

Weldarc 200i AC/DC



Weldarc 200i AC/DC Arc/TIG Welder
Model No. MC105-0 (From serial no. M1052A*)

Operators Manual

01/21

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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 Weldarc 200i inverter is intended for carrying the equipment by hand only.

DO NOT use this handle for suspending or mounting the Weldarc 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 Protection

NEVER LOOK AT AN ARC WITHOUT PROTECTION. Wear a helmet with safety goggles or glasses with side shields underneath, with appropriate filter lenses protected by clear cover lens. This is a **MUST** for welding, cutting, and chipping to protect the eyes from radiant energy and flying metal. Replace the cover lens when broken, pitted, or spattered.

Recommended Shade Filter Lens

Amps	TIG	MMAW	MIG	Pulsed MIG
0-100	10	9	10	12-13
100-150	11	10	10	12-13
150-200	12	10-11	11-12	12-13
200-300	13	11	12-13	12-13
300-400	14	12	13	14
400-500	—	13	14	14
500 +	—	—	14	14

Burn Protection

The welding arc is intense and visibly bright. Its radiation can damage eyes, penetrate light-weight clothing, reflect from light-coloured surfaces, and burn the skin and eyes. Burns resulting from gas-shielded 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 electrode stubs and work pieces should never be handled without gloves.

Ear plugs should be worn when welding 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

MMAW (Stick Welding)

Manual Metal Arc Welding (MMAW) is a process where an arc is struck between a flux-coated consumable electrode and the work piece. The arc and the weld pool are both shielded by gases generated by the flux coating of the electrode.

The Weldarc 200i has been designed to be used with 2.0mm, 2.5mm, 3.2mm and 4.0mm diameter electrodes. The smaller electrodes are used when welding at lower currents, such as sheet metal applications. Increasing the electrode diameter permits higher welding currents to be selected.

WIA supplies a wide range of mild steel and special purpose electrodes which cater for home workshop, rural, and industrial requirements. Some popular AUSTARC electrodes are listed below. The correctly selected AUSTARC electrode will influence the quality of the weld, and the stability of the arc.

Austarc 12P, Classification E4313-A

A popular general purpose electrode used with ease in all positions, vertical up or down. The smooth forceful arc makes it an ideal electrode for all general mild steel applications.

Austarc 13S, Classification E4313-A

A smooth running electrode with a soft arc, particularly suited to light sheetmetal and smooth mitre fillet welds.

Austarc 16TC, Classification E4916-A

A low hydrogen electrode with good arc stability and out-of-position welding characteristics. This electrode is ideal for medium carbon steels, or steels of unknown analysis.

Austarc 11, Classification E4311-A

A high cellulose electrode for all positional welding, AC or DC. Particularly suited for vertical and incline pipe welding where complete root penetration is required.

Unicord 312, Classification ES312-16

A high tensile (50tsi), chromium nickel electrode specially formulated for joining all alloy steels and irons, and for tool and die maintenance.

GTAW (TIG Welding)

Gas Tungsten Arc Welding (GTAW) is a welding process where the arc is struck between a non-consumable tungsten electrode and the work piece. A ceramic nozzle surrounds the tungsten electrode and directs a flow of inert gas, usually Argon, over the electrode and the weld zone. If filler metal is required, it is hand fed into the welding arc. The DC current output of the Weldarc inverter is suitable for welding most ferrous and non-ferrous metals. The AC current output is for welding Aluminium.

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 Weldarc inverter package contains;

- Weldarc Inverter Power Source
- Twist-lock Electrode Holder
- Work Clamp 3m
- (This) Operating Manual MC105-40.
- TIG Torch TIG007 complete with 8m cable with twist-lock connection and fitted with 2.4mm collet and ceriated tungsten
- TIG Consumable KIT
- Argon flow gauge regulator REG003

3 Operation

Whenever the welding output of the Weldarc inverter is open circuit (ie not arcing), the voltage across the welding leads is reduced to a safe level. This provides an increased level of safety to the welding operator during operations such as changing the electrode. The “VRD SAFE” indicator on the front panel is on to confirm the output is in the safe condition.

The term VRD refers to a “Voltage Reducing Device” which complies with AS1674.2 for Category “C” conditions.

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

IMPORTANT NOTICE: Warranty may be voided if equipment is powered from an unsuitable engine driven generator.

Generators used to power this equipment must have a minimum capacity of 10 kW continuous 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, we recommend that operation of equipment on the generator is received from the manufacturer before purchasing the generator.

4 Specifications

Manufactured to Australian Standard AS60974-1
IEC60974-10 6.3.2 6.3.3.

TERM	VALUE	UNIT
Rated Input Voltage	220 - 240	V
Power Frequency	50/60	Hz
Rated Input Capacity	7.9	KVA
Generator Capacity	10	KVA
Rated Maximum Supply Current I _{max}	34	A
Maximum Effective Supply Current I _{eff}	13	A
Output No Load Voltage	71	V
Supply Main Circuit Breaker	25	A
Supply Cable 2.5mm ² & Plug Rating	15	A
Extension Lead Rating	15	A
VRD Safe	13.5	V
Rated Output	240	° C
Stick MMA 170 Amps	@26.8 Volts	15% Duty
Stick MMA 66 Amps	@22.6 Volts	100% Duty
TIG 200 Amps	18 Volts	15% Duty
TIG 77 Amps	13.1 Volts	100% Duty
Current Up Slope Time	0 - 15	S
Current Down slope Time	0 - 25	S
Pulse Frequency	0.5 - 200	Hz
Pulse Ratio Width Adjustment	15 - 85	%
AC Balance Control, Negative	35 - 90	%
AC Frequency	15 - 150	Hz
Arc Force Control MMA	0 - 100	%
Arc Start MMA	0 - 70	A
Arc Start MMA	0.2	S
Post Gas Time	0 - 30	S
Pre Gas Time	0 - 5	S
Cooling Type	Fan on Demand	
Efficiency	≥ 85%	n
Power Factor	0.92	Cosφ

