Razorweld™

OPERATING MANUAL

KUMJRRW160
KUMJRRW200

3 YEARS Warranty
(Power Source)

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

Thank you for your purchase of your RAZORWELD 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.

RAZORWELD welders are manufactured and compliant with - CAN/CSA E60974-1 & ANSI/IEC 60974-1, guaranteeing you electrical safety and performance.

Razorweld™

California Proposition 65

WARNING: This product contains or produces a chemical known to the State of California to cause cancer and birth defects (or other reproductive harm) (California Health and Safety Code Section 25249.5 et seq.)

WARNING: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer (California Health and Safety Code Section 25249.5 et seq.).

INFORMATION SOURCES
- California Health and Safety Code, Section 25249.4 through 25249.13.
- The California Office of Environmental Health Hazard Assessment, 301 Capitol Mall, Sacramento, CA 95814; telephone 916-445-6900.
- California Proposition 65 website: www.oehha.ca.gov/prop65.html.
- American National Standards Institute (ANSI). Product Safety Signs And Labels (ANSI Z535.4), available from ANSI, 25 West 43rd Street, New York, NY 10036; telephone: 212-642-4900; web site: www.ansi.org.

WARRANTY

- 3 Years from date of purchase.
- JASIC Technologies America Inc 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 JASIC Technologies America Inc has inspected product returned for warranty and agree 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.razorweld.com or at the back of this manual.

CONTENTS

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 American standards and regulations. ANSI Z49.1.
- 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.

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.

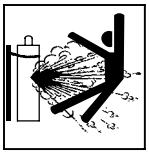
- Do not breathe the smoke and gas generated whilst welding or cutting, keep your head out of the fumes
- Keep the working area well ventilated, use fume extraction or ventilation to remove welding fumes and gases.
- In confined or heavy fume environments always wear an approved air-supplied respirator. 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 welding sparks may cause fire, therefore remove any flammable materials away from the working area, at least 39ft from the welding arc. 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 use 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 ear 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 -14°F to +104°F.

1.3 Keep this equipment 1ft 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 1ft. 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:- 9KVA

- Our equipment as described in this manual conforms to all applicable rules and regulations of the ‘LowVoltage Directive’ (European Council Directive 73/23/EEC) as set out and amended by Council Directive 93/68/EEC) and to the National legislation for the enforcement of this Directive.

- Our equipment as described in this manual conforms to all applicable rules and regulations of the European Council Directive 89/336/EEC, (EMC Directive) and to the National legislation for he enforcement of this Directive.

DIGITAL DC INVERTER WELDER

TIG/STICK - 160 Amp DC Inverter Welder

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

KUMJRRW160

Features

- Latest IGBT Inverter Technology
- Digital Weld Program Sequence Control
- DC TIG (DC tungsten inert gas welding)
  - HF Arc Ignition (prevents tungsten inclusion & tungsten damage)
  - Adjustable Pulse Frequency 0.5 - 200Hz
  - Peak Current, Base Current and Pulse Width Adjustment
  - 2/4T Trigger + Spot Time Adjustment
  - Start & Final Current Adjustment
  - Pre and Post Gas Flow Adjustment
  - Up and Down Slope Adjustment
  - Remote Torch Amp Control
- STICK (stick electrode)
  - Arc Ignition
  - Arc Force
- Digital Display
- Thermal Overload Protection
- Generator compatible (recommend 7.0KVA minimum)

Technical Data

Power Supply / Phases (V-Ph)	115V/230V - 1 ±15%
Rated Input Power (KVA)	7
ieff (Amps)	14.2A 115V - 13.2A 230V
Imax (Amps)	23A 115V - 23A 230V
Rated Output	140A/25.6V MMA - 160A/16.4V TIG
Welding Current Range	10 ~ 160A
No-Load Voltage (V)	65
Duty Cycle @ 104ºF	35%@140Amps TIG-230V 35%@100Amps TIG-115V
Duty Cycle @ 104ºF	35%@140Amps MMA-230V 35%@80Amps MMA-115V
Protection Class	IP21S
Size (inches)	14.4” x 5.3” x 10.9”
Weight (pounds)	13.0
Warranty	3 years on power source

Overview

The RAZOR160 is an inverter-based Digital Controlled DC Tig welding machine with HF arc ignition and pulse capability. Produced using the latest in IGBT technology this machine offers simple easy step by step digital setting of functions and parameters providing you with professional and complete control. The HF arc ignition provides pre gas and instant arc ignition with the press of the torch switch leaving no tungsten inclusion and no contamination of the tungsten electrode. Digital set of Pre Gas Time, Start Current Level, Up Slope Time, Down Slope Time, Finish Current Level and Post Gas Time combined with the choice of 2 or 4T trigger function allows you to control the start and finish of the weld process at the highest professional level. The Digital Control Pulse Frequency allows full parameter setting of Peak Current, Base Current, Pulse Frequency and Pulse Width, allowing to manipulate the heat input to the work, control penetration and minimise distortion. Combining the functions of the RAZOR160 ensures comprehensive control of the welding parameters when welding all DC weldable materials to produce high quality Tig welds. Our unique Torch Remote Control Interface provides remote amperage control from the torch in both static and live welding modes. The DC MMA welding function delivers a smooth and stable arc allowing easy welding with electrodes obtaining high quality welds including cast Iron, stainless and low hydrogen. The added bonus of Arc Ignition and Arc Force control allows you to set the ideal arc condition no matter what electrode you choose.
The RAZOR160 is a professional machine that is suitable for multiple applications; stainless steel fabrication, dairy & food industry, site welding, repair and maintenance applications.
Built to our specification and manufactured in compliance to CAN/CSA E60974-1 & ANSI/IEC 60974-1

Product Code: **KUMJRRW160**

Standard Package includes: RAZOR TIG160, SR17 13ft Pro-Grip Lite TIG torch, 13ft Arc Lead Set, Argon regulator, Carry Bag, Power Adaptor.

DIGITAL DC INVERTER WELDER

TIG/STICK - 200 Amp DC Inverter Welder

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

KUMJRRW200

Features

- Latest IGBT Inverter Technology
- Digital Weld Program Sequence Control
- DC TIG (DC tungsten inert gas welding)
  - HF Arc Ignition (prevents tungsten inclusion & tungsten damage)
  - Adjustable Pulse Frequency 0.5 - 200Hz
  - Peak Current, Base Current and Pulse Width Adjustment
  - 2/4T Trigger + Spot Time Adjustment
  - Start & Final Current Adjustment
  - Pre and Post Gas Flow Adjustment
  - Up and Down Slope Adjustment
  - Remote Torch Amp Control
- MMA (stick electrode)
  - Arc Ignition
  - Arc Force
- Digital Display
- Thermal Overload Protection
- Generator compatible (recommend 9.0KVA 230V)

Technical Data

Power Supply / Phases (V-Ph)	240V - 1 ±15%
Rated Input Power (KVA)	9KVA -230V / 5KVA -115V
ieff (Amps)	14.6
Rated Input Current (A)	20.0
Rated Output	10-160A/26.4V MMA 05-200A/18.0V TIG
No-Load Voltage (V)	43
Duty Cycle @ 104ºC TIG	35%@200 Amps 230V 35%@140 Amps 115V
Duty Cycle @ 104ºC MMA	35%@180 Amps 230V 35%@120 Amps 115V
Efficiency (%)	85
Power Factor	0.70
Protection Class	IP21S
Insulation Class	F
Size (mm)	14.4 x 5.3 x 10.9”
Weight (pounds)	13.5
Warranty	3 years on power source

