use of respective lecture meetings sponsored by the Welding Society and Welding Association, as well as by headquarters and branches of related scientific societies and associations. Make use of qualification tests for welding engineers and welding technicians as well.
- After reading the manual, keep it together with the warranty within reach of people concerned. Read the manual again as necessary.
- Contact our dealers or our branch office, sales office, or local office for any obscure points.
- When this manual is lost or damaged, place an order promptly with our dealer for another copy.
- When transferring the machine, be sure to attach the instruction manual to the machine to transfer it to the next owner.

QUALIFICATIONS FOR MACHINE OPERATOR

Operators and repair staff of this machine must completely understand the contents of the instruction manual and they must be qualified and educated to handle this equipment.

| Symbol | Title | Meaning |
|---|--|--|
|  | General | General caution, warning, and danger. |
|  | Be careful not to get your fingers caught. | Possible injury to fingers if caught in the insertion part. |
|  | Caution: Electric shock! | Possible electric shock under special conditions. |
|  | Ground this equipment. | Operators must ground the equipment using the safety grounding terminal. |
|  | Pull out the power plug from the outlet. | Operators must unplug the power plug from the outlet when a failure occurs or when there is a danger of lightning. |
|  | Caution against bursting | Possible bursting under certain conditions. |
|  | General | General warning. |
|  | Caution: Hot! | Possible injury due to high temperature under certain conditions. |
|  | Caution: Ignition! | Possible ignition under certain conditions. |
|  | Caution: Magnet | Generating a magnetic field and magnetic waves. |
|  | Wear light shielding goggles. | Be sure to wear light shielding goggle when looking at welding arcs. |
|  | Wear dust/gas mask. | Wear a mask when dust, smoke, or gas is to be generated during work. |
|  | Do not lift. | Lifting the carriage is prohibited to prevent an accident due to falling. |




CONTENTS

| | |
|---|----|
| 1. Safety Information..... | 1 |
| 2. Safety precautions | 2 |
| 3. Locations of safety labels | 6 |
| 4. Features and specifications | 7 |
| 4.1 Features | 7 |
| 4.2 Configuration | 7 |
| 4.3 Specifications..... | 8 |
| 5. Method of operation | 9 |
| 5.1 Name of each part..... | 10 |
| 5.1.1 Main unit of welding carriage..... | 10 |
| 5.1.2 Operation panel..... | 14 |
| 5.2 Preparation and procedure for welding | 16 |
| 5.3 System connection diagram | 18 |
| 5.4 Applicable welding machine and signal adaptor | 18 |
| 5.5 Operational precautions..... | 18 |
| 6. Maintenance | 19 |
| 6.1 Maintenance and inspection..... | 19 |
| 6.1.1 Daily inspection | 19 |
| 6.1.2 Monthly inspection | 20 |
| 6.2 Recommended spare parts | 20 |
| 6.3 Trouble shooting | 20 |
| 6.4 Warranty..... | 23 |
| 7. Wiring diagram..... | 24 |
| 7.1 Electrical diagram | 24 |
| 7.2 Assembly drawing of circuit board | 25 |
| 7.2.1 L-DSP-A circuit board | 25 |
| 7.2.2 L-MD-A circuit board..... | 26 |
| 8. Assembly drawing of WEL-HANDY MINI STRONG | 27 |
| 9. Parts list..... | 28 |
| 9.1 Main body and inside parts..... | 28 |
| 9.2 Outside parts..... | 30 |
| 9.3 Electrical parts | 32 |

1 Safety information

Most accidents are caused by negligence of basic safety regulations during operation, inspection, and maintenance. Carefully read, understand, and master the safety precautions and preventive measures written in this manual or on the machine before operation, inspection, and maintenance of the machine.

- Carefully read this manual before use.
- Conduct installation of motive power source on the primary side, select the location of installation, store high-pressure gas, install pipes, store products after welding, and dispose of waste in conformity with laws and your in-house regulations.
- Precautions are provided in this manual for safe operation of the machine and prevention of injury to you or other people or other damage.
- Improper handling of the machine will cause injury or damage at various levels. The levels are classified into three categories, which are represented by respective caution symbols and signal terms to call people's attention. These symbols and terms are used in the same way on the warning labels stuck to the machine.

| Caution symbol | Signal terms | Definition of terms |
|---|--------------------|---|
|  | DANGER | Improper handling is very likely to cause death or serious injury. |
|  | WARNING | Improper handling can cause death or serious injury. |
|  | CAUTION | Improper handling can cause injury or physical damage. It is also used to point out dangerous habitual action. |
| | Notice sign | The notice sign notifies machine operators and maintenance men of precautions as to parts of the machine or peripheral equipment that will lead to breakdown. |

The serious injury mentioned above refers to loss of eyesight, injury, burns (high/medium temperature), electric shock, bone fracture, poisoning which leave an aftereffect or require hospitalization or regular treatment at a hospital for an extended period of time. The injury refers to a wound, burn, or electric shock which do not need hospitalization or regular treatment at a hospital for an extended period of time. The physical damage refers to damage to assets and extensive loss due to damage to the machine.

2 Safety precautions



WARNING

Strictly observe the following to prevent accidents resulting in serious injury or death.

- This welding machine is designed and manufactured by taking safety into consideration. However, never fail to observe the warning and precautions described in this instruction manual, otherwise accidents leading to serious injury or death can result.
- Keep people out of the space around the welding machine and working area.
- The welding machine generates a magnetic field around itself. Such a magnetic field affects certain types of sensors and clocks. For the same reason, any person who have a pacemaker in his heart shall not approach the welding machine in operation or the welding space unless he has obtained doctor's permission.
- For safety, leave the installation, maintenance, inspection, and repair of the machine to a person who has thorough knowledge about welding machines or to a qualified operator.
- For safety, leave the operation of the machine to a person with complete knowledge of the instruction manual and sufficient skill.
- Do not use this machine for any purpose other than arc welding described in the instruction manual.
- Do not remodel the machine.
- Check the safety around the machine before operation to prevent accidents.
- Be sure to hold the handle when carrying the machine.
- Wear leather gauntlets when touching the machine during welding or right after operation.
Do not touch the welded surface until it has cooled.



WARNING

Strictly observe the following to prevent electric shock.



- Do not touch the charged section; otherwise fatal electric shock or burns can result. When the power on the input side is turned on, the input circuit and the inside of the welding machine are charged. Even if the input power is turned off, the capacitor may have been charged. When the welding power is output, the electrode and base metal, as well as the metal portion in contact with these, are charged.
- Never touch charged sections.
- The welding power supply case and base metal, as well as jigs electrically connected to them, shall be grounded in conformity with the law (Technical Standard for Electric Equipment) by a qualified electric engineer.
- Turn off all power supplies on the input side by means of switches in the switch boxes before installation, maintenance, and inspection. The capacitor will not discharge completely right after the input power is turned off. Check that no voltage is remaining before maintenance or inspection.
- Periodically conduct maintenance and inspection. Repair damaged parts before resuming operation.
- Do not use cables with insufficient capacity or damaged cables whose

conductors are exposed.

- firmly tighten and insulate cable connections.
- Firmly connect the welding cable on the base metal side at a location as close as possible to the base metal.
- Do not use the machine with the welding machine case or coser removed.
- Be sure to cover the input and output terminals before use.
- Do not use broken or wet gauntlets.
- Never fail to use a life-line when working in high places.
- Turn off power switches of all devices and input-side power supply when the machine is not used.
- Do not wear wet clothes.
- Do not stand on or touch the wet floor.
- Do not use the machine outdoors when it is raining.
- Do not leave the machine outdoors after use.
- Be sure to install a fuse or breaker on the input power supply side.
- Check the supply voltage of the machine before use.
The tolerance for the input supply voltage is plus or minus 10% of the rating. Use of the machine out of the tolerance is prohibited.
- The metal receptacle (plug) on the tough-rubber sheath cable is threaded. Tighten it firmly.
- The plug of optional power supply cable is the 3P-type with a ground wire
- Be sure to ground the tough-rubber sheath cable of the machine.
- Turn off the power and stop operation in the following cases, and ask an engineer with special knowledge of electricity to repair.
 - *Broken or worn-out cables
 - *Damage due to water leakage or other liquid
 - *Malfunction of the machine inspire of operation in conformity with the instruction manual.
 - *Breakdown of the machine.
 - *Abnormal performance of the machine which requires tune-up.
- Ask an engineer with expertise to maintain, inspect, or repair the machine.
- Please make sure that any foreign material does not attach to the connector of the machine nor to the plug of the power cable when the plug of the power cable is connected to the machine.
Foreign materials can cause short-circuits or melt the connector.



CAUTION

Use protective gear to protect you and others from arc light, scattered spatters/slugs, and noise.



- The arc light includes harmful ultraviolet rays and infrared rays, causing inflammation of eyes or burns.
- Scattered spatters and slugs can damage your eyes and cause burns.
- Noise can cause hearing difficulties.
- Wear light-shielding goggles or hand shield, which blocks light sufficiently, for welding operation or monitoring welding.
- Wear protective goggles to protect your eyes from spatters and slugs.
- Install a protective curtain around the welding site so that arc light will not reach the eyes of people around the site.
- Wear protective gear such as leather gauntlets, clothes with long-sleeves, leg cover, leather apron, helmet, and safety shoes.
- When the noise level is high, wear a noise-proofing protector.

**CAUTION**

Use protective gear to protect you and others from fumes and gas generated by welding.



- Welding generates fumes and gas. Inhalation of such fumes and gas can damage your health.
- Welding operation in a small space causes deficiency of oxygen, which is very likely to cause suffocation.
- To prevent gas poisoning and suffocation, use the local waste disposal facilities stipulated by the law (Industrial Safety and Health Law and Regulations to Prevent Damage due to Dust) or use an effective inhaler.
- When the welding space is small, ventilate the space sufficiently or wear an inhaler. Have a trained watchman monitor welding.
- Welding operation near places where degreasing, washing, or spraying is conducted may lead to generation of harmful gas. Do not conduct welding near such places.
- Welding zinc plated steel sheets or other coated steel sheets will generate harmful fumes. Remove the coating before welding, or wear an inhaler before operation.

**CAUTION**

Strictly observe the following to prevent gas cylinders from falling or bursting.



- Gas cylinders, when they fall, can cause accidents leading to death or injury.
- High-pressure gas is contained in gas cylinders. Improper handling of gas cylinders can cause a burst or emission of high-pressure gas, causing accidents that lead to death or injury.
- Handle gas cylinders in conformity with the law (High Pressure Gas Control Law).
- Do not expose gas cylinders to high temperatures.
- Set gas cylinders in a special cylinder stands to prevent the gas cylinders from falling.
- Never generate arcs on gas cylinders. Do not hook the welding torch on gas cylinders, or do not allow electrode to touch gas cylinders.
- Do not bring your head close to the discharge port when opening the valve on the gas cylinder.
- Attach a protective cap to gas cylinders when they are kept unused.
- Use a gas flow rate controller made or recommended by a welding machine manufacture.
- Read the instruction manual for the gas flow rate controller before use, and strictly observe the precautions.
- Never use a gas cylinder from which gas is leaking or a broken gas cylinder.
- Use gas cylinders only for specified purposes.
- DO not apply oil or grease to the valve on gas cylinders.
- When the valve on gas cylinders is hard to open, contact the dealer.

**CAUTION**

Strictly observe the following to prevent injury due to rotary section.



- Do not bring your hands, hair, or clothes close to the cooling fan of the welding power supply or the feeder roller of the wire feeder; otherwise you can be caught in them.
- Do not bring your head near the end of the welding torch during wire inching; otherwise the wire may stick in your eyes.
- When the spool of wire is released, you can get hurt.
- Do not use the welding machine with its case or cover removed.
- Ask a trained person who has thorough knowledge of welding machines or a qualified person to remove the case for maintenance, inspection, or repair. Install a protective fence around the welding machine to prevent people from getting near carelessly.
- DO not bring your hand, fingers, hair, or clothes close to the rotating cooling fan or the roller of the feeder.
- Do not bring your head near the end of the welding torch during wire inching.
- Secure the end of the wire with the wire stopper on the spool when storing or moving the spool of wire or when setting it in the wire feeder.
- When inserting the spool of wire into the wire guide on the wire feeder, firmly hold the wire so that it will not be released.