4 Specifications (cont)

Insulation Degree	H	
Cover Protection Degree	IP21S	IP
Weight	19.5	kg
Shipping Weight	30.5	kg
Dimension L × W × H	530 x 240 x 420	mm
Shipping Dimension L × W × H	770 x 335 x 460	mm

5 Controls

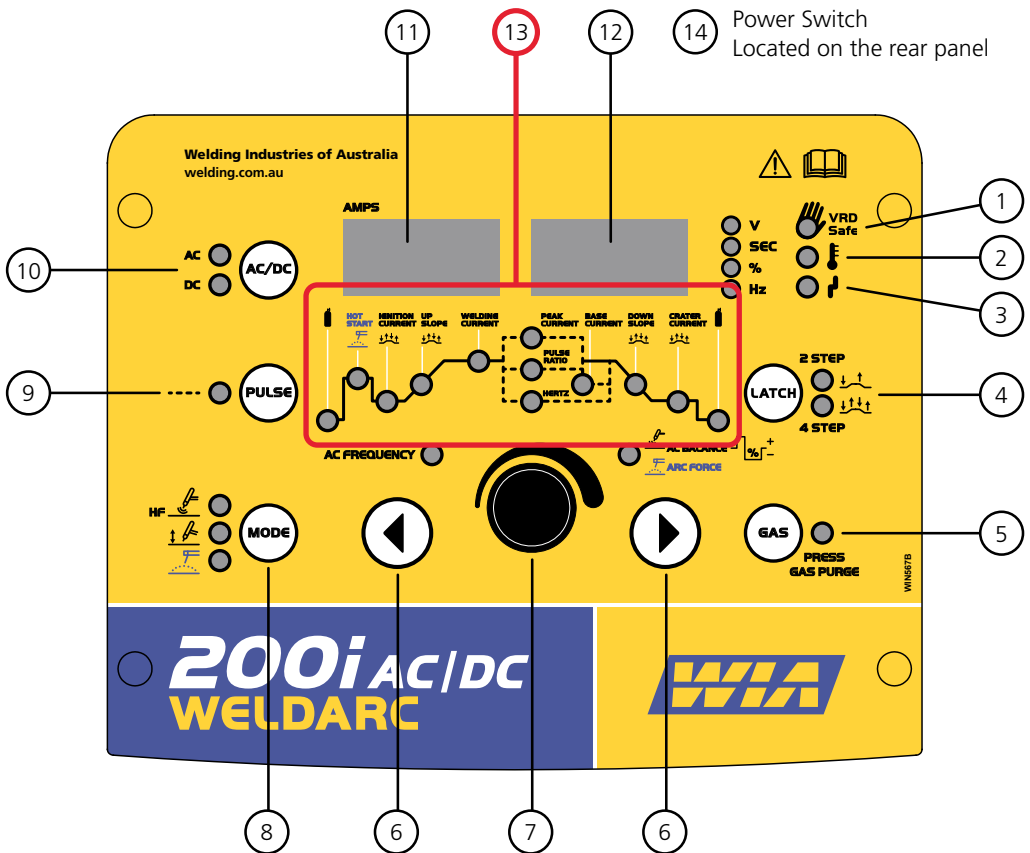


Fig 1 Weldarc 200i AC/DC Controls

1 VRD Safe Mode Indicator

When the machine is in MMA stick mode the light will be on when the voltage across the output terminals is reduced to safe level. The VRD will operate in accordance the requirements of AS1672.2 2007 Category C Environment.

2 Over Temperature Indicator

This light will come on if any internal thermal protection devices have operated due to overheating, caused by the duty cycle being exceeded.

The machine will not weld but the fan will continue to operate to cool the machine. When a safe temperature has been reached, the thermal protection device will reset and welding can continue.

5 Controls

3 Voltage Range Indicator

This light will be on when the input supply voltage is too high or too low. There will be no output.

Low voltage can occur on a weak power supply, or if the machine is operated from a long power cable from a weak supply, or an under rated generator.

High voltage can occur on some rural power supplies and lightly loaded generators.

4 Latch Mode 2T/4T

Latch mode provides a 2 STEP or 4 STEP trigger control while in TIG mode:

4.1 2 STEP

In this mode the torch trigger must be pressed on to initiate welding and held on till welding is finished.

Up slope and down slope, ignition current and crater current cannot be used in the 2 STEP.

4.2 4 STEP

In this mode the torch trigger switch is pressed to start the arc.

The current will stay at the ARC IGNITION setting.

When trigger is released the current will increase to the WELDING CURRENT setting, according to the UP SLOPE time.

Output will continue at WELDING CURRENT setting.

When torch trigger is pressed again then the weld output will decrease down to CRATER CURRENT setting, according to the DOWN SLOPE time.

Weld output will remain at CRATER CURRENT until torch trigger is released, then gas will flow for POST GAS time.

