Portable Automatic Welding Carriage for fillet welding

BUV00B00

WEL-HANDY

COMPACT

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 SANSO 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 nest 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

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 thin 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 far 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 injuly 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 quafified operator.
- For safety, leave the operation of the machine to a person with complete knowledge of the instruction manual end 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 antil 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 vohage is remaining before maintenance or inspection.
- Periodically conduct maintenance and inspection. Repair damaged parts before

resuming operation.

■Do not use cables with Insufflcient 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 oft 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 folerance is prohibited.

■The metal receptacle (plug) on the tough-rubber sheath cable is threaded. Tighten it firmly.

■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 machire.

■ 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 smell 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 (Industriat Safety and Health Law snd 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 operafion near places where degreasing, washing, or opraying 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 strictry 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 tire.
- ■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, an 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.

About the transport of the machine

1. Be sure to hold the handle when carrying the machine.
2. Do not pull the carriage up with a crane, lift, etc. hanging on its Handle for transferring or storing. There is risk of falling off carriage while holding carriage by handle, if there is shockimpact at carriage or if mounting screw of handle is loose.

Machine noise

1. Volume of at the time of driving the machine is less than 70dB.

About external environment

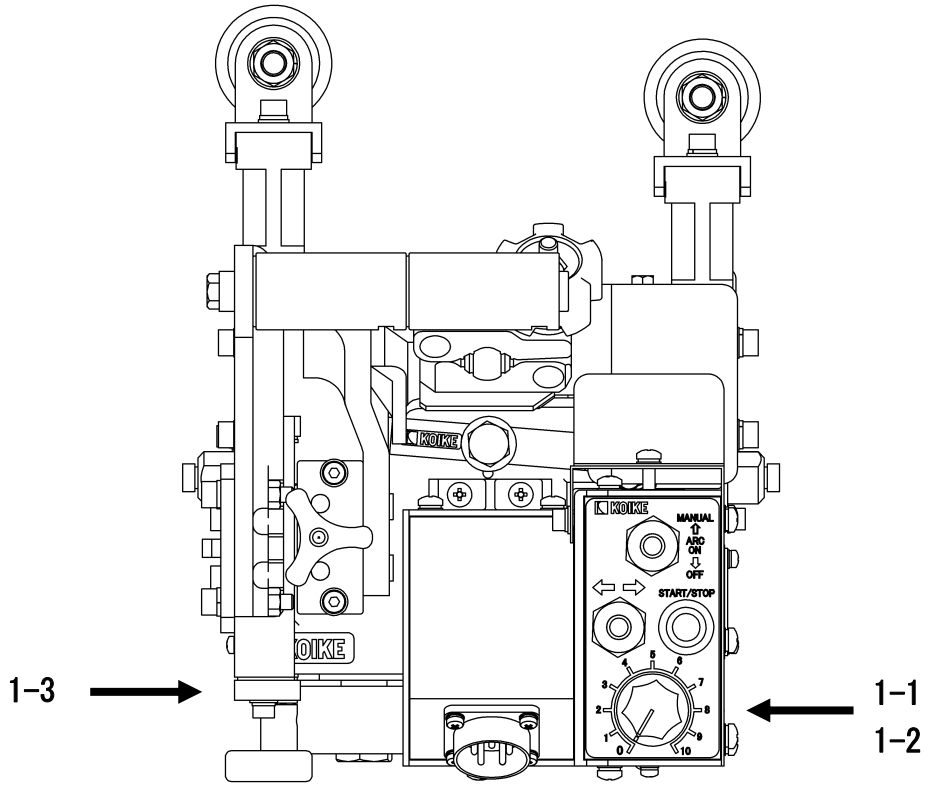
1. Never use the machine outdoors when the weather is wet. This will cause failure of the machine and could cause a fatal accident by electric shock.
2. Please avoid high temperature and humidity.
3. Please use in an environment where the internal temperature is 5 ~ 65 ℃.
4. Please use in an environment with internal humidity of 30 to 80% RH.

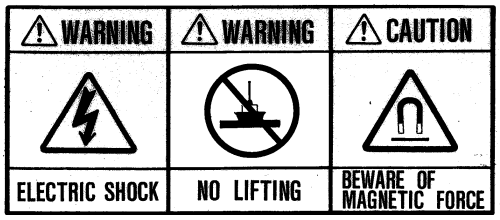
3 Location of Safety labels

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.





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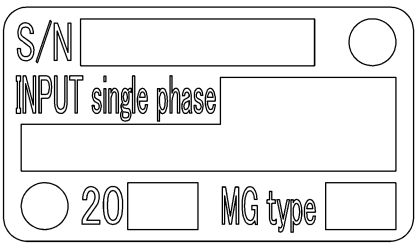

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4 Features and specifications

4.1 Features

The WEL-HANDY COMPACT has been developed to allow even unskilled operators to successfully do horizontal fillet welding (bottom steel plate traveling type) in a simple manner.
Major features are as follows:

1. Compact, Light weight, Durable and Low gravity.
2. The powerful magnet has dramatically enhanced the tracing reliability and tractive force, thereby ensuring stable traveling.
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. can change the position of the roller arm without tools.
6. The height of the guide rollers can be widely adjusted.

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
	Hexagon bolt M6×60	1pc
	Instruction manual	1pc

4.3 Specifications

Item	Specifications
Model	WEL-HANDY COMPACT
Driving method	Rubber roller 4 wheeler driving (permanent magnet absorption type) (Lower plate traveling system, traveling surface is steel plate)
Traveling speed	100~550mm/min / 3.9~21.7inch/min
Torch adjustable range (When the distance from the torch holder to the welding position is 141 mm)	Swept forward angle/sweep back angle：5°/4° Horizontal angle：45° Up:21mm / 0.8inch Dawn:23mm / 0.9inch Froth:20mm / 0.8inch Back:25mm / 1.0inch Horizontal angle：35° Up:40mm / 1.6inch Dawn:4mm / 0.2inch Froth:40mm / 1.6inch Back:5mm / 0.2inch Horizontal angle：55° Up:3mm / 0.1inch(※) Dawn:41mm / 1.6inch Froth:5mm / 0.2inch Back:40mm / 1.6inch ※Change the mounting position +10mm **The above stroke is the stroke when the distance from the torch holder to the tip of the wire is 141 mm(5.6inch).**
Welding reserve	Total start and end : About200mm / 7.9inch
Applied position	Horizontal position (It is a machine dedicated to horizontal fillet. Upward welding of vertical walls is not possible.)
Profiling method	Stand plate press method
Control source	AC100～240V±10% max 0.7A 50-60Hz
Electric power supply and interlock	Torch switch signal (connected to wire supply device) (A contact output of Self-holding type Relay)
Operation switch (operation panel)	Travelling direction changing over switch, travelling speed adjustment switch, START/STOP button Arc mode changing over switch (MANUAL, ARC ON, ARC OFF)
Weight of carriage main body	5.2kg / 11.5lb
Traction force	11kg / 24.3lb
Magnet attraction	25kg (option 30kg) / 55.1lb(option 66.1lb)
Dimension	L200 x W255 x H230mm / L7.87×W10.0×H9.1inch
Operating environment	Temperature：5℃~+65℃ Humidity：30%~80%（No freezing, no condensation）
Storage environment	Temperature：-10℃~+65℃ Humidity：10%~80%（No freezing, no condensation）

5 Method of operation

 WARNING	**Kindly take care about following things to avoid getting an electric shock.**
	● 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.

- Do not use welding equipment without case or cover.
- Kindly use input voltage in the range of AC100~240V(±10%)
  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

Strictly observe the following to prevent burns.

■ Never directly touch the torch nozzle, tip, orifice, insulation cylinder, and the surface of the carriage which are very hot right after welding.

 **WARNING**	**Kindly take care about following things to avoid falling off of carriage**
	● Do not lift the carriage by holding its Handle and grip handle. There is risk of falling off carriage while holding carriage by handle and grip handle, if there is shock impact at carriage or if mounting screw of handle and grip handle is loose.

