Portable Automatic Gas Cutter

BFB00B19

IK-70

Small Circle Cutter

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 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, inspetion, 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. When changing the direction, make sure that the direction switch is in the neutral (stop) position, and operate the direction switch after the machine has stopped.

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

8. 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. When it is difficult to engage the clutch, turn the rotary pipe by hand and lightly push the lever in. Do not push the lever forcibly; otherwise the gears will be damaged, causing knocking.
8. Never disconnect the rotary distributor cover unless necessary; otherwise gas leakage will result.
9. Secure the graduated pipe to prevent it from falling.
10. Secure the vertical-horizontal adjusting holder with a curved handle to prevent the former from falling.
11. 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. Be sure to ground the power cable of the machine.
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

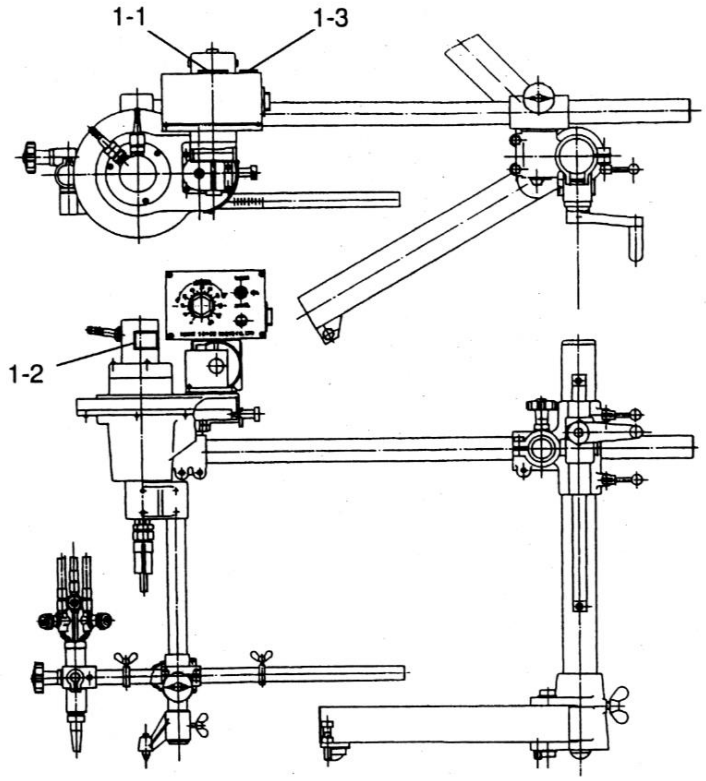
Observe the safety precautions to prevent skin burns. Ignoring heat, spatter, and sparks during operation could cause a fire or burned skin.

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.

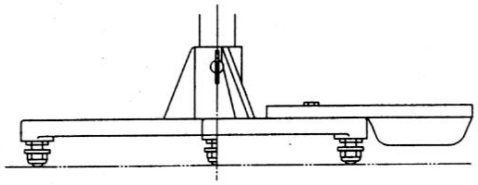
2 Locations of safety labels

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.

IK-70 Model 600



For **Model 1000**



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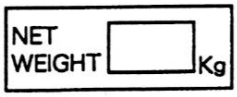

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3 Outline of machine

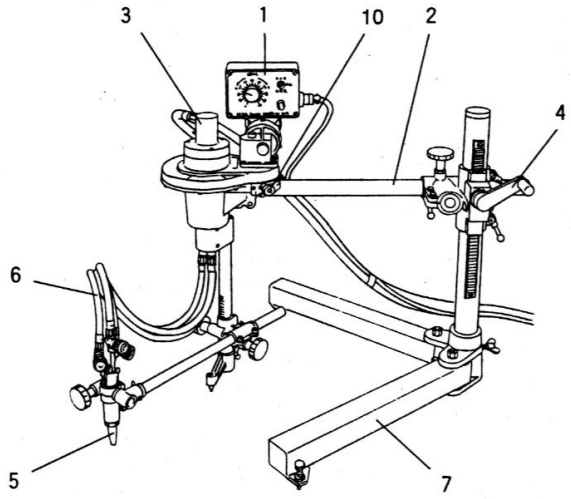
3.1 Features of machine

IK-70 (Small Circle Cutter) has been engineered to ensure unprecedentedly correct and stable cutting speed and wide speed-change range so as to materialize high-speed high-accuracy cutting effects that meet the needs of the precision cutting age. The machine permits precision circular cutting without the help of molds or drawings. Therefore, it exhibits excellent functions in hole making operations in the shipbuilding industry.

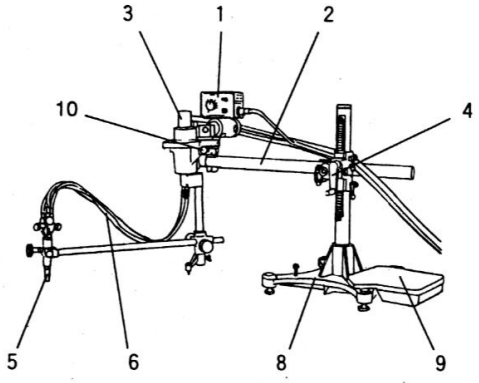
IK-70 (Small Circle Cutter) has been designed on the basis of a variety of circle cutters developed in the past, pursuing the operability from the human engineering stand point. Designed and manufactured from a new point of view the dedicated circle cutter has a substantial lead on our competitors' similar machines in terms of its ease of use, as well as its improved operability, durability, and cutting accuracy. The vertical-horizontal adjusting holder that is bent and fixed permits circular cutting on a wall and slope.

3.2 Name and function of each section

Model 600



Model 1000



1. Control box

Controls the speed and turning d e machine.

2. Horizontal arm

The horizontal adjusting arm lets the drive unit move to the right and left.

3.Rotary distributor

4.Machine up/down unit

Moves the machine up and down. The rack-and-pinion system ensures easy vertical movement, preventing falling by the weight of the unit itself. The very smooth movement facilitates the positioning of steel sheets and the center. When the machine is to be used for cutting on a slope, the bolt on the connection section will be loosened to match the machine angle to the steel sheet angle.

5. Torch

6. Hose

7.Leg (Model 600) (Free opening/with caster)

The legs are light and easy to carry. They can be opened up to 90 degrees according to the cutting size. The casters make the movement on steel sheets smooth. When secured with three bolts during cutting, the legs will never move.

8.Stand (Model 1000)

9.Weight (Model 10OO)

10. Clutch

Changes over from high-speed to low-speed, and vice versa.

3.3 Specifications

Model 600

Weight:	24 kg
Body:	17kg
Stand:	7 kg
Power source:	±10%
Speed control:	control with dial operation
Torch rotation speed:	0.2-6 rpm
Cutting thickness:	5～50 mm

※There is a range that cannot be cut depending on the relationship between cutting thickness and cutting diameter.
Please check “Relationship between the cutting plate thick ness and cutting diameter.”

Bevel angle:	0-45°
Cutting diameter:	φ30 ～ φ600
Motor:	DC Motor 15W 5000rpm (DC24V)
Slope cutting angle:	0-90°
Tip:	102 (for acetylene) or 106 (for propane)
Gas:	Oxygen, Acetylene gas, or LPG gas

Model 1000

Weight:	55 kg
Body:	31 kg
Stand :	9 kg
Weight:	15kg
Power source:	±10%
Speed control:	control with dial operation
Torch rotation speed:	0.04-1.5 rpm
Cutting thickness :	Cutting thickness: 5～50 mm

※There is a range that cannot be cut depending on the relationship between cutting thickness and cutting diameter.
Please check “Relationship between the cutting plate thick ness and cutting diameter.”

Bevel angle:	0-45°
Cutting diameter:	φ150 ～ φ1000
Motor:	DC Motor 15W 5000rpm (DC24V)
Slope cuffing angle:	0-90°

Standard accessories

Tip 102 (for acetylene) or 106 (for propane)

No.0,1,2	1pc each
Tip cleaner:	1set
Fuse(1A):	2pcs
Power cable:	1pc

4 Preparation for operation

4.1 contents of package

The contents of the standard package are shown below. Check them carefully before assembling the machine.

- Body: 1 set
- Gas distributor: 1 set
- Torch holder: 1 set
- Torch: 1 Pc
- Hose
  Distribution hose (3pcs set: 600L): 1 set
- Power cable (3P x 5M): 1 set
- Tip 102 (for acetylene) or 106(for propane): 1 pc each
- Tip cleaner: 1 set
- Fuse (1A): 2pcs

4.2 Machine assembly

Model 600

1. Take out the machine and legs from the packing box.
2. Open the legs and insert the main shaft into them. Secure the main shaft with a wing bolt (M8 x 25).
3. Carefully check that the torch holder, gas distributor, torch, etc. are in position.
4. Check the match marks.
   1) Marks on the vertical-horizontal adjusting holder and horizontal arm adjusting holder.
   2) Marks on the graduated pipe and torch holder
      When marked lines coincide, the horizontal and vertical positions of the machine are perfect.

Model 1000

Model 1000 is packed in three carton boxes. Unpack respective carton boxes to take out the respective parts.