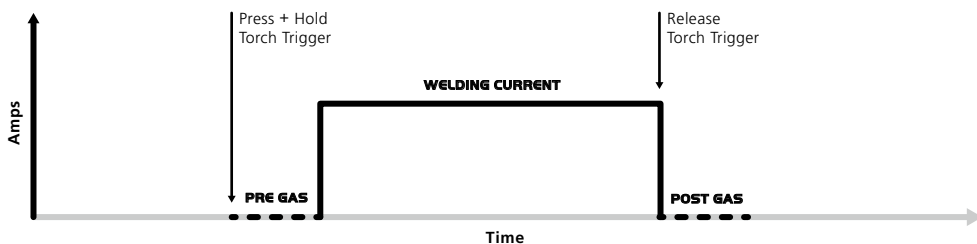


Fig 2 Latch Mode-2 STEP

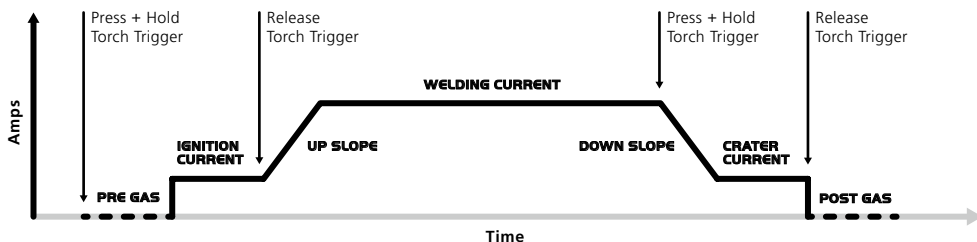


Fig 3 Latch Mode-4 STEP

5 Gas Purge

Press and hold the gas purge button to allow gas to flow without output weld voltage or current. This feature can be used when a gas bottle is connected and air can be purged from the gas line and torch. It can also be used to safely set shielding gas flow rate at the gas flowmeter, without the welding current outputs being live.

6 Parameter Select

Use these buttons to cycle through the Welding parameters, which can then be adjusted by knob 7. If no adjustment is made after 4 seconds the parameter will change back to WELDING CURRENT.

7 Adjustment Knob

This knob is used to adjust the parameter of the weld function, as selected by button 6.

8 Weld Mode Selection

The Weld Mode can select between the three mode of operation.

8.1 Stick MMA Mode

In this mode the machine performs as a DC stick MMA welding machine. The HOT START and ARC FORCE parameters can be adjusted on the front panel.

8.2 Lift Arc TIG

In this mode the machine will perform as a AC or DC TIG machine. The arc start is by Lift Arc technique.

8.3 High Frequency Start TIG

In this mode the machine will perform as AC or DC machine with High Frequency (HF) arc start. When the tungsten is near the work piece and the torch trigger

is pressed, then a high energy spark is created to jump from the tungsten to work piece and initiate an Arc.

9 Pulse Mode

When in LIFT-ARC TIG or HF TIG mode, then Pulse TIG can be selected and the parameters for adjusting the pulse shape will be available for adjustment.

Peak Current, Pulse Ratio, Frequency Hertz, and Base Current.

10 AC/DC Mode

The polarity of the output current can be selected between Alternating Current (AC) or Direct Current (DC).

AC mode can only be selected in TIG mode. The alternating current arc can be used specifically for welding aluminium.

11 AMPS Display

The Left hand digital display will show Amps while adjusting current with knob 7, and then display weld Amps while welding is in progress.

12 Multi Parameter Display

The right hand display will show the value of a parameter being adjusted. The type of parameter will be indicated by one of the 4 indicators next to the display.

For example if the AC Frequency is being adjusted then Hz indicator will be on and the display will show the frequency that is being adjusted by knob 7.

5 Controls

13 Welding Parameters

13.1 Pre Gas

Pre gas flow can be set to a maximum of 5 seconds, to allow gas flow before Arc Start.

13.2 Hot Start

Only available in Stick MMA mode, Hot Start will provide a current boost at the start of the arc. The parameter can be adjusted up to 70Amps which will add to the preset welding current.

13.3 Ignition Current

While in 4 STEP latch mode the arc will start and maintain the Ignition current output until the trigger torch is released.

The IGNITION CURRENT can be more or less than the WELD CURRENT setting.

Setting the IGNITION CURRENT high can be useful for joint preheat.

13.4 Up Slope

The UP SLOPE time is the time taken for the weld current to transition from the IGNITION CURRENT value to WELD CURRENT value. The time can be adjusted from 0 to 15 seconds.

13.5 Welding Current

The setting for actual weld current.

13.6 Pulse Welding

Pulse welding allows the current to be pulsed between two different values, the frequency and ratio can be adjusted. This feature can be used on thin material.

13.6.1 Peak Current

Set the Peak current Amps.

13.6.2 Pulse Ratio

Set the ratio in % for the peak current compared to the back ground current. Range is 15% to 85%.

13.6.3 Hertz

The frequency of the pulse can be set, as number of pulses per second (HERTZ) 0.5Hz to 200Hz.

13.6.4 Base Current

Set the Base current Amps.

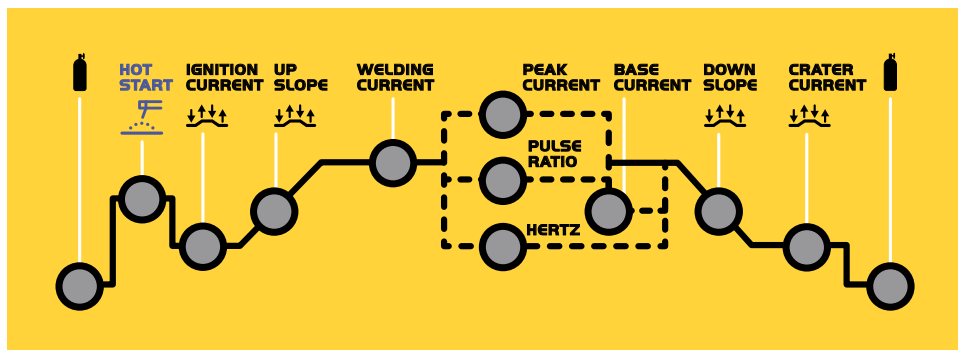


Fig 4 Weldarc 200i AC/DC Welding Parameters

13.6.5 Down Slope

The DOWN SLOPE time is the time taken for the weld current to transition from the WELDING CURRENT value to CRATER CURRENT value. The time can be adjusted from 0 to 25 seconds.