CAUTION

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

■When the switch ot 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

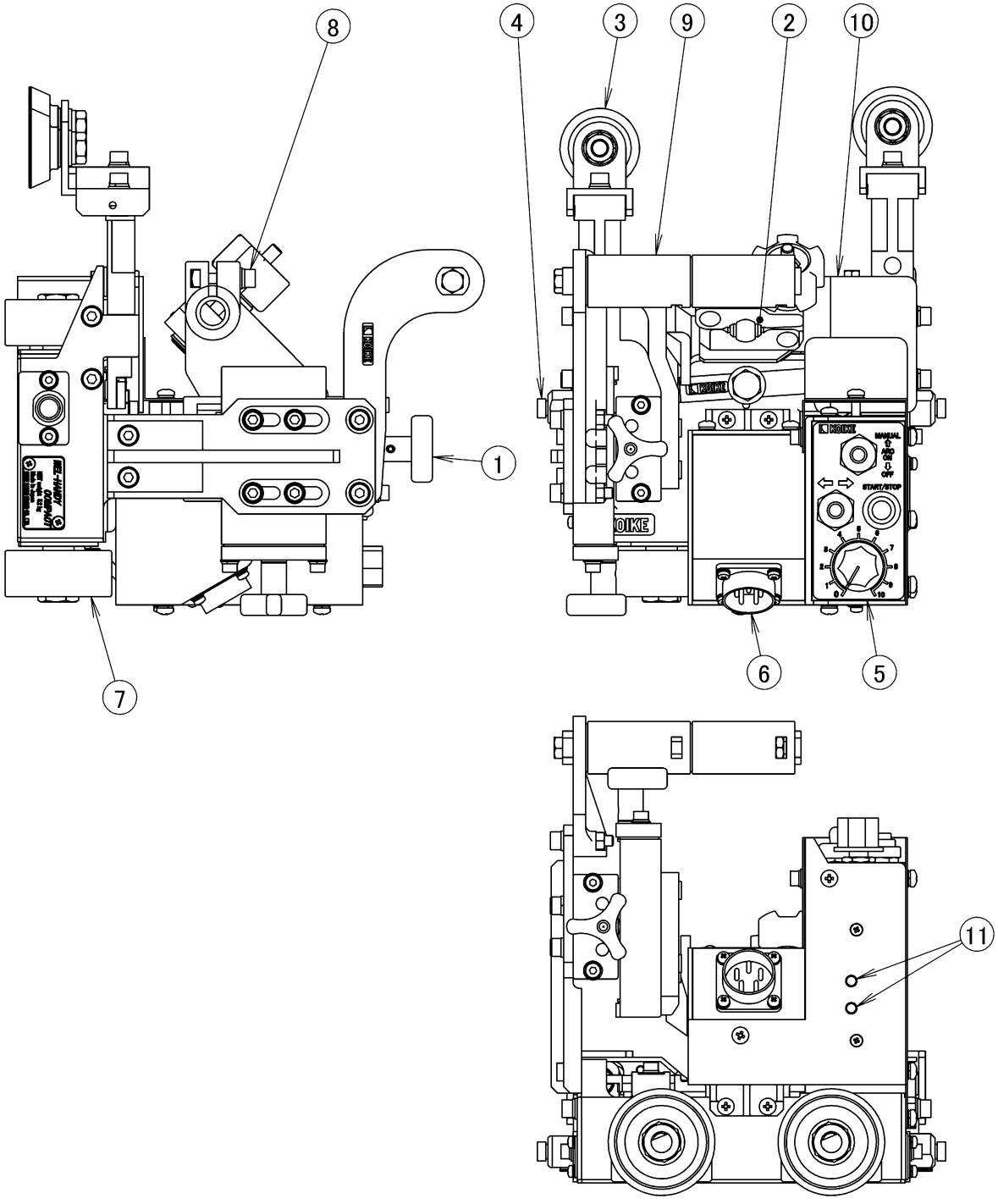


Fig.1 Name of each part

① Slide unit assembly

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

② Torch holder

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

WARNING

Secure the insulated section of the torch when mounting it.

■There is a risk of electric leakage or electric shock if it is fixed in a part other than the insulated part.

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.

It is able to switch manually. It is able to switch by pushing the arm where the mark is visible.

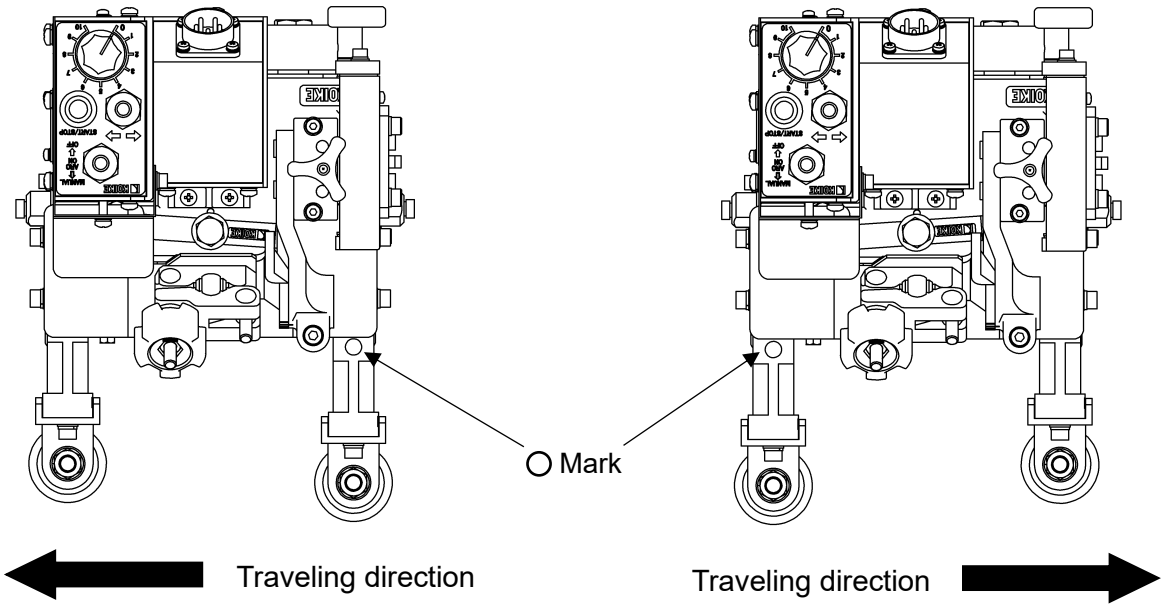
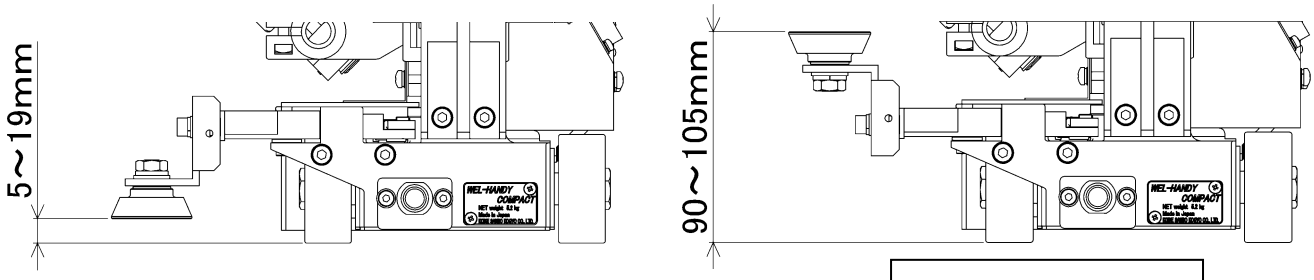


Fig.2 doorway of Guide Roller Arm

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

The height can be adjusted in the range of 5mm(0.197inch) ~ 19mm(0.748inch) and 90mm(3.543inch) ~ 105mm(4.134inch) from the contact patch of a tire.



5mm	=0.197inch
19mm	=0.748inch
90mm	=3.543inch
105mm	=4.134inch

Fig.3 Height of guide roller

④ Limit switch

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

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 traneling carriage will not stop.

⑤ Operation panel

The detail is shown below.

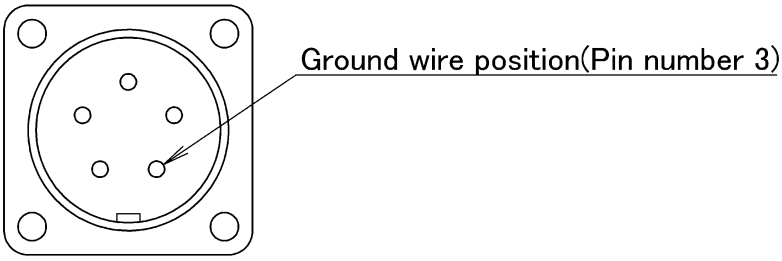
⑥ Receptacle

Kindly connect power cable to this receptacle

WARNING

Never fail to ground the clip.

■ The grounded clip prevents short circuits or electtic shock which results from a short circuit in the carriage, etc.



⑦ Driving wheel (Rubber roller)

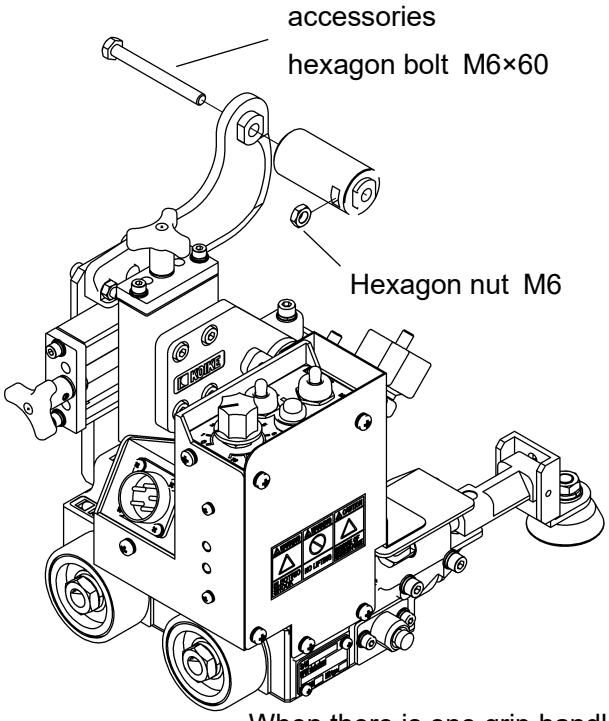
Rubber wheels for driving.

⑧ Torch angle adjusting bolt

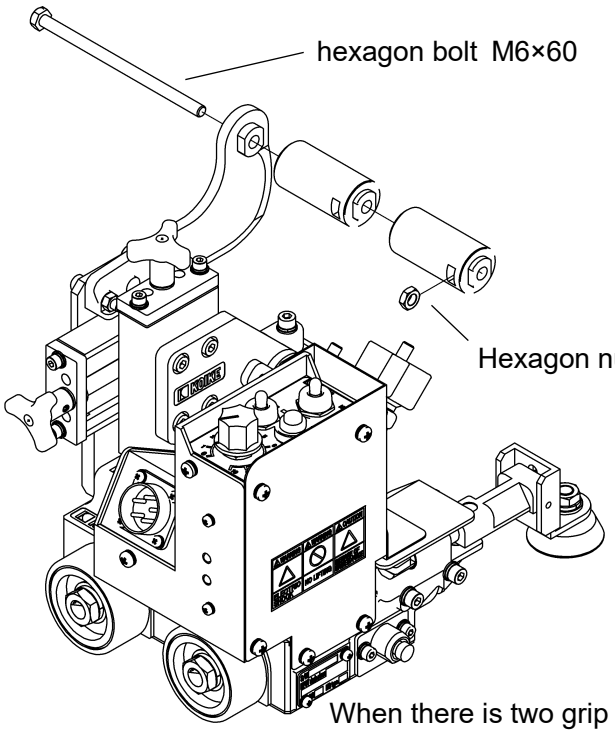
Used to set the torch angle. Loosen the bolt and swing the torch for setting within the range of 35-55 degrees.