Machine assembly	1 pack
Carriage assembly	1 pack
Weight assembly	1 pack

1. Take out the machine, carriage, and weight from the boxes.
2. Place the carriage on a flat floor and put the carriage and weight together with two bolts (M10 x 35).
3. Insert the main shaft into the carriage and secure it with a wing bolt (M8 x 25).
4. Check the match marks.
   1) Marks on the vertical-horizontal adjusting holder and horizontal arm adjusting holder.
   2) Marks on the graduated pipe and torch holder
      When marked lines coincide, the horizontal and vertical positions of the machine are perfect.

4.3 Preparation for operation

4.3.1 Connecting the power cable

1. Connect the power cable to the body.
2. Before plugging the metal plug on the power cord side into the socket on the machine side, check there is no dust inside.
3. The metal plugs are screw-threaded, therefore, fully tighten them so that they will not come loose during operation.

4.3.2 Connecting the gas supply hose

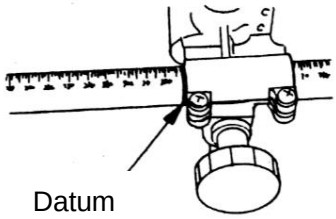
1. Connect the respective gas supply hoses to the primary hose.
2. Securely tighten the joints and check there is no gas leak.

4.3.3 Connecting the tip

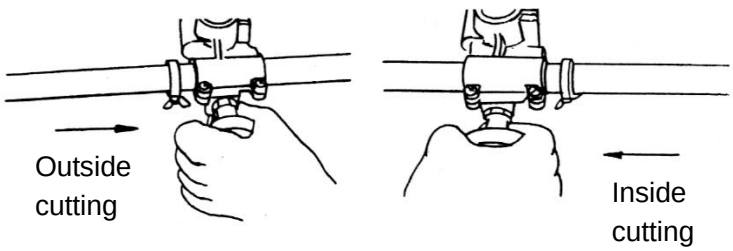
1. Select a proper tip according to the thickness of the steel plate and attach it to the torch.
   (To select a tip, refer to the table of cutting data.)
   - When fixing a tip to the torch, tighten the nut with the two wrenches attached.
   - If the tip is tightened excessively, it will be heated during cutting and tightened still more making it difficult to remove the tip.
   - In addition, avoid damaging the taper of the tip since this may cause backfire.

4.3.4 Setting

1. How to determine the cutting diameter
   1) The graduation on the graduated pipe represents the diameter of cutting circles. The datum point for aligning the graduation is the arrow on the holder.



   2) Calculate the cutting width of the tip.
      (The cutting width is 1.5-2.0 times as large as the cutting oxygen hole diameter.)
      [Example]
      When the sheet is 20 mm in thickness and 200 in dia. (Tip 102).
      The cutting tip is #2 according to the Cutting Data, and the oxygen cutting hole dia. of the #2 tip is 1.4.
      The cutting allowance is 1.4mm x 1.5 = 2.1
      When the cut disc is needed, the graduation will be 200 dia.+ 2.1mm = 202.1 dia.
      When the cut hole is needed, the graduation will be 200 dia.- 2.1mm = 197.9 dia.
      Set the stopper at the above values.
   3) Stopper setting
      The stopper to be used when the cut disc is needed (outside cutting) and that to be used when the cut hole is needed (inside cutting) are different. Set the stopper as shown right.



2. Set the clutch lever in the N (neutral) position, turn the graduated pipe by hand, and adjust the leg opening angle and the horizontal arm length so that the torch and hoses will not touch the legs and shaft column.
3. Align the center with the punched mark. Operate the machine up/down unit so that the center will lightly touch the steel plate.
   (Lift the center so that the distance between the Center and steel plate will be 0.5-1.0 mm.)
4. Secure the curved handle on the machine up/down unit.
5. Secure the machine with the lock bolt on the leg so that the machine will not move.
6. Setting the cutting speed
   The cutting speed (number of revolutions) differs according to the diameter of the cutting circle and the sheet thickness.
   1) Find the optimum cutting speed for the given sheet thickness based on the Cutting Data.
   2) Find the correct clutch -- H(high-speed) and L(low-speed) -- and the number of revolutions based on the table that shows the relationship between the cutting plate thickness and cutting circle.
   3) Set the number of revolutions by means of the speed adjustor.

Relationship between the cutting plate thickness and cutting diameter (Model 600)
L (low-speed) range

Thickness(mm)	5	5-10	10-15	15-30	30-40	40-50	50-
Cut speed(mm/min)	660	550-660	490-550	400-490	350-400	320-350	200-320
Cut diameter φ50	Not use	Not use	Not use	Not use	Not use	Not use	1.3
φ60	Not use	Not use	Not use	Not use	Not use	Not use	1.0
φ70	Not use	Not use	Not use	Not use	Not use	1.4	0.91
φ80	Not use	Not use	Not use	Not use	1.4	1.3	0.79
φ90	Not use	Not use	Not use	1.4	1.2	1.1	0.71
φ100	Not use	Not use	Not use	1.3	1.1	1.0	0.64
φ200	1.0	0.87	0.79	0.64	0.56	0.51	0.32
φ300	0.70	0.58	0.52	0.42	0.37	0.34	0.21
φ400	0.52	0.44	0.39	0.32	0.28	0.25	Not use
φ500	0.42	0.35	0.31	0.25	0.22	0.20	Not use
φ600	0.35	0.29	0.26	0.21	Not use	Not use	Not use

Numbers in the thick line frame: Rotation speed (rpm)

H (high-speed) range

Thickness(mm)	5	5-10	10-15	15-30	30-40	40-50	50-
Cut speed(mm/min)	660	550-660	490-550	400-490	350-400	320-350	200-320
Cut diameter φ30	Not use	5.8	5.3	4.2	3.7	3.4	2.1
φ40	5.2	4.4	3.9	3.2	2.8	2.5	1.6
φ50	4.2	3.5	3.1	2.5	2.2	2.0	Not use
φ60	3.5	2.9	2.6	2.1	1.8	1.7	Not use
φ70	3.0	2.5	2.0	1.8	1.6	Not use	Not use
φ80	2.6	2.2	2.0	1.6	Not use	Not use	Not use
φ90	2.3	1.9	1.7	Not use	Not use	Not use	Not use
φ100	2.1	1.7	1.6	Not use	Not use	Not use	Not use

Numbers in the thick line frame: Rotation speed (rpm)

Relationship between the cutting plate thickness and cutting diameter (Model 1000)

L (low-speed) range

Thickness(mm)	5	5-10	10-15	15-30	30-40	40-50	50-
Cut speed(mm/min)	660	550-660	490-550	400-490	350-400	320-350	200-320
Cut diameter φ150	Not use	Not use	Not use	Not use	Not use	Not use	0.42
φ200	Not use	Not use	Not use	Not use	0.56	0.51	0.32
φ300	Not use	Not use	0.52	0.42	0.37	0.34	0.21
φ400	0.52	0.44	0.44	0.32	0.28	0.25	0.16
φ500	0.42	0.35	0.31	0.25	0.22	0.20	0.13
φ600	0.35	0.29	0.26	0.21	0.18	0.17	0.10
φ650	0.32	0.27	0.24	0.19	0.17	0.16	0.10
φ700	0.30	0.25	0.22	0.18	0.16	0.14	0.09
φ800	0.26	0.22	0.20	0.16	0.14	0.13	0.08
φ900	0.23	0.19	0.17	0.14	0.12	0.11	0.07
φ1000	0.21	0.17	0.16	0.13	0.11	0.10	0.06

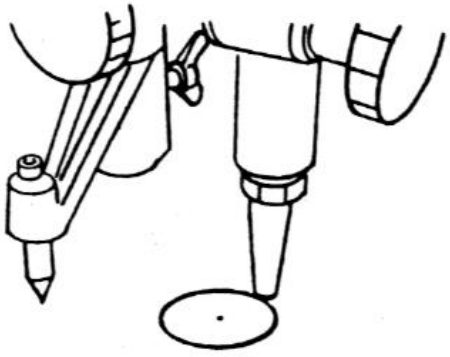
Numbers in the thick line frame: Rotation speed (rpm)

H (high-speed) range

Thickness(mm)	5	5-10	10-15	15-30	30-40	40-50	50-
Cut speed(mm/min)	660	550-660	490-550	400-490	350-400	320-350	200-320
Cut diameter φ150	1.4	1.2	1.0	0.85	0.74	0.68	0.42
φ200	1.0	0.87	0.79	0.64	0.56	0.51	0.32
φ300	0.70	0.58	0.52	0.42	0.37	0.34	0.21
φ400	0.52	0.44	0.39	0.32	0.28	0.25	0.16
φ500	0.42	0.35	0.31	0.25	0.22	0.20	Not use
φ600	0.35	0.29	0.26	0.21	0.18	0.17	Not use
φ650	0.32	0.27	0.24	0.19	0.17	0.16	Not use
φ700	0.30	0.25	0.22	0.18	0.16	Not use	Not use
φ800	0.26	0.22	0.20	0.16	Not use	Not use	Not use
φ900	0.23	0.19	0.17	Not use	Not use	Not use	Not use
φ1000	0.21	0.17	0.16	Not use	Not use	Not use	Not use

Numbers in the thick line frame: Rotation speed (rpm)

7. Release the center as shown below when the cutting diameter range is 30-100.



5 Cutting operation

5.1 Safety measures prior to operation

5.1.1 Grounding the machine

The cable of this machine is equipped with a grounding wire. For safety, be sure to ground the wire as follows, in addition to checking the connection of the power cable.