13.6.6 Crater Current

The current at the end of WELD can be adjusted to a value which will allow controlled finish of the weld. The end of weld pool (Crater) can be filled.

13.6.7 Post Gas

The Post Gas time can be adjusted to allow gas to flow after weld has stopped. This feature can be used to provide a gas shield to the cooling weld pool. Adjustable from 0 to 30 seconds.

13.7 AC Frequency

When AC mode is selected by button (10) then actual AC frequency can be adjusted from 15 to 150Hz.

Increasing the frequency makes the welding current change direction at a faster rate. The arc becomes constricted, more stable and directional, providing deep penetrating narrow welds.

When the frequency is lower the arc is wide with shallow penetration, suitable for butt or edge welds on thin material.

13.8 AC Balance Or Arc Force

13.8.1 AC Balance

When AC TIG mode is selected then the proportion of positive and negative in the cycle can be adjusted. This is referred to as the BALANCE and is expressed as a % of the time that the polarity is negative. Adjustment is from 35% - 90%.

Arc Welding of aluminium is difficult because the metal readily forms an oxide layer, which is an electrical insulator, and inhibits arc formation. The Oxide needs to be "cleaned off". Electrode positive will remove the oxide off the surface as the electrons flow off the aluminium to the tungsten electrode. Continuous electrode positive will burn the tip away, so the current has to be reversed to electrode negative, for some of the time.

For new clean aluminium an AC BALANCE of 65% is a good starting point.

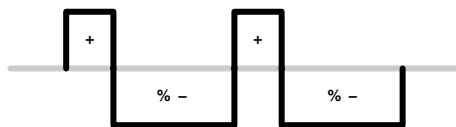


Fig 5 AC Balance

5 Controls

13.8.1.1 Low % Balance

- › Less time negative
- › More time positive
- › More cleaning action
- › More heat in the tungsten
- › Wider weld with shallower penetration

13.8.1.2 High % Balance

- › More time negative
- › Less time positive
- › Less cleaning action
- › Less heat in the tungsten, higher current for smaller electrode
- › Narrow weld beads with deeper penetration
- › Smaller heat affected zone

13.8.2 Arc Force

When machine is in Stick MMA mode, selecting the ARC FORCE allows adjustment of the % increase in current that will occur when the arc starts to short circuit, or snap out. Adjusting this value can be useful when using cellulose electrodes.

14 Power On/Off Switch

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

15 Remote Control Adjustment

The output current of the machine can be controlled remotely by On/ Off trigger switch control and current control adjustment, located in the torch hand piece, or in foot control.

The Remote control adjustment will allow minimum -100% of the current setting on the machine.

For example if the machine is set to 150A the remote adjustment will adjust 10-150A.

15.1 TIG torch used for remote control adjustment

The TIG torch will require a trigger switch and current control potentiometer in the hand piece.

Control plug of the TIG torch is connected to the machine remote control socket FIG 7.

Turn the machine on.

First the machine needs to be adjusted to maximum desired current.

To do this the remote control knob on the TIG torch needs to be adjusted to maximum.

Adjust to the desired maximum current (such as 150A) on the machine with the control knob FIG 1 (7). The AMPS digital display will then show 150A.

Adjust the control knob on the TIG torch, the AMPS display will then change as the knob is adjusted.

15.2 Foot Control for remote control adjustment

The WIA foot control (part number AA76) has an in built trigger switch and current control and can be used to control the weld start and weld current.

Control plug of the TIG torch is connected to the machine remote control socket FIG 7.

Turn the machine on.

First the machine needs to be adjusted to maximum desired current

Select LIFT TIG MODE to prevent HF during setup.

Press the foot control pedal to maximum.

Adjust to the desired maximum current (such as 150A) on the machine with the control knob FIG 1 (7). The AMPs digital display will then show 150A.

Release the foot control pedal and the current to will adjust down from 150A to 10A.

HF MODE can now be selected if required.

6 Installation

Connection to Electrical Mains Power Supply

The Weldarc 200i AC/DC is fitted with a 15 Amp plug and socket, 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 4.

The minimum recommended main power supply circuit breaker rating for Weldarc inverter are listed in Section 4.

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 4.

If it is necessary to use an extension power supply cable, ensure that it is rated as per Section 4. Voltage drop which will occur over long lengths of cable will reduce the quality of welds and the maximum welding current available from the equipment.

As noted previously, it is not recommended that the Weldarc inverter 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.

7 Basic Welding Information

Stick Welding (MMAW)

Connection for Stick Welding

It is important to select the electrode polarity in accordance with the manufacturers recommendations for that electrode. Most common electrodes, including cellulose types, are operated with the electrode at positive polarity, as illustrated in Figure 6.

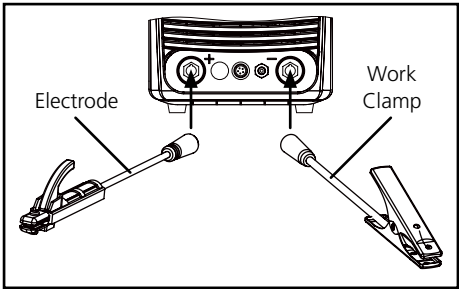


Fig 6 Connections for Stick Welding (MMAW)

Stick Welding

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. Place the desired electrode in the electrode holder.