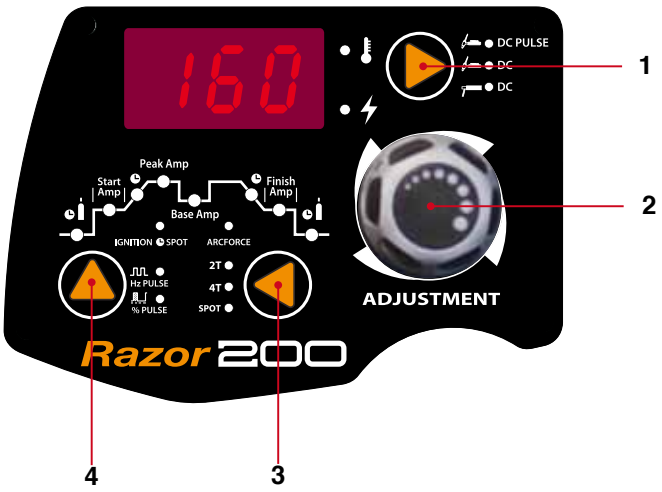
Overview

The RAZOR200 is an inverter-based Digital Controlled DC Tig welding machine with HF arc ignition and pulse capability. Produced using the latest in IGBT technology this machine offers simple easy step by step digital setting of functions and parameters providing you with professional and complete control. The HF arc ignition provides pre gas and instant arc ignition with the press of the torch switch leaving no tungsten inclusion and no contamination of the tungsten electrode. Digital set of Pre Gas Time, Start Current Level, Up Slope Time, Down Slope Time, Finish Current Level and Post Gas Time combined with the choice of 2 or 4T trigger function allows you to control the start and finish of the weld process at the highest professional level. The Digital Control Pulse Frequency allows full parameter setting of Peak Current, Base Current, Pulse Frequency and Pulse Width, allowing to manipulate the heat input to the work, control penetration and minimise distortion. Combining the functions of the RAZOR200 ensures comprehensive control of the welding parameters when welding all DC weldable materials to produce high quality Tig welds. Our unique Torch Remote Control Interface provides remote amperage control from the torch in both static and live welding modes. The DC MMA welding function delivers a smooth and stable arc allowing easy welding with electrodes obtaining high quality welds including cast Iron, stainless and low hydrogen. The added bonus of Arc Ignition and Arc Force control allows you to set the ideal arc condition no matter what electrode you choose.
The RAZOR200 is a professional machine that is suitable for multiple applications; stainless steel fabrication, dairy & food industry, site welding, repair and maintenance applications.
Built to our specification and manufactured in compliance to CAN/CSA E60974-1 & ANSI/IEC 60974-1

Product Code: **KUMJRRW200**

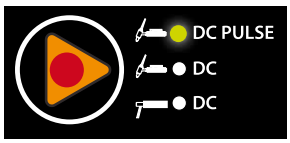
Standard Package includes: RAZOR200 Machine, SR26 x 13Ft Tig Torch, 13Ft Arc Lead set, Argon Regulator

Front Panel Functions

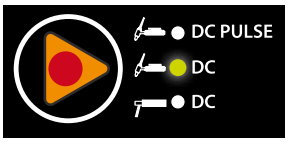


Indicates Action Selector Pad

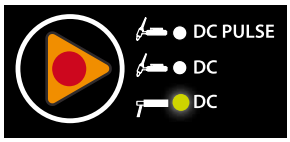
1. Mode Selector - Enables selection of required welding mode - STICK - DC TIG - DC PULSE TIG.



DC Pulse Tig: Select by pushing selector pad to cycle through to illuminate the DC Pulse icon.



DC Tig: Select by pushing the selector button to cycle through to illuminate the DC icon.



Stick: Select by pushing the selector button to cycle through to illuminate the DC icon.

2. Encoder Knob - provides digital adjustment of welding parameters.

The **Encoder Knob** is used to set the value of the parameters required. Turning the encoder will adjust the value shown in the digital display screen.

3. Torch Switch Mode Selector - Controls the on/off cycle of the machine using the torch switch while incorporating the weld program parameters selections.

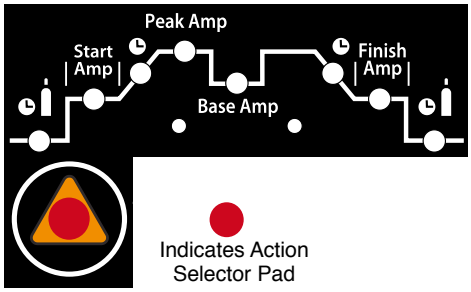
2T: Select the 2T icon using the selector pad. **2T** uses 2 actions of the torch switch while incorporating weld program parameter selections.
(refer to page 11 for instruction of 2T function)

4T: Select the 4T icon using the selector pad. **4T** uses 4 actions of the torch switch while incorporating weld program parameter selections. 4T provides operator control of the Start and Finish periods of the weld sequence

(refer to page 12 for instruction of 4T function)

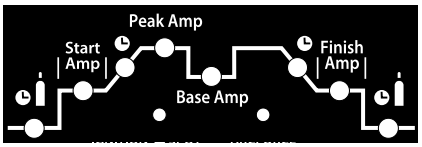
SPOT: Select the SPOT icon using the selector pad.
Spot uses a single action of the torch switch 1) Pressing the torch switch gives arc ignition and initializes the welding sequence for a period of time set using the spot timer.
(refer to page 12 for instruction of SPOT function)

4. Weld Program - Provides selection weld program parameters



Parameter selection: Select by pushing selector pad to cycle through to illuminate the icon of the parameter required. Each push of the selector pad will move the icon illumination in a clockwise cycle.

Pre Gas Timer - Provides selection for gas flow time prior to the arc starting.

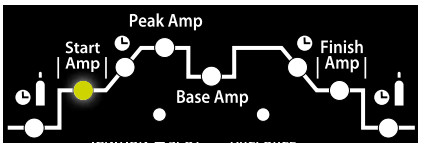


Pre Gas Time: Select by pushing selector pad to cycle through to illuminate the Pre Gas Timer icon.

Turn the Encoder to set the Pre-Gas Time (Range is 0-10 Sec)

The value selected shows on the digital display. It is the length of time the gas will flow before the arc starts.

Start Amp - Provides selection for the amount of amps required at the start of the weld.

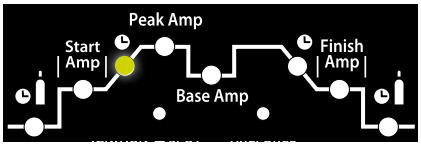


Pre Gas Time: Select by pushing selector pad to cycle through to illuminate the Start Amp icon.

Turn the Encoder to set the Start Amp value (Range is 10-200A)

The value selected shows on the digital display. It is the amount of amps the machine will deliver at the start of the welding sequence.

Up Slope Time - Sets the transition time from Start Amperage to Welding Amperage

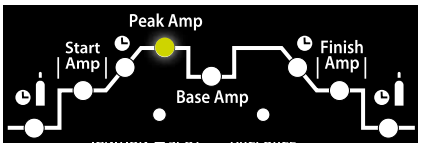


Up Slope Time: Select by pushing selector pad to cycle through to illuminate the Up Slope icon.

Turn the Encoder to set the Up Slope value (Range is 0-60 Sec)

The value selected shows on the digital display. It is the amount of time the welding current takes to climb from start amperage to welding amperage.

Peak Amp - Provides selection for the Maximum Welding Amperage required during welding.

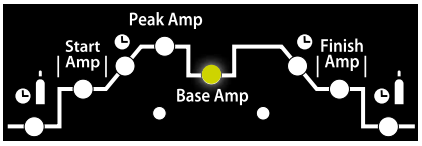


Peak Amp: Select by pushing selector pad to cycle through to illuminate the Peak Amp icon.

Turn the Encoder to set the Peak Amp value (Range is 10-200A)

The value selected shows on the digital display. It is the maximum set value of amperage the machine will deliver.

Base Amp - Provides selection for the Base Amperage during the Pulse Welding cycle.

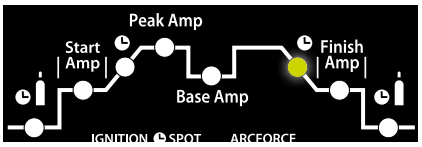


Base Amp: Select by pushing selector pad to cycle through to illuminate the Peak Amp icon.