■How to ground the machine

・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

Referring to the Cutting Data, select the suitable tip according to the plate thickness.
For a heavily rusted plate or for a bevel cutting of more than 20 degrees, select the tip one grade higher than the one shown in the Cutting Data.

5.1.3 Operation of running direction changeover switch

- Use the drive switch to change the direction of rotation (clockwise-counterclockwise). The machine is at rest when the switch is in the neutral position.
- When changing the direction of rotation, be sure to return the drive switch to the stop (neutral) position. After the machine has stopped, change the direction of rotation.
- Be sure to set the switch in the stop (neutral) position unless the mac is to be moved.
- Set the drive switch in the stop (neutral) position when turning on the power. When the switch is in the clockwise or counterclockwise turning position, the machine will begin to move, which is very dangerous.

5.2 Ignition and flame adjustment

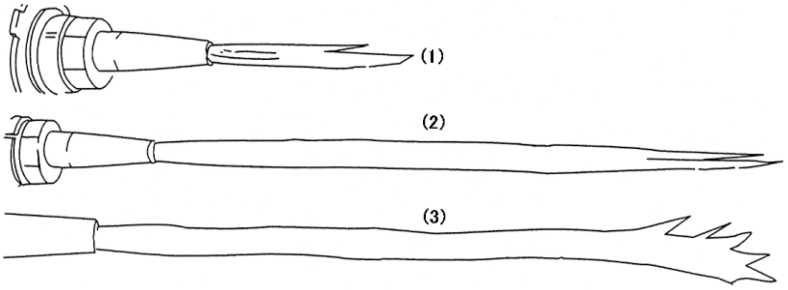
Adjust the gas pressure according to the Cutting Data. The data shows the pressure when all the valves are open. Readjust the pressure after ignition.

■Flame adjustment method

1. Open the fuel gas valve 1/4 to 1/2 a turn, and light the torch with an igniter.
2. Then, open the preheating oxygen valve gradually until a white cone of the standard flame gas been obtained. (The incandescent area should be uniform and about 5-6 mm in length.)
3. Open the jet oxygen valve fully. Readjust the flame if its condition has changed. A disorderly flow of the jet oxygen will adversely affect the quality of the cutting surface. In such a case, clean the tip with a suitable cleaning needle while the jet oxygen is flowing.

4. Appropriate distance between the tip end and cutting surface:
   - Acetylene gas ..... 8-10 mm
   - LPG gas ..... 5-8 mm

Neutral flame ensures good quality cut surfaces. (Oxygen flame may be used for bevel cutting.)
Oxygen flame causes short cutting-oxygen current, allowing slugs to adhere, melting the upper edge of the cutting surface, and causing adverse effects on the cut surface. Similar defects will result when the cutting oxygen pressure is too high.



(1)Oxidizing Flame

(2)Neutral Flame

(3)Carbonizing Flame

5.3 Cutting and piercing method

1. Cut in from the end of steel plate.
2. Pierce steel plate before cutting.
3. Drill a hole before cutting.

■Piercing method

1) Ignite and adjust the flame.
2) Thoroughly preheat the cut-in point until it is white hot.
3) Open the cutting oxygen valve to pierce the steel plate. The tip should be about 15-20 mm from the plate to prevent slag from splashing onto the tip and adhering there, which will shorten the working life of the tip.

5.4 Procedures for starting cutting operation and extinguishing the flame

1. Align the tip with the cutting start point, ignite, and then adjust the flame.
2. Sufficiently preheat the cutting start point.
3. After sufficient heating, let the cutting oxygen out and begin cutting simultaneously by turning the graduated pipe feed handle.
4. Turn on the switch or engage the clutch right before the graduated pipe strikes against the stopper, and continue cutting up to the stopper position.
5. Extinguish the flame after cutting as follows:
   1) Turn off the motor switch (or turning direction switch).
   2) Close the cutting oxygen valve.
   3) Close the preheating oxygen valve.
   4) Close the fuel gas valve.

5.5 Safety measures against backfire and flashback

5.5.1 Prevention of backfire

Backfires may cause serious accidents or fires. Be careful to prevent such disaster. When a backfire occurs, find the cause and inspect and maintain the machine correctly before using the machine again.
The followings are causes of backfire:

1) Improper gas pressure adjustment
2) Overheated tip
3) Slag clogged in tip
4) Damage to the tapered section of the tip or torch will cause backfire.

5.5.2 Prevention of flashback

Flashback could cause fire and break the machine. Should there be a hissing sound in the torch, quickly take the following action:

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

Should flashback occur, find the cause and take appropriate action before using the machine again.

5.6 Cutting operation

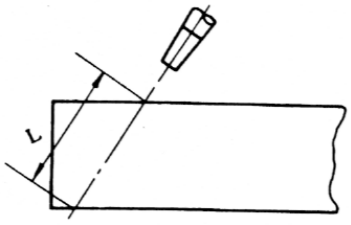
5.6.1 Bevel cutting

For bevel cutting, use the angle graduation (45 degrees to the right and left from the 0 degrees; 1 division = 5 degrees) on the torch holder to fix the torch at the desired angle.

Dimension L will be calculated as the sheet thickness, based on which the tip will be selected. In order to make up for the lost heating power due to escaping flame, use a tip that is one size larger.

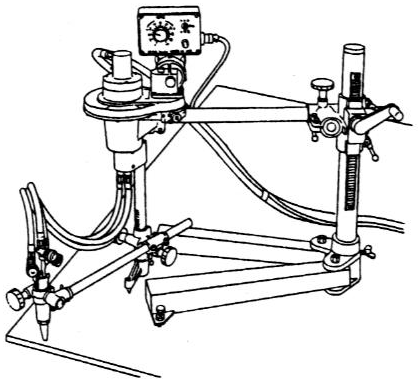
Slightly increase the oxygen to improve the cutting efficiency of the flame.

Note: Determine the cutting diameter by actual measurement.



5.6.2 Corner cutting

Close the carriage as shown.



6 Maintenance and inspection

Inspect and maintain the machine as shown below in order to use the machine under the best conditions.

6.1 Disassembly of the machine

Disassemble the machine as follows:

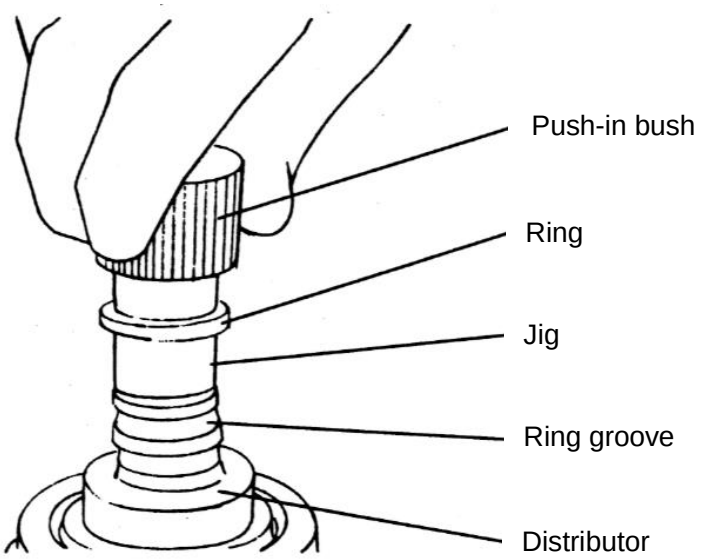
1. Remove the torch.
2. Remove the arc rotation unit from the base shaft.
3. Remove the speed reducer on the gear case of the machine.
4. Remove the gear case, horizontal arm, and its related parts from the machine up/down unit.
5. Loosen the wing bolt to remove the main shaft and legs.
6. Remove the speed reducer box and motor case from the gear case.
7. Remove the gear table from the speed reducer box.

6.1.1 Daily inspection

1. Wipe the outside of the machine with a clean cloth to remove dirt.
2. Check that the shaft column is at right angles to the horizontal arm. (Check the match mark.)
3. Check that the graduated pipe is at right angles to the torch holder. (Check the match mark.)

6.1.2 Three-month inspection

1. Measurement of insulation resistance (When the applied voltage is 500V, check that the resistance is 5MΩ or more.)
2. Change the grease in the speed reducer box when it is extremely dirty.
3. Separate gear case (A) from gear case (B) and apply molybdenum oil to the clutch.
4. Replace the internal parts when they are worn extremely.
5. Use the following jig to replace the special ring in the rotary distributor.



7 Troubleshooting

1) The machine will not move. (The motor will not run.)

Cause	Inspection point	Correction
1)Power is not supplied.	Check the power supply. Check the connections.	Replace the power supply if it is defective
2)Fuse blown	Check the 1A fuse in the control box to see if it has blown.	Replace the blown fuse.
3)Disconnection of power cable.	Check the cable with a tester. "∞" indicates disconnection.	Repair the disconnected cable
4)Poor connection	Check that lead wires are correctly connected to the terminal block.	Connect the wires again.
5)Defective switch	Remove the switch and check for continuity between terminals with a tester.	Replace the switch if it is defective.
6)Defective speed controlling resistor	Check with a tester that the resistance is 50 kΩ.	Replace the resistor if it is defective.
7)Disconnection of lead wire	Check for continuity between the lead wires with a tester.	Replace disconnected lead wires.
8)Defective motor	If all the above items are normal, the motor is defective.	Repair or replace the motor with a new one.
9)Defective controller	If all the above items are normal, the controller is defective.	Replace the defective controller.

