



# 250A ARC WELDER 230/415V 3PH WITH ACCESSORY KIT MODEL NO: 250XTD

Thank you for purchasing a Sealey Power Welder. 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: BEFORE USING THIS PRODUCT, PLEASE READ THE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS, AND CAUTIONS. USE THIS 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.**

## INTRODUCTION

This instruction manual contains the information required to prepare your arc welding set for welding. For Individual model specifications refer to part 2. The instructions are not intended to show you how to become a welder. If you have no experience, we recommend that you seek training from an expert source. Arc welding is relatively easy to perform, but does require a steady hand and time practising with scrap metal, as it is only with continued practice that you will achieve the desired results.



Refer to  
instructions



Wear protective  
gloves



Wear protective  
clothing



Warning:  
Arc rays



Warning:  
Fumes and  
gases



Warning:  
Magnetic field



Warning:  
Fire risk



Wear protective  
footwear

## 1. SAFETY INSTRUCTIONS

### 1.1. ELECTRICAL SAFETY

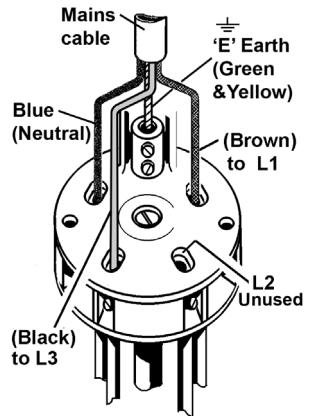
**□ WARNING!** It is the responsibility of the owner and the operator to read, understand and comply with the following:

You must check all electrical products, before use, to ensure that they are safe. You must inspect power cables, plugs, sockets and any other connectors for wear or damage. You must ensure that the risk of electric shock is minimised by the installation of appropriate safety devices. A Residual Current Circuit Breaker (RCCB) should be incorporated in the main distribution board. We also recommend that a Residual Current Device (RCD) is used. It is particularly important to use an RCD with portable products that are plugged into a supply which is not protected by an RCCB. If in any doubt consult a qualified electrician. You may obtain a Residual Current Device by contacting your Sealey stockist.

You must also read and understand the following instructions concerning electrical safety.

- 1.1.1. The **Electricity at Work Act 1989** requires that all portable electrical appliances, if used on business premises, are tested by a qualified electrician, using a Portable Appliance Tester (PAT), at least once a year.
- 1.1.2. The **Health & Safety at Work Act 1974** makes owners of electrical appliances responsible for the safe condition of those appliances and the safety of the appliance operators. **If in any doubt about electrical safety, contact a qualified electrician.**
- 1.1.3. Ensure that the insulation on all cables and on the appliance is safe before connecting it to the power supply. See 1.1.1. and 1.1.2. and use a Portable Appliance Tester.
- 1.1.4. Ensure that cables are always protected against short circuit and overload.
- 1.1.5. Regularly inspect power supply cables and plugs for wear or damage and check all connections to ensure that none is loose.
- 1.1.6. **Important:** Ensure that the voltage marked on the appliance matches the power supply to be used and that the plug is fitted with the correct fuse - see fuse rating at right.
- 1.1.7. **DO NOT** pull or carry the appliance by the power cable.
- 1.1.8. **DO NOT** pull the plug from the socket by the cable.
- 1.1.9. **DO NOT** use worn or damaged cables, plugs or connectors. Immediately have any faulty item repaired or replaced by a qualified electrician.

- 1.3 250XTD REQUIRES TO BE CONNECTED TO A 3 PHASE SUPPLY AND MUST HAVE AN APPROPRIATE PLUG FITTED.**
- WARNING!** Electrical installation of welder to a 3 phase 415Volt supply must only be carried out by a qualified electrician. Make sure the power supply cable is correctly connected to the Earth.
- 1.3.1** This product must be fitted with a 3 phase plug as shown on the right, and will require a minimum of 16AMPS per phase, (preferably 32AMP) electrical supply.  
You must contact a qualified Electrician to ensure an appropriately fused supply is available.  
Connect GREEN/YELLOW wire to Earth 'E'  
Connect BLUE wire to the NEUTRAL Terminal.  
Connect BROWN wire to L1 Terminal.  
L2 Terminal is in this instance, unused.  
Connect the BLACK wire to terminal L3.  
When completed, check there are no bare wires, that all wires have been connected correctly and the cable restraint is tight. (NOTE: The cable core colours found in the mains cable on this welder are consistent with Amendment 2 to BS7671:2001 which harmonised UK cable core colours with those used in Europe.)
- 1.3.2** DO NOT use this product with a standard extension cable. Only use ARMoured extension cable.



