



# UNIMIG

## OPERATING MANUAL

### KUMJRRW200

### KUMJRRW160



**3 YEARS Warranty**  
(Power Source)

Please read and understand this instruction manual carefully before the installation and operation of this equipment.



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### **Thank you for your purchase of your UNI-MIG welding machine.**

We are proud of our range of welding equipment that has a proven track record of innovation, performance and reliability.

Our product range represents the latest developments in Inverter technology put together by our professional team of highly skilled engineers. The expertise gained from our long involvement with inverter technology has proven to be invaluable towards the evolution and future development of our equipment range. This experience gives us the inside knowledge on what the arc characteristics, performance and interface between man and machine should be.

Within our team are specialist welders that have a proven history of welding knowledge and expertise, giving vital input towards ensuring that our machines deliver control and performance to the utmost professional level.

We employ an expert team of professional sales, marketing and technical personnel that provide us with market trends, market feedback and customer comments and requirements. Secondly they provide a customer support service that is second to none, thus ensuring our customers have confidence that they will be well satisfied both now and in the future.

UNI-MIG welders are manufactured and compliant with - AS/NZ60974.1 2006 - AS60974-6:2006 guaranteeing you electrical safety and performance.

## WARRANTY

- 3 Years from date of purchase.
- Welding Guns Of Australia PTY LTD Ltd warranties all goods as specified by the manufacturer of those goods.
- This Warranty does not cover freight or goods that have been interfered with.
- All goods in question must be repaired by an authorised repair agent as appointed by this company.
- Warranty does not cover abuse, mis-use, accident, theft, general wear and tear.
- New product will not be supplied unless Welding Guns Of Australia PTY LTD has inspected product returned for warranty and agree's to replace product.
- Product will only be replaced if repair is not possible
- Please view full Warranty term and conditions supplied with machine or at [www.unimig.com.au/warranty.asp](http://www.unimig.com.au/warranty.asp) or at the back of this manual.

# SAFETY

**Welding and cutting equipment can be dangerous to both the operator and people in or near the surrounding working area, if the equipment is not correctly operated. Equipment must only be used under the strict and comprehensive observance of all relevant safety regulations. Read and understand this instruction manual carefully before the installation and operation of this equipment.**

## MACHINE OPERATING SAFETY

- Do not switch the function modes while the machine is operating. Switching of the function modes during welding can damage the machine. Damage caused in this manner will not be covered under warranty.
- Disconnect the electrode-holder cable from the machine before switching on the machine, to avoid arcing should the electrode be in contact with the work piece.
- Operators should be trained and or qualified.



**Electric shock: It can kill.** Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and internal machine circuits are also live when power is on. In Mig/Mag welding, the wire, drive rollers, wire feed housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is dangerous.

- Connect the primary input cable according to Australian and New Zealand standards and regulations.
- Avoid all contact with live electrical parts of the welding circuit, electrodes and wires with bare hands. The operator must wear dry welding gloves while he/she performs the welding task.
- The operator should keep the work piece insulated from himself/herself.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cable for wear and tear, replace the cable immediately if damaged, bare wiring is dangerous and can kill.
- Do not use damaged, under sized, or badly joined cables.
- Do not drape cables over your body.
- We recommend (RCD) safety switch is used with this equipment to detect any leakage of current to earth.



**Fumes and gases are dangerous.** Smoke and gas generated whilst welding or cutting can be harmful to people's health. Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Do not breathe the smoke and gas generated whilst welding or cutting, keep your head out of the fumes
- Keep the working area well ventilated, use fume extraction or ventilation to remove welding fumes and gases.
- In confined or heavy fume environments always wear an approved air-supplied respirator. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near de-greasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapours to form highly toxic and irritating gases.
- Materials such as galvanized, lead, or cadmium plated steel, containing elements that can give off toxic fumes when welded. Do not weld these materials unless the area is very well ventilated, and or wearing an air supplied respirator.



**Arc rays: harmful to people's eyes and skin.** Arc rays from the welding process produce intense visible and invisible ultraviolet and infrared rays that can burn eyes and skin.

- Always wear a welding helmet with correct shade of filter lens and suitable protective clothing including welding gloves whilst the welding operation is performed.
- Measures should be taken to protect people in or near the surrounding working area. Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.



**Fire hazard.** Welding on closed containers, such as tanks, drums, or pipes, can cause them to explode. Flying sparks from the welding arc, hot work piece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- The cutting sparks may cause fire, therefore remove any flammable materials well away from the working area. Cover flammable materials and containers with approved covers if unable to be moved from the welding area.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to the required Safety Standards to insure that flammable or toxic vapors and substances are totally removed, these can cause an explosion even though the vessel has been “cleaned”. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapours (such as petrol)
- Have a fire extinguisher nearby and know how to use it. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.



**Gas Cylinders.** Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Because gas cylinders are normally part of the welding process, be sure to treat them carefully. CYLINDERS can explode if damaged.

- Protect gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Insure cylinders are held secure and upright to prevent tipping or falling over.
- Never allow the welding electrode or earth clamp to touch the gas cylinder, do not drape welding cables over the cylinder.
- Never weld on a pressurised gas cylinder, it will explode and kill you.
- Open the cylinder valve slowly and turn your face away from the cylinder outlet valve and gas regulator.



**Gas build up.** The build up of gas can causes a toxic environment, deplete the oxygen content in the air resulting in death or injury. Many gases used in welding are invisible and odourless.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.



**Electronic magnetic fields.** MAGNETIC FIELDS can affect Implanted Medical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near any electric welding, cutting or heating operation.



**Noise can damage hearing.** Noise from some processes or equipment can damage hearing. Wear approved hearing protection if noise level is high.



**Hot parts.** Items being welded generate and hold high heat and can cause severe burns. Do not touch hot parts with bare hands. Allow a cooling period before working on the welding gun. Use insulated welding gloves and clothing to handle hot parts and prevent burns.

## CAUTION

### 1. Working Environment.

- 1.1 The environment in which this welding equipment is installed must be free of grinding dust, corrosive chemicals, flammable gas or materials etc, and at no more than maximum of 80% humidity.
- 1.2 When using the machine outdoors protect the machine from direct sun light, rain water and snow etc; the temperature of working environment should be maintained within -10°C to +40°C.
- 1.3 Keep this equipment 30cm distant from the wall.
- 1.4 Ensure the working environment is well ventilated.

### 2. Safety Tips.

#### 2.1 Ventilation

This equipment is small-sized, compact in structure, and of excellent performance in amperage output. The fan is used to dissipate heat generated by this equipment during the welding operation.

**Important:** Maintain good ventilation of the louvers of this equipment. The minimum distance between this equipment and any other objects in or near the working area should be 30 cm. Good ventilation is of critical importance for the normal performance and service life of this equipment.

#### 2.2 Thermal Overload protection.

Should the machine be used to an excessive level, or in high temperature environment, poorly ventilated area or if the fan malfunctions the Thermal Overload Switch will be activated and the machine will cease to operate. Under this circumstance, leave the machine switched on to keep the built-in fan working to bring down the temperature inside the equipment. The machine will be ready for use again when the internal temperature reaches safe level.

#### 2.3 Over-Voltage Supply

Regarding the power supply voltage range of the machine, please refer to “Main parameter” table. This equipment is of automatic voltage compensation, which enables the maintaining of the voltage range within the given range. In case that the voltage of input power supply amperage exceeds the stipulated value, it is possible to cause damage to the components of this equipment. Please ensure your primary power supply is correct.

- 2.4 Do not come into contact with the output terminals while the machine is in operation. An electric shock may possibly occur.

## MAINTENANCE

Exposure to extremely dusty, damp, or corrosive air is damaging to the welding machine. In order to prevent any possible failure or fault of this welding equipment, clean the dust at regular intervals with clean and dry compressed air of required pressure.

**Please note that:** lack of maintenance can result in the cancellation of the guarantee; the guarantee of this welding equipment will be void if the machine has been modified, attempt to take apart the machine or open the factory-made sealing of the machine without the consent of an authorized representative of the manufacturer.

## TROUBLE SHOOTING

Caution: Only qualified technicians are authorized to undertake the repair of this welding equipment. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed in this manual.

### Note:

Minimum Motor Generator Power Suggested:- 9.0KVA

## EMC DECLARATION

IEC 60974-10:2007

Arc Welding equipment - Part 10: Electromagnetic compatibility (EMC) requirements (Classification of ISM Equipment - According to IEC 60974-10:2007 and CISPR 11: 2033+A1:2004 Clause 4.1 and 4.2. The EUT Belongs to Apparatus Group2 Class A)

# RAZORWELD ARC 160

## MMA/TIG - 160 Amp DC Inverter Welder

Welds: Steels, Stainless, Cast Iron, Bronze, Copper



### Industrial Rated 240V Single Phase 160 Amp DC Welder Small, Lightweight and Portable

#### Features

- 10 Amp Plug
- Selectable VRD on/off (Voltage Reduction Device)
- Single PCB construction
- MMA
- PFC ( Power Factor Correction) for maximum electrical efficiency
  - Hot start (improves electrode starting)
  - Arc Force (boosts current to prevent electrode extinguishing)
  - Excellent arc stability with all electrodes
- DC TIG
  - Lift Arc ignition (prevents tungsten sticking during arc ignition)
  - Ultra smooth DC TIG welding current
- Thermal overload protection
- IP21S rating for environmental/safety protection
- Generator compatible (recommend 7.5 KVA minimum)
- Auto-compensation for voltage fluctuation
- Minimal harmonic feedback to power grid



Selectable VRD on/off  
(Voltage Reduction Device)



#### Technical Data

Power Supply / Phases (V-Ph)	240V - 1 ±15%
Rated Input Power (KVA)	7.1
I <sub>eff</sub>	10A
Rated Output	160A/26.4V MMA 160A/16.4V TIG
Welding Current Range	10~160A
No-Load Voltage (V)	9
Duty Cycle @ 40°C as per AS/NZ60974-1	20%@160Amps MMA 45%@160Amps TIG
Power Factor	0.99
Protection Class	IP21S
Insulation Class	F
Size (mm)	365 x 227 x 135
Weight (kg)	6.5
Warranty	3 years on power source



RAZOR160CA  
Standard Package



RAZOR160CT  
TIG Option

#### Overview

The ARC160 is an inverter-based welding machine produced using the latest in IGBT technology. This machine is reliable, robust and stacked with features that you can expect from a quality welder. The DC MMA welding capability delivers a smooth and incredibly stable arc allowing easy welding with electrodes producing high quality welds including cast Iron, stainless and low hydrogen. The ARC160 is equipped with DC Lift Arc function, connection of the 26V TIG torch allows quality DC TIG welding of steel, stainless steel, bronze and copper. The Lift Arc function is superb and delivers perfect arc ignition every time without any sticking of the tungsten electrode to the work piece, a remarkably smooth stable arc produces high quality TIG welds. The ARC160 is an exceptional machine that is suitable for a wide range of industrial applications including, site welding, farming, along with repair and maintenance applications. ARC160 is packaged in a Razorweld carry bag with your choice of MMA option accessories or MMA/TIG option accessories. The ARC160 gives you the best of both worlds great portability, with the power to get the job done. Built to our specification and manufactured in compliance to AS/NZ60974-1

#### Product Code: KUMJRRW160CA

MMA option includes: ARC160 Machine, Earth Lead & Arc Lead 25mm x 4m, Razorweld Carry Bag

#### Product Code: KUMJRRW160CT

TIG option includes: ARC160 Machine, Earth Lead & Arc Lead 25mm x 4m, 26V x 4m TIG Torch, UNI-FLAME Argon Flowmeter Regulator and Razorweld carry bag