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

Use the Weld Mode Selection button to select Stick Mode.

Select an appropriate welding current for the electrode diameter by setting the knob on the machine front panel. WIA AUSTARC electrodes will give the best results.

To strike the arc, drag the end of the electrode along the work piece as if striking a match. As the arc initiates, lift the electrode slightly away, aiming to establish an arc length of approximately 3mm.

As the electrode end is consumed, feed the electrode into the arc in order to maintain arc length. As a general rule, the arc should be held as short as possible while still giving stable burn off and good weld appearance. An arc which is too long causes an unwieldy flow of metal with a rough weld appearance and reduced penetration. An arc too short leads to a narrow weld deposit and "stuttery" arc characteristics, and the electrode is liable to freeze onto the work piece.

As the solidified weld deposit forms, move the end of the electrode slowly along the weld path, aiming to maintain a pool of molten weld metal behind the arc. Decreasing this rate of travel will result in a wider weld deposit, and similarly increasing it will narrow the weld deposit.

Always fill the crater which tends to form at the end of a weld deposit, by pausing momentarily before withdrawing the electrode to break the arc. Unfilled craters are a point of weakness, and can lead to weld cracking.

Current Range for General Purpose Electrodes

Diameter (mm)	Current (Amps)
2.0	40 - 60
2.5	60 - 85
3.2	90 - 130
4.0	130 - 180

7 Basic Welding Information

TIG Welding (GTAW)

Connection for TIG Welding

For TIG Welding, the TIG torch is connected to the negative terminal. Figure 7 illustrates the correct connection of the welding torch and gas supply. Welding grade Argon is the shielding gas most commonly used for AC/DC GTAW welding. The torch will require a tungsten electrode.

Before first use of the welding torch, allow gas to purge the torch and hoses for 1 minutes at approximately 10 litres/min. For welding purposes, the gas flow rate should be set in the range 5-11 litres/min.

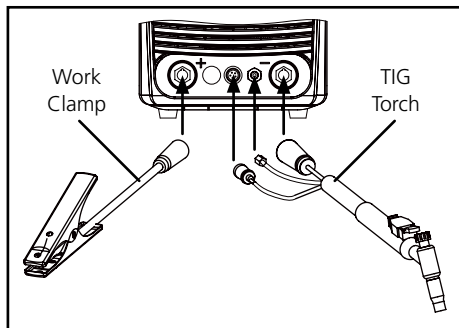


Fig 7 Connections for TIG Welding

Electrode TIG

Thoriated Tungsten electrodes are normally used for DC welding current, and Zirconiated Tungsten electrodes are normally used for AC TIG welding.

For AC TIG welding a Thoriated tungsten (red tip) can be used for low current AC TIG but the tip does not ball well and the arc can then wander.

Ceriated or Lanthanated are preferred for advanced AC Welding with square wave output. They can also be used on DC TIG, so they are a good AC or DC electrode if only one electrode type is to be used.

Tungsten Electrode Preparation

The tungstens needs to be ground to a point, the grinding should only be in the direction of the point and should be done on a fine grit grinding wheel. The resulting grind pattern will produce a sharp directed arc. Poor tip preparation will result in arc wander.

A common practice is to grind the tip such that the length of the points is approximately 2 times the diameter. The result will be an included angle of 30 degrees.

For AC tip preparation, creating a blunt end will assist a symmetrical and small ball to develop at the tip.

It is important to maintain the electrode point for DC or ball for AC. If the tip accidentally touches weld pool it will become contaminated and the arc will become erratic, and will need to be re ground.

Tungstens containing at least 2% lanthana will hold a point when used with both DC and AC welding currents

Tungsten Current Ranges

Electrode Diameter (mm)	Gas Cup Size	DC Current Amps	AC Current Amps	Filler Wire Diameter (mm)
1.0	6	15-80	20-60	1.6
1.6	6	70-150	50-100	1.6-2.4
2.4	8	150-250	100-160	2.4-3.2

Safety Consideration Thoritated Tungsten.

Thoriated Tungsten contains the element Thorium (Th). Thorium is a radioactive element which mainly emits alpha particles. Alpha particles cannot penetrate skin, or clothing, but can be a harmful carcinogen if released inside the digestive tract, or lungs.

There is almost no release of radioactive material during arcing.

There is no significant hazard in handling and storage. The Thoria is inside the tungsten electrode, it is enclosed in a tungsten matrix and so there is little radiation emitted externally.

The greatest risk of exposure is during the grinding of the thoriated tungsten electrodes. Care needs to be taken, to control the dust. A dust mask should be worn, and grinder area clean up should be done with a vacuum cleaner.

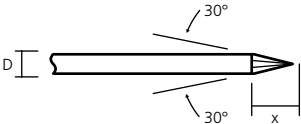


Fig 8 Tungsten Preparation
x = 1.5 to 4 times diameter
(2 x D = 30° included angle)

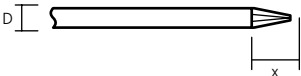


Fig 9 AC Advanced Preparation
x = 1.5 to 4 times diameter

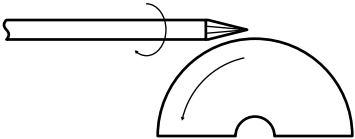


Fig 10 Correct Grind Direction

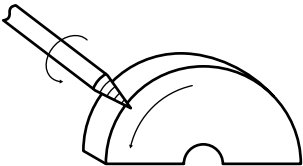


Fig 11 Incorrect Grind Direction

7 Basic Welding Information

TIG Welding Operation

Connect the Work Clamp to the work piece.

