



INSTRUCTIONS FOR
PLASMA CUTTER INVERTER 40AMP 230V
MODEL NO: **PP40E**

Thank you for purchasing a Sealey product. Manufactured to a high standard, this product will, if used according to these instructions, and properly maintained, give you years of trouble free performance.

IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS & CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. KEEP THESE INSTRUCTIONS SAFE FOR FUTURE USE.



Refer to
Instruction
Manual



Fire
Hazard



Arc Rays
Wear protective
Eye protection



Electric Shock
Hazard



Fumes / Gases
Use in ventilated
area



Hot surfaces
Wear Protective
Gloves



Magnetic Fields
Produced

1. SAFETY

1.1. Electrical Safety

- WARNING!** It is the user's responsibility to check the following:
 - Check all electrical equipment and appliances to ensure that they are safe before using. Inspect power supply leads, plugs and all electrical connections for wear and damage. Sealey recommend that an RCD (Residual Current Device) is used with all electrical products. If the Plasma cutter is used in the course of business duties, it must be maintained in a safe condition and routinely PAT (Portable Appliance Test) tested.
 - Electrical safety information, it is important that the following information is read and understood.
- ✓ Ensure that the insulation on all cables and on the appliance is safe before connecting it to the power supply, regularly inspect power supply cables and plugs for wear or damage and check all connections to ensure that they are secure.
- ✓ Ensure that the voltage rating on the appliance suits the power supply to be used and that the correct plug is fitted, with the correct rated supply.
- WARNING!** The electrical installation of the plasma cutting unit must only be carried out by a qualified electrician.
- ✗ **DO NOT** pull or carry the appliance by the power cable.
- ✗ **DO NOT** pull the plug from the socket by the cable.
- ✗ **DO NOT** use worn or damaged cables, plugs or connectors. Ensure that any faulty item is repaired or replaced immediately by a qualified electrician.
- ✓ If the cable or plug is damaged during use, switch off the electricity supply and remove from use.

A) Connect the GREEN/YELLOW earth wire to the earth terminal 'E'.

B) Connect the BROWN live wire to the live terminal 'L'.

C) Connect the BLUE neutral wire to the neutral terminal 'N'.

Ensure that the cable outer sheath extends inside the cable restraint and that the restraint is tight.

230V 1ph
THE PLASMA INVERTER
MUST BE CONNECTED TO A
32AMP SUPPLY FOR
MAXIMUM OUTPUT

1.2. GENERAL SAFETY

- WARNING!** If using a generator to power the inverter. The generator must be self regulating and stable with regard to voltage, waveform and frequency. The output must be greater than the power consumption of the inverter. If any of these requirements are not met the electronics within the inverter may be affected.
- WARNING!** The use of an unregulated generator may be dangerous and will invalidate the warranty.
- WARNING!** The inverter may produce voltage surges in the mains supply which can damage other sensitive equipment (e.g. computers). It is recommended that the inverter is connected to a power supply that does not feed any sensitive equipment.
- ▲ **DANGER!** Direct contact with the plasma inverter circuit or torch is dangerous. You **MUST** unplug the inverter from the mains power supply, before connecting or disconnecting cables or performing maintenance or service.
- ✓ Keep the plasma inverter, cables and torch in good condition. *Take immediate action to repair or replace damaged parts.*
- ✓ Use recommended parts and accessories only. *Unapproved parts may be dangerous and will invalidate the warranty.*
- ✓ Only use the cutting torch provided and ensure that any replacement is of the same type.
- ✓ Use the plasma inverter in a suitable work area. Ensure that the area has adequate ventilation as cutting fumes are harmful. For enclosed areas we recommend the use of an air and smoke extraction system. If you are not able to provide adequate extraction and/or ventilation, wear a respirator suitable for protection against toxic fumes, smoke and gases.
- ✓ Ensure that there are no obstructions to the flow of clean cool air and ensure that there are no conductive dusts, corrosive vapours or humidity which could enter the unit and cause serious damage.
- WARNING:** Use a welding head shield to protect your eyes and avoid exposing skin to the ultraviolet rays given off by the electric arc. Always wear protective clothing, insulating gloves and shoes. Keep all protective items clean and undamaged.
- ✓ Wear correct fitting protective clothing, remove watches, rings and other loose jewellery and contain long hair.
- ✓ Stand correctly, keeping a good footing and balance and ensure that the floor is not slippery. Wear non-slip shoes.
- ✓ Ensure that the work piece is correctly secured before cutting.
- ✓ Avoid unintentional contact with the work piece. Accidental or uncontrolled switching on of the torch may be dangerous and will wear

the nozzle.