Turn the Encoder to set the Peak Amp value (Range is 10-200A)

The value selected shows on the digital display. It is the set value of amperage the machine will deliver during the Base Amp period of the pulse cycle.

Down Slope Time - Sets the transition time from Welding Amperage to Finish Amperage

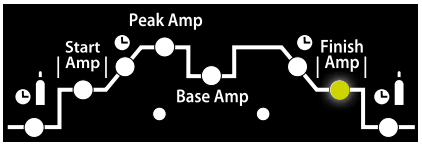


Up Slope Time: Select by pushing selector pad to cycle through to illuminate the Up Slope icon.

Turn the Encoder to set the Up Slope value (Range is 0-60 Sec)

The value selected shows on the digital display. It is the amount of time it takes for the welding amperage to drop down to the set Finish Amperage.

Finish Amp - Provides selection for the amount of amps required at the end of the weld.

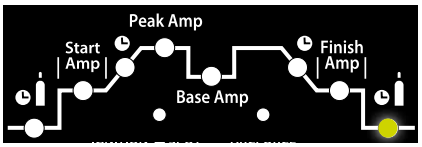


Base Amp: Select by pushing selector pad to cycle through to illuminate the Peak Amp icon.

Turn the Encoder to set the Peak Amp value (Range is 10-200A)

The value selected shows on the digital display. It is the amount of amps the machine will deliver at the finish of the welding sequence.

Post Gas Timer - Provides selection for continued gas flow time at the end of the welding after the arc is out.



Pre Gas Time: Select by pushing selector pad to cycle through to illuminate the Post Gas Timer icon.

Turn the Encoder to set the Post Gas Time (Range is 0-10 Sec)

The value selected shows on the digital display. It is the length of time the gas will flow after the arc is finished.

Pulse Mode Selection - Provides parameters for Pulse Width and Pulse Frequency in DC Pulse Tig Mode.

Pulse Width: Select by pushing selector pad to cycle through to illuminate the % Pulse icon.

Rotate the Adjustment Encoder Knob to set the Pulse Width (Range is 10 - 90%).

The value selected is shown in the digital display. The value selected is the % of on time of the Peak Amp during each pulse.

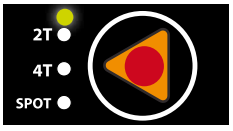
Pulse Frequency: Select by pushing selector pad to cycle through to illuminate the Hz Pulse icon.

Rotate the Adjustment Encoder Knob to set the Pulse Frequency (Range is 0.5 - 200 Hz).

The value selected is shown in the digital display. The value selected is the amount of pulses per second (Hz)

Torch Switch Mode Selection - Provides a choice of Torch Switch control sequence.

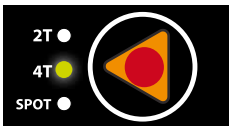
2T - Selection provides 2 times function of the torch switch.



2T: Select by pushing selector pad to cycle through to illuminate the 2T icon.

2T Selection provides 2 times function of the torch switch.
(1) Pressing the torch switch gives arc ignition and initializes the welding sequence, the welding current is maintained by the torch switch being held on.
(2) Releasing the torch switch stops the welding sequence by introducing down slope, the current falls to minimum level and then terminates the welding current and introduces the post flow gas.

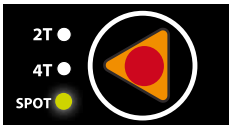
4T - Selection provides 4 times function of the torch switch.



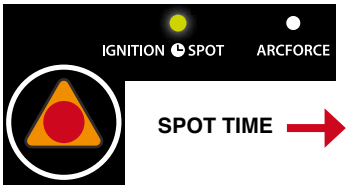
4T: Select by pushing selector pad to cycle through to illuminate the 4T icon.

(1) Pressing and holding on the torch switch activates Pre Gas then arc ignition initializing the set Start Amp level. Holding the torch switch on keeps the amperage output at the set Start Amp level.
(2) Releasing the torch switch activates Up Slope allowing the amperage to increase during the set Up Slope time to reach the set Peak Amp level. Machine output remains at Peak Amp level.
(3) Pressing and holding on the torch switch activates Down Slope allowing the amperage to decrease during the set Down Slope time to reach the set Finish Amp level. Holding the torch switch on keeps the amperage output at the set Final Amp level.
(4) Releasing the torch switch ends the welding sequence bringing in the Post Flow gas time.

SPOT Selection provides a set weld sequence time



SPOT: Select by pushing selector pad to cycle through to illuminate the SPOT icon. Provides a set weld sequence time.

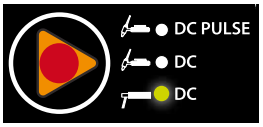


SPOT TIME: Select by pushing selector pad to cycle through to illuminate the SPOT icon. Allows to set the weld sequence time.

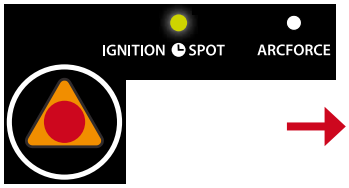
Turn the Encoder to set the SPOT TIME value (Range is 0.1-10 Sec)

The value selected shows on the digital display. It is the set amount of time the machine will deliver amperage output.

IGNITION TIME For STICK (Stick) welding only. Selection allows for high amperage start for a selected time period.



IGNITION: Select MMA by pushing selector pad to cycle through to illuminate the icon. Only for MMA (Stick Electrode) welding. Provides short time period of high amperage at the start of the welding.

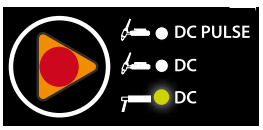


Select by pushing selector pad to cycle through to illuminate the IGNITION icon. Allows to set the time period of the arc ignition.

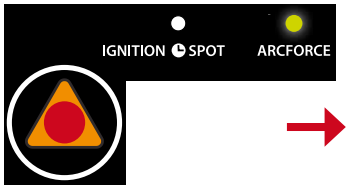
Turn the Encoder to set the IGNITION TIME value.
(Range is 0.1-1.0 Sec)

The value selected shows on the digital display. It is the set amount of time the machine will deliver higher amperage at the start of the welding. Only for MMA function

ARC FORCE For STICK (Stick) welding only. Selection allows for adjustment of the ARC FORCE



ARC FORCE: Select MMA by pushing selector pad to cycle through to illuminate the icon. Only for MMA (Stick Electrode) welding. Provides soft or digging type of arc.



Select by pushing selector pad to cycle through to illuminate the ARC FORCE icon. Allows to set the force of the arc from soft to digging type.

Turn the Encoder to set the ARC FORCE value.
(Range is 0-180)

The value selected shows on the digital display. Low setting provides soft buttery arc. High setting provides aggressive digging arc. Only for MMA function

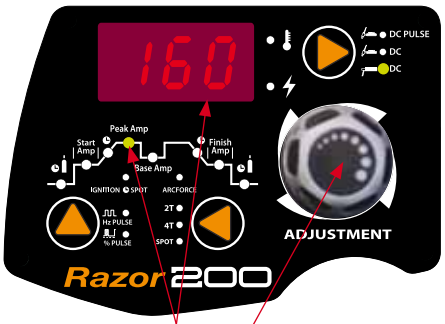
ARC FORCE - What is the Arc Force Control and what does it do?
The arc force control lets you adjust the force of the arc from a soft buttery arc to a more penetrating, digging type of arc.
Arc voltage drops as the arc gets tighter and can cause the electrode to stick/short circuit to the work piece.
When you set the arc force high the machine senses the drop in voltage. As the rod is about to stick the machine compensates by increasing the arc voltage. This boost in arc voltage/current blasts away base metal and electrode to prevent the electrode from welding itself to the work piece. Higher Arc Force is more suited to Cellulose and Low Hydrogen type electrodes where a forceful arc characteristic is preferred to maintain the arc and better control penetration. Lower Arc Force is better suited to Hardfacing and Cast Iron electrodes where a soft buttery arc is preferred to prevent the electrode material diluting too much with the base metal.

