Portable Automatic Gas Cutting Machine

BBF00A14

EDGE-CUT

OPERATION MANUAL

Read and understand the contents of this Manual carefully before operating, inspecting and servicing this product.

KOIKE SANSO KOGYO CO., LTD.

INTRODUCTION

Thank you very much for purchasing this product. Read this operation 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 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 operates the machine can refer to it as necessary.

■Do not use the machine carelessly without following the instructions in the manual.

■Use the machine only after you have completely understood the contents of the manual.

■If an explanation in the manual is difficult to understand, contact our company or sales service office.

■Keep the manual to hand at all times and read it as many times as is necessary for a complete understanding.

■If the manual becomes lost or damaged, place an order with our company or sales service office for a new one.

■When transferring the machine to a new owner, be sure to hand over this instruction manual as well.

QUALIFICATIONS FOR MACHINE OPERATOR

Operators and repair staff of this machine must completely understand the contents of the instruction manual and have either of the following qualifications:

1. Gas welding foremen's license
2. Completion of gas welding training course
3. Approval by the Minister of Labor

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 port.
	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 damage.
	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.

CONTENTS

1 Safety information

Many accidents are caused by operation, inspection, and maintenance which disregard the basic safety rules. Carefully read, understand, and master the safety measures and precautions described in this instruction manual and on the machine before operating, inspecting, and maintaining the machine.

The safety messages are classified as indicated on the machine safety labels:

■WARNING 

This word is used in a warning message and a warning label is positioned at places that could cause injury or serious accident.

■CAUTION 

This word is used in a caution message and a caution label is positioned at places that could cause slight injury or machine damage. This is also used as a caution for frequent dangerous actions.

■NOTICE SIGNS 

This is a sign to show machine operators and maintenance engineers items that relate directly to damage of machines and surrounding facilities and equipment.

1.1 General machine safety precautions

Read and fully understand the following important safety information:

1.1.1 Machine safety

1.The machine casing is mainly made of aluminum alloy to reduce weight. For this reason, be careful not to drop a heavy item on the machine, or not drop the machine when carrying it, since the alloy is not designed to withstand such impact.

2.When mounting hoses to the torch and distributor, tighten the nut with the attached wrench. After mounting, be sure to check there is no gas leak with a detection liquid. If a gas leak is found, retighten the nut firmly.

3.When fixing a tip to the torch, tighten the nut with the two wrenches attached. In addition, avoid damaging the taper part of the tip since this may cause backfire.

4.Never disassemble the machine other than during maintenance and inspection. Otherwise, malfunction will result.

5.Never remodel the machine. Remodeling is very dangerous.

6. Always turn the power off when not in use.

7. 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.

1.1.2 Safety clothing

1.Be sure to wear protector’s gauntlets, goggles, helmet, and safety shoes during operation.

2.Avoid operating the machine with wet clothes or hands in order to prevent electric shock.

1.1.3 Operation and handling safety precautions

1. Read this instruction manual before operating the machine.
2. Mount and center the machine correctly and confirm correct motion before operation.
3. Before connecting the power plug to the outlet, make sure that the power switch is in the OFF position (or the normal/reverse changeover switch is in the stop position).
4. Prior to operating the machine, check the safety of the surroundings to avoid accidents.
5. Never move the machine while the preheat flame is on.
6. Take great care of spatters and dross when operating the machine at a high position. They may injure people below.
7. Correctly fix the head shield so that it will not touch the plate
8. Screw the horizontal bar with the pan-head screw (SP-5x16) on the horizontal bar holder.
9. Always close the PO and GAS valves when not in use.
10. Intentionally throwing or dropping the equipment may not only shorten the service life of the equipment, but may also damage the valve and cause gas a leakage.
11. Do not place the equipment directly on sandy or muddy ground.
12. Be sure to hold the handle when carrying the machine.

1.1.4 Electrical system precautions

1. Be sure to check the input power voltage of the machine before operation. The input power voltage should be in the range of ±10% of the rated voltage. The machine should not be operated out of this range.
2. The metal plugs are screw-threaded, therefore, fully tighten them so that they will not come loose during operation.
3. The ground pin is attached to the rubber plug of a cabtyre cord. Please use a power receptacle with a ground pin opening.
4. **Stop operation and turn off the power in the following cases, and ask a qualified electrician to repair the machine.**

   1)Broken or abraded cables
   2)When the machine has been in contact with water, or in case of liquid damage to the machine.
   3)Abnormal machine operation despite operating the machine according to the instruction manual
   4)Machine breakdown
   5)Poor machine performance that requires repair
5. Periodically inspect the electrical system.

1.1.5 Maintenance and inspection precautions

1. Ask a qualified electrician to perform repair and inspection service.
2. Disconnect the power plug before inspecting and repairing the machine.
3. Maintain the machine periodically.

1.2 Gas cutting safety precautions

Strictly observe the safety rules and precautions to ensure the safety of gas cutting operations.
Operators and supervisors MUST keep safety in mind.

1.2.1 Prevention of explosion


1. Never cut pressurized cylinders or hermetically sealed containers.
2. Ensure sufficient ventilation for gas cutting to prevent the air from becoming stale.

1.2.2 Pressure regulator safety precautions

1. Before starting operation, check that all pressure regulators are operating correctly.
2. Ask a skilled repair engineer to perform maintenance and inspection service.
3. Do not use pressure regulators from which gas is leaking, nor malfunctioning pressure regulators.
4. Do not use pressure regulators smeared with oil or grease.

1.2.3 High Pressure gas cylinder safety precautions

1. Never use broken cylinders or cylinders from which gas are leaking.
2. Install cylinders upright and take measures to prevent them from falling.
3. Use cylinders only for specified purposes.
4. Do not smear container valves with oil or grease.
5. Install cylinders in a place free from heat, sparks, slag, and open flame.
6. Contact the distributor if the container valves will not open.
   Never use a hammer, wrench, or other tools to forcibly open container valves.

1.2.4 Safety precautions for hoses

1. Use the oxygen hose for oxygen gas only.
2. Replace cracked hoses or other hoses damaged by sparks, heat, unshielded fire, etc.
3. Install hoses without twisting.
4. To prevent breakage of hoses, take great care during operation and transportation.
5. Do not hold the hoses when moving the machine.
6. Periodically check the hoses for damage, leakage, fatigue, loose joints, etc, to ensure safety.
7. Cut hoses to the minimum possible length. Short hoses reduce hose damage and pressure drop, as well as reduce the flow resistance.

1.2.5 Safety precautions for fire

Take safety precautions to prevent fire prior to gas cutting.
Ignoring hot metal, sparks, and slag could cause a fire.

1. Keep a fire extinguisher, fire extinguish sand, bucket full of water, etc. ready on the site where gas cutting is performed.
2. Keep flammables away from the cutting area to avoid exposure to sparks.
3. Always cool down steel plates that have become hot after cutting, as well as hot cut parts or scrap, before bringing them close to flammables.
4. Never cut containers to which flammable materials are stuck.

1.2.6 Safety precautions for skin burns

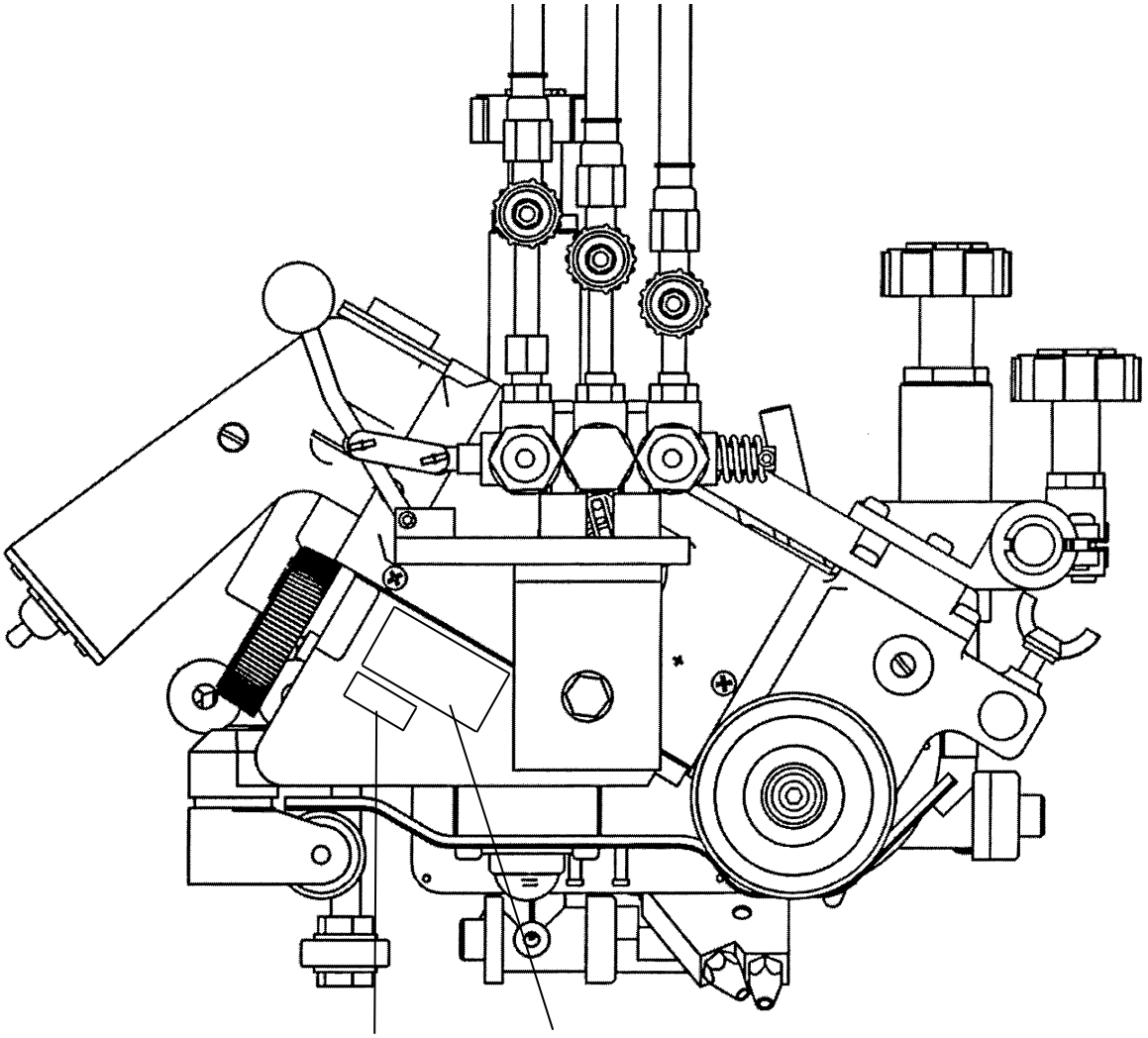
Observe the safety precautions to prevent skin burns. Ignoring heat, spatter, and sparks during operation could cause a fire or burned skin.

