

INSTRUCTIONS FOR

INVERTER

Model: **MW140PLUS.V2**
MW160PLUS
MW170.V3



MODEL NOS:	MW160PLUS	MW170.V3	MW140PLUS.V2
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Thank you for purchasing a Sealey 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. MAKE CAREFUL NOTE OF SAFETY INSTRUCTIONS, WARNINGS AND CAUTIONS. THIS PRODUCT SHOULD ONLY BE USED FOR ITS INTENDED PURPOSE. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. RETAIN THESE INSTRUCTIONS FOR FUTURE USE.

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 dealer. **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.
- 1.1.11. **DO NOT** use this product with a cable extension reel.
- 1.1.10. Products which require more than 13 amps are supplied without a plug.
THE MW160PLUS AND THE MW170.V3 REQUIRE TO BE CONNECTED TO A 30AMP SUPPLY. WE RECOMMEND THAT YOU DISCUSS THE INSTALLATION OF AN INDUSTRIAL ROUND PIN PLUG AND SOCKET WITH YOUR ELECTRICIAN.

FUSE RATING 30 AMP

⚠ WARNING! Be very cautious if using a diesel generator. The generator must be stable with regard to frequency (Hz), voltage and wave form. The output must be higher than the absorbed power (kW) of the inverter. The diesel generator must also be self regulating.

Use of a generator without a regulator may be dangerous and will invalidate your inverter warranty.

Note that model MW160PLUS has a supply filter to minimise the risk of damage from unstable power supplies and is, therefore, the preferred model when the only source of power is a generator.

1.2. GENERAL SAFETY

▲ DANGER! Unplug the inverter from the power supply before connecting or disconnect cables or performing maintenance or service. Direct contact with the inverter circuit is dangerous.

- ✓ Keep the inverter and cables in good working order and condition. *Take immediate action to repair or replace damaged parts.*
- ✓ Use genuine parts and accessories only. *Unapproved parts may be dangerous and will invalidate the warranty.*
- ✓ Keep the inverter clean for best and safest performance.
- ✓ Ensure that the work area has adequate ventilation or facilities for the removal of harmful welding fumes near the arc. A risk assessment should be undertaken and acted upon to assess fume exposure limits based on composition, concentration and length of exposure.
- ⚠ WARNING!** Cable connectors must be turned fully in the dinse sockets to ensure a good electrical contact. Loose connections will cause overheating, rapid deterioration and loss in efficiency.
- ✓ Ensure that there is no obstruction to the flow of clean, cool air around the machine and ensure that there are no conductive dusts, corrosive vapours or humidity which could enter the inverter and cause serious damage.
- ✓ Keep the work area clean and tidy and free from unrelated materials. Also ensure that the work area has adequate lighting.
- ✓ Take adequate measures to insulate the operator from the arc, the workpiece and any (accessible) earthed metal parts in the vicinity. Wear insulating clothing, gloves, shoes and head coverings and operate from insulating mats and platforms where necessary.
- ⚠ WARNING:** Use welding head shield to protect eyes and avoid exposing skin to ultraviolet rays given off by electric arc. Wear safety welding gauntlets and fire resistant protective clothing.
- ✓ Use non-reflecting welding curtains to protect other people in the vicinity of the arc from exposure to ultra violet and infrared rays produced by the arc.
- ✓ Remove ill fitting clothing, remove ties, watches, rings and other loose jewellery and contain long hair.
- ✓ Ensure that the workpiece is correctly secured before operating the inverter.
- ✓ Avoid unintentional contact with workpiece. Accidental striking of the arc is dangerous and may damage the torch.
- ✓ Protect cables from heat and sharp or abrasive items.
- ✓ Keep unauthorised persons away from the work area. Any persons working within the area must wear the same protective items.
- ✓ Operators must receive adequate training before using the inverter.
- ✓ Stand correctly keeping a good footing and balance, ensure that the floor is not slippery and wear non-slip shoes.
- ⚠ WARNING:** When unit is switched off the yellow fault indicator LED (fig 7.4) will come on for 10-15 seconds whilst the capacitor discharges. **DO NOT** open the unit until the light goes out.
- ✓ Turn potentiometer down to minimum setting when not in use.
- ✗ DO NOT connect the return cable to any metallic structure which is not part of the workpiece. This will jeopardise weld quality and may be dangerous. *Exception:* Metallic work bench, but connect as near to weld as possible.
- ⚠ WARNING!** Extra caution is required in the following unavoidable circumstances. **⚠ Welding in confined spaces.** **⚠ Welding in the presence of flammable or explosive materials.** **⚠ Welding where there is an increased risk of electric shock.** A risk assessment must be carried out and acted upon by qualified Health & Safety personnel. Such welding operations should always be attended by personnel trained to deal with emergencies. Welding operators must not be allowed to work in elevated positions unless insulated safety platforms are used.
- ⚠ WARNING!** Working with more than one welding machine on a single work-piece or work-pieces that are connected electrically may generate a dangerous accumulation of no-load voltage between the two different electrode holders or torches, the value of which may reach double the allowed limit. A qualified supervisor should assess the risk using appropriate measuring equipment and take suitable protective measures.

- x DO NOT attempt to fit any unapproved torches, components, or parts to the inverter unit.
- x DO NOT hit the electrode on the workpiece, this may damage the electrode and make strike-up difficult.
- ☐ **WARNING! When TIG welding keep the gas bottle away from sources of heat including sunlight.**
- x DO NOT get inverter wet or use in damp or wet locations or areas where there is condensation.
- ▲ **DANGER! DO NOT weld near flammable materials - solids, liquids, or gases.**
- x DO NOT weld containers or pipes which have held flammable materials - gases, liquids or solids. Avoid operating on materials cleaned with chlorinated solvents or near such solvents.

- x DO NOT perform welding on pressurised containers.
- x DO NOT operate the inverter if it or the cables are damaged.
- x DO NOT pull the inverter by the cables, or the torch.
- x DO NOT bend, strain or stand on cables.
- x DO NOT place cables where they will endanger others. Long lengths of slack must be gathered and neatly coiled.
- x DO NOT use welding cables over 10m in length.
- x DO NOT touch workpiece near to the weld as it will be very hot. Allow to cool.
- x DO NOT touch the torch immediately after use. Allow the torch to cool.
- x DO NOT operate the inverter while under the influence of drugs, alcohol or intoxicating medication, or if tired.
- ✓ When not in use, store the inverter in a safe, dry, childproof area.