**1.4 GENERAL SAFETY**  **WARNING!** Arc welding produces sparks, fused metal projectiles and fumes which are dangerous.

- WARNING:** Unplug from the mains power supply before performing maintenance or service.
- ✓ Keep the welder and cables in good working order and condition. Take immediate action to repair or replace damaged parts.
  - ✓ Replace or repair damaged parts. Use genuine parts only, unauthorised parts may be dangerous and will invalidate the warranty.
  - ✓ Keep the welder clean for best and safest performance.
  - ✓ Locate welder in a suitable work area. Ensure area has adequate ventilation as welding fumes are harmful.
  - ✓ Keep work area tidy and free from unrelated materials. Also ensure work area has adequate lighting and a fire extinguisher is at hand.
- WARNING:** You **MUST** use an appropriate shaded lens welding face mask (contact your Sealey stockist for details). **DANGER!** Permanent 9\*eye damage may result if you do not use correct protection. Also wear safety welding gauntlets and dry, oil free safety protective clothing to protect yourself from sparks and hot droplets of fused metal. Cover exposed flesh to avoid potential burns from the ultraviolet rays of the arc. Use non-reflective welding curtains to protect other people in the area.
- ✓ Check you have good ventilation and that air can flow freely around the welder.
- ▲ DANGER!** Ensure no flammable or combustible materials are near work area. Welding containers or pipes which hold, or have held dangerous gases or substances may explode or burn. Materials cleaned with chlorinated solvents, or varnished surfaces pose danger of toxic fumes.
- ✓ Keep unauthorised persons at a safe distance from the work area. Persons within the work area are subject to the same dangers as the welder and must take the same precautions.
  - ✗ **DO NOT** weld on pressurised containers.
  - ✗ Remove ties, watches, rings and other jewellery and contain long hair.
  - ✗ **DO NOT** use the welder for any purpose other than that for which it is designed.
  - ✗ **DO NOT** use the welder in damp or wet locations.
  - ✗ **DO NOT** stand welder on a metal workbench, car bodywork or similar object.
  - ✗ **DO NOT** touch any live metal parts of the torch or electrode while the machine is switched on.
  - ✗ **DO NOT** weld without a welding safety head shield, gauntlets, clothing.
  - ✗ **DANGER! DO NOT** weld near inflammable materials - solids, liquids, or gases.
  - ✗ **DO NOT** operate welder while under the influence of drugs, alcohol or other medication, or if you are tired.
  - ✗ **DO NOT** operate the welder if it or the cables are damaged.
  - ✗ **DO NOT** allow untrained persons to operate the welder.
  - ✗ **DO NOT** pull welder by the cable, or electrode holder. **DO NOT** bend or strain cables, protect from sharp or abrasive items. **DO NOT** stand on cables or leads. Protect from heat. Long lengths of slack must be gathered and neatly coiled. **DO NOT** place cables where they endanger others.
  - ✗ **DO NOT** touch the electrode holder or workpiece immediately after welding as they will be very hot. Allow to cool.
  - ✗ **DO NOT** open the cover of the machine. Switch off machine and remove the plug from the power supply after use.
  - ✗ The electromagnetic fields generated by the welding process may interfere with the operation of electrical and electronic equipment.
  - ✗ Users of vital electrical or electronic devices (e.g. pace-makers, respirators etc.) should consult a doctor before entering areas where welding machines are in use, (see Section 8).
  - ✗ Users of vital electrical or electronic devices should not use any welding machine.

## 2. DESCRIPTION & SPECIFICATIONS

Model No:	250XTD
Welding Current:	40-180A(230V), 60-250A(415V)
Electrode Capacity:	Ø1.6-5.0mm
Cooling:	Forced Air
Output Cable	25mm <sup>2</sup>
No-Load Voltage:	47V, 55V
Absorbed Power:	8.6kW / 15kW
Supply:	230V - 1ph, 415V 3ph