⑨ Grip handle

A grip handle for carrying the carriage. The grip handle is attached by connecting two parts. The grip handle can be shortened by connecting one part. If you want to shorten the grip handle, use the attached hexagon bolt M6×60.



When there is one grip handle



When there is two grip handle

WARNING

Be sure to tighten the grip handle.

■ Be sure to tighten the handle. If the tightening is weak, there is a risk that the grip handle will come off when the carriage is impacted or the screws are loose.

WARNING

Be sure to hold the grip part of the handle with your hand when carrying it.
Do not lift the grip part of the grip handle with a crane or the like.

■ Make sure that the tightening torque of the grip handle is 5.2 N·m.There is a risk that the grip handle will come off and fall if an impact is applied when it is lifted or if the mounting screw of the grip handle is loose.

WARNING

Please use the grip handle with caution. (Be careful not to drop it.)

■ It is possible to change the length of the handle from 2 to 1, but if it is 1, the part to hold will be shorter, making it difficult to hold.
When using one, please use it after fully understanding the condition.

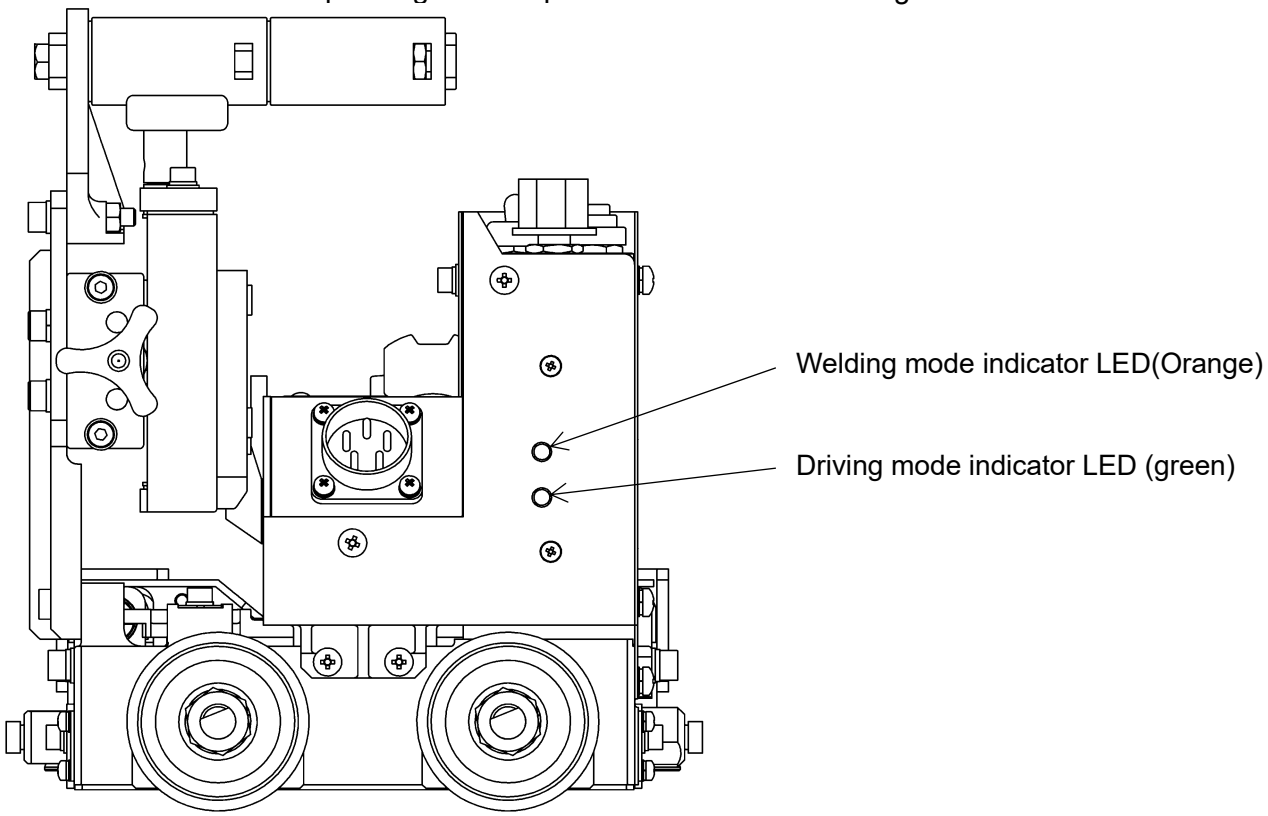
The handle is attached for the purpose of lifting and transporting the carriage.
Do not use more force than necessary, lean on it, or use it for anything other than its intended purpose.

⑩ Heat insulator plate

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

⑪ Operation indicator LED

It turns on and off depending on the operation mode of the carriage.



・Welding mode indicator LED（Orange)

When the arc mode selector switch described later is in ARC ON mode, it lights up when the carriage is stopped. Blinks when the carriage is moving.

When the arc mode selector switch is in ARC OFF mode, it goes out. It goes off even when the carriage is moving.

・Driving mode indicator LED (green)

Lights up after the power is turned on.

When the carriage is stopped, the traveling direction switch keeps lighting when left traveling is

selected, and blinks when right traveling is selected.

Blinks when the carriage is moving. The faster the speed, the shorter the blinking interval.

5.1.2 Operation panel

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WARNING	**Kindly take care about following things to avoid getting an electric shock.**
	■ 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.

- Do not use welding equipment without case or cover.
- Kindly use input voltage in the range of AC100~240V(±10%)
  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.

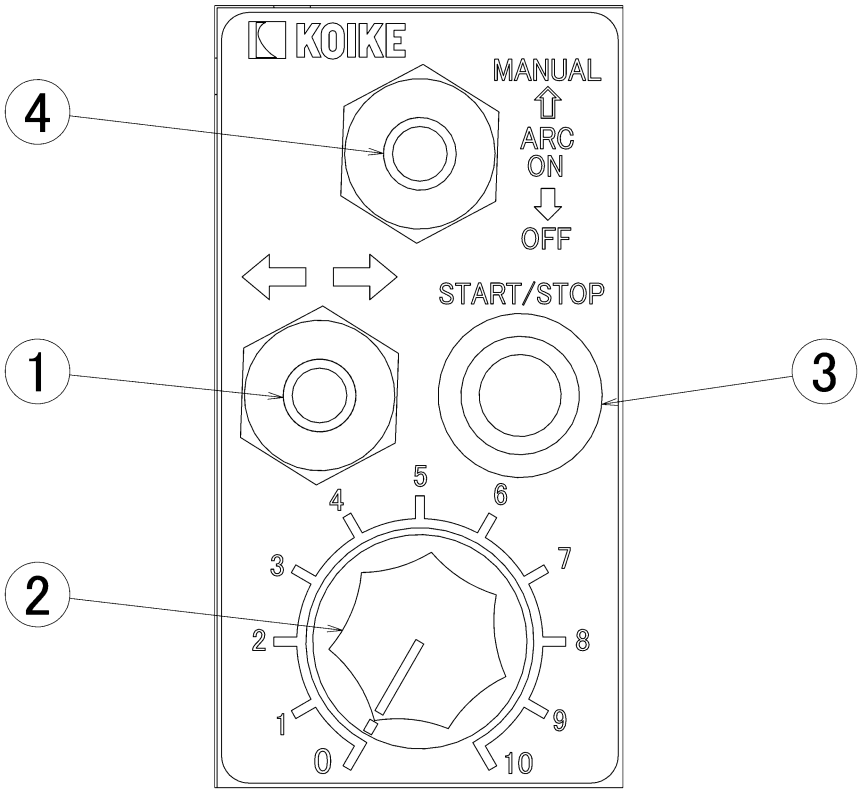


Fig 5 Operation panel

① Traveling direction changing over switch

It is possible to select traveling direction of carriage.

② Traveling speed adjustment switch

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

④ 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.

If set to ARC ON while the carriage is moving, the carriage movement will continue and an arc signal will be output.

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

If set to ARC OFF while the carriage is moving, the carriage movement will continue and the arc signal output will stop.

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.
(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.)

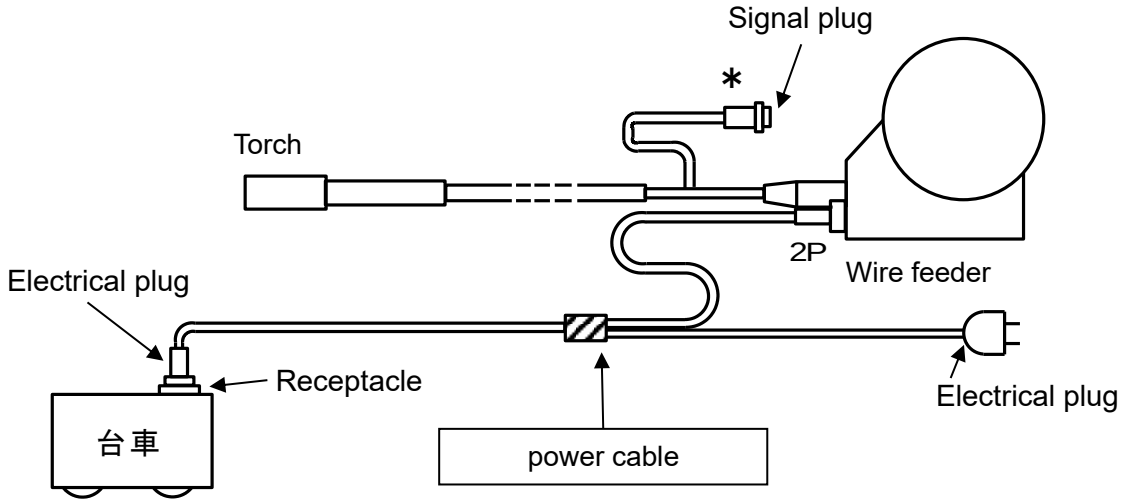
CAUTION
Pay attention to the following during welding.