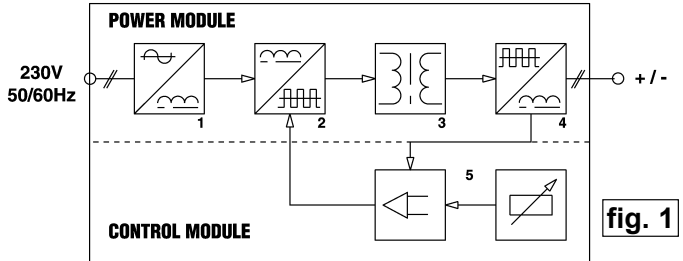
2. DESCRIPTION & SPECIFICATION

2.1. INTRODUCTION: These Inverters are lightweight, powerful and versatile. They are suitable for ARC or TIG welding using the "Scratch-Start" method. They have Arc-Force circuitry making them suitable for welding with a wide variety of rods including rutile, basic and stainless of various sizes (see charts). These machines also have a thermal cut-out and mains voltage LEDs and are fitted with a Hot-Start system to counter electrode sticking during scratch-starting. Model MW160PLUS features a supply filter to minimise the risk of damage when powered from a generator.

2.2. DESCRIPTION: These models are "constant current rectifiers" for ARC welding and are controlled by a transistor bridge with a high frequency. The specific characteristics of the "INVERTER" system provide high speed and precise regulation, ensuring a high quality result for both stick electrode and TIG welding (DC). The "INVERTER" system, regulated at the input of the primary mains, also allows for a drastic reduction in the volumes of both the transformer and the reactance. This reduction in volume and weight enhances the mobility of the machines. The unit has a power module which has been developed on a special printed circuit designed to maximise reliability and reduce maintenance.

2.3. CIRCUIT SYSTEM DESCRIPTION Refer to fig. 1

1. Mains input (single phase), rectifier unit and condenser.
2. Transistors and drivers switching bridge (IGBT). Turns the mains rectified voltage into high frequency alternating voltage and permits power regulation according to the current/voltage of the weld.



3. High frequency transformer: The primary windings are fed by the voltage converted by Block 2. It has the function of adapting voltage and current to the values required by the ARC welding procedure and, simultaneously, isolates the welding circuit from the mains.
4. Secondary rectifier bridge with inductance. Changes the alternating current supplied by the secondary windings into direct current.
5. Electronic and regulation board: Instantly checks the value of the welding current against that selected by the user. It modulates the commands of the IGBT drivers, which control regulation. The control board also determines the dynamic response of the current transient while the electrode melts (instantaneous short circuit), and is responsible for the safety system.

2.4. SPECIFICATION

Model	MW160PLUS	MW170.V3	MW140PLUS
Output:	5-150A	5-160A	5-130A
Duty Cycle:	35% @ 150A	35% @ 160A	25% @ 130A
Electrode Capacity:	Ø1.6-4.0mm	Ø1.6-4.0mm	Ø1.6-3.2mm
Supply Filter:	YES	No	YES
Absorbed Power:	4.5kW	4.5kW	4.2kW
Mains Voltage:	230V-1ph	230V-1ph	230V - 1ph
Insulation Class:	H	H	H
Protection:	IP23	IP23	IP23
Weight:	6.5kg	6.1kg	5.1kg
Accessories Included:	No	No	No
ARC Accessory Ref:	INV/16	INV/16	INV/16
TIG Accessory Ref:	INV/TIG	INV/TIG	INV/TIG

3. CABLE ASSEMBLY

3.1 Unpack the product and check contents. Should there be any damaged or missing parts contact your supplier immediately.

3.2 WELDING ACCESSORY KITS.

- 3.2.1 ARC WELDING: To perform conventional ARC welding you will require Sealey Kit INV/16 which contains a welding mask, electrode holder, earth clamp, cables and chipping hammer. This kit is not supplied with the inverter.
- 3.2.2 TIG WELDING: To perform TIG welding you will require Sealey Kit INV/TIG which contains a welding mask, TIG torch and cable with integral gas connection hose, gas regulator, earth clamp, earth cable and dinse connector and chipping hammer. This kit is not supplied with the inverter.

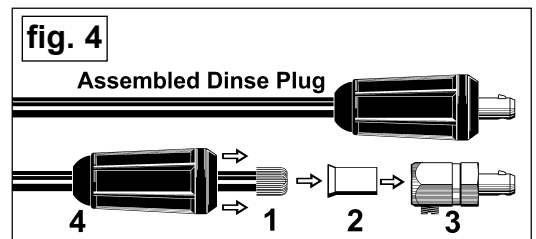
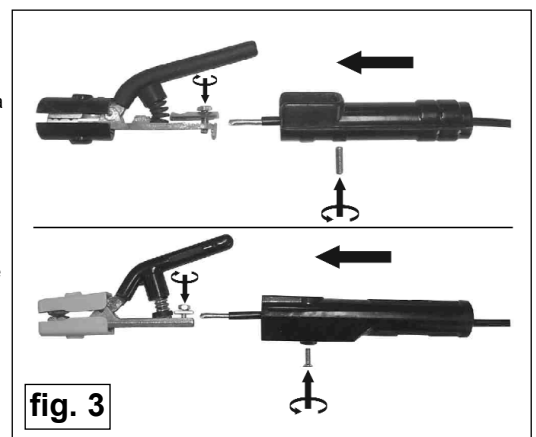
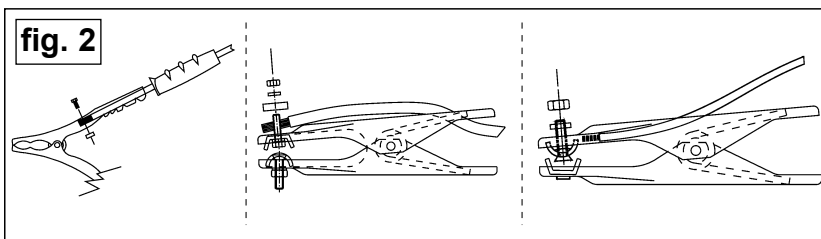
☐ **WARNING! Ensure that the inverter is not plugged into the power supply before assembling, connecting or disconnect cables. See Safety Instructions (Section 1).**

3.3 WELDING CABLE ASSEMBLY.

With either accessory kit it may be necessary to assemble the clamps and connectors to the cables as indicated in the adjacent diagrams.