**CAUTION**

Strictly observe the following to prevent fire, explosion, or burst.

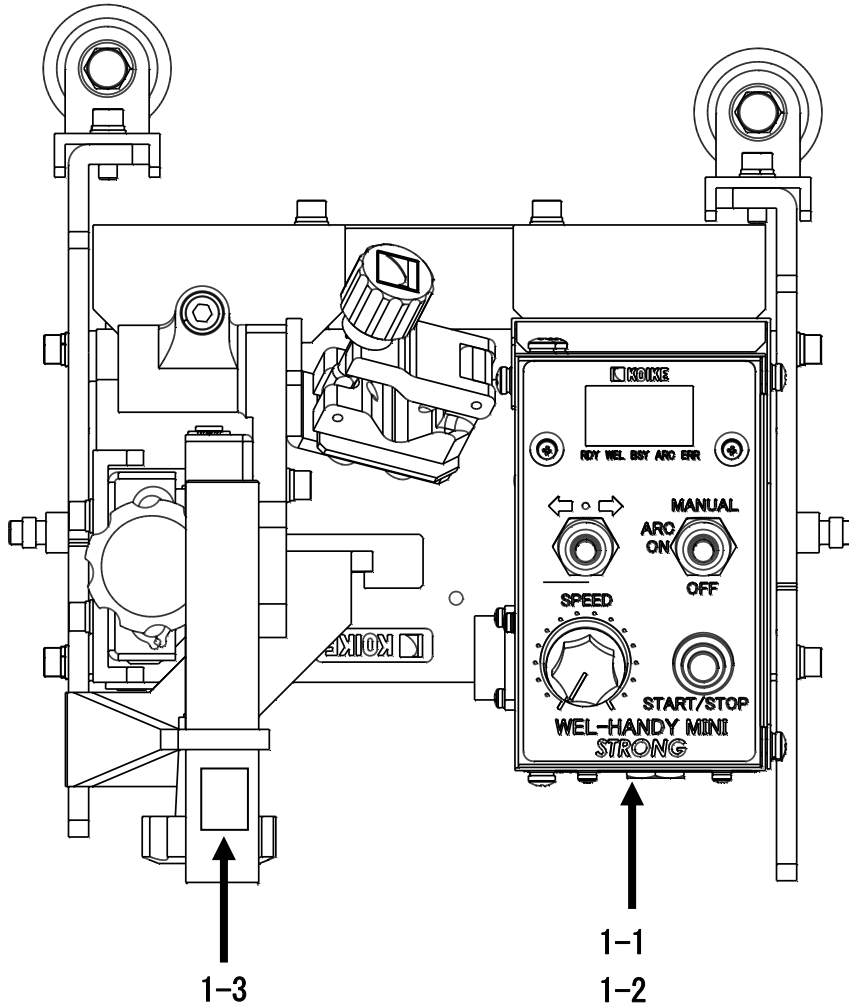


- Spatters and hot base metal right after welding can cause fire.
- Imperfect connection of cables or imperfect contact on the route of the electric current on the steel bar and other base metal can cause fire because of heating due to resistance.
- Arcs generated on the container of gasoline or other inflammables can cause explosion.
- welding of sealed tanks or pipes can cause bursts.
- Do not do welding in a place where scattered spatters will be in contact with inflammables.
- Do not do welding in a place near inflammable gas.
- Do not bring hot base metal right after welding close to inflammables.
- Welding on ceilings, floors, and walls may cause fire on the hidden side. Remove inflammables from the hidden side.
- Firmly tighten cable connections, and firmly connect the welding cable on the base metal side at a location as close as possible to the base metal.
- Do not weld gas pipes filled with gas.
- Do not weld sealed tanks or pipes.
- Provide a fire extinguisher near the welding place to prepare for the worst.
- Do not weld a container that has inflammables inside.
- Do not have a lighter, matches, or other inflammables with you during welding.

3 Location of Safety labels

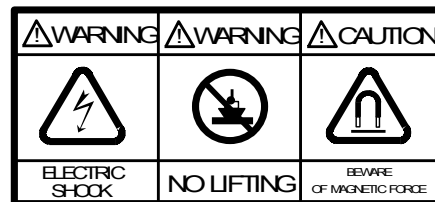
Safety labels and labels for correct operations are stuck to the machine.

- Carefully read labels before operation and follow the instructions decried on them.
- Never peel off the labels. Keep them clean and legible at all times.



| | |
|---|------------|
| Serial No. | 123456 |
| WEL-HANDY MINI STRONG | |
| Input power | DC24V 1.3A |
| Single phase | |
| Electrical Drawing No. | 61007549 |
| NET weight | 8.2 kg |
| Magnet type | 35 kg |
| 2016 | |
| 1-9-3, Onodai, Midori-ku, Chiba-shi, Chiba, Japan | |
| KOIKE SANSO KOGYO CO., LTD. | |
| Made in Japan | |

1-1



1-2

Year of manufacture



1-3

4 Features and specifications

4.1 Features

This carriage "WEL-HANDY MINI STRONG" was developed to make it available even for a non-skilled welding operator, to carry out horizontal fillet welding (down laid welding), vertical fillet welding and overhead welding by easy operations.

Major features are as follows:



- 1) Compact, Light weight, Durable and Low gravity.
- 2) By the adoption of a powerful magnet in this carriage, the tracing reliability and the traction power have been greatly improved. Therefore, in addition to horizontal fillet welding, various welding construction including vertical fillet welding and upward fillet welding has been realized.
- 3) It is able to operate plural machine by improved tracing reliability and automatic stopping function.
- 4) The direction changeover switch permits rightward/leftward traveling.
- 5) The roller arm is possible the change of taking in and out with one-touch operation due to the fixation ceremony by the screw.
- 6) The height of the guide rollers can be widely adjusted. (cf. Figure 3.)
- 7) A rough indication of speed is displayed by a digital meter. It can be used for exploit the indications of welding condition.
- 8) By pressing the Limit switch while stopping of carriage, carriage moves at constant speed and it becomes easy to align.
- 9) It is equipped with an overload detective function of the motor, to minimize the damage to the work caused by continuing the welding of the steel plate, when this carriage is stopped by the load from outside in any case.


The above features are expected to exhibit their effects in terms of "welding efficiency" and "operation by unskilled workers."



4.2 Configuration

- | | |
|-------------------------|----------|
| 1) Main unit | 1set |
| 2) Accessories | |
| *Hexagon wrench (M6/M5) | 1pc each |
| Instruction manual | 1pc |

5 Method of operation

| | |
|---|--|
|  WARNING | <p>Kindly take care about following things to avoid getting an electric shock.</p> |
|  | <ul style="list-style-type: none"> ● Kindly remove input plug from outlet while checking, dis-assembling or repairing and turn OFF the control source while leaving. If it is necessary to carry out checking in the energized state, professional engineer having enough knowledge and skill about electric handling should go since there is risk of short circuit, getting electric shock. |
| <ul style="list-style-type: none"> ● Do not use welding equipment without case or cover. ● Kindly use input voltage in the range of DC24V There is risk of short circuit due to failure of printed board on operation panel. ● In case of crack in insulation cover of power cable and torch cable, do not expose it to high temperature. There is risk of short circuit due to tearing of insulation covering. ● Kindly weld below the rated current and usage rate of torch to prevent dielectric breakdown due to overheating. ● Kindly place power cable and torch cable in proper manner so that they are not stretched or pulled. There is possibility of breakage of insulation by damaging holding part and connector part due to pulling. ● Do not throw or drop main body of carriage. There is risk of damaging insulation by breaking. ● While connecting to power cable plug to main body, kindly connect after verifying that foreign object is not touching to connector of main body, power cable plug .There is risk of connector erosion due to short circuit by foreign object. | |

| | |
|---|---|
|  WARNING | <p>Strictly observe the following to prevent burns.</p> |
| <ul style="list-style-type: none"> ■ Never directly touch the torch nozzle, tip, orifice, insulation cylinder, and the surface of the carriage which are very hot right after welding. | |

| | |
|---|---|
|  WARNING | <p>Kindly take care about following things to avoid falling off of carriage</p> |
|  | <ul style="list-style-type: none"> ● Do not lift the carriage by holding its Handle. There is risk of falling off carriage while holding carriage by handle, if there is shock impact at carriage or if mounting screw of handle is loose. |



CAUTION

Set the welding power switch in the "No Self-Holding (or No Crater Treatment)" position.

■ When the switch of the welding power supply, which is to be connected to the welding machine, is set in the "Self.Holding (or Crater Treatment)" position, the welding arc will not stop even if the welding operation is stopped.

5.1 Name of each part

5.1.1 Main unit of welding carriage

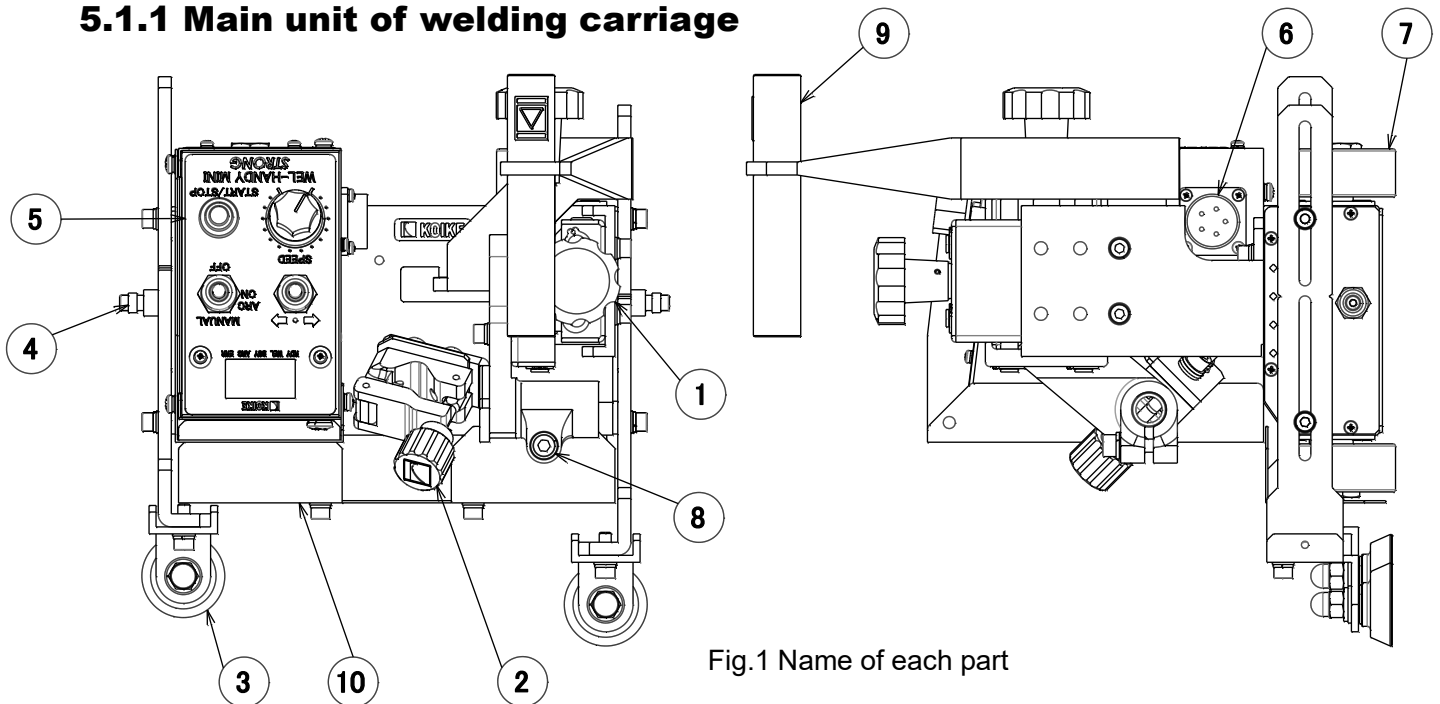


Fig.1 Name of each part

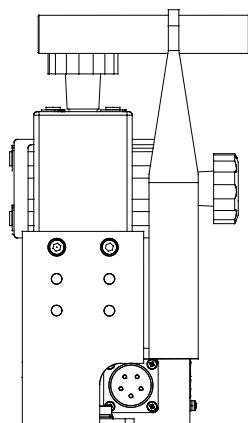
(1) Slide unit assembly

The arc point can be adjusted toward UP/DOWN or FRONT/REAR.