- ✓ Keep unauthorised persons away from the work area. Any persons working within the area must wear the same protective items as the operator.
- × **DO NOT** use cables and torch if the insulation is worn or connections are loose.
- × **DO NOT** attempt to fit any unauthorised torch or other component to the plasma cutting unit.
- × **DO NOT** cut surfaces that are painted, galvanic coated, oily or greasy.
- × **DO NOT** use cables over 10m in length.
- × **DO NOT** connect the return cable to any structure which is not part of the work piece (other than a metal work bench supporting the work piece).
- ▲ **DANGER! DO NOT** cut near flammable materials - solids, liquids, or gases. Remove all flammable materials such as waste rags etc.
- × **DO NOT** cut containers or pipes which have held flammable materials - gases, liquids or solids. **DO NOT** cut materials that have been cleaned with chlorinated solvents (or near such solvents) as vapours from the arc action may produce toxic gases.
- × **DO NOT** operate the inverter while under the influence of drugs, alcohol or intoxicating medication, or if tired.
- × **DO NOT** use the plasma inverter for a task it is not designed to perform.
- × **DO NOT** operate the plasma inverter if any parts are damaged or missing as this may cause failure and/or personal injury.
- × **DO NOT** strain or bend the cables, protect them from sharp or abrasive items and **DO NOT** stand on them.
- ✓ Protect cables from heat. Long lengths of slack must be gathered and neatly coiled. **DO NOT** place cables where they will endanger others.
- × **DO NOT** hold unsecured work piece in your hand.
- × **DO NOT** get the plasma inverter wet or use in damp or wet locations or areas where there is condensation.
- × **DO NOT** touch the work piece close to the cut as it will be very hot. Allow to cool. The cut edge of the work piece will also be very sharp.
- × **DO NOT** touch the torch immediately after use. Allow the torch to cool.
- ✓ When not in use store the unit in a safe, dry, childproof area.

2. INTRODUCTION

Inverter power supply fitted with plasma cutter control circuitry. Features digital Amp display and 2 LEDs on the front panel indicating overload and mains power. Supplied with a 4.6mtr plasma torch which has a regulated push button arc, to avoid having to touch the work piece, 2mtr earth cable and 2mtr gas hose and regulator. Ideal for cutting steel, stainless steel, galvanised steel, aluminium, copper and brass. IP21S Rated.

3. SPECIFICATIONS

Model NO:.....	PP40E
Power Output:.....	8-40A
Duty Cycle:.....	60%@40A
.....	100%@30A
Maximum Cutting Thickness:	11mm
Air Requirements:	250lts./min
Air Pressure	43.5-58psi
Absorbed Power:.....	6.2kW
Supply:.....	230V
Insulation:.....	F
Protection:.....	IP21S
Weight:.....	9.6Kg
Consumables	PP40E.E- Electrode, short Pack of 5
.....	PP40E.N- Nozzle, short Pack of 5
.....	PP40E.D- Diffuser Pack of 5
.....	PP40E.SC- Safety cap Pack of 2

4. SET UP AND CONTROLS

- **WARNING!** Before operating the machine ensure that you read, understand and apply Section 1 safety instructions. Ensure that the machine is disconnected from the power supply before moving or changing accessories.
- 4.1. **Air line**
- 4.1.1. Attach air regulator to the unit as shown in fig.2/fig.3.
- 4.1.2. Attach a clean dry compressed air supply (requirements as in specifications) to the regulator positioned on the back of the unit.
- 4.2. **Torch lead**
- 4.2.1. Screw fitting to the air line connection nipple (fig.1.8). Then slide outer sleeve over connection and tighten (Hand tight).
- 4.2.2. Pull the collar of the 2 pin plug back toward the cable and plug into the socket, observing the fit one way groove, screw collar over connection. On removal, remember to unscrew pull back the collar initially and then the plug. **DO NOT** remove by pulling the cable.
- 4.2.3. Remove the pilot arc terminal knob fully and place the eye of the red cable over the screw and clamp with terminal knob.
- 4.3. **Locating the inverter**
- 4.3.1. Ensure that the work area has a good airflow and that there is no dust, smoke or gas present.
- 4.3.2. Ensure that there is a minimum clearance of 500mm around the machine, and that there are no obstacles to prevent a cool airflow. Also check to ensure that the front outlet and rear grilles are not blocked.
- 4.3.3. When moving the machine, disconnect from the mains power supply and gather all cables safely.
- 4.4. **Connecting the return cable**
- 4.4.1. Check that there is a good electrical contact. **Caution:** Ensure that you have made good contact on oxidised or coated sheets.
- 4.4.2. Make the earth connection as close to the cutting area as possible.
 - × **DO NOT** connect to structures or objects, other than the metal work bench which is supporting the workpiece. To do so may damage the safety system and will give a poor cut.
 - × **DO NOT** make the earth connection to the part of the work piece that will be removed.
- 4.5. **Isolation switch**
- 4.5.1. The I/O (on/off) switch is located at the rear of the machine (fig.1.2) . A green LED will illuminate on the front panel (fig.1.1) indicating that mains power is present. The control and duty circuits are now live but the torch will remain in 'stand-by' mode until the air supply is connected and the torch button is pressed.