# RAZORWELD ARC 200

## MMA/TIG - 200 Amp DC Inverter Welder

Welds: Steels, Stainless, Cast Iron, Bronze, Copper



### Industrial Rated 240V Single Phase 200 Amp DC Welder Small, Lightweight and Portable



#### Features

- Single PCB construction
- MMA
- PFC ( Power Factor Correction) for maximum electrical efficiency
- VRD (Voltage Reduction Device)
  - Hot start (improves electrode starting)
  - Arc Force (boosts current to prevent electrode extinguishing)
  - Excellent arc stability with all electrodes
- DC TIG
  - Lift Arc ignition (prevents tungsten sticking during arc ignition)
  - Ultra smooth DC TIG welding current
- Thermal overload protection
- IP21S rating for environmental/safety protection
- Generator compatible (recommend 9.0 KVA minimum)
- Auto-compensation for voltage fluctuation
- Minimal harmonic feedback to power grid



#### Technical Data

Power Supply / Phases (V-Ph)	240V - 1 ±15%
Rated Input Power (KVA)	9.0
I <sub>eff</sub>	15A
Rated Output	200A/28V MMA 200A/18V TIG
Welding Current Range	10~200A
No-Load Voltage (V) MMA	9 VRD ON 69 VRD OFF
Duty Cycle @ 40°C as per AS/NZ60974-1	30%@200Amps MMA 45%@200Amps TIG
Protection Class	IP21S
Insulation Class	F
Size (mm)	365 x 227 x 135
Weight (kg)	6.5
Warranty	3 years on power source



RAZOR200CA  
Standard Package



RAZOR200CT  
TIG Option

#### Overview

The ARC200 is an inverter-based welding machine produced using the latest in IGBT technology. This machine is reliable, robust and stacked with features that you can expect from a quality welder. The DC MMA welding capability delivers a smooth and incredibly stable arc allowing easy welding with electrodes producing high quality welds including cast Iron, stainless and low hydrogen. The ARC200 is equipped with DC Lift Arc function, connection of the 26V TIG torch allows quality DC TIG welding of steel, stainless steel, bronze and copper. The Lift Arc function is superb and delivers perfect arc ignition every time without any sticking of the tungsten electrode to the work piece, a remarkably smooth stable arc produces high quality TIG welds. The ARC2000 is an exceptional machine that is suitable for a wide range of industrial applications including, site welding, farming, along with repair and maintenance applications. ARC200 is packaged in a Razorweld carry bag with your choice of MMA option accessories or MMA/TIG option accessories. The ARC200 gives you the best of both worlds great portability, with the power to get the job done. Built to our specification and manufactured in compliance to AS/NZ60974-1

#### Product Code: KUMJRRW200CA

MMA option includes: ARC200 Machine, Earth Lead & Arc Lead 25mm x 4m, Razorweld Carry Bag

#### Product Code: KUMJRRW200CT

TIG option includes: ARC200 Machine, Earth Lead & Arc Lead 25mm x 4m, 26V x 4m TIG Torch, UNI-FLAME Argon Flowmeter Regulator and Razorweld carry bag





## FRONT MACHINE LAYOUT DESCRIPTION



## Rear Machine Layout Description



## VRD (Safe Function) Description - Note 160PFC Only



VRD reduces the welding power source's open circuit voltage (OCV). OCV is the voltage measured across the terminals when not welding. The VRD unit will turn on welding power when the resistance between the electrode and work is less than 200 Ohms (typically metal to metal contact). The Safe Function (VRD) allows the reduction of the no load voltage in the power source to a very safe level  $U_0 < 24V$ . This function can be started up with the safe key indicated in the picture

Key in the OFF position : Safe Function disconnected  
Key in the ON position: Safe Function connected

When the Safe function is active, the green led on the front panel of the power source is ON.

## INSTALLATION SET UP FOR MMA (STICK) WELDING WITH MMA-TIG160/200PFC

Please install the machine strictly according to the following steps.  
The protection class of this machine is IP21, so avoid using it in rain.

### Connection of Input Cables

Primary input cable is supplied with this welding equipment. Connect the primary input cable with power supply of required input voltage. Refer to data plate on machine for Input voltage, I<sub>MAX</sub> and I<sub>EFF</sub>.

- (1) Turn the power source on and select the MMA function with the TIG/MMA selector switch.
- (2) Connection of Output Cables: Various electrodes require a different polarity for optimum results refer to the electrode manufacturers information for the correct polarity. Most GP electrodes are Electrode connected to  $\oplus$  output socket, Earth Connected to the  $\ominus$  output socket
- (3) Set the welding current relevant to the electrode type and size being used as recommended by the electrode manufacturer.
- (4) Place the electrode into the electrode holder and clamp tight
- (5) Strike the electrode on the work to create the arc and hold the electrode steady to maintain the arc
- (6) Hold the electrode slightly above the work piece to maintain the arc while travelling at an even speed to create and even weld deposition
- (7) To finish the weld, break the arc by quickly snapping the electrode away from the work piece.
- (8) Wait for the weld to cool and carefully chip away the slag to reveal the weld metal underneath.



(3) Set the welding current using the amperage control dial.



(4) Place the electrode into the electrode holder and clamp tight.



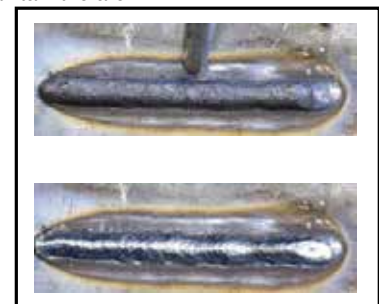
(5) Strike the electrode against the workpiece to create an arc and hold the electrode steady to maintain the arc.



(6) Hold the electrode slightly above the work maintaining the arc while travelling at an even speed.



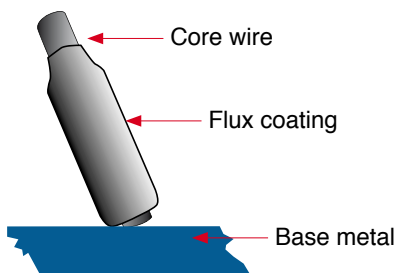
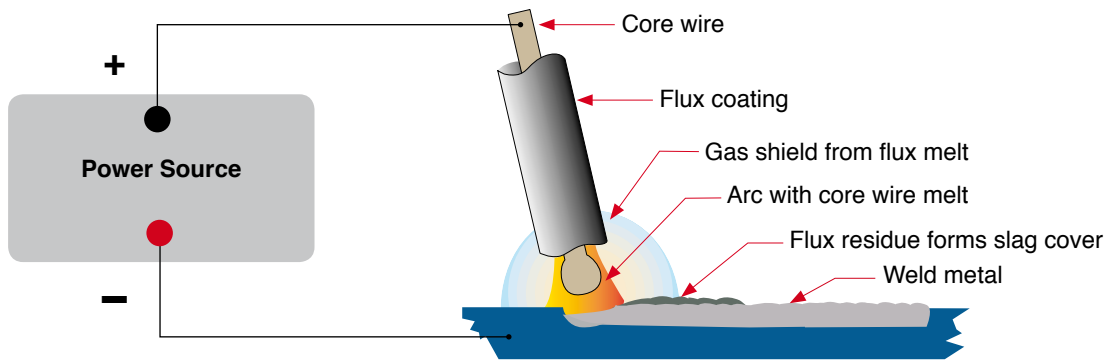
(7) To finish the weld, break the arc by quickly snapping the electrode away from the work piece.



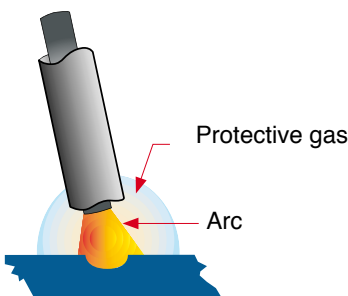
(8) Wait for the weld to cool and carefully chip away the slag to reveal the weld metal below.

# MMA (Manual Metal Arc) Welding

One of the most common types of arc welding is manual metal arc welding (MMA) or stick welding. An electric current is used to strike an arc between the base material and a consumable electrode rod or 'stick'. The electrode rod is made of a material that is compatible with the base material being welded and is covered with a flux that gives off gaseous vapours that serve as a shielding gas and providing a layer of slag, both of which protect the weld area from atmospheric contamination. The electrode core itself acts as filler material the residue from the flux that forms a slag covering over the weld metal must be chipped away after welding.



- The arc is initiated by momentarily touching the electrode to the base metal.
- The heat of the arc melts the surface of the base metal to form a molten pool at the end of the electrode.
- The melted electrode metal is transferred across the arc into the molten pool and becomes the deposited weld metal.
- The deposit is covered and protected by a slag which comes from the electrode coating.
- The arc and the immediate area are enveloped by an atmosphere of protective gas



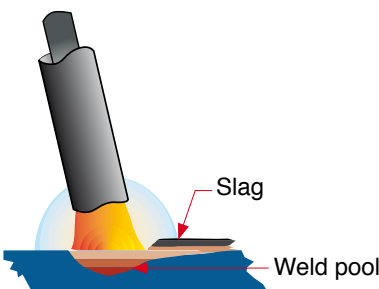
Manual metal arc (stick) electrodes have a solid metal wire core and a flux coating. These electrodes are identified by the wire diameter and by a series of letters and numbers. The letters and numbers identify the metal alloy and the intended use of the electrode.

The **Metal Wire Core** works as conductor of the current that maintains the arc. The core wire melts and is deposited into the welding pool.

The covering on a shielded metal arc welding electrode is called **Flux**. The flux on the electrode performs many different functions. These include:

- producing a protective gas around the weld area
- providing fluxing elements and deoxidizers
- creating a protective slag coating over the weld as it cools
- establishing arc characteristics
- adding alloying elements.

Covered electrodes serve many purposes in addition to adding filler metal to the molten pool. These additional functions are provided mainly by the covering on the electrode.



# MMA (Stick) Welding Fundamentals

## Electrode Selection

As a general rule, the selection of an electrode is straight forward, in that it is only a matter of selecting an electrode of similar composition to the parent metal. However, for some metals there is a choice of several electrodes, each of which has particular properties to suit specific classes of work. It is recommended to consult your welding supplier for the correct selection of electrode.

## Electrode Size

Average Thickness of Material	Maximum Recommended Electrode Diameter
1.0 - 2.0mm	2.5mm
2.0 - 5.0mm	3.2mm
5.0 - 8.0mm	4.0mm
8.0 - > mm	5.0mm

The size of the electrode generally depends on the thickness of the section being welded, and the thicker the section the larger the electrode required. The table gives the maximum size of electrodes that may be used for various thicknesses of section based on using a general purpose type 6013 electrode.

## Welding Current (Amperage)

Electrode Size $\varnothing$ mm	Current Range (Amps)
2.5mm	60 - 100
3.2mm	100 - 130
4.0mm	130 - 165
5.0mm	165 - 260

Correct current selection for a particular job is an important factor in arc welding. With the current set too low, difficulty is experienced in striking and maintaining a stable arc. The electrode tends to stick to the work, penetration is poor and beads with a distinct rounded profile will be deposited. Too high current is accompanied by overheating of the electrode resulting in undercut and burning through of the base metal and

producing excessive spatter. Normal current for a particular job may be considered as the maximum, which can be used without burning through the work, overheating the electrode or producing a rough spattered surface. The table shows current ranges generally recommended for a general purpose type 6013 electrode.

## Arc Length

To strike the arc, the electrode should be gently scraped on the work until the arc is established. There is a simple rule for the proper arc length; it should be the shortest arc that gives a good surface to the weld. An arc too long reduces penetration, produces spatter and gives a rough surface finish to the weld. An excessively short arc will cause sticking of the electrode and result in poor quality welds. General rule of thumb for down hand welding is to have an arc length no greater than the diameter of the core wire.

## Electrode Angle

The angle that the electrode makes with the work is important to ensure a smooth, even transfer of metal. When welding in down hand, fillet, horizontal or overhead the angle of the electrode is generally between 5 and 15 degrees towards the direction of travel. When vertical up welding the angle of the electrode should be between 80 and 90 degrees to the work piece.