1. Do not perform cutting near flammables. (Move flammables well away from the sparks.)
2. Do not cut containers filled with flammables.
3. Do not keep lighters, matches, and other flammables nearby.
4. Flames from the torch will burn the skin. Keep your body away from the torch and tip, and check the safety before operating the switches and valves.
5. Wear the correct protectors to protect your eyes and body.
6. Correctly tighten the tip to prevent backfire.
   - ●When fixing a tip to the torch, tighten the nut with the two wrenches attached.
   - ●If the tip is tightened excessively, it will be heated during cutting and tightened still more, making it difficult to remove the tip.
   - ●Avoid damaging the taper of the tip since this may cause backfire.
7. Check with soapsuds for any leakage of gas from the connection part of the distributor, hose and torch.
   Never use oil or grease on the connection of the oxygen pipe to avoid backfire which may lead to explosion.
8. Be sure to check the following when igniting:
   - ●Place the torch on the torch holder before igniting.
   - ●Always wear the required protectors (gauntlets, helmet, goggles, etc.)
   - ●Check for any obstacles, dangerous materials and flammables near or in the direction of cutting. Determine the gas pressure.
   - ●The gas pressure must be within the appropriate range. (For the gas pressure, refer to the Cutting Data.)
9. The torch, tip and heat shield are heated to a very high temperature. Always wear gauntlets when handling them. Also the surface after cutting is very hot so do not touch it even while wearing gauntlets.
10. Never move the machine while the preheat flame is on.

2 Locations of safety labels

Safety labels and other labels for correct operation are affixed to the machine.

- Carefully read the labels and follow the instructions on them when operating the machine.
- Never remove the labels. Keep them clean and legible at all times.



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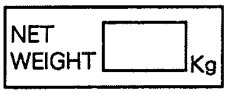

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3 Outline of the machine

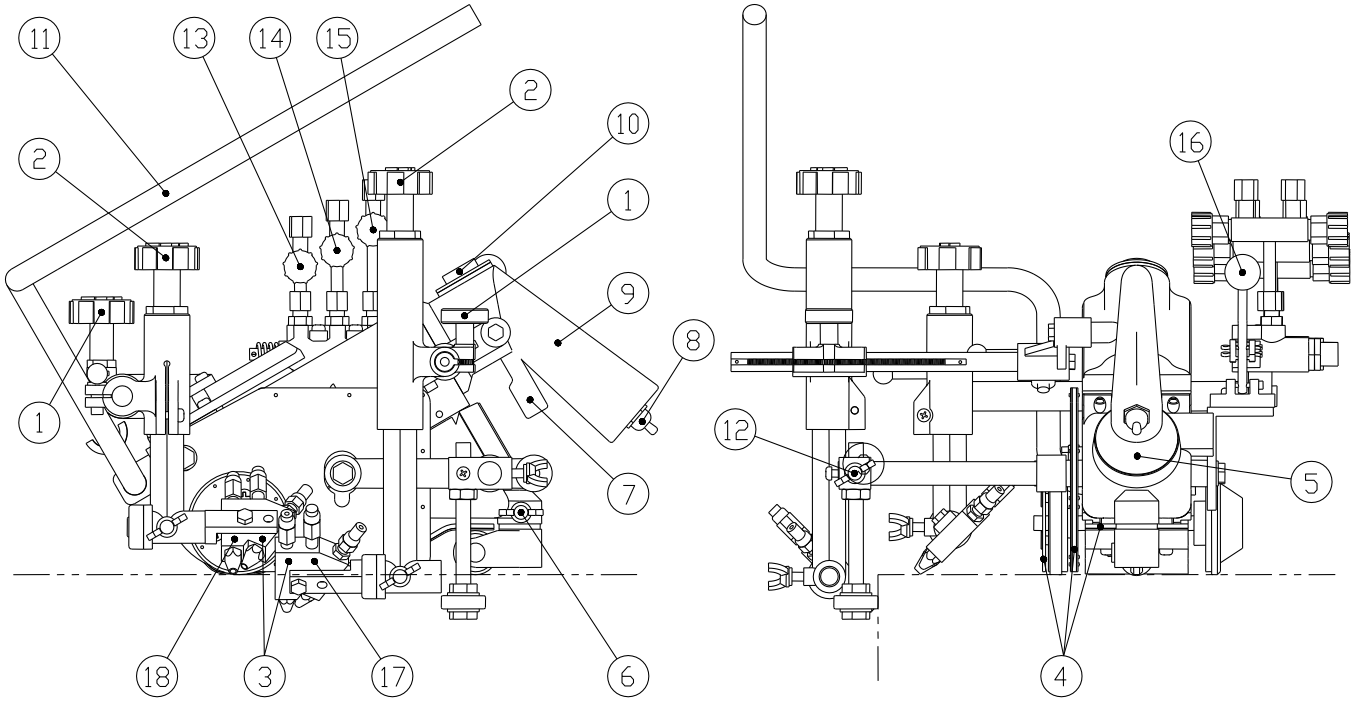
3.1 Features of the machine

The EDGE-CUT achieves high-quality cutting of the X-shaped grooves only by one unit although it has conventionally been done by two portable cutting machines. By copying the sheet steel edge with a roller, high-quality groove cutting is possible. This machine has originally been developed as a result of intensive research of the field work in users' precincts.

This machine has the following features:

1) Clutch operation and speed control can be done only by gripping the handle with one hand.
2) Valves with a preset function eliminate complicate operation of the flame adjustment gas valve.
3) Thorough measures for thermal insulation (for the bottom surface, side surface and wheel) can block heat so that the speed does not change during cutting.
4) Mounting the copy roller ensures high-quality cutting.
5) The smoothly operating torch holder quickly responds to a change of root face during cutting. A rack type and a screw type are available.
6) A bottom roller and a handle are mounted for improving workability at the start and end of cutting.
7) Type 100 specifications are optionally available.

3.2 Name and function of each section



(1) Cross feed handle A'ssy
Positional regulation of the torch in horizontal position
(2) Vertical handle A'ssy
Positional regulation of the torch in vertical position
(3) Off-center torch
Cuts a maximum length of 50 mm of grooves
NOTE) A type 100 torch is also available.
(4) Heat shield
Mounted on three sections including the bottom surface, side surface and wheel
(5) Speed control handle
The operation speed is made higher when the handle is turned clockwise, and the speed lower when the handle turned counter-clockwise
(6) Wing bolt
(7) Clutch lever
Griped to make free the machine body
(8) Direction switch
Switching forward and backward movements and stoppage
(9) Grip
(10) Receptacle
Cabtyre cord for power supply
(11) Handle
Supports the machine at the start and end of cutting
(12) Wing bolt
Adjusts the copy roller position in the right/left direction
(13) Twin valve A'ssy (JOX)
Adjusts the flow of cutting oxygen
(14) Twin valve A'ssy (POX)
Adjusts the flow of preheating oxygen
(15) Twin valve A'ssy (FG)
Adjusts the flow of fuel gas
(16) Lever
Opens/closes cutting oxygen, preheating oxygen and fuel gas
For details, refer to Page 11.
(17) Foregoing torch
(18) Following torch

3.3 Specifications

Item	Specifications
Model	EDGE-CUT
Overall length	402 mm
Overall weight	Off-center type: 11.5 kg, Type 100: 12.5 kg
Cutting thickness	Up to 50 mm in groove cutting length
Groove angle	0 ~ 45º
Cutting speed	100 ~ 1000 mm/min
Used tip nozzle	Off-center type: Type 300 tip nozzle Type 100: Type 100 tip nozzle
Used gas	Oxygen, acetylene, or LPG gas
Tracing method	Tracing of sheet steel end face
Heat shield	Insulation material inside + Lower thermal insulation plate (bottom surface, side surface, wheel)
Clutch	Trigger type
Direction switch	Advance-stop-return
Gas operation	Valve with preset function
Motor	DC24V

4 Preparation for operation

4.1 Contents of package

The standard package includes the following items. Check the contents before assembling.

Construction	Off-center type	Type 100
Main unit	○	○
Valve with preset function	○	○
Torch	300-type	Type 100
Weight	×	○
Cross bar A'ssy of the following torch	２００Ｌ	３００Ｌ
Cross bar A'ssy of the foregoing torch	２００Ｌ	３００Ｌ
Cross bar A'ssy of the guide copy roller A'ssy	１５０Ｌ	２５０Ｌ
Hoses	Foregoing side: 900 (L), 3 pcs./set Following side: 600 (L), 3 pcs./set	Foregoing side: 900 (L), 3 pcs./set Following side: 600 (L), 3 pcs./set
Power cord (3P x 5 m)	○	○
Tip nozzle	301 No.0、1、2、3、4 302 No.12、13、14、15、16 or 306 No.15、16、17、18 2 pcs each	Type 100: No.0、1、2 2 pcs each
Tip nozzle cleaning needle	○	○
Philips (+) driver	○	○
Spanner (3 pcs.)	○	○
Operation manual (this one)	○	○
Hexagon wrench (M6)	○	○

4.2 Assembly of the machine

1. Take out the main unit from the package.
2. Mount the weight on the horizontal bar (only for the type 100 specification)
3. Connect the primary hose to the valve with a preset function.
   - Blue hose (for oxygen)
   - Orange hose (for LPG gas) or red hose (for acetylene)

4.3 Preparation for operation  

4.3.1 Connection of power cord

1. Connect the power cord to the main unit.
2. Connect the metal consent (plug) of the cabtyre cord to the metal consent (receptacle) of the machine. Before connection, check that there is no foreign matter or dust inside.
3. The metal consent is a screw type. Always tighten the screw to prevent the plug from coming off while the machine is traveling.

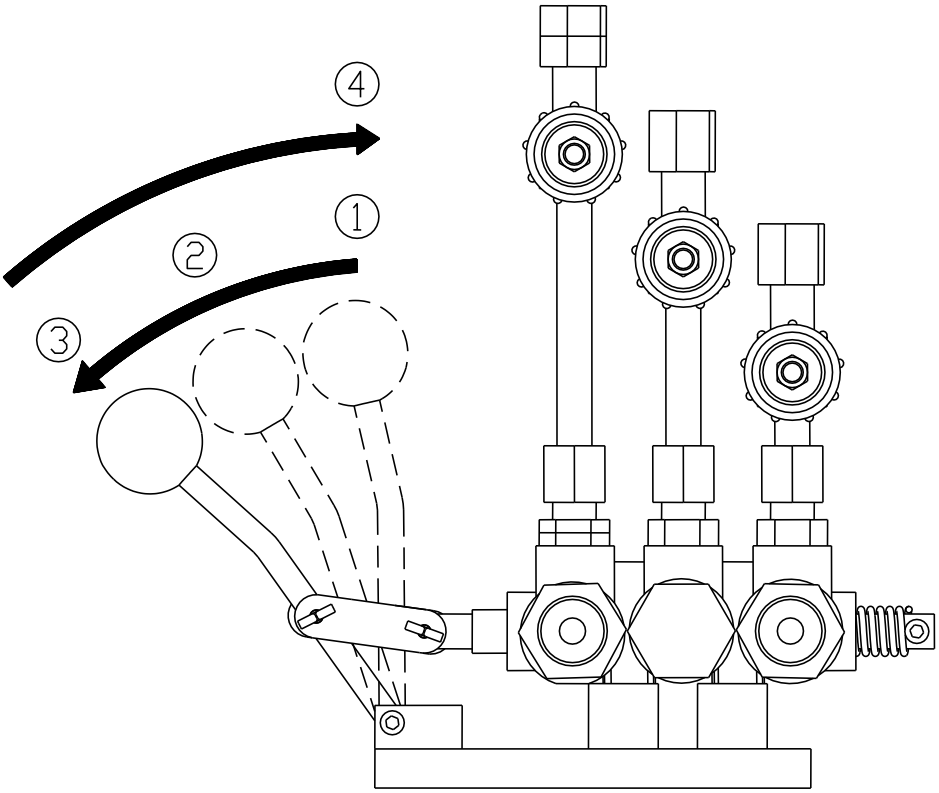
4.3.2 Connection of gas supply hose

1. Connect each gas supply hose to the main hose.
2. When connecting, tighten the hose securely and check that there is no gas leakage.

