

Cutmatic 45



Cutmatic 45
Plasma Cutter 45 Amp
Model No. MC108-0 Iss A

Operators Manual

10/19

Welding Industries of Australia

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Read First

The information contained in this manual is set out to enable you to properly maintain your new equipment and ensure that you obtain maximum operating efficiency.

Please ensure that this information is kept in a safe place for ready reference when required at any future time.

When ordering spare parts, please quote the model and serial number of the power source and part number of the item required. All relevant numbers are shown in lists contained in this manual. Failure to supply this information may result in unnecessary delays in supplying the correct parts.

Safety

Before this equipment is put into operation, please read the Safe Practices section of this manual. This will help to avoid possible injury due to misuse or improper welding applications.

Plastic Handles on Power Source

Please note that the handle fitted to the Plasma Cutter is intended for carrying the equipment by hand only.

DO NOT use this handle for suspending or mounting the Plasma Cutter in any other manner.

Safe practices when using welding equipment

These notes are provided in the interests of improving operator safety. They should be considered only as a basic guide to Safe Working Habits. A full list of Standards pertaining to industry is available from the Standards Association of Australia, also various State Electricity Authorities, Departments of Labour and Industry or Mines Department and other Local Health or Safety Inspection Authorities may have additional requirements. Australian Standard AS1674.2 provides a comprehensive guide to safe practices in welding.

Eye and face protection

Plasma Arc Cutting produces Optical radiation above safe levels for the unprotected eyes in the ultraviolet-C, ultraviolet-B, and visible light ranges.

Therefore it is recommended to protect exposed skin and eyes from UV radiation with appropriate protection.

For current of 20-45 Amp the recommended eye protection Lens shade Number is 5.

Burn protection

Although the plasma arc is not as intense as arc welding processes, there is still high level of Ultra violet radiation. Its radiation can damage eyes, penetrate light-weight clothing, reflect from light-coloured surfaces, and burn the skin and eyes. Radiation burns resulting from arcs resemble acute sunburn, but can be more severe and painful.

Wear protective clothing – leather or heat resistant gloves, hat, and safety-toed boots. Button shirt collar and pocket flaps, and wear cuffless trousers to avoid entry of sparks and slag.

Avoid oily or greasy clothing. A spark may ignite them. Hot metal such as work pieces should never be handled without gloves.

Ear plugs should be worn when cutting in overhead positions or in a confined space. A hard hat should be worn when others are working overhead.

Flammable hair preparations should not be used by persons intending to weld or cut.

Toxic fumes

Adequate ventilation with air is essential. Severe discomfort, illness or death can result from fumes, vapours, heat, or oxygen depletion that welding or cutting may produce. **NEVER** ventilate with oxygen.

Lead, cadmium, zinc, mercury, and beryllium bearing and similar materials when welded or cut may produce harmful concentrations of toxic fumes. Adequate local exhaust ventilation must be used, or each person in the area as well as the operator must wear an air-supplied respirator. For beryllium, both must be used.

Metals coated with or containing materials that emit fumes should not be heated unless coating is removed from the work surface, the area is well ventilated, or the operator wears an air-supplied respirator.

Work in a confined space only while it is being ventilated and, if necessary, while wearing air-supplied respirator.

Vapours from chlorinated solvents can be decomposed by the heat of the arc (or flame) to form phosgene, a highly toxic gas, and lung and eye irritating products. The ultra-violet (radiant) energy of the arc can also decompose trichlorethylene and perchlorethylene vapours to form phosgene. Do not weld or cut where solvent vapours can be drawn into the welding or cutting

atmosphere or where the radiant energy can penetrate to atmospheres containing even minute amounts of trichlorethylene or perchlorethylene.

Fire and explosion prevention

Be aware that flying sparks or falling slag can pass through cracks, along pipes, through windows or doors, and through wall or floor openings, out of sight of the operator. Sparks and slag can travel up to 10 metres from the arc.