## Travel Speed

The electrode should be moved along in the direction of the joint being welded at a speed that will give the size of run required. At the same time, the electrode is fed downwards to keep the correct arc length at all times. Excessive travel speeds lead to poor fusion, lack of penetration etc, while too slow a rate of travel will frequently lead to arc instability, slag inclusions and poor mechanical properties.

## Material and Joint Preparation

The material to be welded should be clean and free of any moisture, paint, oil, grease, mill scale, rust or any other material that will hinder the arc and contaminate the weld material. Joint preparation will depend on the method used include sawing, punching, shearing, machining, flame cutting and others. In all cases edges should be clean and free of any contaminants. The type of joint will be determined by the chosen application.

# RECOMMENDED ELECTRODE CLASSIFICATION & SELECTION CHART

	APPLICATION	DIAMETER	PACKAGE	PART No
<b>MILD STEEL</b>	<b>ESR11</b> General-purpose electrode for structural steelwork, workshop and maintenance welding. Easily operated in positional welding, including vertically-down. Good gap-bridging. Possible to use equally well both with AC and DC. Smooth arc, well suited for tack-welding due to it's easy arc striking and restriking properties. Welds are smooth, slightly concave and blending into base metal without undercutting. Slag is self-releasing in most cases. Suitable for welding on galvanized, primer painted and slightly rusted components.	2.5 / 3.2mm	HANDYPACK	ESR-11-BLISTER
		2.5mm	2.5KG PACK	ESR-11-2.5mm-2.5kg
		2.5mm	5.0KG PACK	ESR-11-2.5mm-5kg
		3.2mm	2.5KG PACK	ESR-11-3.2mm-2.5kg
		3.2mm	5.0KG PACK	ESR-11-3.2mm-5kg
		4.0mm	5.0mKG PACK	ESR-11-4.0mm-5kg
<b>LOW HYDROGEN</b>	<b>ESB-44</b> Multi-purpose electrode suitable for structural steelwork, workshop and maintenance welding. Smooth and clean welds, blending into base metal without undercuts. Excellent gap bridging properties. The double covering of this electrode produces a stable, concentrated and directed arc, thus being ideally suited for root pass and positional welding. Welds are of X-ray quality.	2.5 / 3.2mm	HANDYPACK	ESB-44-BLISTER
		2.5mm	5.0KG PACK	ESB-44-2.5mm-5kg
		3.2mm	2.5KG PACK	ESB-44-3.2mm-2.5kg
		3.2mm	5.0KG PACK	ESB-44-3.2mm-5kg
		4.0mm	6.5KG PACK	ESB-44-4.0mm-6.5kg
<b>STAINLESS STEEL</b>	<b>EI 316L</b> Electrode for welding austenitic stainless Cr-Ni-Mo steels or cast steels, having an extra low carbon content. For operating temperatures of up to +400°C. Especially suitable for welding of stainless steel chemical tanks and pipes in chemical, textile, paint, paper industries. Possible to use equally well both with AC and DC. Easy arc striking and restriking. Fine metal droplet transfer, good fusion of joint faces, finely rippled bead surface, easily removable slag.	2.5 / 3.2mm	HANDYPACK	EI316L-BLISTER
		2.5mm	1.75KG PACK	EI316L-2.5mm-1.75kg
		3.2mm	2.0KG PACK	EI316L-3.2mm-2.0kg
		4.0mm	2.0KG PACK	EI316L-4.0mm-2kg
<b>HARD FACING</b>	<b>EH531</b> Heavy coated, high recovery (235%) hardfacing electrode, depositing evenly distributed Cr, B carbides in austenitic stainless steel matrix. Suitable for hardfacing of parts subjected to heavy abrasion with moderate impact. Required hardness and abrasion resistance can be obtained in the first layer even on low alloy steels. The hardfacing layers have a very smooth surface and machinable only by grinding. Suitable to use in excavator teeth, leading edges of excavator buckets, mixer blades, gravel pumps, conveyor worn-screws, conveyor belts. Possible to use with both DC and AC.	3.2mm	HANDYPACK	EH-531-BLISTER
		3.2mm	5.0KG PACK	EH-531-3.2mm-5kg
		4.0mm	5.0KG PACK	EH-531-4.0mm-5kg
		5.0mm	5.0KG PACK	EH-531-5.0mm-5kg
<b>CAST IRON</b>	<b>ENI-416</b> Electrode having a nickel-iron core wire for welding cast iron with or without preheating. The weld metal features a low coefficient of thermal expansion and as a result , little shrinkage. It has higher strength properties than pure nickel weld metal and is therefore preferable used for welding nodular cast iron, white and black heart malleable cast iron, as well as austenitic nodular cast iron or joining these metals to components made of steel, copper or nickel materials. Easy arc striking and restriking, stable arc, smooth bead. Weld metal is machinable. Weld short beads.	2.5 / 3.2mm	HANDYPACK	ENI-416-BLISTER
		2.5mm	1.75KG PACK	ENI-416-2.5mm-1.75kg
		3.2mm	1.75KG PACK	ENI-416-3.2mm-1.75kg
		4.0mm	2.25KG PACK	ENI-416-4.0mm-2.25kg
<b>DISIMILAR METALS</b>	<b>EI 312</b> Electrode for joining dissimilar steels and depositing claddings on ferritic steels. The ferritic-austenitic Cr-Ni weld metal contains approximately 50% of delta-ferrite and is non-scaling up to +1100°C. It features high resistance to cracking and is therefore suited for joining difficult to weld steels and depositing stress-relaxing buffer layers on crack sensitive base metals. Suitable for welding galvanized steel plates. Possible to use equally well both with AC and DC. Easy arc striking and restriking. Fine metal droplet transfer, good fusion of joint faces, finely rippled bead surface, easy slag removal.	2.5 / 3.2mm	HANDYPACK	EI-312-BLISTER
		2.5mm	1.75KG PACK	EI-312-2.5mm-1.75kg
		3.2mm	1.75KG PACK	EI-312-3.2mm-1.75kg
		4.0mm	2.0KG PACK	EI-312-4.0mm-2kg

For a full range of recommended MAGMAWELD welding electrodes please visit our website @ [WWW.UNIMIG.COM.AU](http://WWW.UNIMIG.COM.AU)  
 The above chart is a reference only and are not included in this kit.

# INSTALLATION AND SET UP FOR DC TIG WELDING FOR MMA-TIG160/200PFC

- (1) Switch on the machine, select the **TIG** function with the TIG/MMA selector switch.
- (2) Insert the power cable plug of the TIG torch into the **Negative** socket on the front of the machine and tighten it.
- (3) Insert the earth cable plug into the **Positive** socket on the front of the machine and tighten it.
- (5) Connect the gas line of the TIG torch to regulator and connect the regulator to the gas cylinder. Carefully open the gas cylinder valve and set the flow rate to between 8 -10 l/min.
- (5) Set the welding current using the amperage control dial



(4) Carefully open the valve of the gas cylinder, set the flow to 8-10 l/min

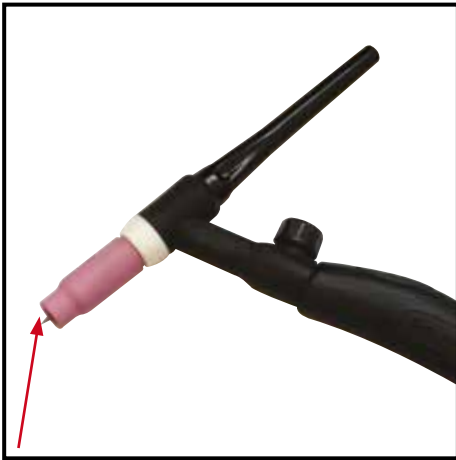


(5) Set the welding current using the amperage control dial

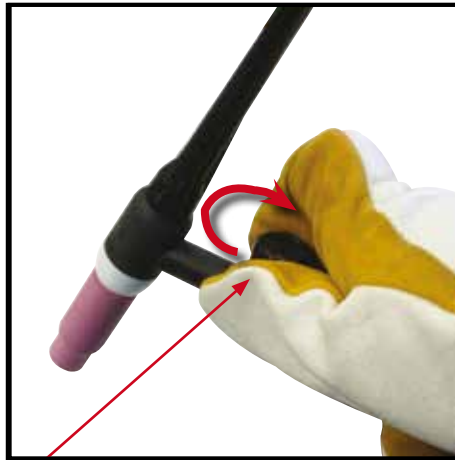
## LIFT ARC DC TIG OPERATION FOR MMA-TIG160/200PFC

Lift Arc ignition allows the arc to be started easily in DC TIG by simply touching the tungsten to the work piece and lifting it up to start the arc. This prevents the tungsten tip sticking to the work piece and breaking the tip from the tungsten electrode. There is a particular technique called “rocking the cup” used in the Lift Arc process that provides easy use of the Lift Arc function.

- (6) Make sure the front end parts of the TIG torch are correctly assembled, use the correct size and type of tungsten electrode for the job, the tungsten electrode requires a sharpened point for DC welding.
- (7) Turn on the Gas Valve located on the TIG torch handle.
- (8) Lay the outside edge of the Gas Cup on the work piece with the Tungsten Electrode 1- 2mm from the work piece.
- (9) With a small movement rotate the Gas Cup forward so that the Tungsten Electrode touches the work piece.
- (10) Now rotate the Gas Cup in the reverse direction to lift the Tungsten electrode from the work piece to create the arc.



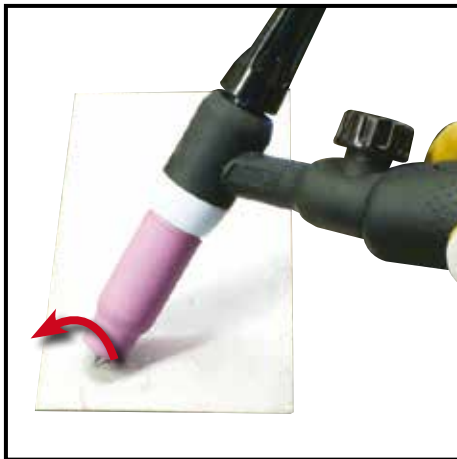
(6) Assemble front end parts of the TIG torch, fitting a sharpened tungsten suitable for DC welding.



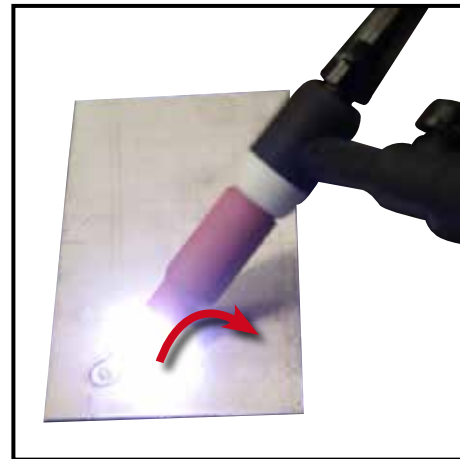
(7) Turn on the Gas Valve



(8) Lay the outside edge of the Gas Cup on the work piece with the Tungsten Electrode 1- 2mm from the work piece.



(9) With a small movement rotate the Gas Cup forward so that the Tungsten Electrode touches the work piece.

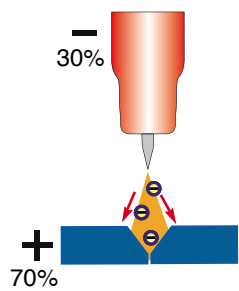


(10) Now rotate the Gas Cup in the reverse direction to lift the Tungsten electrode from the work piece to create the arc.