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

Use the Weld Mode Selection Switch to select LIFT TIG or HF TIG Mode.

Select an appropriate welding current for the job by setting the knob on the machine front panel.

HF Start

When HF Start TIG is selected then the electrode tip is brought close to the work piece, but not touching.

Pressing the trigger will produce a high voltage spark that will jump to the work piece and initiate an arc.

HF TIG can be used where work piece contamination by the electrode is a concern. Also where repetitive starts causes contamination of the electrode, which produces an unstable arc.

LIFT TIG Operation

When the Welding mode is set to LIFT TIG then the arc start can be achieved with the following procedure.

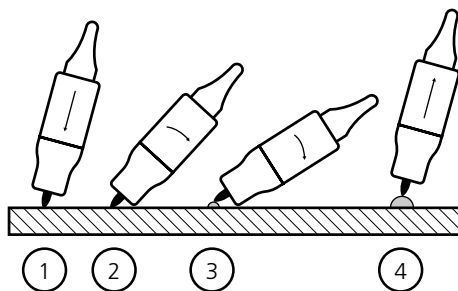


Fig 12 Lift TIG Operation Procedure

- 1 Touch the electrode lightly against the work piece.
- 2 Press the torch trigger switch. The shielding gas will start to flow and a small current will pass through the electrode.
- 3 While still holding the electrode against the work piece, roll the hand piece over until the cup rests on the work piece.

Use the cup as a pivot point to roll the hand piece over allowing the electrode to lift off the work piece.

The arc will ignite.

- 4 Immediately lift the cup off the work piece, the current will rise to the welding level within the up-slope time.

Use of a copper striking plate can be used to avoid electrode contamination. The electrode can also be contaminated by contact with the filler rod.

A contaminated electrode produces an unstable arc. If this occurs regrind the electrode tip.

8 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 Weldarc inverter power source. The display panel lights should be on. If not, test outlet using a known working appliance.
- 2 Check that the welding 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 and electrode holder. Loose connections can prevent proper flow of the welding current.
- 4 The Weldarc inverter welding 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 Temp light will be on. Leave the machine energised with the fan running to achieve the maximum cooling rate.
- 5 If the supply voltage is too high or too low then the Voltage Range Indicator light will be on and the machine will not deliver welding current.

Check the mains voltage supply. Long extension cords can cause low voltage. A generator can cause high voltage.

The electrical components of the equipment are shown in the circuit diagram below. The Weldarc inverter is an inverter type design, where the mains supply is first rectified, filtered then chopped to a high frequency before being applied to the welding transformer. The output of this transformer is rectified to form the welding output of the machine.

9 Service Information

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.

The electrical components of the equipment are shown in the circuit diagram below. The Weldarc inverter is an inverter type design, where the mains supply is first rectified, filtered then chopped to a high frequency before being applied to the welding transformer. The output of this transformer is rectified to form the welding output of the machine.