Set Up Procedure for STICK (Stick) Welding: Razor16O/2OO TIG-STICK

(1) Connecting the Welding Lead Set: 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 ⊖ output socket, Earth Connected to the ⊕ output socket

(2) Turn the power source on using the on/off switch located on the rear machine panel.

(3) Select DC STICK Function. Push the button until the **DC** icon illuminates green.



(4) Set the weld amperage by rotating the **Adjustment Encoder Knob**. Set the amperage according to the electrode type and size being used as recommended by the electrode manufacturer. The **Peak Amp** icon will be illuminated and the set amperage will show in the **Digital Display**.

(5) Select **Ignition** and **Arc Force** Push the button until the **Ignition** icon illuminates green. Rotate the **Adjustment Encoder Knob** to set the **Arc Ignition Time** the set time will be shown on the Digital Display.
Push the button until the **Arc Force** icon illuminates green. Rotate the **Adjustment Encoder Knob** to set the **Arc Force** the set value will be shown on the Digital Display

Refer to Page 12 for instruction on **Arc Ignition Time** and **Arc Force Control**

6) Connect the Earth Clamp securely to the work piece or the work bench.

7) Place and clamp an electrode into the Electrode Hand Piece

8) Strike the electrode against the work piece to create an arc, lift slightly and hold the electrode steady to maintain the arc

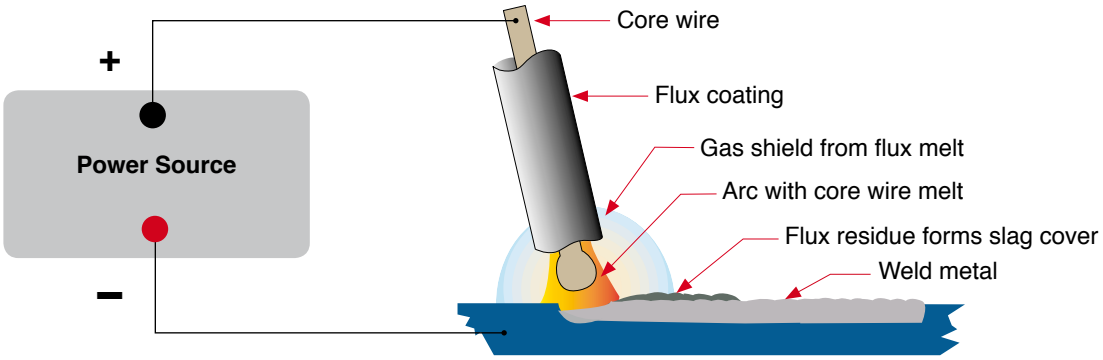
9) Hold the electrode slightly above the work maintaining the arc while travelling at an even speed.

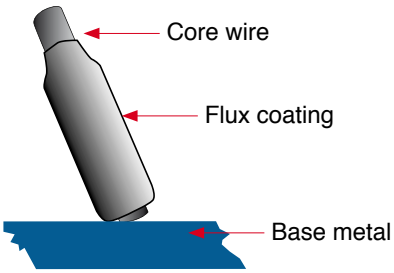
10) To finish the weld, break the arc by quickly snapping the electrode away from the work piece.

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

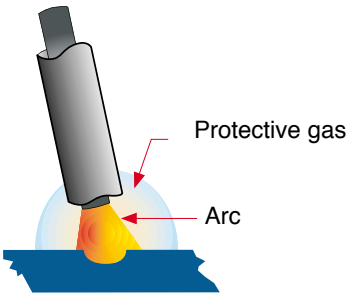
MMA (Stick) Welding

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 vapors 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.



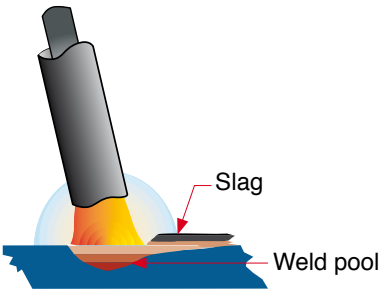


- The arc is initiated by momentarily touching the electrode to the base metal.
- The heat of the arc melts the surface of the base metal to form a molten pool at the end of the electrode.
- The melted electrode metal is transferred across the arc into the molten pool and becomes the deposited weld metal.
- 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 recommend to consult your welding supplier for the correct selection of electrode.

Electrode Size

Average Thickness of Material	Maximum Recommended Electrode Diameter
0.03 - 0.07 inches	0.09 inches
0.07 - 0.19 inches	0.12 inches
0.19 - 0.31 inches	0.15 inches
0.31 - > inches	0.19 inches

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 maybe used for various thicknesses of section based on using a general purpose type 6013 electrode.

Welding Current (Amperage)

Electrode Size ø mm	Current Range (Amps)
0.09 inches	60 - 100
0.12 inches	100 - 130
0.15 inches	130 - 165
0.19 inches	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 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, over-heating 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 contaminates. The type of joint will be determined by the chosen application.

Installation Set Up for DC TIG Welding: Razor16O/2OO TIG-STICK

(1) Turn on the machine using the **ON/OFF** switch
(2) Select the **TIG** function with the **TIG/MMA** selector switch
(3) Connect the **Tig Torch** connector to the **negative terminal** and tighten it
(4) Connect the **Earth Cable** connector into the **positive termina**l and tighten it
(5) Connect the torch switch remote lead into the torch remote socket
(6) Insert the torch gas connector into the quick lock gas receptacle
(7) Connect gas line to Gas Regulator and connect the gas regulator to the Gas Cylinder
Connect the gas line to the quick lock gas inlet connector at the rear of the machine

HF (high frequency) ignition allows the arc to be started in Tig welding without touching the tungsten to the work piece. By pressing the torch switch the machine will activate the gas flow and the HF ignition resulting in the arc igniting across the gap between the tungsten electrode and the work piece. The distance between the electrode and the work piece can be up to 13/64". This arc ignition method prevents tungsten inclusion in the work piece, promotes longer tungsten life and offers better operator control over the starting and stopping the arc.

(1) Assemble the front end torch parts use the correct size and type of tungsten electrode for the job, the tungsten electrode requires a sharpened point for DC welding.

(2) Select **DC Tig** and choose **2T** or **4T** trigger function preferred as per the descriptions below

2T Selection provides 2 times function of the torch switch.

(1) Pressing the torch switch gives arc ignition and initializes the welding current and the welding current is maintained by the torch remaining on.

(2) Releasing the torch switch stops the welding by introducing down slope and the current falls to minimum level and then terminates the welding current and introduces the post flow gas.

4T Selection provides 4 times function of the torch switch

(1) Pressing the torch switch gives arc ignition and initializes the welding current

(2) Releasing the torch switch continues the welding operation.

(3) Pressing the torch switch and holding introduces down slope and current falls to minimum current.

(4) Releasing the torch switch terminates the welding operation and introduces the post flow gas.

(3) Choose the preferred welding current (amperage) to suit the tungsten size material type and thickness to be welded.

(4) Lay the outside edge of the Gas Cup on the work piece with the Tungsten Electrode 0.040" - 1/8" from the work piece this method will provide a clean positive arc ignition.

(5) Press the torch switch and the arc will ignite across the gap between the tungsten and work piece. Hold even distance of about 5/64" gap between the tungsten and work piece to maintain the arc.

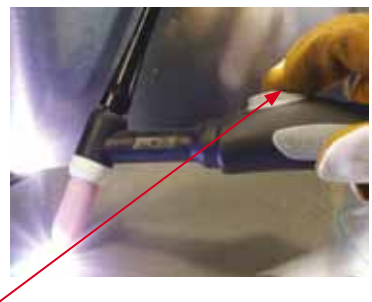
(6) Release the torch switch to bring in the end of the welding sequence dependant of 2T or 4T trigger function choice.

(1) Assemble the front end torch parts use the correct size and type of tungsten electrode for the job, the tungsten electrode requires a sharpened point for DC welding

(2) Select **DC** Tig Function. Push the button until the **DC** icon illuminates green. Select **2T** or **4T** trigger function as required by the pushing the button to cycle through the trigger options. The icon will illuminate green for the selected trigger option.