Keep equipment clean and operable, free of oil, grease, and (in electrical parts) of metallic particles that can cause short circuits.

If combustibles are present in the work area, do NOT weld or cut. Move the work if practicable, to an area free of combustibles. Avoid paint spray rooms, dip tanks, storage areas, ventilators. If the work can not be moved, move combustibles at least 10 metres away out of reach of sparks and heat; or protect against ignition with suitable and snug-fitting fire-resistant covers or shields.

Walls touching combustibles on opposite sides should not be welded on or cut. Walls, ceilings, and floor near work should be protected by heat-resistant covers or shields.

A person acting as Fire Watcher must be standing by with suitable fire extinguishing equipment during and for some time after welding or cutting if;

- Combustibles (including building construction) are within 10 metres.
- Combustibles are further than 10 metres but can be ignited by sparks.
- Openings (concealed or visible) in floors or walls within 10 metres may expose combustibles to sparks.
- Combustibles adjacent to walls, ceilings, roofs, or metal partitions can be ignited by radiant or conducted heat.

After work is done, check that area is free of sparks, glowing embers, and flames.

A tank or drum which has contained combustibles can produce flammable vapours when heated. Such a container must never be welded on or cut, unless it has first been cleaned as described in AS.1674.2. This includes a thorough steam or caustic cleaning (or a solvent or water washing, depending on the combustible's solubility), followed by purging and inerting with nitrogen or carbon dioxide, and using protective equipment as recommended in AS.1674.2. Water-filling just below working level may substitute for inerting.

Hollow castings or containers must be vented before welding or cutting. They can explode. Never weld or cut where the air may contain flammable dust, gas, or liquid vapours.

Shock Prevention

Exposed conductors or other bare metal in the welding circuit, or ungrounded electrically alive equipment can fatally shock a person whose body becomes a conductor. Ensure that the equipment is correctly connected and earthed. If unsure have the equipment installed by a qualified electrician. On mobile or portable equipment, regularly inspect condition of trailing power leads and connecting plugs. Repair or replace damaged leads.

Fully insulated electrode holders should be used. Do not use holders with protruding screws. Fully insulated lock-type connectors should be used to join welding cable lengths.

Terminals and other exposed parts of electrical units should have insulated knobs or covers secured before operation.

1 Introduction

Plasma Arc Cutting

A Plasma is a gas which has been ionized by increasing the energy level to the point where the electrons are stripped from the gas molecule and are free to move. The free moving electrons mean the gas can conduct electricity, and the gas can reach high temperatures of 20,000C.

A plasma is created by an arc. By allowing more current to flow through the plasma, the plasma energy can be increased. By forcing a gas such as nitrogen, oxygen, argon, or air through the plasma arc, a high energy plasma stream is created.

These features of the plasma are exploited when using the plasma cutter.

The Cutmatic 45 uses compressed air from external source, as the gas medium for the plasma.

The Plasma cutter torch, provides a pilot arc to initiate the plasma stream. When the Plasma stream is brought into contact with the electrically conductive work piece, the plasma current is transferred to the work piece. The plasma power source increases the current through the plasma. The high temperature then melts the work piece and the high volume of gas transports molten material away from the cut.

The plasma process provides a low cost method of cutting any conductive metal including steel, alloyed steel, stainless steel, cast iron, aluminium, aluminium alloys, copper and copper alloys.

The Cutmatic 45 can clean cut ferrous metal up to 16mm. Different nozzle sizes are available, 1.0mm for high current and 0.8mm for low current applications.

2 Receiving

Check the equipment received against the shipping invoice to make sure the shipment is complete and undamaged. If any damage has occurred in transit, please immediately notify your supplier.

The Cutmatic 45 inverter package contains;

- Cutmatic 45 Inverter Power Source
- Parker SCP40 Torch
- Work Clamp 4m
- Air Hose 3m
- Cutting Tip 1.0mm (1)
- Cutting Tip 0.8mm (1)
- Electrodes (1)
- Cutting Guide
- (This) Operating Manual MC108-40.

