Supporting equipment for WU-5R

WU-5R

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.

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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.

■**In case if you get connected WU-5R, make sure to Turn Off the Power.**
Caution: When the power is on if it gets connected there is a possibility of failure.

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.





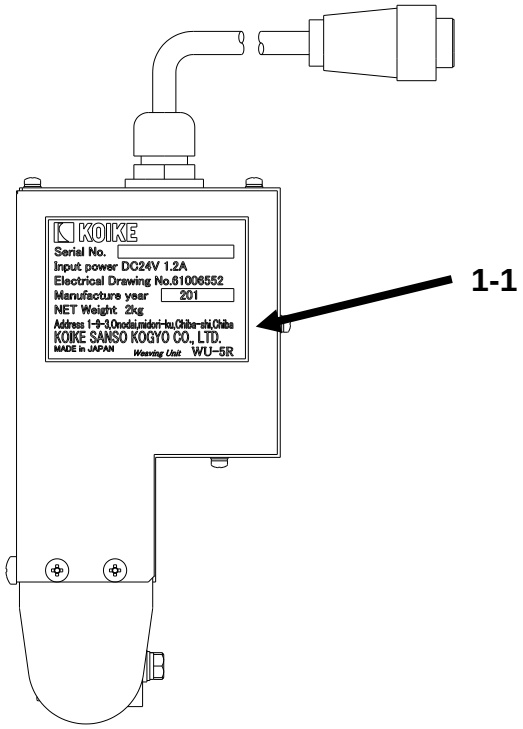
- ■Spatters and hot base metal right after welding can cause tire.
- ■Imperfect connection of cables or imperfect contact on the route of the electric current on the steel bar and other base metal can cause fire because of heating due to resistance.
- ■Arcs generated on the container of gasoline or other 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.

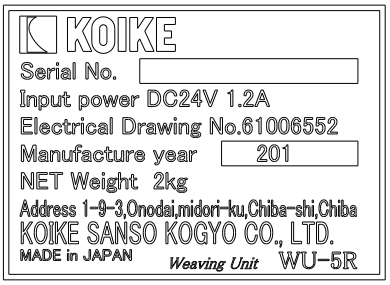
3 Location of Safety labels

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.





1-1

4 Features and specifications

4.1 Features

This machine, weaving unit WU-5R is an optional unit to realize weaving welding with easier operations. By introducing this unit, various types of welding machine can easily get a weaving function. The main features as below.

1. Compact and light, very easy to mount on the welding machine.
2. Electronically controlled, very simple operations.
3. The machine can be used in various ways at your convenience, because the weaving main unit is supplied separately.
4. Can change weaving condition (swing speed, amplitude, stop time, origin position) of welding.
5. Numeric data set is displayed digitally, so you can check it at a glance.
6. By the origin position adjustment function, the origin alignment can be easily carried out.
7. Forward angle, back angle adjustment can be done.
8. While weaving welding, tack/stitch running can be done.

4.2 Configuration

The following configuration becomes IK-72 configuration.
If you have purchased in the WU-5R alone, please refer to page 27.

1. Main unit	1set
2. Control cable	1pc
3. Exclusive use welding torch (option)	
4. Accessories	
*Hexagon wrench (M6/M5/M4)	1pc each
Instruction manual	1pc

4.3 Specifications

4.3.1 Weaving unit WU-5R body

Item	Specifications
Model	Weaving unit WU-5R
Input power supply	DC24V 1.2A (supplied from WEL-HANDY MULTIⅡ TACK/STITCH)
Weight	2kg / 4.4lb
Carriage dimensions	L125×W91×H185mm(Includes torch holder) L4.9×W3.6×H7.3inch(Includes torch holder)
Drive motor	2 phase excitation stepping motor Step angle 1.8degrees
Mechanical section	Reduction ratio 1/318 Length From the rotation center to the torch tip 100mm / 3.94inch
Forward/backward angles	5°
Allowable torque	20kgf・cm / 17.4lbf・inch ※It becomes numeric value in the weaving unit drive shaft portion. By the hold method of the blowtorch, the numerical value mentioned above may not appear. So, please note this beforehand.
Torch holder	For direct torch For curved torch

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 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 within ±10%for power supply input to input plug (Kindly use input voltage in the range of AC100V~AC240V to the welding carriage). WU-5R is operated with DC24V supplied from the welding carriage.
  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. 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.

5.1 Operation panel

V3.35

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.

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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 receptacle.

■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.

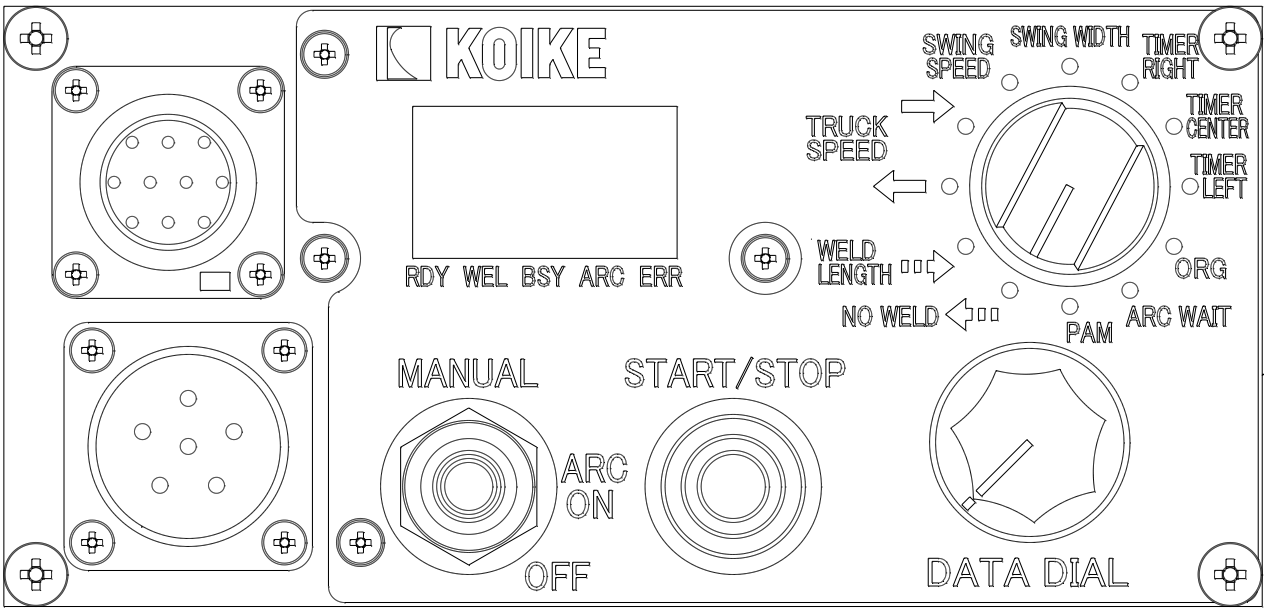
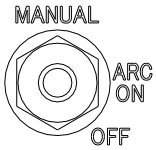
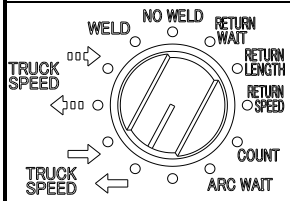
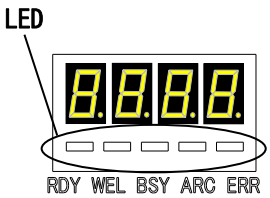


Fig 5 Operation panel

5.1.1 Explanation about operation Unit functions

<table>
<tr><th>Display</th><th>Name</th><th>Function</th></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>
</td><td>START/STOP Button</td><td>It is used at the time of start/stop of travelling of carriage. Moreover, there are cases where this function is used to set parameters.
※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 .</td></tr>
<tr><td>
</td><td>Arc changing over switch</td><td>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. Further it is used to change welding distance, preliminary feeding distance, welding return distance during traveling of Tack/Stitch carriage.