(3) Set the amps required by pushing the button, cycle through to illuminate the Peak Amp icon. Set the amperage with the encoder adjustment knob.

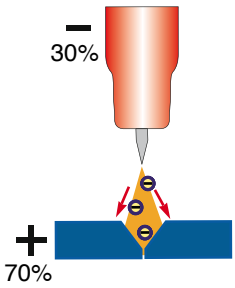
(4) Lay the outside edge of the Gas Cup on the work piece with the Tungsten Electrode 0.040" - 1/8 from the work piece



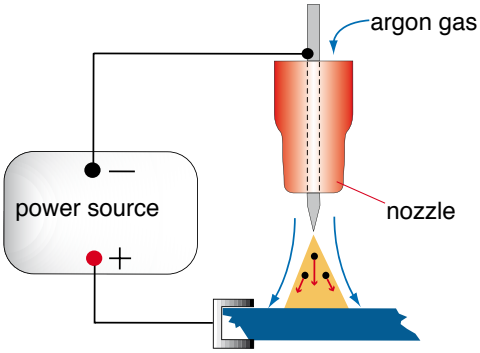
(5) Press the torch switch and the arc will ignite across the gap between the tungsten and work piece. Hold even distance of about 5/64" gap between the tungsten and work piece to maintain the arc.

(6) Release the torch switch to bring in the end of the welding sequence dependant of 2T or 4T trigger function choice

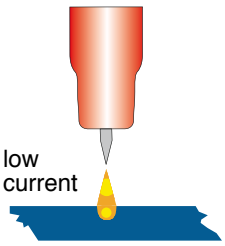
DC TIG Welding



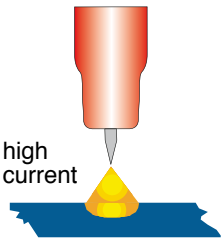
The DC power source uses what is known as DC (direct current) in which the main electrical component known as electrons flow in only one direction from the negative pole (terminal) to the positive pole (terminal). In the DC electrical circuit there is an electrical principle at work which should always 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 it's 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 34232°F. 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.

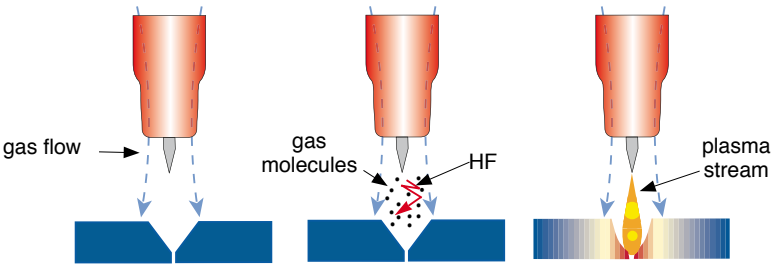


The intensity of the arc is proportional to the current that flows from the tungsten. The welder regulates the welding current to adjust the power of the arc. Typically thin material requires a less powerful arc with less heat to melt the material so less current (amps) is required, thicker material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



HF ARC IGNITION for TIG (tungsten inert gas) Welding

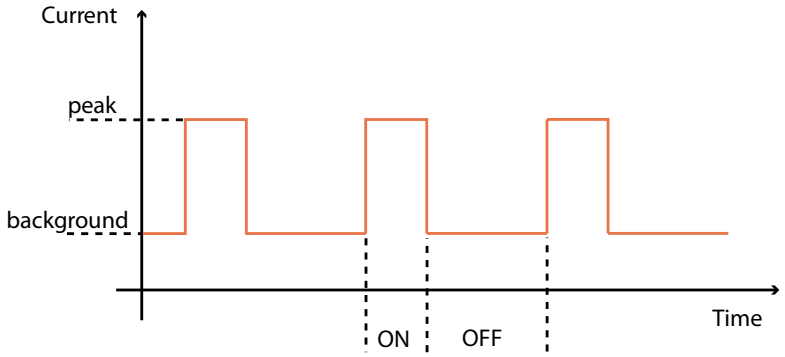
HF (high frequency) ignition allows the arc to be started in Tig welding without touching the tungsten to the work piece. By pressing the torch switch the machine will activate the gas flow and introduce the HF (high frequency) (high voltage) spark, this "ionizes" the air gap making it conductive allowing an arc to be created without touching the tungsten to the work piece. The gas molecules are superheated by the arc creating a stream of super heated gas that changes the molecular structure into producing a plasma stream. This plasma stream provides heat and energy that allows us to melt and fuse metals in an inert gas shielded environment know as TIG (tungsten inert gas) welding.



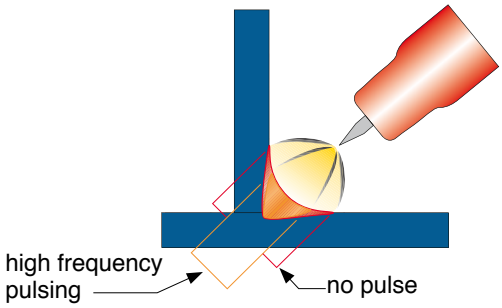
DC Pulse TIG Welding

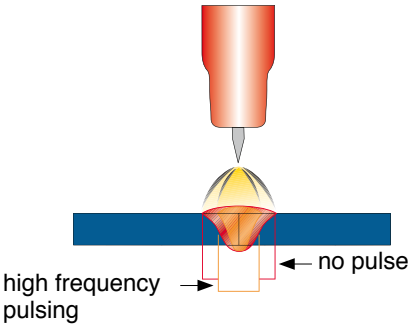
Pulse TIG welding is when the current output (amperage) changes between high and low current. Electronics within the welding machine create the pulse cycle. Welding is done during the high-amperage interval (this high amperage is referred to as peak current). During the low amperage period, the arc is maintained but the current output of the arc is reduced (this low amperage is referred to as base current). During pulse welding the weld pool cools during the low amperage period. This allows a lower overall heat input into the base metal. It allows for controlled heating and cooling periods during welding providing better control of heat input, weld penetration, operator control and weld appearance.
There are 4 variables within the pulse cycle:
Peak Current - Base Current - Pulse Frequency - Pulse Width
Setting and manipulation of these variables will determine the nature of the weld current output and is at the discretion of the operator.

Peak Current is the main welding current (amps) set to melt the material being welded and works much the same as setting maximum amperage values for regular DC TIG: as a guide use 30-40 amps for every 0.040”of material thickness.
Base Current is the set level of background current (amps) which cools the weld puddle and affects overall heat input. Background Amps is a percentage of peak amperage. As a rule, use enough background current to reduce the weld pool to about half its normal size while still keeping the weld pool fluid. As a guide start by setting the background amperage at 20 to 30 percent of peak amperage.
Pulse Frequency is the control of the amount of times per second (Hz) that the welding current switches from Peak Current to Base Current. DC Pulse TIG frequency generally ranges from 20 to 300 HZ depending on the job application. Control of the pulse frequency also determines the appearance of the weld.
Pulse Width is the control of the percentage of time during one pulsing cycle the power source spends at the peak current (main amperage). Example is with the Pulse Width set at 80 percent and a rate of 1 pulse per second (PPS), the machine will spend 80% of the pulse at peak amperage and 20% at the base current. Increasing the pulse width percentage adds more heat to the job, while decreasing pulse width percentage reduces heat



DC Pulse Tig welding allows faster welding speeds with better control of the heat input to the job, reducing the heat input minimising distortion and warping of the work and is of particular advantage in the welding of thin stainless steel and carbon steel applications. The high pulse frequency capability of the advanced inverter agitates the weld puddle and allows you to move quickly without transferring too much heat to the surrounding metal. Pulsing also constricts and focuses the arc thus increasing arc stability, penetration and travel speeds.