4.3.3 Connection of tip nozzle

1. Select a tip nozzle according to the thickness of the cutting material, and mount it on the blow pipe.
   For selecting the tip nozzle, refer to the Tip Nozzle Capacity Standard Table. (Refer to Page 31.)
   - When mounting the tip nozzle on the blow pipe, tighten them securely using two attached spanners.
   - Do not tighten the tip nozzle excessively. Doing so may cause the tip nozzle to be heated during cutting resulting the tip nozzle to be further tightened to the blow pipe, making it difficult to dismount.
   - Do not damage the tip nozzle mounting tapered section. Doing so may cause a backfire.

4.3.4 Use of valve with preset function



(1) = Close Shuts off gas flow even when an adjusting valve is opened

(2) = Ignite Supplies preheating oxygen and fuel gas
Once the flame is adjusted, setting the lever to this position and igniting achieve an appropriate preheating flame at all times.

(3) = Cut Supplies all kinds of gas
Cutting oxygen is discharged in addition to the preheating flame in (2) to start cutting.
NOTE) When cleaning the tip nozzle, close the fuel valve first.

(4) = Close Stops flowing all kinds of gas when the valve is manually turned in the direction of the arrow

CAUTION	When gas is not supplied, even if it moves a lever to cutting (3), it may return to ignition (2). If it is in a gas supply state, it will be held in the state of cutting (3). It is not unusual.

5 Cutting operation

5.1 Safety measures to take before operation

5.1.1 Grounding of earth cable

As safety measures for operators, check first that the input current and voltage are appropriate and the power connection is correct.

■ Grounding of Earth Cable

・The ground pin is attached to the rubber plug of a cabtyre cord. Please use a power receptacle with a ground pin opening.

5.1.2 Selection of tip nozzle

Select an appropriate tip nozzle according to the thickness of sheet steel to cut, referring to the Tip Nozzle Capacity Standard Table. When the sheet steel is excessively rusty or the groove angle is more than 20º, use a tip nozzle listed on the top of the Standard Table.

5.1.3 Operation of travel direction selector switch

- Change over the travel direction between advance and return with the travel direction selector switch. The neutral position is to stop the machine.
- When changing over the travel direction, stop the machine first by setting the selector switch back to the stop (neutral) position.
- Always place the selector switch to the stop (neutral) position in other cases than traveling the machine.
- When turning on the power, set the travel direction selector switch to the stop (neutral) position.
- If this switch remains at the advance or return position when turning on the power, the machine starts traveling and constitutes hazardous situation.
- Never insert your hand(s) between the main unit and the sheet steel while the machine is traveling. Doing so may pinch your hand(s).

5.2 Ignition and flame adjustment

- Before ignition, adjust the gas pressure, referring to the Tip Nozzle Capacity Standard Table. The pressure listed in the table indicates a value when all valves are opened. After ignition, correct and adjust the pressure as required. (Refer to Page 29.)

■ Adjustment of Flame

1. Open the fuel gas valve with a preset function by 1/4 to 1/2 turns, and pull the lever to the position (2) (for supplying preheating oxygen and fuel gas). After that ignite with a lighter. (Refer to Page 11.)
2. Immediately after ignition, open the preheating oxygen valve little by little to obtain a white spot of the standard flame. (The preferable white spot is 5 ? 6 mm in length and evenly generated.)
3. Fully open the cutting oxygen valve and pull the lever to the position (3) (for supplying cutting oxygen). (Refer to Page 11.) If the flame state changes, adjust it again. If the cutting aerial flow is unstable, it may affect the cutting surface quality. If the quality is low, clean the tip nozzle hole with the attached cleaning needle suited to the hole diameter while discharging the cutting oxygen.

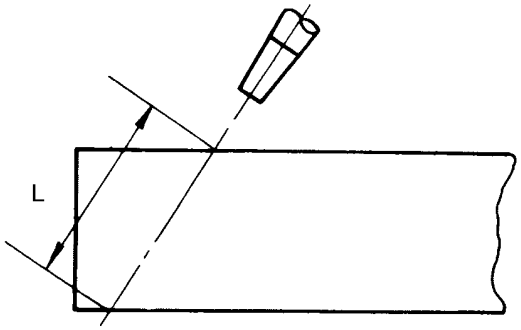
5.3 Cutting operation

1. Place the machine at a cutting position and adjust the copy roller to the sheet steel end face. (Adjust the copy roller height according to the sheet steel thickness.)
   NOTE) Set the machine main unit in parallel with the sheet plate end face.
2. Ignite the tip nozzle of the foregoing torch and the following torch in accordance with the procedure for flame adjustment.
3. Set down the normal/reverse switch in the cutting direction, while pressing the clutch to bring the foregoing torch to the cutting start point.
4. After preheating the sheet steel sufficiently, pull the lever and discharge cutting oxygen to start cutting. (Set the lever to the position (3).) Manually cut on the foregoing torch side, while using the bottom roller and the handle, until the following torch reaches the cutting start point.
5. When the following torch reaches the cutting start point, return the lever to shut off the cutting oxygen. (Set the lever to the position (2).)
6. Preheat the sheet steel and pull the lever. As soon as the cutting oxygen is discharged, release the clutch and travel the machine to cut on both the following torch side and the foregoing torch side.
7. Adjust to the optimum cutting speed with the speed control dial while checking the cutting status carefully.
8. After cutting is finished, return the lever and shut off all gases. (Set the lever to the position (4).)
9. Set the normal/reverse switch to the neutral position to stop traveling.
10. After cutting is completely finished, close the cutting oxygen valve, preheating oxygen valve and fuel gas valve with a preset function one by one in this order.

For the consequent operation, repeat the steps from item 1.

5.3.1 Groove cutting

When cutting in the inclined direction to make a groove, fix the blow pipe at a desired angle referring to the angle scale (5º/scale) on the blow pipe support.
Since dimension L shown below is used as plate thickness in calculation, select the tip nozzle based on this dimension.
In order to cover the heating power reduced by the weakened flame, use a tip nozzle with a larger number by one than the specified.
Slightly increase the amount of oxygen used for the flame to improve the cutting efficiently.



5.4 Safety measures against backfire and flashback

5.4.1 Prevention of backfire

Backfire may cause a serious accident or fire. Pay special attention to avoid this.
If backfire occurs, always locate the cause, check and service equipment, and restore the normal status before using the machine.
Backfire may be caused under the following conditions:

1) Each gas pressure is not adjusted correctly.
2) The tip nozzle is heated.
3) Slag adheres to the tip nozzle hole.
4) The tip nozzle taper section or the blow pipe taper contact section is damaged.

5.4.2 Prevention of flashback

Flashback may cause a fire or equipment damage.
If the blow pipe hisses, stop operation immediately and take measures in the following procedure:

1) Close the preheating oxygen valve.
2) Close the fuel gas valve.
3) Close the cutting oxygen valve.

If flashback occurs, always locate the cause, check and service equipment, and restore the normal status before using the machine.

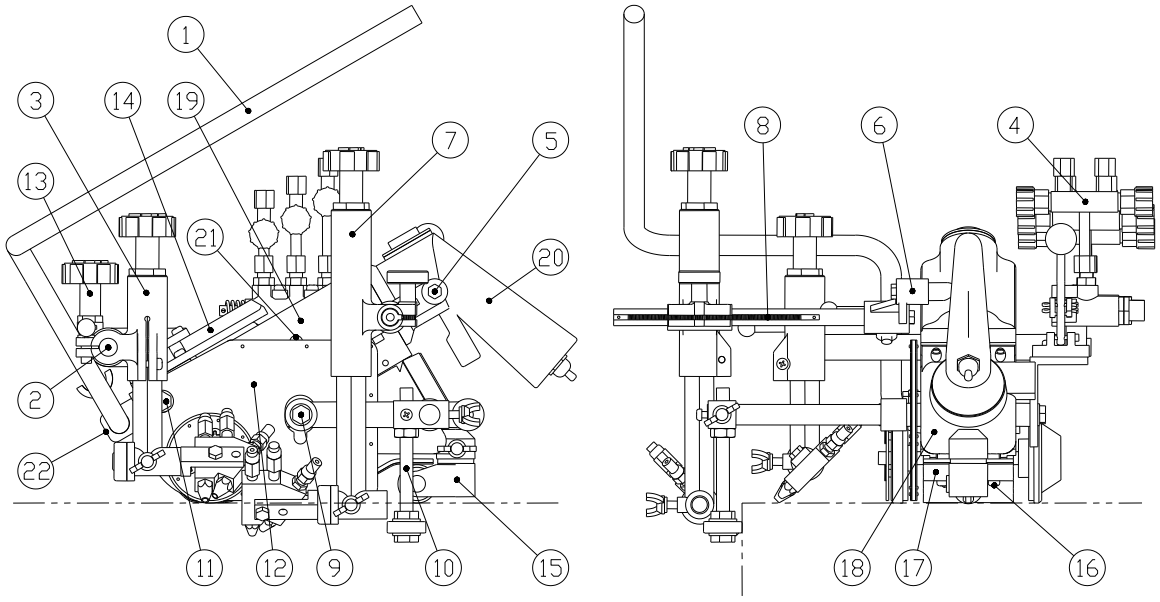
6 Maintenance and inspection

Inspect and take care of the machine, referring to the procedure below, in order to use the machine in the best conditions.