9.1 Circuit Diagrams – Power Source

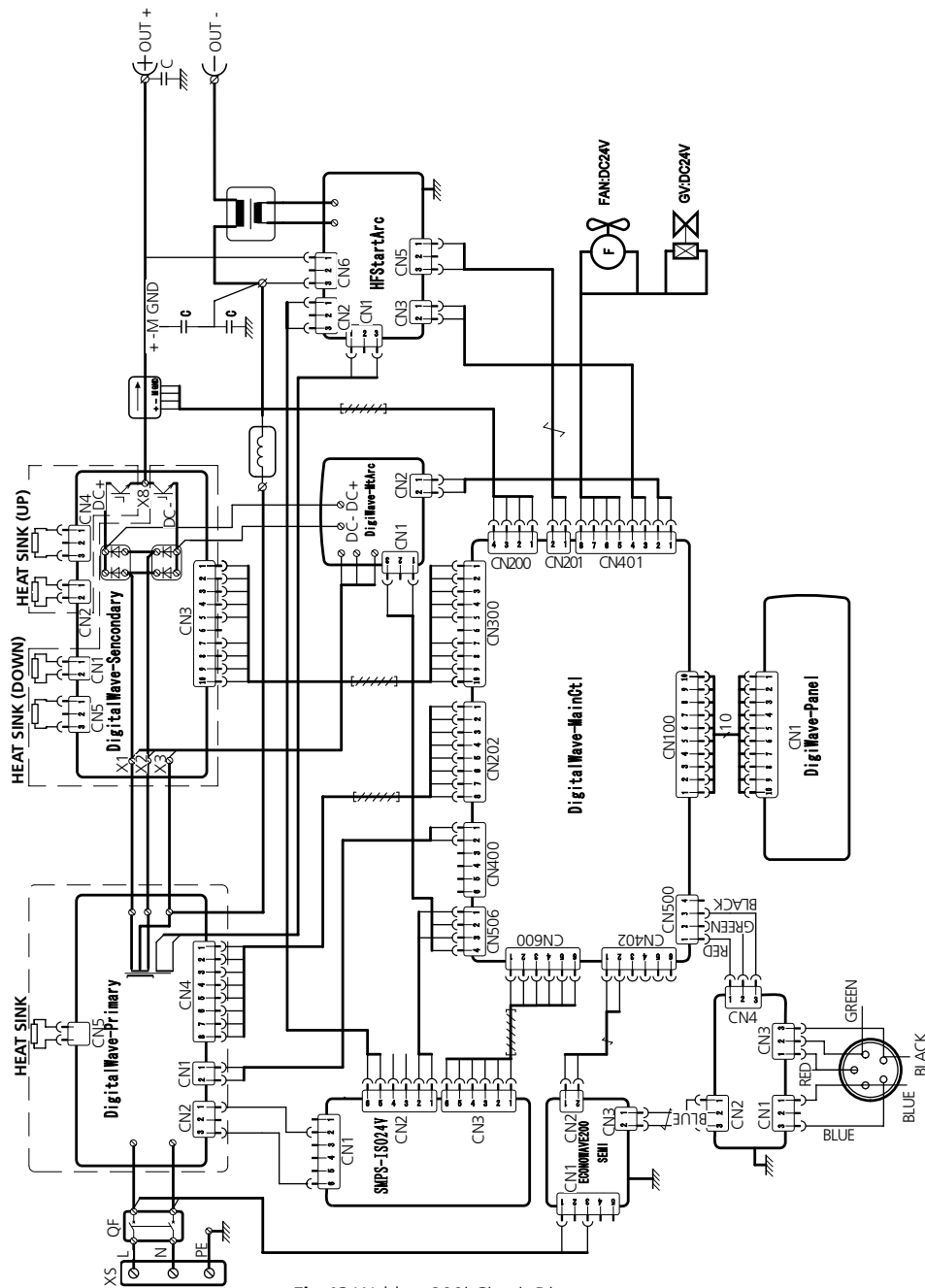


Fig 13 Weldarc 200i Circuit Diagram

10 Assembly and Parts List - Weldarc 200i AC/DC Power Source

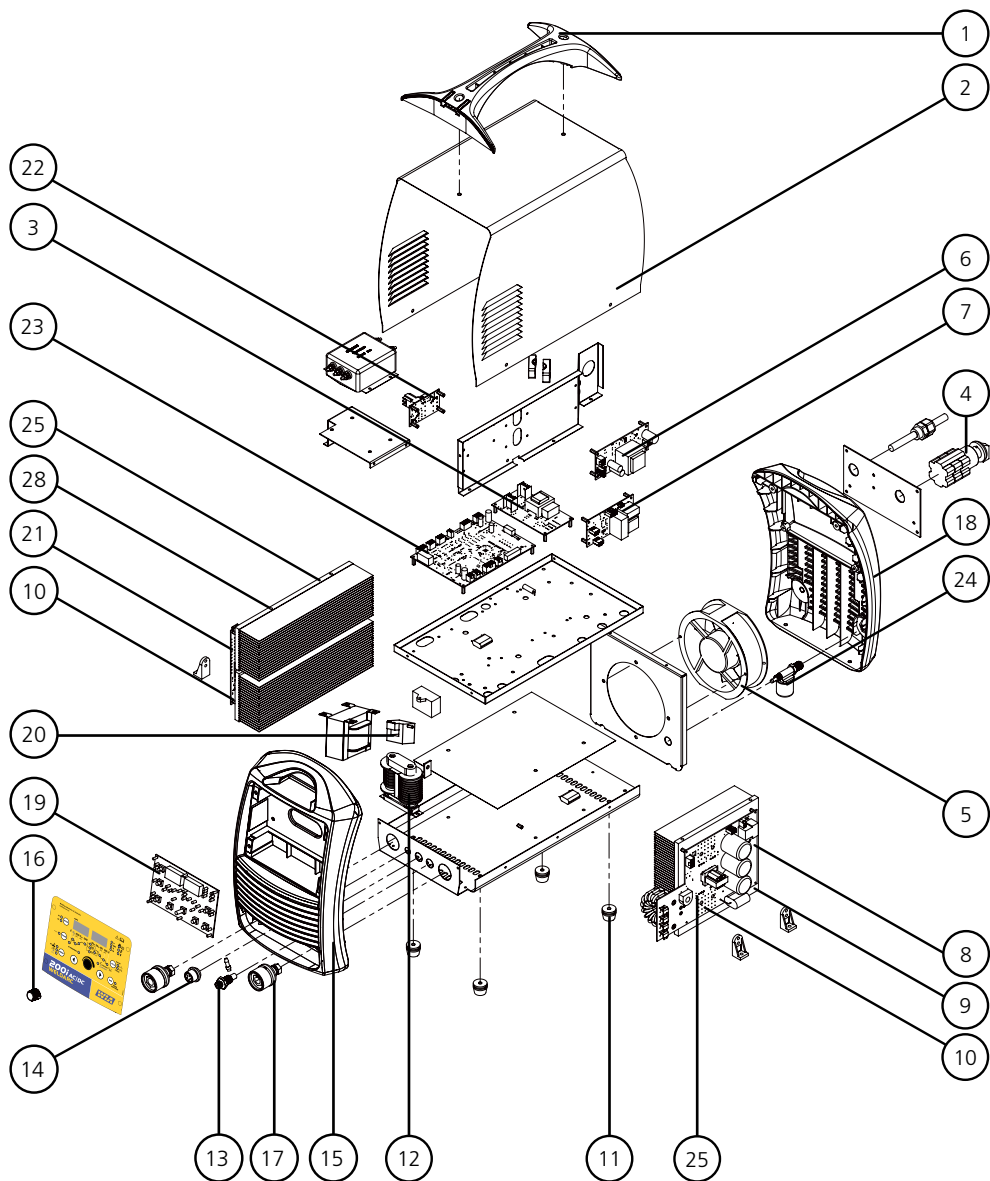


Fig 14 Weldarc 200i AC/DC Power Source Assembly

Item #	Part #	Description	Qty
1	M0067	HANDLE	1
2	PAN161	ENCLOSURE	1
3	PWA024	PCB ASSY ARC STABILIZER	1
4	E0089	SWITCH ON OFF	1
5	FAN013	FAN 240V	1
6	PWA025	PCB ASSY POWER SUPPLY 24V	1
7	PWA026	PCB ASSY HV PULSE MC105	1
8	D0036	DIODE BRIDGE 35A 1000V	2
9	PWA027	PCB ASSY PRIMARY INVERTER MC105	1
10	D0038	IGBT	12
11	M0068	FOOT PLASTIC	4
12	L0033	HF COUPLING TRANSFORMER	1
13	M0069	GAS CONNECTION FRONT M10	1
14	E0079	PLUG 5 PIN MC105	1
15	M0070	FRONT PANEL PLASTIC MC105	1
16	M0096	KNOB 25MM 6MM MC105	1
17	CX58	PANEL MOUNT DINSE SOCKET	2
18	M0074	BACK PANEL	1
19	PWA028	PCB ASSY FRONT PANEL MC105	1
20	E0080	HALL EFFECT TRANSDUCER MC105	1
21	D0039	FAST RECOVERY DIODE	2
22	PWA029	PCB ASSY TRIGGER ISOLATION	1
23	PWA030	PCB ASSY MAIN CONTROL MC105	1
24	E0041	GAS VALVE	1
25	R0032	THERMISTOR	3
26	REG003	ARGON REGULATOR	1
27	CLA002	WORK CLAMP	1
28	PWA039	SECONDARY INVERTER	1
Not Shown	MC 105-40	OPERATING MANUAL	1
Not Shown	TIG007	TIG TORCH	1



10 Assembly and Parts List – Torch

Item #	Part #	Description	Qty
	10N31	COLLET BODY 1.6mm	1
	10N32	COLLET BODY 2.4mm	1
	10N28	COLLET BODY 3.2mm	1
	10N23	COLLET 1.6mm	1
	10N24	COLLET 2.4mm	1
	10N25	COLLET 3.2mm	1
	10N50	CERAMIC NOZZLE SIZE 4 (6mm)	1
	10N49	CERAMIC NOZZLE SIZE 5 (8mm)	1
	10N48	CERAMIC NOZZLE SIZE 6 (10mm)	1
	10N47	CERAMIC NOZZLE SIZE 7 (11mm)	1
	10N46	CERAMIC NOZZLE SIZE 8 (12.5mm)	1
	57Y04	SHORT BACK CAP	1
	57Y03	MEDIUM BACK CAP	1
	57Y02	LONG BACK CAP	1
	E0088	CABLE PLUG	1
	M0075	GAS CONNECTOR	1
	E0091	TORCH TRIGGER	1

11 Australian Warranty Information



WIA Weldmatic MIG & Weldarc MMA Equipment 2 Year Warranty Statement

Welding Industries of Australia (WIA) warrants to the original retail purchaser that the Weldmatic welding machine purchased (Product) will be free from defects in materials and workmanship for a period of 2 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 Weldarc power source only, and does not extend to the 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.

For products purchased in 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.

Warranty provided by:

Welding Industries of Australia
