INSTRUCTION MANUAL FOR PLASMA CUTTER

Operating Instructions

Plasma 60/100P

CE

Contents

RECOGNIZE SAFETY INFORMATION

The symbols shown in this section are used to Identify potential hazards When you see a safety symbol in this manual or on your machine. Understand the potential for personal injury, and follow the related Instructions to avoid the hazard.

Read carefully all safety messages in this manual and safety labels on your machine.

- Keep the safety labels on your machine in good condition. Replace missing or damaged labels immediately.
- Learn how to operate the machine and how to use the controls properly, Do not let anyone operate It without instruction.
- Keep your machine In proper working condition Unauthorized modifications to the machine may affect safety and machine service life.

DANGER WARNING CAUTION

A signal word DANGER or WARNING is used with a safety symbol DANGER identifies the most serious hazards

- DANGER and WARNING safety labels are located on your machine near specific hazards.
- WARNING safety messages precede related Instructions In this manual that may result In injury or death If not followed correctly.
- CAUTION safety messages precede related Instructions in this manual that may result in damage to equipment if not followed correctly

CUTTING CAN CAUSE FIRE OR EXPLOSION

Fire Prevention

- Be sure the area is safe before doing any cutting. Keep a fire extinguisher nearby.
- Remove all flammables within 35 feet (10 m) of the cutting area.
- Quench hot metal or allow it to cool before handling or before letting It touch combustible materials.
- Never cut containers with potentially flammable materials inside - they must be emptied and properly cleaned first.
- Ventilate potentially flammable atmospheres before cutting.
- When cutting with oxygen as the plasma gas. an exhaust ventilation system is required.

Explosion Prevention

- Do not use the plasma system if explosive dust or vapours may be present
- Do not cut pressurized cylinders, pipes or any closed container.
- Do not cut containers that have held combustible materials.

WARNING

Explosion Hazard
Argon-Hydrogen and Methane

Hydrogen and methane are flammable gases that present an explosion hazard. Keep flames away from cylinders and hoses that contain methane or hydrogen mixtures Keep flames and sparks away from the torch when using methane or argon-hydrogen plasma

WARNING

Hydrogen Detonation with Aluminum Cutting

- When cutting aluminum underwater. or With the water touching the underside of the aluminum, free hydrogen gas may collect under the workpiece and detonate during plasma cutting operations.
- Install an aeration manifold on the floor of the water table to eliminate the possibility of hydrogen detonation. Refer to the Appendix section of this manual for aeration manifold details.

ELECTRIC SHOCK CAN KILL

Touching live electrical parts can cause a fatal shock or severe burn .

- Operating the plasma system completes an electrical circuit between the torch and the workpiece. The workpiece and anything touching the workpiece are part of the electrical circuit.
- Never touch the torch body, workpiece or the water In a water table when the plasma system is operating.

Electric Shock Prevention

All R-Tech plasma systems use a high voltage in the cutting process (240v to 4145 VDC are common). Take the following precautions when operating this system:

Wear Insulated gloves and boots, and keep your body and clothing dry.

- Do not stand, Sit or lie on- or touch- any wet surface when using the plasma system.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground. If you must work in or near a damp area, use extreme caution.
- Provide a disconnect switch close to the power supply with properly sized fuses. This switch allows the operator to turn off the power supply quickly In an emergency situation.
- When using a water table, be sure that It is correctly connected to earth ground.
- Install and ground this equipment according to the instruction manual and In accordance with national and local codes.
- Inspect and replace any worn or damaged torch leads
- Inspect the input power cord frequently for damage or cracking of the cover. Replace a damaged power cord immediately. **Bare wiring can kill.**
- Do not pick up the workpiece, including the waste cutoff ,while you cut. Leave the workpiece in place or on the workbench with the work cable attached during the cutting process.
- Never bypass or shortcut the safety interlocks
- Before removing any power supply or system enclosure cover, disconnect electrical input power. Wait 5 minutes alter disconnecting the main power to allow capacitors to discharge
- Before checking, cleaning or changing torch parts disconnect the main power or unplug the power supply
- Never operate the plasma system unless the power supply covers are in place. Exposed power supply connections present a severe electrical hazard.

STATIC ELECTRICITY CAN DAMAGE CIRCUIT BOARDS

Use proper precautions when handing printed circuit boards.

- Store PC boards in anti-static containers.
- Wear a grounded wrist strap when handing PC boards.