6.1 Disassembly of the machine

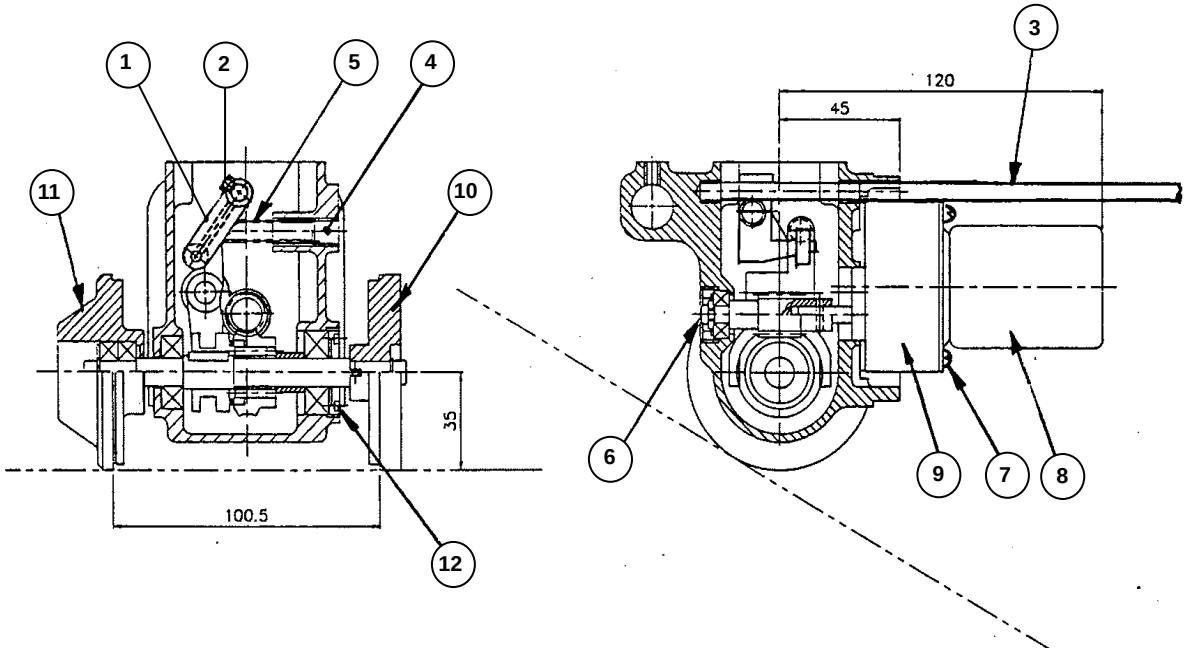
1. Dismount the handle (1) from the main unit.
2. Dismount the holder (3) of the following torch from the horizontal bar (2), and disconnect the distribution hose from each twin valve (4) with a preset function.
3. Loosen the hexagon head bolt (5) and dismount the assembly of the horizontal bar support (6), holder of the foregoing torch (7), and horizontal bar (8) to disconnect the distribution hose.
4. Loosen the hexagon head bolt (9) and dismount the guide copy roller assembly (10) from the main unit.
5. Loosen the hexagon head bolt (11) to dismount the external thermal insulation plate (12).
6. Dismount the lateral feed table assembly (13) and the gear box cover (14) from the main unit.
7. Loosen the caster fixing bolts and dismount the caster (15).
8. Remove four screws (16) and dismount the bottom thermal insulation plate assembly (17).
9. Remove the screws and dismount the lower case (18) from the main unit.
10. Remove three screws on the handle of the main unit cover (19) and dismount the connector (6-pin type) to separate the knob (20) from the main unit.
11. Remove two screws (21) that fix the controller, and separate the main unit cover (19) from the controller.
12. Remove the connecting terminal of the fan mounted on the main unit case.
13. Disconnect the lead wire of the motor from the connector.
14. Dismount the main unit cover (19) from the gear box (22).

The above procedure completes the disassembly of the main unit. After finishing maintenance and inspection, assemble the machine again in the correct procedure.



6.2 Disassembly for maintenance and inspection of the gear box

1. Loosen the set screw (2) of the clutch joint (A) (1) inside the gear box, and dismount the clutch shaft (3) and the clutch joint (A) from the gear box.
2. Remove the spring support (4) and dismount the spring (5).
3. Remove the screw (6) that fixes the worm.
4. Remove the screw (7) that fixes the motor, and take out the motor (8) and the gear head (9).
5. Remove the fixing bolts of the drive wheel (10) and the idle wheel (11) to dismount the drive wheel and the idle wheel.
6. Remove the bearing support (12).
   (Lightly tap it with a punch and a hammer to turn in the counterclockwise direction.)
7. Take out the drive shaft together with the gear.
8. Clean the inside with washing oil, etc.
9. Assemble in the reverse procedure (10) ~ (3). Check that the clutch lever fits in the clutch groove securely when assembling.



6.3 Daily inspection

1. Remove dust and iron powder from the horizontal bar rack and the lateral feed handle pinion.
2. Apply machine oil to the caster axle.
   Supply grease to the balls if the caster does not operate smoothly.

6.4 Semi-yearly or every 1000-hour inspection

1. Remove dust from the control board and transformer attached to the case.
2. Check if there is sufficient grease in the gear box. If not, supply it.

6.5 Yearly or every 2000-hour inspection

1. Disassemble and clean the gear box, and supply a moderate amount of grease. (Use a type of grease designated by Koike.)
2. When assembling, check that the clutch lever fits in the clutch groove securely.

7 Troubleshooting

1. The machine does not operate. (The motor does not rotate.)

Cause	Check Point	Measures
1) Power is not supplied.	Check the power supply and power cord connection.	
2) The power cord is disconnected.	Check the cord for continuity using a tester. If the tester indicator over-swings, the cord is disconnected.	Repair the disconnection or replace the cord.
3) The connecting section is faulty.	Check the connector for the correct connection.	Connect again.
4) Any switch is faulty.	Dismount the switch and check continuity between terminals using a tester.	Replace, if it is faulty.
5) Any volume is disconnected.	Check if the resistance is 5 KΩ using a tester.	Replace, if it is faulty.
6) The transformer is disconnected.	Check continuity using a tester.	Replace, if it is faulty.
7) The lead wire is disconnected.	Check each lead wire for continuity using a tester.	Replace the faulty lead wire.
8) Coils in the motor are faulty.	If the above items are all normal, the motor may be faulty.	Repair or replace with a new one.
9) The controller is stopped due to abnormal temperature rise.	After cooling the main unit (for about 20 min.), turn on the drive switch again to check.	If it does not function, replace the controller.

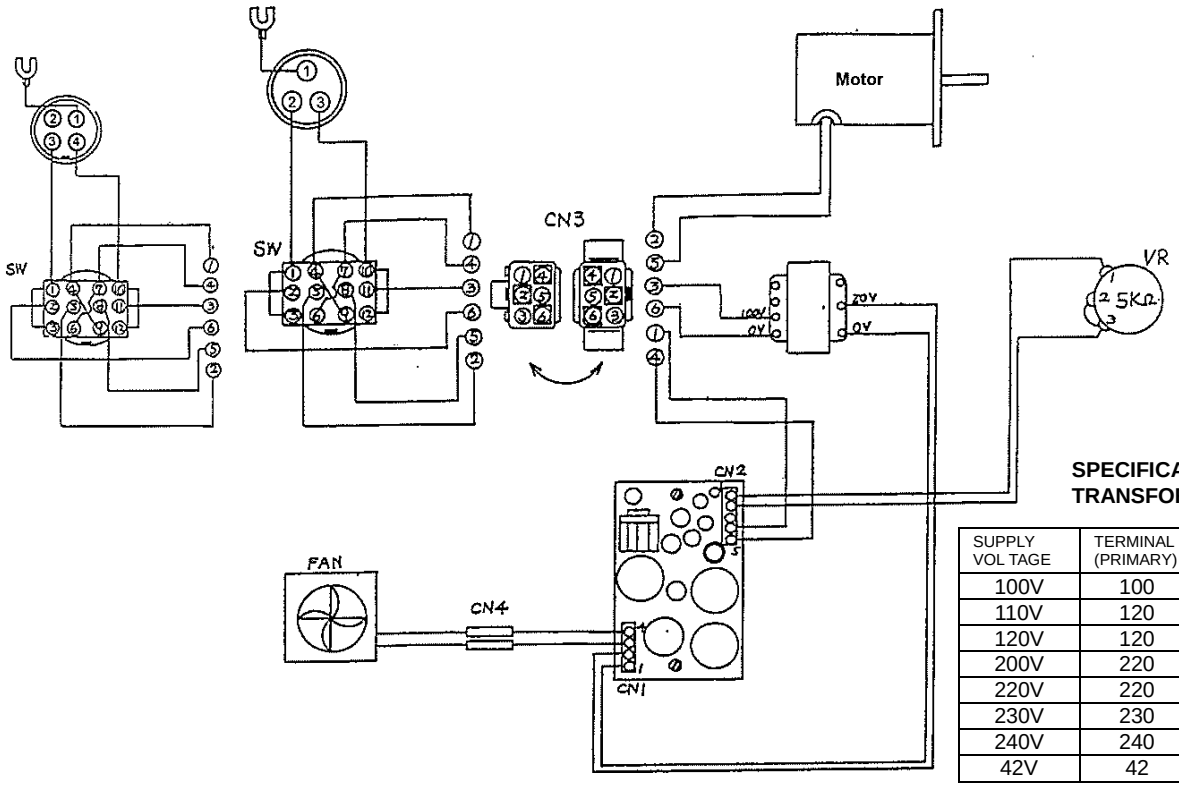
2. The machine does not operate. (The motor is rotating.)

Cause	Check Point	Measures
1) The machine malfunctions.	Dismount the cover from the gear box, and check the clutch for operation.	Disassemble to clean and repair.
2) The reduction gears idle.	The motor rotates even when the drive wheel is manually pressed while the normal/reverse switch is turned on.	Replace the gear head.

3. The machine operates but not normally.

Cause	Check Point	Measures
1) The speed is too fast.	The power voltage is not normal.	Check the voltage.
2) Low speed is not available.	(1) The volume is faulty. (2) The wiring is faulty. (3) The motor is faulty.	Replace the volume. Repair the wiring. Repair or replace the motor.
3) High speed is not available.	The power voltage is lowered.	Check the voltage using a tester.
4) Speed is unstable.	The gear is damaged.	Replace the gear or lap it. NOTE) Do not damage the gear when disassembling for repair.
5) The speed is not adjustable.	The controller is faulty.	Replace or repair.
6) Knocking occurs.	(1) The gear is worn out. (2) The clutches (A) and (B) are engaged improperly. (3) The clutch key is worn out. (4) The shaft and the drive wheel are loosened. (5) The rail surface in contact with the drive wheel has foreign matter or damage. (6) The hose or cabtyre cord obstructs the traveling of the machine. (7) The caster is faulty. (8) The drive wheel and the idle wheel have damage or foreign matter.	Replace. Replace. Replace or repair. Replace or repair. Call attention or repair. Make consideration during operation. Replace or repair. Replace or repair.