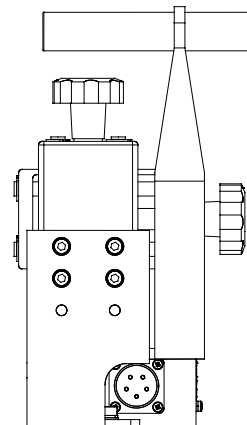
The each stroke is 45 mm / 1.77inch.

※If you want to use a standard slide unit, you can not use the installed to the top of the hole of the bracket as shown in the figure below. If you install a standard slide unit with the holes on the top of the bracket might sandwich the hand between the handle.

The top of the hole in the bracket only if you use the four-hole slide unit (StNo.T61000645) is used.



Not use (standard slide unit)



The four-hole slide unit

(2) Torch holder

Insert the exclusive use torch mounting section into the torch holder to secure it.

| | |
|---|--|
| | <p>WARNING</p> |
| <p>Secure the insulated section of the torch when mounting it.</p> | |
| | <p>■ When the conductive section is secured, a short circuit and/or electric shock can result.</p> |

(3) Guide roller and arm

Press them against the vertical plate for welding by tracing.

Kindly fit doorway of Guide Roller Arm as shown in Figure 2.

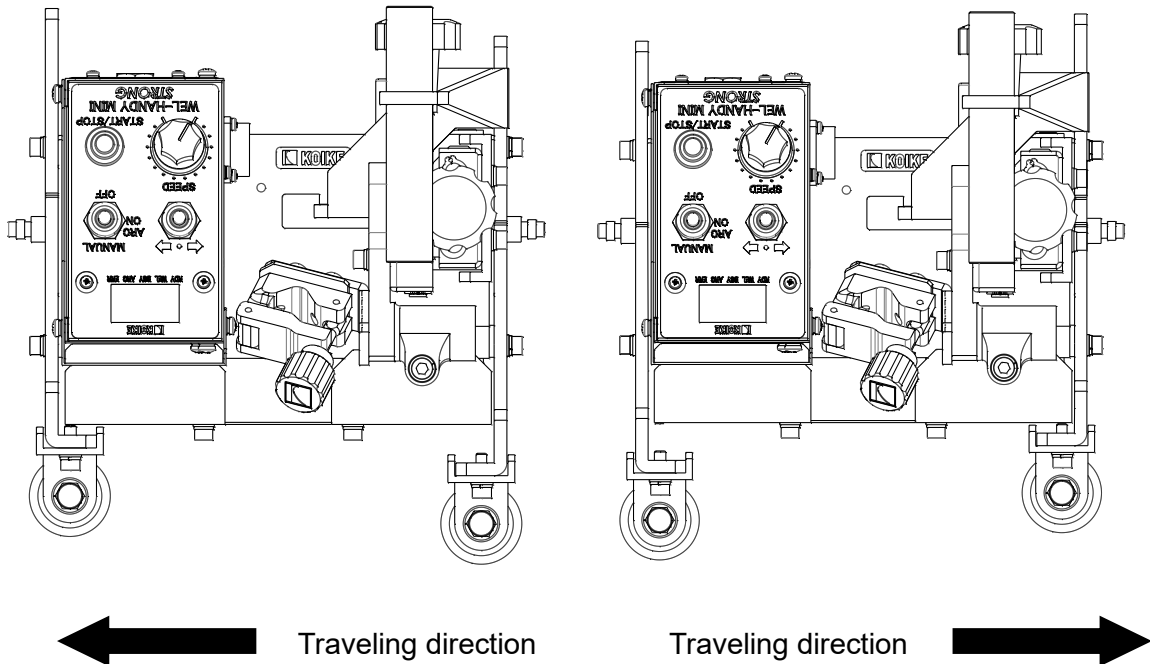


Fig.2 doorway of Guide Roller Arm

The height of the guide rollers can be adjusted by changing the attaching method.

The height can be adjusted in the range of -18mm(0.709inch) ~ 16mm(0.630inch) and 66mm(2.599inch) ~ 101mm(3.976inch) from the contact patch of a tire.

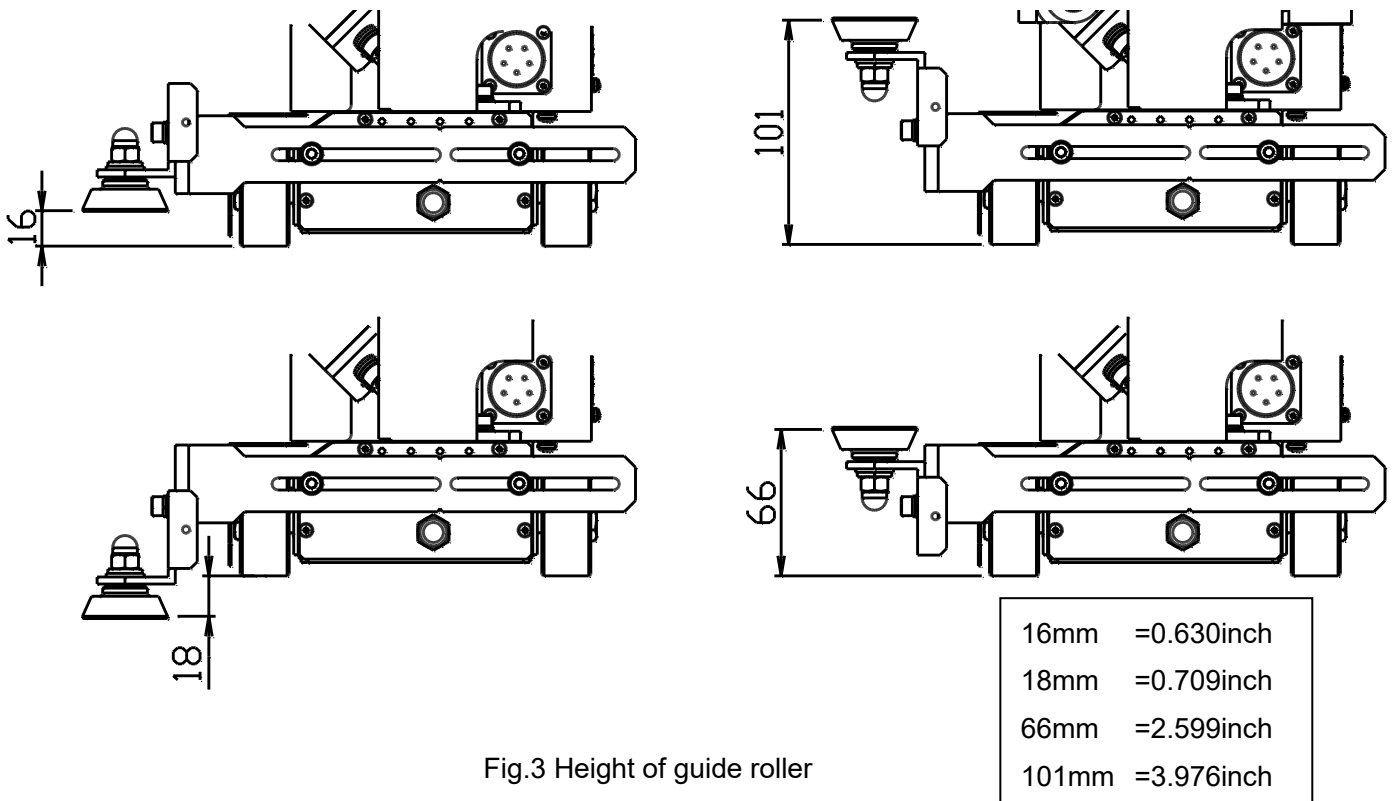


Fig.3 Height of guide roller

(4) Limit switch (“Fine tuning button for positioning” at the time of stopping of carriage)

These are provided on both sides of the carriage, serving as (welding) stop button.

By pressing Limit switch at the time of stopping of carriage, carriage moves towards opposite direction of pressed Limit switch only while switch is in pressed state. Kindly use it while fine tuning movement at the time of positioning of carriage.



CAUTION

Do not apply impact to the limit switch.

- When impact is applied to the limit switch, it can be broken. When the limit switch is broken, the automatic stopping function will not work, and arcs and the traveling carriage will not stop.



(5) Operation panel

The detail is shown below.

(6) Receptacle

Kindly connect power cable to this receptacle.

The cable is connected between the control panel and the wire feeder, as well as power supply. (The cable is divided in the middle into one for the wire feeder and another for the input power.)

| | |
|---|--|
|  | WARNING |
| Never fail to ground the clip. | |
|  | <ul style="list-style-type: none"> ■ The grounded clip prevents short circuits or electric shock which results from a short circuit in the carriage, etc. |

(7) Driving wheel (Rubber roller)

(8) Torch angle adjusting bolt



Used to set the torch angle. Loosen the bolt and swing the torch for setting within the range of 40-55 degrees.


(9) Handle


Lever to turn ON/OFF the handle-magnet for transporting the carriage.



Lifting the handle turns OFF (detaches from the steel plate) the magnet built into the carriage.

Releasing the handle turns ON (adsorbs to the steel plate) the magnet.

| | | |
|---|----------------|---|
|  | WARNING | Do not lift carriage by holding handle |
|  | | <ul style="list-style-type: none"> ● Do not lift carriage by holding its Handle. There is risk of falling off carriage while holding the carriage by handle, if there is shock impact to carriage or if mounting screw of handle is loose. |

| | | |
|---|----------------|--|
|  | CAUTION | When the carriage is set, the magnet is automatically adsorbed (turned ON). |
| | | <ul style="list-style-type: none"> ● When this carriage is set to a steel plate, the magnet turns ON automatically. As the handle works, please make sure that your fingers or clothes may not be smashed. In addition, please pay attention to the movements of that handle with adsorption. |

| | | |
|---|----------------|---|
|  | CAUTION | When the handle is lifted up, the adsorption of the magnet turns OFF automatically. |
| | | <ul style="list-style-type: none"> ● When the handle is lifted up, the carriage is detached from the steel plate, and the adsorption of the magnet turns automatically into the OFF condition. |



| | | |
|---|----------------|--|
|  | CAUTION | Possibility of sandwiching the hand between the slide unit is there . |
|  | | <ul style="list-style-type: none"> ● If the mounting position of the slide unit is in the upper or middle position , there is a possibility that sandwich the hand between the handle and slide unit at the time of carriage set . Please be careful. |

(10) Heat insulator plate

It protect the drive roller and fuselage from heat and sputtering.