3 Specifications

Manufactured to Australian Standard - AS60974.1

Torch Trigger complies with HRD - AS1674.2 Category C.

Primary Voltage	220-240 Vac, 50/60 Hz
Rated Primary Current (I_{eff})	14.2 Amps
Maximum Primary Current (I_{max})	22.5 Amps
Rated Output @ 40°C	45 Amps, 98 V, 40% duty
Duty cycle based on 10 minute cycle time	28 Amps, 91.3 V, 100% duty
Continuous Rated Output@ 40°C	28 Amp
Cutting Current	15 - 45 Amps
Open Circuit Voltage	310 V
Shipping Weight	16 kg - Includes leads
Power Source Weight	11.5 kg
Main Circuit Breaker Rating	25 Amps
Supply Plug	15 Amp
Fitted Supply Cable	2.5 mm ² Three Core, Heavy Duty PVC
Power Supply Outlet (240 V) & Extension Lead Rating	15 Amp
Cooling	Fan cooled.
Airflow Requirements	115 l/per minute, pressure 90 PSI/0.6 MPa. Output disabled for air pressure less than 50PSI/.35MPa.
Generator Requirements	8-10 kVA

4 Features

4.1 Power Factor Correction (PFC)

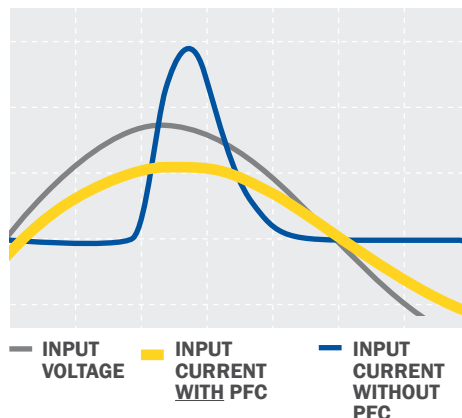
PFC provides a input power conditioner system to smooth the input current.

On a conventional inverter machine the input current presents in short high current pulses every half mains cycle. These pulses, cause input voltage drop, on extension leads and generators.

The PFC spreads the current pulse over the whole mains cycle.

The overall effect is PFC provides stable operation, on challenging power supplies, particularly on long supply leads and generators.

Power Factor Correction



To overcome this problem the Cutmatic 45 uses a contact pilot ARC method.

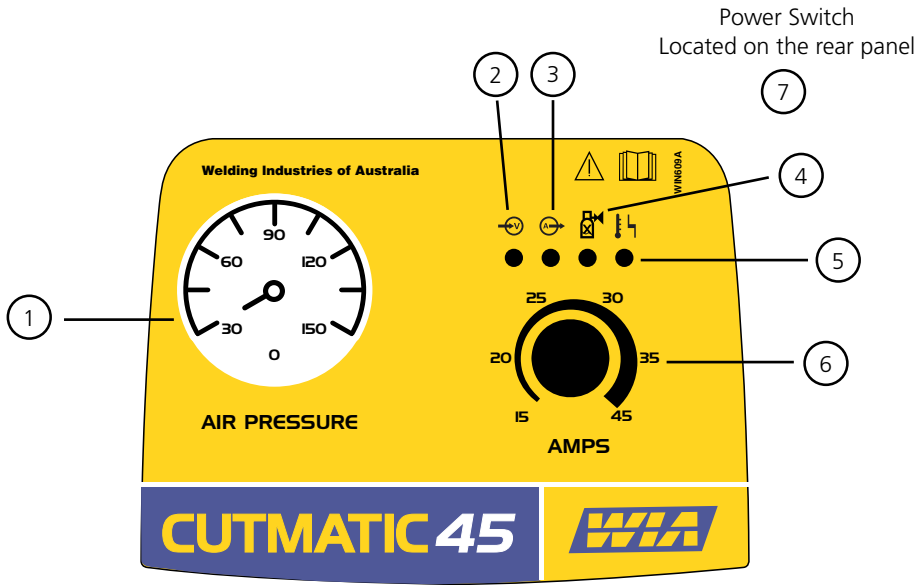
Air pressure is used to move the internal electrode in the torch when the trigger is pressed. The movement creates a gap which creates a spark which ignites the plasma inside the torch head.