- 3.3.1 EARTH CLAMP: Refer to fig.2.
- 3.3.2 ELECTRODE HOLDER: Refer to fig.3. (For ARC welding)
- 3.3.3 DINSE PLUG ASSEMBLY: Refer to fig.4.

☐ **WARNING! Cable connectors must be turned fully into the dinse sockets to ensure a good electrical contact. Loose connections will cause overheating, rapid deterioration and loss in efficiency.**



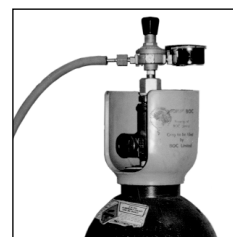
4. CONNECTING CABLES & GAS

- ❑ **WARNING!** Ensure that the inverter is not plugged into the power supply before assembling, connecting or disconnect cables. See Safety Instructions (Section 1).
 - ❑ **WARNING!** Failure to follow the electrical safety instructions will affect the operating performance and may damage the built-in safety system which could result in personal injury or fatality and will invalidate the warranty.
- 4.1 **ELECTRODE HOLDER CABLE CONNECTION:** BEFORE CONNECTING CABLES IT IS IMPORTANT TO REFER TO THE INSTRUCTIONS ON THE ELECTRODE PACKAGING WHICH WILL INDICATE THE CORRECT POLARITY FOR THE ELECTRODE, TOGETHER WITH THE MOST SUITABLE CURRENT TO USE.
- 4.2 **ARC WELDING.** Normally, when ARC welding, the ELECTRODE HOLDER is connected to the "POSITIVE" (+) terminal (fig. 5).
- 4.3 **TIG WELDING** Normally, when TIG welding alloys, the ELECTRODE HOLDER is connected to the "NEGATIVE" (-) terminal (fig. 5).
- 4.4 **WORK CLAMP CABLE CONNECTION**
The work clamp cable is connected to the inverter terminal which is not occupied by the electrode holder cable. The clamp is connected to:
- a) The workpiece.
 - b) A metal work bench. The connection must be as close to the proposed weld as possible.
- ❑ **WARNING!** *Dinse cable connectors must be turned fully into the dinse sockets to ensure a good electrical contact. Any loose connections will cause overheating, rapid deterioration and loss in efficiency.*
DO NOT use welding cables over 10m in length. With the exception of a metallic workbench, DO NOT connect the work clamp to a metal structure which is not part of the workpiece, as this will jeopardise weld quality and may be dangerous.
- 4.5 **CONNECTING THE GAS FOR TIG WELDING (Using optional kit INV/TIG)**
- 4.5.1 When using Argon gas fit the Bull Nose Adaptor to the cylinder with a spanner.
- 4.5.2 Fit the gas regulator onto the Bull Nose Adaptor (see fig.6).
- 4.5.3 The black gas supply tube is an integral part of the INV/TIG Torch/Cable assembly. Screw the female brass connector at the end of the tube directly to the gas regulator as shown in fig.6.
- 4.5.4 Close the regulator before opening the cylinder valve. Test for leaks.
- 4.5.5 Set the gas flow to suit the welding parameters required. See WELDING PARAMETER TABLES for general guidance.
- 4.5.6 If necessary the gas flow can be adjusted during welding using the regulator knob.

fig. 5



fig. 6



5. CONTROLS & PREPARATION

- 5.1 **FRONT PANEL CONTROLS (See fig.7)**
- 5.1.1 **POTENTIOMETER:** (fig.7-2) To regulate welding current with scale graduated in Amps. May be regulated during welding.
- 5.1.2 **GREEN LED:** (fig.7-3) Mains power indicator, machine ready.
- 5.1.3 **YELLOW LED:** (fig.7-4) Normally off. When on it means no welding current due to one of the following faults:
1. **Thermal protection:** Inside machine the temperature is excessive. The machine is ON but will not deliver current until a normal temperature is reached. Once this happens the re-start is automatic.
 2. **Mains over/under voltage protection:** Shuts down the machine if the power supply voltage is too high or too low.
 3. **Short circuit protection:** If there is a short-circuit lasting more than 1.5 seconds (i.e. electrode sticking), machine stops. Re-start is automatic.
- 5.1.4 **FUNCTION SELECTION SWITCH:** (fig.7-5) Selects the desired welding mode:
1. TIG - SCRATCH: Left hand position for TIG welding with scratch strike (without HOT START and ARC FORCE).
 2. ARC WELDING WITH ELECTRODE: Right hand position for electrode welding (with HOT START and ARC FORCE).
(NOTE: Arc welding with particular rutile electrodes may result in excessive spattering. In this case we advise moving the selection switch to the TIG position.)
- 5.2 **REAR PANEL FACILITIES (See fig.8)**
- 5.2.1 **MAINS ON/OFF SWITCH.** The mains ON/OFF switch is located on the rear panel and illuminates when in the ON position.
- 5.2.2 **PRODUCT RATING PLATE.** The product rating plate is printed on the rear panel. Refer to Section 10 for an explanation of the symbols used.
- 5.3 **SITING THE INVERTER.** When commencing work the inverter should be placed on a stable flat surface to prevent it from tipping or moving hazardously. The surface used should be capable of supporting the weight of the inverter.
- 5.3.1 Ensure that the ventilation slots on the front and rear panels are not obstructed and at the same time make sure conductive dusts, corrosive vapours, humidity etc will not be sucked into the machine. Leave at least 250mm free space around the inverter.

fig. 7

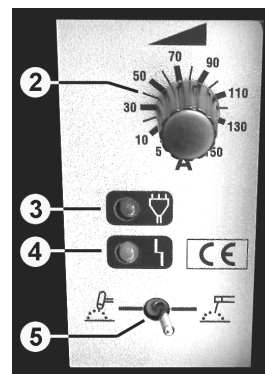
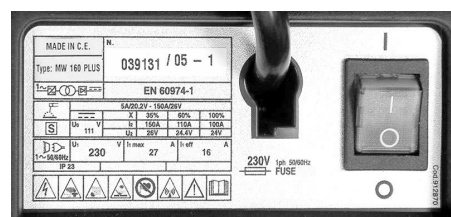


fig. 8



6. WELDING PROCEDURE

- ❑ **WARNING!** Ensure that you read, understand and follow the safety instructions. Place the welding mask in front of your face before striking the arc.