Note:

Protection of the over load.

When the motor was locked by any reason, the motor rotation will be stopped after about four second.

(Recovery: Please turn on the power supply again.)

2) The speed cannot be controlled (The motor runs)

Cause	Inspection point	Correction
1)Defective speed control resistor	Remove the speed control resistor and apply the probes of a tester to resistor terminals 2 and 1 or 2 and 3. If the pointer continuously moves from 0 to 50 K ohm when the handle is turned slowly, the resistor is normal.	Replace the defective resistor.
2)Defective controller	When 1) is normal, the controller is defective.	Replace the defective controller.

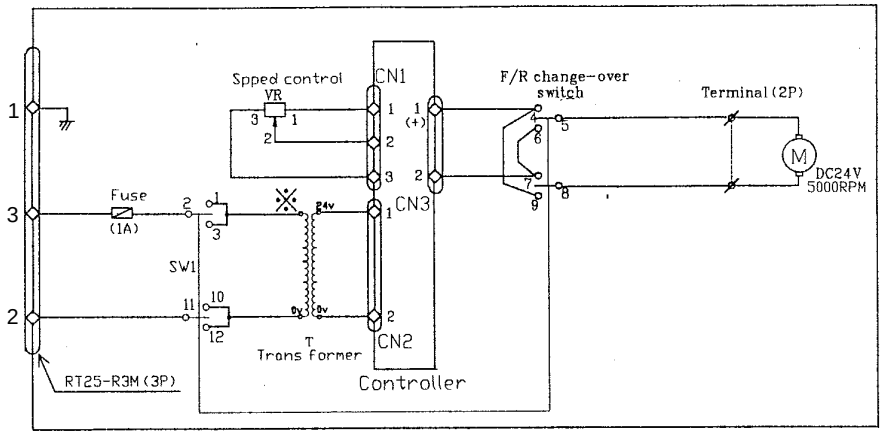
3) The machine will not move. (The motor runs.)

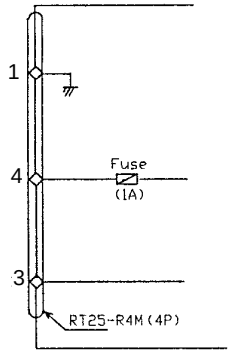
Cause	Point to be checked	Correction
(A) Reduction gear slips. 1) Gear table and reducer box slip	Remove the reducer box and run the motor. When the 8th gear will not turn, overhaul the gear table.	Repair or replace.
2) Clutch slips. (2-stage speed changer)	When the motor continues running after the clutch has been engaged even if the rotary pipe section is held by hand.	Overhaul the clutch table.

4) The machine moves but the operation is not normal.

Cause	Point to be checked	Correction
1) The speed is not fast.	The input voltage is incorrect.	Check the voltage.
2) Low speed is unavailable	A. When the resistor is defective. B. When the wiring is incorrect. C. When the motor is defective.	Replace the resistor. Repair the wiring. Repair or replace the motor.
3) High speed is unavailable	When the supply voltage has dropped.	Check with a tester.
4) The speed is irregular	When gears are damaged. A. Abrasion of gear B. Poor gear engagement C. Scratches on clutch gears D. Broken EP ring E. When the center is forcibly pushed against the steel plate. F. Screws for the base shaft and rotary pipe holder are loose.	Replace or lap the gears. Note: Be careful not to damage the gears when disassembling them for repair. Replace Replace Replace or repair Replace Lift the machine Tighten M5 screw
5) Turning center is unavailable.	1. The rotary pipe is curved or the keyway is abraded. 2. The fixing spring pins (4 dia.) for the rotary pipe and rotary pipe holder are worn out. 3. Abrasion of the center stopper handle.	

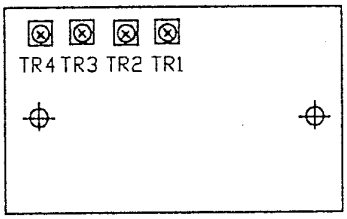
8 Wiring diagram





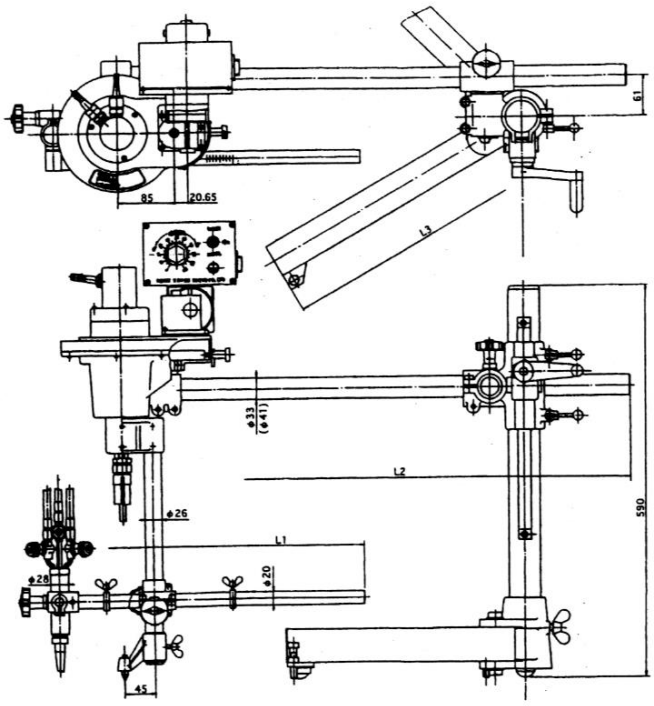
	TRANSFORMER Connection	
SUPPLY VOLTAGE	PRIMARY 接 v	SECONDARY
100V	100V	24V
110V	120V	
120V	120V	
200V	220V	
220V	220V	
230V	230V	
240V	240V	

Controller adjust
TR1 : SPEED MAX.
TR3 : SPEED MINI.