5.1.2 Operation panel

V3.32

| | |
|--|--|
|  WARNING | Kindly take care about following things to avoid getting an electric shock. |
|  | <ul style="list-style-type: none"> ■ Kindly remove input plug from outlet while checking, dis-assembling or repairing and turn OFF the control source while leaving. If it is necessary to carry out checking in the energized state, professional engineer having enough knowledge and skill about electric handling should go since there is risk of short circuit, getting electric shock. |
| <ul style="list-style-type: none"> ● Do not use welding equipment without case or cover. ● Kindly use input voltage in the range of DC24V There is risk of short circuit due to failure of printed board on operation panel. ● In case of crack in insulation cover of power cable and torch cable, do not expose it to high temperature. There is risk of short circuit due to tearing of insulation covering. ● Kindly place power cable and torch cable in proper manner so that they are not stretched or pulled. There is possibility of breakage of insulation by damaging holding part and connector part due to pulling. ● Never fail to turn OFF the power switch (1) before attaching or detaching the metal plug. ● When you remove the plug, put rubber cap on the receptacle to prevent dust and dirt. ● When you found dust and dirt in the receptacle, remove these before connecting electric power cable plug. | |

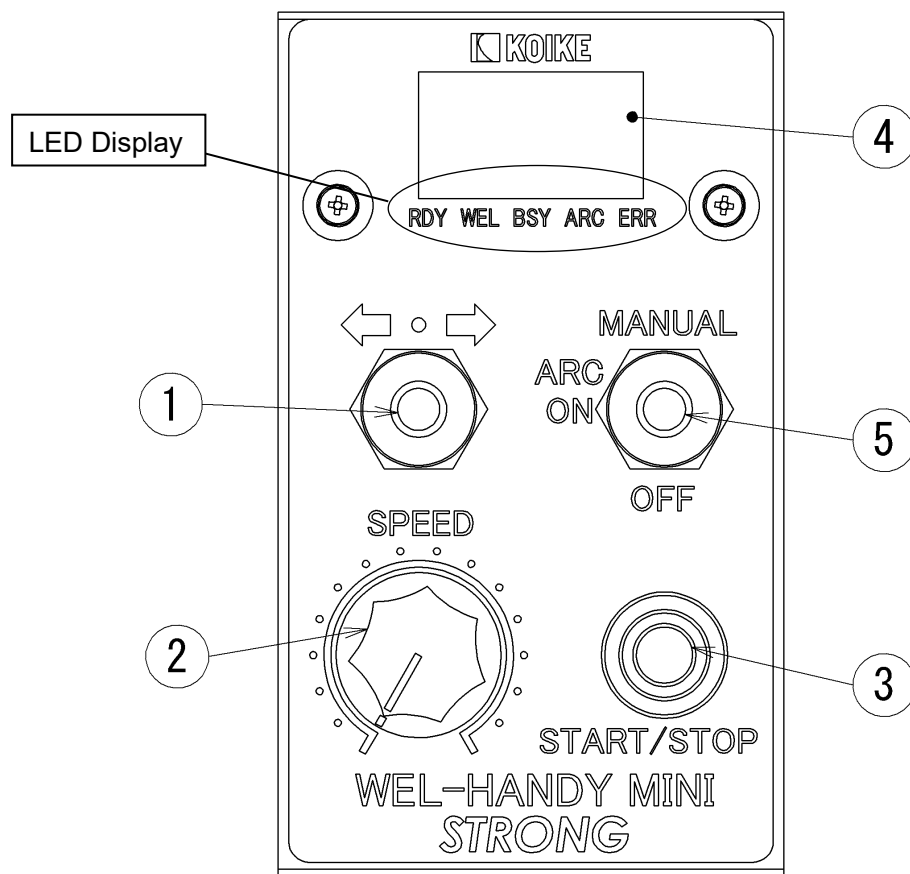


Fig 5 Operation panel

(1) Traveling direction changing over switch

It is possible to select traveling direction of carriage. When switch position is neutral, carriage cannot travel or move.

(2) Traveling speed adjustment switch

Kindly turn carriage in clockwise direction to increase speed of carriage and turn it in anti-clockwise direction to reduce speed of carriage.

(3) START/STOP button

It is welding Start/Stop switch.

If START/STOP button is pressed while carriage is stopped, carriage starts traveling at the same time of display of torch switch signal.

If START/STOP button is pressed while carriage is travelling, carriage stops at the same time of stopping of torch switch signal.

※When an error occurs, the error display is reset when you press the START / STOP switch .

However , error if there is still cause of the error occurs again . Check each error Solution , please remove the cause .

(4) Digital Meter

A rough indication of the carriage running speed is displayed by number.

The motor commanded voltage is displayed by division of 1,000. There is no unit.

Digital indication of 50~1000




RDY : It turns ON when electric supply of carriage is ON.

WEL : It turns ON when welding signal is displayed while carriage is travelling.

BSY : It turns ON during carriage is operating regardless of display/non display of welding signal.

ARC : It turns ON at option of MANUAL, ARCON in (5) arc mode changing over switch.

ERR : It turns ON at generation of operation error. At this time corresponding error number of error content is displayed on digital display.

| Error display | Error contents | Dealing method |
|---|--|--|
|  | Motor Overload Error | Please make sure that no load would be applied to the motor. |
|  | Truck backup error (Parameter) | Please make sure not to turn OFF the power in the truck operation or in fine-tuning move in the limit switch. After the change if you want to back up the parameters, please OFF the power to the truck is stopped. |
|  | Truck backup error (System parameter) | After an error occurs, it will return to the Parameter at the time of the backup to one before. Parameter : Parameter that can be arbitrarily set change System parameter : Internal parameter that cannot be arbitrarily set change |

※In error return method, kindly turn OFF the power supply by removing power cable plug from operation panel and then after verifying as per above mentioned dealing method, kindly insert the plug in operation panel and turn ON electric supply.

(5) Arc mode changing over switch

There can be 3 modes of changing over in 3 point changing over switch as shown below.

MANUAL : Kindly use it in wire inching and arc test. Wire comes out only while switch is on MANUAL.

※ Kindly take care as Arc is generated if torch end is touching welding material.

ARC ON : Kindly use this position in normal welding operation.

Carriage starts traveling automatically after start of welding by pressing START/STOP button.

ARC OFF : Only traveling of carriage is possible without welding operation by pressing START/STOP button at this position.

**CAUTION**

Please do not press the START / STOP button while you are down to MANUAL side.

- Press the START / STOP button while you are down to MANUAL side , and back to the ARC ON continues to output the arc signal , and then traveling trolley and to ARC OFF. Again , the running of the arc output and the truck and press the START / STOP button will stop . Please be when subjected to the above-mentioned operation and restart to turn OFF the power once.

5.2 Preparation and procedure for welding

Conduct welding in the following manner, while referring to the Fig. 6 “System connection diagram” and the operation procedure in item 5.1.

**WARNING**

Strictly observe the following to prevent electric shock.



- Turn OFF the control power and welding power, and then conduct operations from (1) to (4) shown below.
- When you remove the plug, put rubber cap on the receptacle to prevent dust and dirt.
- When you found dust and dirt in the receptacle, remove these before connecting electric power cable plug.

- (1) Remove rubber cap, then connect the control cable to metal socket on the control panel.
- (2) Mount the exclusive use torch on the torch holder.
- (3) Connect the torch to the mating wire feeder.
- (4) Connect the 2-core metal plug of the control cable to the metal socket of the wire feeder and the input power plug to the nearest outlet.

(Note) The only interfacing signal with the welding power supply is the torch signal, which is an output from the A-contact point at a salt-holding type.

**CAUTION**

Set the welding power supply side in the “No Self-Holding (or No Crater Treatment)” position.

- When it is set in the “Self-Holding (or Crater Treatment)” position, arcs will not stop even if welding is completed.

- (5) Turn ON the power switch of the welding power supply and insert the wire into the torch. (Insert the torch cable straightly.)

**CAUTION**

When inserting the wire, do not bring your head near the wire that comes out of the tip.

- Your eyes can be damaged.

- (6) Press the tracing roller against the vertical plate, and set the carriage in the welding position.
(7) Turn the handle of the slide unit assembly (UP/DOWN or FRONT/REAR) for torch position alignment.
(8) Select the welding direction and set the welding speed.
(9) Determine the start position.
Positioning of carriage (fine tuning) can be carried out easily by pressing Limit switch.
(10) Set the welding conditions by means of the welding power supply.
(11) Press the start/stop button and start welding. (Arcs will be generated at the same time.)

**CAUTION**

Pay attention to the following during welding.

- Wear a welding mask, face guard, and welding protectors to protect yourself from arc light, fumes, and spatters.

- (12) Finely adjust the welding conditions (current, voltage, speed, etc.) as necessary.
(13) Welding can be stopped by means of the stop switch or Limit switch.
(While the carriage stops, arcs stop at the same time.)

**CAUTION**

Please always is the trolley when the power is turned OFF to go to during the stop.

- Truck will be successfully backed up the inside of the Parameter When you turn OFF the power supply during the stop.
You can not properly back up the Parameter and turn OFF the power during operation.

5.3 System connection diagram

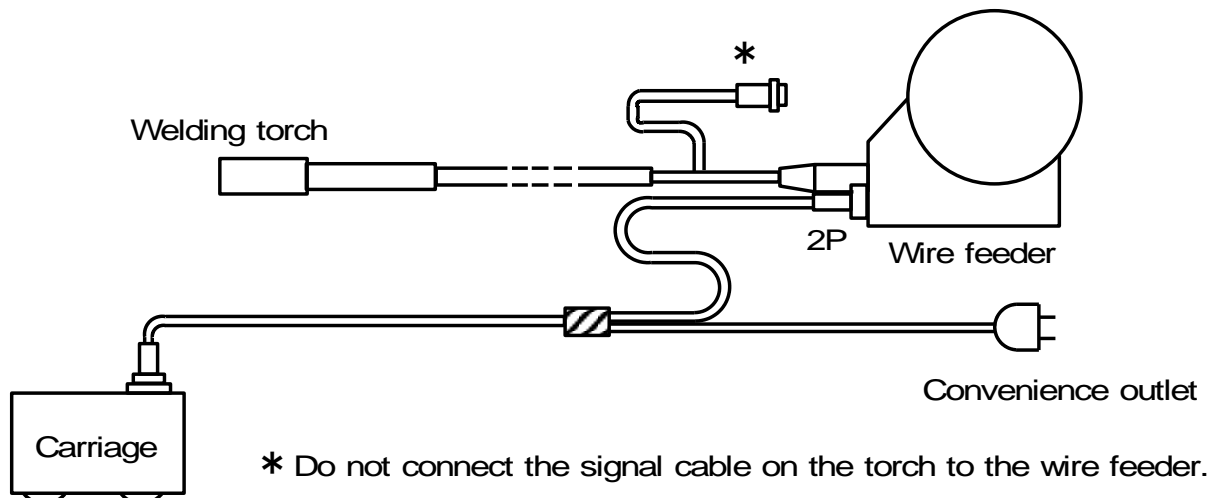


Fig.6 System connection diagram

5.4 Applicable welding machine and signal adaptor

This welding machine is to be used in combination with a semi-automatic (CO₂, MAG) welding machine (power supply and feeder) available on the market.

The only electric signal interface with the welding machine is the torch signal, and the welding machine outputs (relay A-contact point) a self-holding type signal. Set the switch on the welding power supply side in the "No Self-Holding" position.

The signal cable plug is D25-2P (connectable to wire feeders made by Matsushita or Daihen). Plugs for connection to wire feeders of other manufacturer are also available as options. Contact us in that case. Contact the manufacturer of the wire feeder you use for purchasing a correct torch that matches the feeder.



(Note) The welding cable, gas hose and torch switch cable must be connected to the wire feeder. The connecting hardware and connector differ according to power supply manufacturer. Use the correct ones.


5.5 Operational precautions

- 1) Make sure that the operating voltage is as specified, If the difference exceeds plus or minus 10% of the input power, trouble can occur.
- 2) Clean the traveling surface to remove remaining bars, slugs, spatters, etc. before starting welding. (For prevention of slippage during welding.)
- 3) When long cables are necessary, take appropriate measures for the cables to prevent catching or entanglement by means of a jig crane, etc.

