

DRAPER[®]**230V/400V**

ARC WELDERS

71090-71151

IMPORTANT: Please read these instructions carefully to ensure the safe and effective use of this product and save these instructions for future reference. This manual has been compiled by Draper Tools and is an integrated part of the product with which it is enclosed and should be kept with it for future references.

This manual describes the purpose for which the product has been designed and contains all the necessary information to ensure its correct and safe use. We recommend that this manual is read before any operation or, before performing any kind of adjustment to the product and prior to any maintenance tasks. By following all the general safety instructions contained in this manual, it will ensure both product and operator safety, together with longer life of the product itself.

All photographs and drawings in this manual are supplied by Draper Tools to help illustrate the operation of the product. Whilst every effort has been made to ensure accuracy of information contained in this manual, the Draper Tools policy of continuous improvement determines the right to make modifications without prior warning.

1. TITLE PAGE

1.1 INTRODUCTION:

USER MANUAL FOR:

230V/400V ARC WELDERS

Stock nos. 71090 & 71151.

Part no. AW164AT & AW260AT

1.2 REVISIONS:

Date first published July 2017

As our user manuals are continually updated, users should make sure that they use the very latest version.

Downloads are available from: <http://www.drapertools.com/manuals>

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1.3 UNDERSTANDING THIS MANUALS SAFETY CONTENT:

WARNING! Information that draws attention to the risk of injury or death.

CAUTION! Information that draws attention to the risk of damage to the product or surroundings.

1.4 COPYRIGHT © NOTICE:

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3. GUARANTEE

3.1 GUARANTEE

Draper tools have been carefully tested and inspected before shipment and are guaranteed to be free from defective materials and workmanship.

Should the tool develop a fault, please return the complete tool to your nearest distributor or contact Draper Tools Limited, Chandler's Ford, Eastleigh, Hampshire, SO53 1YF. England.

Telephone Sales Desk: (023) 8049 4333 or Product Helpline (023) 8049 4344.

A proof of purchase must be provided with the tool.

If upon inspection it is found that the fault occurring is due to defective materials or workmanship, repairs will be carried out free of charge. This guarantee period covering parts/labour is 12 months from the date of purchase except where tools are hired out when the guarantee period is 90 days from the date of purchase. This guarantee does not apply to normal wear and tear, nor does it cover any damage caused by misuse, careless or unsafe handling, alterations, accidents, or repairs attempted or made by any personnel other than the authorised Draper warranty repair agent.

Note: If the tool is found not to be within the terms of warranty, repairs and carriage charges will be quoted and made accordingly.

This guarantee applies in lieu of any other guarantee expressed or implied and variations of its terms are not authorised.

Your Draper guarantee is not effective unless you can produce upon request a dated receipt or invoice to verify your proof of purchase within the guarantee period.

Please note that this guarantee is an additional benefit and does not affect your statutory rights.

Draper Tools Limited.

4.1 SCOPE

AC welding machine suited to light repair and fabrication work.

4.2 SPECIFICATION

Stock no.	71090	71151
Part no.	AW164AT	AW260AT
Rated voltage	230V~50Hz	230V/400V~50Hz
Absorbed power	8.0kVA	14.2kVA
Duty cycle	10%@160A	10%@250A
Welding current range	60-160A	100-250A
Coupling device	Direct fit	Direct fit
Usable electrodes	1.6mm-4.0mm	1.6mm-5.0mm
Insulation class	H	H
IP Protection class	IP21S	IP21S
Cooling device	Fan	Fan
Dimensions (LxWxH)	470x240x320mm	585x325x440mm
Weight (nett)	16kg	24kg

4.3 HANDLING & STORAGE

Care must still be taken when handling and lifting. Dropping this machine will have an effect on its operation and may also result in personal injury. This machine is not a toy and must be respected.

The environment will have a negative result on its operation if you are not careful. If the machine is unprotected from dust and debris; components will become clogged:
And if not cleaned and maintained correctly or regularly the machine will not perform at its best.