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 .</td></tr>
<tr><td>
</td><td>SELECT SWITCH</td><td>It is used for selecting each parameter and traveling mode.
Kindly verify <u>5.2.2 Regarding SELECT SWITCH</u> for each parameter.</td></tr>
<tr><td>
</td><td>DATA DIAL</td><td>It is used in setting carriage travelling speed and each parameter.
It increases the value at clockwise rotation and decreases at counter-clockwise rotation.
Moreover, it outgrows increase/decrease of value at swift rotation.</td></tr>
<tr><td>
</td><td>Digital Meter</td><td>It displays carriage travelling speed or value of each parameter.
Operation status of carriage can be known from LED display of digital meter.
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</td></tr>
</table>

<Regarding Error number>

Error number	Error contents	Dealing method
	Encoder line Connection error	Please confirm whether an encoder line isn't connected to MD-CN10. If it is connected, connect it to MD-CN5.
	Motor deviation over error	Kindly verify whether there is load on motor or motor DC line or encoder line is slipping off. If line is slipping/ coming off, kindly connect motor DC line to MD-CN4 and encoder line to MD-CN5.
	Welding signal detection error	Kindly verify welding current (delivery device) connection (check whether welding current is turned OFF or check whether power supply cable is disconnected or whether signal connector is slipped out/fall off)
	Welding signal inverse detection error	Please make sure crater settings match in contact power supply side and the truck side.
	When welding distance is 0 during TACK/STITCH operation	Kindly set welding distance at more than 1mm or 0.1inch.
	Motor overload error	Please make sure the load is not applied to the motor.
	Trduck backup err （parameter）	Please make sure the truck and the WU-5R is not OFF the power while fine-tuning move in operation or limit switch . After the change if you want to back up the parameters , please OFF the power to the truck is stopped . After the error occurs, it returns to the parameters of the time that was backed up to the one before . parameter：Parameters that can be arbitrarily set change system parameter：Internal parameters that can not be arbitrarily set change
	Trduck backup err （system parameter）	
	WU-5R backup err（parameter）	
	WU-5R backup err （system parameter）	

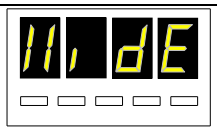
※ In error return method, kindly turn OFF the power supply by removing power cable plug from operation panel and then after verifying as per above mentioned dealing method, kindly insert the plug in operation panel and turn ON electric supply.

※ When an error occurs , the error display is reset when you press the START / STOP button , and after checking the above-mentioned Resolution Please use eliminate the cause .

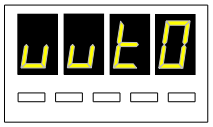
5.1.2 Regarding SELECT SWITCH

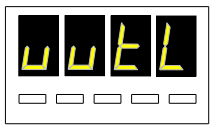
It is possible to carry out continuous welding and tack/stitch welding operation by selecting each mode and each parameter by SELECT SWITCH

Regarding each mode and each parameter it is given as below.

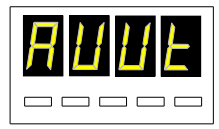
Operation unit display	Digital display	Setting range	Factory default
TRUCK SPEED		50～1500mm/min	—
		2.0～59.0inch/min	
		Function	
		Continuous traveling mode It is used when carriage is **to be run continuously**. When this mode is selected, carriage starts traveling in the direction of directing arrow by pressing START/STOP button. It shows carriage traveling speed value during stop and traveling operation. It is possible to change carriage traveling speed by turning DATA DIAL during stop and traveling of carriage.※Running speed of tack/stitch driving mode of the carriage also set here. Kindly turn DATA DIAL in clock wise direction to increase speed of carriage and in anti-clock wise direction to reduce speed.	
Operation unit display	Digital display	Setting range	Factory default
SWING SPEED		400～1500mm/min	400mm/min
		15.7～59.0inch/min	15.7inch/min
		Function	
		Weaving swing speed setting Selecting when setting the swing speed during weaving operations. ※Weaving swing speed of tack/stitch driving mode also set here. During the stop in the digital meter, swing speed value is displayed. Swing speed can be changed by turning DATA DIAL during the stop. Swing speed can be changed during the carriage driving by combined SELECT SWITCH to SWING SPEED. In a state in which combined to SWING SPEED if you press the START / STOP button, weaving works alone. (An arc does not occur at the time of the movement alone)	
Operation unit display	Digital display	Setting range	Factory default
SWING WIDTH		0～100.0mm	10.0mm
		0～3.94inch	0.39inch
		Function	
		Weaving swing width setting Selecting when setting the swing width during weaving operations. ※Weaving swing width of tack/stitch driving mode also set here. During the stop in the digital meter, swing width value is displayed. Swing width can be changed by turning DATA DIAL during the stop. Swing width can be changed during the carriage driving by combined SELECT SWITCH to SWING WIDTH. In a state in which combined to SWING WIDTH if you press the START / STOP button, weaving works alone. (An arc does not occur at the time of the movement alone)	

Operation unit display	Digital display	Setting range	Factory default
TIMER RIGHT		0～10.0s	0s
		Function	
		Right torch stop time setting Selecting when setting the right torch stop time during weaving operations. Right torch stop time of tack/stitch driving mode also set here. During the stop in the digital meter, right torch stop time value is displayed. Right torch stop time can be changed by turning DATA DIAL during the stop. Right torch stop time can be changed during the carriage driving by combined SELECT SWITCH to TIMER RIGHT. In a state in which combined to TIMER RIGHT if you press the START / STOP button, weaving works alone. (An arc does not occur at the time of the movement alone)	

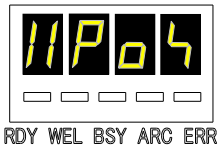
Operation unit display	Digital display	Setting range	Factory default
TIMER CENTER		0～10.0s	0s
		Function	
		Central torch stop time setting Selecting when setting the central torch stop time during weaving operations. Central torch stop time of tack/stitch driving mode also set here. During the stop in the digital meter, central torch stop time value is displayed. Central torch stop time can be changed by turning DATA DIAL during the stop. Central torch stop time can be changed during the carriage driving by combined SELECT SWITCH to TIMER CENTER. In a state in which combined to TIMER CENTER if you press the START / STOP button, weaving works alone. (An arc does not occur at the time of the movement alone)	

Operation unit display	Digital display	Setting range	Factory default
TIMER LEFT		0～10.0s	0s
		Function	
		Left torch stop time setting Selecting when setting the left torch stop time during weaving operations. Left torch stop time of tack/stitch driving mode also set here. During the stop in the digital meter, left torch stop time value is displayed. Left torch stop time can be changed by turning DATA DIAL during the stop. Left torch stop time can be changed during the carriage driving by combined SELECT SWITCH to TIMER LEFT. In a state in which combined to TIMER LEFT if you press the START / STOP button, weaving works alone. (An arc does not occur at the time of the movement alone)	

Operation unit display	Digital display	Setting range	Factory default
ORG		—	—
		Function	
		Origin position adjustment setting During the carriage stopped or carriage traveling by turning the DATA DIAL you can adjust the position of the origin of the torch. Turn the DATA DIAL clockwise, the torch moves to the left. Turn in the counter-clockwise direction, the torch moves to the right.	