6 Maintenance

For correct operation of the machine for an extended period of time without trouble, the daily maintenance is indispensable. (Refer to 6.1 "Maintenance and inspection.")
When trouble occurs, refer to 6.3 "Trouble and corrective measures."

| | |
|---|--|
|  WARNING | <p>Kindly take care about following things to avoid getting an electric shock.</p> |
|  | <ul style="list-style-type: none"> ● Kindly remove input plug from outlet while checking, dis-assembling or repairing and turn OFF the control source while leaving. If it is necessary to carry out checking in the energized state, professional engineer having enough knowledge and skill about electric handling should go since there is risk of short circuit, getting electric shock. |
| <ul style="list-style-type: none"> ● Do not use welding equipment without case or cover. ● Kindly use power outlet with earth pin outlet since input plug has earth pin. It is connected to main body of carriage in operation panel. ● Kindly use input voltage in the range of DC24V There is risk of short circuit due to failure of printed board on operation panel. ● In case of crack in insulation cover of power cable and torch cable, do not expose it to high temperature. There is risk of short circuit due to tearing of insulation covering. ● Kindly weld below the rated current and usage rate of torch to prevent dielectric breakdown due to overheating. ● Kindly place power cable and torch cable in proper manner so that they are not stretched or pulled. There is possibility of breakage of insulation by damaging holding part and connector part due to pulling. ● Do not throw or drop main body of carriage. There is risk of damaging insulation by breaking. ● While connecting to power cable plug to main body, kindly connect after verifying that foreign object is not touching to connector of main body, power cable plug .There is risk of connector erosion due to short circuit by foreign object. | |

| | |
|---|--|
|  | <p>WARNING As for the attachment, removal of the drive wheel, please use 2 spanners without fail.</p> |
| <ul style="list-style-type: none"> ■ Hold the driving wheel of the other side, when attaching or removing the driving wheels. And then loosen the hexagon nut on the side of attaching or removing the driving wheels. There is the possibility that damages the part of drive relation. | |

6.1 Maintenance and inspection

6.1.1 Daily inspection

- (1) Clean the nozzle and check the tip tot abrasion.
- (2) Clean wheels. (Removal of iron powder etc.)
- (3) Check guide rollers for smooth rotation. (Cleaning)
- (4) Remove spatters from the carriage.



6.1.2 Monthly inspection







- (1) Check the locking screws of the torch holder, tracing arm, handle, carriage bottom plate, etc. for looseness.
- (2) Check cables (torch and control) for twisting or broken sheathing.
- (3) Confirmation of the operation of auto stop limit switch.
- (4) Confirmation of smooth operation of the control unit by means of the front/rear, up/down control knob.
- (5) Check the switches on the operation panel for looseness or breakage, and confirm the operation of switches.
- (6) Clean the conduit liner of the torch.
- (7) Check the operation panel, switches, and controls for looseness or breakage. Check their operation.

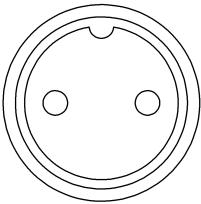



6.2 Recommended spare parts

- (1) Guide roller
- (2) Driving roller
- (3) Each switch
- (4) Printed circuit board

6.3 Trouble shooting

| Defects | Cause/check position | |
|---|--|---|
| (1)Slipping off of profiling while traveling | 1) Guide roller is not rotating. 2) Cable is stuck in and it is blocking smooth traveling of carriage. 3) Traveling surface is not smooth and wheel cannot touch the surface. 4) Lot of sputter is adhered on driving roller and carriage is not rotating smoothly. | |
| (2)No electric power supply | 1) No power supply voltage to outlet 2) Cable is disconnected | |
| |  WARNING | Kindly take care about following things to avoid getting an electric shock. |
|  | | ● Since above mentioned 1) and 2) checking are to be carried out while control power supply is ON, professional engineer having enough knowledge and skill about electric handling should go to prevent risk of short circuit, getting an electric shock. |

| | | | | | |
|--|---|--|---|---|---|
| <p>(3) Traveling speed of carriage is not changing</p> | <p>1) Defect, disconnection of traveling speed adjustment switch * Kindly verify conduction between Variable resistor and L-DSP-A board by tester when power supply is turned OFF.</p> <ul style="list-style-type: none"> ▪ When it is conducting Kindly verify whether resistance value between variable resistor terminals is changed by tester. ▪ When it is not conducting There is disconnection of electric wire. Kindly replace the same. <table border="1" data-bbox="679 488 1449 954"> <tr> <td data-bbox="679 488 943 595">  <p>WARNING</p> </td> <td data-bbox="943 488 1449 595"> <p>Kindly take care about following things to avoid getting an electric shock.</p> </td> </tr> <tr> <td data-bbox="679 595 943 954">  </td> <td data-bbox="943 595 1449 954"> <ul style="list-style-type: none"> ● Kindly carry out continuity check by tester while electric supply is turned OFF. ● Since above mentioned 2) and 3) checking are to be carried out while control power supply is ON, professional engineer having enough knowledge and skill about electric handling should go to prevent risk of short circuit, getting an electric shock. </td> </tr> </table> <p>2) Defective motor 3) Defective printed board 4) Disconnection of motor encoder line</p> |  <p>WARNING</p> | <p>Kindly take care about following things to avoid getting an electric shock.</p> |  | <ul style="list-style-type: none"> ● Kindly carry out continuity check by tester while electric supply is turned OFF. ● Since above mentioned 2) and 3) checking are to be carried out while control power supply is ON, professional engineer having enough knowledge and skill about electric handling should go to prevent risk of short circuit, getting an electric shock. |
|  <p>WARNING</p> | <p>Kindly take care about following things to avoid getting an electric shock.</p> | | | | |
|  | <ul style="list-style-type: none"> ● Kindly carry out continuity check by tester while electric supply is turned OFF. ● Since above mentioned 2) and 3) checking are to be carried out while control power supply is ON, professional engineer having enough knowledge and skill about electric handling should go to prevent risk of short circuit, getting an electric shock. | | | | |
| <p>(4) No welding operation and no traveling of carriage at the pressing of START/STOP button while stopping of carriage</p> | <p>1) Limit switch at carriage traveling direction side is pressed. ※ Carriage starts traveling by pressing Limit switch which is at opposite side of carriage traveling direction.</p> <p>2) Defective START/STOP button 3) Defective printed board 4) Defective Limit switch or disconnection Limit switch</p> | | | | |
| <p>(5) There is welding operation but no traveling of carriage at the pressing of START/STOP button while stopping of carriage</p> | <p>1) Defective printed board 2) Disconnection of motor (disconnection of DC line or disconnection of both DC line and encoder line)</p> | | | | |

| | | | | | |
|---|--|--|--|---|--|
| <p>(6) There is traveling of carriage but no welding operation at the pressing of START/STOP button while stopping of carriage</p> | <p>1) ARC OFF option is selected in Arc mode changing over switch. 2) No welding current. 3) The signal cable for the torch switch is not connected to the welding power supply. 4) Check for a short circuit between the 2pins of the 2-pin metal outlet for the torch switch (see figure below) on our cable. If it is a dedicated torch, check for a short circuit between the 2pins of the 2pin metal outlet for the torch switch connected to the feeder.</p> <ul style="list-style-type: none"> ▪ In case of short circuit, welding current is defective ▪ In case of no short circuit, there must be disconnection of cable , defective printed board  <p>Connector shape reference</p> | | | | |
| <p>(7) No stopping of welding operation and traveling of carriage at the pressing of START/STOP button during welding operation</p> | <p>1) Defective START/STOP button 2) Defective printed board</p> | | | | |
| <p>(8) There is stopping of traveling of carriage but no stopping of welding operation at the pressing of START/STOP button during welding operation</p> | <p>1) Should be “with Self holding” option selected at welding current. * Kindly set it to “Without self-holding”. 2) Defective printed board.</p> | | | | |
| <p>(9) There is stopping of welding operation but no stopping of traveling of carriage at the pressing of START/STOP button during welding operation</p> | <p>1) Defective printed board</p> | | | | |
| <p>(10) No stopping of welding and traveling of carriage even at pressing of Limit switch</p> | <p>1) Limit switch is not pressed completely. 2) Defective Limit switch *Kindly verify conduction of terminal 1- terminal 4 of Limit switch by tester. At normal conduction, it makes “click” sound at pressing of Limit switch and it turns OFF the conduction between terminals at the same time.</p> <table border="1" data-bbox="679 1756 1449 1966"> <tr> <td data-bbox="679 1756 943 1861">  <p>WARNING</p> </td> <td data-bbox="943 1756 1449 1861"> <p>Kindly check the conduction between terminals by tester while electric supply is turned OFF.</p> </td> </tr> <tr> <td colspan="2" data-bbox="679 1861 1449 1966"> <p>● If electric supply is turned ON during verification of conduction between terminals by tester, there is risk of electric shock due to short circuit.</p> </td> </tr> </table> |  <p>WARNING</p> | <p>Kindly check the conduction between terminals by tester while electric supply is turned OFF.</p> | <p>● If electric supply is turned ON during verification of conduction between terminals by tester, there is risk of electric shock due to short circuit.</p> | |
|  <p>WARNING</p> | <p>Kindly check the conduction between terminals by tester while electric supply is turned OFF.</p> | | | | |
| <p>● If electric supply is turned ON during verification of conduction between terminals by tester, there is risk of electric shock due to short circuit.</p> | | | | | |

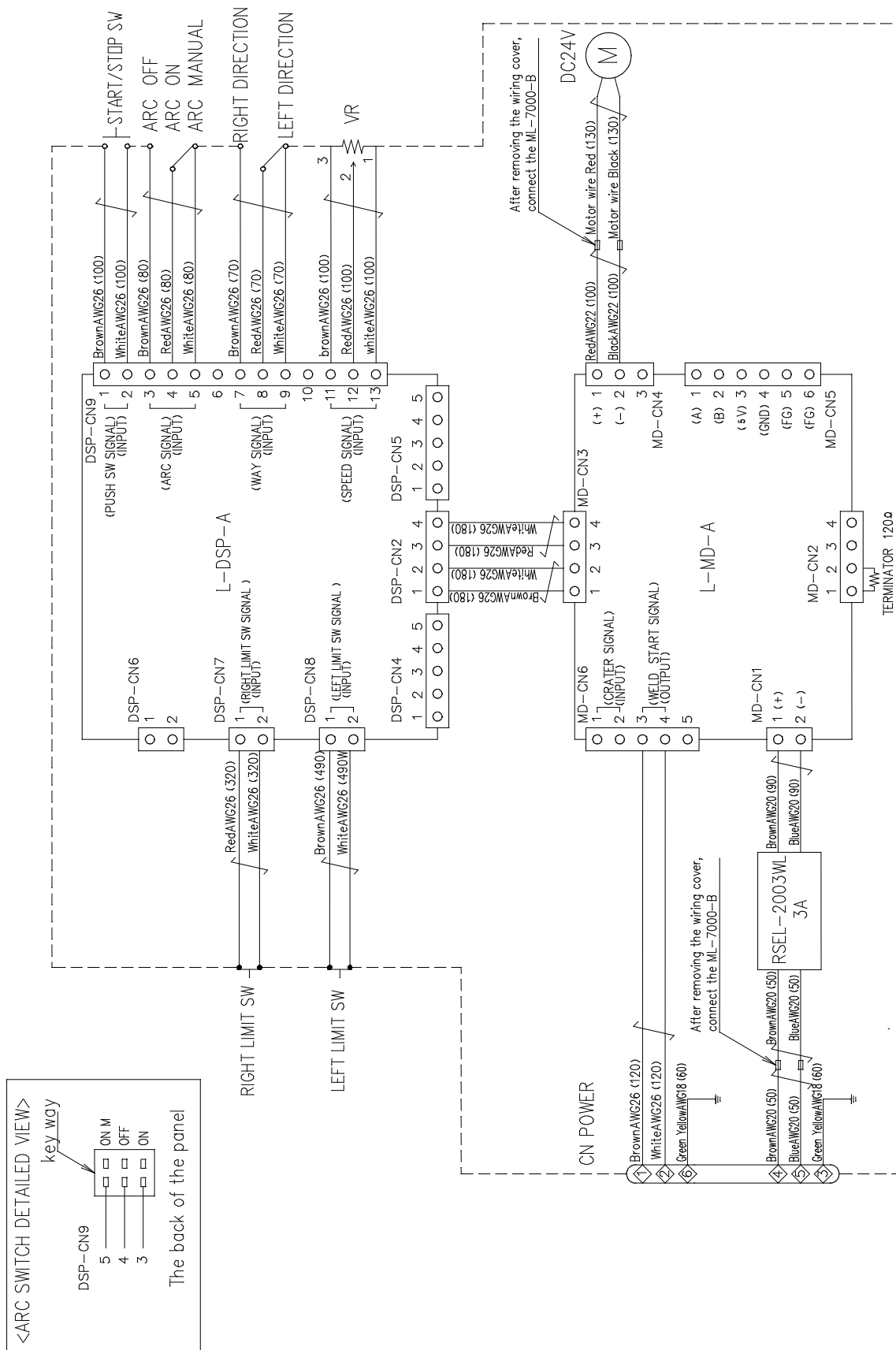
| | |
|--|---|
| (11) There is stopping of traveling of carriage but no stopping of welding operation at pressing of Limit switch | 1) Should be "with Self holding" option selected at welding current. * Kindly set it to "Without self-holding". 2) Defective printed board. |
| (12) There is stopping of welding operation but no stopping of traveling of carriage at pressing of Limit switch | 1) Defective printed board |
| (13) Absorption force is not weaken even at drawing off magnet lever | 1) Defective magnet rotation shaft *If the rotating shaft broken it must be changed. |
| (14) Error display E.024 is displayed. | 1) An abnormal load is applied to the motor. Please make sure that no load would be applied to the motor. |
| (15) Error display E.025, E.026 is displayed. | 1) Truck of parameters , backup of the system parameters was not successful . After changing parameters , please do the backup and OFF the power while stopped . |