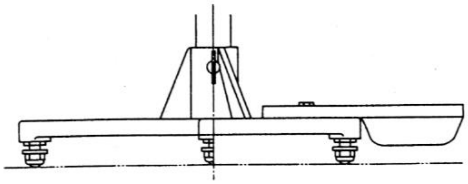


9 Assembly drawing of IK-70

Model 600

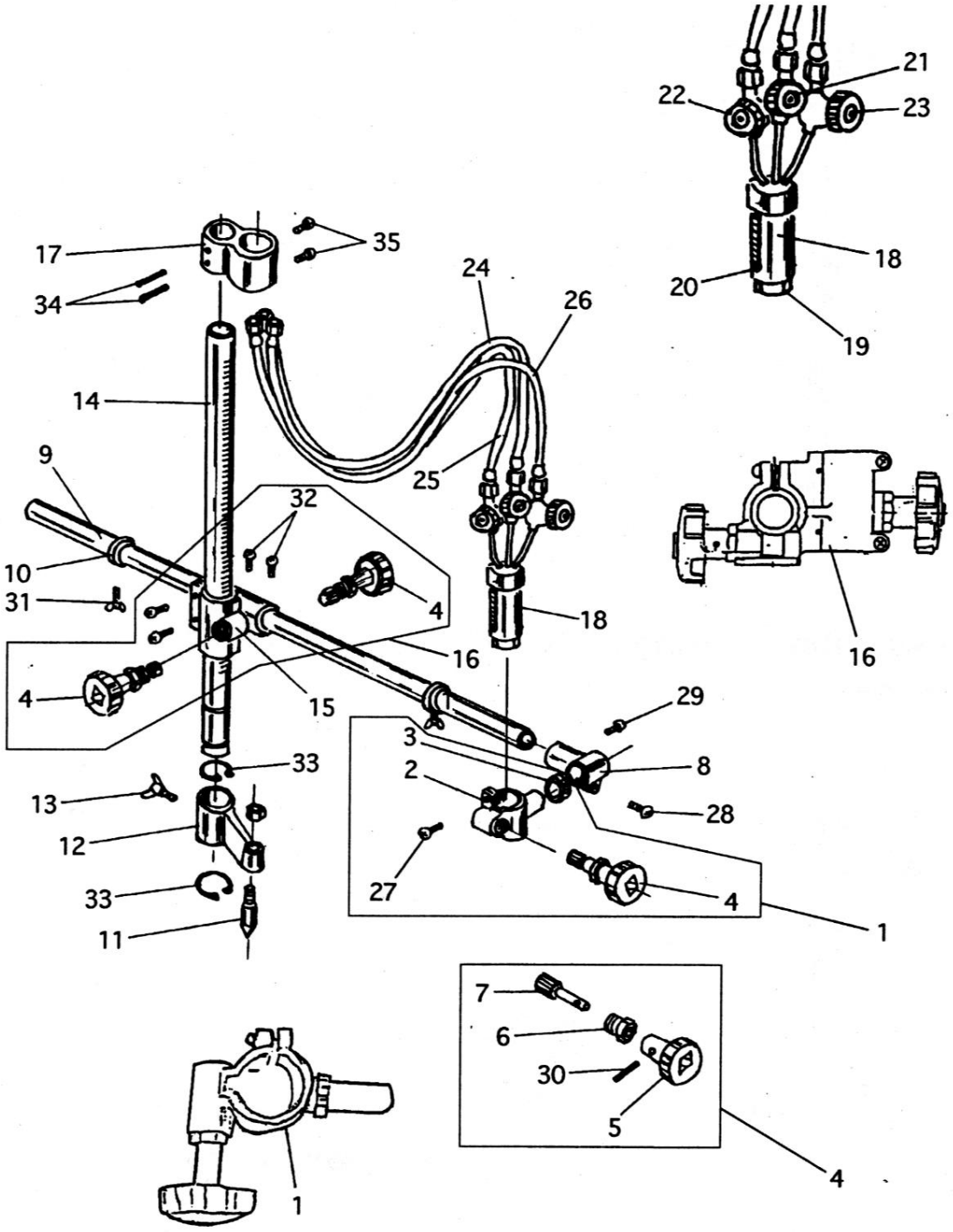


Model 1000



10 Parts List

10.1 Gas unit



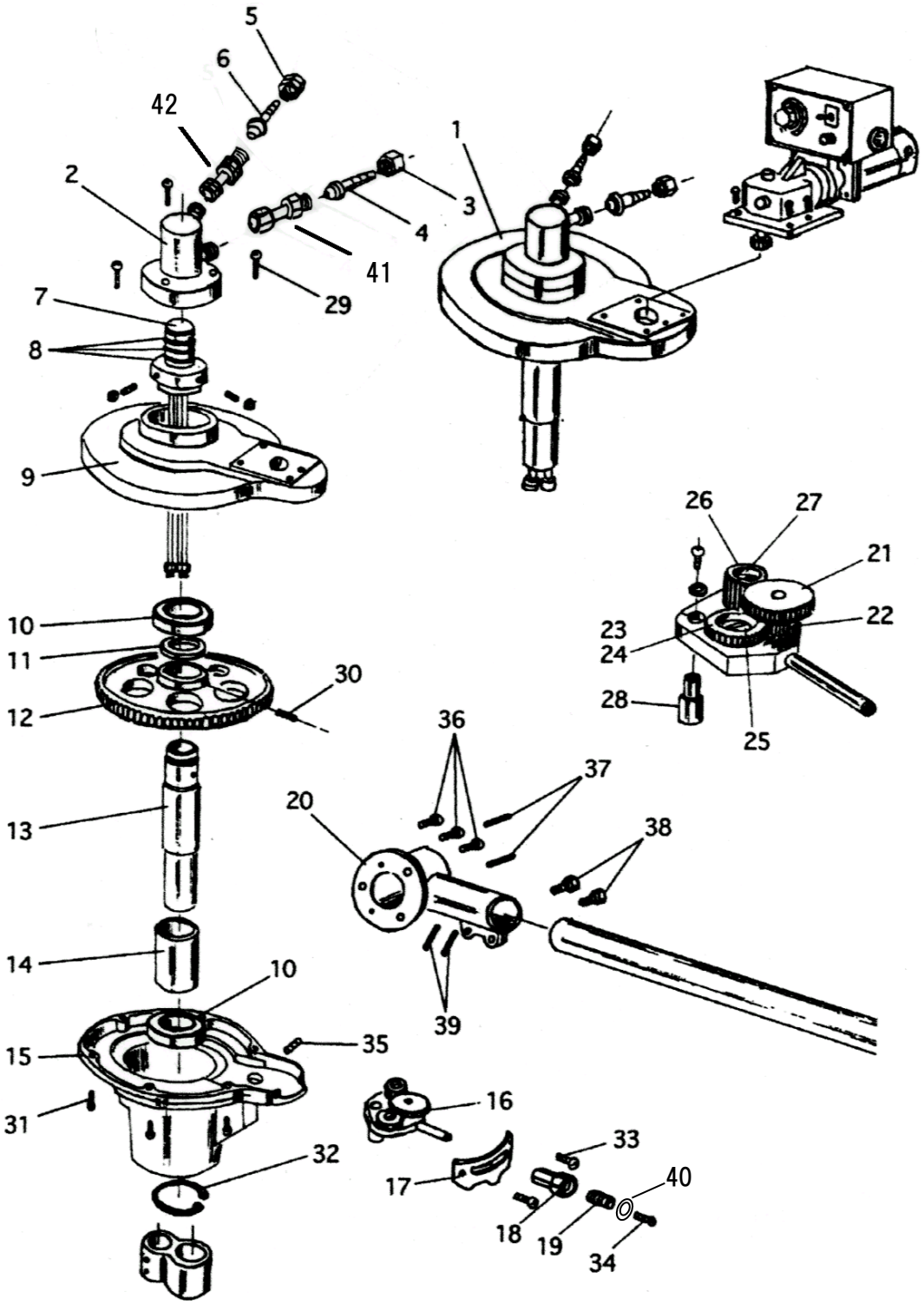
Gas unit

Item No.	Part name	Q'ty	Stock No.	Remarks
1	Torch holder assembly	1	60030992	
2	Torch holder	1	60031351	
3	Graduation collar	1	60030906	
4	Pinion assembly	3	60030908	
5	Handle	3	60030223	Diameter 40 mm ※1
6	Pinion metal (A)	3	60030909	
7	Pinion (A)	3	60030910	※1
8	Torch holder bracket	1	60030907	
9	Graduation bar (mm)	1	60030911	Model 1000
	Graduation bar (inch)	1	60032142	Model1000 USA only.★
	Graduation bar (mm)	1	60032100	Model 600
	Graduation bar (inch)	1	60032143	Model 600 USA only ★
10	Stopper	2	60030912	
	Stopper assembly	2	60030965	With wing bolt
11	Center	1	60030913	With NH, SW
12	Center holder	1	60030914	
13	Stop handle	1	60030915	
14	Rotary pipe	1	60030916	※1
15	Torch feed holder	1	60030917	With key
16	Torch feed holder assembly	1	60032101	With screw
17	Rotary pipe holder	1	60030918	※1
18	Torch	1	60010201	Except USA, KE
	Torch	1	60010202	USA only
	Torch	1	60010204	KE only
19	Tip fixing nut	1	60005020	
20	Torch for rack	1	60010203	
21	Valve for Jet oxygen	1	60015354	Except KE
	Valve for Jet oxygen	1	60015358	KE only
22	Valve for Preheat oxygen	1	60015355	Except KE
	Valve for Preheat oxygen	1	60015358	KE only
23	Valve for Gas	1	60015356	
24	Hose for Jet oxygen (Model 600)	1	60030305	Except USA
	Hose for Jet oxygen (Model 600)	1	60030304	USA only
	Hose for Jet oxygen (Model 1000)	1	60030324	Except USA
	Hose for Jet oxygen (Model 1000)	1	60030323	USA only
25	Hose for Preheat oxygen (Model 600)	1	60030305	Except USA
	Hose for Preheat oxygen (Model 600)	1	60030304	USA only
	Hose for Preheat oxygen (Model 1000)	1	60030324	Except USA
	Hose for Preheat oxygen (Model 1000)	1	60030323	USA only
26	Hose for Gas (Model 600) Red	1	60030307	Except USA
	Hose for Gas (Model 600)	1	60030308	USA only
	Hose for Gas (Model 600) Orange	(1)	61001810	
	Hose for Gas (Model 1000) Red	1	60030326	Except USA
	Hose for Gas (Model 1000)	1	60030327	USA only
	Hose for Gas (Model 1000) Orange	(1)	61001811	
27	Screw	1	6C520516	SP-5x16
28	Screw	1	6C520515	SP-5x15
29	Screw	1	6C520410	SP-4x10
30	Spring pin	3	6B022516	PR-2.5x16
31	Wing bolt	2	6C110408	BS-4x8
32	Screw	4	6C520515	SP-5x15
33	Stop ring	2	6B520260	STW-26
34	Spring pin	2	6B024034	PR-4x34
35	Screw	2	6C520508	SP-5x8

※1 It is necessary to drill and pin the holes to match the actual product.

Note: When replacing parts, the horizontal and vertical directions are There is a possibility of deviation.