TOXIC FUMES CAN CAUSE INJURY OR DEATH

The plasma arc by itself is the heat source used for cutting. Accordingly, although the plasma arc has not been identified as a source of toxic fumes, the material being cut can be a source of toxic fumes or gases that deplete oxygen.

Fumes produced vary depending on the metal that is cut. Metals that may release toxic fumes include, but are not limited to, Stainless steel, Carbon steel, Zinc (galvanized) and copper.

In some cases, the metal may be coated with a substance that could release toxic fumes. Toxic coatings include, but are not limited to, Lead (in some paints), Cadmium (in some paints and fillers) and Beryllium.

Gases produced by plasma cutting vary based on the material to be cut and the method of cutting, but may include ozone, oxides of nitrogen, hexavalent chromium, hydrogen and other substances if such are contained in or released by the material being cut.

Caution should be taken to minimize exposure to fumes produced by any industrial process. Depending upon the chemical composition and concentration of the fumes (as well as other factors such as ventilation) there may be a risk of physical illness.

It is the responsibility of the equipment and site owner to test the air quality in the area where the equipment is used and to ensure that the air quality in the workplace meets all local and national standards and regulations.

The air quality level in any relevant workplace depends on site-specific variables such as:

- Table design (wet, dry, underwater)
- Material composition, surface finish and composition of coatings.
- Volume of material removed.
- Duration of cutting or gouging.
- Size.: air volume ventilation and filtration of the work area.
- Personal protective equipment
- Number of welding and cutting systems in operation.
- Other site processes that may produce fumes.

If the workplace must conform to national or local regulations only monitoring or testing done at the site can determine whether the site is above or below allowable levels.

To reduce the risk of exposure to fumes:

- Remove all coating and solvents from the metal before cutting .
- Use local exhaust ventilation to remove fumes from the air.
- Do not inhale fumes. Wear an air-supplied respirator when cutting any metal coated with, containing, or suspected to contain toxic elements.
- Assure that those using welding or cutting equipment as well as air-supplied respiration devices, are qualified and trained in the proper use of such equipment
- Never cut containers with potentially toxic materials inside. Empty and properly clean the container first.
- Monitor or test the air quality at the site as needed.
- Consult with a local expert to implement a site plan to ensure safe air quality .

A PLASMA ARC CAN CAUSE INJURY AND BURNS

Instant–on Torches

The plasma arc comes on immediately when the torch switch is activated.

The plasma arc will cut quickly through gloves and skin.

- Keep away from the torch tip.
- Do not hold metal near the cutting path.
- Never point the torch toward yourself or others.

ARC RAYS CAN BURN EYES AND SKIN

Eye Protection

Plasma arc rays produce intense visible and invisible ultraviolet and infrared rays that can burn eyes and skin.

- Use eye protection in accordance with applicable national or local codes.
- Wear eye protection: safety glasses or goggles with side shields, or a welding helmet with appropriate lens shading to protect your eyes from the arc's ultraviolet and infrared rays.

Lens Shade ISO 4850

Arc Current	AWS (USA)	
Up to 100A	No.8	No.11
100-200A	No.10	No.11-12
200-400A	No.12	No.13
Over 400A	No.14	No.14

Skin Protection

Wear protective clothing to protect against burns caused by ultraviolet light, sparks and hot metal.

- Gauntlet gloves, safety shoes and hat.
- Flame-retardant clothing to cover all exposed areas.
- Cuffless trousers to prevent entry of sparks and slag.
- Remove any combustables, such as a butane lighter or matches, from your pockets before cutting.

Cutting Area

Prepare the cutting area to reduce reflection and transmission of ultraviolet light:

- Paint walls and other surfaces with dark colours to reduce reflection.
- Use protective screens or barriers to protect others from flash and glare.
- Warn others not to watch the arc. Use placards or signs.

GROUNDING SAFETY

Input Power

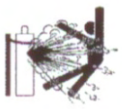
Work Cable
Attach the work cable securely to the workpiece or the work table with good metal-to-metal contact. Do not connect it to the piece that will fall away when the cut is complete.

Work Table
Connect the work table to an earth ground, in accordance with appropriate national or local electrical codes.

- Be sure to connect the power cord ground wire to the ground in the disconnect box.
- If installation of the plasma system Involves connecting the power cord to the power supply, be sure to connect the power cord ground wire properly.
- Place the power cord's ground wire on the stud first, then place any other ground wires on top of the power cord ground. Fasten the retaining nut tightly.
- Tighten all electrical connections to avoid excessive heating.