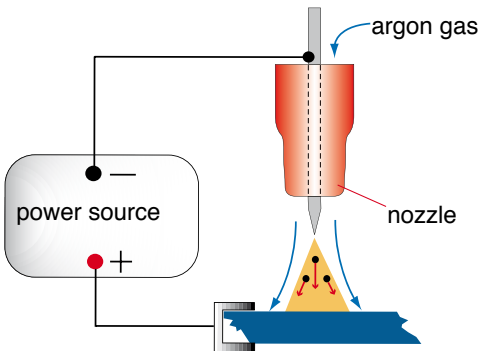
**IMPORTANT! - We strongly recommend that you check for gas leakage prior to operation of your machine. We recommend that you close the cylinder valve when the machine is not in use.**

**Welding Guns Of Australia PTY LTD, authorised representatives or agents of Welding Guns Of Australia PTY LTD will not be liable or responsible for the loss of any gas.**

## DC TIG Welding

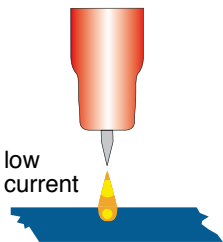


The DC power source uses what is known as DC (direct current) in which the main electrical component known as electrons flow in only one direction from the negative pole (terminal) to the positive pole (terminal). In the DC electrical circuit there is an electrical principle at work which should always be taken into account when using any DC circuit. With a DC circuit 70% of the energy (heat) is always on the positive side. This needs to be understood because it determines what terminal the TIG torch will be connected to (this rule applies to all the other forms of DC welding as well).

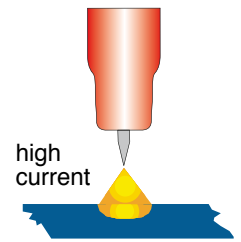


DC TIG welding is a process in which an arc is struck between a TUNGSTEN electrode and the metal work piece. The weld area is shielded by an inert gas flow to prevent contamination of the tungsten, molten pool and weld area.

When the TIG arc is struck the inert gas is ionized and superheated changing its molecular structure which converts it into a plasma stream. This plasma stream flowing between the tungsten and the work piece is the TIG arc and can be as hot as 19,000°C. It is a very pure and concentrated arc which provides the controlled melting of most metals into a weld pool. TIG welding offers the user the greatest amount of flexibility to weld the widest range of material and thickness and types. DC TIG welding is also the cleanest weld with no sparks or spatter.

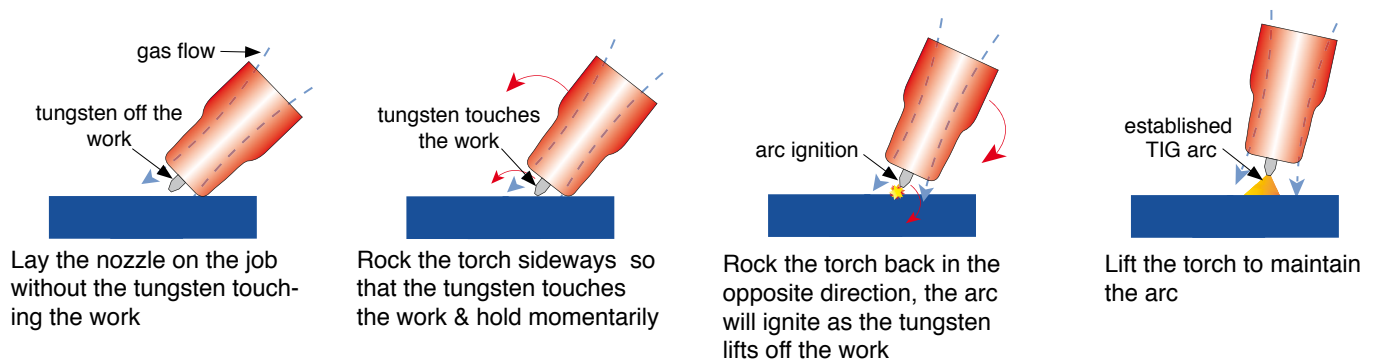


The intensity of the arc is proportional to the current that flows from the tungsten. The welder regulates the welding current to adjust the power of the arc. Typically thin material requires a less powerful arc with less heat to melt the material so less current (amps) is required, thicker material requires a more powerful arc with more heat so more current (amps) are necessary to melt the material.



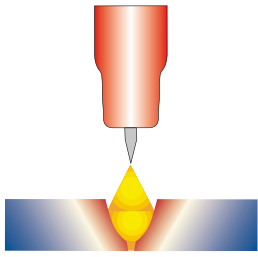
## LIFT ARC IGNITION for TIG (tungsten inert gas) Welding

Lift Arc is a form of arc ignition where the machine has low voltage on the electrode to only a few volts, with a current limit of one or two amps (well below the limit that causes metal to transfer and contamination of the weld or electrode). When the machine detects that the tungsten has left the surface and a spark is present, it immediately (within microseconds) increases power, converting the spark to a full arc. It is a simple, safe lower cost alternative arc ignition process to HF (high frequency) and a superior arc start process to scratch start.



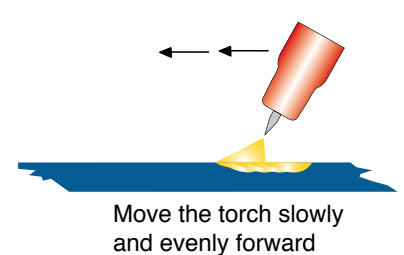
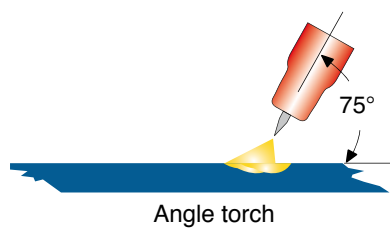
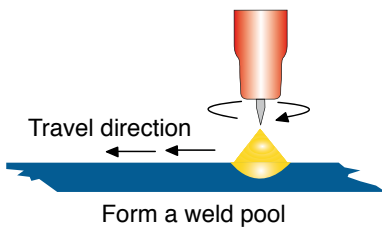


## TIG Welding Fusion Technique

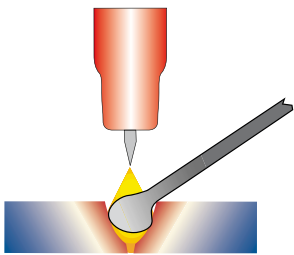


Manual TIG welding is often considered the most difficult of all the welding processes. Because the welder must maintain a short arc length, great care and skill are required to prevent contact between the electrode and the workpiece. Similar to Oxygen Acetylene torch welding, TIG welding normally requires two hands and in most instances requires the welder to manually feed a filler wire into the weld pool with one hand while manipulating the welding torch in the other. However, some welds combining thin materials can be accomplished without filler metal like edge, corner, and butt joints.

This is known as Fusion welding where the edges of the metal pieces are melted together using only the heat and arc force generated by the TIG arc. Once the arc is started the torch tungsten is held in place until a weld pool is created, a circular movement of the tungsten will assist in creating a weld pool of the desired size. Once the weld pool is established tilt the torch at about a  $75^\circ$  angle and move smoothly and evenly along the joint while fusing the materials together.

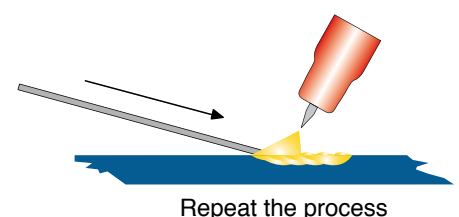
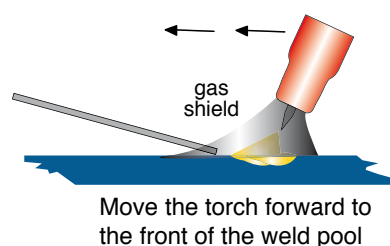
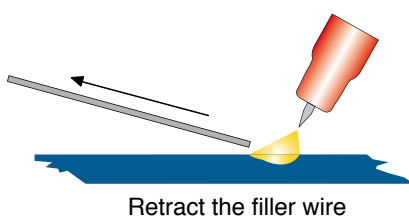
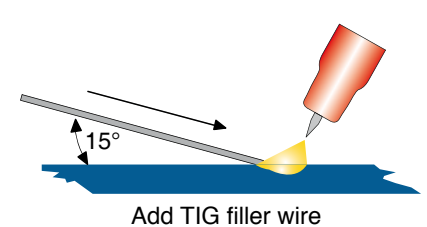
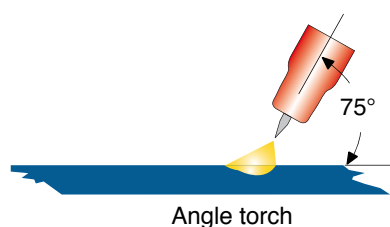
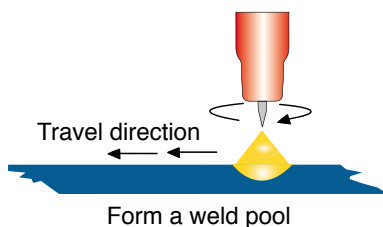


## TIG Welding with Filler Wire Technique



It is necessary in many situations with TIG welding to add a filler wire into the weld pool to build up weld reinforcement and create a strong weld. Once the arc is started the torch tungsten is held in place until a weld pool is created, a circular movement of the tungsten will assist in creating a weld pool of the desired size. Once the weld pool is established tilt the torch at about a  $75^\circ$  angle and move smoothly and evenly along the joint. The filler metal is introduced to the leading edge of the weld pool. The filler wire is usually held at about a  $15^\circ$  angle and fed into the leading edge of the molten pool, the arc will melt the filler wire into the weld pool as the torch is moved forward.

Also a dabbing technique can be used to control the amount of filler wire added, the wire is fed into the molten pool and retracted in a repeating sequence as the torch is moved slowly and evenly forward. It is important during the welding to keep the molten end of the filler wire inside the gas shield as this protects the end of the wire from being oxidised and contaminating the weld pool.



# Tungsten Electrodes

Tungsten is a rare metallic element used for manufacturing TIG welding electrodes. The TIG process relies on tungsten's hardness and high-temperature resistance to carry the welding current to the arc. Tungsten has the highest melting point of any metal, 3,410 degrees Celsius.

Tungsten electrodes are nonconsumable and come in a variety of sizes, they are made from pure tungsten or an alloy of tungsten and other rare earth elements. Choosing the correct tungsten depends on the material being welded, the amount of amps required and whether you are using AC or DC welding current.

Tungsten electrodes are colour-coded at the end for easy identification.

Below are the most commonly used tungsten electrodes found in the New Zealand and Australian market.

## Thoriated

Thoriated tungsten electrodes (AWS classification EWTh-2) contain a minimum of 97.30 percent tungsten and 1.70 to 2.20 percent thorium and are called 2 percent thoriated. They are the most commonly used electrodes today and are preferred for their longevity and ease of use. Thorium increases the electron emission qualities of the electrode, which improves arc starts and allows for a higher current-carrying capacity. This electrode operates far below its melting temperature, which results in a considerably lower rate of consumption and eliminates arc wandering for greater stability. Compared with other electrodes, thoriated electrodes deposit less tungsten into the weld puddle, so they cause less weld contamination.

Thorium however is a low-level radioactive hazard and many users have switched to other alternatives. Regarding the radioactivity, thorium is an alpha emitter but when it is enclosed in a tungsten matrix the risks are negligible. Thus holding a stick of Thoriated tungsten in your hand should not pose a great threat unless a welder has open cuts on their skin. Thoriated tungsten should not get in contact with open cuts or wounds. The more significant danger to welders can occur when thorium oxide gets into the lungs. This can happen from the exposure to vapours during welding or from ingestion of material/dust in the grinding of the tungsten. Follow the manufacturer's warnings, instructions, and the Material Safety Data Sheet (MSDS) for its use.