When the torch is brought close to the work piece the , plasma will transfer to the work piece the current will increase and cutting can commence.

4.2 Pilot Arc

To create the Plasma gas an arc needs to be established in the gas flow. A common starting method was to use high frequency and high voltage between the internal electrode and the torch tip. The high frequency signal can create electrical interference and disrupt communication, radio, TV and other electronic equipment.

5 Controls



1 Air Pressure Gauge

The Air pressure Gauge indicates the input air pressure. The air pressure can be adjusted by the large black knob on the air cleaner at the rear of the panel.

Typical pressure is 0.6 Mpa or 90 PSI.

2 Power On Indicator

3 Indicates Torch Retaining Cup on tight

4 Air Pressure Warning

If the air pressure is too low or not turned on then the indicator will be off.

5 Over Temperature Indicator

This light is on if any internal thermal protection devices have operated. Allow the machine to cool down.

6 Cutting Current Control

This control sets the amount of output current of the power source within the available range. Rotate the knob clockwise to increase the output current.

7 Power On/Off Switch

In the OFF position, this switch isolates the power source from the mains power supply. The switch is located on the rear panel.

6 Installation

Connection to Electrical Mains Power Supply

The Cutmatic 45 is fitted with a 15 Amp plug, recognisable by a wide earth pin. Power supply authorities require that equipment fitted with a 15 Amp plug shall ONLY be connected to a 240 Volt, 15 Amp power point. DO NOT modify the plug.

The minimum capacity of the main power supply wiring and power outlet supplying a welder is selected according to the Effective Primary Current of the equipment. Refer to Section 3.

The minimum recommended main power supply circuit breaker ratings for the Cutmatic 45 inverters are listed in Section 3.

The current rating of the mains cable depends on cable size and method of installation. Refer to AS/NZS 3008.1, Table 9.

If it becomes necessary to replace the mains flexible supply cable, use only cable with correct current rating. See Section 3.

If it is necessary to use an extension power supply cable, ensure that it is rated as per Section 3. Voltage drop which will occur over long lengths of cable will reduce the maximum welding current available from the equipment.

Successful Operation

Welding Equipment at maximum output require high current during operation, then minimum current during idle time.

Mains supply circuit breaker tripping can sometimes occur.

Successful operation will depend on a number of factors:

- Variation in circuit breaker thresholds.
- Ambient temperature.

- Number of previous circuit breaker operations.
- Actual weld conditions, resulting in higher weld currents.
- Repeated starts can result in repeated surge currents raising circuit breaker threshold.

Repeated Circuit breaker operation at weld start can sometimes be overcome by using a "D" curve circuit breaker.

To reduce nuisance tripping, a higher rated circuit breaker can be selected, but the supply circuit wiring capacity must be increased to suit.

Connection to Generator

The Cutmatic 45 can be operated from a generator. The PFC feature will allow greater tolerance to variable generator outputs. However, it is not recommended that the equipment be powered from small engine-driven generator sets unless they have adequate voltage regulation. Poor regulation results in peaks of supply voltage which can occur with some equipment of this type. Excessive voltage peaks can damage the circuits of the welder.

Generators used to power this equipment must have the recommended minimum capacity and incorporate output voltage regulation.

Due to variation between generators by different manufacturers, it is impossible for WIA to validate operation from all generators. Therefore, correct operation of welding equipment on the generator should be confirmed by the manufacturer, before purchasing the generator.

7 Setup for Cutting

Connection for Plasma Cutting

Connect the work lead and torch as illustrated below.