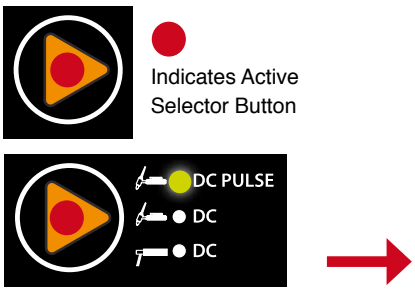


The Razorweld TIG machine has digital pulse frequency control. All the parameters for DC Pulse Tig welding - Peak Amp, Base Amp, Pulse Frequency and Pulse Width are easy to set via the digital control panel.

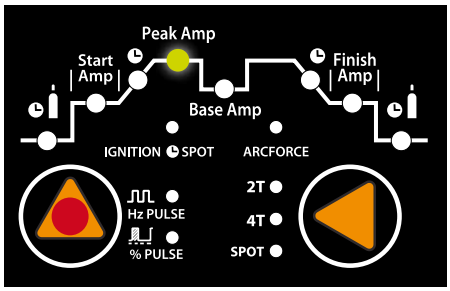
EXAMPLE OF PULSE DC TIG WELDING - SETUP PARAMETERS:

Material = Stainless Steel x 5/64 / Tungsten Electrode = 1/16 2% Thoriated / Gas = Argon

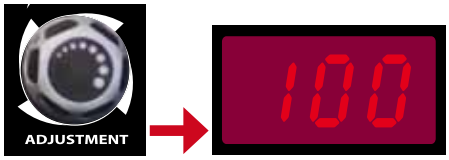
The following steps are a guide as a starting point for you to set the machine up in Pulse mode to give an example of welding in Pulse mode function. You can experiment by changing any of the variables to see what effect it has over the welding and what the end result can be, but it is suggested to change only one variable at a time and then check the welding to see what the result is, in this way you acquire a better understanding of how each variable affects the welding current.



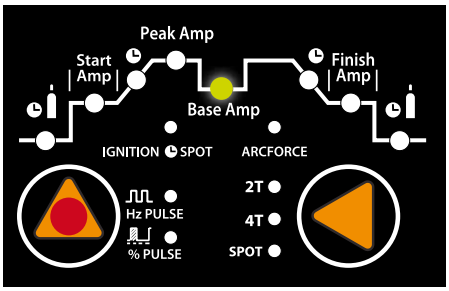
1. Select DC Pulse by pushing selector button to cycle through to illuminate DC Pulse icon.



2. Select Peak Amp by pushing the selector button to cycle through to illuminate the Peak Amp Icon

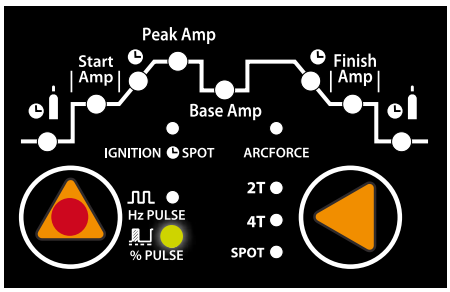


3. Rotate the Adjustment Encoder Knob to set the Peak Amp at 100A
(Range is 10-200 Amps)



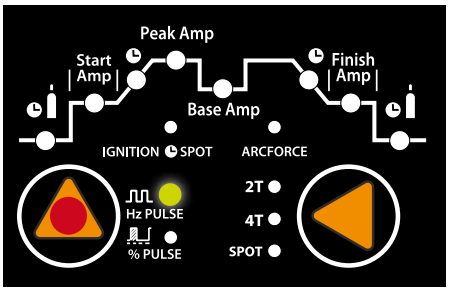
4. Select the Base Amp by pushing the selector button to cycle through to illuminate the Base Amp Icon

5. Rotate the Adjustment Encoder Knob to set the Base Amp at 30A - (Range is 10-200 Amps)



6. Select the Pulse Width (on time of the Peak Amp) by pushing the selector button to cycle through to illuminate the % Pulse Icon

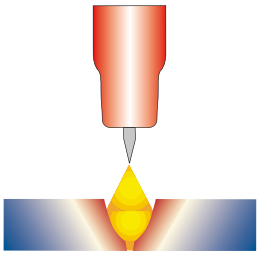
7. Rotate the Adjustment Encoder Knob to set the Pulse Width at 60% - (Range is 10 - 90%).



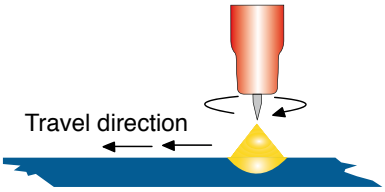
8. Select the Pulse Frequency by pushing the selector button to cycle through to illuminate the Hz Pulse Icon

9. Rotate the Adjustment Encoder Knob to set the Pulse Frequency to 2 Hz - (0.5 - 200Hz)

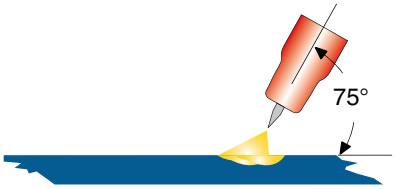
TIG Welding Fusion Technique



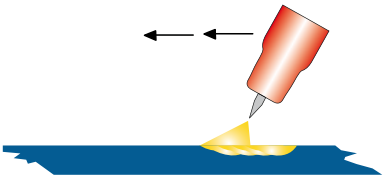
Manual TIG welding is often considered the most difficult of all the welding processes. Because the welder must maintain a short arc length, great care and skill are required to prevent contact between the electrode and the workpiece. Similar to Oxygen Acetylene torch welding, Tig welding normally requires 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 is creating a weld pool of the desired size. Once the weld pool is established tilt the torch at about a 75° angle and move smoothly and evenly along the joint while fusing the materials together.



Form a weld pool

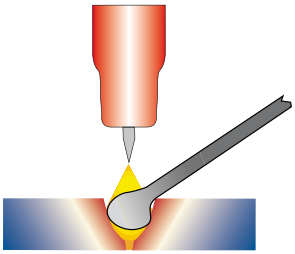


Angle torch

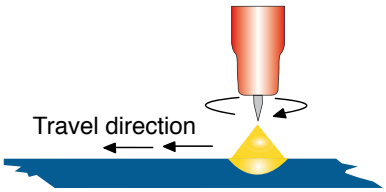


Move the torch slowly and evenly forward

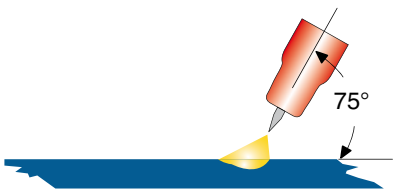
TIG Welding with Filler Wire Technique



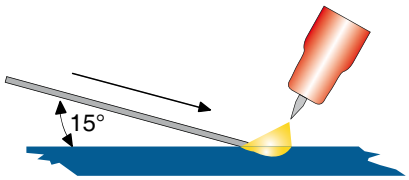
It is necessary in many situations with TIG welding to add a filler wire into the weld pool to build up weld reinforcement and create a strong weld. Once the arc is started the torch tungsten is held in place until a weld pool is created, a circular movement of the tungsten will assist is creating a weld pool of the desired size. Once the weld pool is established tilt the torch at about a 75° 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° 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.