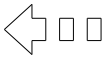
Operation unit display	Digital display	Setting range	Factory default
ARC WAIT		0～10.0s	0.5s
		Function	
		Arc stability time setting (It shows time till start of travelling of carriage after Arc ON) This mode is selected to set Arc stability time at the time of continuous travelling mode and tack/stitch travelling mode. It is time till start of travelling of carriage by pressing START/STOP button. It carries out welding while carriage is in stop state during Arc stability time and countdowns digital meter time. It displays Arc stability time value on the digital meter while carriage is in stop state. Arc stability time can be changed by turning DATA DIAL only while carriage is in stop state.	

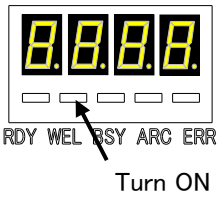
⚠ **CAUTION**	**Arc stability time setting (It shows time till start of travelling of carriage after Arc ON)** This mode is selected to set Arc stability time at the time of continuous travelling mode and tack/stitch travelling mode. It is time till start of travelling of carriage by pressing START/STOP button. It carries out welding while carriage is in stop state during Arc stability time and countdowns digital meter time. It displays Arc stability time value on the digital meter while carriage is in stop state. Arc stability time can be changed by turning DATA DIAL only while carriage is in stop state.

Operation unit display	Digital display	Setting range	Factory default
WELD LENGTH □ □ ⇨		1～999.9mm	20.0mm
		0.1～39.4inch	0.8inch
		Function	
		Weaving tack/stitch driving mode and welding distance setting Carriage is selected by you when weaving tack/stitch run is done, also you select welding distance at the time of tack/stitch run. Press the START/STOP button while selecting this mode starts the running of the carriage in the direction of the arrow.※ While weaving welding, tack/stitch running is done. During the stop in the digital meter, welding distance value is displayed. Welding distance at the time of tack/stitch welding can be changed by turning DATA DIAL during the stop. If you want to change the welding distance in tack/stitch traveling, the SELECT SWITCH To change from match to WELD LENGTH, or you can change the operation of the arc changeover switch. (Please refer to page 26 for more information on how to change.)	

⚠	When it is set to 0mm/0inch, it displays error and it is not possible to operate. Kindly operate by setting at more than 1mm or 0.1inch.

Carriage traveling speed will run with the value of the continuous running mode (CARRIAGE SPEED).

Operation unit display	Digital display	Setting range	Factory default
NO WELD 		0～999.9mm	20.0mm
		0～39.4inch	0.8inch
		Function	
		Preliminary feeding distance settings (It shows length of the portion not to be weld) This mode is selected to set preliminary feeding distance at the time of tack/stitch travelling mode. It displays preliminary feeding distance value on the digital meter at stopping of carriage. It is possible to change the preliminary feeding distance at tack/stitch welding by turning DATA DIAL while carriage is stopped. It is possible to change preliminary feeding distance during carriage travelling by matching SELECT SWITCH to NO WELD or by Arc changing over switch operation.(Kindly refer to page no.26 for change method details) Kindly always keep the carriage maximum speed of travelling during preliminary feeding distance as (1500mm/min) / (59.0inch/min).	

Operation unit display	Digital display	Setting range	Factory default
PAM		0000～0011	—
		Function	
		Parameter setup mode Each parameter can be set from this mode. ※ This mode can be operated only while carriage is in stop state. Details about parameter numbers are given below. ※ For more information please refer to each function of the SELECT SWICTH . For more information on the parameters number, please check **Parameter number details.** 1)Turn SELECT SWITCH and  and match it. 2)Select the parameter number to be changed by turning DATA DIAL. 3)Set by pressing START/STOP button. 4)Edit by turning DATA DIAL. It turns ON WEL of LED during editing.  5)Set by pressing START/STOP button after completion of editing. ※)While initializing, turn OFF electric supply for once after above mentioned operation, and turn ON the electric supply again and complete the operation.	

Parameter number details

<table>
<tr><th>Parameter number</th><th>Function</th></tr>
<tr><td>0000
↳PASS</td><td><u>Input prevent erroneous settings</u>
Parameter values enables you to edit the parameters at the time of the 0114
In other value becomes an input of only this parameter.
Please use for the erroneous input prevention.
Setting range：0000～9999
Factory default：0114</td></tr>
<tr><td>0001
↳Mode</td><td><u>Traveling function additional settings</u>
Setting range：0～7
Factory default：0
You can add a function at the time of the truck traveling.
Please enter the sum of the A value of each item is set value.
Example：If you want to turn on the B0(A=1） and B2(A=4)
Set value =1+4=5
<table>
<tr><th rowspan="2"></th><th rowspan="2">Function</th><th colspan="2">A</th></tr>
<tr><th>ON</th><th>OFF</th></tr>
<tr><td>B0</td><td>After the end of welding, if ON to return automatically to the welding start position.
※For the fillet weld of the copying operation, the original position and the displacement occurs.</td><td>1</td><td>0</td></tr>
<tr><td>B1</td><td>Process at the time of the stop in the tack welding STOP switch.
OFF：Start tuck operation from the beginning
ON：Start a tuck operation from the stop was continued.
However, tuck portion was stopped during the welding is done the welding from the next tack without welding</td><td>2</td><td>0</td></tr>
<tr><td>B2</td><td>Tack welding, Empty run distance　Extension function
OFF：Only stops at the extension OFF between the arc changeover switch ON
ON：Extended operating in the arc changeover switch 1 time ON, the stop at the second time of ON (self-holding)</td><td>4</td><td>0</td></tr>
</table></td></tr>
<tr><td>0002
↳AUTO</td><td><u>Arc stability waiting time settings</u>
Setting range：0~10.0s
Factory default：0s
※ It can be also set in ARC WAIT OF SELECT SWICTH.</td></tr>
<tr><td>0003
↳Ncrt</td><td><u>Torch switch ON output time setting (crater Process)</u>
Setting range :-0.1～1.0s
Factory default：0
Set the torch switch output ON time during welding start-up to the welding power source.
・If the setting of a welding power source is Mu self-holding of (crater non-compliant), this parameter Please to 0 the data.
・In the case of self-holding Available (crater corresponding) Please set this value to a value of from 0.4 to 1.0.
・If, is set to the above values, please set to -0.01 If the arc interruption occurs frequently. In this case the signal is in the ON state until the arc STOP timing. However, there is a case that does not correspond to this specification by welding power source. Please adjust in the 1.0.</td></tr>
</table>

0004
↳ rUt

Welding return waiting time settings

Setting range：0～999.9s

Factory default：0s

This mode is selected to set welding return waiting time at the time of continuous travelling mode and TACK/STITCH travelling mode.

It displays welding return waiting time value while stopping on the digital meter.

It is possible to change the welding return waiting time by turning DATA DIAL during stopping of carriage.

By crater (self-holding) the presence or absence setting, will change the welding current in the welding return latency.

※Caution

Please be sure to match the crater (self-holding) set in the welding power source side and the truck side. In accordance with the following table the crater (self-holding) switch of the welding power supply, please to fit the setting.

How to set the truck side, please set in the number 0003 parameter setting mode.

Welding power source		Truck
Crater (self-holding) **"ON"**	⟷ match	**-0.1 or 0.1~1.0**
Crater (self-holding) **"OFF"**	⟷ match	0000

Caution	If the setting does not match, it might welding operation is not to set street. Please use the combined always crater (self-holding) setting.