4.6. **Cutting regulator**

4.6.1. The cutting current is regulated by the knob/potentiometer on the front panel (fig.1.5).

4.7. **Thermal switch and mains voltage fault**

4.7.1. If the yellow LED (fig.1.3) on the front panel illuminates this indicates a mains voltage or thermal problem and the machine will be automatically shut down as a result of one of the following:

- a) The power transformer has overheated.
- b) There has been a decrease or increase in the mains voltage supplied to the machine.

When the safety switch is activated in this way the problem is normally self-rectifying, and dependant upon duty cycle time, see rating plate in section 9. The switch will re-set and the LED will go out and the machine is then ready for use again.

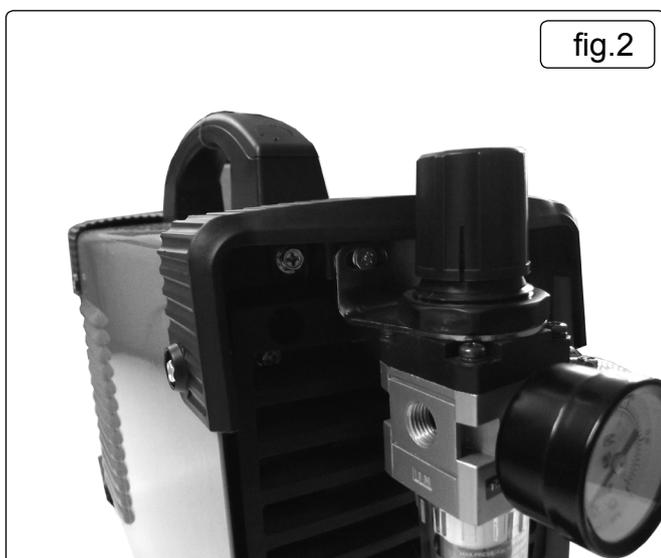
4.8. **Torch**

4.8.1. Although the machine and torch may be fully powered, the torch button is the only way to activate the cutting process.

4.8.2. To turn the cutting process on, the torch button must be fully depressed.

4.8.3. Release the button and the cutting cycle will stop immediately. The cooling air (post-air) will continue to flow for a further 5 seconds approximately.

- 1. POWER SUPPLY INDICATOR
- 2. ON / OFF SWITCH
- 3. WARNING OVER HEATING LAMP
- 4. DIGITAL CURRENT DISPLAY
- 5. CURRENT ADJUSTMENT
- 6. WORK PIECE CONNECTION
- 7. TWO PIN SOCKET
- 8. CONNECTION TO TORCH



5. OPERATION

- ❑ **WARNING!** Before operating the machine ensure that you read, understand and apply Section 1 safety instructions and that you have familiarised yourself with the controls. Ensure that the machine is disconnected from the power supply before moving or changing accessories.

5.1. Set-up (air supply connected in section 4)

- 5.1.1. Check that the earth cable is correctly clamped to the work piece or work bench.
- 5.1.2. Switch on the mains power supply. Switch on the machine by operating the I/O switch on the rear panel (fig.1.2).
- 5.1.3. Set the current regulation control (fig.1.5) to the required value.
- 5.1.4. Press the torch button and release to commence the flow of cooling air (post-air).
- 5.1.5. Allow the air flow to continue to remove any condensation from the torch. The air flow will automatically stop after approx. 5secs.
NOTE: Longer than standard nozzles and electrodes are available to improve accessibility in awkward cutting positions.