Connections for Plasma Cutting



Be certain that you are wearing suitable protective clothing, gloves etc and that you are working in a non-hazardous area. If necessary, refer again to **Section 1 - Safe Practices** in this manual.

Connect the work clamp to the work piece. Connect Air line from Air Compressor to Air Filter Connection on rear of machine. Turn Air on.

Check Cutting Tip size is suitable for thickness of material.

Current Range for Cutting Tips

Diameter (mm)	AMPS	Thickness (mm)
Tip Ø 0.8	15-30	1-6
Tip Ø 1.0	20-45	5-16

Turn on the power switch located on the rear panel. Wait approximately 5 seconds as the unit goes through its initiation sequence. Start plasma arc as per arc startup sequence.

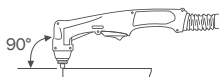
8.1 Plasma Cutting Start Sequence - Edge Start

⚠ The pilot arc starts immediately when trigger is pulled



Connect work clamp to a clean, paint-free location on workpiece, as close to cutting area as possible.

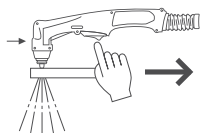
⚠ Connect work clamp to portion of workpiece that does not fall away after being cut.



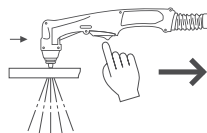
For standard cutting, place tip drag shield on edge of metal so arc can blow past edge.



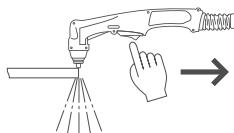
Slide trigger lock and press trigger. Pilot arc starts and will go out after 3 seconds if cutting arc is not established.



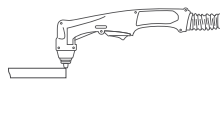
After cutting arc starts, slowly start moving torch across metal.



Adjust torch speed so sparks go through metal and out bottom of cut.



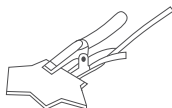
Pause briefly at end of cut before releasing trigger.



Postflow continues after releasing trigger; cutting arc can be instantly restarted during postflow by raising trigger lock and pressing trigger.

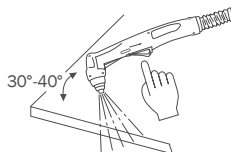
8.2 Plasma Cutting Start Sequence - Pierce Start

⚠ The pilot arc starts immediately when trigger is pulled

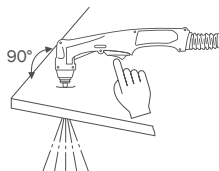


Connect work clamp to a clean, paint-free location on workpiece, as close to cutting area as possible.

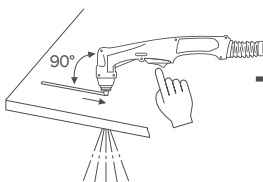
⚠ Connect work clamp to portion of workpiece that does not fall away after being cut.



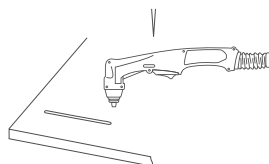
Hold torch at an angle to the workpiece. Slide trigger lock and press trigger. Pilot arc starts and will go out after 3 seconds if cutting arc is not established.



Rotate torch to upright position approx. 90° to surface. When arc has pierced through workpiece, start cutting.



Maintain approximately 90° torch position to surface, and continue cutting.



Release trigger. Postflow continues after releasing trigger; arc can be instantly restarted during postflow by raising trigger lock and pressing trigger.

9 External Trouble Shooting

If you are in Australia and the following checks do not identify the fault condition, the equipment should be returned to a WIA Service agent. Phone 1300 300 884 for details of your nearest service agent.

If you are in New Zealand and the following checks do not identify the fault condition, the equipment should be returned to the original place of purchase with proof of purchase, or contact Weldwell on 06 8341 600.