0005
↳ rPoS

Welding return distance setting

Setting range：0～999.9mm 0～39.4inch

Factory default：0mm 0inch

This mode is selected to set welding return distance at the time of continuous travelling mode and TACK/STITCH travelling mode.

It operates after completion of welding return waiting time.

It operates after completion of welding distance at welding return waiting time as 0s.

It displays welding return distance value while stopping of carriage on digital meter.

It is possible to change welding return distance by turning DATA DIAL during stopping of carriage.

By crater (self-holding) the presence or absence setting, will change the welding current in the welding return latency.

※Caution

Please be sure to match the crater (self-holding) set in the welding power source side and the truck side. In accordance with the following table the crater (self-holding) switch of the welding power supply, please to fit the setting.

How to set the truck side, please set in the number 0003 parameter setting mode.

Welding power source		Truck
Crater (self-holding) **"ON"**	⟷ match	**-0.1 or 0.1~1.0**
Crater (self-holding) **"OFF"**	⟷ match	0000

Caution	If the setting does not match, it might welding operation is not to set street. Please use the combined always crater (self-holding) setting.

0006 ↳rSPd	**Welding return speed settings** Setting range：50～1500mm/min 2.0~59.0inch/min Factory default:200mm/min 7.9inch/min This mode is selected to set welding return travelling speed at the time of continuous travelling mode and TACK/STITCH travelling mode. It displays welding return speed value during stopping of carriage on digital meter.
0007 ↳cont	**Welding frequency settings** Setting range：0～999time Factory default：0time It is welding frequency at the time of TACK/STITCH travelling mode. It displays welding frequency during stopping of carriage on digital meter. Welding frequency at the time of TACK/STITCH travelling by turning DATA DIAL only while stopping of carriage. (It is not possible to make changes while carriage is travelling) If welding frequency is set to 0, it continues with TACK/STITCH travelling till START/STOP button or Limit switch is pressed.
0008 ↳tAn,	**Torch switch signal minimum time time setting** Setting range：0.4～1.5s Factory default：0.7s Torch switch ON time, OFF time time setting to ensure this setting. If this value is small, so there is a case where welding power source is not able to receive the signal, please be careful.
0009 ↳,nCH	**Metric, Inch switch over settings** 0000 ：Metric 0001 ：Inch The displayed set value of speed and distance can be switched in metric and inches. Refer to "switch over method of metric and inch" for method to switch. ※ The factory default is the metric specifications.
0010 ↳conP	**Speed, moving position correction** Setting range：50～200% Factory default：100% Can run the display of the actual speed correction. Actual speed ＝ Traveling display × [This parameter value]%
0011 ↳ dEF	Not used

5.1.3 Metric, Inch switch over method

1.Turn ON the electric supply.

2.Select “PAM” in selection switch and turn ON the START/STOP switch for once.

3.Turn the DATA DIAL and select 0009 , then turn ON START/STOP switch for once.

4.Select 0000 or 0001 and then turn ON the START/STOP switch for once.

0000: Metric specification (mm)

0001: Inch specification (inch)

5. Turn OFF the electric supply.
6. Turn ON electric supply again.
7. Turn OFF electric supply after display of speed.
8. Turn ON electric supply again(Changing over completion)

※ Initial setting is Metric specification.

※ While using in Inch specification, kindly change it to Inch specification by above mentioned operation while changing internal board.

※Kindly keep interval between turning ON/OFF of electric supply for more than 2 seconds.

※Kindly carry out verification by traveling speed display after completion of changing over.

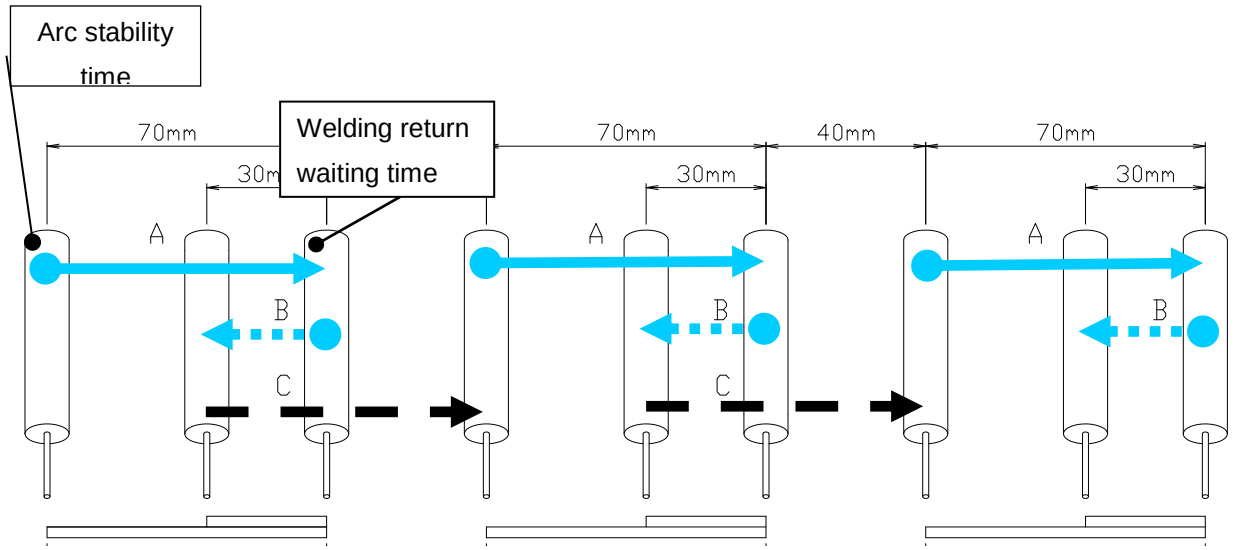
(10~1500mm specification, 2.0~59.0 Inch specification)

5.1.4 Weaving tack/stitch running motion pattern diagram

Example 1) Weaving tack/stitch welding parameter setting

Welding distance	70mm / 2.76inch
Welding return distance	30mm / 1.18inch
Sky transmission distance	40mm / 1.57inch
Welding return waiting time	1sec
Arc stability time	1sec

Operation sequence	Movement
A	Welding movement
B	Welding return distance
C	preliminary feeding distance



※In the weaving tack driving ●→ and ←●- at the time of the operation, the weaving operation will

be done.At the time of sky transmission distance, the weaving operation is not done.

※Stop work by START / STOP button or limit switch, the running and welding can be stopped.

※Only when the limit switch is pressed during welding movement, welding move at the time the limit switch is pressed.Motion is finished and moves to welding return movement.