## Ceriated (Color Code: Orange)

Ceriated tungsten electrodes (AWS classification EWCe-2) contain a minimum of 97.30 percent tungsten and 1.80 to 2.20 percent cerium and are referred to as 2 percent ceriated. Ceriated tungstens perform best in DC welding at low current settings. They have excellent arc starts at low amperages and become popular in such applications as orbital tube welding, thin sheet metal work. They are best used to weld carbon steel, stainless steel, nickel alloys, and titanium, and in some cases it can replace 2 percent thoriated electrodes. Ceriated tungsten is best suited for lower amperages it should last longer than Thoriated tungsten higher amperage applications are best left to Thoriated or Lanthanated tungsten.

## Lanthanated (Color Code: Gold)

Lanthanated tungsten electrodes (AWS classification EWL-1.5) contain a minimum of 97.80 percent tungsten and 1.30 percent to 1.70 percent lanthanum, and are known as 1.5 percent lanthanated. These electrodes have excellent arc starting, a low burn off rate, good arc stability, and excellent re-ignition characteristics. Lanthanated tungstens also share the conductivity characteristics of 2 percent thoriated tungsten. Lanthanated tungsten electrodes are ideal if you want to optimise your welding capabilities. They work well on AC or DC electrode negative with a pointed end, or they can be balled for use with AC sine wave power sources. Lanthanated tungsten maintains a sharpened point well, which is an advantage for welding steel and stainless steel on DC or AC from square wave power sources.

## Zirconiated (Color Code: White)

Zirconiated tungsten electrodes (AWS classification EWZr-1) contain a minimum of 99.10 percent tungsten and 0.15 to 0.40 percent zirconium. Most commonly used for AC welding Zirconiated tungsten produces a very stable arc and is resistant to tungsten spitting. It is ideal for AC welding because it retains a balled tip and has a high resistance to contamination. Its current-carrying capacity is equal to or greater than that of thoriated tungsten. Zirconiated tungsten is not recommended for DC welding.

## Tungsten Electrodes Rating for Welding Currents

Tungsten Diameter mm	DC Current Amps Torch Negative 2% Thoriated	AC Current Amps Un-Balanced Wave 0.8% Zirconiated	AC Current Amps Balanced Wave 0.8% Zirconiated
1.0mm	15 - 80	15 - 80	20 - 60
1.6mm	70 - 150	70 - 150	60 - 120
2.4mm	150 - 250	140 - 235	100 - 180
3.2mm	250 - 400	225 - 325	160 - 250
4.0mm	400 - 500	300 - 400	200 - 320

## Tungsten Preparation

Always use **DIAMOND** wheels when grinding and cutting. While tungsten is a very hard material, the surface of a diamond wheel is harder, and this makes for smooth grinding. Grinding without diamond wheels, such as aluminium oxide wheels, can lead to jagged edges, imperfections, or poor surface finishes not visible to the eye that will contribute to weld inconsistency and weld defects.

Always ensure to grind the tungsten in a longitudinal direction on the grinding wheel. Tungsten electrodes are manufactured with the molecular structure of the grain running lengthwise and thus grinding crosswise is “grinding against the grain.” If electrodes are ground crosswise, the electrons have to jump across the grinding marks and the arc can start before the tip and wander. Grinding longitudinally with the grain, the electrons flow steadily and easily to the end of the tungsten tip. The arc starts straight and remains narrow, concentrated, and stable.



### Electrode Tip/Flat

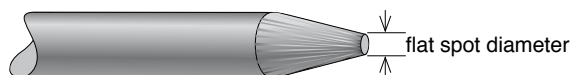
The shape of the tungsten electrode tip is an important process variable in precision arc welding. A good selection of tip/flat size will balance the need for several advantages. The bigger the flat, the more likely arc wander will occur and the more difficult it will be to arc start. However, increasing the flat to the maximum level that still allows arc start and eliminates arc wander will improve the weld penetration and increase the electrode life. Some welders still grind electrodes to a sharp point, which makes arc starting easier. However, they risk decreased welding performance from melting at the tip and the possibility of the point falling off into the weld pool.



### Electrode Included Angle/Taper - DC Welding

Tungsten electrodes for DC welding should be ground longitudinally and concentrically with diamond wheels to a specific included angle in conjunction with the tip/flat preparation. Different angles produce different arc shapes and offer different weld penetration capabilities. In general, blunter electrodes that have a larger included angle provide the following benefits:

- Last Longer
- Have better weld penetration
- Have a narrower arc shape
- Can handle more amperage without eroding.



Sharper electrodes with smaller included angle provide:

- Offer less arc weld
- Have a wider arc
- Have a more consistent arc



The included angle determines weld bead shape and size. Generally, as the included angle increases, penetration increases and bead width decreases.

Tungsten Diameter	Diameter at the Tip - mm	Constant Included Angle - Degrees	Current Range Amps	Current Range Pulsed Amps
1.0mm	.250	20	05 - 30	05 - 60
1.6mm	.500	25	08 - 50	05 - 100
1.6mm	.800	30	10 - 70	10 - 140
2.4mm	.800	35	12 - 90	12 - 180
2.4mm	1.100	45	15 - 150	15 - 250
3.2mm	1.100	60	20 - 200	20 - 300
3.2mm	1.500	90	25 - 250	25 - 350

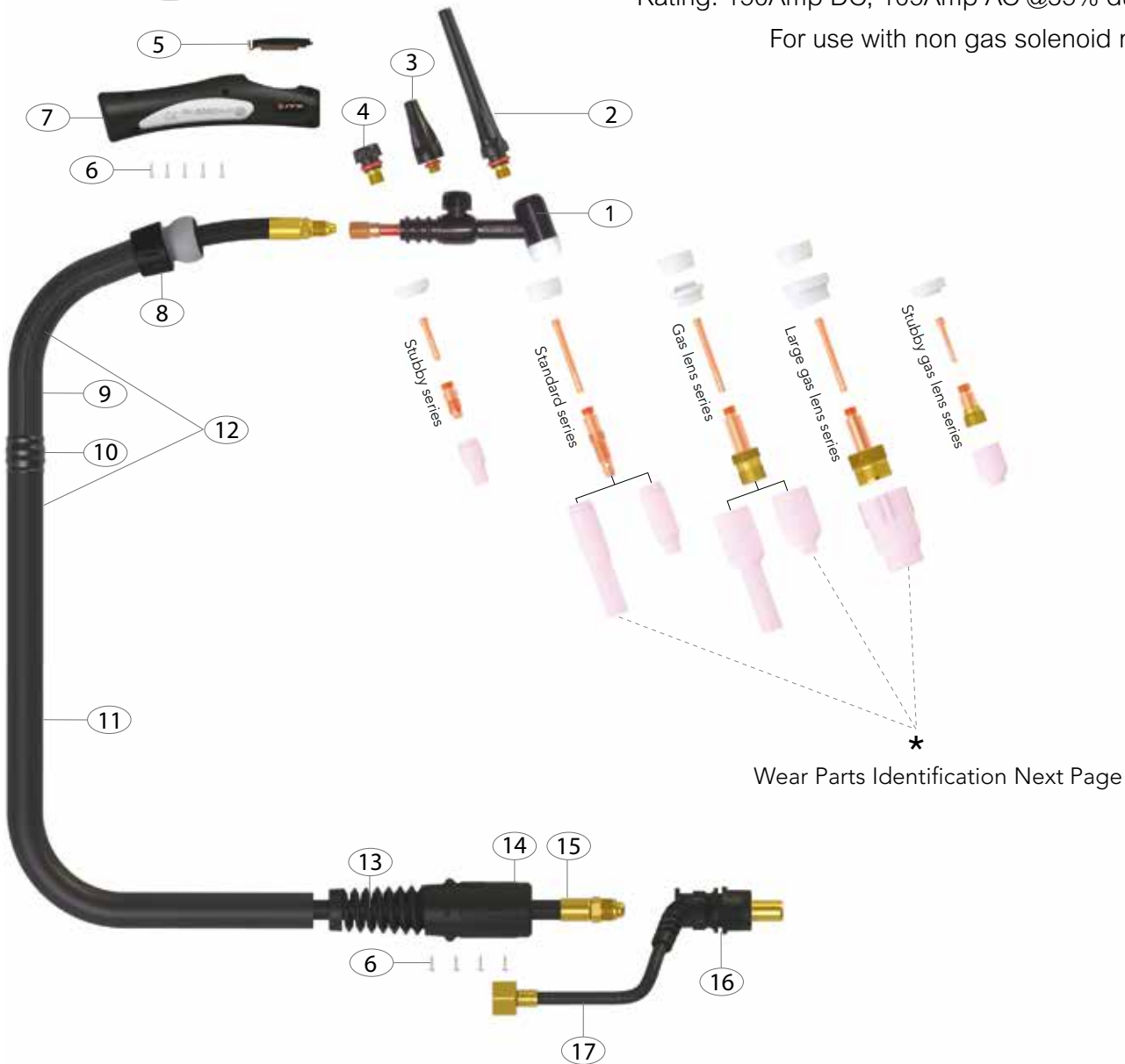
# Suregrip Series 17V TIG TORCH



## 150A AIR COOLED TIG WELDING TORCH

Rating: 150Amp DC, 105Amp AC @35% duty cycle.

For use with non gas solenoid machines



\*  
Wear Parts Identification Next Page




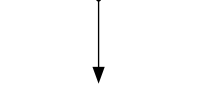

Torch Model		
Description	Part Number	
	4m	8m
17V Suregrip Tig Torch Package c/w 2m Gas Hose	17V-4MCP25	17V-8MCP25

Spare Parts			
Part Number	Description	Part Number	Description
1	WP17V Torch head	11	UERNCL-32 Neoprene Cover X 3.2mt
	WP17VF Torch head flexible		UERNCL-72 Neoprene Cover X 7.2mt
2	57Y02 Back cap long	12	UERCO100-40 Sheath X 12.5ft Inc Leather Cover
3	57Y03 Medium back cap		UERCO100-80 Sheath X 25ft Inc Leather Cover
4	57Y04 Short back cap	13	USLH917-S Cable Support Small
5	UERBS Blank Kitt	14	USLH917-H "Surelok" Housing Small
6	UERSP1 Screw Pack	15	USL57Y01AR "Power Cable X 12.5ft" Surelok " Rubber
7	UERH100 Small Ergo Tig Handle		USL57Y03AR Power Cable X 25ft "Surelok" Rubber
8	UERKJ100 Small Knuckle Joint	16	USL3550 "Surelok" Body & Support
9	UERLC200-08 Leather Cover X 0.8mt	17	USL-1-GS4 Gas Supply Hose
10	UERJK100 Jointing Repair Kit		

# Suregrip Series 17V TIG TORCH



## Standard Front End Parts

<table border="0"> <tr> <th>Part #</th> <th>Description</th> </tr> <tr> <td>18CG</td> <td>Cup Gasket</td> </tr> </table> 	Part #	Description	18CG	Cup Gasket	<table border="0"> <tr> <th>Part #</th> <th>Description</th> </tr> <tr> <td>10N30</td> <td>Collet Body 1.0mm</td> </tr> <tr> <td>10N31</td> <td>Collet Body 1.6mm</td> </tr> <tr> <td>10N32</td> <td>Collet Body 2.4mm</td> </tr> <tr> <td>10N28</td> <td>Collet Body 3.2mm</td> </tr> </table> 	Part #	Description	10N30	Collet Body 1.0mm	10N31	Collet Body 1.6mm	10N32	Collet Body 2.4mm	10N28	Collet Body 3.2mm	<table border="0"> <tr> <th>Part #</th> <th>Description</th> <th></th> <th></th> </tr> <tr> <td>10N49L</td> <td>Long Alumina Nozzle</td> <td>Ø 8mm</td> <td>#5L</td> </tr> <tr> <td>53N48L</td> <td>Long Alumina Nozzle</td> <td>Ø 10mm</td> <td>#6L</td> </tr> <tr> <td>53N47L</td> <td>Long Alumina Nozzle</td> <td>Ø 11mm</td> <td>#7L</td> </tr> </table> 	Part #	Description			10N49L	Long Alumina Nozzle	Ø 8mm	#5L	53N48L	Long Alumina Nozzle	Ø 10mm	#6L	53N47L	Long Alumina Nozzle	Ø 11mm	#7L											
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10N46	Alumina Nozzle	Ø 13mm	#8																																								
10N45	Alumina Nozzle	Ø 16mm	#10																																								
10N44	Alumina Nozzle	Ø 19mm	#12																																								