No Welding Current

Check:

- 1 Check that mains supply is available at the Plasma Cutter power source. At least one of the display panel lights should be on. If not, test outlet using a known working appliance.
- 2 Check that the torch and work leads are connected securely to the output sockets at the front of the machine.
- 3 Check for continuity of the work lead, work clamp. Loose connections can prevent proper flow of the cutting current and also make starting difficult.
- 4 Over temperature light on. The Plasma cutter power source incorporates an in built protection device which will operate if the unit is overloaded. In this event, the machine will not deliver welding current, and the Over Temperature light will be on. Leave the machine energised with the fan running to achieve the maximum cooling rate.

- 5 Check the retaining cup is screwed on tight. When the retaining cup is on tight the light will be on when trigger pressed (refer 7 Controls item 3).
- 6 Check if air pressure light is on (refer 7 controls item 4). If not then there is a problem with the air supply.

Poor Cut Performance

- 1 The Cutmatic 45 has power factor correction which will compensate for fluctuating main supply. however there is a limit to how much compensation can be made. Check the mains voltage supply. Long extension cords can cause low voltage.
- 2 When operating on generators the power factor correction PFC will smooth out the peak current. however there is a limit to how much the PFC can do, check generator size is adequate.

10 Service Information

The electrical components of the equipment are shown in the circuit diagram on page 14.

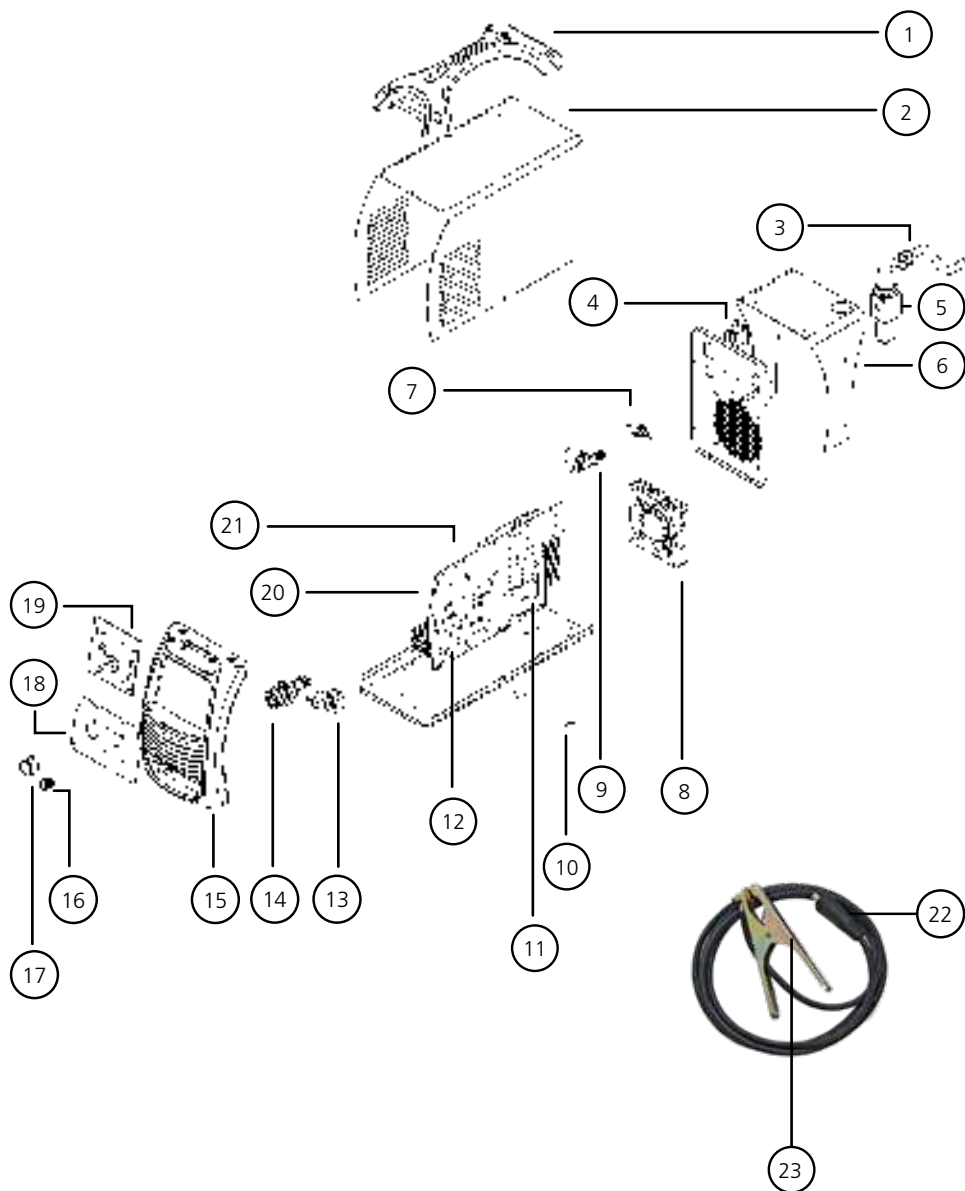
The Plasma Cutter is an inverter type design, where the mains supply is first rectified, filtered then chopped to a high frequency before being applied to the AC weld transformer. The output of this transformer is rectified to form the welding output of the machine.