■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.)

5.3 System connection diagram



Do not connect the torch signal cable to the wire feeder.

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 (CO_2, 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.

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 present 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	**Kindly take care about following things to avoid getting an electric shock.**
	● 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.

- 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 AC100~240V(±10%)
  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
As for the attachment, removal of the drive wheel, please use 2 spanners without fail.

■ 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

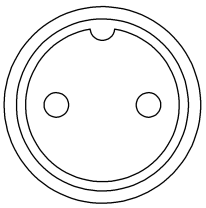
(1) Check the locking screws of the torch holder, tracing arm, handle, grip handle, carriage bottom plate, etc. for looseness.
(2) heck cables (torch and control) for twisting or broken sheathing.
(3) Confirmation of the operation of auto stop limit switch.
(4) Confirmation of smooth operation of the 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

<table>
<tr><th>Defects</th><th>Cause/check position</th></tr>
<tr><td>(1) Slipping off of profiling while traveling</td><td>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.</td></tr>
<tr><td>(2) No electric power supply</td><td>1) No power supply voltage to outlet
2) Cable is disconnected
<table>
<tr><td>  WARNING</td><td>Kindly take care about following things to avoid getting an electric shock.</td></tr>
<tr><td>  </td><td>● 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.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Defects</th><th>Cause/check position</th></tr>
<tr><td>(3) Traveling speed of carriage is not changing</td><td>1) Defect, disconnection of traveling speed adjustment switch
* Kindly verify conduction between Variable resister and DMDU-C board by tester when power supply is turned OFF.
・When it is conducting
Kindly verify whether resistance value between variable resister terminals is changed by tester. If the resistance value does not change, the variable resistor is defective. If the resistance value changes, the DMDU-C or motor is defective, or the motor wire is broken.
・When it is not conducting
There is disconnection of electric wire. Kindly replace the same.
<table><tr><td>WARNING</td><td>Kindly take care about following things to avoid getting an electric shock.</td></tr><tr><td></td><td>● Kindly carry out continuty check by tester while electric supply is turned OFF.</td></tr></table></td></tr>
<tr><td>(4) No welding operation and no traveling of carriage at the pressing of START/STOP button while stopping of carriage</td><td>1) Defective START/STOP button
2) Defective DMDU-C board
3) Defective Limit switch or disconnection Limit switch
4) Limit switch is in the pressed state.</td></tr>
<tr><td>(5) There is welding operation but no traveling of carriage at the pressing of START/STOP button while stopping of carriage</td><td>1) Defective DMDU-C board
2) Disconnection of motor</td></tr>
<tr><td>(6)There is traveling of carriage but no welding operation at the pressing of START/STOP button while stopping of carriage</td><td>1) ARC OFF option is selected in Arc mode changing over switch.
2) The welding power supply is not turned on.
3) The signal cable for the torch switch is not connected to the welding power supply.
4) Check for a short circuit between the 2-pins of the 2-pins metal outlet for the torch switch (see figure below) on our cable.
※Please check during operation.
・In case of short circuit
Welding power supply, defective feeding device
・In case of no short circuit
Cable break, Defective Arc mode changing over switch, Defective DMDU-C board
 
Connector reference drawing</td></tr>
</table>

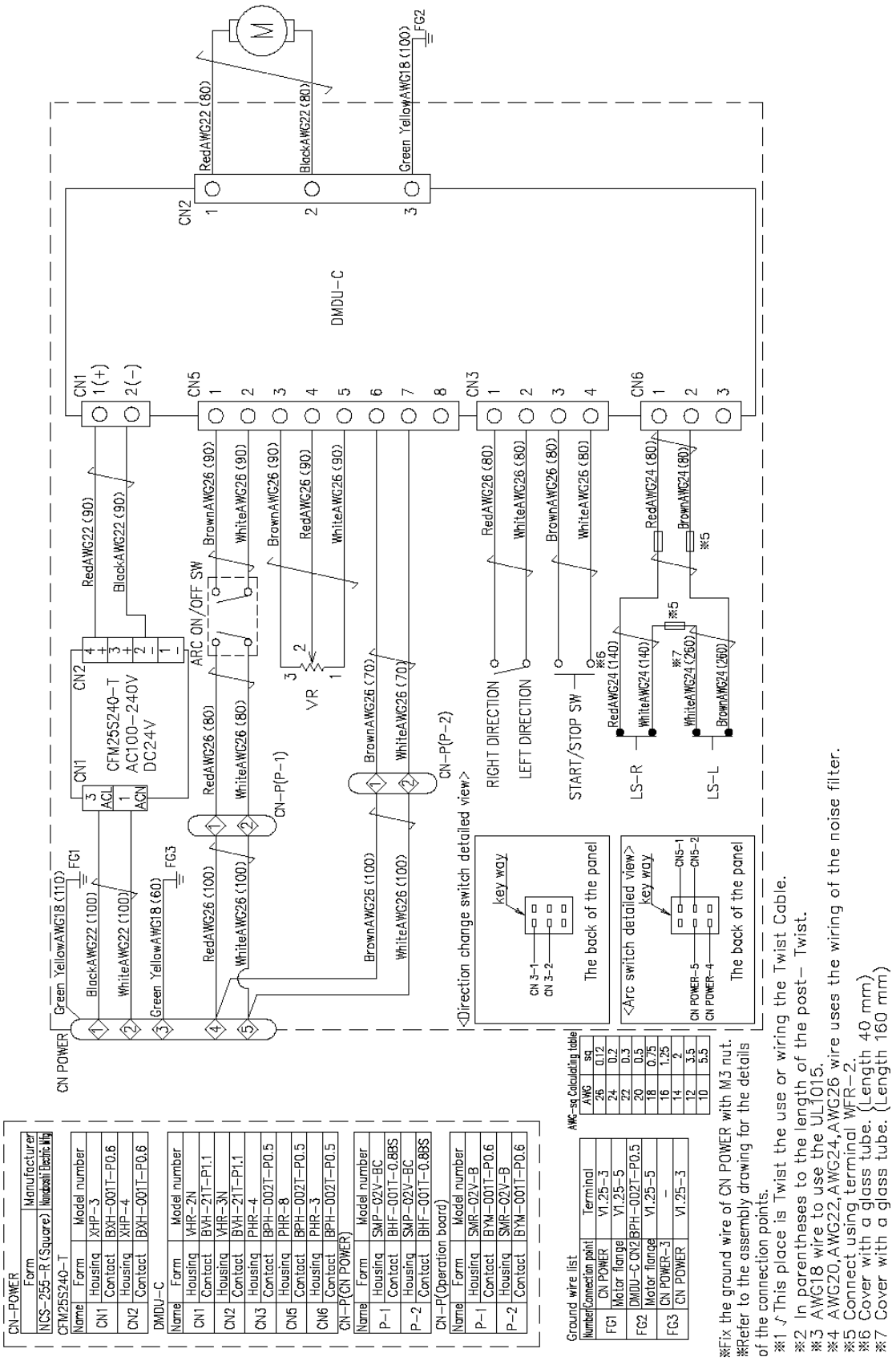
<table>
<tr><th>Defects</th><th>Cause/check position</th></tr>
<tr><td>(7) No stopping of welding operation and traveling of carriage at the pressing of START/STOP button during welding operation</td><td>1) Defective START/STOP button or disconnection of START/STOP button
2) Defective DMDU-C board</td></tr>
<tr><td>(8) There is stopping of traveling of carriage but no stopping of welding operation at the pressing of START/STOP button during welding operation</td><td>1) Should be “with Self holding” option selected at welding current. *Kindly set it to “Without self-holding”.
2) The spring inside the relay on DMDU-C board may have slackened, and the contacts may not be open due to the influence of magnetic force. Replace the DMDU-C board.</td></tr>
<tr><td>(9) There is stopping of welding operation but no stopping of traveling of carriage at the pressing of START/STOP button during welding operation</td><td>1) Defective DMDU-C board
2) Disconnection of motor</td></tr>
<tr><td>(10) No stopping of welding and traveling of carriage even at pressing of Limit switch</td><td>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.
・When continuity is turned off
Defective DMDU-C board
<table><tr><td>WARNING</td><td>Kindly check the conduction between terminals by tester while electric supply is turned OFF.</td></tr><tr><td colspan="2">● If electric supply is turned ON during verification of conduction between terminals by tester, there is risk of electric shock due to short circuit.</td></tr></table></td></tr>
<tr><td>(11) There is stopping of traveling of carriage but no stopping of welding operation at pressing of Limit switch</td><td>1) Should be “with Self holding” option selected at welding current.
* Kindly set it to “Without self-holding”.
2) Defective DMDU-C board</td></tr>
<tr><td>(12) There is stopping of welding operation but no stopping of traveling of carriage at pressing of Limit switch</td><td>1) Defective DMDU-C board</td></tr>
</table>