## Compact Gas Lens Front End Parts

<table border="0"> <tr> <th>Part #</th> <th>Description</th> </tr> <tr> <td>54N01</td> <td>Gas Lens Gasket</td> </tr> </table> 	Part #	Description	54N01	Gas Lens Gasket	<table border="0"> <tr> <th>Part #</th> <th>Description</th> </tr> <tr> <td>45V25</td> <td>Gas Lens Body 1.6mm</td> </tr> <tr> <td>45V26</td> <td>Gas Lens Body 2.4mm</td> </tr> <tr> <td>45V27</td> <td>Gas Lens Body 3.2mm</td> </tr> </table> 	Part #	Description	45V25	Gas Lens Body 1.6mm	45V26	Gas Lens Body 2.4mm	45V27	Gas Lens Body 3.2mm	<table border="0"> <tr> <th>Part #</th> <th>Description</th> </tr> <tr> <td>54N14</td> <td>Gas lens ceramic 8.0mm</td> </tr> <tr> <td>54N15</td> <td>Gas lens ceramic 7.0mm</td> </tr> <tr> <td>54N17</td> <td>Gas lens ceramic 5.0mm</td> </tr> </table> 	Part #	Description	54N14	Gas lens ceramic 8.0mm	54N15	Gas lens ceramic 7.0mm	54N17	Gas lens ceramic 5.0mm
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54N01	Gas Lens Gasket																					
Part #	Description																					
45V25	Gas Lens Body 1.6mm																					
45V26	Gas Lens Body 2.4mm																					
45V27	Gas Lens Body 3.2mm																					
Part #	Description																					
54N14	Gas lens ceramic 8.0mm																					
54N15	Gas lens ceramic 7.0mm																					
54N17	Gas lens ceramic 5.0mm																					

### TR0004-16



**RED**  
ANSI/AWS A5.12-98  
ISO 6848 WT20

**2% Thoriated:** Best stability at medium currents, good arc starts, medium tendency to spit, medium erosion rate. Commonly used for steel and stainless steel applications

1/16 x 7" (1.6mm x 175mm)  
3/32 x 7" (2.4mm x 175mm)  
1/8 x 7" (3.2mm x 175mm)

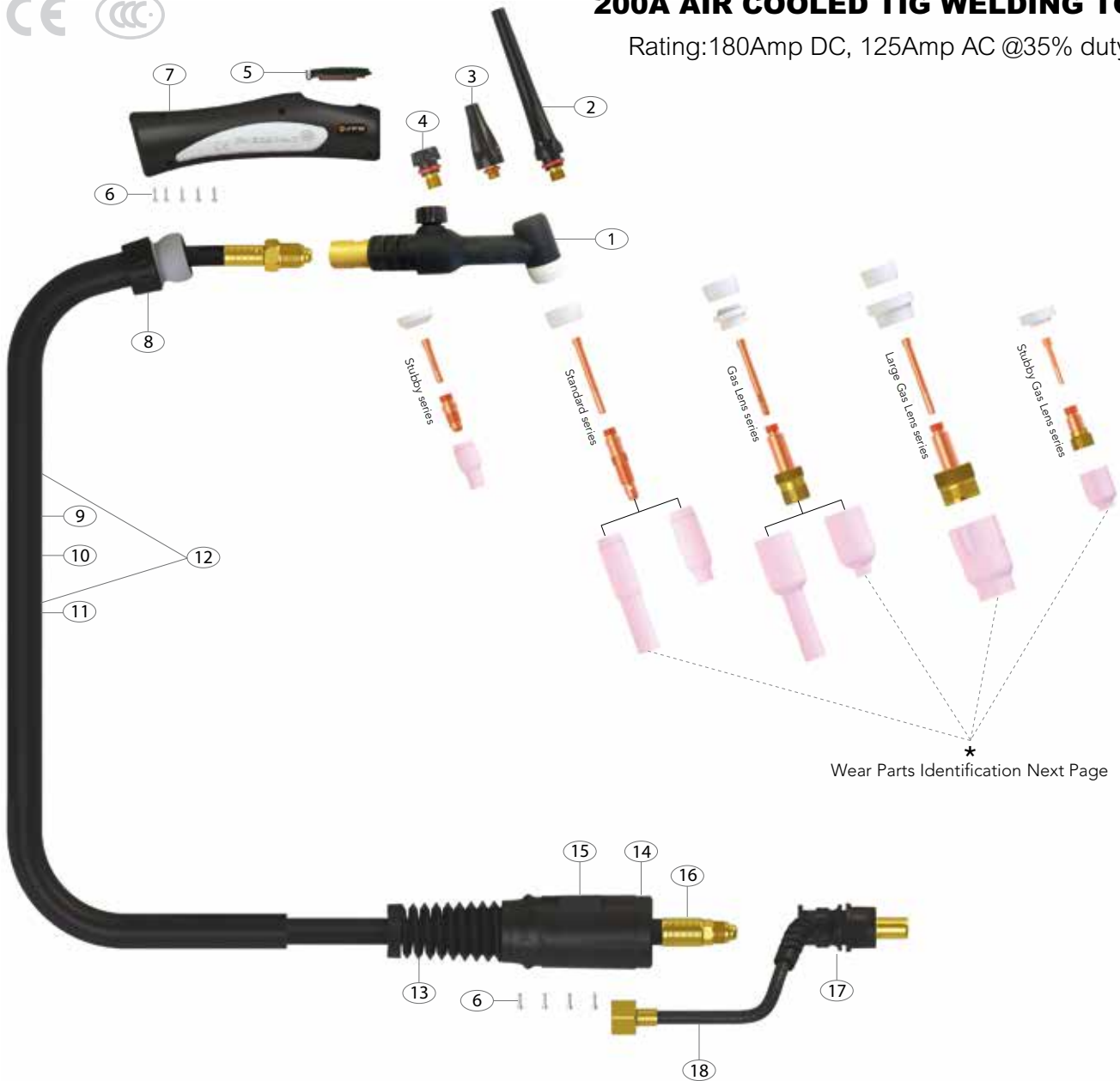
Part #	Description
TR0004-10	1.0mm x 175mm thoriated tungsten electrode 2%
TR0004-16	1.6mm x 175mm thoriated tungsten electrode 2%
TR0004-24	2.4mm x 175mm thoriated tungsten electrode 2%
TR0004-32	3.2mm x 175mm thoriated tungsten electrode 2%

# Suregrip Series 26V TIG TORCH



## 200A AIR COOLED TIG WELDING TORCH

Rating: 180Amp DC, 125Amp AC @35% duty cycle.



\*  
Wear Parts Identification Next Page

Torch Model		Part Number	
Description		4m	8m
26V Tig Torch Package c/w 2m Gas Hose		26V-4MCP50	26V-8MCP25 26V-8MCP50

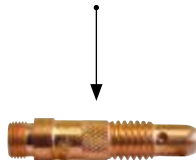
Spare Parts			
Part Number	Description	Part Number	Description
1	WP26V WP26VF	11	UERNCL-32 UERNCL-72
	Torch head Torch head flexible		Neoprene Cover X 3.2mt Neoprene Cover X 7.2mt
2	57Y02	12	UERCO200-40 UERCO200-80
	Back cap long		Sheath X 12.5ft Inc Leather Cover Sheath X 25ft Inc Leather Cover
3	57Y03	13	USLH26-S
	Medium back cap		Cable Support Large
4	57Y04	14	USLH26-H
	Short back cap		"Surelok" Housing Large
5	UERBS	15	USLH26-C
	Blank Kit		"Surelok" Housing Cover
6	UERSP1	16	USL46V28AR USL46V30AR
	Screw Pack		Power Cable X 12.5ft "Surelok" Rubber Power Cable X 25ft "Surelok" Rubber
7	UERH200	17	USL3550
	Large Ergo Tig Handle		"Surelok" Body & Support
8	UERKJ200	18	USL-1-GS4
	Large Knuckle Joint		Gas Supply Hose
9	UERLC200-08		
	Leather Cover X 0.8mt		
10	UERJK200		
	Jointing Repair Kit		

## Standard Front End Parts

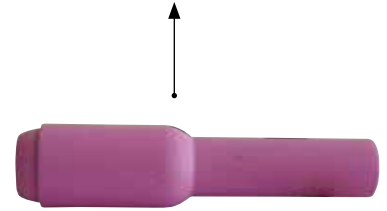
**Part #** 18CG  
**Description** Cup Gasket



**Part #** 10N30  
10N31  
10N32  
10N28  
**Description** Collet Body 1.0mm  
Collet Body 1.6mm  
Collet Body 2.4mm  
Collet Body 3.2mm



**Part #** 10N49L  
53N48L  
53N47L  
**Description** Long Alumina Nozzle Ø 8mm #5L  
Long Alumina Nozzle Ø 10mm #6L  
Long Alumina Nozzle Ø 11mm #7L



**Part #** 10N22  
10N23  
10N24  
10N25  
**Description** Collet 1.0mm  
Collet 1.6mm  
Collet 2.4mm  
Collet 3.2mm



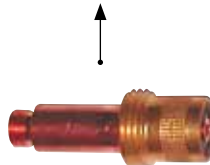
**Part #** 10N50  
10N49  
10N48  
10N47  
10N46  
10N45  
10N44  
**Description** Alumina Nozzle Ø 6mm #4  
Alumina Nozzle Ø 8mm #5  
Alumina Nozzle Ø 10mm #6  
Alumina Nozzle Ø 11mm #7  
Alumina Nozzle Ø 13mm #8  
Alumina Nozzle Ø 16mm #10  
Alumina Nozzle Ø 19mm #12

## Compact Gas Lens Front End Parts

**Part #** 54N01  
**Description** Gas Lens Gasket



**Part #** 45V25  
45V26  
45V27  
**Description** Gas Lens Body 1.6mm  
Gas Lens Body 2.4mm  
Gas Lens Body 3.2mm



**Part #** 54N14  
54N15  
54N17  
**Description** Gas lens ceramic 8.0mm  
Gas lens ceramic 7.0mm  
Gas lens ceramic 5.0mm



### TR0004-16



**RED**  
ANSI/AWS A5.12-98  
ISO 6848 WT20

**2% Thoriated:** Best stability at medium currents, good arc starts, medium tendency to spit, medium erosion rate.  
Commonly used for steel and stainless steel applications

1/16 x 7" (1.6mm x 175mm)  
3/32 x 7" (2.4mm x 175mm)  
1/8 x 7" (3.2mm x 175mm)

**Part #** TR0004-10  
TR0004-16  
TR0004-24  
TR0004-32  
**Description** 1.0mm x 175mm thoriated tungsten electrode 2%  
1.6mm x 175mm thoriated tungsten electrode 2%  
2.4mm x 175mm thoriated tungsten electrode 2%  
3.2mm x 175mm thoriated tungsten electrode 2%

## MMA (Stick) WELDING TROUBLE SHOOTING

The following chart addresses some of the common problems of MMA welding. In all cases of equipment malfunction, the manufacturer's recommendations should be strictly adhered to and followed.