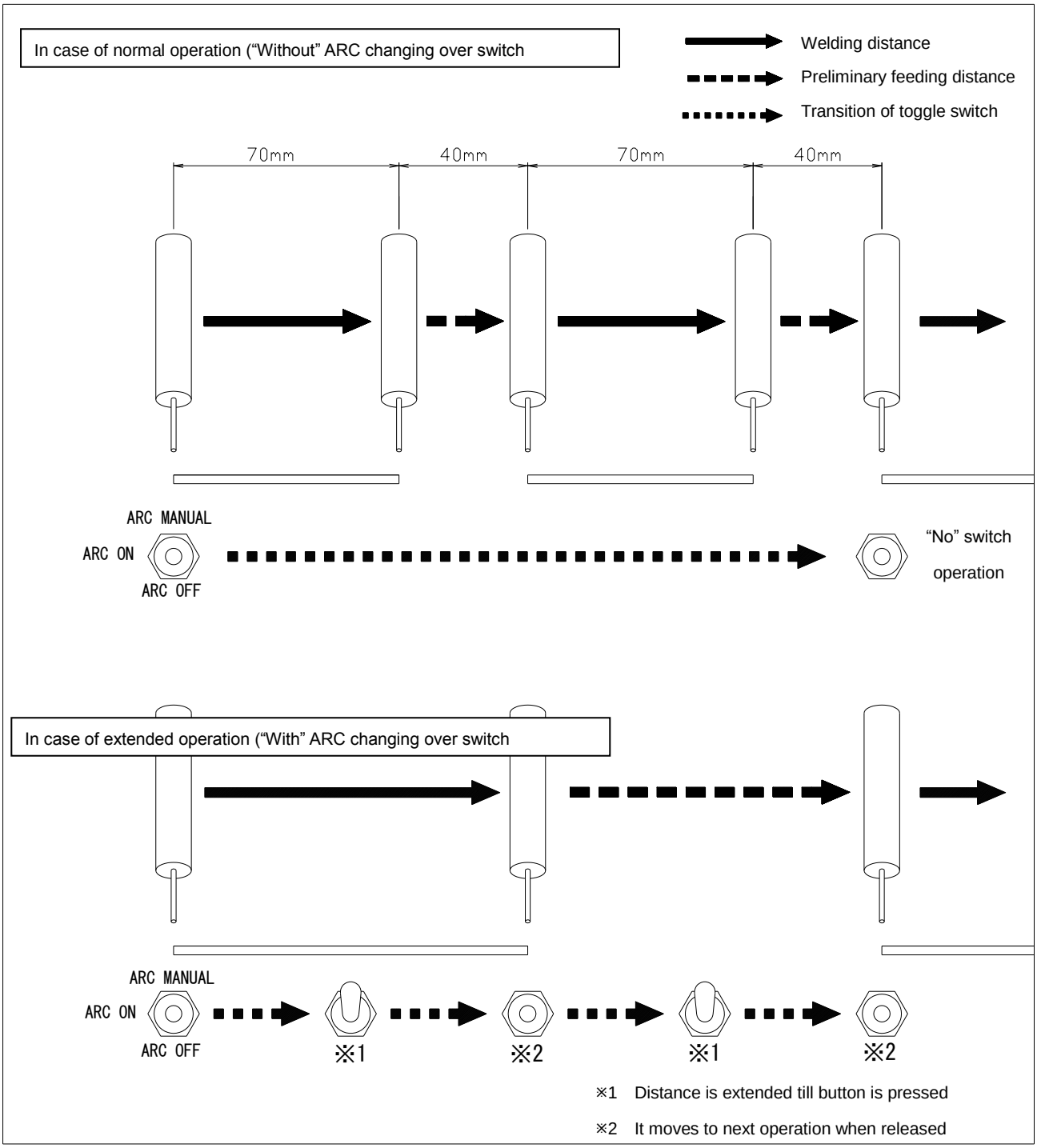
Driving and welding will stop at the time of the welding return operation is completed.

※If the START/STOP button has been pressed, in any action at the time the START/STOP button has been pressed Driving and welding stops.

※If you stop in the START / STOP button or limit switch,weaving unit will stop back to always origin position.

Further, “Welding distance”, “Preliminary feeding distance”, “Welding return distance” can be changed by operating “Arc changing over switch” during weaving tack/stitch welding operation.

Kindly operate by referring to below mentioned settings while changing distance during weaving tack/stitch welding operation.

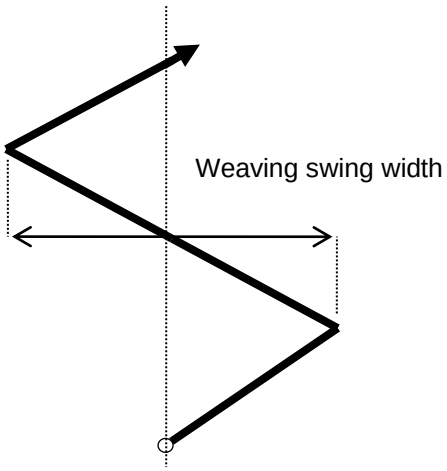


5.1.5 Weaving movement time chart

The weaving movement at the time of the weaving welding becomes like the following time chart.

Example1) Parameter settings

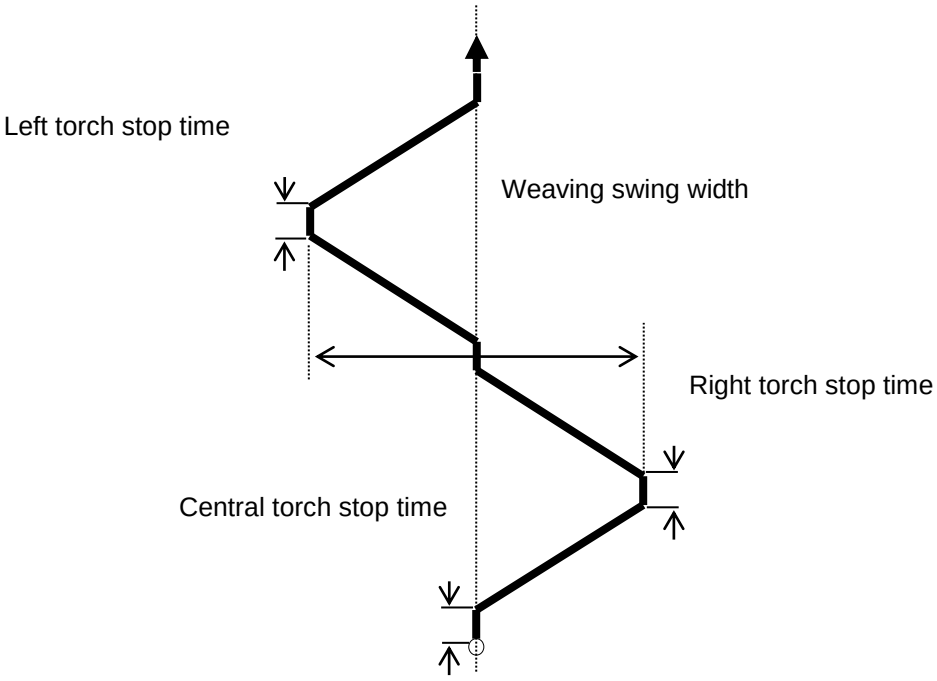
Central torch stop time	0sec
Left torch stop time	0sec
Right torch stop time	0sec
Weaving swing width	10mm / 0.39inch



Origin position

Example2) Parameter settings

Central torch stop time	1.0sec
Left torch stop time	1.0sec
Right torch stop time	1.0sec
Weaving swing width	10mm / 0.39inch



Origin position

※Weaving swing speed, is the speed at the position 100 mm or 3.94 inch away from the center of rotation.