8 Wiring diagram

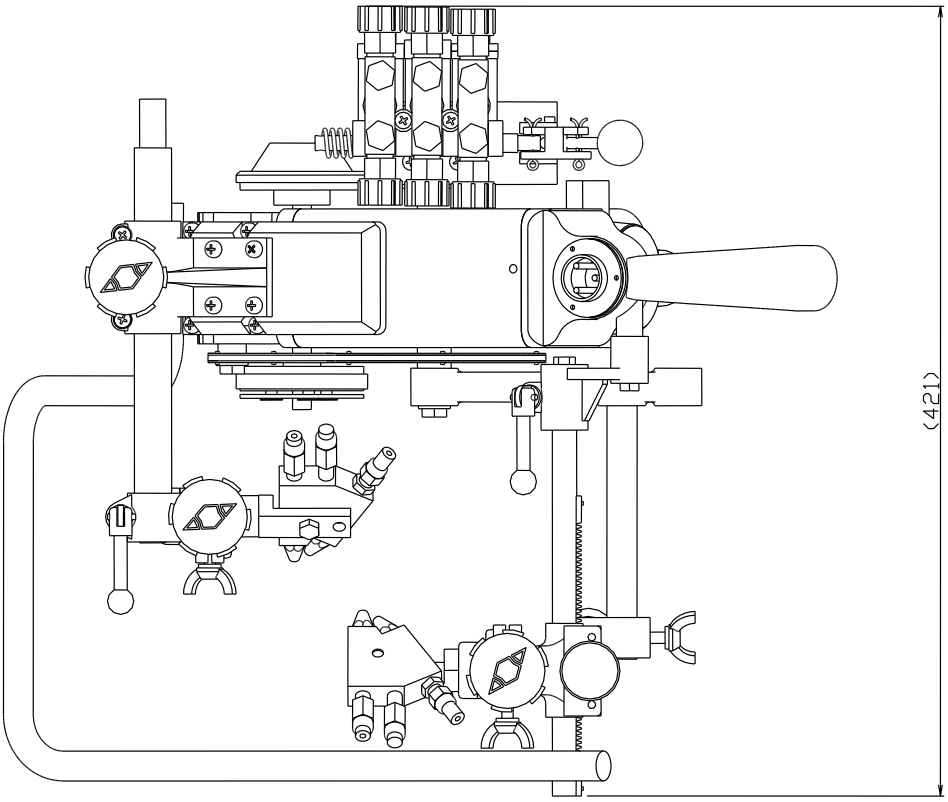


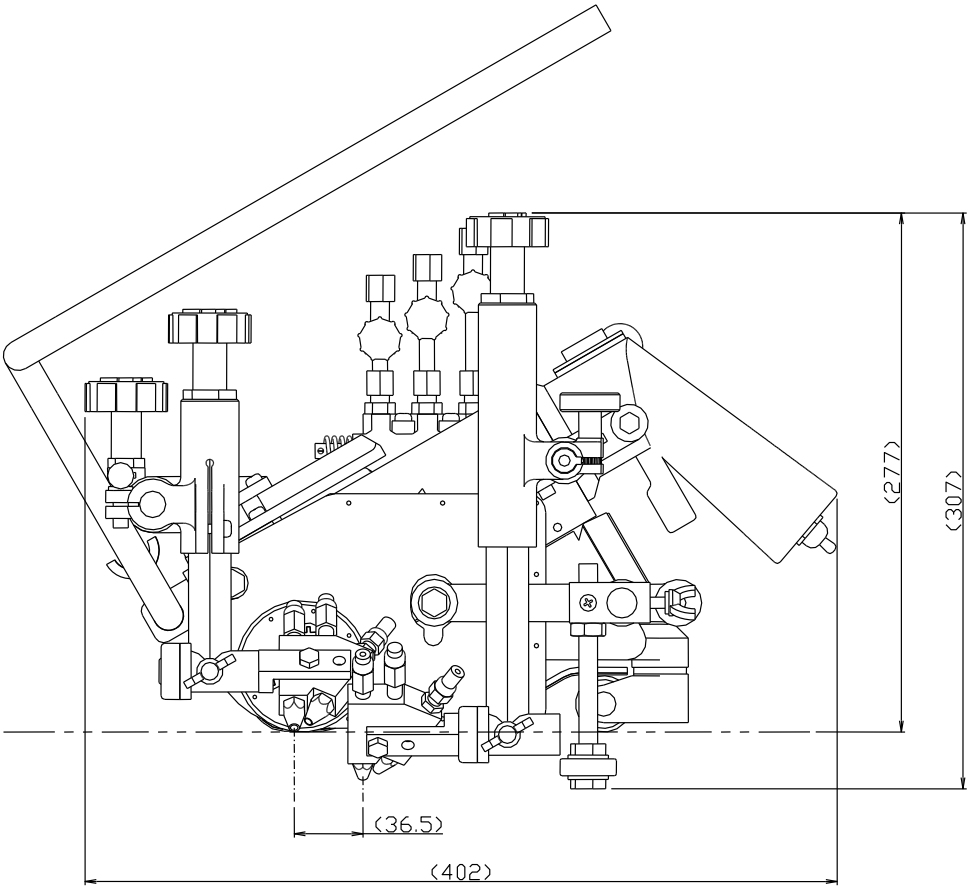
SPECIFICATION OF TRANSFORMER

SUPPLY VOL TAGE	TERMINAL (PRIMARY)	TERMINAL (SECONDARY)
100V	100	20
110V	120	22
120V	120	20
200V	220	22
220V	220	20
230V	230	20
240V	240	20
42V	42	20