10.2 Rotary distributor unit

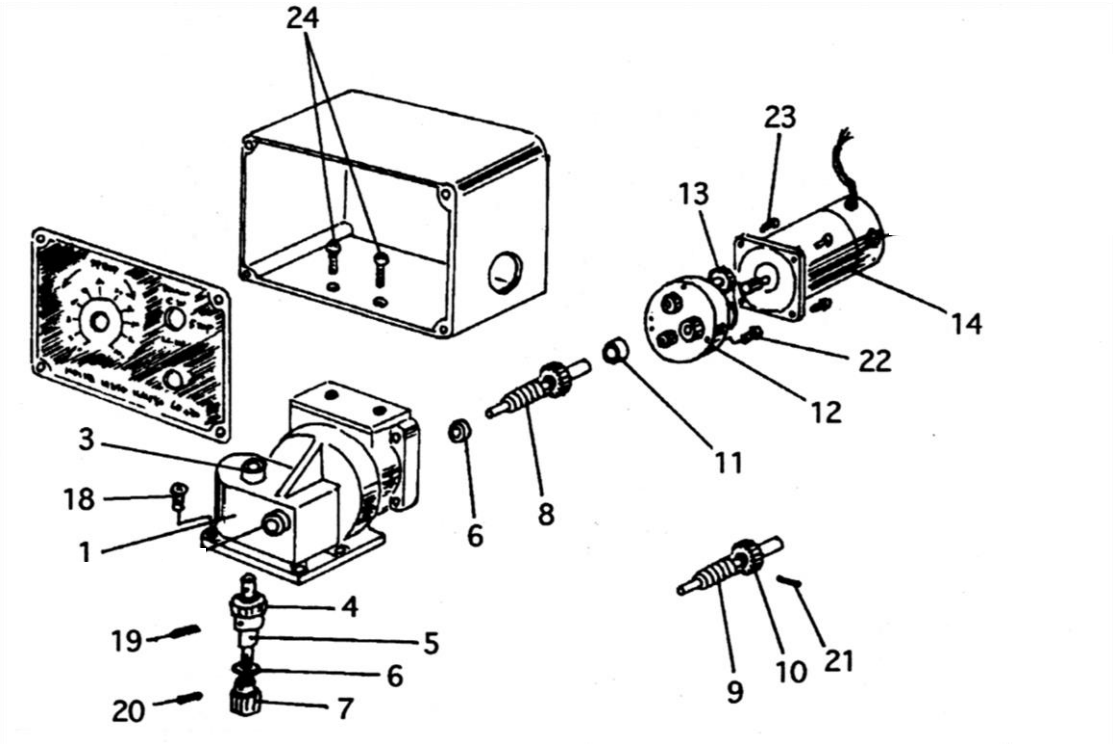


Rotary distributor unit

Item No.	Part name	Q'ty	Stock No.	Remarks
1	Distributor assembly	1	60030919	Except USA
	Distributor assembly	1	60030978	USA only
2	Distributor cover	1	60032107	Except USA
	Distributor cover	1	60032136	USA only
3	Nut for Oxygen	1	60015001	
	Nut for Oxygen	1	60015056	KE only
4	Hose connector (OX)	1	60015003	
	Hose connector (OX)	1	60015040	KE only
5	Nut for Gas	1	60015002	
	Nut for Gas	1	60015054	KE only
6	Hose connector (GAS)	1	60015004	
	Hose connector (GAS)	1	60015062	KE only
7	Distributor assembly	1	60032106	Except USA ★
	Distributor assembly	1	60032199	USA only
8	FP-ring	3	60030922	
9	Gear case (A)	1	60032105	
10	Bearing	2	6A036008	6008ZZ
11	Collar (B)	1	60032103	
12	Gear	1	60032104	※1
13	Main shaft	1	60032102	※1
14	Collar	1	60030921	
15	Gear case (B)	1	60030920	
16	Clutch assembly	1	60030924	
17	Clutch plate	1	60030923	
18	Clutch handle	1	60030927	
19	Spring	1	60030928	
20	Cross feed arm holder	1	60030941	※1
21	9th gear	1	60032108	
22	10th gear	1	60032109	
23	11th gear	1	60032110	
24	Bearing	1	6A030608	608ZZ
25	11th gear shaft	1	60032111	
26	12th gear	1	60030925	With DU bush
27	12th gear shaft	1	60030926	
28	Clutch shaft of rotation	1	60032112	With screw
29	Screw	3	6C520430	SP-4x30
30	Spring pin	1	6B024012	PR-4x12
31	Screw	5	6C530418	
32	Stop ring	1	6B500680	RS-68
33	Screw	2	6C530412	SP-4x12(with WS)
34	Screw	1	6C520306	SP-3x6
35	Screw	1	6C540404	SS-4x4
36	Screw	3	6C530520	SP-5x20(with WS)
37	Spring pin	2	6B024018	PR-4x18
38	Hexagon bolt	2	6C010825	BH-8x25
39	Spring pin	2	6B024040	PR-4x40
40	Washer	1	6D500030	WF-3
41	Adaptor(OX)	1	61003245	
42	Adaptor(FG)	1	61003246	

※1 It is necessary to drill and pin the holes to match the actual product.

10.3 Speed adjusting unit

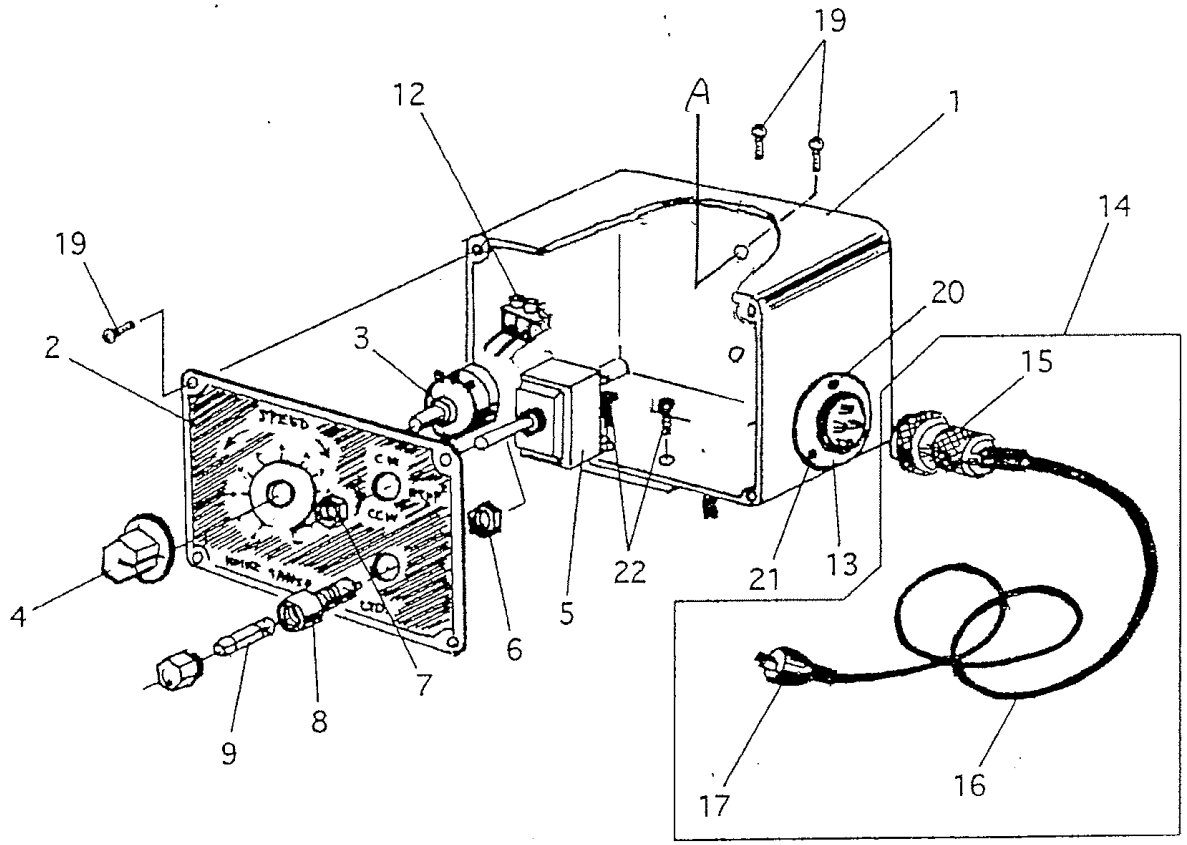


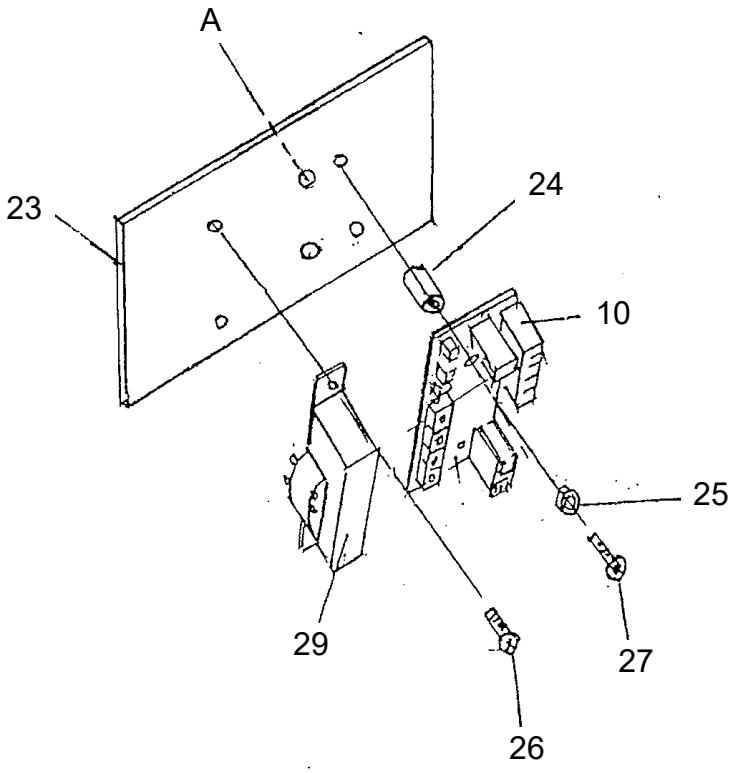
Speed adjusting unit

Item No.	Part name	Q'ty	Stock No.	Remarks
1	Gear box assembly	1	60032150	
3	Ring	1	60032137	With screw
4	Worm wheel	1	60032118	※1
5	8th gear shaft	1	60032123	※1
6	Collar F	2	60030930	
7	8th gear	1	60032122	※1
8	Worm shaft assembly	1	60032132	Model 600
	Worm shaft assembly	1	60030931	Model 1000
9	Worm	1	60032116	※1
10	7th gear	1	60032114	Model 600 ※1
	7th gear	1	60030676	Model 1000 ※1
11	Collar E	1	60032120	Model 600
	Collar E	1	60032121	Model 1000
12	Gear assembly	1	60030933	Model 600
	Gear assembly	1	60030626	Model 1000
13	1st gear	1	60032126	
14	Motor (DC24V)	1	61007883	15W 5000rpm ★
18	Screw	4	6C530514	SP-5x14 with WS
19	Spring pin	1	6B022518	PR-2.5x18
20	Spring pin	1	6B022512	PR-2.5x12
21	Spring pin	1	6B022514	PR-2.5x14
22	Screw	2	6C530418	SP-4x18 with WS
23	Screw	4	6C530415	SP-4x15 with WS
24	Screw	2	6C530412	SP-4x12 with WS

※1 It is necessary to drill and pin the holes to match the actual product.