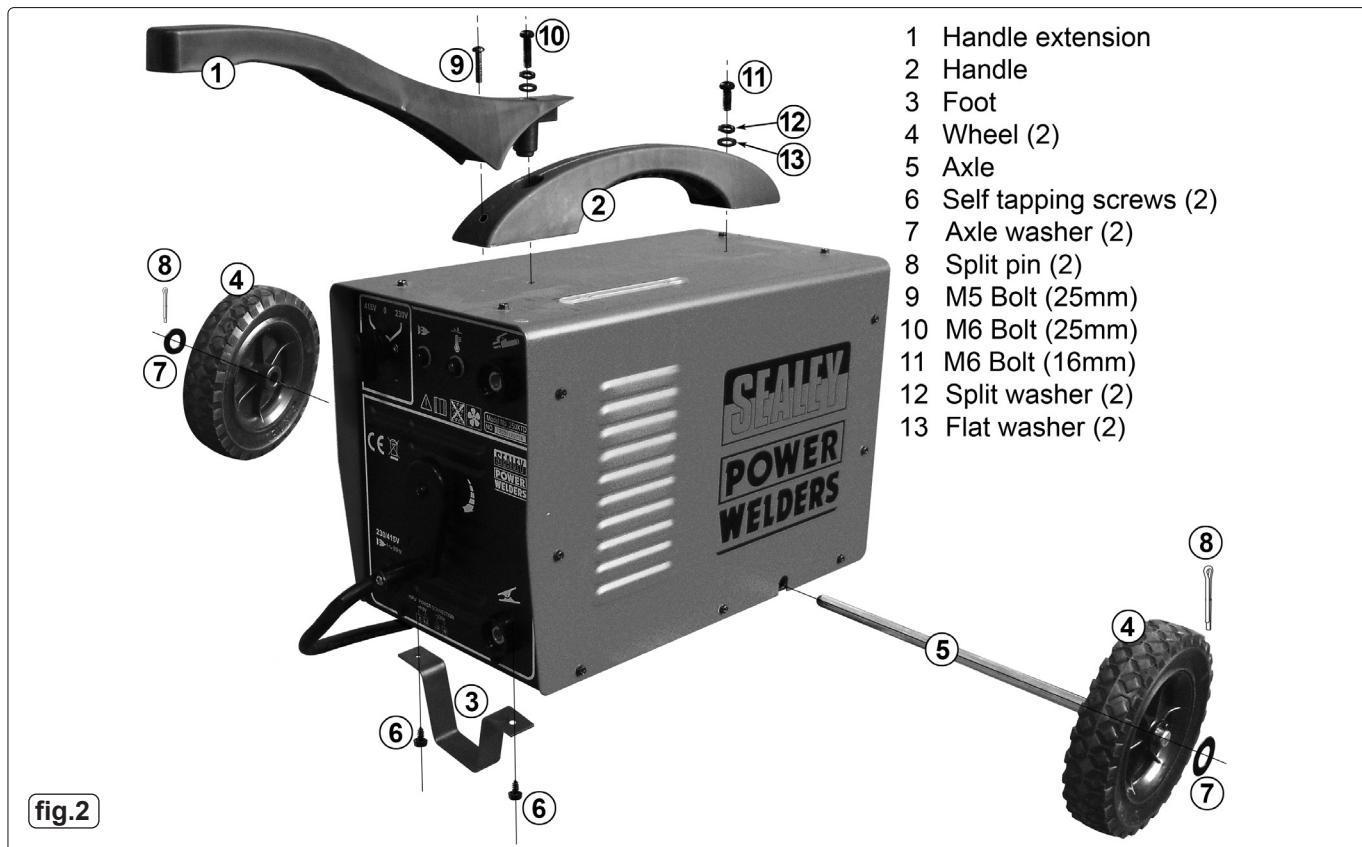
Super-Duty arc welder offering dual voltage input, allowing use on single phase 230V input up to the maximum that can be achieved on a 30Amp power supply. Higher performance can then be achieved by switching to 415V and connecting to an appropriate supply. Please consult an electrician. Supplied with a full set of accessories including electrode holder, earth clamp and chipping hammer/wire brush.

**IMPORTANT INFORMATION:** To operate all welders to their full capacity, you must run them on the correct power supply. To check the amperage, use the following formula: **KVA Rating x 4.35 = Correct Amps Supply**