6.1 ARC WELDING

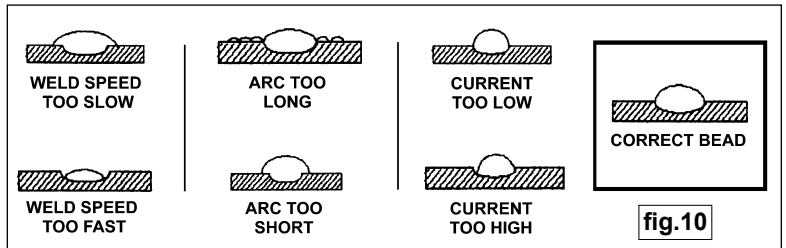
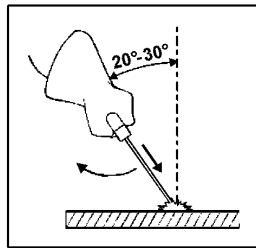
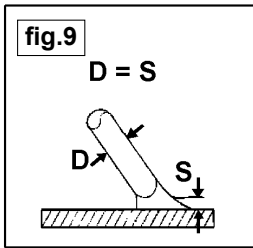
- 6.1.1 **ELECTRODE POLARITY:** It is essential that the user refers to the makers instructions on the stick electrode packaging to determine the correct polarity of the stick electrode and the recommended current.
- 6.1.2 **WELDING CURRENT:** In general the welding current must be regulated according to the diameter of the electrode in use (see chart on right) and the type of joint to be welded. Further consideration must be given to the location of a weld, for example: Welds that are performed on a horizontal surface require a higher voltage than those performed on a vertical or overhead surface. The mechanical characteristics of the weld will be determined not only by the current intensity used, but also by the diameter and quality of the electrode, the length of arc and the work rate and position of the user. The condition of the electrode is an important factor and must never be wet or damp.
- 6.1.3 **ARC FORCE:** The properties of the weld also depend on the arc force value (dynamic behaviour) of the welder. The arc force function is automatically active when the welding mode switch is set to the right hand arc welding position. It should be noted that higher arc force values achieve better penetration and allow welding in any position typically with basic and cellulose electrodes. If lesser penetration is required the switch can be set to the TIG - SCRATCH position which will disable the arc force and hot start functions.
- 6.1.4 **ARC WELDING PROCEDURE:** (Optional Arc welding accessory kit INV/16 is available your Sealey dealer.)
- (a) Strike the electrode tip on the workpiece as if you were striking a match.

Electrode Diameter (mm)	Welding Current (Amp)	
	Min	Max
1.6	.25	.50
2.0	.40	.80
2.5	.60	.110
3.2	.80	.160
4.0	.120	.200

- ❑ **WARNING!** DO NOT hit the electrode on the workpiece, as this may damage the electrode.

(b) As soon as the arc is ignited, maintain a distance from the workpiece equal to the diameter of the electrode being used. Keep this distance as constant as possible for the duration of the weld. As you advance along the workpiece the angle of the electrode must be maintained between 20° to 30°. See fig.9.

(c) At the end of the weld bead, bring the end of the electrode backward in order to fill the weld crater, quickly lift the electrode from the weld pool to extinguish the arc. See fig.10 for guidance on achieving a satisfactory weld bead.



6.2 TIG WELDING

6.2.1 **THE TIG WELDING PROCESS:** (Optional TIG welding accessory kit INV/TIG is available your Sealey dealer.)

TIG (Tungsten Inert Gas) welding uses an arc struck between a tungsten electrode and the work to fuse the joint. The electrode itself is not consumed and filler metal may be required to build the weld profile. The process is protected from atmospheric oxidation by a shield of inert gas which flows from the ceramic nozzle. This gas is normally pure argon, but helium by itself or a mixture of helium and argon may be used for special applications. For stainless steel use a mixture of argon and hydrogen.

To achieve a good weld the pieces should be carefully cleaned and free of oxidation, oil, grease and solvents etc

6.2.2 **CONDITION OF ELECTRODE:** The tip of the electrode should be kept in good condition by sharpening it axially on a grinding wheel as shown in fig.11. Ensure that the tip is perfectly centred to prevent arc deviation. It is important to carry out the grinding along the length of the electrode. This operation should be repeated periodically depending on the amount of use and wear of the electrode, or when the electrode has been accidentally contaminated, oxidised or used incorrectly.

6.2.3 **CHOICE OF ELECTRODE:** The electrode diameter should be chosen according to the suggestions shown in the table in fig.12. In general when performing TIG DC welding (with the electrode attached to the negative terminal) an electrode with 2% Thorium (red band) can be used or an electrode with 2% Cerium (grey band). To achieve a good weld it is essential to use the exact electrode diameter with the exact current. The electrode will usually protrude from the ceramic nozzle by 2-3mm but this may be increased this can be increased to 8mm for corner welding.

6.2.4 **TIG WELDING PROCEDURE:**

WARNING! Keep the gas bottle away from sources of heat including sunlight.

WARNING! DO NOT hit the electrode on the workpiece, as this may damage the electrode.

(a) Strike the electrode tip on the workpiece as if you were striking a match.

(b) Point the electrode in the direction of the weld at about 2.5mm distance from the surface and use the arc to melt the metal at the joint.

(c) To increase or decrease flow of gas, use the control knob on the torch handle.

(d) Filler metal may be added by using cut lengths of wire over 1.5mm diameter. To use filler metal (for example when making a fillet weld), add it to the leading edge of the weld pool.

To end welding lift the electrode quickly away from the workpiece.

6.3 TORCH MAINTENANCE:

6.3.1 Do not allow the torch or its cable to rest on hot surfaces as this will damage the insulating materials.

6.3.2 Make regular checks on the gas pipe and connector seals. Ensure that the collet and collet body are accurately matched to the selected electrode diameter in order to avoid overheating, bad gas diffusion and poor performance.