10.4 Control panel

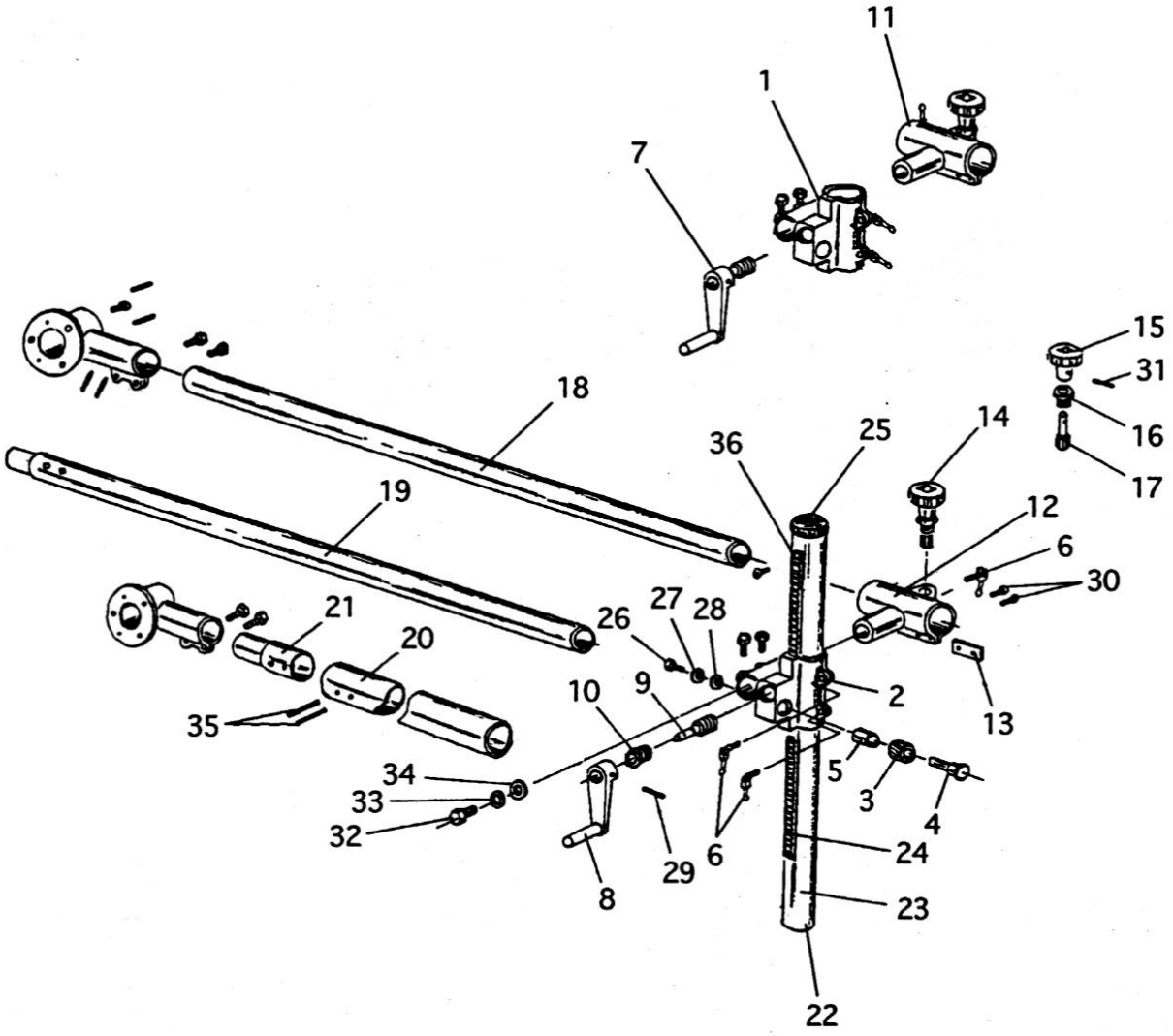




Control panel

Item No.	Part name	Q'ty	Stock No.	Remarks
1	Control box	1	60032152	
2	Control panel	1	60030936	
3	Variable resistor	1	60030745	50 KΩ
4	Speed adjuster	1	60030980	
5	Switch	1	60031458	S-43
6	Nut for dust protector	1	60032480	
7	Cap for dust protector	1	60032431	
8	Fuse holder	1	64000019	★
9	Fuse	1	60030707	1A
10	Controller	1	69000105	
12	Terminal	1	60031666	2P
13	Metal socket	1	6N100061	3P AC100V
	Metal socket	1	6N100062	4P AC220V - AC240V
14	Cabtyre code ass'y(3P)	1	61004264	3P AC100V
	Cabtyre code ass'y(4P)	1	61004265	4P AC220V - AC240V
	Cabtyre code ass'y(4P)	1	61004271	DIN type
	Cabtyre code ass'y(3P)	1	61004272	No plug type
	Cabtyre code ass'y(4P) CEtype	1	61005384	KE only DIN type
	Cabtyre code ass'y(3P) CEtype	1	61005385	KE only No plug
15	Metal plug	1	6N100056	3P AC100V
	Metal plug	1	6N100057	4P AC220V - AC240V
16	Cabtyre code(5M)	1	61004458	
	Cabtyre code(5M) CEtype	1	61005393	KE only
17	Rubber plug	1	60030280	
	DIN plug	1	64000183	
19	Screw	6	6C520408	SP-4×8
20	Screw	1	6C510310	SM-3×10
	Nut	1	6D010030	NH-3 ★
21	Screw	2	6C510306	SM-3×6
22	Screw	2	6C530412	SP-4×12 (with WS) ★
23	Bracket	1	61001067	
24	Spacer	2	6R020001	
25	Isolation washer	2	60036374	
26	Screw	2	6C530306	SP-3x6 (with WS) ★
27	Screw	2	6C520310	SP-3x10
28	Trans former	1	61000472	AC100V - AC220V
	Trans former	1	61000672	AC230V - AC240V

10.5 Vertical-horizontal adjusting holder



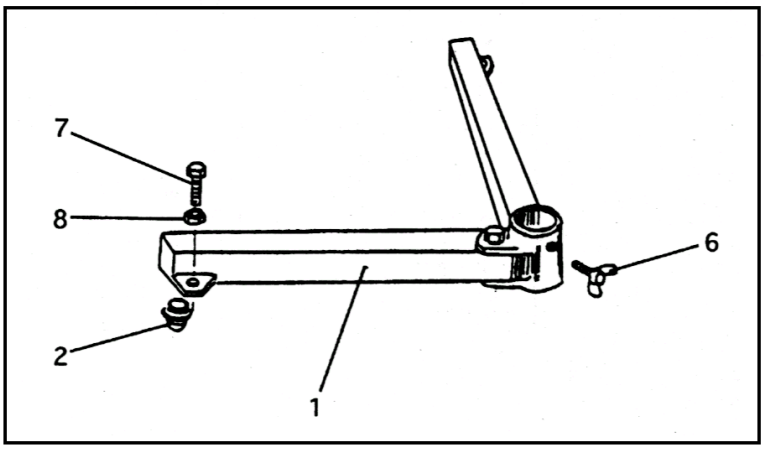
Vertical-horizontal adjusting holder

Item No.	Parts Name	Q'ty	Stock No.	Remarks	
1	Positioner holder assembly	1	60030989		
2	Positioner holder	1	60030982		
3	G-gear	1	60030945		
4	G-gear shaft	1	60030946		
5	G-collar	1	60030947		
6	Crank handle	3	60032211	M8x25	
7	Up/Down feed assembly	1	60032133		
8	Handle	1	60032529		※1
9	G-pinion	1	60030948		※1
10	G-pinion metal	1	60030949		
11	Arm adjusting holder assembly	1	60032128	Model 600	
	Arm adjusting holder assembly	1	60032130	Model 1000	
12	Arm adjusting holder	1	60032129	Model 600	
	Arm adjusting holder	1	60030981	Model 1000	
13	Key	1	60030954		
14	Cross feed handle assembly	1	60030316		
15	Handle	1	60030317	Diameter 50mm	※1
16	Pinion metal	1	60030318		
17	Pinion	1	60030319		※1
18	Arm	1	60032127	Model 600	
19	Arm assembly	1	60030944	Model 1000	
20	Arm (A)	1	60030942	Model 1000	※1
21	Arm (B)	1	60030943	Model 1000	※1
22	Pole assembly	1	60030990	With rack	
23	Pole	1	60030951		
24	Rack	1	60030952		
25	Rubber cap	1	60030953		
26	Screw	1	20517398-Y	M8x15	★
27	Washer spring	1	6D510080	WS-8	
28	Washer flat	1	6D500080	WF-8	
29	Spring pin	1	6B023030	PR-3x30	
30	Screw	2	6C520418	SP-4x18	
31	Spring pin	1	6B022516	PR-2.5x16	
32	Hexagon bolt	1	6C022030	BH-20x30	
33	Washer spring	1	6D510020	WS-20	
34	Washer flat	1	60032191		
35	Spring pin	2	6B024040	PR-4x40	
36	Screw	2	6C500512	SF-5x12	