### 3. ASSEMBLY

#### 3.2. Assembly (Refer to fig.2)

- 3.2.1 Lay a protective covering such as some cardboard packaging onto the floor and, with the help of another person, carefully turn the welder upside down onto it. Place the bent metal foot (3) onto the bottom of the casing just behind the front panel and fix it in place using two self tapping screws (6).
- 3.2.2 Assemble the wheels and axle as follows. Slide a wheel (4) onto one end of the axle (5) followed by a large flat washer (7). Insert a split pin (8) through the hole in the end of the axle (5) and bend the ends over. Insert the free end of the axle/wheel assembly into the hole in the side of the casing as shown in fig.2 and guide it through the casing to emerge from the hole on the far side of the casing. Slide the other wheel (4) onto the axle and retain it with a large flat washer (7) and a split pin (8). Bend the ends of the split pin over to retain the assembly.
- 3.2.3 Attach the handle extension to the handle as follows. Take the handle extension (1) and push the large recessed spigot on its underside into the matching hole in the handle (2) as shown in fig.2. Secure the two parts together using the 25mm M5 bolt (9) provided.
- 3.2.4 Place the handle assembly onto the top of the casing and align it with the fixing holes. Secure the back end of the handle using an M6 16mm bolt (11), a split washer (12) and a flat washer (13) as shown in fig.2. Secure the front end of the handle using an M6 25mm bolt (10), a split washer (12) and a flat washer (13) as shown in fig.2.



## 4. CONTROLS & SYMBOLS

FOR THE SPECIFICATION OF YOUR PARTICULAR WELDER REFER TO THE RATINGS PLATE DETAILS PRINTED ON THE TOP COVER OF THE WELDER

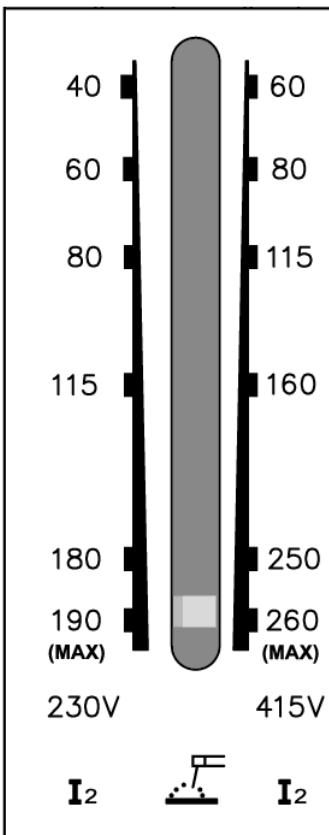
		Model No.	<b>180XT</b>
EN 60974 - 1			
		60 A / 20.4V - 180 A / 25.2V	
X	10%	60%	100%
U <sub>0</sub> 50V	I <sub>2</sub> 180 A	70 A	55A
	U <sub>2</sub> 25.2V	20.8V	20.2V
	U <sub>1</sub> 230V	I <sub>1max</sub> 43A	I <sub>1eff</sub> 13.8A
IP21S			

### KEY TO RATINGS PLATE SYMBOLS

- Manual welding with coated electrode
- Power source and AC single phase
- Single phase arc welder transformer
- U<sub>0</sub> ... ...V** Rated open circuit voltage
- I<sub>2</sub> ... ...A** Rated welding current
- U<sub>1</sub>... ...V** Power source voltage
- I<sub>1max</sub>... A** Rated MAX supply current
- X** % of duty cycle
- I<sub>1eff</sub> ... A** Maximum effective supply current
- U<sub>2</sub>... ...V** The voltage of the arc
- IP21S** Case protection class relating to prevention of foreign bodies and moisture entering the case.

\* SHOWN AS EXAMPLE ONLY

**250XTD**



SCALE MARKINGS / DETAILS WILL VARY FROM WELDER TO WELDER

fig.4



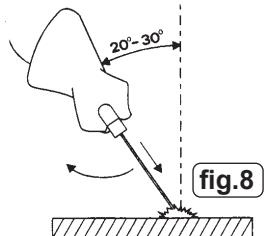
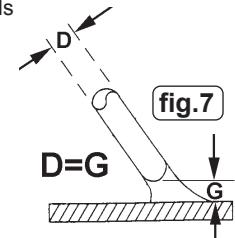
fig.5

## 5. ENVIRONMENTAL CONDITIONS

- 5.1. **Temperature.** When welding, the temperature should not be below -10°C or above 40°C. During storage or transit the temperature should not fall below -25°C or rise above 55°C.  
5.1.1 **Humidity.** The relative humidity should be no greater than 50% at 40°C or 90% at 20°C.  
5.1.2 **Altitude.** The welder can be used up to 1000 Metres only.