5. HEALTH & SAFETY INFORMATION

5.1 GENERAL SAFETY INSTRUCTIONS

WARNING: When using electric tools basic safety precautions should always be followed to reduce the risk of fire, electric shock and personal injury including the following.

Read all these instructions before attempting to operate this product and save these instructions.

Electric shock can kill:

- Remove the plug from the socket before carrying out adjustment, servicing or maintenance.
- Allow 5 minutes waiting time for the capacitors to discharge before removing the panels for any maintenance operations
- Do not touch live electrical parts.
- Never use electrode holders or cables with damaged or deteriorated insulation.
- Keep working environment, equipment, cables and clothing free from grease, oil, moisture and dirt.
- Ensure welding machine has been correctly earthed and all panels are fitted securely.
- The operator must be insulated from the floor and work bench using a dry insulation mat.
- Wear isolating footwear and gloves that are in good condition, i.e. without holes.
- In hazardous conditions of increased electric shock always ensure a second person is present in case of accident.
- Never change electrodes with bare hands or damp gloves (for ARC/MMA welders).
- Keep welding cables away from power cables.
- Regularly inspect the condition of the welding, earth, and power cables for signs of damage.
- Do not leave machine unattended and remove plug from socket when not in use.
- Do not use welding cables unsuitable for the amperage.
- Ensure earth clamp is adjacent to weld seam, secured to bare metal and when not in use is insulated for safety.
- Keep all equipment well maintained.
- The operator shall prevent gas cylinders in the vicinity of the work piece from becoming part of the welding circuit.

Fumes & gases can be harmful:

- The welding process generates hazardous fumes as a by product. Inhalation of these fumes is hazardous to health.
- Keep your head away from the weld to avoid breathing the fumes.
- If welding in confined spaces ensure adequate ventilation and use a fume extractor.
- Welding fumes displace oxygen. Danger of suffocation.
- By products of welding can react with other chemical vapours to produce a toxic/explosive environment.

Welding can cause fire or explosion:

- Arc welding and allied processes can cause fire and explosions and precautions shall be taken to prevent these hazards.
- Before starting a weld ensure the area is clear of flammable materials.
- Remove any inflammables to a safe distance, especially substances likely to generate a dangerous vapour.

5. HEALTH & SAFETY INFORMATION

- The welding arc can cause serious burns. Avoid contact with skin.
- Sparks and molten metal are cast out during welding. Take precautions to prevent fire igniting and wear protective clothing.
- Sparks and molten metal can pass through gaps. Be aware that fire can start out of sight. Flammables in a locked cabinet may not be safe.
- Do not weld pressurised containers.
- Do not weld tanks, drums or other vessels until they have been correctly cleaned/prepared for welding.
- Always have appropriate and fully maintained fire fighting equipment suitable for the materials used and for use in electrical environments available in close proximity at all times.
- Keep clothing free from oil and grease.
- Wear hat, flame-proof apron, woollen clothing, gloves, long sleeve tops with closed neck, trousers (without turn-ups) to cover non-slip boots.
- Protective head and shoulder coverings should be worn when overhead welding.
- Avoid taking any fuels with you e.g. cigarette lighters or matches.
- Hot spots and their immediate surroundings should be observed until their temperature has dropped to normal.

Personal Protection:

- The body should be protected by suitable clothing.
- The use of neck protection may be necessary against reflected radiation.
- Wear safety glasses when chipping, wire brushing, grinding or when near cooling welds as metal filings or slag can be thrown up. Fully enclosed goggles are advisable.
- Arc machines generate a magnetic field which is detrimental to pacemaker recipients. Consult your doctor before going near welding equipment/operations.
- The UV and IR radiation generated by welding is highly damaging to the eye, causing burns. This can also affect the skin. Protect the eyes and face.
- The face and eyes shall be protected by suitable welding shields equipped with appropriate ocular protection filters.
- Where environments are subject to pedestrians and traffic ensure a protective screen is used to avoid accidental arc glare.
- Do not weld in the vicinity of children or animals and ensure no one is looking before striking up.
- In the welding environment, damaging levels of noise can exist. Wear hearing protection if the process dictates.
- Do not touch hot equipment or metal. Allow the weld time to cool, use the correct tool and wear protective welding gauntlets.
- Wear flame retardant clothing (leather, wool, etc.).
- Take care when adjusting or maintaining the torch that it has had time to cool sufficiently and is disconnected.
- The arc generates
 - ultra-violet radiation (can damage skin and eyes);
 - visible light (can dazzle eyes and impair vision);
 - infra-red (heat) radiation (can damage skin and eyes);
- Such radiation can be direct or reflected from surfaces such as bright metals and light coloured objects.

5. HEALTH & SAFETY INFORMATION

Gas cylinders:

- Gas cylinders should be located or secured so that they cannot be knocked over.
- Shield gas containers can explode if damaged. Take care when handling.
- Ensure gas cylinders are shut-off when not in use and between operations.
- Take care that no build-up of gas is permitted to form in confined area's.
- Cylinders must be in an upright position at all times during use and storage.
- The gas cylinder must never come in to contact with the electrode.
- Follow the manufacturer's instructions for handling, storing and using the gas bottle correctly and safely.
- Use the correct equipment to connect the gas bottle to the welding torch.

Limitations:

- Do not use for;
 - operations in severe conditions (e.g. extreme climates, freezer applications, strong magnetic fields etc).
 - operations subject to special rules (e.g. potentially explosive atmospheres, mines etc).
 - operations that require ingress protection greater than IPX0, e.g. in rain or snow etc.

DRAPER Stock No:71090 Part No:AW166AT DRAPER TOOLS LIMITED, 5053 TVE, UK		Serial Number:										
1-  1-		EN 60974-1										
 ~50Hz		60A/20.4V-160A/24.4V										
S U₀=46V		<table><tr><td>X (%)</td><td>10</td><td>60</td></tr><tr><td>I₂ (A)</td><td>160</td><td>65</td></tr><tr><td>U₂ (V)</td><td>24.4</td><td>20.6</td></tr></table>		X (%)	10	60	I ₂ (A)	160	65	U ₂ (V)	24.4	20.6
X (%)	10	60										
I ₂ (A)	160	65										
U ₂ (V)	24.4	20.6										
 ~50Hz U_i=230V		I_{max} = 36A I_{eff} = 15.3A										
IP21S			Weight: kg									

General:

- Training should be sought out in
 - the safe use of this equipment;
 - the processes;
 - the emergency procedures;
- Welding power sources are not to be used for pipe thawing.
- Take precautions against toppling over, if the power source shall be placed on a tilted plane.
- All equipment should be kept in good working condition, inspected and, when defective, promptly repaired or withdrawn from service - All equipment should be placed so that it does not present a hazard in passageways, on ladders or stairways, and should be operated in accordance with the manufacturer's instructions.
- In the vicinity of an arc, non-reflective curtains or screens shall be used to isolate persons from the arc radiation. A warning, e.g. a symbol for eye protection, should refer to the hazard of arc radiation.

DRAPER Stock No.71155 Part No:AW200AT DRAPER TOOLS LIMITED, 5053 TVE, UK		Serial Number:										
1-  1-		EN 60974-1										
 50Hz		100A/22V-250A/28V										
S $U_0=46V$		<table><tr><td>X (%)</td><td>10</td><td>60</td></tr><tr><td>I₂ (A)</td><td>250</td><td>102</td></tr><tr><td>U₂ (V)</td><td>28</td><td>22.1</td></tr></table>		X (%)	10	60	I ₂ (A)	250	102	U ₂ (V)	28	22.1
X (%)	10	60										
I ₂ (A)	250	102										
U ₂ (V)	28	22.1										
 1-50Hz $U_i=230V$ $U_i=400V$		<table><tr><td>$I_{max} = 60A$</td><td>$I_{eff} = 18.2A$</td></tr><tr><td>$I_{max} = 34.5A$</td><td>$I_{eff} = 11 A$</td></tr></table>		$I_{max} = 60A$	$I_{eff} = 18.2A$	$I_{max} = 34.5A$	$I_{eff} = 11 A$					
$I_{max} = 60A$	$I_{eff} = 18.2A$											
$I_{max} = 34.5A$	$I_{eff} = 11 A$											
IP21S			Weight: kg									