COMPRESSED GAS EQUIPMENT SAFETY

- Never lubricate cylinder valves or regulators with oil or grease.
- Use only correct gas cylinders, regulators, hoses and fittings designed for the specific application.
- Maintain all compressed gas equipment and associated parts in good condition.
- Label and colour-code all gas hoses to identify the type of gas in each hose. Consult applicable national or local codes



GAS CYLINDERS CAN EXPLODE IF DAMAGED

Gas cylinders contain gas under high pressure. If damaged, a cylinder can explode

- Handle and use compressed gas cylinders in accordance with applicable national or local codes.
- Never use a cylinder that is not upright and secured in place.
- Keep the protective cap in place over valve except when the cylinder is in use or connected for use.
- Never allow electrical contact between the plasma arc and a cylinder.
- Never expose cylinders to excessive heat, sparks, slag or open flame
- Never use a hammer, wrench or other tool to open a stuck cylinder valve.

Controls and indicators

Front controls and LEDS

POWER

Power ON LED(green)
When illuminated, this LED indicates that the power switch has been set at I(ON)and that the safety interlocks are satisfied.

Temperature LED(yellow)
When illuminated, this LED indicates that the power supply temperature is outside the acceptable operating range

Gas pressure LED(yellow)
When illuminated, this LED indicates that the gas pressure is below 40 psi(2.8bar).Correct this condition before you continue.

Torch cap LED(yellow)
When illuminated, this LED indicates that the consumables are loose, improperly installed, or missing.

5 A

Amps adjustment knob
Use this knob to set the output current.

Rear Panel

The VP-60/100P have an ON/OFF rocker switch, a mains cable, air pressure regulator and PCL outlet for the attachment of the air line

ON (1) OFF (0) powerswitch
Activates the powersupply and its control circuits.

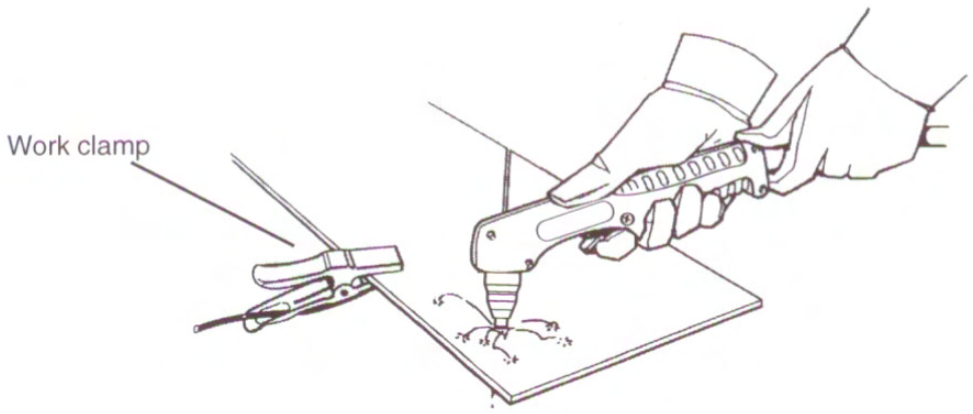
Air pressure regulator
With a screw type valve to allow for the setting of the correct air pressure.

PCL fitting
For connecting a suitable air line.

Mains Cable
Please ensure the correct plug type is fitted.

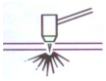
Attach the work clamp

The work clamp must be attached to the workpiece while you are cutting . Ensure that the work clamp and the workpiece make good metal-to-metal contact . Attach the work clamp as close as possible to the area being cut to reduce exposure to electric and magnetic fields(EMF).
Do not attach the work clamp to the portion of the workpiece to be cut away.

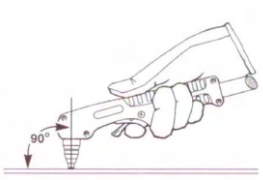


OPERATION

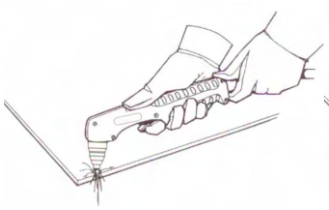
To start a cut from the edge of the workpiece



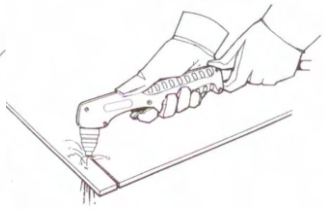
1 . With the work clamp attached to the workpiece hold the torch nozzle perpendicular to the edge of the workpiece.