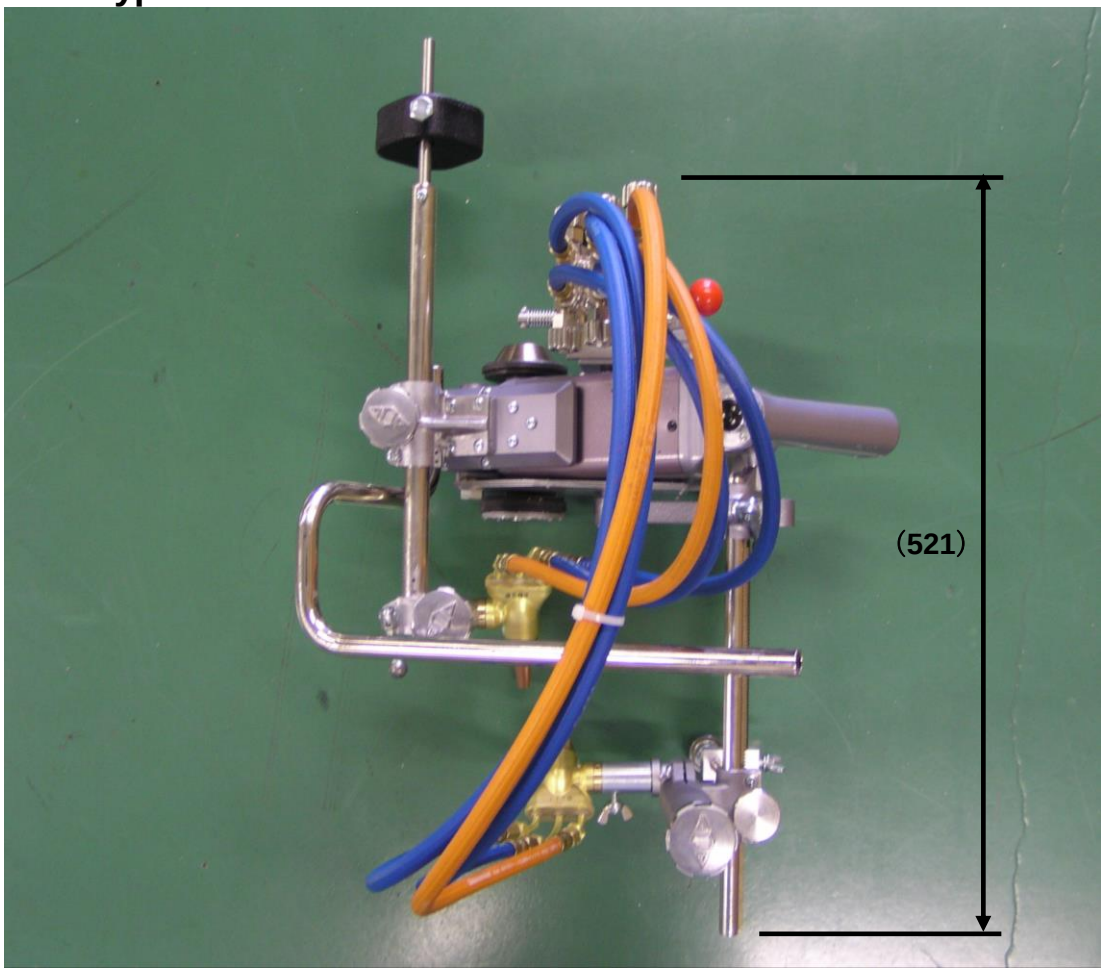
9 Assembly drawing of EDGE-CUT

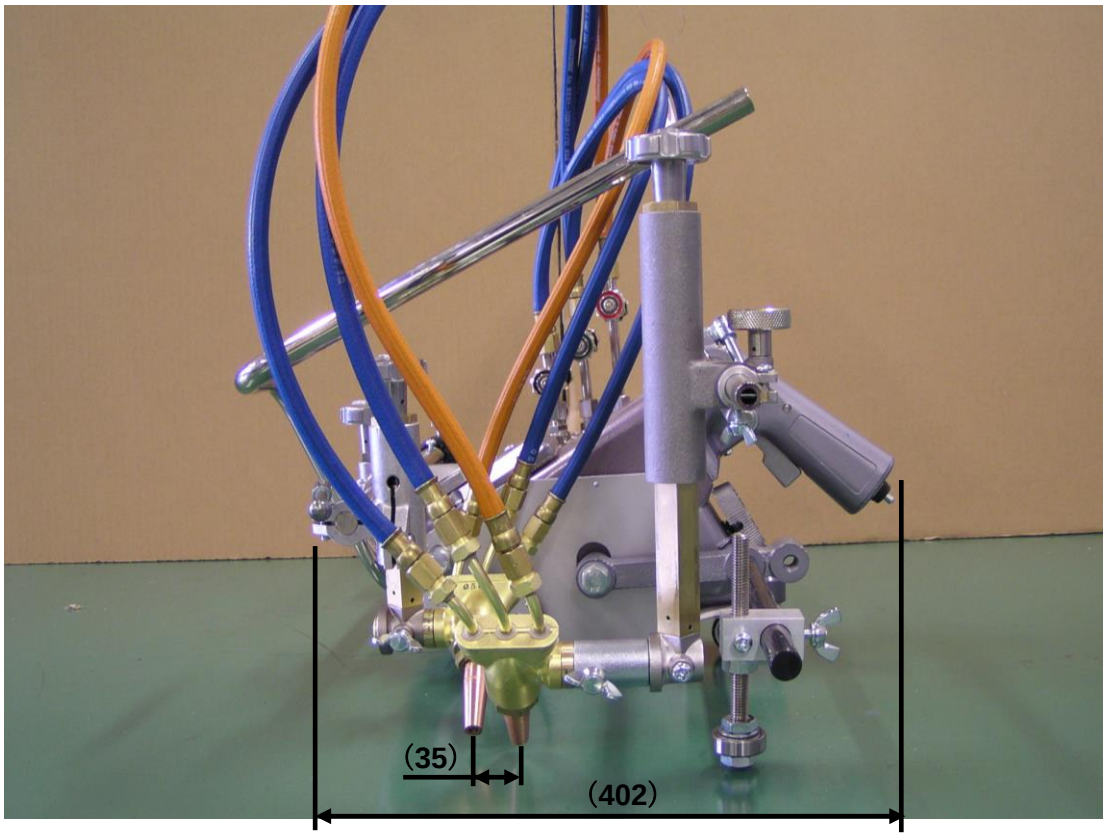
9.1 Off-center type





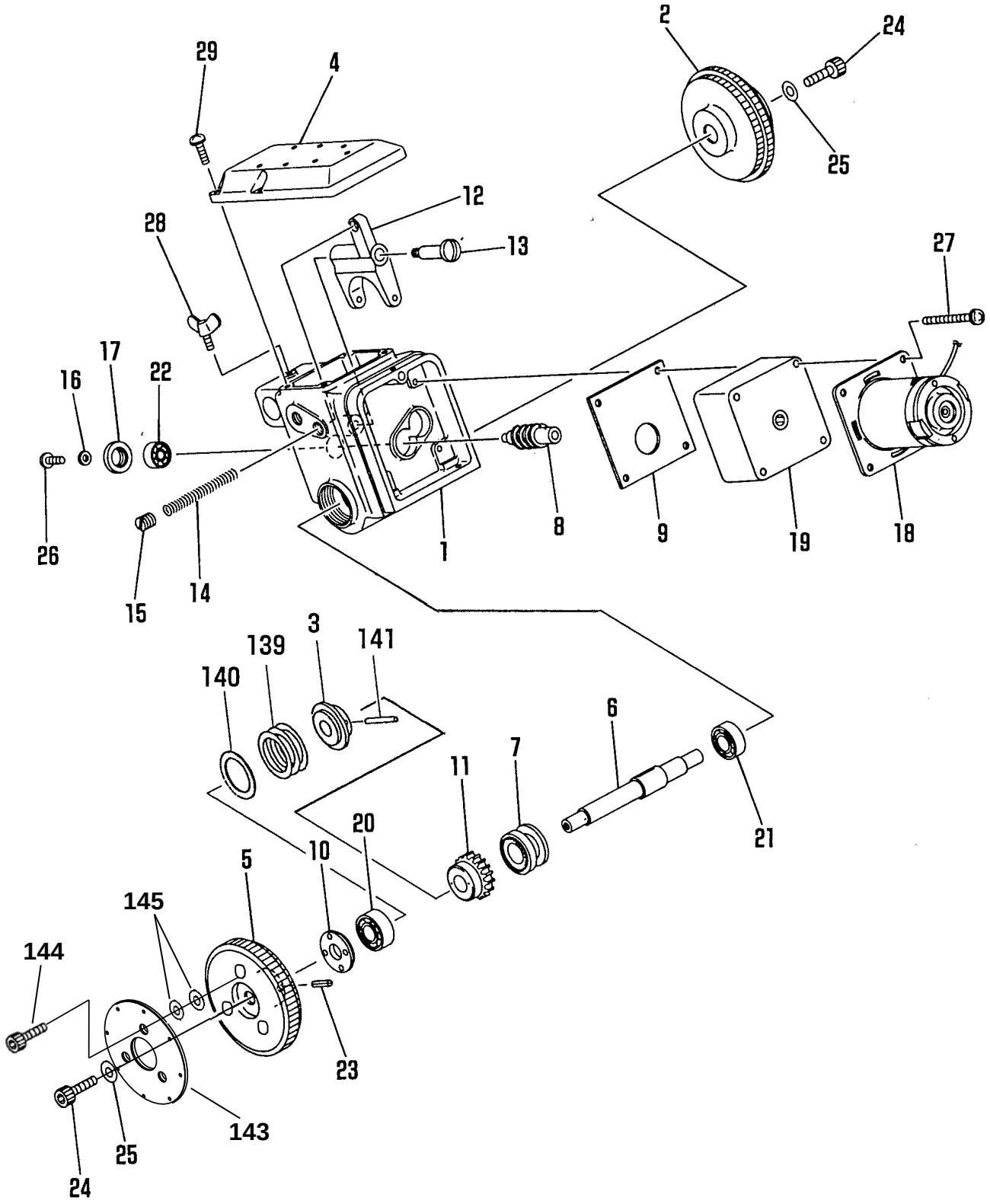
9.2 Type 100





10 Parts list

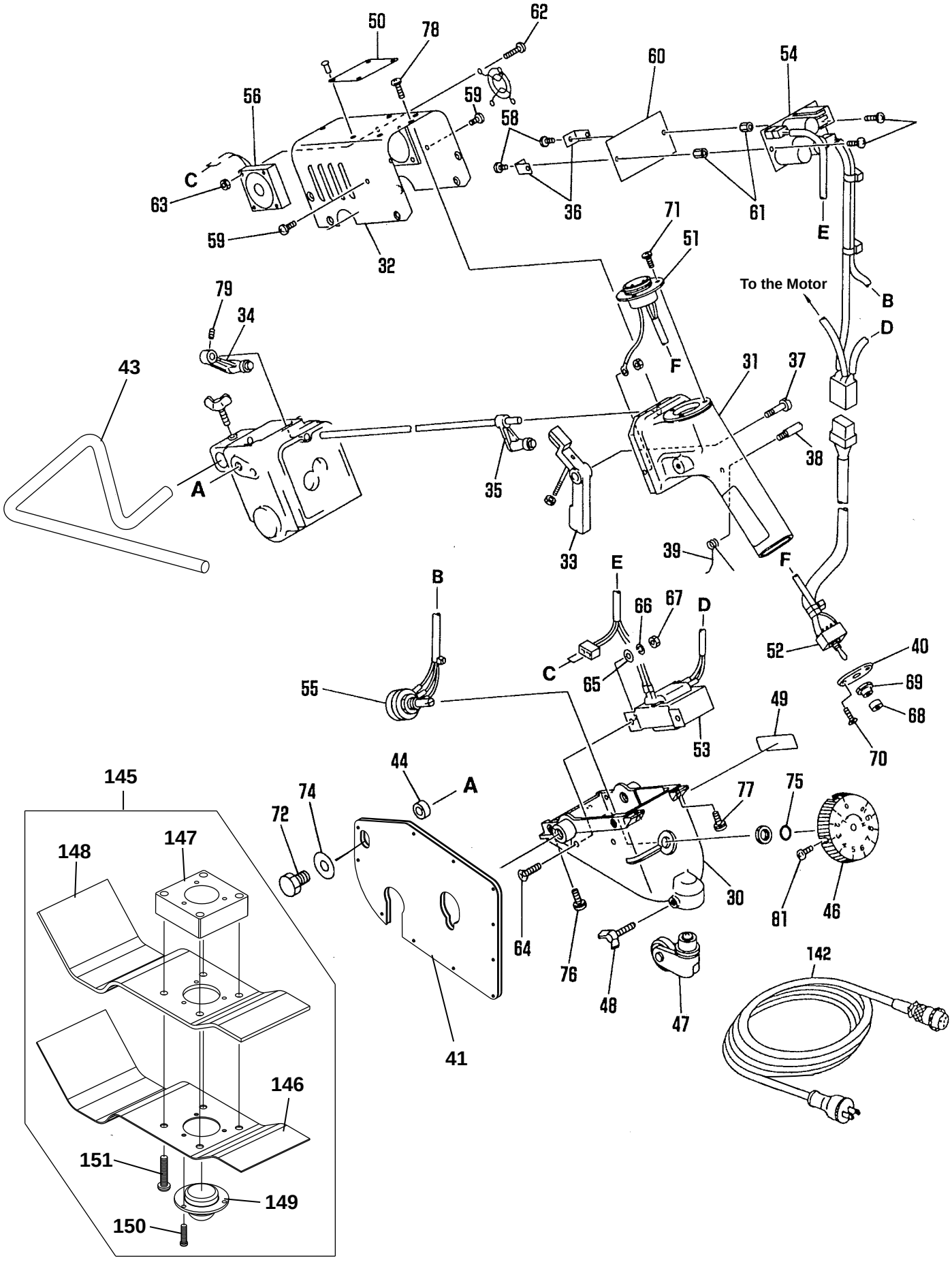
10.1 Drive unit



Drive unit

Item No.	Part name	Q'ty	Stock No.	Remarks
1	Gear box	1	61003558	
2	Idle wheel A'ssy	1	60036804	
3	Collar	1	60036806	
4	Gear box cover	1	61003561	
5	Drive wheel	1	61003549	
6	Drive shaft A'ssy	1	61005717	with key
7	Clutch (A)	1	60036404	
8	Worm gear	1	60036406	
9	Teflon packing	1	60036409	
10	Bearing retaining screw	1	60030516	
11	Worm Wheel A'ssy	1	60030518	
12	Clutch lever	1	60030528	
13	Clutch lever shaft	1	60030534	
14	Lever spring	1	60030530	
15	Spring retainers	2	60030531	
16	Washer	1	60031015	
17	Bearing retainer	1	60032591	
18	Motor A'ssy	1	61002409	DME44S6HPB
19	Gear head	1	60036437	6H90
20	Bearing	1	6A036200	6200ZZ
21	Bearing	1	6A036000	6000ZZ
22	Bearing	1	6A030606	606ZZ
23	Spring pin	1	6B022518	PR-2.5x18
24	Hexagon bolt	2	6C030508	BC-5x8
25	Washer	2	6D500050	WF-5
26	Screw	1	6C520406	SP-4x6
27	Screw	4	6C530440	SP-4x40(WS)
28	Wing bolt	1	6C110612	BS-6x12
29	Screw	4	6C530412	SP-4x12(WS)
139	Wave washer	2	60036966	BWW-6200
140	Washer	1	60036807	
141	Spring pin	1	6B022518	PR-2.5x18
143	Heat shield	1	60033878	
144	Hexagon bolt	3	6C030612	BC-6x12
145	Washer	6	6D500060	WF-6