5. HEALTH & SAFETY INFORMATION

5.2 CONNECTION TO THE POWER SUPPLY

Make sure the power supply information on the machine's rating plate is compatible with the power supply you intend to connect it to.

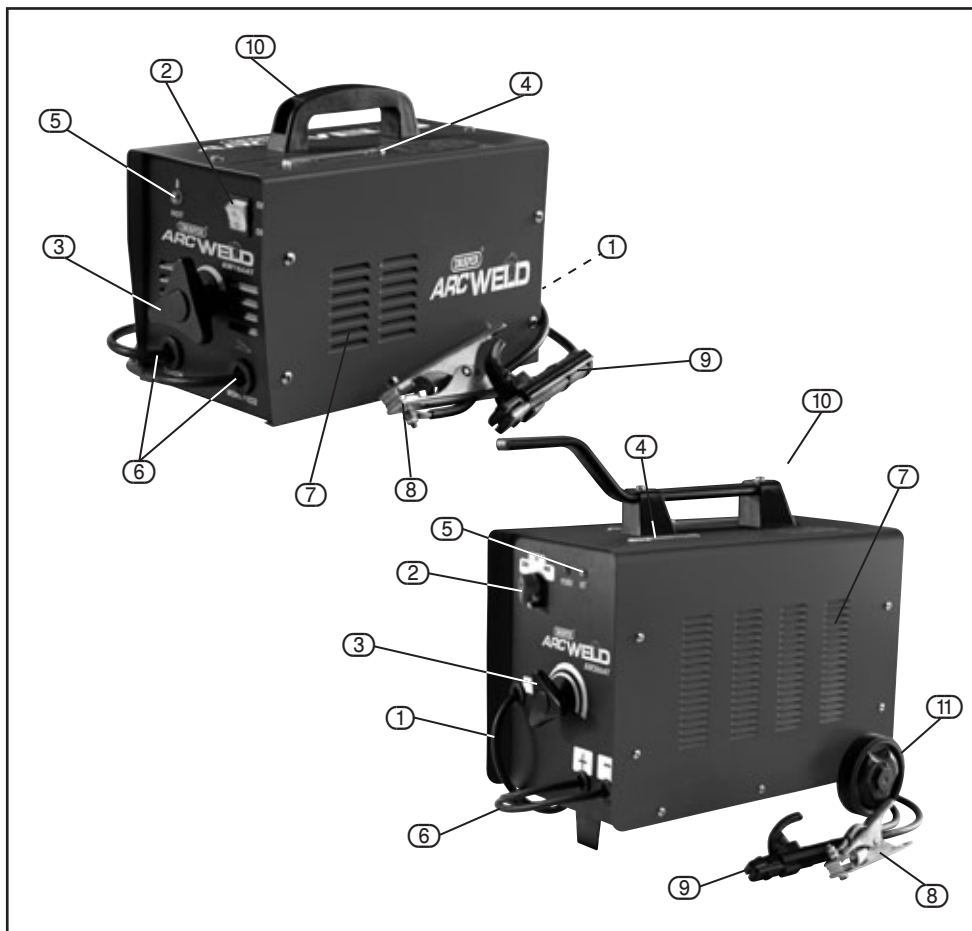
This machine comes supplied without a plug. It is designed for connection to a 16amp power supply rated at 230V AC or 400V AC (71151 only).

Note: For Stock No.71151 you must ensure that the machines voltage selector switch is set to the voltage that you will use to supply power to this machine, failure to do so will cause damage to the machine that would not be covered under warranty.