(ABN 63 004 235 063)

A Division of ITW Australia Pty Ltd
5 Allan Street, Melrose Park
South Australia 5039

Ph: 1300 300 884

Email: info@welding.com.au

Web: www.welding.com.au

12 New Zealand Warranty Information



WIA Weldmatic MIG & Weldarc MMA Equipment

2 Year Warranty Statement

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 8341600.

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



High Performing Austarc Electrodes



Austarc 16TC

- Smooth running, basic low hydrogen electrode, developed for all positional (except vertical down) welding, using AC or DC power sources.
- Unique twin coating delivers significantly improved arc stability and control of all applications.

Classification:

AS/NZS 4855-B –
E49 16 A U H10
AWS A5. 1: E7016 H8

Part Numbers:

16TC25 (2.5mm)
16TC32 (3.2mm)
16TC40 (4.0mm)
16TC50 (5.0mm)
16TC60 (6.0mm)



Austarc 18TC

- An iron powder hydrogen controlled electrode used primarily on C-Mn and low alloy structural steels.
- Unique twin coating design offers excellent AC tability and superb DC+ arc transfer.

Classification:

AS/NZS 4855-B –
E49 18-1 A U H5
AWS A5.1: E7018-1

Part Numbers:

18TC25 (2.5mm)
18TC32 (3.2mm)
18TC40 (4.0mm)



Austarc 11

- High cellulose electrode developed for all positional welding on both AC and DC current.
- It is particularly suited for vertical and incline pipe welding where complete root penetration is required.

Classification:

AS/NZS 4855-B –
E43 11 A
AWS A5. 1: E6011

Part Numbers:

1125 (2.5mm)
1132 (3.2mm)
1140 (4.0mm)
1150 (5.0mm)

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

Miller Digital Elite™ Series

AUTO-DARKENING HELMETS

Raptor P/N - 281007 **Inferno** P/N - 281003

Lucky's Speed Shop P/N - 281001 **Black** P/N - 281000

**WITH CLEARLIGHT™ LENS TECHNOLOGY –
HIGH DEFINITION OPTICS FOR
PRECISION ARC RECOGNITION**



Raptor

Inferno

Black

**Lucky's
Speed Shop**



- ClearLight™ Lens Technology provides enhanced clarity and natural colour – so that you can see more detail.
- Lens and helmet comply with Australian Standards AS/NZS 1338.1 (Auto-Darkening) and AS/NZS 1337.1 B (High Impact).
- Lightweight at only 510g.
- Four independent arc sensors.
- Suits MIG, Stick, Flux-Cored & Pulse.
- Four modes – Weld, Cut, Grind & X-Mode.
- TIG rating 5 Amps.
- 3 year warranty (Auto-Darkening lens only).

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