6.4 Warranty

This is thoroughly inspected and tested before leaving the factory, and guaranteed for 12 months from the date of purchase against defective workmanship and material. Should any trouble develop, return the complete equipment prepaid to KOIKE Sanso Kogyo Co., Ltd.
Authorized KOIKE Distributor.

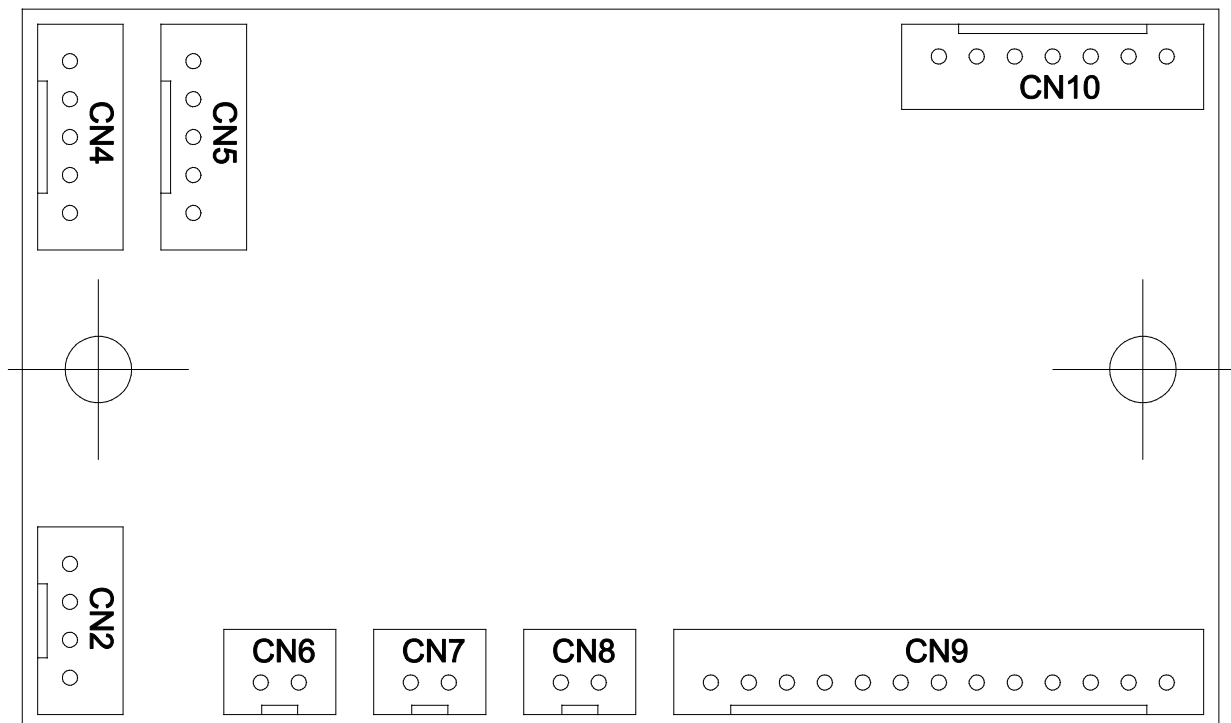
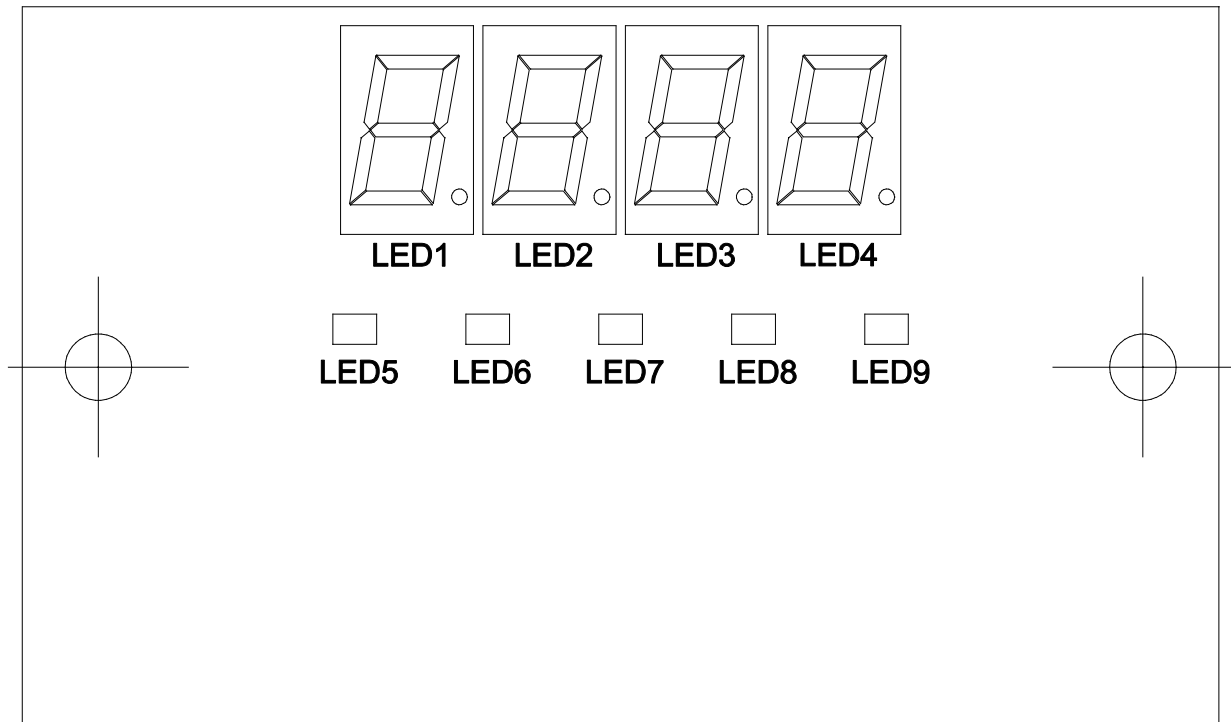
7 Wiring diagram

7.1 Electrical diagram

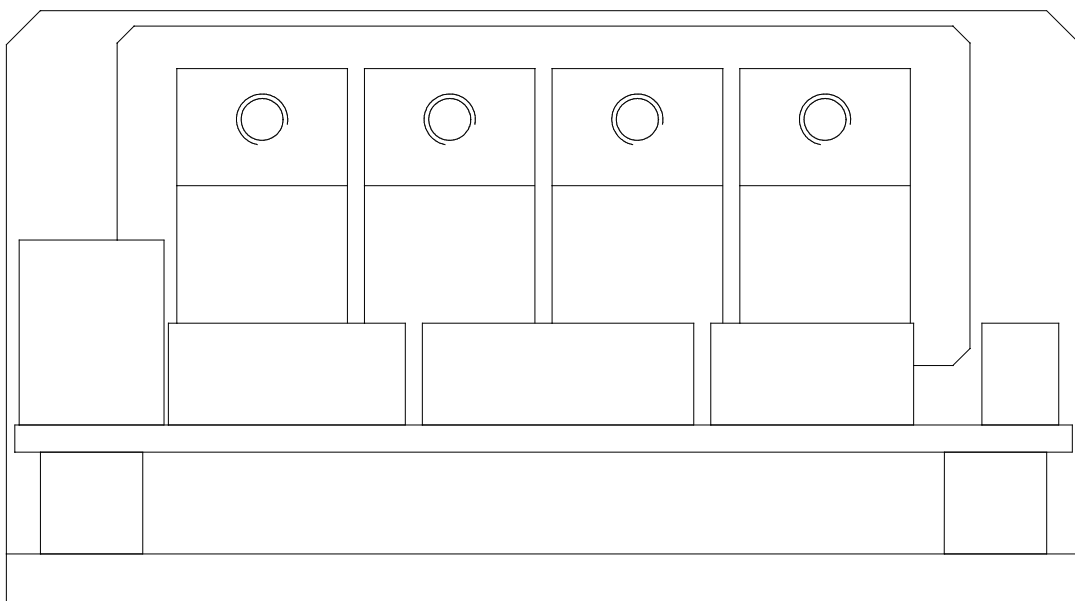
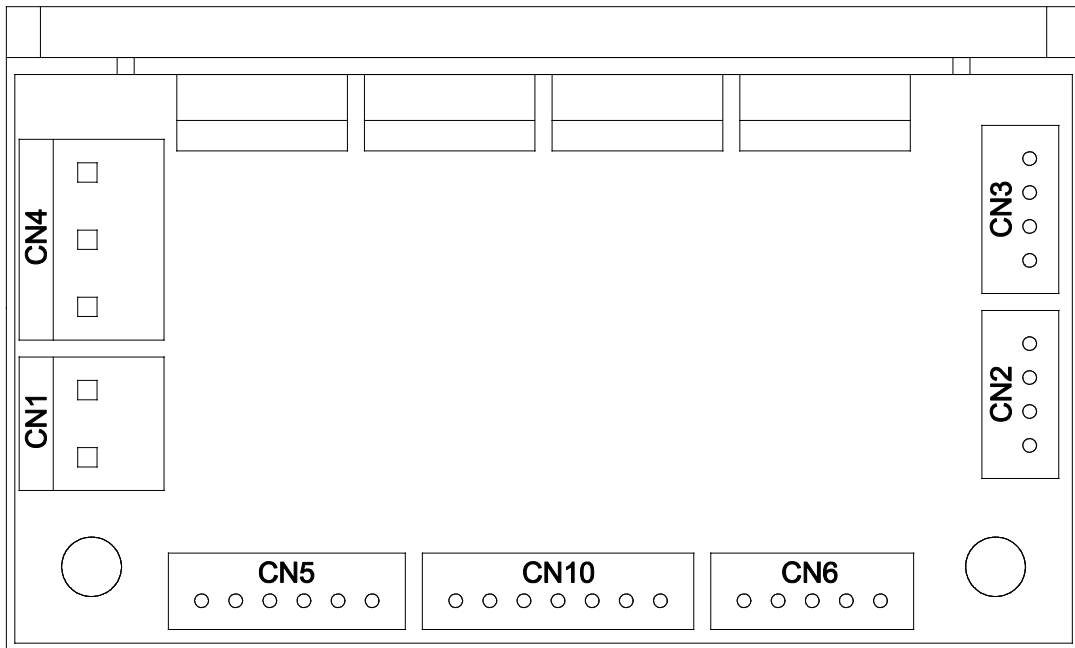