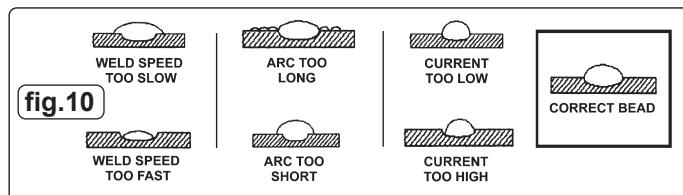
## 6. OPERATING INSTRUCTIONS

- WARNING!** If you have no welding experience, we recommend you seek supervised training from an expert source.
- 6.1 **Introduction.** Your welder features a single phase transformer with a drooping characteristic suitable for welding with an alternating current using stick electrodes with diameters from 1.5mm to the highest electrode diameter as shown on the chart below (See fig.9).
- 6.2 **Current regulation.** The intensity of the welding current can be adjusted continuously by means of a manually operated magnetic shunt. See fig.5-6 & fig6-5. The value of the current ( $I^2$ ) may be read in amps on the graduated scale on the top panel of the welder (See fig.4).
- 6.3 **Thermostatic Protection.** When the machine becomes overheated the built in automatic protection cuts off the supply and a yellow lamp illuminates on the front panel. See fig.5-3. When the machine has cooled the light goes out and the supply is automatically restored. As you use larger welding rods you may experience a temporary current shut off. The larger the welding rod, the greater the current required, consequently, the hotter the machine will become and the quicker it will cut out.
- 6.4 **Setting up the welder.**
- 6.4.1 Ensure the machine is turned off from the mains power supply. See fig.5-1.
- 6.4.2 Insert the quick connector for the work clamp lead into the socket marked with the work clamp symbol. See fig.5-5 & fig.6-4. Rotate the connector fully through 180° to ensure a secure connection. Attach the work clamp to a point on the workpiece that has been cleanly ground to provide good contact. Attach it as close as possible to the joint to be made.
- 6.4.3 Insert the quick connector for the electrode holder lead into the socket marked with the electrode holder symbol. Rotate the connector fully through 180° to ensure a secure connection. See fig.5-4.
- 6.4.4 Select the diameter of electrode to be used in relation to the type of joint to be made. Consideration should be given to the fact that higher current values should be used for flat welding, whereas for vertical or over head welding lower current values are required. Insert the electrode into the electrode holder. Ensure there is a good connection. Ensure welding surfaces are kept clean and free from grease, or oil.
- 6.4.5 Establish the welding current required in relation to the diameter of electrode you are using by making reference to the table below (fig.9).
- 6.4.6 Set the current required in amps using the control wheel on the front panel. See fig.5-6. Turn the control clockwise to increase the current, and anti-clockwise to decrease the current. The current set can be read from the graduated scale on the top panel of the machine. See Fig.4..
- 6.5 **Commencing welding.** It is advisable to practice on scrap metal first especially where potentially difficult welds are to be undertaken.
- WARNING!** Remember to wear a full face welding mask, gauntlets and protective clothing, and ensure you have read, understood and apply safety instructions. Wear goggles whilst chipping slag.
- 6.5.1 **DO NOT** switch on the power supply until you are fully ready to start welding.
- 6.5.2  **WARNING!** DO NOT switch from one voltage to another whilst welding.
- 6.5.3 Place the face mask in front of your face.
- 6.5.4 To strike the arc, tap the electrode lightly on the workpiece as if striking a match. **DO NOT** hit the electrode on the workpiece as this may damage the stick.
- 6.5.5 As soon as the arc is struck maintain a steady gap between the end of the electrode and the workpiece equal to the diameter of the electrode in use (See fig.7). Try to maintain this gap continuously throughout the duration of the weld. The electrode should also be held at an angle of 20° to 30° from the vertical. (See fig.8).
- 6.5.6 At the end of the weld bead, move the tip of the electrode backwards in order to fill the weld crater. Quickly lift the electrode from the weld pool to extinguish the arc. Refer to fig.10 for a welding fault analysis.
- 6.5.7 If the electrode sticks, you may be holding it too close to the workpiece. Pull sharply to the left, and then to the right to free the electrode.
- 6.5.8 After welding, chip off the slag with the chipping hammer provided. Always wear goggles.
- 6.5.9 Disconnect welder from the mains power supply before resetting the electrode holder.
- WARNING!** Use pliers to remove the hot consumed electrodes or to move the hot welded pieces.