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

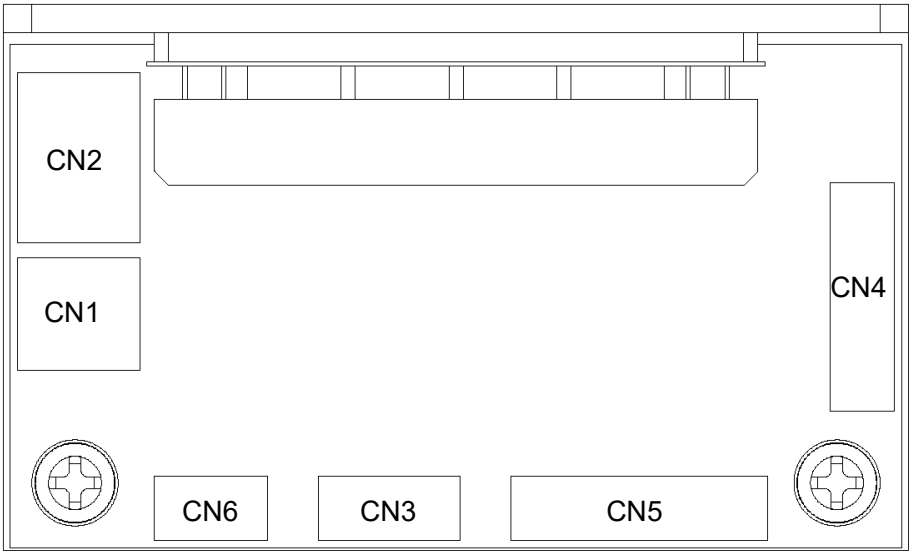
7.1 Electrical diagram

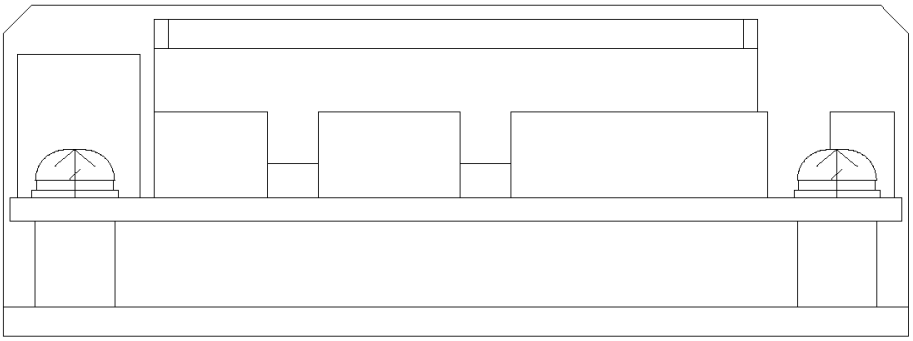


※Fix the ground wire of CN POWER with M3 nut.
※Refer to the assembly drawing for the details of the connection points.
※1 This place is Twist the use or wiring the Twist Cable.
※2 In parentheses to the length of the post- Twist.
※3 AWG18 wire to use the UL1015.
※4 AWG20,AWG22,AWG24,AWG26 wire uses the wiring of the noise filter.
※5 Connect using terminal WFR-2.
※6 Cover with a glass tube. (Length 40 mm)
※7 Cover with a glass tube. (Length 160 mm)