7.2 Assembly drawing of circuit board

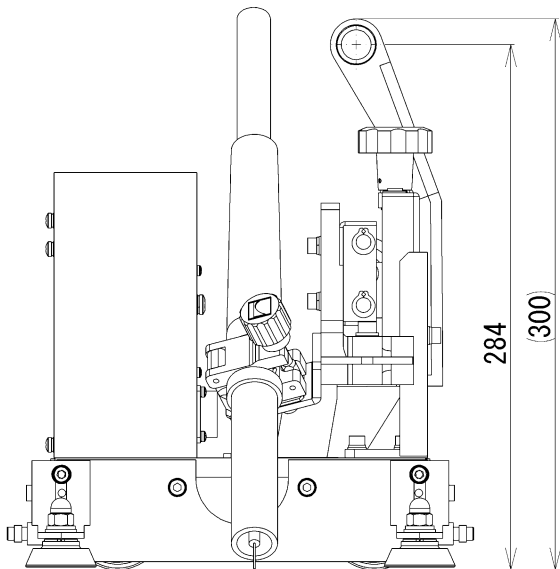
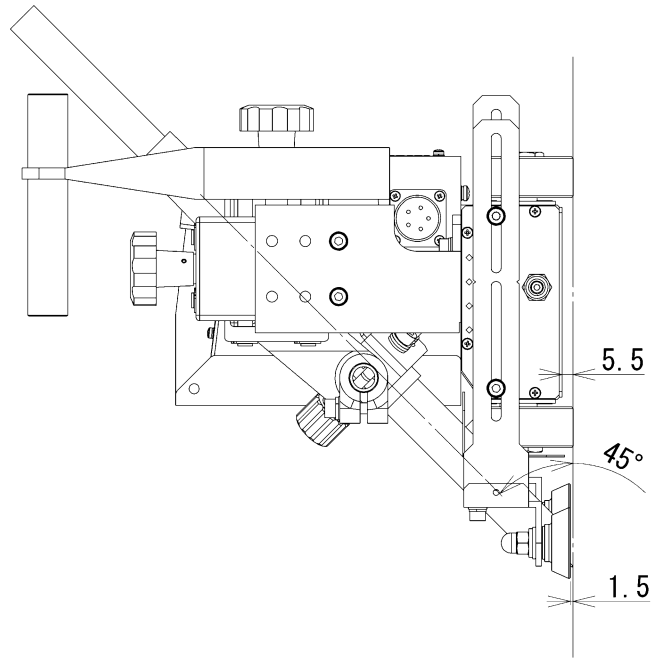
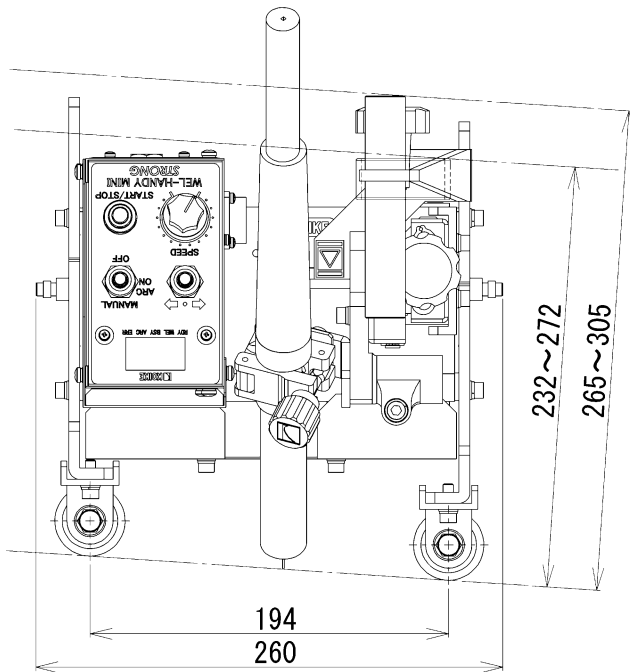
7.2.1 L-DSP-A circuit board



7.2.2 L-MD-A circuit board



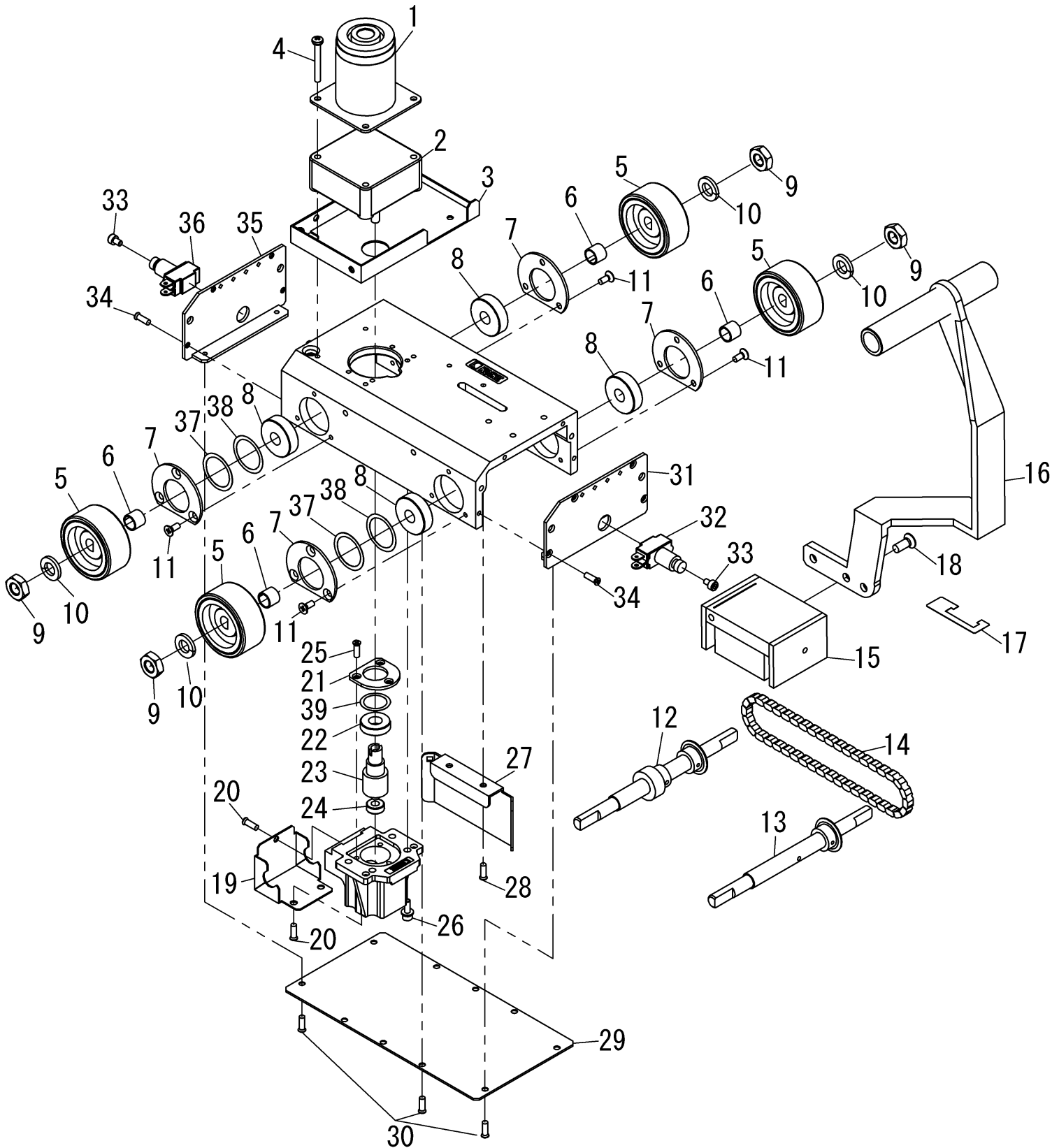
8 Assembly drawing of WEL-HANDY MINI STRONG



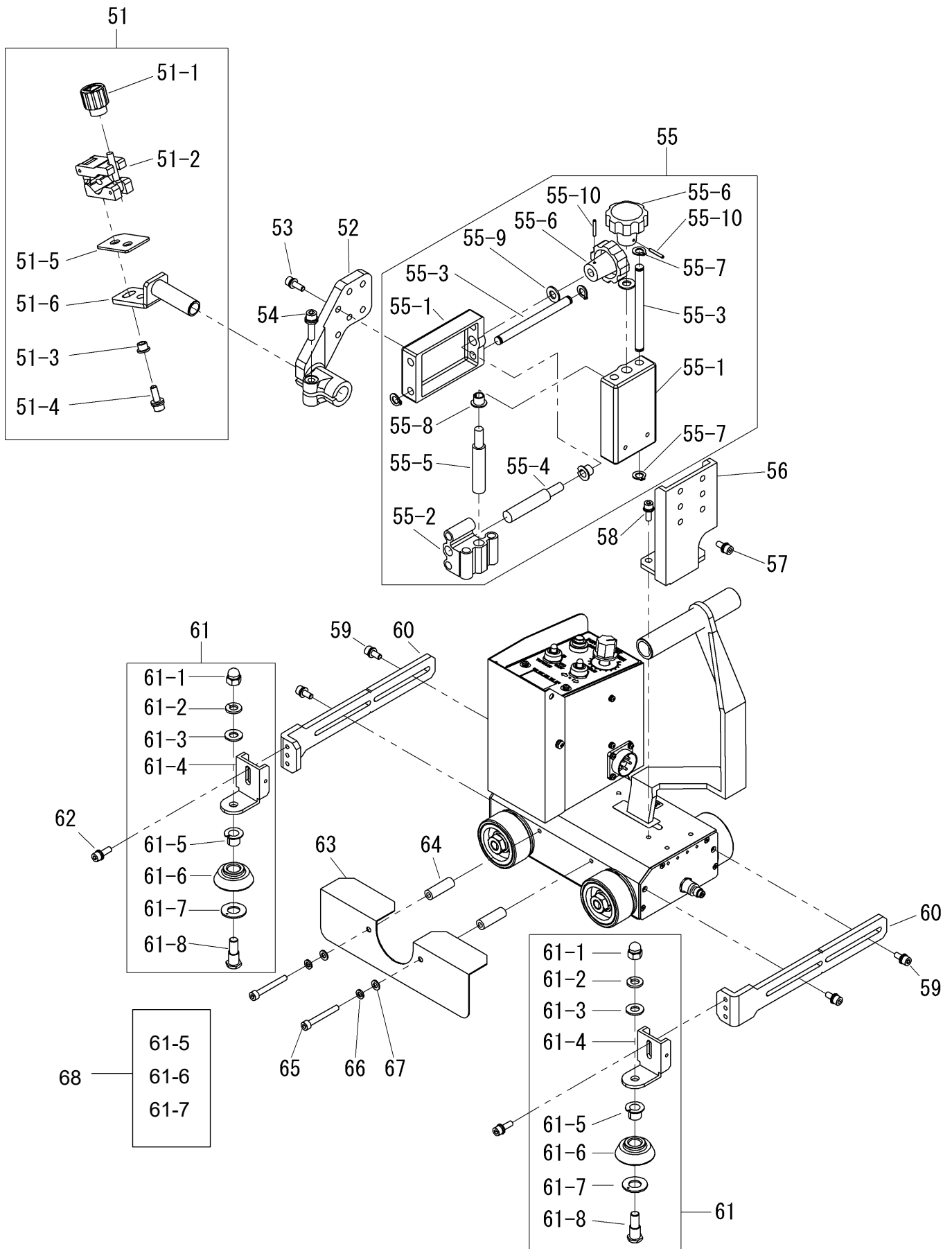
| | |
|-------|-------------|
| 1.5mm | =0.059inch |
| 5.5mm | =0.217inch |
| 194mm | =7.638inch |
| 232mm | =9.134inch |
| 260mm | =10.236inch |
| 265mm | =10.433inch |
| 272mm | =10.709inch |
| 284mm | =11.121inch |
| 300mm | =11.811inch |
| 305mm | =12.008inch |