6.3.3 At least once a day check the torch components for wear and make sure that they are correctly assembled.

7. TROUBLESHOOTING

Should you have a problem with the inverter, check the following:

- That the welding current is correct for the diameter and type of electrode being used.
- That the mains switch is on, and illuminated. If this is not the case then there may be a mains supply problem.
- That the yellow LED is not illuminated. If it is this indicates either a main under-voltage or a short circuit.
- That the nominal intermittence ratio is correct, and that the fan is working correctly. In the case of a thermal protection interruption, wait for the machine to cool.
- That you are using the correct voltage. If the supply is too high or too low the machine will cut out.
- That the cables are undamaged and that there is nothing causing a short-circuit.
- That all circuit connections are correct. In particular check that the work clamp is correctly attached to the workpiece. Ensure that there is no grease, paint etc on the contact surfaces.
- That correct gas is being used.

8. MAINTENANCE

WARNING! DISCONNECT FROM THE MAINS ELECTRICAL SUPPLY AND WAIT FOR CIRCUIT LIGHT TO GO OUT BEFORE ATTEMPTING TO OPEN THE UNIT.

● Inspect the inverter internally with a frequency dependent on the amount of use and the dustiness of the environment and remove dust deposits from the transformer, reactance and rectifier using a jet of dry compressed air (max 10bar). Do not direct compressed air onto the circuit boards. These should be cleaned with a soft brush.

● At the same time check that the electrical connections are tight and that there is no damage to the wiring insulation.

● After inspection and cleaning ensure that the cover is correctly replaced and that the fixing screws are fastened right down.

● Keep the outside of the machine clean by wiping with a soft dry cloth. For any other service or maintenance, contact your local Sealey service agent.

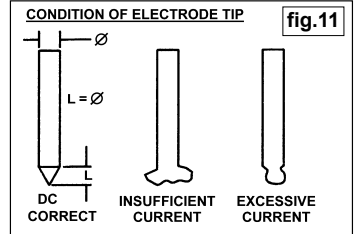
WARNING! NEVER OPERATE THE INVERTER WITH THE COVERS REMOVED.

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 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.

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



Material thickness	Current (Amps)	Electrode diameter	Ceramic nozzle	Gas supply	Filler rod diameter
0.3 - 0.5	5 - 20	0.5	6.5	3	-
0.5 - 0.8	15 - 30	1	6.5	3	-
1	30 - 60	1	6.5	3 - 4	1
1.5	70 - 100	1.6	9.5	3 - 4	1.5
2	90 - 110	1.6	9.5	4	1.5 - 2.0
3	120 - 150	2.4	9.5	5	2 - 3
4	140 - 190	2.4	9.5 - 11	5 - 6	3
0.3 - 0.8	20 - 30	0.5 - 1	6.5	4	-
1	80 - 100	1	9.5	6	1.5
1.5	100 - 140	1.6	9.5	8	1.5
2	130 - 160	1.6	9.5	8	1.5

SUGGESTED PARAMETERS FOR TIG WELDING

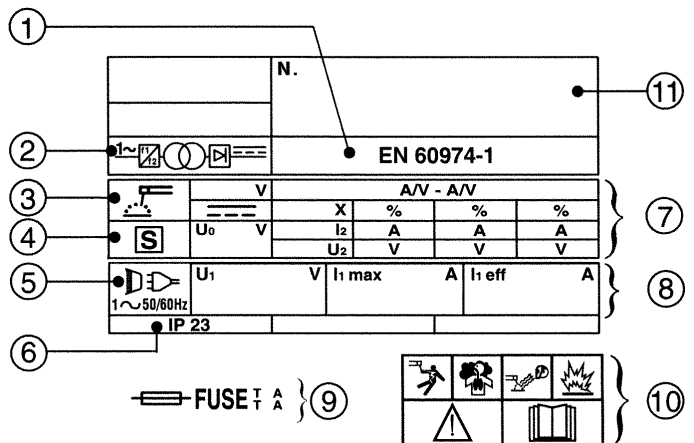
assistance of the supplier. In some cases this remedial action may be as simple as earthing the circuit (see Note). In other cases it could involve constructing an electromagnetic screen, enclosing the welding power source and the work, complete with associated input filters. In all cases the electromagnetic 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.'

- 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 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.
- 9.9. **Earthing of the workpiece.** Where the workpiece is not bonded to earth for electrical safety, nor connected to earth 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.
- 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.

10. RATING PLATE

On the rear of the inverter is the rating plate, giving the following data:

- The standard relating to the safety and construction of arc welding and associated equipment.
- Inverter-transformer-rectifier.
- Welding procedure: manual arc welding with covered electrode.
- S: Indicates that welding may be carried out in environments with a heightened risk of electric shock e.g. very close to large metallic objects.
- Power Supply: Single-phase AC.
- Rating of internal protection provided by casing.
- Output
U₀: Maximum open-circuit voltage.
I₂, U₂: Current and corresponding voltage.
X: Welding ratio based on a 10 minute cycle. 30% indicates 3 minutes welding and 7 minutes rest, 100% indicates continuous welding.
A/V-A/V: Welding current adjustment range and corresponding voltages.
- Power Supply
U₁: Rated supply voltage and frequency.
I_{max}: Maximum current.
I_{1eff}: Maximum effective current.



- Delayed fuse for supply protection.
- Symbols referring to safety.
- Serial Number. Specifically identifies each inverter.

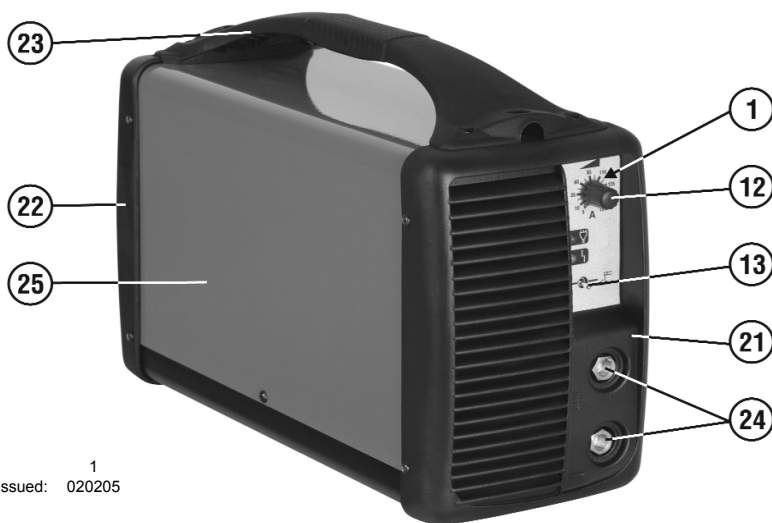
NOTE: It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.