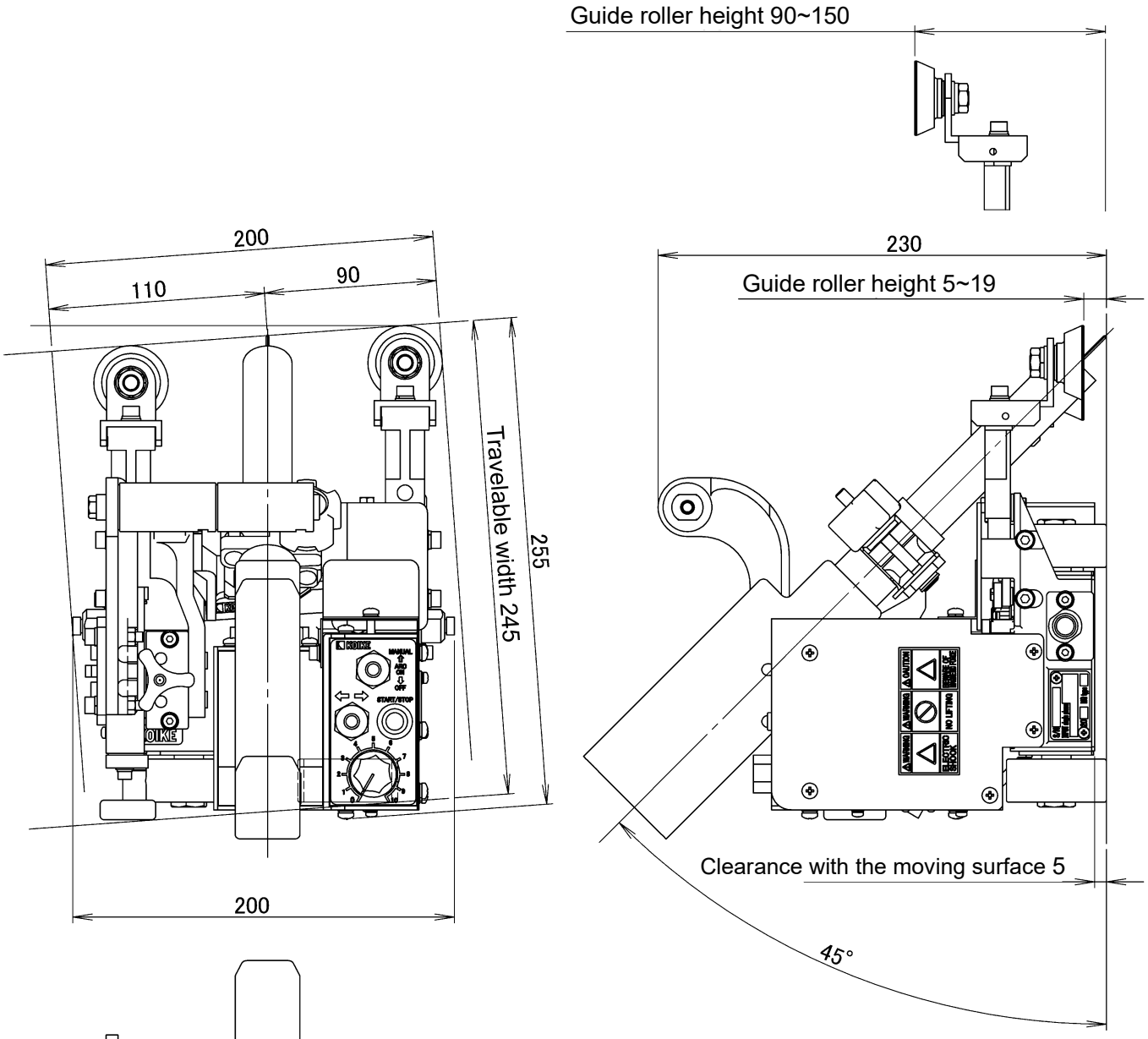
7.2 Assembly drawing of circuit board

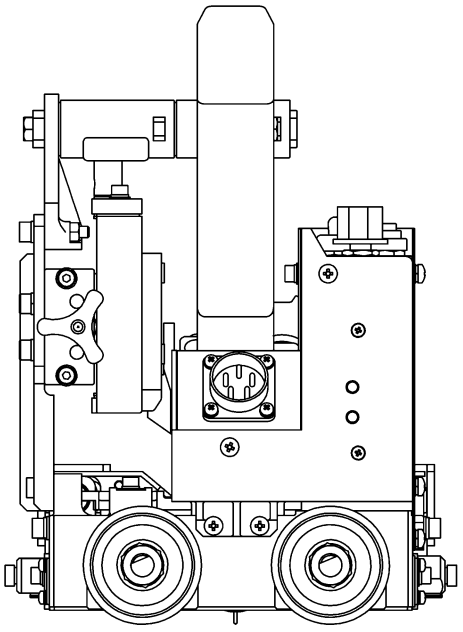
DMDU-C board





8 Assembly drawing of WEL-HANDY COMPACT

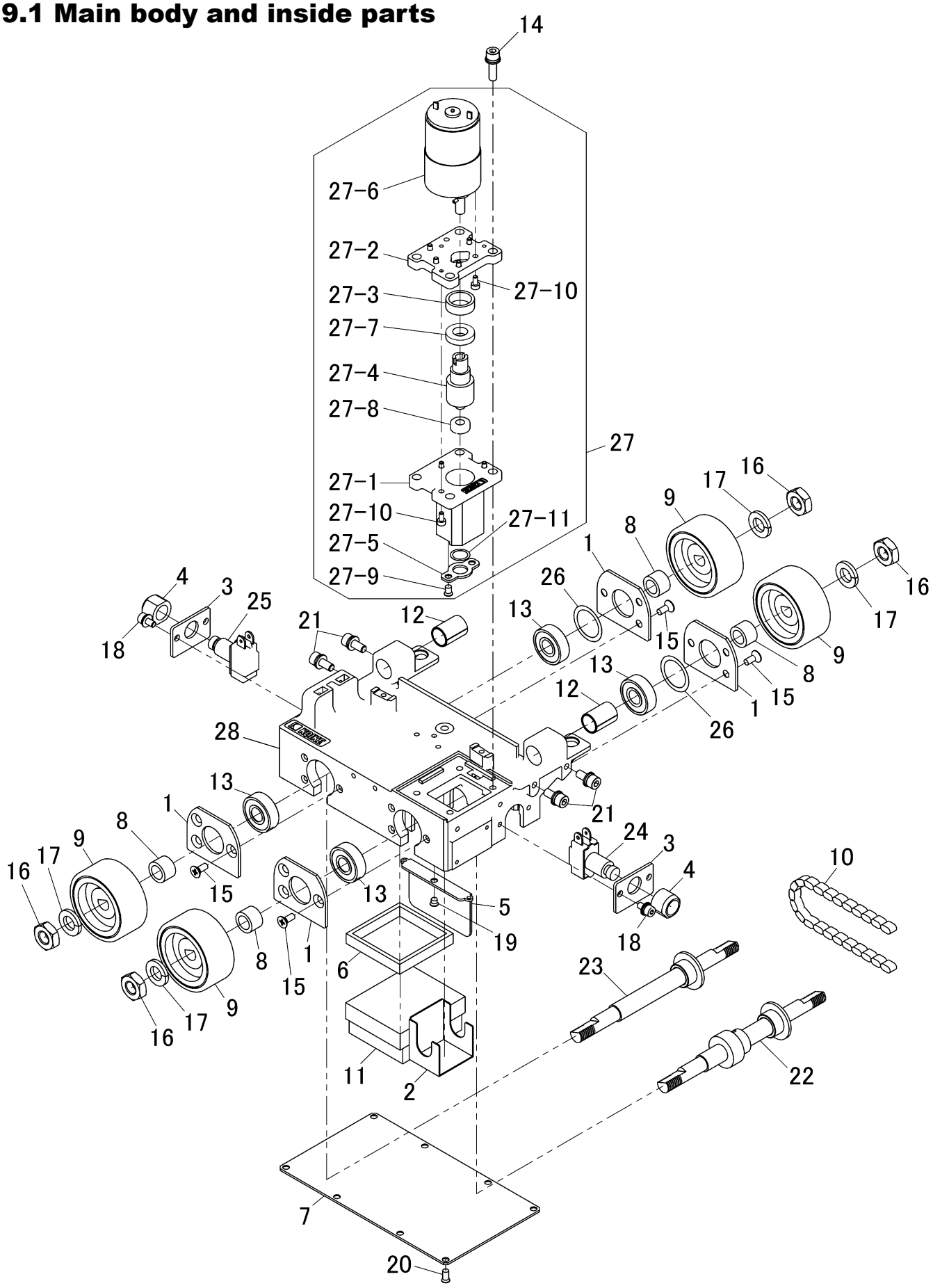




5mm	=0.197inch
19mm	=0.748inch
90mm	=3.543inch
110mm	=4.331inch
150mm	=5.906inch
200mm	=7.874inch
230mm	=9.055inch
245mm	=9.646inch
255mm	=10.039inch

9 Parts list

9.1 Main body and inside parts



Main body and inside parts

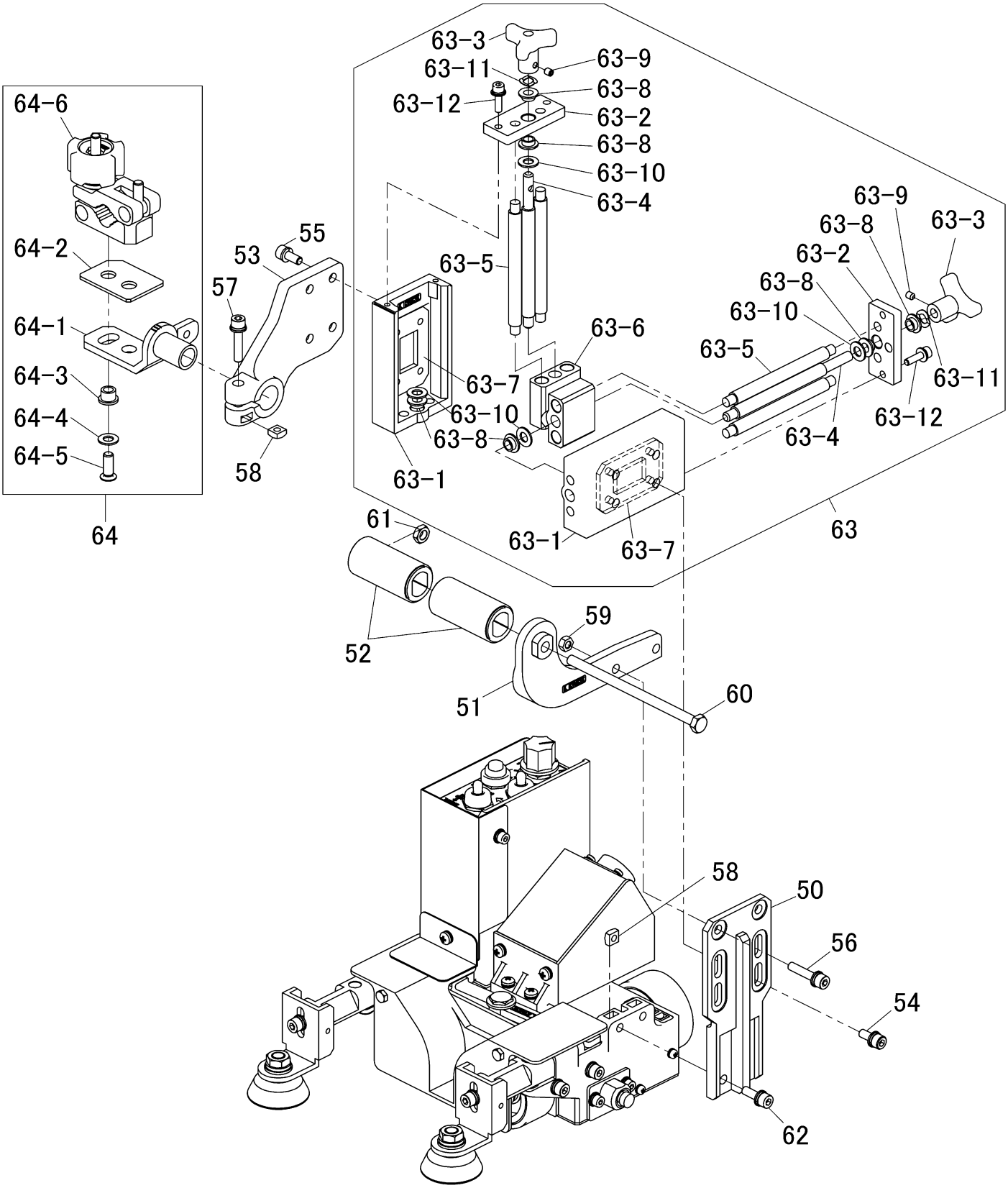
ITEM No.	PART NAME	QTY	STOCK No	REMARKS
1	Body bearing plate	4	20521497	
2	Gear cover	1	20521498	
3	Limit switch mounting bracket	2	20521499	
4	Switch cover	2	20521500	
5	Chain cover	1	20521508	
6	magnet spacer	1	20521480	Only standard magnet
7	Under cover	1	20521565	
8	spacer	4	61007553	
9	Drive roller	4	61000579	
10	Chain	1	20521566	
11	Standard magnet	1	20521353	Standard type
	Strong magnet	(1)	20521354	Strong type
12	DU bush	2	20521569	TSA 1220
13	Bearing	4	6A036000	6000ZZ
14	Hexagon socket head cap screw	4	20523760-Y	BC-5×20(WS)
15	Screw	12	6C500410	SF-4×10
16	Nut	4	6D030100	NH-10
17	Spring washer	4	6D510100	WS-10
18	Hexagon socket head cap screw	4	6C450410	BC-4×10(WS,WF)
19	Screw	1	20521720	M4×4
20	Screw	8	20504669-Y	M4×8
21	Hexagon socket head cap screw	4	6C450512	BC-5×12
22	Drive shaft assembly	1	20522361	
23	Idle shaft assembly	1	20522362	
24	Limit switch(R)	1	20522367	
	Push button switch	1	64000171	SB-221(N/C)R2B
25	Limit switch(L)	1	20522368	
	Push button switch	1	64000171	SB-221(N/C)R2B
26	Sim ring	(2)	20522474-Y	※1
27	Gear box assembly	1	20522365	
27-1	Gear case	1	20521494	
27-2	Reducer bracket	1	20521492	
27-3	Gear box bearing spacer	1	20521495	

ITEM No.	PART NAME	QTY	STOCK No	REMARKS
27-4	Worm gear	1	20521405	
27-5	COM Gear box bearing plate	1	20521496	
27-6	Motor	1	20521355	
27-7	Bearing	1	20521573	6800ZZ
27-8	Bearing	1	6A030686	686ZZ
27-9	Screw	2	6C730406	M4×6
27-10	Hexagon socket head cap screw	9	20524004-Y	BC-3×6(WS)
27-11	Sim ring	(1)	20522478	※1
28	Body	1	20524437	※2