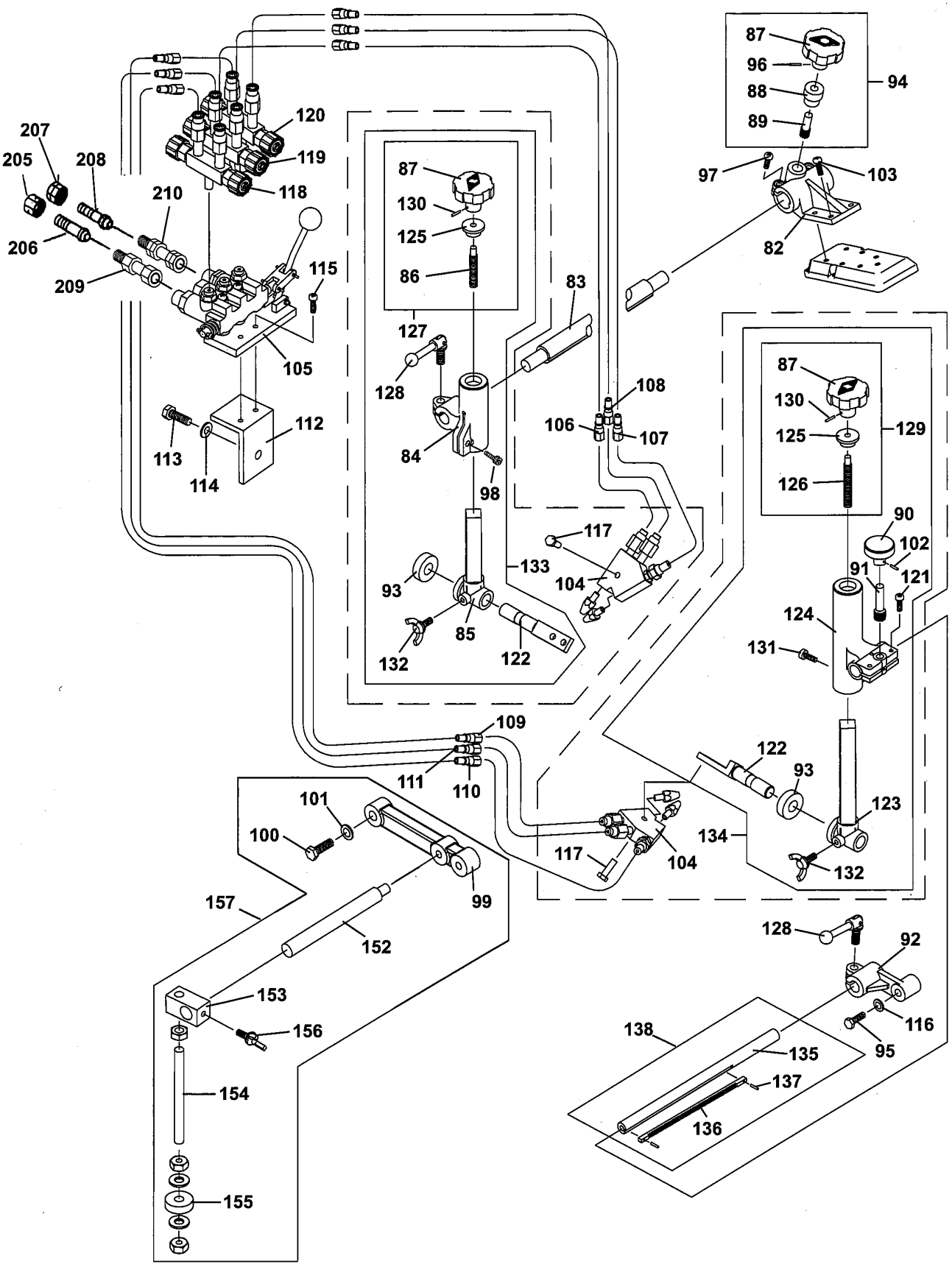
10.2 Main body and electric components



Main body and electric components

Item No.	Part name	Q'ty	Stock No.	Remarks
30	Lower casing	1	61003559	
31	Grip	1	61003560	
32	Cover	1	60036813	
33	Clutch lever	1	60036825	
34	Clutch joint A'ssy (A)	2	60036827	
35	Clutch joint A'ssy (B)	2	60036828	
36	Base plate mounting brackets	2	60036908	
37	Lever shaft	1	60036819	
38	Spring shaft	1	60036820	
39	Spring	1	60036821	
40	Switch mounting plate	1	60036822	
41	Inner heat shield	1	61003531	
43	Handle	1	61003355	
44	Collar	1	600360524	
46	Speed control handle	1	60036442	
47	Guide wheel A'ssy	1	60036870	
48	Wing bolt	1	6C110615	BS-6x15
49	Machine face plate	1		
50	Name plate	1		
51	Receptacle	1	6N100062	NCS-254-R
		(1)	6N100061	NCS-253-R
52	Direction switch	1	60036910	
53	Transformer	1	60036435	For 100V～220V
		(1)	60036441	For 42V
54	Controller	1	60036436	KO-0907
55	Speed-setting VR	1	60036440	RV24YN20SB55K
56	93 Fan Assembly	1	61002410	With Fan Guard
58	Screw	4	6C520305	SP-3x5
	Washer	4	6D500030	WS-3
59	Screw	2	6C630306	SP-3x6
60	Guard plate	1	60036909	
61	Spacers	2	60036911	
62	Screw	4	6C520312	SP-3x12
63	Nut	4	6D010030	NH-3
64	Screw	2	6C520415	SP-4x15
65	Washer	2	6D500040	WF-4
66	Washer	2	6D510040	WS-4
67	Nut	2	6D010040	NH-4
68	Dust protective cap	1	60032431	
69	Dust protective nut	1	60032480	
70	Screw	2	6C510310	SM-3x10
71	Screw	3	6C510306	SM-3x6
72	Hexagon bolt	1	6C011015	BH-10x15
74	Washer	1	6D500100	WF-10
75	O-ring	1	60036472	P-6
76	Screw	2	6C530515	SP-5x15(WS)
77	Screw	2	6C530412	SP-4x12(WS)
78	Screw	9	6C670406	SM-4x6
79	Screw	1	6C540405	SS-4x5
81	Screw	2	6C520408	SP-4x8
142	Cabtyre cord A'ssy	1	61005384	For 220V DIN
		(1)	61005385	For 42V No plug
145	Heat shield A'ssy	1	61003550	
146	Heat shield	1	61003532	
147	Heat shield plate	1	61003551	
148	Insulating material	1	61003552	
149	Caster	1	60032134	
150	Screw	3	6C530312	SP-3x12(WS)
151	Screw	4	6C520630	SP-6x30
	Washer	4	6D510060	WS-6
	Washer	4	6D500060	WF-6

10.3 Holder and distributing components

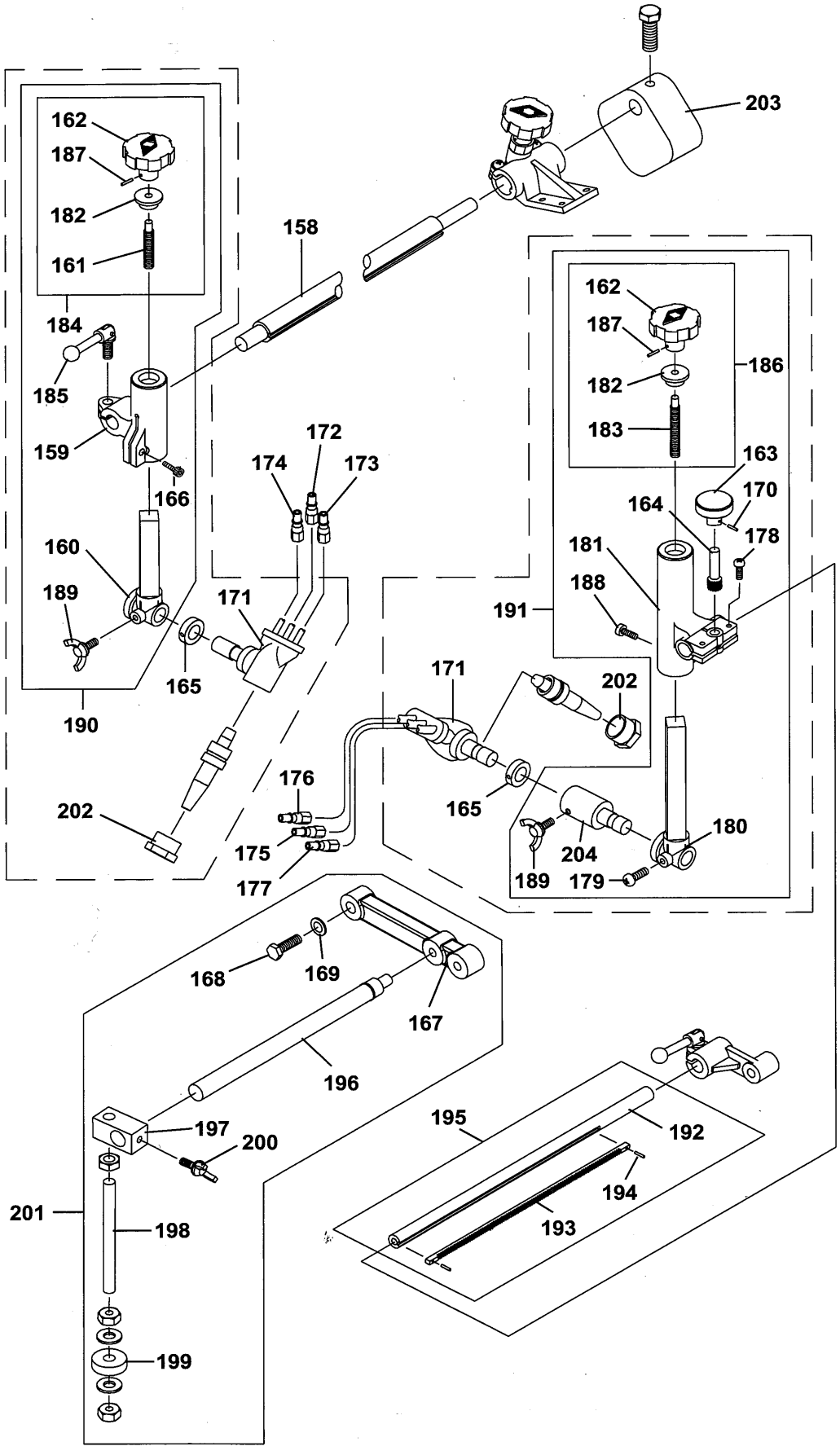


Holder and distributing components

Item No.	Part name	Q'ty	Stock No.	Remarks
82	Cross feed table A'ssy	1	60036848	
83	Cross bar	1	60036849	
84	Support base	1	60030566	
85	Holder support	1	60030567	
86	Square thread	1	60030565	
87	ϕ40 handle	1	60030223	
88	ϕ14 pinion	1	60030557	
89	Cross feed pinion	1	60030558	
90	Handle	1	60031628	
91	Pinion	1	60031627	
92	Hold bar	1	61003529	
93	Calibration collar	1	60030568	
	Screw	1	6C560408	SS-4x8
94	Cross feed handle A'ssy	1	60030556	
95	Hexagon bolt	1	6C010835	BH-8x35
96	Spring pin	1	6B022516	PR-2.5x16
97	Screw	2	6C520516	SP-5x16
98	Hexagon bolt	1	6C030615	BC-6x15
99	Copy roller bracket	1	61003530	
100	Hexagon bolt	1	6C021030	BH-10x30
101	Washer	1	6D500100	WF-10
102	Spring pin	1	6B022012	PR-2.0x12
103	Screw	4	6C510515	SM-5x15
104	Torch	1	60010604	Propane
		(1)	60010603	Acetylene
105	Auto-stop A'ssy	1	61003612	
106	JOX hose	1	60030305	600L
107	POX hose	1	60030305	600L
108	FG hose	1	61001810	600L Propane
		(1)	60030307	600L Acetylene
109	JOX hose	1	60030324	900L
110	POX hose	1	60030324	900L
111	FG hose	1	61001811	900L Propane
		(1)	60030326	900L Acetylene
112	L bracket	1	61003575	
113	Hexagon bolt	1	6C021030	BH-10x30
114	Washer	1	6D500100	WF-10
115	Screw	2	6C530515	SP-5x15(WS)
116	Washer	1	6D500080	WF-8
	Washer	1	6D510080	WS-8
117	Hexagon bolt	1	6C010620	BH-6x20
118	Twin valve A'ssy (JOX)	1	60013499	
119	Twin valve A'ssy (POX)	1	60013500	
120	Twin valve A'ssy (FG)	1	61003573	
121	Screw	2	6C520514	SP-5x14
122	German torch support	1	61003556	
123	Holder support	1	60032252	
124	Cross feed holder	1	61003524	★
125	Square thread metal	1	60030564	
126	Square thread	1	60032284	
127	Vertical handle A'ssy	1	60030563	
128	Bent handle	1	60030313	
129	Vertical handle A'ssy	1	60032253	
130	Spring pin	1	6B022516	PR-2.5x16
131	Hexagon bolt	1	6C030615	BC-6x15
132	Wing bolt	1	6C110615	BS-6x15
133	Following holder A'ssy	1	61003577	
134	Foregoing holder A'ssy	1	61003546	
135	Cross bar	1	60033111	
136	Rack	1	60033110	
137	Spring pin	2	6B022013	PR-2x13
138	Cross feed bar A'ssy	1	60031626	
152	Weight bar	1	60031855	
153	Guide copy bracket	1	60036969	
154	Guide bar	1	60036970	
155	Bearing	1	6A036200	6200ZZ
156	Wing bolt	1	6C110612	BS-6x12
157	Guide copy roller A'ssy	1	61003557	
205	Nut for Oxygen	1	60015056	
206	Hose connector (OX)	1	60015040	
207	Nut for Gas	1	60015054	
208	Hose connector (Gas)	1	60015062	
209	Adaptor (OX)	1	60012917	00K17
210	Adaptor (FG)	1	60012906	00K06