5.2. Cutting from the edge

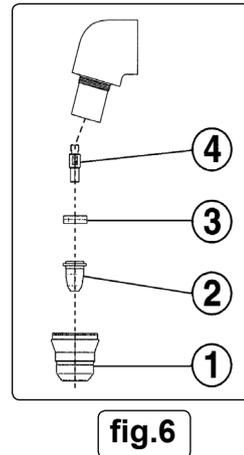
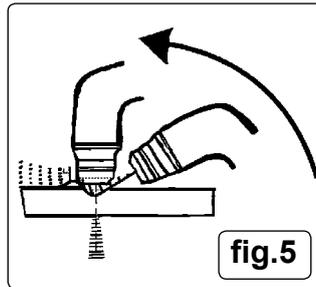
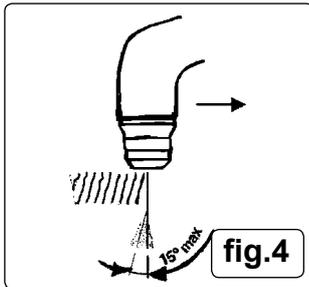
- 5.2.1. Bring the torch nozzle toward the edge of the work piece and hold it at 3mm above the cutting line.
- 5.2.2. Press and hold down the torch button. After about 1/5 of a second of pre-air, the pilot arc will be generated. If the distance between the torch nozzle and the work piece is correct, the arc will immediately jump to the work piece and the cutting process will begin.
- 5.2.3. Move the torch slowly and smoothly forward, on the surface of the work piece, along the cutting line.
- 5.2.4. Adjust the cutting speed according to the thickness of the material and the selected current.
- 5.2.5. Check the underside of the cut. The arc should make a 5 - 10° angle with the vertical in the opposite direction to the cutting direction (fig.4).

5.3. Cutting from the centre

- 5.3.1. Place the torch nozzle at an angle to the surface at the start-of-cut position (fig.5).
- 5.3.2. Initiate the pilot arc, then slowly and smoothly bring the torch head to the upright position. The arc will pierce the work piece and cutting can start.

5.4. Arc off

- 5.4.1. Release the torch button to switch off the arc. The post-air will continue to flow, cooling the nozzle.
- 5.4.2. Other reasons for the arc ceasing are:
 - a) The distance between the torch nozzle and work piece is too great.
 - b) You have completed a cut and have continued beyond the edge of a work piece.
 - c) The waste falls away from the work piece thus increasing the gap.



6. MAINTENANCE

- ▲ **DANGER!** Ensure that the machine is disconnected from the power supply before performing service or maintenance on any part of the unit, cables or torch.

6.1. The inverter

- ✗ **DO NOT** open the unit. Service and maintenance of the machine must only be undertaken by an authorised service agent.
- 6.1.1. Keep the machine clean by wiping with a soft cloth. Do not use abrasives.
- 6.1.2. Periodically check to ensure that the carrying handle is in good order and condition. If not replace it immediately.
- 6.1.3. Ensure that the front and rear air vents are not blocked.

6.2. Cables and leads

- 6.2.1. Check to ensure cables and leads are in good condition. If damaged, contact your authorised service agent.
- 6.2.2. Keep cables and leads clean. Do not use solvents.

6.3. Torch

Check torch regularly. Maintenance will depend on frequency and type of usage and is essential for correct and safe use of the torch.

- ❑ **WARNING!** Ensure that the torch is cool before attempting any maintenance. Always re-assemble the torch in the correct order as shown in (fig.6). Never use tools to tighten nozzle components, hand tighten only.

6.3.1. Manually dismantle the torch nozzle head.

6.4. Cap (fig.6.1)

Clean cap and check to ensure it is not damaged (including distortion, burns, cracks). If in any doubt, replace.

6.5. Electrode (fig.6.2)

Check the build-up on the emitting surface of the electrode. When the build-up is approximately 2mm replace the electrode.

NOTE: We recommend that the electrode and nozzle are changed at the same time.

6.5.1. Air distribution ring (fig.6.3)

Check that the ring is not burned or cracked and that the airflow holes are not obstructed. If damaged replace.