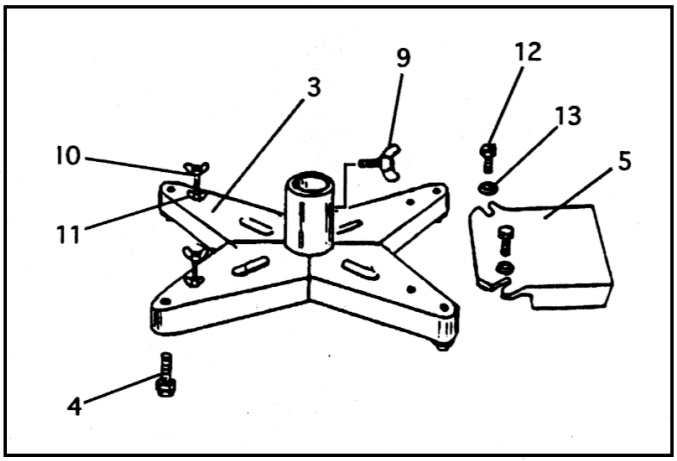
※1 It is necessary to drill and pin the holes to match the actual product.

10.6 Carriage

Model 600



Model 1000



Item No.	Part name	Q'ty	Stock No.	Remarks
1	Leg assembly	1	60032131	
2	Caster	3	60032134	
3	Carriage assembly	1	60030708	
4	Idle wheel unit	4	30030709	
5	Weight	1	60030903	
6	Wing bolt	1	60032156	3/8x25 ★
7	Hexagon bolt	3	6C011045	BH-10x45
8	Hexagon nut	3	6D010100	NH-10
9	Wing bolt	1	6C110825	BS-8x25
10	Wing bolt	2	6C111130	BS-10x130
11	Wing nut	2	6D080100	NB-10 ★
12	Hexagon bolt	2	6C011045	BH-10x45
13	Washer flat	2	6D500100	WF-10 ★

11 Cutting data

102 (STANDARD SPEED) for Acetylene

PLATE THICKNESS (mm)	TIP SIZE	CUTTING SPEED (mm/min)	OXYGEN PRESSURE (kg/c ㎡) / (Mpa)		FUEL GAS PRESSURE (kg/c ㎡) / (Mpa)	KERF WIDTH (mm)
			CUTTING	PREHEAT		
3	00	680	1.5 / 0.15	1.5 / 0.15	0.2 / 0.02	1.0
6	0	610	2.0 / 0.2	2.0 / 0.2	0.2 / 0.02	1.3
10	0	560	2.0 / 0.2	2.0 / 0.2	0.2 / 0.02	1.5
12.5	1	530	2.5 / 0.25	2.5 / 0.25	0.2 / 0.02	1.8
19	2	460	3.0 / 0.3	3.0 / 0.3	0.25 / 0.025	2.0
25	2	430	3.0 / 0.3	3.0 / 0.3	0.25 / 0.025	2.0
38	3	355	3.0 / 0.3	3.0 / 0.3	0.25 / 0.025	2.3
50	4	320	3.0 / 0.3	3.0 / 0.3	0.25 / 0.025	2.8
60	5	280	4.0/0.4	4.0/0.4	0.3/0.03	3.0
75	5	250	4.0/0.4	4.0/0.4	0.3/0.03	3.0
100	6	200	4.0/0.4	4.0/0.4	0.3/0.03	3.6
125	6	180	4.0/0.4	4.0/0.4	0.4/0.04	3.6
150	7	150	4.5/0.45	4.5/0.45	0.4/0.04	4.1
200	7	130	4.5/0.45	4.5/0.45	0.4/0.04	4.3
250	8	80	4.5/0.45	4.5/0.45	0.4/0.04	5.6
300	8	50	4.5/0.45	4.5/0.45	0.4/0.04	6.6

102-D7 (HIGH SPEED) for Acetylene

PLATE THICKNESS (mm)	TIP SIZE	CUTTING SPEED (mm/min)	OXYGEN PRESSURE (kg/c ㎡) / (Mpa)		FUEL GAS PRESSURE (kg/c ㎡) / (Mpa)	KERF WIDTH (mm)
			CUTTING	PREHEAT		
3	00	800	7.0 / 0.7	1.5 / 0.15	0.2 / 0.02	0.8
6	0	740		2.0 / 0.2	0.2 / 0.02	1.0
10	0	680		2.0 / 0.2	0.2 / 0.02	1.3
12.5	1	630		2.5 / 0.25	0.2 / 0.02	1.3
19	2	560		3.0 / 0.3	0.25 / 0.025	1.5
25	2	510		3.0 / 0.3	0.25 / 0.025	1.8
38	3	460		3.0 / 0.3	0.2 5/ 0.025	2.0
50	4	410		3.0 / 0.3	0.2 5/ 0.025	2.6
60	5	360		4.0/0.4	0.3/0.03	2.8
75	5	320		4.0/0.4	0.3/0.03	2.8
100	6	250		4.0/0.4	0.3/0.03	3.3
125	6	230		4.0/0.4	0.3/0.03	3.6
150	7	180		4.5/0.45	0.4/0.04	3.6
200	7	140		4.5/0.45	0.4/0.04	4.6
250	8	100		4.5/0.45	0.4/0.04	5.1
300	8	80		4.5/0.45	0.4/0.04	6.1

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 (kg/c㎡) / (Mpa)		FUEL GAS PRESSURE (kg/c㎡) / (Mpa)	KERF WIDTH (mm)
			CUTTING	PREHEAT		
3	00	680	1.5 / 0.15	1.5 / 0.15	0.2 / 0.02	1.0
6	0	610	2.0 / 0.2	2.0 / 0.2	0.2 / 0.02	1.3
10	0	560	2.0 / 0.2	2.0 / 0.2	0.2 / 0.02	1.5
12.5	1	530	2.5 / 0.25	2.5 / 0.25	0.2 / 0.02	1.8
19	2	460	3.0 / 0.3	3.0 / 0.3	0.2 / 0.02	2.0
25	2	430	3.0 / 0.3	3.0 / 0.3	0.2 / 0.02	2.0
38	3	355	3.0 / 0.3	3.0 / 0.3	0.2 / 0.02	2.3
50	4	320	3.0 / 0.3	3.0 / 0.3	0.25 / 0.025	2.8
60	5	280	4.0/0.4	4.0/0.4	0.3/0.03	3.0
75	5	250	4.0/0.4	4.0/0.4	0.3/0.03	3.0
100	6	200	4.0/0.4	4.0/0.4	0.350.035	3.6
125	6	180	4.0/0.4	4.0/0.4	0.35.035	3.6
150	7	150	4.5/0.45	4.5/0.45	0.4/0.04	4.1
200	7	130	4.5/0.45	4.5/0.45	0.4/0.04	4.3
250	8	80	4.5/0.45	4.5/0.45	0.4/0.04	5.6
300	8	50	4.5/0.45	4.5/0.45	0.4/0.04	6.6

106-D7 (HIGH SPEED) for Propane

PLATE THICKNESS (mm)	TIP SIZE	CUTTING SPEED (mm/min)	OXYGEN PRESSURE (kg/c㎡) / (Mpa)		FUEL GAS PRESSURE (kg/c㎡) / (Mpa)	KERF WIDTH (mm)
			CUTTING	PREHEAT		
3	00	800	7.0 / 0.7	1.5 / 0.15	0.2 / 0.02	0.8
6	0	740		2.0 / 0.2	0.2 / 0.02	1.0
10	0	680		2.0 / 0.2	0.2 / 0.02	1.3
12.5	1	630		2.5 / 0.25	0.2 / 0.02	1.3
19	2	560		3.0 / 0.3	0.2 / 0.02	1.5
25	2	510		3.0 / 0.3	0.2 / 0.02	1.8
38	3	460		3.0 / 0.3	0.2 / 0.02	2.0
50	4	410		3.0 / 0.3	0.2 / 0.02	2.6
60	5	360		4.0/0.4	0.25.025	2.8
75	5	320		4.0/0.4	0.25.025	2.8
100	6	250		4.0/0.4	0.3/0.03	3.3
125	6	230		4.0/0.4	0.3/0.03	3.6
150	7	180		4.5/0.45	0.3/0.03	3.6
200	7	140		4.5/0.45	0.3/0.03	4.6
250	8	100		4.5/0.45	0.4/0.04	5.1
300	8	80		4.5/0.45	0.4/0.04	6.1

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.

IK-70 (Small Circle Cutter)

OPERATION MANUAL

Date of issue:	Feb.1996
2nd	Jun.2005
3rd	Sep.2005
4th	May.2007
5th	Mar.2008
6th	Nov.2008
7th	Dec.2008
8th	Feb.2009
9th	Sep.2010
10th	Dec.2010
11th	Jun.2011
12th	Dec.2011
13th	Nov.2012
14th	Aug.2013
15th	Jan.2015
16th	Nob.2016
17th	Jul.2017
18th	Aug.2018
19th	Mar.2020
20th	Nov.2020

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