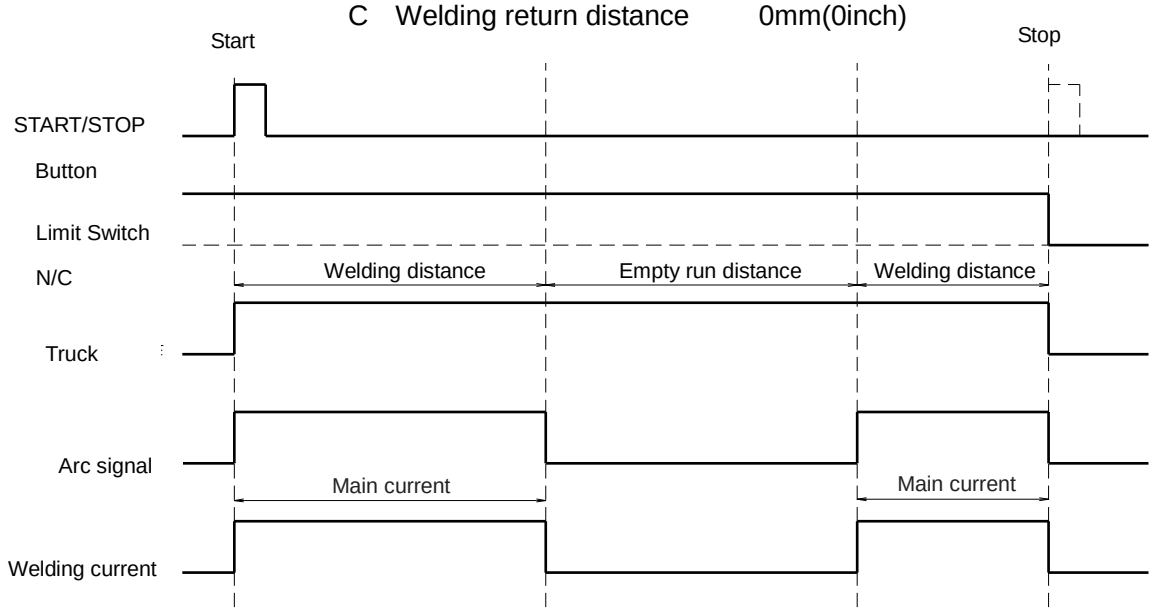
5.1.6 tack/stitch running motion Time chart

Crater (self-holding)"OFF" setting

A Arc stability waiting time 0s

B Welding return waiting time 0s

C Welding return distance 0mm(0inch)

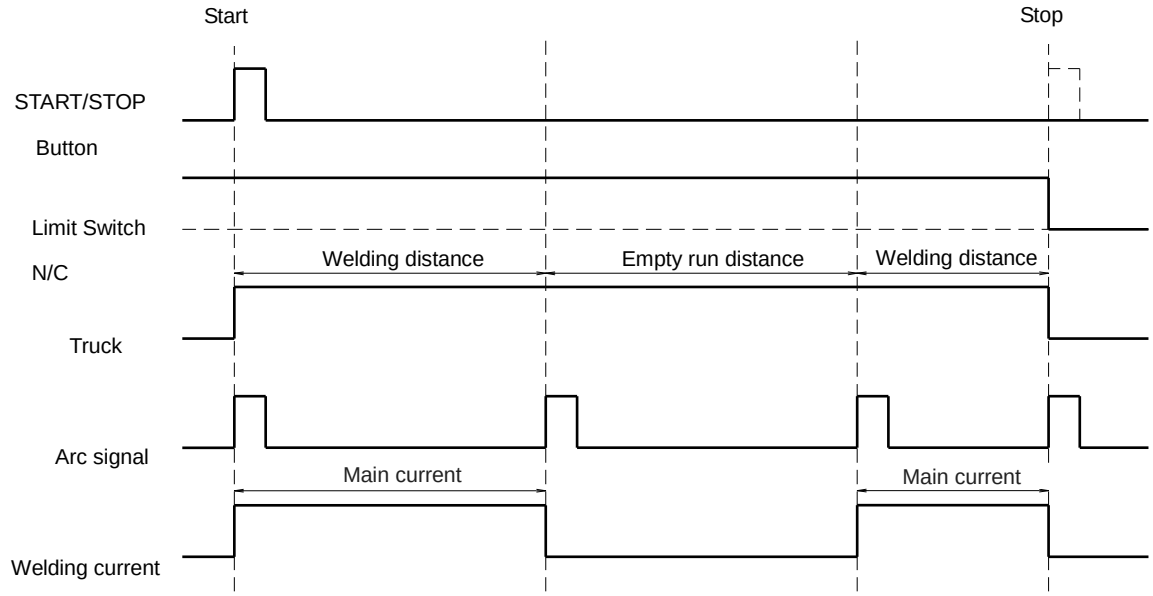


Crater (self-holding)"ON" setting

A Arc stability waiting time 0s

B Welding return waiting time 0s

C Welding return distance 0mm(0inch)

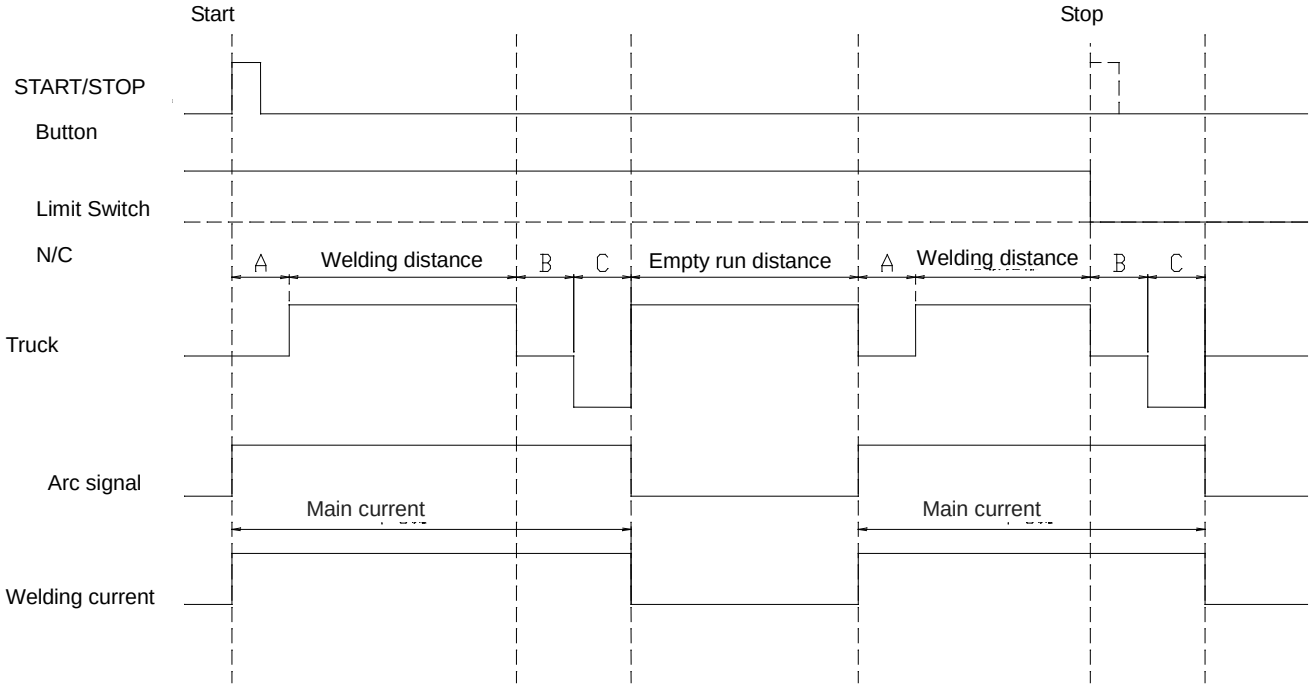


Crater (self-holding)"OFF" setting

A Arc stability waiting time 1.0s

B Welding return waiting time 1.0s

C Welding return distance 5mm(0.19inch)