Electrode Diameter (mm) .....	Welding Current (Amp)
1.6 .....	25min ..... 50max
2.0 .....	40min ..... 80max
2.5 .....	60min ..... 110max
3.2 .....	80min ..... 160max
4.0 .....	105min ..... 185max
5.0 .....	130min ..... 220max

fig.9



## 7. MAINTENANCE

- WARNING!** Ensure the welder is disconnected from the electrical mains power supply before attempting any service or maintenance tasks outlined below.
- 7.1 Keep the welder clean and dry at all times. Use a dry cloth to clean the unit.
- 7.2 Keep all electrodes clean and ensure all cables are in good condition.
- 7.3 Inspect the welder regularly, with a frequency depending on use and the dustiness of the environment. Remove dust deposits from the transformer using a jet of dry compressed air, (Max 10bar).
- 7.4 At the same time make sure that the electrical connections are tight and check the wiring for damage to the insulation.
- 7.5 If necessary use a very thin layer of high temperature grease, to lubricate the moving parts of the regulators (threaded shaft, sliding surfaces, shunts etc.).
- 7.6 After these light maintenance operations ensure that the welder covers are replaced and that all fastening screws are fully tightened .
- 7.7 Use an authorised service agent for any other maintenance or service requirements.
- WARNING!** Never perform welding operations with the covers removed.

## **8. ELECTROMAGNETIC COMPATIBILITY**

- 8.1** 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)
- 8.2** **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 compatibility in a non-industrial environment (e.g. in residential areas). Therefore it is most important that the equipment is used and installed according to the following instructions.
- 8.3** **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 input filters. In all cases the electromagnetic disturbances shall be reduced to the point where they are no longer troublesome.
- 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.'
- 8.4** **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 :
- a) Other supply cables, control cables, signalling and telephone cables, above, below and adjacent to the welding equipment.
  - b) Radio and television transmitters and receivers.
  - c) Computer and other control equipment.
  - d) Safety critical equipment, e.g. security monitoring of industrial equipment.
  - e) The health of people in the vicinity, e.g. persons fitted with a pacemaker or hearing aid.
  - f) Equipment used for calibration or measurement.
  - g) 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.
  - h) The time of day that welding and other activities are to be carried out.
- 8.5** **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.
- 8.6** **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.
- 8.7** **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.
- 8.8** **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 workpiece 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.
- 8.9** **Earthing of the workpiece.** It is important that the workpiece is separately bonded to earth **in addition to** the welder/cutter return cable. Where the workpiece 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 workpiece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthing of the workpiece increasing the risk of injury to others or damage to other electrical equipment. Where necessary, the connection of the workpiece to earth should be made by a direct connection to the workpiece, but in some countries where direct connection is not permitted, the bonding should be achieved by a suitable capacitance, selected according to national regulations.
- 8.10** **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.

## 9. TROUBLESHOOTING

- 9.1 Machine frequently cuts out:** (A) The welder is being overworked causing the thermostatic control to activate. (B) May also be due to a sticking electrode causing the machine to cut out for up to ten minutes. Cut out will automatically reset when welder has cooled.
- 9.2 Difficulty in striking an arc:** a). The electrode is damp. Heat it up to 60° - 70° before using.  
b). Wrong type of electrode.

PROBLEM	CAUSE	SOLUTION
Arc becomes unsteady or is difficult to strike	1. Input voltage too low	1. Ensure that the power supply is of the required specification for the welder.
	2. Use of a thinner, non standard Welding cable resulting in too much resistance.	2. Use the correct cable as supplied with the machine.
	3. Welding cable quick connector not properly tightened resulting in excessive resistance.	3. Ensure that cable quick connector is fully inserted and turned through 180°.
	4. Regulation screw and nut worn out.	4. Replace worn parts.
	5. Faulty power switch	5. Replace power switch.
Welder overheats and cuts out	1. Welder overloaded	1. Wait for welder to cool down, then operate it within the requirements of the duty cycle.
	2. 250XTD, ensure that correct input voltage is selected for the current welding task.	2. To use 415V the welder must be connected across two phases of a three phase supply. If in doubt, consult an electrician
	3. Cooling fan broken	3. Repair or replace the cooling fan
Arc will not strike or is difficult to strike after the welder is switched on	1. No input voltage from power source	1. Check power source wiring, switch and fuse
	2. 250XTD, power supply incorrectly connected	2. To use 415V the welder must be connected across two phases of a three phase supply. If in doubt, consult an electrician
	3. Partial winding short circuit	3. Return welder to supplier for repair
Cooling fan not working	1. Faulty start up capacitor	1. Replace capacitor
	2. Motor burned out	2. Replace motor
	3. Faulty wiring	3. Check wiring
For all other problems refer to your local supplier		



### ENVIRONMENT 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. When the product becomes completely unserviceable and requires disposal, drain any fluids (if applicable) into approved containers and dispose of the product and fluids according to local regulations.



### 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 is required for any claim.

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