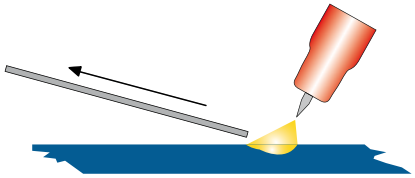
Form a weld pool



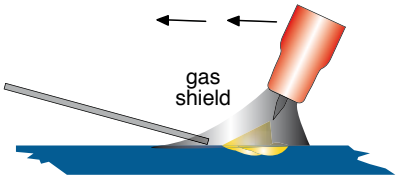
Angle torch



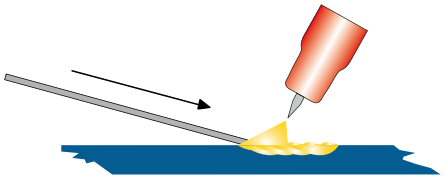
Add Tig filler wire



Retract the filler wire



Move the torch forward to the front of the weld pool

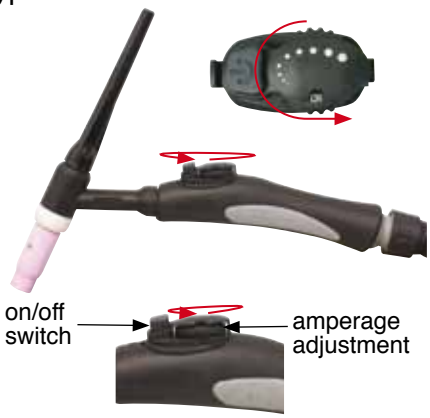


Repeat the process

Remote Amperage Control Operation Procedure Razor16O/2OO TIG-STICK

Remote amperage controls allow for the welding current to adjusted remotely from the welding machine during welding. The Razor160 and Razor200 TIG - STICK machines are compatible with the ER1MS-H Remote Hand Amp Control supplied with the RazorWeld Tig Torch supplied with the machine.

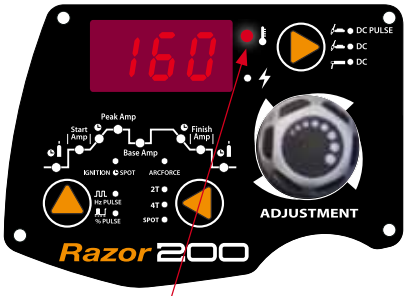
Type: ER1MS-H



Connection and operation of the remote hand control

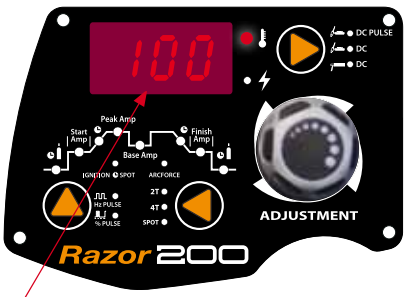
(2) Connect the remote control 7 pin plug from the Tig Torch switch lead to the 7 pin remote receptacle on the front panel of the machine.

(3) Activate the remote control. Press and hold down the torch switch for 5 seconds. The machine will give an audible beep single indicate the remote is activated. Repeat the procedure to de-activate the remote control.



(4) The thermal **LED** will illuminate **RED** to indicate the machine is in remote control mode

(2) Rotate the Remote Control Knob to adjust the amperage output of the machine. The remote can be used static or during welding to adjust the amps up or down.



(4) The amps set by the remote control will show in the Digital Display of the machine.

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, 6170 degree Fahrenheit.
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.

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 EWLa-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.

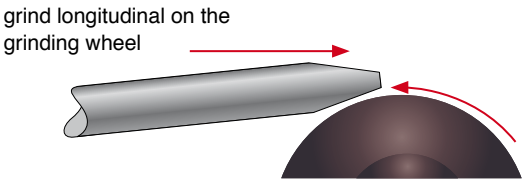
Zirconiated (Color Code: White)
Zirconiated tungsten electrodes (AWS classification EWZr-1) contain a minimum of 99.10 percent tungsten and 0.15 to 0.40 percent zirconium. Most commonly used for AC welding Zirconiated tungsten produces a very stable arc and is resistant to tungsten spitting. It is ideal 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.

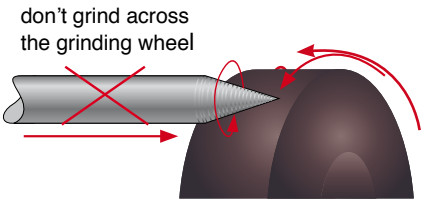
Tungsten Electrodes Rating for Welding Currents

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
3/64" (0.040")	15 - 80	15 - 80	20 - 60
1/16" (.062" & .060")	70 -150	70 - 150	60 - 120
3/32" (.93")	150- 250	140 - 235	100 - 180
1/8" (.125")	250 - 400	225 - 325	160 - 250
5/32" (.156")	400 - 500	300 - 400	200 - 320

Tungsten Preparation

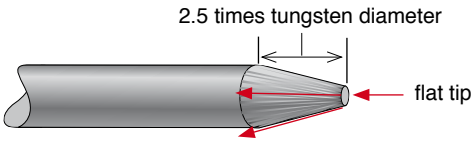
Always use **DIAMOND** wheels when grinding and cutting. While tungsten is a very hard material, the surface of a diamond wheel is harder, and this makes for smooth grinding. Grinding without diamond wheels, such as aluminium oxide wheels, can lead to jagged edges, imperfections, or poor surface finishes 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.

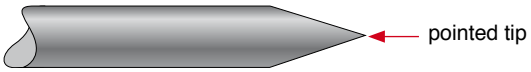




Electrode Tip/Flat

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 wonder 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.

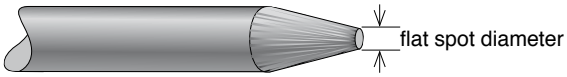


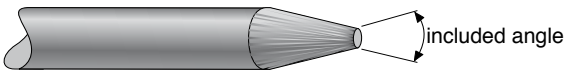


Electrode Included Angle/Taper - DC Welding

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

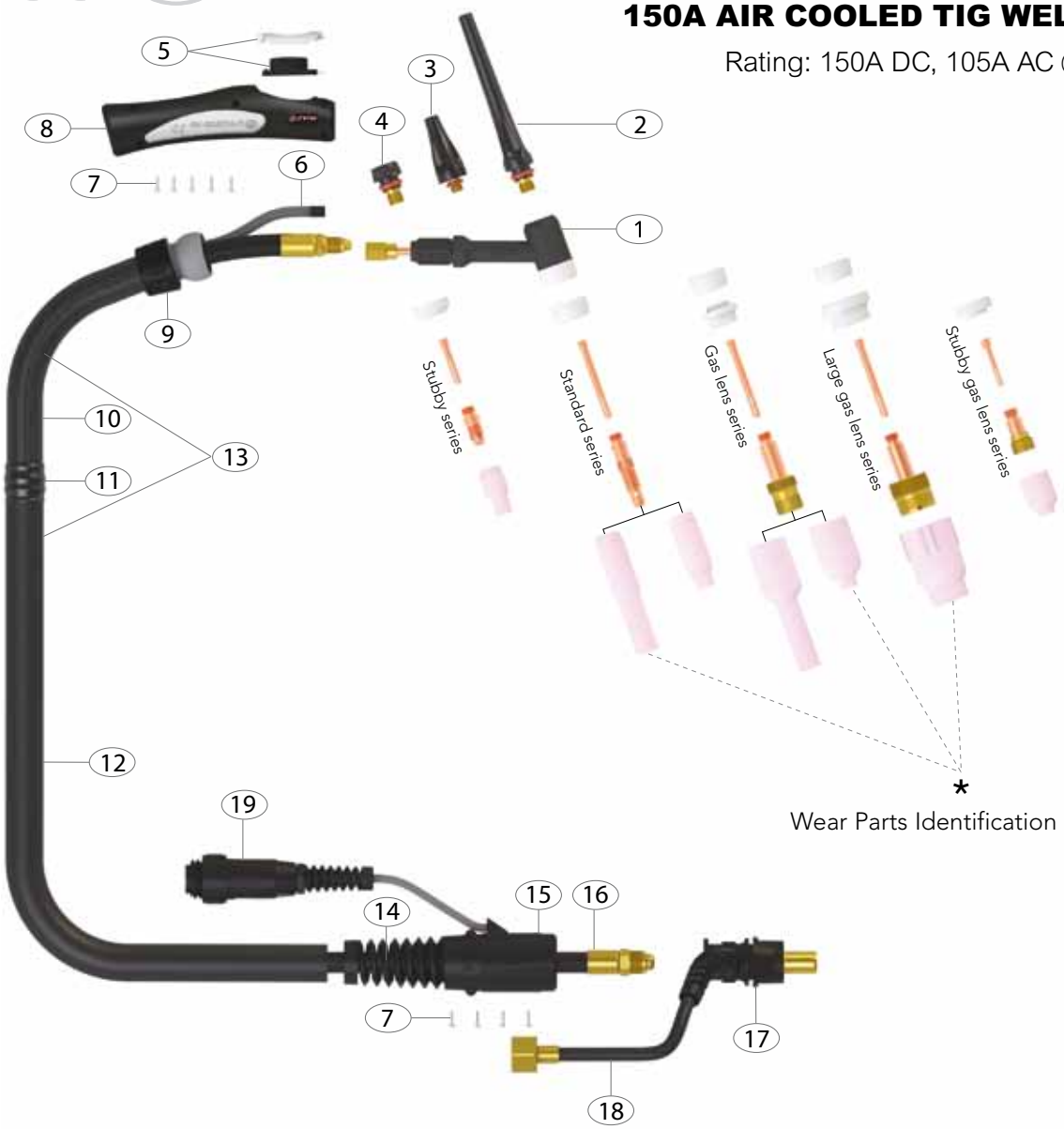
The included angle determines weld bead shape and size. Generally, as the included angle increases, penetration increases and bead width decreases.