10.4 Option

10.4.1 Type 100



Type 100

Item No.	Part name	Q'ty	Stock No.	Remarks
158	Cross bar (300L) A'ssy	1	61003672	Type 100
159	Support base	1	60030566	
160	Holder support	1	61003727	
161	Square thread	1	60030565	
162	ϕ 40 handle	1	60030223	
163	Handle	1	60031628	
164	Pinion	1	60031627	
165	Calibration collar	1	60030906	with screw
166	Hexagon bolt	1	6C030615	BC-6x15
167	Copy roller bracket	1	61003530	
168	Hexagon bolt	1	6C021030	BH-10x30
169	Washer	1	6D500100	WF-10
170	Spring pin	1	6B022012	PR-2.0x12
171	Torch	1	60010303	
172	JOX hose	1	60030305	600L
173	POX hose	1	60030305	600L
174	FG hose	1	61001810	600L Propane
175	JOX hose	1	60030324	900L
176	POX hose	1	60030324	900L
177	FG hose	1	61001811	900L Propane
178	Screw	2	6C520514	SP-5x14
179	Screw	1	6C520615	SP-6x15
180	Holder support	1	61003726	
181	Cross feed holder	1	61003524	★
182	Square thread metal	1	60030564	
183	Square thread	1	60032284	
184	Vertical handle A'ssy	1	60030563	
185	Bent handle	1	60030313	
186	Vertical handle A'ssy	1	60032253	
187	Spring pin	1	6B022516	PR-2.5x16
188	Hexagon bolt	1	6C030615	BC-6x15
189	Wing bolt	1	6C110615	BS-6x15
190	Following holder A'ssy	1	61003720	Type 100
191	Foregoing holder A'ssy	1	61003719	Type 100
192	Cross bar (300L)	1	60038817	Type 100
193	Rack (300L)	1	60038820	Type 100
194	Spring pin	2	6B022013	PR-2x13
195	Cross feed bar A'ssy	1	60038804	Type 100
196	Weight bar (250L)	1	61003607	Type 100
197	Guide copy bracket	1	60036969	
198	Guide bar	1	60036970	
199	Bearing	1	6A036200	6200ZZ
200	Wing bolt	1	6C110612	BS-6x12
201	Guide copy roller A'ssy	1	61003631	Type 100
202	Tip fixing bolt	1	60005020	
203	Weight	1	60030578	with hexagon bolt
204	Shaft	1	61003704	Type 100

11 Cutting data

11.1 Tip nozzle (Type 300)

301-302 For Acetylene

PLATE THICKNESS (mm)	TIP SIZE		PRESSURE (MPa)/(kg/c㎡)		Flux (nl/h)			CUTTING SPEED (mm/min)
	CUTTING (301)	PREHEAT (302)	OX	FG	JOX	POX	FG	
3	(00)	12	0.18/1.8	0.020/0.20	1,000	210	190	800
5	0		0.20/2.0		1,500			730
10			0.25/2.5		1,800			600
15	1		0.30/3.0	0.025/0.25	2,900	230	210	520
20	2	13	0.35/3.5	0.030/0.30	4,300	310	280	450
25		14	0.40/4.0		5,000	400	365	400
30		15				440	400	370
35	3		0.45/4.5	0.035/0.35	6,800	470	425	340
40	4	16			8,000	480	435	320
45			0.50/5.0		8,600			300
50								280

301-306 For Propane

PLATE THICKNESS (mm)	TIP SIZE		PRESSURE (MPa)/(kg/c㎡)		Flux (nl/h)			CUTTING SPEED (mm/min)
	CUTTING (301)	PREHEAT (306)	OX	FG	JOX	POX	FG	
3	(00)	15	0.25/2.5	0.020/0.20	1,100	1,240	310	800
5	0		0.30/3.0		1,800			730
10			0.35/3.5	0.030/0.30	2,100	1,480	370	600
15	1				2,700			520
20	2	16			3,800	1,880	470	450
25		17	0.40/4.0	0.020/0.20	4,200	2,120	530	400
30								370
35	3		0.45/4.5		5,900			340
40	4	18	0.50/5.0	0.015/0.15	7,500	2,400	600	320
45			0.55/5.5		8,200			300
50								280

NOTE

1) All pressures are torch inlet pressures.
2) Oxygen purity is minimum of 99.7%.
3) Depending on the surface condition of the steel plate (scale, paint) either increase the fuel gas pressure or decrease the cutting speed. Also, when precision cutting is required, adjust all data.

11.2 Tip nozzle (Type 100)

102(STANDARD SPEED) For Acetylene

PLATE THICKNESS (mm)	TIP SIZE	CUTTING SPEED (mm/min)	OXYGEN PRESSURE (Mpa) / (kg/c ㎡)		FUEL GAS PRESSURE (Mpa) / (kg/c ㎡)	KERF WIDTH (mm)
			CUTTING	PREHEAT		
3	00	680	0.15 / 1.5	0.15 / 1.5	0.02 / 0.2	1.0
6	0	610	0.2 / 2.0	0.2 / 2.0	0.02 / 0.2	1.3
10	0	560	0.2 / 2.0	0.2 / 2.0	0.02 / 0.2	1.5
12.5	1	530	0.25 / 2.5	0.25 / 2.5	0.02 / 0.2	1.8
19	2	460	0.3 / 3.0	0.3 / 3.0	0.025 / 0.25	2.0
25	2	430	0.3 / 3.0	0.3 / 3.0	0.025 / 0.25	2.0
38	3	355	0.3 / 3.0	0.3 / 3.0	0.025 / 0.25	2.3
50	4	320	0.3 / 3.0	0.3 / 3.0	0.025 / 0.25	2.8

102-D7(HIGH SPEED) For Acetylene

PLATE THICKNESS (mm)	TIP SIZE	CUTTING SPEED (mm/min)	OXYGEN PRESSURE (Mpa) / (kg/c ㎡)		FUEL GAS PRESSURE (Mpa) / (kg/c ㎡)	KERF WIDTH (mm)
			CUTTING	PREHEAT		
3	00	800	0.7 / 7.0	0.15 / 1.5	0.02 / 0.2	0.8
6	0	740	0.7 / 7.0	0.2 / 2.0	0.02 / 0.2	1.0
10	0	680	0.7 / 7.0	0.2 / 2.0	0.02 / 0.2	1.3
12.5	1	630	0.7 / 7.0	0.25 / 2.5	0.02 / 0.2	1.3
19	2	560	0.7 / 7.0	0.3 / 3.0	0.025 / 0.25	1.5
25	2	510	0.7 / 7.0	0.3 / 3.0	0.025 / 0.25	1.8
38	3	460	0.7 / 7.0	0.3 / 3.0	0.025 / 0.25	2.0
50	4	410	0.7 / 7.0	0.3 / 3.0	0.025 / 0.25	2.6

NOTE

1) All pressures are torch inlet pressures.
2) Oxygen purity is minimum of 99.7%.
3) Depending on the surface condition of the steel plate (scale, paint) either increase the fuel gas pressure or decrease the cutting speed. Also, when precision cutting is required, adjust all data.

106(STANDARD SPEED) For Propane

PLATE THICKNESS (mm)	TIP SIZE	CUTTING SPEED (mm/min)	OXYGEN PRESSURE (Mpa) / (kg/c ㎡)		FUEL GAS PRESSURE (Mpa) / (kg/c ㎡)	KERF WIDTH (mm)
			CUTTING	PREHEAT		
3	00	680	0.15 / 1.5	0.15 / 1.5	0.02 / 0.2	1.0
6	0	610	0.2 / 2.0	0.2 / 2.0	0.02 / 0.2	1.3
10	0	560	0.2 / 2.0	0.2 / 2.0	0.02 / 0.2	1.5
12.5	1	530	0.25 / 2.5	0.25 / 2.5	0.02 / 0.2	1.8
19	2	460	0.3 / 3.0	0.3 / 3.0	0.02 / 0.2	2.0
25	2	430	0.3 / 3.0	0.3 / 3.0	0.02 / 0.2	2.0
38	3	355	0.3 / 3.0	0.3 / 3.0	0.02 / 0.2	2.3
50	4	320	0.3 / 3.0	0.3 / 3.0	0.025 / 0.25	2.8

106-D7(HIGH SPEED) For Propane

PLATE THICKNESS (mm)	TIP SIZE	CUTTING SPEED (mm/min)	OXYGEN PRESSURE (Mpa) / (kg/c ㎡)		FUEL GAS PRESSURE (Mpa) / (kg/c ㎡)	KERF WIDTH (mm)
			CUTTING	PREHEAT		
3	00	800	0.7 / 7.0	0.15 / 1.5	0.02 / 0.2	0.8
6	0	740	0.7 / 7.0	0.2 / 2.0	0.02 / 0.2	1.0
10	0	680	0.7 / 7.0	0.2 / 2.0	0.02 / 0.2	1.3
12.5	1	630	0.7 / 7.0	0.25 / 2.5	0.02 / 0.2	1.3
19	2	560	0.7 / 7.0	0.3 / 3.0	0.02 / 0.2	1.5
25	2	510	0.7 / 7.0	0.3 / 3.0	0.02 / 0.2	1.8
38	3	460	0.7 / 7.0	0.3 / 3.0	0.02 / 0.2	2.0
50	4	410	0.7 / 7.0	0.3 / 3.0	0.02 / 0.2	2.6

NOTE

1) All pressures are torch inlet pressures.
2) Oxygen purity is minimum of 99.7%, propane is minimum of JIS Grade 3.
3) Depending on the surface condition of the steel plate (scale, paint) either increase the fuel gas pressure or decrease the cutting speed. Also, when precision cutting is required, adjust all data.

EDGE-CUT

OPERACTION MANUAL

Date of issue:	Oct.2005
2nd	Dec.2005
3rd	Apr.2006
4th	Sep.2006
5th	Jun.2007
6th	Mar.2008
7th	Jul.2008
8th	Dec.2010
9th	Nov.2011
10th	Jan.2013
11th	May.2016
12th	Dec.2016
13th	Feb.2018
14th	Feb.2023
15th	Sep.2023

KOIKE SANSO KOGYO CO., LTD.

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