A suitable plug must be fitted by a qualified electrician.

Because it is constructed mostly of metal parts, it is a Class 1 machine; meaning, it must have an earth connection in the power supply. This is to prevent electrocution in the event of a failure.

6. IDENTIFICATION



- ① Power cable.
- ② On/off foot switch.
- ③ Welding current adjustment.
- ④ Current adjustment indicator.
- ⑤ Thermal cutout signal.
- ⑥ Connections for welding cables.
(some machines have directly
connected cables).

- ⑦ Ventilation grille.
- ⑧ Direct fit earth clamp.
- ⑨ Electrode holder.
- ⑩ Handle.
- ⑪ Transport wheels.

7. UNPACKING & CHECKING

7.1 PACKAGING

Carefully remove the product from the packaging and examine it for any sign of damage caused during shipping. Lay the contents out and check them. If any part is damaged or missing, do not attempt to use the tool and contact the Draper Helpline immediately (see back page for details).

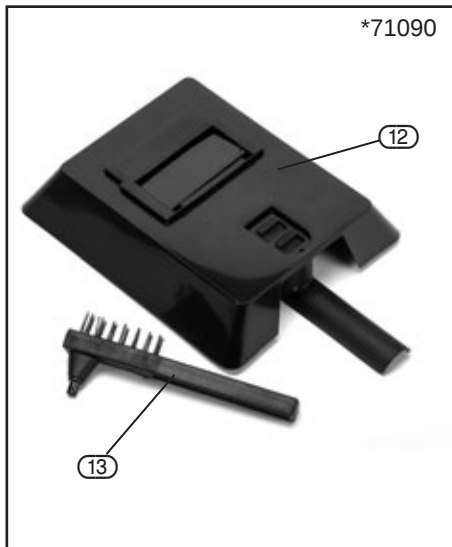
Retain the packaging material at least during the guarantee period: in case the machine needs to be returned for repair.

Warning! Some of the packaging materials used may be harmful to children, keep them out of reach from children.

Disposed of any packaging correctly and according to local regulations.

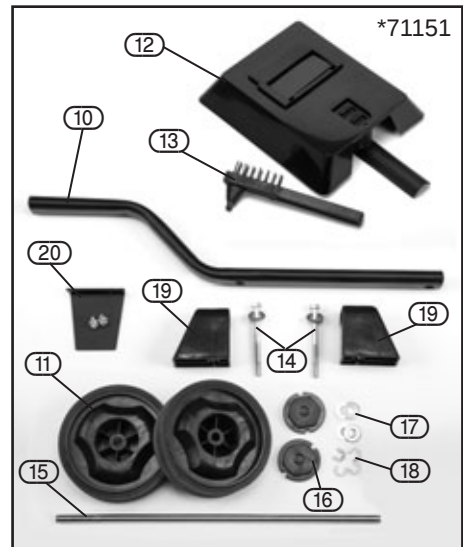
7.2 WHAT'S IN THE BOX?

As well as the product; there are several parts not fitted or attached to it.



(12) Chipping hammer/wire brush.

(13) Hand held mask.



(12) Chipping hammer/wire brush.

(13) Hand held mask.

(14) Handle bolts x2.

(15) Wheel axle bar.

(16) Wheel covers.

(17) Wheel washers x4.

(18) Wheel circlips x4.

(19) Handle support.

(20) Front support.

8. PREPARING THE WELDERS

NOTE: Remove the plug from the socket before carrying out adjustment, servicing or maintenance.

Check that the electrical supply delivers the voltage and frequency corresponding to the welding machine and that it is fitted with a delayed fuse suited to the maximum delivered rated current.

NOTE: The welding machines are set to the highest voltage at the factory.