<b>1: No arc</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Incomplete welding circuit	Check earth lead is connected. Check all cable connections.
Wrong mode selected	Check the MMA selector switch is selected
No power supply	Check that the machine is switched on and has a power supply
<b>2: Porosity – small cavities or holes resulting from gas pockets in weld metal.</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Arc length too long	Check that pure Argon is being used
Work piece dirty, contaminated or moisture	Remove moisture and materials like paint, grease, oil, and dirt, including mill scale from base metal
Damp electrodes	Use only dry electrodes
<b>3: Excessive Spatter</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Amperage too high	Decrease the amperage or choose a larger electrode
Arc length too long	Shorten the arc length
<b>3: Weld sits on top, lack of fusion</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Insufficient heat input	Increase the amperage or choose a larger electrode
Work piece dirty, contaminated or moisture	Remove moisture and materials like paint, grease, oil, and dirt, including mill scale from base metal
Poor welding technique	Use the correct welding technique or seek assistance for the correct technique
<b>4: Lack of penetration</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Insufficient heat input	Increase the amperage or choose a larger electrode
Poor welding technique	Use the correct welding technique or seek assistance for the correct technique
Poor joint preparation	Check the joint design and fit up, make sure the material is not too thick. Seek assistance for the correct joint design and fit up
<b>5: Excessive penetration - burn through</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Excessive heat input	Reduce the amperage or use a smaller electrode
Incorrect travel speed	Try increasing the weld travel speed
<b>6: Uneven weld appearance</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Unsteady hand, wavering hand	Use two hands where possible to steady up, practise your technique
<b>7: Distortion – movement of base metal during welding</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Excessive heat input	Reduce the amperage or use a smaller electrode
Poor welding technique	Use the correct welding technique or seek assistance for the correct technique
Poor joint preparation and or joint design	Check the joint design and fit up, make sure the material is not too thick. Seek assistance for the correct joint design and fit up
<b>7: Electrode welds with different or unusual arc characteristic</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Incorrect polarity	Change the polarity, check the electrode manufacturer for correct polarity



## TIG WELDING TROUBLE SHOOTING

The following chart addresses some of the common problems of DC TIG welding. In all cases of equipment malfunction, the manufacturer's recommendations should be strictly adhered to and followed.

<b>1: Tungsten burning away quickly</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Incorrect Gas	Check that pure Argon is being used
No gas	Check the gas cylinder contains gas and is connected and the torch gas valve is open
Inadequate gas flow	Check the gas is connected, check hoses, gas valve and torch are not restricted. Set the gas flow between 10 - 15 l/min flow rate
Back cap not fitted correctly	Make sure the torch back cap is fitted so that the o-ring is inside the torch body
Torch connected to DC +	Connect the torch to the DC- output terminal
Incorrect tungsten being used	Check and change the tungsten type if necessary
Tungsten being oxidised after weld is finished	Keep shielding gas flowing 10–15 seconds after arc stoppage. 1 second for each 10 amps of weld current.
<b>2: Contaminated tungsten</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Touching tungsten into the weld pool	Keep tungsten from contacting weld puddle. Raise the torch so that the tungsten is off of the work piece 2 - 5mm
Touching the filler wire to the tungsten	Keep the filler wire from touching the tungsten during welding, feed the filler wire into the leading edge of the weld pool in front of the tungsten
Tungsten melting into the weld pool	Check that correct type of tungsten is being used. Too much current for the tungsten size so reduce the amps or change to a larger tungsten
<b>3: Porosity - poor weld appearance and colour</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Incorrect Gas	Check that pure Argon is being used
Inadequate gas flow / gas leaks	Check the gas is connected, check hoses, gas valve and torch are not restricted. Set the gas flow between 10 - 15 l/min flow rate. Check hoses and fittings for holes, leaks etc.,
Moisture on the base metal	Remove all moisture from base metal before welding
Contaminated base metal	Remove materials like paint, grease, oil, and dirt, including mill scale from base metal
Contaminated filler wire	Remove all grease, oil, or moisture from filler metal.
Incorrect filler wire	Check the filler wire and change if necessary
<b>4: Yellowish residue / smoke on the alumina nozzle &amp; discoloured tungsten</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Incorrect Gas	Use pure Argon gas
Inadequate gas flow	Set the gas flow between 10 - 15 l/min flow rate
Alumina gas nozzle too small for size of tungsten being used	Increase the size of the alumina gas nozzle
<b>5: Unstable Arc during DC welding</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Torch connected to DC +	Connect the torch to the DC- output terminal
Contaminated base metal	Remove materials like paint, grease, oil, and dirt, including mill scale from base metal.
Tungsten is contaminated	Remove 10mm of contaminated tungsten and re grind the tungsten
Arc length too long	Lower torch so that the tungsten is off of the work piece 2 - 5mm
<b>7: Arc wanders during DC welding</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Poor gas flow	Check and set the gas flow between 10 - 15 l/min flow rate
Incorrect arc length	Lower torch so that the tungsten is off of the work piece 2 - 5mm
Tungsten incorrect or in poor condition	Check that correct type of tungsten is being used. Remove 10mm from the weld end of the tungsten and re sharpen the tungsten
Poorly prepared tungsten	Grind marks should run lengthwise with tungsten, not circular. Use proper grinding method and wheel.
Contaminated base metal	Remove contaminating materials like paint, grease, oil, and dirt, including mill scale from base metal.
Contaminated filler wire	Remove all grease, oil, or moisture from filler metal.
Incorrect filler wire	Check the filler wire and change if necessary

<b>8: Arc difficult to start or will not start DC welding</b>	
<i>Possible Reason</i>	<i>Suggested Remedy</i>
Incorrect machine set up	Check machine set up is correct
No gas, incorrect gas flow	Check the gas is connected and cylinder valve open, check hoses, gas valve and torch are not restricted. Set the gas flow between 10 - 15 l/min flow rate
Tungsten is contaminated	Remove 10mm of contaminated tungsten and re grind the tungsten
Incorrect tungsten size and or tungsten being used	Check and change the size and or the tungsten if required
Loose connection	Check all connectors and tighten
Earth clamp not connected to work	Connect the earth clamp directly to the work piece wherever possible

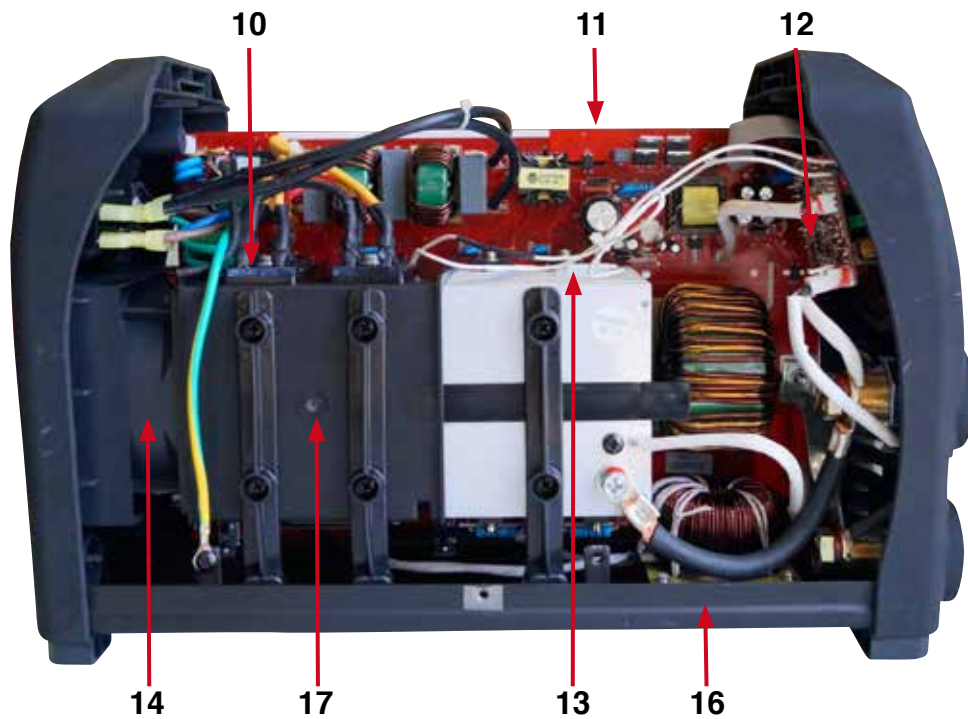
## **ATTENTION! - CHECK FOR GAS LEAKAGE**

At initial set up and at regular intervals we recommend to check for gas leakage.

Recommended procedure is as follows:

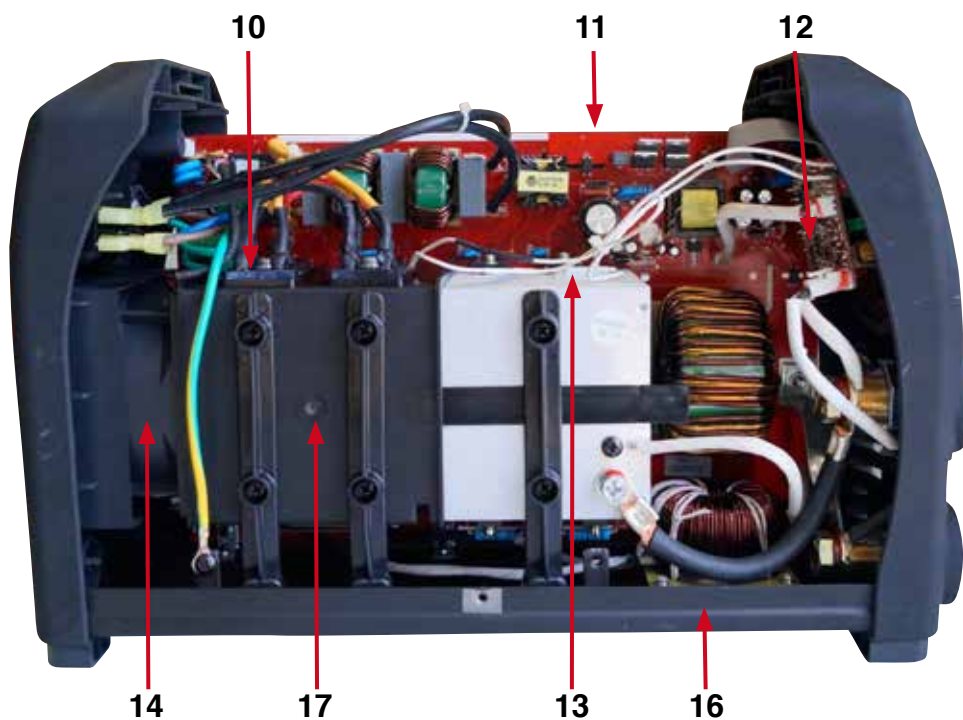
1. Connect the regulator and gas hose assembly and Tighten all connectors and clamps.
2. Slowly open the cylinder valve.
3. Set the flow rate on the regulator to approximately 8-10 l/min.
4. Close the cylinder valve and pay attention to the needle indicator of the contents pressure gauge on the regulator, if the needle drops away towards zero there is a gas leak.  
Sometimes a gas leak can be slow and to identify it will require leaving the gas pressure in the regulator and line for an extended time period. In this situation it is recommended to open the cylinder valve, set the flow rate to 8-10 l/min, close the cylinder valve and check after a minimum of 15 minutes.
5. If there is a gas loss then check all connectors and clamps for leakage by brushing or spraying with soapy water, bubbles will appear at the leakage point.
6. Tighten clamps or fittings to eliminate gas leakage.