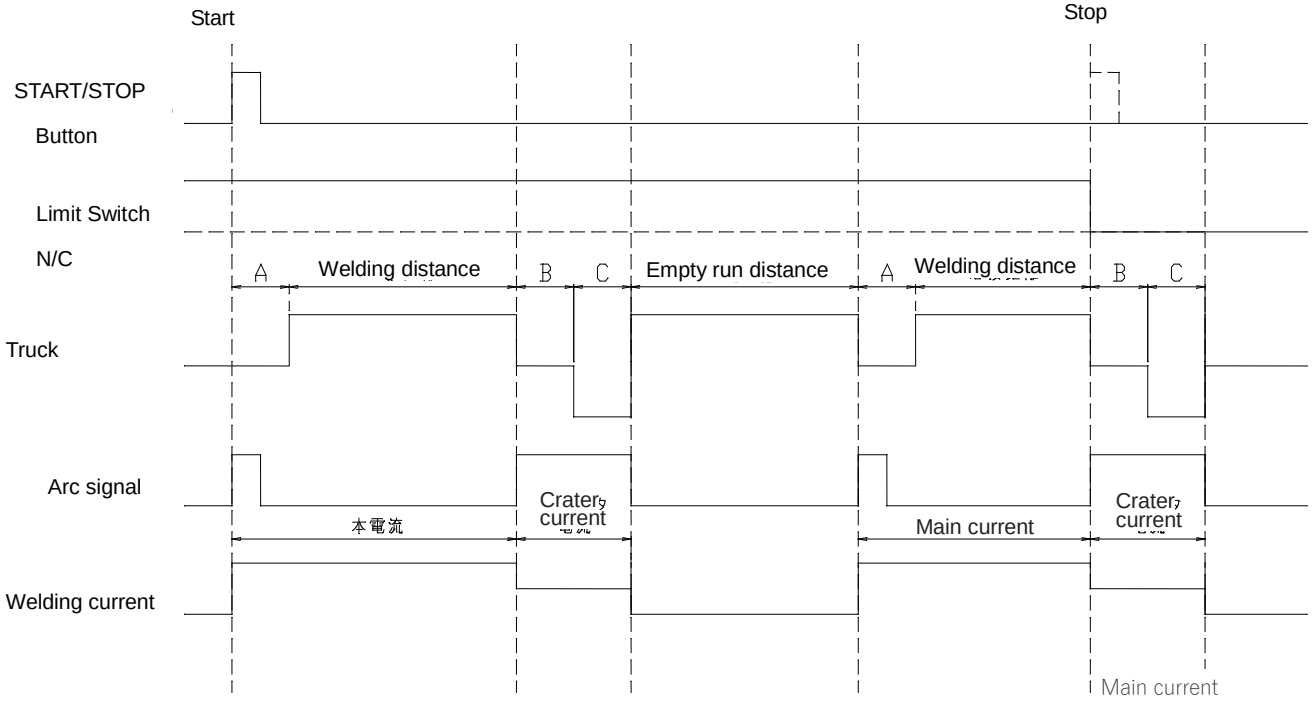


Crater (self-holding)"ON" setting

A Arc stability waiting time 1.0s

B Welding return waiting time 1.0s

C Welding return distance 5mm(0.19inch)



6 Preparation of work if you have purchased in WU-5R unit

6.1 Package contents (WU-5R unit)

If you have purchased in WU-5R unit, packing contents are as follows.
Please check before assembling.

1. Weaving unit body ---------- 1set
2. IK-72 WEAVING Operation panel name plates---------- 1pc
3. Weaving mounting plate---------- 1pc
4. Holder mounting bracket ---------- 1pc
5. Arm mounting plate ---------- 2pcs
6. Eye bolt M6 (with nut) ---------- 1pc
7. Hexagon hole bolt BC-5×16 (with WS,WF) ---------- 4pcs
8. Hexagon hole bolt BC-5×12 (with WS,WF) ---------- 2pcs
9. Countersunk screw with cross hole SF-5×12 ---------- 4pcs
10. Hexagon hole bolt BC-5×18 (with WS,WF) ---------- 4pcs
11. Pan head screws SP-3×6 (with WS,WF) ---------- 2pcs
12. Hexagon hole bolt BC-4×12 (with WS,WF) ---------- 2pcs
13. Countersunk screw SF-5x10---------- 2pcs
14. Hexagon hole bolt BC-5×14 (with WS,WF) ---------- 2pcs
15. Hex wrench (M4,M5,M6)---------- 1pc each
16. Instruction manual, Warranty card ---------- 1pc

6.2 Machine Assembly

Following Assembly, the top purchase WU-5R alone, when assembled to IK-72 tack/stitch will need work.

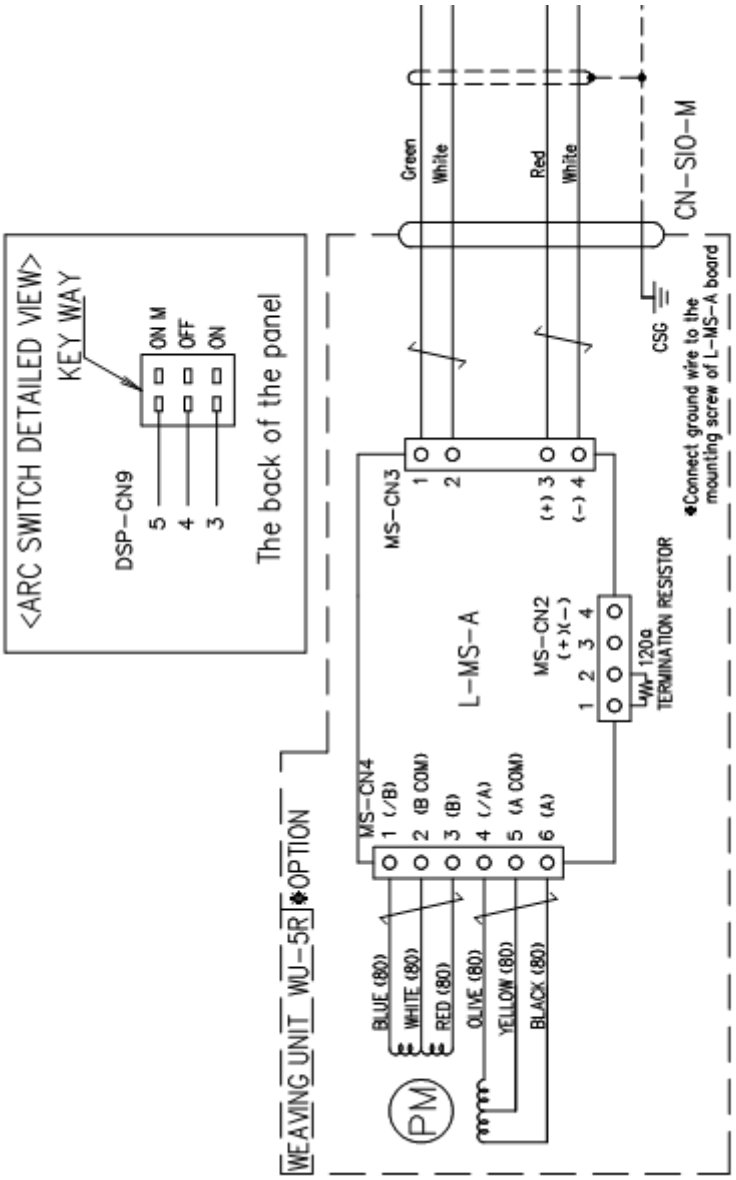
1. Remove the Panel name plates from IK-72 TACK/STITCH with the weaving unit attached to the bracket, slide unit, fixed holders, arm, Control Panel.
2. Take out the main body of weaving unit and accessories out of packing box.
3. Slide unit that was removed from IK-72 TACK/STITCH It will secure the weaving mounting plate with the Countersunk screw SF-5x10.
4. It will secure the weaving unit body and the weaving mounting plate with the hexagon bolts BC-5×14 (with WS,WF),hexagon hole bolt BC-4x12(with WS,WF)
5. IK-72 TACK/STITCH holder mounting bracket installed in the hexagon hole bolts BC-5×16 (with WS,WF).
6. Slide unit with holder mounting bracket fixed in the hexagon hole bolts BC-5×12 (with WS,WF).
7. IK-72 TACK/STITCH attach arm mounting plate with cross hole with plate screw SF-5×12.