9 Parts list

9.1 Main body and inside parts



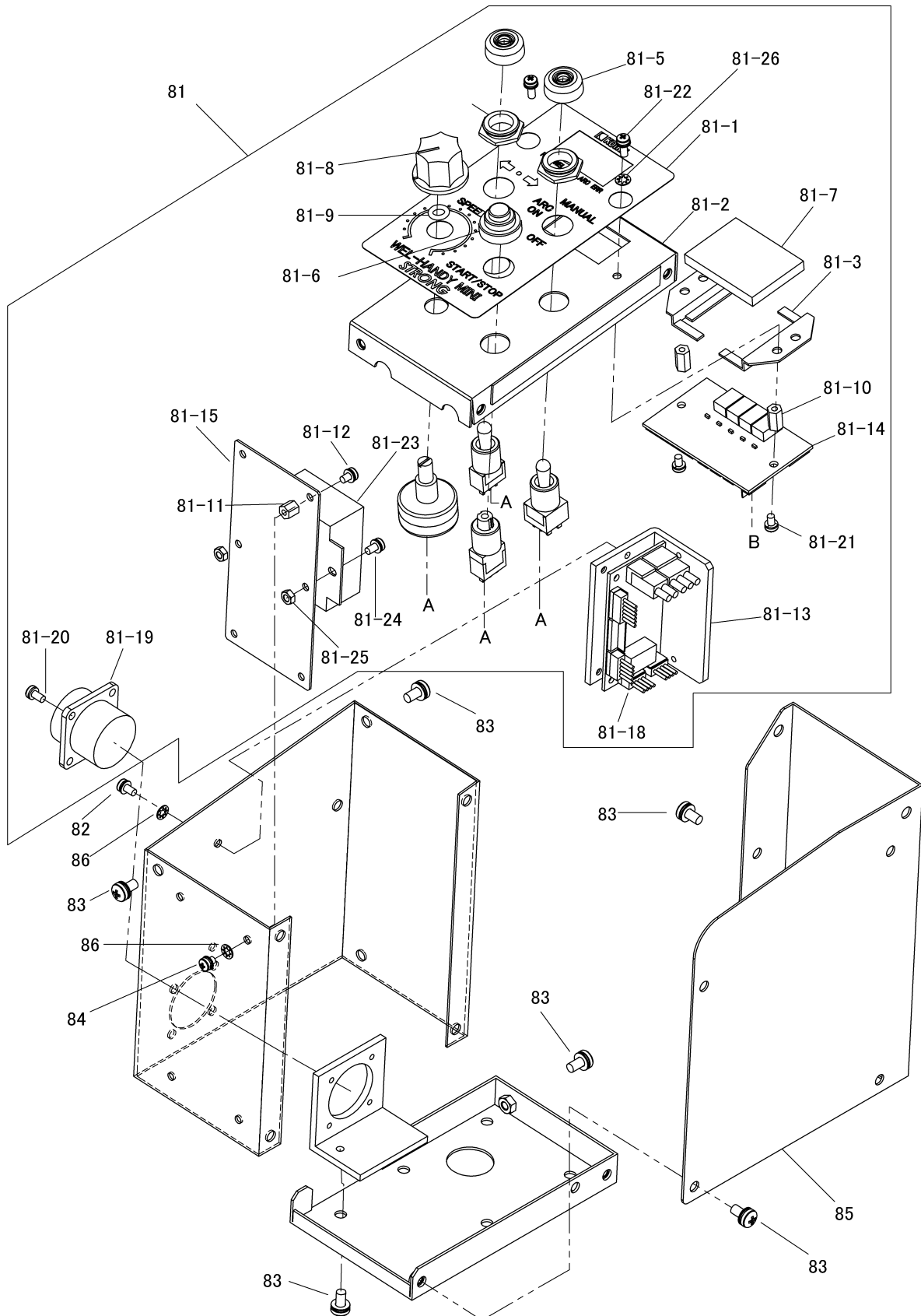
9.2 Outside parts



Outside parts

| ITEM No. | PART NAME | QTY | STOCK No. | REMARKS | ITEM No. | PART NAME | QTY | STOCK No. | REMARKS |
|----------|-----------------------|-----|-----------|-------------------|----------|-----------------------|-----|-----------|------------------------------|
| 51 | Torch holder assembly | 1 | 61007168 | | 61-8 | Guide roller shaft | 1 | 61006967 | |
| 51-1 | Clamp knob | 1 | 60038166 | | 62 | Hexagon bolt | 2 | 6C450516 | M5×16(WS,WF) ★ |
| 51-2 | Holder body | 1 | 61003323 | | 63 | Heat shield | 1 | 61006965 | |
| 51-3 | Insulating collar | 2 | 60038149 | | 64 | Collar | 2 | 64000575 | |
| 51-4 | Hexagon bolt | 2 | 6C030618 | M6×18 ★ | 65 | Hexagon bolt | 2 | 6C030540 | M5×40 ★ |
| 51-5 | Insulating plate | 1 | 60038148 | | 66 | Spring washer | 2 | 6D510050 | WS-5 ★ |
| 51-6 | Holder received bar | 1 | 61006968 | | 67 | Washer | 2 | 6D500050 | WF-5 ★ |
| 52 | Fixing holder | 1 | 61000597 | | 68 | Guide Roller Assembly | 1 | 67000482 | (With DU bush, DU washer) |
| 53 | Hexagon bolt | 2 | 6C450515 | M5×15(WS,WF) ★ | | | | | |
| 54 | Hexagon bolt | 1 | 6C450625 | M6×25(WS,WF) ★ | | | | | |
| 55 | Slide unit assembly | 1 | 61000645 | | | | | | |
| 55-1 | Slide base | 2 | 61000595 | | | | | | |
| 55-2 | Nut | 1 | 61000596 | | | | | | |
| 55-3 | Shaft | 4 | 61000598 | | | | | | |
| 55-4 | Screw shaft | 1 | 61000600 | | | | | | |
| 55-5 | Screw shaft(left) | 1 | 61000659 | | | | | | |
| 55-6 | Handle | 2 | 61000061 | | | | | | |
| 55-7 | Stop ring | 8 | 6B520080 | STW-8 | | | | | |
| 55-8 | DU bush with brim | 2 | 64000016 | MB0808-15FDU | | | | | |
| 55-9 | DU washer | 2 | 6D520006 | WC06DUN | | | | | |
| 55-10 | Spring pin | 2 | 6B022518 | PR-2.5×18 | | | | | |
| 56 | Slide unit bracket | 1 | 61006973 | | | | | | |
| 57 | Hexagon bolt | 2 | 6C450512 | M5×12(WS,WF) ★ | | | | | |
| 58 | Hexagon bolt | 3 | 6C450515 | M5×15(WS,WF) ★ | | | | | |
| 59 | Hexagon bolt | 4 | 6C450512 | M5×12(WS,WF) ★ | | | | | |
| 60 | Roller arm | 2 | 61006963 | | | | | | |
| 61 | Guide roller assembly | 2 | 61007170 | | | | | | |
| 61-1 | Hexagon nut | 1 | 6D040080 | M8 ★ | | | | | |
| 61-2 | Spring washer | 1 | 6D510080 | WS-8 ★ | | | | | |
| 61-3 | Washer | 1 | 6D500080 | WF-8 ★ | | | | | |
| 61-4 | Guide roller plate | 1 | 61006962 | | | | | | |
| 61-5 | DU bush with brim | 1 | 6D711018 | MB1010-18FDN | | | | | |
| 61-6 | Guide roller | 1 | 67000374 | | | | | | |
| 61-7 | DU washer | 1 | 6D520010 | WC10DUN | | | | | |

9.3 Electrical parts



Electrical parts

| ITEM No. | PART NAME | QTY | STOCK No. | REMARKS | ITEM No. | PART NAME | QTY | STOCK No. | REMARKS |
|----------|------------------------|-----|-----------|---------------------------|----------|-----------|-----|-----------|---------|
| 81 | Operation panel ass'y | 1 | 61007692 | | | | | | |
| 81-1 | Operation plate | 1 | 61006987 | | | | | | |
| 81-2 | Operation box C | 1 | 61006971 | | | | | | |
| 81-3 | Glass pressing | 2 | 61006450 | | | | | | |
| 81-4 | Dustproof nut | 2 | 60032480 | | | | | | |
| 81-5 | Water proof cap | 2 | 60032431 | | | | | | |
| 81-6 | Water proof cap | 1 | 64000024 | For pushbutton | | | | | |
| 81-7 | Dark gray glass | 1 | 61006298 | | | | | | |
| 81-8 | Nob | 1 | 60031249 | | | | | | |
| 81-9 | O-ring | 1 | 60036472 | P-6 | | | | | |
| 81-10 | Spacer | 2 | 64000497 | Hexagon type SP-10 | | | | | |
| 81-11 | Spacer | 4 | 64000574 | Hexagon type ASB-306E | | | | | |
| 81-12 | Screw | 4 | 6C570305 | M3×5(WS,WF) ★ | | | | | |
| 81-13 | L-MD-A circuit board | 1 | 20508809 | ※1 | | | | | |
| 81-14 | L-DSP-A circuit board | 1 | 20508806 | ※1 | | | | | |
| 81-15 | Noise filter board | 1 | 61007569 | | | | | | |
| 81-16 | Switch ass'y | 1 | 61007231 | DSP-CN9 | | | | | |
| 81-17 | Harness ass'y A(4P~4P) | 1 | 61006508 | MD-CN3~DSP-CN2 | | | | | |
| 81-18 | Terminal resistance | 1 | 61006519 | MD-CN2 | | | | | |
| 81-19 | Receptacle assembly | 1 | 61007570 | with connector, lead wire | | | | | |
| | Receptacle | 1 | 64000584 | NCS-256-R (Square) | | | | | |
| 81-20 | Screw | 4 | 6C570308 | M3×8(WS,WF) ★ | | | | | |
| 81-21 | Screw | 2 | 6C570306 | M3×6(WS,WF) ★ | | | | | |
| 81-22 | Screw | 2 | 6C570308 | M3×8(WS,WF) ★ | | | | | |
| 81-23 | Noise filter | 1 | 64000583 | | | | | | |
| 81-24 | Screw | 2 | 6C570306 | M3×6(WS,WF) ★ | | | | | |
| 81-25 | Hexagon Nut | 2 | 6D500030 | M3 ★ | | | | | |
| 81-26 | Toothed lock washer | 1 | 6D550030 | AW-3 | | | | | |
| 82 | Screw | 2 | 6C570306 | M3×6(WS,WF) ★ | | | | | |
| 83 | Screw | 9 | 6C570408 | M4×8(WS,WF) ★ | | | | | |
| 84 | Screw | 4 | 6C570306 | M3×6(WS,WF) ★ | | | | | |
| 85 | Operation box A | 1 | 61006969 | | | | | | |
| 86 | Toothed lock washer | 2 | 6D550030 | AW-3 | | | | | |

※1 During parts order, please inform the versions that are listed in the printed board.

<MEMO>

**WEL-HANDY MINI STRONG
OPERATION MANUAL**

| | |
|----------------|----------|
| Date of issue: | Aug.2016 |
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