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.

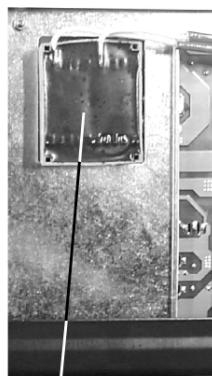
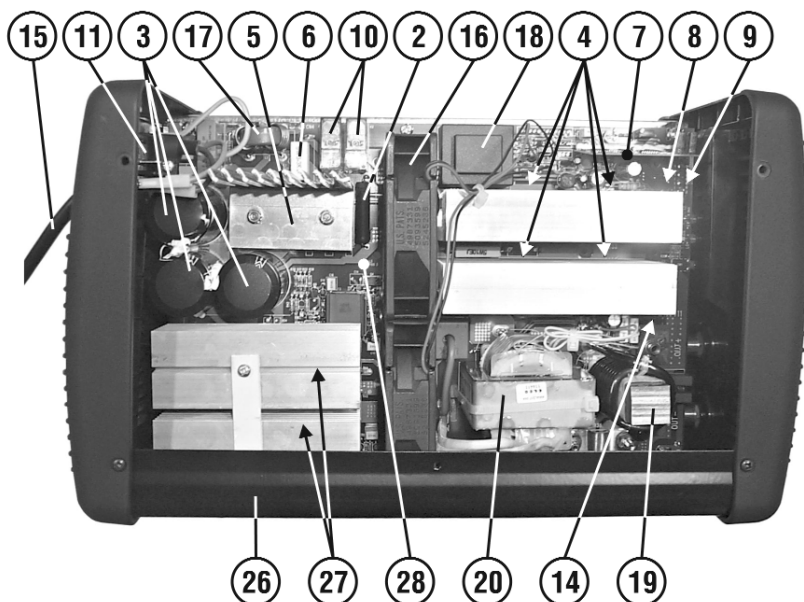
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	MW140PLUS.V2, MW160PLUS, MW170.V3 - 3 - 160505		



Issue: 1
Date Issued: 020205

ITEM	PART NO.	DESCRIPTION
1	120/112017	POTENTIOMETER
2	120/112048	RESISTOR
3	120/113156	CAPACITOR
4	120.112948	DIODE
5	120.116066	RECTIFIER
6	120.113046	RESISTANCE
7	120.114410	CONTROL BOARD
8	120.116115	CAPACITOR 1A 400V
9	120.116171	CAPACITOR 5A 100V
10	120.116320	RELAY
11	120/121007	SWITCH
12	120.121064	KNOB FOR POTENTIOMETER
13	120.121193	SWITCH
14	120.121200	THERMOSTAT
15	120/132158	MAINS CABLE
16	120/152006	FAN
17	120/164741	INDUCTANCE FILTER
18	120.169369	AUXILIARY TRANSFORMER
19	120.169383	INDUCTANCE
20	120.169407	POWER TRANSFORMER
21	120.322692	FRONT PANEL
22	120.322694	BACK PANEL
23	120.322695	HANDLE
24	120/712000	DINSE SOCKET
25	120.990971	COVER KIT
26	120.990913	BOTTOM KIT
27	120.990918	KIT IGBT + DIODE
28	120.990921	COMPLETE CONTROL PCB KIT
29	120.169404	FILTER INDUCTANCE