8.1 PREPARING THE WELDING CIRCUIT

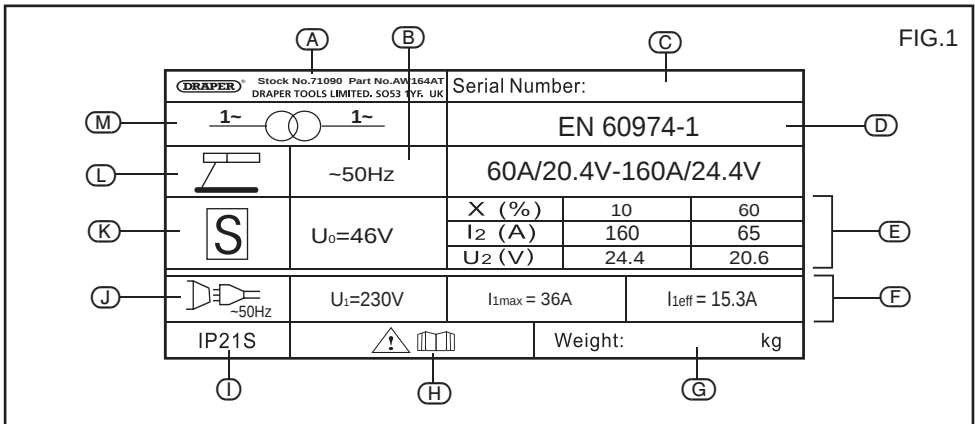
Connect the ground “lead” to the piece to be welded. Connect the welding electrode to the electrode holder.

When the machine is turned on and the electrode touches, the workpiece, the electrical circuit is complete, this will result in the welding arc being produced.

9. SETTING THE WELDERS

A data plate is affixed to the welding machine. Fig.1. shows examples of this plate.

- (A) **Constructor name and machine part No.**
- (B) **Delivered alternate current frequency.**
- (C) **Serial number.**
- (D) **European reference standard for the construction and safety of welding equipment.**
- (E) **WELDING CIRCUIT PERFORMANCE**
 - U₀V** Minimum and maximum open circuit voltage (open welding circuit).
 - Ø** Diameter of weldable electrodes.
 - I₂A** Value of the current needed to weld using different electrode diameters.
 - A/V** Conventional welding current (maximum) and corresponding normalised voltage.
- (F) **POWER SUPPLY DATA**
 - U₁** Input voltage (permitted tolerance: +/- 10%)
 - I₁ eff** Effective absorbed current.
 - I₁ max** Maximum absorbed current.
- (G) **Weight**
- (H) **Safety symbols.**
- (I) **Level of protection from solids and liquids.**
- (J) **Input power required:**
 - 1" alternate single phase voltage, frequency
- (K) **Symbol indicating the possibility to use the welding machine in environments potentially subject to electric discharges.**
- (L) **Indicates the machine is an ARC/MMA process machine.**
- (M) **Indicates this machine produces an AC welding current.**



9. OPERATING INSTRUCTIONS

NOTE: Once you have put the welding machine into operation, switch it on and carry out the required adjustments.

9.1 ADJUSTING THE WELDING CURRENT

Select the welding current depending on the electrode, the joint and the welding position. Indicatively, the currents to be used with the different electrode diameters are listed in Fig.2.

NOTE: Do not force the adjustment flywheel as this could damage the welding machine. Check the adjustment on the current adjustment indicator.

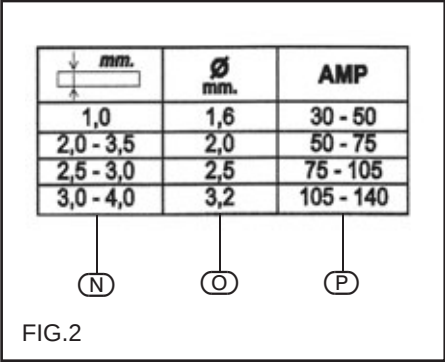
NOTE: To strike the welding arc with the coated electrode, brush it onto the piece to be welded and as soon as the arc is struck, hold it constantly at a distance equal to the electrode diameter and at an angle of approximately 20-30 degrees in the direction in which you are welding.