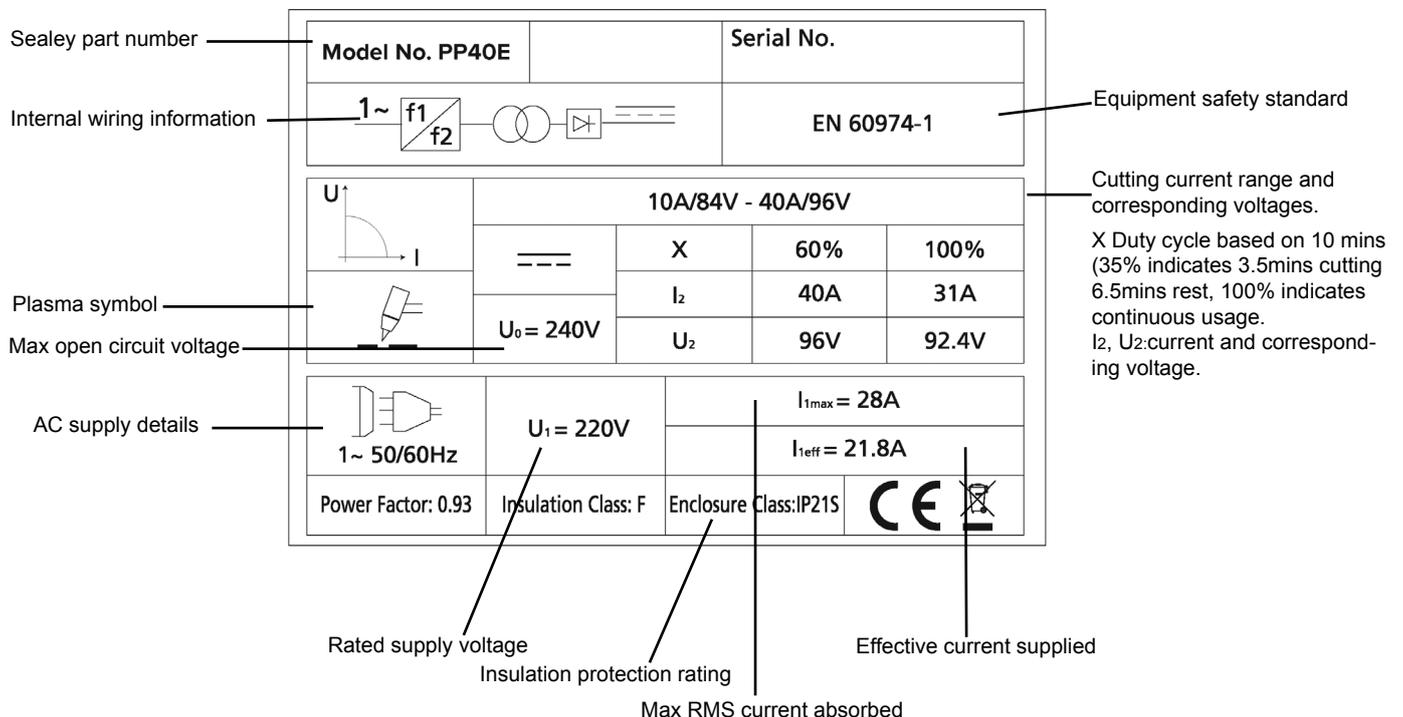
6.5.2. Nozzle (fig.6.4)

If the surface is oxidised, clean with extra fine abrasive paper. Check wear of the plasma arc hole and the inner and outer surfaces. If hole has widened, or nozzle is damaged in any way, replace it. The nozzle "V" crater should be 1.5mm in depth.

7. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	REMEDY
Insufficient penetration or excessive scoria settlement.	Cutting speed too fast. Touch angle too great. Work piece is too thick. Electrode and nozzle are worn out.	Slow the cutting speed. Adjust the torch angle. Confirm work piece thickness and re-check technical data. Replace electrode and nozzle.
Interruption of cutting arc.	Cutting speed too low. Excessive distance between torch and work piece. Electrode is worn out. Intervention of the protection system.	Increase the cutting speed. Decrease the distance between torch and work piece. Replace electrode and nozzle. Check warning lights and take appropriate action.
The torch is cutting at tilt when you wish it to be perpendicular.	Torch position not correct. Asymmetric wear of nozzle hole and/or wrong assembly of torch parts.	Re-align the torch. Check assembly (see fig.6) and change nozzle if necessary.
Excessive wear of nozzle and electrode.	Air pressure too low. Contaminated air (humidity-oil). Excessive pilot arc ignitions in the air. Nozzle holder damaged.	Increase air pressure. Check air supply system. Do not casually turn the torch on and off. Change the nozzle holder.