※1 Quantity change according to the actual item

※2 **If you replace body, the product warranty will be void.**

9.2 Holder relationship

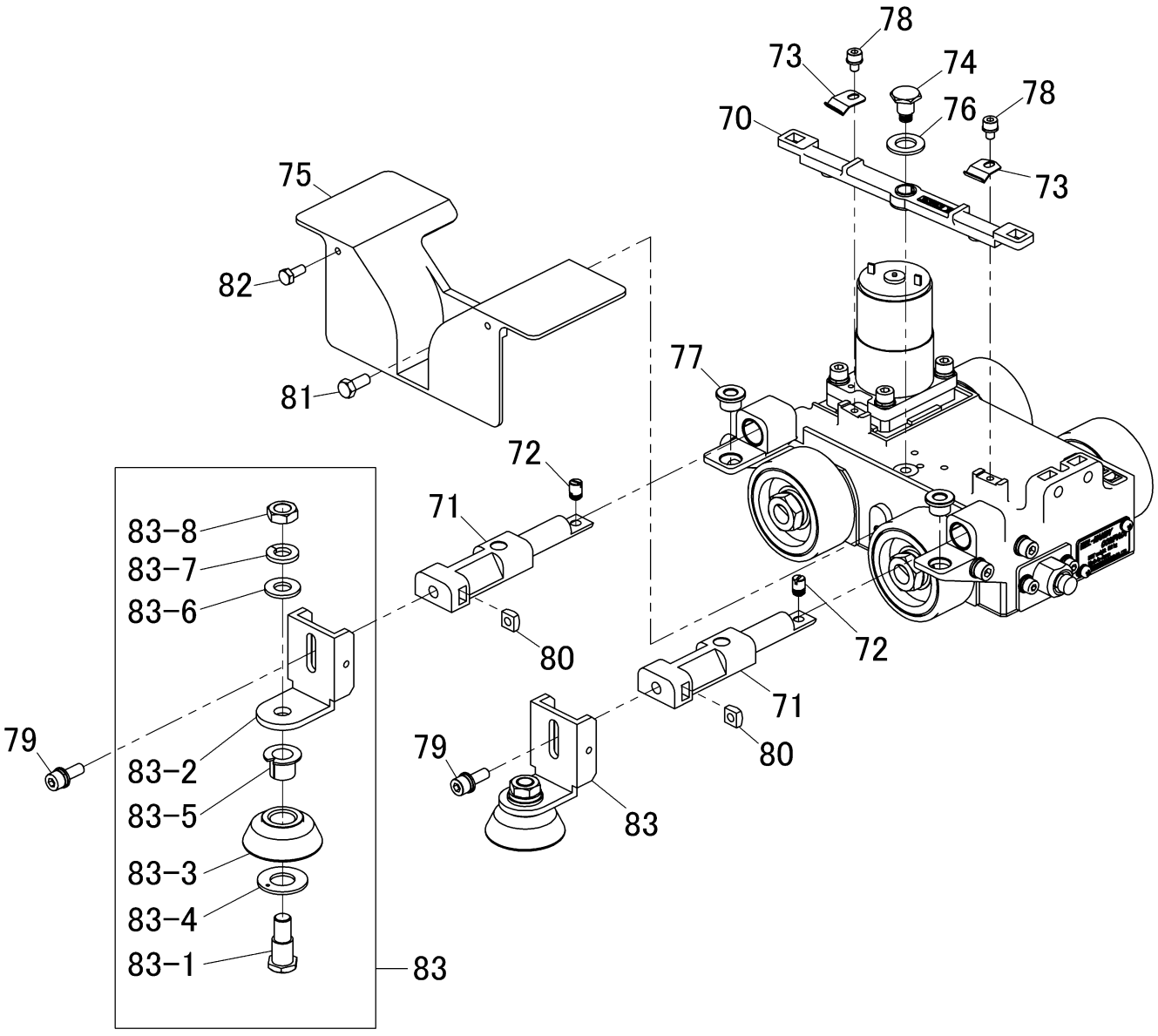


Holder relationship

ITEM No.	PART NAME	QTY	STOCK No	REMARKS
50	Slide unit bracket	1	20521430	
51	Handle	1	20521546	
52	Grip handle	2	20521547	
53	Holder bracket	1	20521521	
54	Hexagon socket head cap screw	4	20522375-Y	BC-5×13
	Spring washer	4	6D510050	WS-5
	Washer	4	6D500050	WF-5
55	Hexagon socket head cap screw	4	6C030512	BC-5×12
	Spring washer	4	6D510050	WS-5
56	Hexagon socket head cap screw	2	6C030525	BC-5×25
	Spring washer	2	6D510050	WS-5
57	Hexagon socket head cap screw	2	6C450525	M5×25 （WS,WF）
58	Square nut	3	20504590-Y	M5
59	Nut	2	6D010050	NH-5
60	Hexagon head bolt	1	40006670-Y	M6×110
61	Nut	1	6D010060	NH-6
62	Hexagon socket head cap screw	2	6C450516	BC5×16 （WS,WF）
63	Slide unit assembly	1	20522369	
63-1	Slide unit base	2	20521509	
63-2	Slide unit cover	2	20521517	
63-3	Handle	2	20521519	
63-4	Slide unit screw	2	20521511	
63-5	Slide unit shaft	4	20521512	
63-6	Slide unit block	1	20521516	
63-7	Plate nut	2	20521513	
63-8	Bush	6	20521568	GFM-0608-04
63-9	Screw	2	6C560405	SSS-4×5
63-10	Washer	4	6D500060	WF-6
63-11	Wave Washer	2	5A002294-Y	WW-6
63-12	Hexagon socket head cap screw	4	6C450415	BC-4×15 （WS,WF）
64	Torch holder assembly	1	20522370	
64-1	Torch holder received	1	20521431	
64-2	Insulating plate	1	60038148	
64-3	Spacer	2	60038149	

ITEM No.	PART NAME	QTY	STOCK No	REMARKS
64-4	Washer	2	6D500060	WF-6
64-5	Screw	2	20521574-Y	M6×16
64-6	Clamp assembly	1	20523296	

9.3 Arm relationship

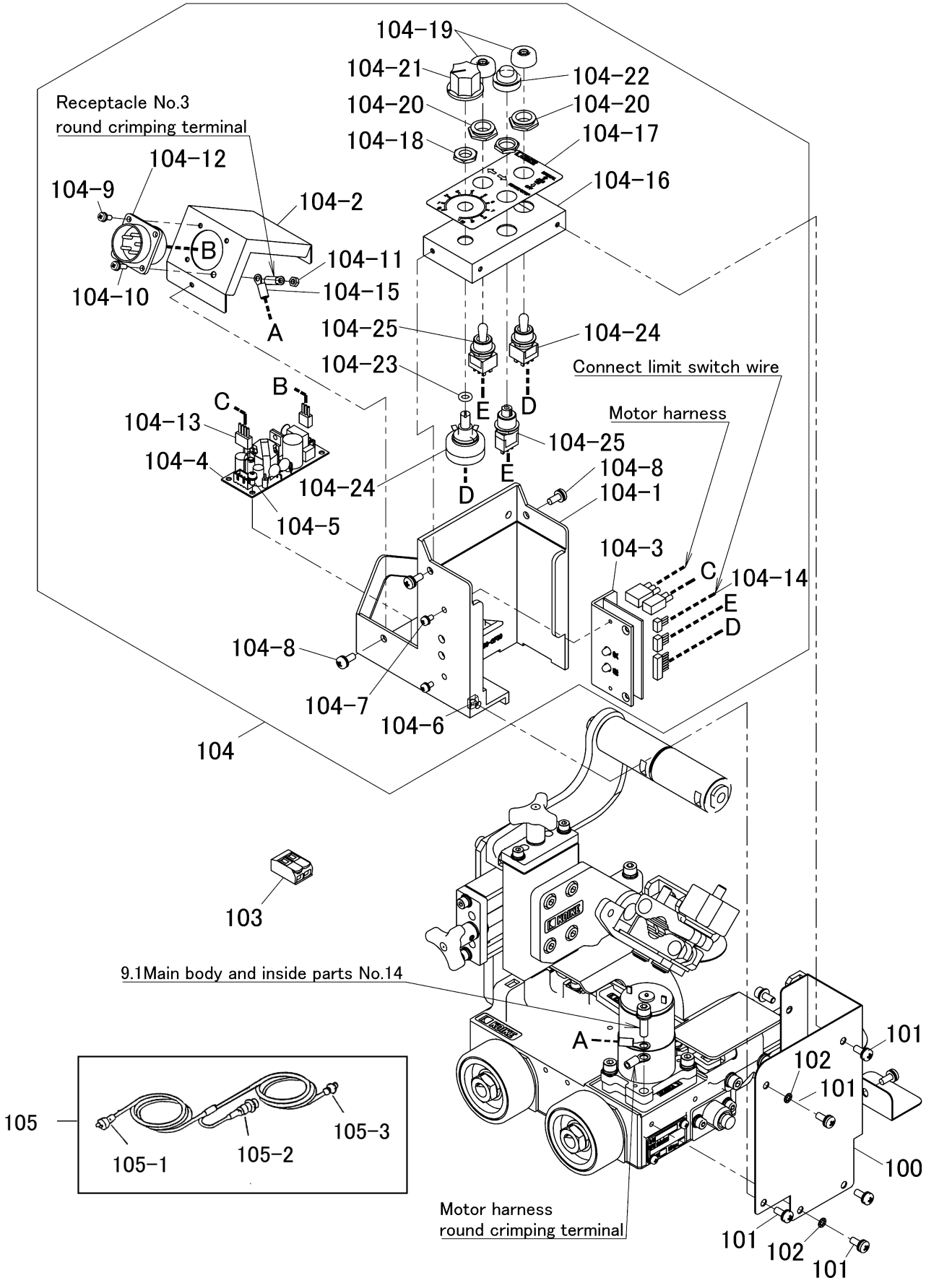


Arm relationship

ITEM No.	PART NAME	QTY	STOCK No.	REMARKS
70	Arm link A	1	20523297	With DU bush
71	Arm link B	2	20521501	
72	Arm link shaft	2	20521503	
73	Lock spring	2	20521507	
74	Arm rotating shaft	1	20521504	
75	Cover	1	20521593	
76	DU washer	1	6D520008	WC08DUN
77	bush	2	20521572	30F-0608
78	Hexagon socket head cap screw	2	6C030406	BC-4×6
79	Hexagon socket head cap screw	2	6C450515	BC-5×15 （WS,WF）
80	Square nut	2	20504590-Y	M5
81	Screw	1	20522480-Y	M5×12
82	Screw	2	20522481-Y	M4×10
83	Roller assembly	2	20520309	
83-1	Roller axis	1	20520310	
83-2	Roller bracket	1	20503655	
83-3	Guide roller	1	67000374	
83-4	DU Washer	1	6D520010	
83-5	DU bush	1	6D711018	
83-6	Washer	1	6D500080	WF-8
83-7	Spring washer	1	6D510080	WS-8
83-8	Nut	1	6D030080	NH-8