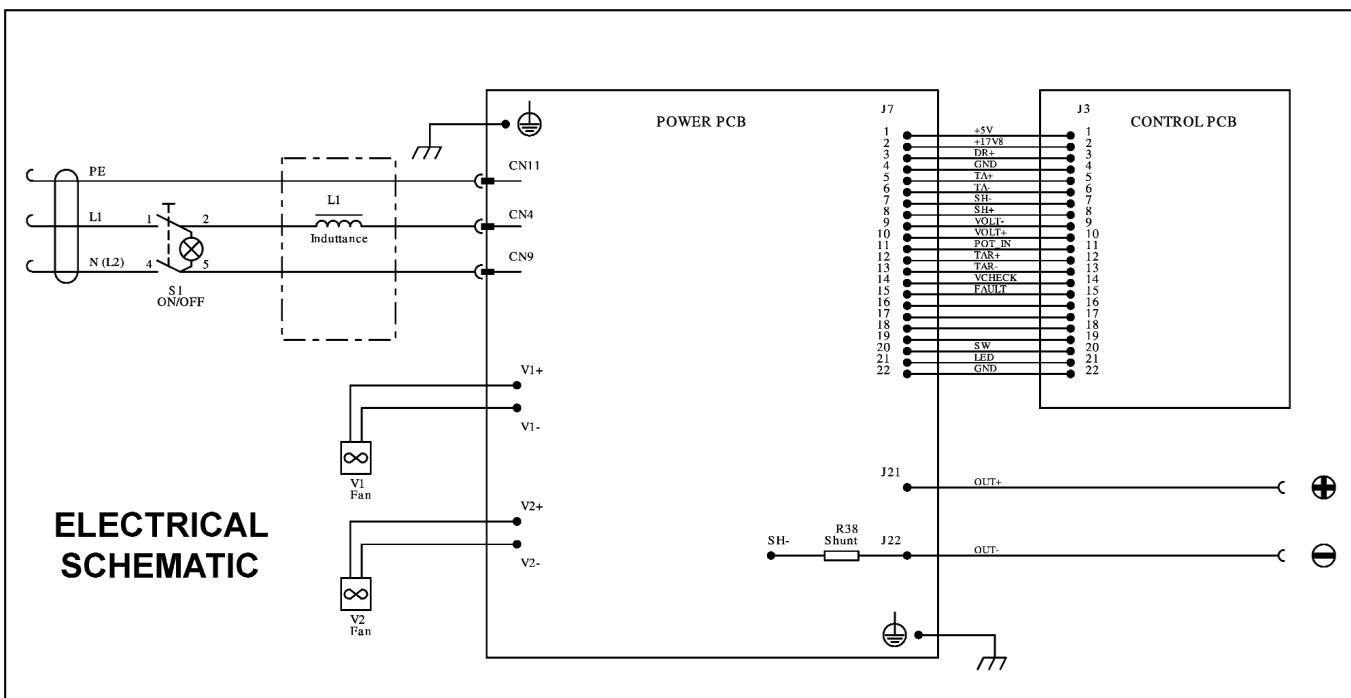
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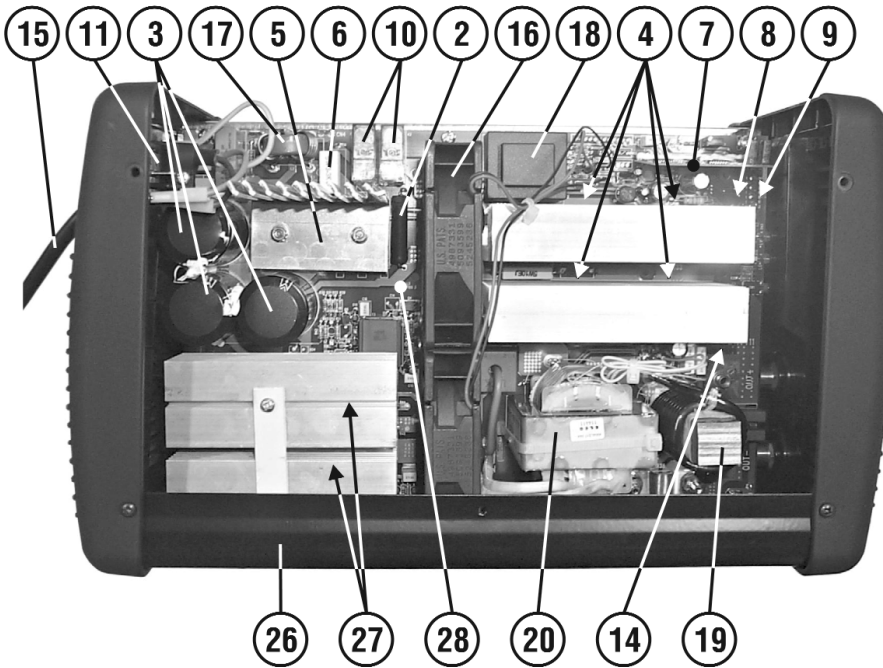
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PARTS LIST FOR INVERTER: MW170.V3



ITEM	PART NO.	DESCRIPTION
1	120.112017	POTENTIOMETER
2	120.112048	RESISTOR
3	120.112514	CAPACITOR
4	120.112948	DIODE
5	120.113018	RECTIFIER
6	120.113046	RESISTANCE
7	120.114410	CONTROL BOARD
8	120.116115	CAPACITOR 1A 400V
9	120.116171	CAPACITOR 5A 100V
10	120.116320	RELAY
11	120.121007	SWITCH
12	120.121064	KNOB FOR POTENTIOMETER
13	120.121193	SWITCH
14	120.121200	THERMOSTAT
15	120.132158	MAINS CABLE
16	120.152006	FAN
17	120.164741	INDUCTANCE FILTER
18	120.169369	AUXILIARY TRANSFORMER
19	120.169383	INDUCTANCE
20	120.169384	POWER TRANSFORMER
21	120.322692	FRONT PANEL
22	120.322694	BACK PANEL
23	120.322695	HANDLE
24	120.712000	DINSE SOCKET
25	120.990972	COVER KIT
26	120.990913	BOTTOM KIT
27	120.990918	KIT IGBT + DIODE
28	120.990919	COMPLETE CONTROL PCB KIT