CAUTION: The following information is intended for use by qualified service personnel. When the unit is energised LETHAL VOLTAGES are present on the electrical and electronic components. It is not intended that persons without suitable training and knowledge attempt to perform service tasks on the components of this welder.

Before removing the equipment cover, ENSURE that the equipment is disconnected from the mains power supply. When the equipment is energised LETHAL VOLTAGES are present on the electrical components enclosed.

If the supply cable is damaged it must be replaced by the manufacturer, their service agent or a similarly qualified person.

10.1 Assembly and Parts List - Cutmatic 45 Power Source



Cutmatic 45 Power Source Assembly

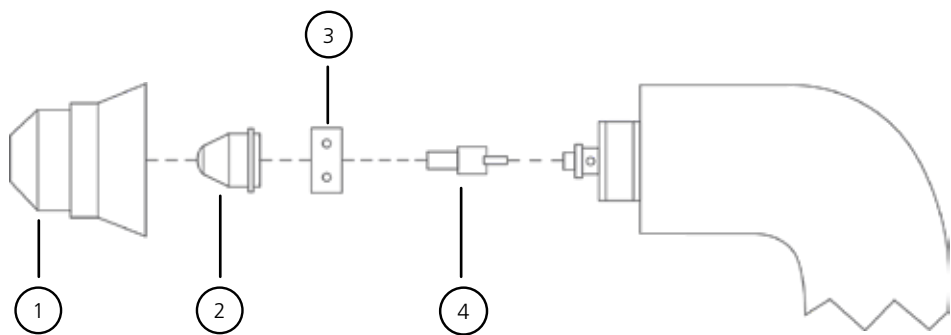
10.2 Assembly and Parts List - Cutmatic 45 Power Source

Item #	Part #	Description	Qty
1	M0089	Handle	1
2	PAN168	Outer Cover	1
3		Supply Cord 2.5mm ² Heavy Duty 15Amp Plug	1
4	E0078	Switch	1
5	M0091	Air Regulator	1
6	PAN169	Air Filter Bracket	1
7	E0095	Switch Pressure	1
8	FAN011	Large Fan	1
9	E0096	Gas Valve	1
10	M0043	Foot	2
11	D0046	IGBT	2
12	D0045	Diode	5
13	E0094	Socket Dinse Small with Cover	1
14	E0097	Central Connector Torch	1
15	M0090	Front Plastic Panel	1
16	M0058	Knob	1
17	M0095	Pressure Gauge	1
18	WIN609	Front Sticker Cutmatic 45	1
19	PWA051	PCB Front Panel Cutmatic 45	1
20	PWA050	PCB Main Control Cutmatic 45	1
21	FAN018	Small Fan	1
22	SA32-0/1	Small Dinse Connector	1
23	CLA002	Work Clamp	1
Not shown	MC108-40	Operating Manual	1