# SPARE PARTS IDENTIFICATION - ARC160PFC



Part Number	Description	Part Number	Description
1.	10045765 front plastic panel	10.	10006650 Single-phase rectifier bridge
2.	10043476 carry strap / handle	11.	10043327 main PCB
3.	10004966 TIG/MMA selector switch	12.	10052250 control PCB
4.	10004636 panel socket 35-50	13.	10037766 thermal switch
5.	10052313 front panel adhesive sticker	14.	10052310 cover
6.	30000103 Amperage knob	15.	10044009 fan-24V DC
7.	10052306 cable support assembly	16.	10042320 base plate
8.	10052508 rear plastic panel	17.	10043959 Insulation Sheet
9.	10004949 ON/OFF switch		

# SPARE PARTS IDENTIFICATION - ARC200PFC



Part Number	Description	Part Number	Description
1. 10045765	front plastic panel	10. 10037345	Single-phase rectifier bridge
2. 10043476	carry strap / handle	11. 10046842	main PCB
3. 10004966	TIG/MMA selector switch	12. 10046844	control PCB
4. 10004636	panel socket 35-50	13. 10037766	thermal switch
5. 10048359	front panel adhesive sticker	14. 10048366	cover
6. 30000103	Amperage knob	15. 10047583	fan-24V DC
7. 10042876	cable support assembly	16. 10042320	base plate
8. 10045764	rear plastic panel	17. 10043959	Insulation Sheet
9. 10004949	ON/OFF switch		

Welding Guns Of Australia Pty Ltd ('Us', 'We') warrants that the following products under UNI-MIG, UNI-TIG, UNI-PLAS, UNI-FLAME, TECNA, T&R, HIT-8SS & ROTA, supplied by Us and purchased by you from an Authorised UNI-MIG, UNI-TIG, UNI-PLAS, UNI-FLAME, TECNA, T&R, HIT-8SS & ROTA Dealer throughout Australia are free of Material and Faulty Workmanship defects except for those products listed under 'Warranty Exclusions'.

These terms and conditions supersede and exclude all former and other representations and arrangements relating to any warranties on these products.

## WARRANTY PERIOD

We offer the following 'Warranty Periods' from 'date of purchase':

An Extended Warranty Period of 6 months total shall apply only to Machinery where offered and warranty is registered online.

### UNI-MIG WELDING MACHINES

UNI-MIG DIY Series (Power Source Only)	2 Years	(Clause 3)
RAZORWELD Series (Power Source Only)	3 Years	(Clause 1&3)
UNI-MIG Procraft Series (Power Source Only)	3 Years	(Clause 1&3)
UNI-MIG Trade Series (Power Source Only)	3 Years	(Clause 1&3)
UNI-MIG Trade Series SWF (Power Source / Seperate Wire Feeder Only)	3 Years	(Clause 1&3)
UNI-MIG Workshop Series (Power Source Only)	3 Years	(Clause 1&3)
UNI-MIG Workshop Series SWF (Power Source / Separate Wire Feeder Only)	3 Years	(Clause 1&3)
UNI-MIG Jasic Inverter MIG (Power Source Only)	3 Years	(Clause 3)
UNI-MIG Jasic Inverter MIG SWF (Power Source / Separate Wire Feeder Only)	3 Years	(Clause 3)
UNI-TIG Jasic Inverter TIG (Power Source Only)	3 Years	(Clause 3)
UNI-MIG Water Cooler	1 Year	(Clause 3)
T&R Pulse MIG (Power Source Only)	2 Year	(Clause 3)
T&R Pulse MIG SWF (Power Source / Separate Wire Feeder Only)	2 Year	(Clause 3)
UNI-PLAS (Power Source Only)	3 Years	(Clause 3)
UNI-PLAS Jasic Series (Power Source Only)	2 Years	(Clause 3)
UNI-PLAS Site Cut Series (Power Source Only)	1 Year	(Clause 3)
UNI-FLAME Gas Cutting and Welding Kits	3 Months	(Clause 2&3)
UNI-FLAME Straight Line & Gas Cutting Machines (Power Source Only)	1 Year	(Clause 3)
UNI-FLAME Regulators Argon/ Acetylene / Oxygen / LPG / Bobbin Flowmeter	1 Year	
UNI-FLAME Automatic Welding Helmet	2 Years	
UNI-MIG Automatic Welding Helmets	2 Years	
TECNA (Power Source Only)	1 Year	(Clause 3)
HIT-8SS Automatic Carriage (Power Source Only)	1 Year	(Clause 3)
ROTA 102 Rotating table	1 Year	
HOTBOX ElectrodeOven	1 Year	
SPOTCAR 3500	1 Year	(Clause 3)
TORCHES -GMAW, GTAW, MMAW, PLASMA, EARTH LEADS, INTERCONNECTING CABLES, GAS HOSE	3 Months	(Clause 3)

**(Clause 1)** 3 year warranty on transformers, inductor and rectifier. 1 year warranty on PCB, and all other components, .

**(Clause 2)** Gas Hose, Flashbacks are subject to and covered by the Manufacture's Individual Warranty, Contact the manufacturer for details

**(Clause 3)** This only Covers Manufactures defaults on all accesories for the first three months after date of purchase.

## WARRANTY / RETURNS / EXCHANGES

We understand that sometimes you may need to return a product you have purchased from Welding Guns Of Australia PTY LTD Authorised Dealer Network, to assist you, we have set out below the Welding Guns Of Australia PTY LTD Returns Policy that you should know.

Our Returns Policy includes the rights you have under the Australian Consumer Law and other relevant laws. Your Rights under the Australian Consumer Law - 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.

- You shall inspect the Goods on delivery and shall within seven (7) days of delivery (time being of the essence) notify Welding Guns Of Australia PTY LTD of any alleged defect, shortage in quantity, damage or failure to comply with the description or quote.
- You shall also afford Welding Guns Of Australia PTY LTD the opportunity to inspect the Goods within a reasonable time following delivery if you believe the Goods are defective in any way.
- If you shall fail to comply with these provisions the Goods shall be presumed to be free from any defect or damage. For defective Goods, which Welding Guns Of Australia PTY LTD has agreed in writing that you are entitled to reject, Welding Guns Of Australia PTY LTD liability is limited to either (at the Welding Guns Of Australia PTY LTD discretion) replacing the Goods or repairing the Goods except where you have acquired Goods as a consumer within the meaning of the Trade Practices Act 1974 or the Fair Trading Acts of the relevant state or territories of Australia, and is therefore also entitled to, at the consumer's discretion either a refund of the purchase price of the Goods, or repair of the Goods, or replacement of the Goods.

Returns will only be accepted provided that:

- (a) You have complied with the provisions outlined above, and
- (b) where the Goods are unable to be repaired, the Goods are returned at your cost within thirty (30) days of the delivery date, and
- (c) Welding Guns Of Australia PTY LTD will not be liable for Goods which have not been stored or used in a proper manner, and
- (d) the Goods are returned in the condition in which they were delivered and with all packaging material, brochures and instruction material in as new condition as is reasonably possible in the circumstances.

- Welding Guns Of Australia PTY LTD Accepts no responsibility for products lost, damaged or mislaid whilst in transit
- Welding Guns Of Australia PTY LTD may (at their sole discretion) accept the return of Goods for credit but this may incur a handling fee of up to fifteen percent (15%) of the value of the returned Goods plus any freight costs.
- Where a failure does not amount to a major failure, Welding Guns Of Australia PTY LTD is entitled to choose between providing you with a repair, replacement or other suitable remedy.
- Your rights under the Australian Consumer Law are not limited by a defined time. However, the Australian Consumer Law does recognise that the relevant time period can vary from product to product, depending on factors such as the nature of the product and the price. Welding Guns Of Australia PTY LTD adopts the same approach. As you can appreciate, the type of remedy we can offer you may also vary depending on how long it takes you to return the product to us.

## MAKING A CLAIM

If you wish to make a claim under this Warranty, you should:

- Return the product to the point of purchase either in person or on a prepaid courier; or
- Contact Us by Telephone

Sydney Head Office: 02 9870 4200 or Mail PO Box 3033 Lansvale NSW 2166.  
Queensland: 07 3333 2855  
Victoria: 03 8682 9911  
Western Australia: 08 6363 5111

When returned, the product must be accompanied with the original invoice including the purchase price and disclosing the purchase date

All costs of installation, cartage, freight, travelling expenses, hiring tools and insurance are paid by the Customer.

To the extent permitted by law, our total liability for loss or damage of every kind related to the product in any way whatsoever is limited to the amount paid to the retailer by you for the product or the value of the product.

No responsibility will be taken for products lost, damaged or mislaid whilst in transit.

## WARRANTY EXCLUSIONS

This Warranty covers Material and Faulty Workmanship defects only.

This Warranty does not cover damage caused by:

- Normal wear and tear due to usage
- Misuse or abusive use of the UNI-MIG, UNI-TIG, UNI-PLAS, UNI-FLAME, TECNA, T&R, HIT-8SS & ROTA,
- Failure to follow instructions supplied with the product.
- Failure to clean or improper cleaning of the product
- Failure to maintain the equipment such as regular services etc
- Incorrect voltage or non-authorized electrical connections
- Improper installation
- Use of non-authorized/non-standard parts
- Abnormal product performance caused by any ancillary equipment interference or other external factors
- Failure or any breakage caused by overload, dropping or abusive treatment or use by the customer
- Repair, modifications or other work carried out on the product other than by an Authorised UNI-MIG, UNI-TIG, UNI-PLAS, UNI-FLAME, TECNA, T&R, HIT-8SS & ROTA Service Dealer

Unless it is a manufacturing fault, this Warranty does not cover the following parts:

### **MIG Welding Torches and Consumables to suit, such as:**

Gas Nozzels, Gas Diffusers, Contact Tip holder, Contact tip, Swan Necks, Trigger, Handle, Liners, Wire Guide, Drive Roller, Gas Nozzle Spring, Neck Spring, Connector Block, Insulator, Gas Nipple, Cap, Euro Block, Head Assembly, Gas Block, Trigger Spring, Spring Cable Support, Neck Insulator, Shroud Spring, Gun Plug Cover, Lock Nut, Snap On Head, Spring Cap, Ball, Motor 42 Volt, Pot 10K standard, Knob, Drive Roll Seat, Washer, Bow, Ball Bearing, Wire Condue Nipple, Central Plug, Printed Circuit Board, Gun Plug House, Cable Support, Gas Connector, Handle To Suit PP36 with Knobs, All Xcel-Arc/ Magmaweld Mig Welding Wires & Electrodes, Arc Leads, Welding Cable, Electrode Holder, Eatch Clamps

### **TIG Welding Torches and Consumables to suit, such as:**

Tungsten Electrodes, Collet, Collet Body, Alumina Nozzle, Torch Head, Torch Head water Cooled, Torch Head Flexible, Back Caps, Gas Lens, Torch Handle, Cup Gasket, Torch Body Gas Valve, O-ring, All UNI-MIG TIG Welding Rods, All Xcel-Arc/ Magmaweld Electrodes, Arc Leads, Welding Cable, Electrode Holder, Eatch Clamps.

## **PLASMA Cutting Torches and Consumables to suit, such as:**

All Cutting Tips, All Diffuser/Swirl Ring, All Electrode, Retaining Caps, Nozzle Springs, All Spacers, All Shield Caps, All Air and Power Cables, All Switches, All O-rings, All Springs, All Circle Guides and Cutting Kits, Torch Bodies, Air Filter Regulator, Arc Leads, Welding Cable, Electrode Holder, Eatch Clamps

## **STRAIGHT LINE CUTTING MACHINES and Consumables to suit, such as:**

Hoses, Fittings, Track, Cutting Nozzles.

## **HIT-8SS Welding Carriage Consumables to suit, such as:**

Input Cord, Inter-connecting Cord, Triggering Cable.

This Warranty does not cover products purchased:

- From a non-authorized UNI-MIG, UNI-TIG, UNI-PLAS, UNI-FLAME, TECNA,T&R, HIT-8SS & ROTA Dealer (such as purchases from unauthorised retailers and purchases over the Internet from unauthorised local/international sellers or sites such as EBay)
- At an auction;
- From a private seller

Unless it is a manufacturing fault, this Warranty does not apply to any products sold to Hire Companies.

These conditions may only be varied with the written approval of the Directors of Welding Guns Of Australia PTY LTD

**REMEMBER TO RETAIN YOUR ORIGINAL INVOICE FOR PROOF OF PURCHASE.**

## **Notes**











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