8. RATING PLATE



9. ELECTROMAGNETIC COMPATIBILITY

- 9.1. **THIS EQUIPMENT IS IN CONFORMITY WITH THE EUROPEAN STANDARD ON THE ELECTROMAGNETIC COMPATIBILITY OF ARC WELDING EQUIPMENT AND SIMILAR PROCESSES (e.g. ARC AND PLASMA CUTTING)**
- 9.2. **Protection against interference.** (E.M.C.) The emission limits in this standard may not, however, provide full protection against interference to radio and television reception when the equipment is used closer than 30m to the receiving antenna. In special cases, when highly susceptible apparatus is being used in close proximity, additional mitigation measures may have to be employed in order to reduce the electromagnetic emissions. At the same time there could occur some potential difficulties in having electromagnetic installed according to the following instructions.
- 9.3. **Installation and use.** The user is responsible for installing and using the equipment according to these instructions. If electromagnetic disturbances are detected, then it shall be the responsibility of the user of the equipment to resolve the situation with the technical assistance of the supplier. In some cases this remedial action may be as simple as earthing the circuit (see Note:). In other cases it could involve constructing an electromagnetic screen, enclosing the welding power source and the work, complete with associated sign
Note: The welding/cutting circuit may or may not be earthed for safety reasons. Changing the earthing arrangements should only be authorised by a person who is competent to assess whether the changes will increase the risk of injury, e.g. by allowing parallel welding/cutting circuit return paths which may damage the earth circuits of other equipment. Further guidance is given in IEC 974-13 Arc Welding Equipment - Installation and Use.'
- 9.4. **Assessment of area.** Before installing the equipment the user shall make an assessment of potential electromechanical problems in the surrounding area. The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.
The following shall be taken into account:
- Other supply cables, control cables, signalling and telephone cables, above, below and adjacent to the welding equipment.
 - Radio and television transmitters and receivers.
 - Computer and other control equipment.
 - Safety critical equipment, e.g. security monitoring of industrial equipment.
 - The health of people in the vicinity, e.g. persons fitted with a pacemaker or hearing aid.
 - Equipment used for calibration or measurement.
 - The immunity of other equipment in the environment. The user shall ensure that other equipment being used in the environment is compatible. This may require additional protective measures.
 - The time of day that welding and other activities are to be carried out.
- 9.5. **Mains supply.** The equipment should be connected to the mains supply according to these instructions. If interference occurs, it may be necessary to take additional precautions such as filtering of the mains supply. Consideration should also be given to shielding the supply cable of permanently installed equipment in metallic conduit or equivalent. This shielding should be connected to the power source so that good electrical contact is maintained between the conduit and the welding power source enclosure
- 9.6. **Maintenance of the equipment.** The equipment should be routinely maintained according to these instructions. All access and service covers should be closed and properly fastened when the welding equipment is in operation. The welding equipment should not be modified in any way except for those changes and adjustments covered in these instructions. In particular, the spark gaps of any arc striking and stabilising devices should be adjusted and maintained according to the instructions.
- 9.7. **Cables.** The welding/cutting cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.
- 9.8. **Equipotential bonding.** Bonding of all metallic components in the welding/cutting installation and adjacent to it should be considered. However, metallic components bonded to the work piece will increase the risk that the operator could receive a shock by touching these metallic components and the electrode at the same time. The operator should be insulated from all such bonded metallic components.
- 9.9. **Earthing of the work piece.** It is important that the work piece is separately bonded to earth in addition to the welder/inverter return cable. Where the work piece is not bonded to earth for electrical safety reasons or because of its size and position, e.g. ship's hull or building steelwork, a connection bonding the work piece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthing of the work piece increasing the risk of injury to others or damage to other electrical equipment. Where necessary, the connection of the work piece to earth should be made by a direct connection to the work piece, but in some countries where direct connection is not permitted, the bonding should be achieved by a suitable capacitance, selected according to national regulations.
- 9.10. **Screening and shielding.** Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening of the entire welding/cutting installation may be considered for special applications.

Parts support is available for this product. To obtain a parts listing and/or diagram, please log on to www.sealey.co.uk, email sales@sealey.co.uk or telephone 01284 757500.



Environmental Protection

Recycle unwanted materials instead of disposing of them as waste. All tools, accessories and packaging should be sorted, taken to a recycling centre and disposed of in a manner which is compatible with the environment.



WEEE Regulations

Dispose of this product at the end of its working life in compliance with the EU Directive on Waste Electrical and Electronic Equipment (WEEE). When the product is no longer required, it must be disposed of in an environmentally protective way. Contact your local solid waste authority for recycling information.

NOTE: It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.

IMPORTANT: No liability is accepted for incorrect use of this product.

WARRANTY: Guarantee is 12 months from purchase date, proof of which will be required for any claim.



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