Issue: 1
Date Issued: 210205

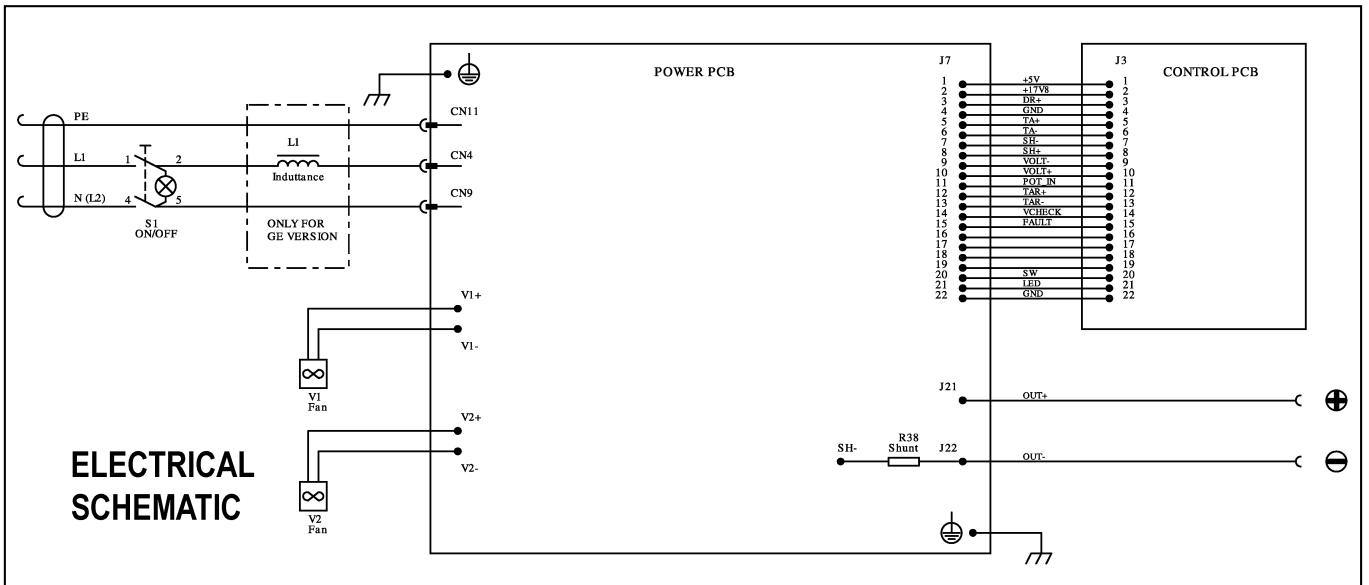
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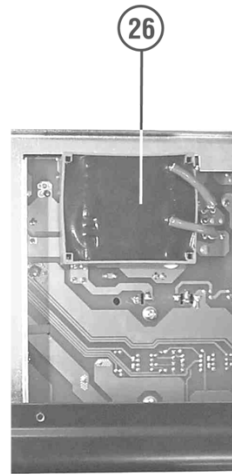
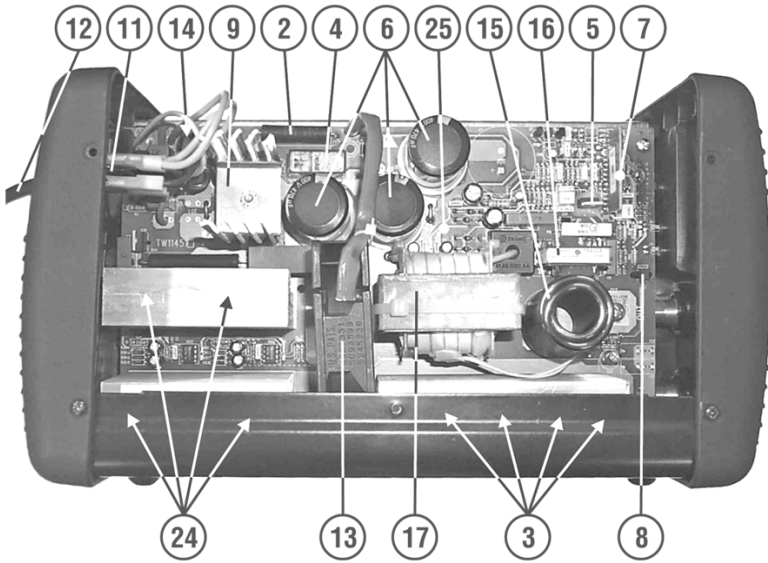
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ITEM	PART NO.	DESCRIPTION
1	120/112017	POTENTIOMETER
2	120/112048	RESISTOR
3	120.112948	DIODE
4	120.113233	RELAY
5	120/113487	PWM CONTROLLER
6	120.113156	CAPACITOR
7	120/114079	CONTROL PCB
8	120.116232	OPTO-COUPLER
9	120.116369	RECTIFIER
10	120.121064	KNOB FOR POTENTIOMETER
11	120/122381	SWITCH, GREEN ROCKER
13	120/152006	FAN
14	120/164741	INDUCTANCE FILTER
15	120/169144	INDUCTANCE
16	120.169308	TRANSFORMER
17	120.169391	POWER TRANSFORMER
18	120.322687	FRONT PANEL
19	120.32269	BACK PANEL
20	120.322691	HANDLE
21	120/712000	DINSE SOCKET
22	120.980025	COVER KIT
23	120.990917	BOTTOM KIT
24	120.990922	KIT & DIODE
25	120.990925	COMPLETE CONTROL PCB KIT
26	120.169394	FILTER INDUCTANCE



Issue: 1
Date Issued: 160505

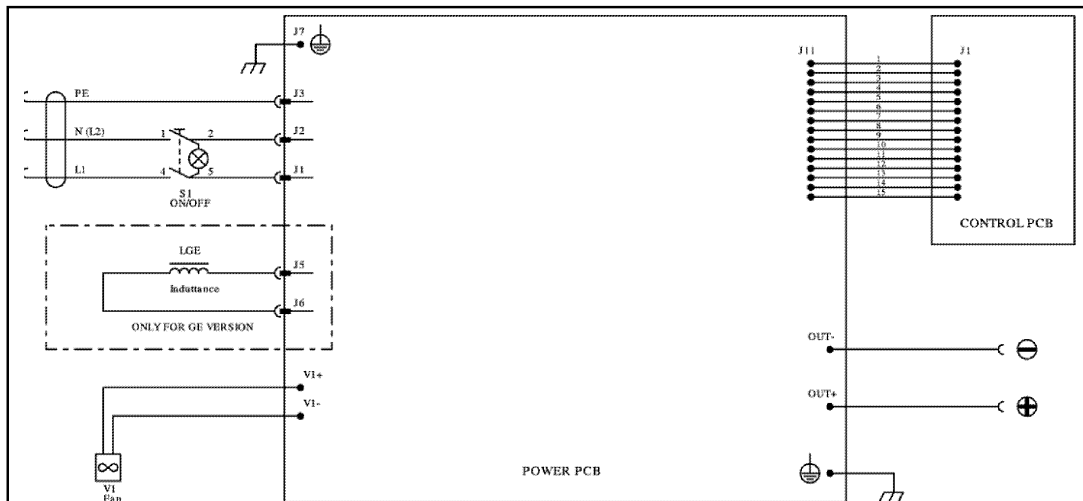
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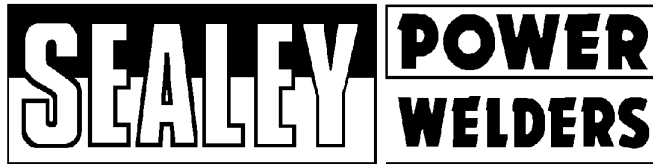
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Models:
MW140PLUS.V2
MW160PLUS
MW170.V3

DECLARATION OF CONFORMITY

We, the sole importer into the UK, declare that the products listed below are in conformity with the following standards and directives.

INVERTERS
MW140PLUS.V2, MW160PLUS & MW170PLUS

73/23/EEC Low Voltage Directive
89/336/EEC EMC Directive
93/68/EEC CE Marking Directive

The construction files for these products are held by the Manufacturer and may be inspected, by a national authority, upon request to Jack Sealey Ltd.



Signed by Mark Sweetman
2nd February 2005

*For Jack Sealey Ltd. Sole importer
into the UK of Sealey Power Welders.*

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 equipment.

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

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