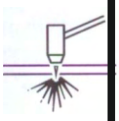
2.Press the torch trigger to start the arc. Pause at the edge until the arc has cut



3.Drag tho nozzle lightly across the workpieceto proceed with the cut

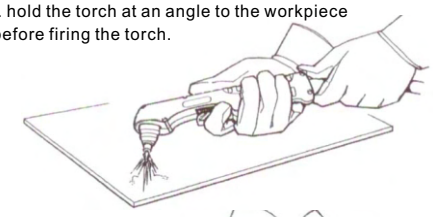


To pierce a workpiece

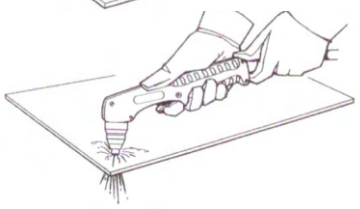


When firing the torch at an angle,sparks and hot metal will spray out from the nozzle . Point the torch away from yourself and others.

1.With the work clamp attached to the workpiece. hold the torch at an angle to the workpiece with the nozzle within 1/16 inch (1.5 mm) of it before firing the torch.

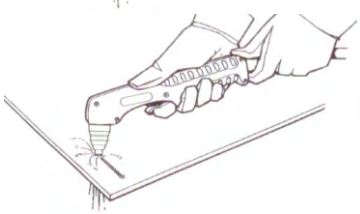


2.Fire the torch while still at an angle to the workpiece, then slowly rotate the torch to a perpendicular (90) position.

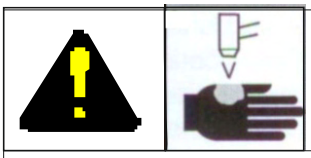


3. Hold the torch in place. When sparks exit from the bottom of the workpiece. the arc has pierced the material

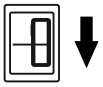
4.When the pierce is complete, drag the nozzlelightly along the workpiece to proceed with the cut



The consumables



WARNING
INSTANT-ON TORCHES
PLASMA ARC CAN CAUSE INJURY AND BURNS



The plasma arc comes on immediately when the torch trigger is activated.
Make sure the power is OFF before changing consumables.

To operate the torch, it must have a complete set of consumable parts installed: a retaining cap, swirl ring, electrode and cutting tip.

Replacement Consumables :

	VP-P60 (P80 TORCH)	**VP-P100 (PT-100 TORCH)**
ELECTRODE	RT-PT80-52558	RT-PT100-52556
CUTTING TIP	RT-PT80-51311.11	RT-PT100-51246.11 - (1.1MM) RT-PT100-51245.09 - (0.9MM) RT-PT100-51246.12 - (1.2MM) RT-PT100-51245.14 - (1.4MM)
RETAINING NOZZLE	RT-PT80-60510	RT-PT100-60500 RT-PT100-60501 - (80 - 100AMP)
DOUBLE POINTED SPACER	RT-PT80-60434	RT-PT100-60444
GAS DIFFUSER	RT-PT80-60027	RT-PT100-60025 - (30 - 70AMP) RT-PT100-60026 - (80 - 100AMP)
O-RING	RT-PT80-51620.60	RT-PT100-51190.41
COOLING TUBE	RT-PT80-09800.42	RT-PT100-09700.48
TORCH SWITCH	RT-PT80-07301.20	RT-PT80-07301.20
HANDLE AND SWITCH	RT-PT80-09705	RT-PT80-09705
TORCH HEAD	RT-PT80-09800	RT-PT100-09700

Main Technical Specifications

VP-P60 60AMP PLASMA CUTTER

Input Voltage	415v 3 PHASE
Rated Duty Cycle(%)	35 @ 60 AMPS
Rated Input Current(A)	17.6 amps
Working Air Pressure	65 - 75 psi Air Flow Rate: 110LPM
Ordinary Steel	21mm
Stainless Steel & Aluminium	16mm
Severance Cut	30mm
Dimensions(mm)	570 x 330 x 600
Gross Weight(kg)	18

VP-P100 100AMP PLASMA CUTTER

Input Voltage	415v 3 PHASE
Rated Duty Cycle(%)	35 @ 200 AMPS
Rated Input Current(A)	17.6 amps
Working Air Pressure	75 - 80 psi Air Flow Rate: 200LPM
Ordinary Steel	31mm
Stainless Steel & Aluminium	24mm
Severance Cut	30mm
Dimensions(mm)	570 x 330 x 600
Gross Weight(kg)	22