Cutmatic 45 Circuit Diagram



10.3 Assembly and Parts List - Cutmatic 45 Torch



Item #	Part #	Description
	SCP40-60-CC1BG	Surecut Plasma Torch x 6mt
1	SCP2530-6	Retaining Cap, 6 holes
2	SCP2524-10	Cutting Tip 1.0mm Flat (5 Pack)
	SCP2524-08	Cutting Tip 0.8mm Flat (5 Pack)
3	SCP2506	Swirl Ring 45i
4	SCP2504	Electrode 45i (5 Pack)
Not shown	SCP2516	Safety trigger
Not shown	SCP2540	Cutting Guide Double Pointed
Not shown	SCP2551	Cutting Buggy
Not shown	SCP2550	Circle Cutting Attachment Kit

11 Australian Warranty Information



Australia Warranty

WIA Cutmatic 45

3 Year Warranty Statement

Welding Industries of Australia (WIA) warrants to the original retail purchaser that the Cutmatic 45 plasma cutting machine purchased (Product) will be free from defects in materials and workmanship for a period of 3 years from the date of purchase of the Product by the customer. If a defect in material or workmanship becomes evident during that period, Welding Industries of Australia will, at its option, either:

- Repair the Product (or pay for the costs of repair of the Product); or
- Replace the Product.

In the event of such a defect, the customer should return the Product to the original place of purchase, with proof of purchase, or contact Welding Industries of Australia on 1300 300 884 to locate an authorised service agent.

Any handling and transportation costs (and other expenses) incurred in claiming under this warranty are not covered by this warranty and will not be borne by Welding Industries of Australia. Welding Industries of Australia will return the replacement product, if original found to be faulty, freight free to the customer.

This warranty covers the Cutmatic 45 power source and wirefeeder only, and does not extend to the regulator, gun assembly or accessories included in the original purchase package.

The obligation of Welding Industries of Australia under this warranty is limited to the circumstances set out above and is subject to:

- The customer being able to provide proof of purchase of the Product and the purchase price paid for the Product;
- The relevant defect in materials or workmanship;
- The Product not having been altered, tampered with or otherwise dealt with by any person in a manner other than as intended in respect of the relevant Product; and
- The Product not having been used or applied in a manner that is contrary to customary usage or application for the relevant Product or contrary to any stated instructions or specification of Welding Industries of Australia.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. The benefits given by this warranty are in addition to other rights and remedies which may be available to the customer under any law in relation to goods and services to which this warranty relates.

12 New Zealand Warranty Information



New Zealand Warranty

WIA Cutmatic 45s purchased in New Zealand have identical warranty conditions as Australia, with the below conditions:

In the event of defects listed in the Australian warranty conditions, the customer should return the Product to the original place of purchase, with proof of purchase, or contact Weldwell on 06 8341 600.

The warranty shall not apply to parts that fail due to normal wear.

For customers located in New Zealand, you can contact:

Weldwell New Zealand
Division of ITW New Zealand

64 Thames Street
Napier 4110
New Zealand

Ph: 06 8341 600

Email: info@weldwell.co.nz

Notes:

Notes:

WIA Auto-Darkening Helmets

ViewFX P/N - 235650 BlueFX P/N - 235660

PROTECTION, COMFORT & PERFORMANCE AT AN AFFORDABLE PRICE



- Lens and helmets comply with Australian Standards AS/NZS 1338.1 (Auto-Darkening) and AS/NZS 1337.1B (High Impact)
- High Impact Rating.
- BlueFX - 2 arc sensors and 1 year warranty (Auto-Darkening lens only).
- ViewFX - 4 arc sensors, large 97x60mm viewing area and 2 year warranty (Auto-Darkening lens only).

For more information call **1300 300 884** or visit **welding.com.au**