9.2 THERMAL CUTOUT SIGNAL

The warning light switched on means that the thermal protection is running.
If the welding time is exceeded, a thermal cutout stops operation before the welder is damaged. Wait for operation to be resumed and, if possible, wait a few minutes more.
If the thermal cutout continues to cut in, the welding machine is being pushed beyond its normal performance levels.

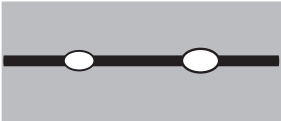
9.3 RECOMMENDATIONS FOR USE

Only use an extension lead when absolutely necessary and providing it has an equal or larger section to the power cable and is fitted with a grounding conductor.
Do not block the welder air intakes. Do not store the welder in containers or on shelving that does not guarantee suitable ventilation.
Do not use the welder in any environment in the presence of gas, vapours, conductive powders (e.g. iron shavings), brackish air, caustic fumes or other agents that could damage the metal parts and electrical insulation.
NOTE: The electric parts of the welder have been treated with protective resins. When used for the first time, smoke may be noticed; this is caused by the resin drying out completely. The smoke should only last for a few minutes.



- (N) Plate thickness
- (O) Electrode Diameter
- (P) Welding amperage

10. TROUBLESHOOTING

EXAMPLE	TERM	CAUSE
	Insufficient penetration	- Incorrect arc distance. - Welding current too low. - Wire speed too low. - Welding line not central to butt.
	Overlap	- Wire size too large for application. - Torch speed too slow.
	Pitting	- Contamination in the metal (eg rust). - Shield gas breakdown. - Incorrect arc distance. - Area cooling down too fast.
	Untidy weld	- Unsteady torch movement. - Worn wire tip.
	Burn through	- Current too high for material thickness. - Torch speed too slow.

11. MAINTENANCE

11.1 MAINTENANCE & PARTS REPLACEMENT

Regular inspection and cleaning reduces the necessity for maintenance operations and will keep your welder in good working condition.

The welder must be correctly ventilated during tool operation. For this reason avoid blocking the air inlets. After use disconnect the tool from the power supply and vacuum the ventilation slots.

If the replacement of the supply cord is necessary, this has to be done by the manufacturer or his agent in order to avoid a safety hazard.

12. EXPLANATION OF SYMBOLS

12.1 EXPLANATION OF SYMBOLS



Attention.



Danger of electric shock.



Danger of fire.



Danger of explosion.



Danger of welding fumes.



Danger of ultraviolet radiation.



Danger of burning splashes.



Warning!
Wear suitable respiratory protection.



Warning!
Wear suitable welding eye/face protection.



Warning!
Wear ear defenders (During grinding operations).



Warning!
Read the instruction manual



WEEE
Do not dispose of Waste Electrical & Electronic Equipment in with domestic rubbish



Class 1 appliance
(Must be earthed).

13. DISPOSAL

13.1 DISPOSAL

- At the end of the machine's working life, or when it can no longer be repaired, ensure that it is disposed of according to national regulations.
- Contact your local authority for details of collection schemes in your area.

In all circumstances:

- Do not dispose of power tools with domestic waste.
- Do not incinerate.
- Do not abandon in the environment.
- Do not dispose of WEEE* as unsorted municipal waste.



* Waste Electrical & Electronic Equipment.

14.1 GLOSSARY

ALPHABETICAL LIST OF WORDS RELATING TO THIS MANUAL

- Duty cycle** The duty cycle is the percentage of 10 minutes that the machine can weld for at a set amperage (10%=1min up to 100%=10mins). The higher the amperage, the lower the welding time.
- Polarity** The relative orientation of electric poles.

CONTACT US

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Internet: www.drapertools.com

E-mail: sales@drapertools.com

General Enquiries: (023) 8026 6355

Service/Warranty Repair Agent:

For aftersales servicing or warranty repairs, please contact the
Draper Tools Helpline for details of an agent in your local area.

YOUR DRAPER STOCKIST