ITEM No.	PART NAME	QTY	STOCK No.	REMARKS

9.4 Electrical parts(1)



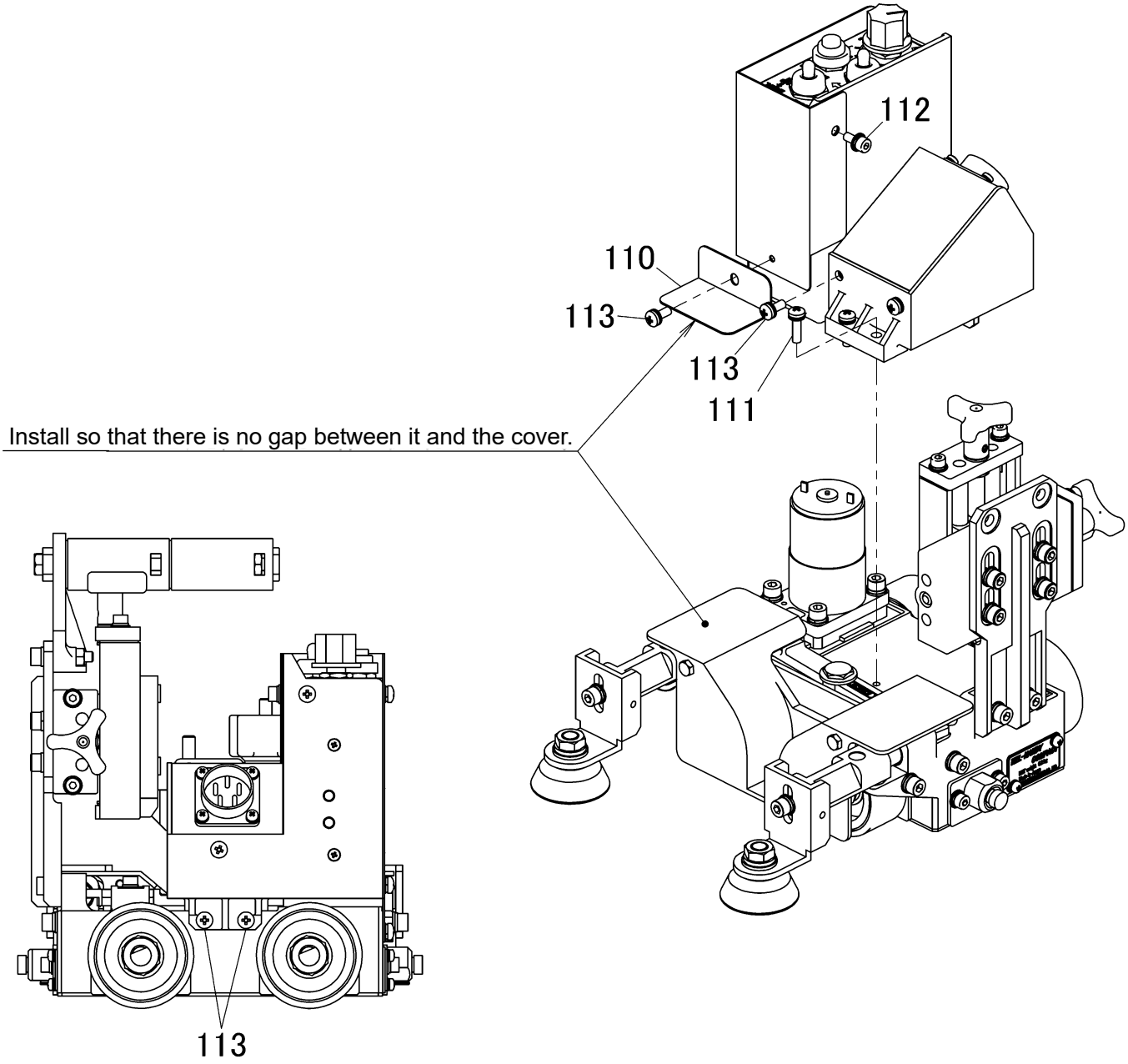
Electrical parts(1)

ITEM No.	PART NAME	QTY	STOCK No.	REMARKS
100	Operation board cover	1	20521560	
101	Screw	5	6C570410	SP-4×10(WS,WF)
102	Toothed washer	2	6D550040	AW-4
103	Terminal block	3	20521567	WFR-2
104	Electrical diagram	1	20522342	
104-1	Power supply box	1	20521479	
104-2	Power supply box cover	1	20521557	
104-3	DMDU-C board	1	20518030	※1
104-4	Power circuit board	1	20521358	CFM25S240-T
104-5	Tapping screw	4	20522386-Y	M3×8
	Washer	4	6D500030	WF-3
104-6	Square nut	1	20522385-Y	M4
104-7	Screw	2	6C570306	SP-3×6(WS,WF)
104-8	Screw	3	6C570410	SP-4×10(WS,WF)
104-9	Screw	3	6C530308	SP-3×8（WS）
104-10	Screw	2	6C570310	SP-3×10（WS,WF）
104-11	Nut	1	6D010030	NH-3
104-12	Receptacle assembly	1	20522384	With harness
	Receptacle	1	64000510	NCS-255-R (Square)
104-13	Harness plaiting A	1	20522387	CFM-CN2 ~DMDU-CN1
104-14	Harness plaiting B	1	20522388	DMDU-CN6
104-15	Ground wire A	1	20522389	
104-16	Operation board	1	20521558	
104-17	Operation name plate	1	20521559	
104-18	Nut(54D)	1	6D400010	
104-19	waterproof cap	2	60032431	
104-20	Dustproof nut	2	60032480	
104-21	Knob	1	60031249	K-2901D
104-22	Waterproof cap for push button	1	64000024	AT-4043
104-23	O-ring	1	60036472	P-6

ITEM No.	PART NAME	QTY	STOCK No.	REMARKS
104-24	Arc switch and volume assembly	1	20522390	DMDU-CN5
	Toggle switch	1	6N110009	M-2029L/B
	Variable resistor	1	6N310010	RV24YN20SB103
104-25	Direction switch and push button switch assembly	1	20522391	DMDU-CN3
	Toggle switch	1	61001047	M-2021L/B
	Push button	1	60038204	MB2011L-B
105	Machine connection cable (option)	1	61004860	Except USA
	Machine connection cable (option)	1	61004861	USA only
105-1	Plug	1	6N100058	NCS-255-P
105-2	Plug	1	60035563	25-2A Except USA
	Plug	1	60037689	MS3106B 18-11P USA only
	Plug	1	6N460017	MS3057-10A USA only
105-3	Power plug	1	60030280	ME2538

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

9.5 Electrical parts(2)

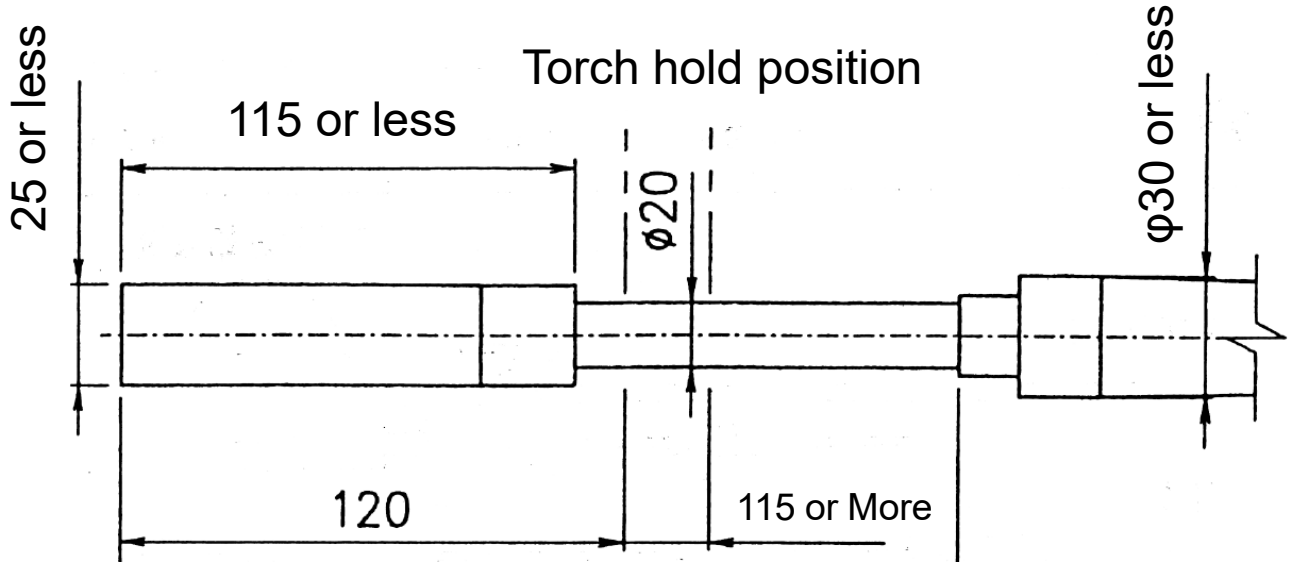


ITEM No.	PART NAME	QTY	STOCK No.	REMARKS
110	Operation board heat shield	1	20521561	
111	Screw	2	20523666-Y	SP-4×15(WS,WF)
112	Hexagon socket head cap screw	1	6C450410	BC-4×10 (WS,WF)
113	Screw	5	6C570410	SP-4×10(WS,WF)

ITEM No.	PART NAME	QTY	STOCK No.	REMARKS

10 About the use of commercial torches

When using a commercially available torch, it can be used if the shape of the torch is as shown in the figure.



＜MEMO＞

WEL-HANDY COMPACT
OPERATION MANUAL

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