8. Arm mounting plate removed from the IK-72 TACK/STITCH is installed in the hexagon hole bolts BC-5×18 (with WS,WF).
9. IK-72 TACK/STITCH operation panel is installed in pan head sems screws SP-3×6 (with WS,WF) WEAVING operation panel nameplate 3.
10. IK-72 TACK/STITCH on which M6 eye bolt (with nut) is installed.

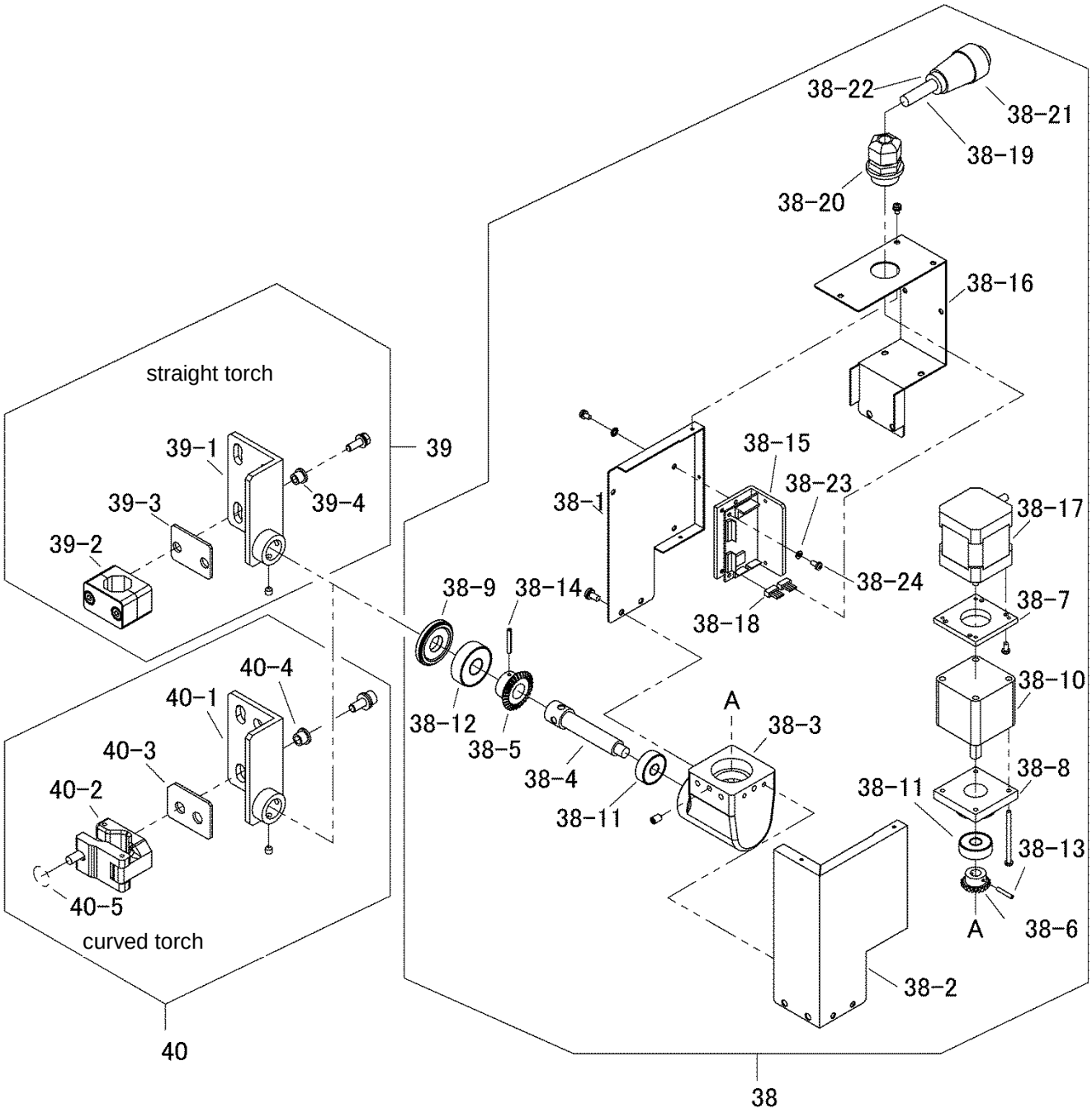
11. Insert weaving unit cable metal plug into IK-72W TACK/STITCH operation panel receptacles.

 **CAUTION**	**In case if you get connected WU-5R, make sure to Turn Off the Power.**
■ When the power is on if it gets connected there is a possibility of failure.	

7. WU-5R Weaving unit Wiring diagram



8. Weaving unit parts



Weaving unit parts

ITEM No.	PART NAME	QTY	STOCK No.	REMARKS
38	Weaving unit assembly	1	61006521	
38-1	Weaving cover A	1	61006498	
38-2	Weaving cover B	1	61006499	
38-3	Weaving case	1	61002169	
38-4	Drive shaft	1	61002170	
38-5	Bevel gear (large)	1	61007550	
38-6	Bevel gear(small)	1	61007551	
38-7	Motor assembly bracket	1	61002175	
38-8	Gear assembly bracket	1	61002176	
38-9	Adjuster	1	60030250	
38-10	Reduction gear unit	1	64000036	IG-43 1/212.5
38-11	Bearing	2	6A030628	628ZZ
38-12	Bearing	1	6A036201	6201ZZ
38-13	Spring pin	1	6B022515	PR-2.5×15
38-14	Spring pin	1	6B023020	PR-3.0×20
38-15	L-MS-A circuit board	1	61006285	※1
38-16	Weaving cover C	1	61006500	
38-17	Stepping motor assembly	1	61006756	With CN With Pinion
38-18	Terminal resistance	1	61006519	MS-CN2
38-19	Cable	1	61006578	
38-20	Cable clamp	1	64000520	OA-W1609
38-21	Plug	1	64000524	NJC-2010-PM
38-22	Cable bushing	1	64000582	NJC-20-CB
38-23	Spring washer	1	6D510030	WS-3 ★
38-24	Screw	1	6C520306	SP-3×6 ★
39	Torch holder assembly (for straight torch)	1	61002165	
39-1	Holder received bar (for straight torch)	1	61001698	
39-2	Torch holder (for straight torch)	1	60037601	With screw
39-3	Insulating plate (for straight torch)	1	61001641	
39-4	Insulating collar (for straight torch)	2	61001642	
40	Torch holder assembly (for curved torch)	(1)	61002162	Accessory (USA only)
40-1	Holder received bar (for curved torch)	(1)	61001261	
40-2	Holder body	(1)	60038161	
40-3	Insulating plate (for curved torch)	(1)	60038148	
40-4	Insulating collar (for curved torch)	(2)	60038149	
40-5	Clamp knob	(1)	60038166	

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

WU-5R WEAVING UNIT

OPERATION MANUAL

KOIKE SANSO KOGYO CO.,LTD.