Tungsten Diameter	Diameter at the Tip - mm	Constant Included Angle - Degrees	Current Range Amps	Current Range Pulsed Amps
3/64” (0.040”)	.250	20	05 - 30	05 - 60
1/16” (.062” & .060”)	.500	25	08 - 50	05 - 100
1/16” (.062” & .060”)	.800	30	10 - 70	10 - 140
3/32” (.93”)	.800	35	12 - 90	12 - 180
3/32” (.93”)	1.100	45	15 - 150	15 - 250
1/8” (.125”)	1.100	60	20 - 200	20 - 300
1/8” (.125”)	1.500	90	25 - 250	25 - 350

SR17 ERGO TIG TORCH

150A AIR COOLED TIG WELDING TORCH

Rating: 150A DC, 105A AC @35% ducy cycle.



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Wear Parts Identification Next Page

Torch Model

Description	Part Number 13ft
SR17 Pro-Grip Lite Tig Torch Package QF Gas Connect	SR-17-13FTCP25
	SR-17-13FTCP50

Spare Parts

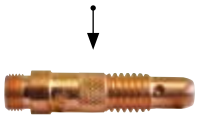
	Part Number	Description		Part Number	Description
1	WP17	Torch head	12	UERNCL-32	Neoprene Cover X 3.2mt / 10ft
	WP17F	Torch head flexible		UERNCL-72	Neoprene Cover X 7.2mt / 23ft
2	57Y02	Back cap long	13	UERCO100-40	Sheath X 12.5ft Inc Leather Cover
3	57Y03	Medium back cap		UERCO100-80	Sheath X 25ft Inc Leather Cover
4	57Y04	Short back cap	14	USLH917-S	Cable Support Small
5	UER1MS	Momentary Kit	15	USLH917-H	“Surelok “ Housing Small
6	UERSWL4	Trigger Lead 12.5ft	16	USL57Y01AR	“Power Cable X 12.5ft “Surelok “ Rubber
	UERSWL8	Trigger Lead 25ft		USL57Y03AR	Power Cable X 25ft “Surelok “ Rubber
7	UERSP1	Screw Pack	17	USL3550	“Surelok “ Body & Support
8	UERH100	Small Ergo Tig Handle	18	USL-1-GS4	Gas Supply Hose
9	UERKJ100	Small Knuckle Joint	19	10004667	7 Pin Plug
10	UERLC200-08	Leather Cover X 0.8mt / 2ft			
11	UERJK100	Jointing Repair Kit			

SR17 ERGO TIG TORCH

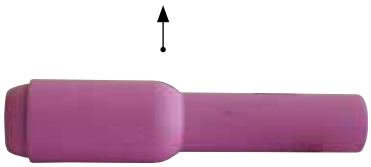
Standard Front End Parts

Part #	Description
18CG	Cup Gasket

Part #	Description
10N30	Collet Body 1.0mm / 0.040”
10N31	Collet Body 1.6mm / (1/16)
10N32	Collet Body 2.4mm / (3/32)
10N28	Collet Body 3.2mm / (1/8)



Part #	Description
10N49L	Long Alumina Nozzle Ø 8mm / (5/16) #5L
53N48L	Long Alumina Nozzle Ø 10mm / (25/64) #6L
53N47L	Long Alumina Nozzle Ø 11mm / (7/16) #7L



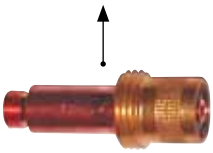
Part #	Description
10N22	Collet 1.0mm / 0.040”
10N23	Collet 1.6mm / ((1/6)
10N24	Collet 2.4mm / (3/32)
10N25	Collet 3.2mm / (1/8)

Part #	Description	
10N50	Alumina Nozzle Ø 6mm / (15/64)	#4
10N49	Alumina Nozzle Ø 8mm / (5/16)	#5
10N48	Alumina Nozzle Ø 10mm / (25/64)	#6
10N47	Alumina Nozzle Ø 11mm / (7/16)	#7
10N46	Alumina Nozzle Ø 13mm / (33/64)	#8
10N45	Alumina Nozzle Ø 16mm / (5/8)	#10
10N44	Alumina Nozzle Ø 19mm / (3/4)	#12

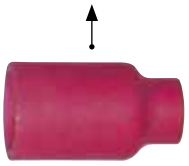
Compact Gas Lens Front End Parts

Part #	Description
54N01	Gas Lens Gasket

Part #	Description
45V25	Gas Lens Body 1.6mm / (1/16)
45V26	Gas Lens Body 2.4mm / (3/32)
45V27	Gas Lens Body 3.2mm /(1/8)



Part #	Description
54N14	Gas lens ceramic 8.0mm / (5/16)
54N15	Gas lens ceramic 7.0mm / (9/32)
54N17	Gas lens ceramic 5.0mm / (13/64)



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 / 0.040” x 6 57/64” thoriated tungsten electrode 2%
TR0004-16	1.6mm x 175mm / (1/16) x 6 57/64” thoriated tungsten electrode 2%
TR0004-24	2.4mm x 175mm / (3/32) x 6 57/64” thoriated tungsten electrode 2%
TR0004-32	3.2mm x 175mm / (1/8) x 6 57/64” thoriated tungsten electrode 2%

TR0006-16

WHITE
ANSI/AWS A5.12 M-98
ISO 6848 WZ8

.8% Zirconiated: Balls well, handles higher current with less spitting, better arc starts and arc stability than pure tungsten
Commonly used for aluminium 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
TR0006-10	1.0mm x 175mm / 0.040” x 6 57/64” zirconiated tungsten electrode 1%
TR0006-16	1.6mm x 175mm / (1/16) x 6 57/64” zirconiated tungsten electrode 1%
TR0006-24	2.4mm x 175mm / (3/32) x 6 57/64” zirconiated tungsten electrode 1%
TR0006-32	3.2mm x 175mm / (1/8) x 6 57/64” zirconiated tungsten electrode 1%

TIG WELDING TROUBLE SHOOTING

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

1: Tungsten burning away quickly	
Possible Reason	*Suggested Remedy*
Incorrect Gas	Check that pure Argon is being used
No gas	Check the gas cylinder contains gas and is connected
Inadequate gas flow	Check the gas is connected, check hoses, gas valve and torch are not restricted. Set the gas flow between 20 - 35 CFH 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.
Tungsten melting back into the nozzle on AC welding	Check that correct type of tungsten is being used. Check the balance control is not set too high on the balance - reduce to a lower setting
2: Contaminated tungsten	
Possible Reason	*Suggested Remedy*
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 5/64" - 13/64"
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
3: Porosity - poor weld appearance and colour	
Possible Reason	*Suggested Remedy*
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 20 - 35 CFH 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
4: Yellowish residue / smoke on the alumina nozzle & discoloured tungsten	
Possible Reason	*Suggested Remedy*
Incorrect Gas	Use pure Argon gas
Inadequate gas flow	Set the gas flow between 20 - 35 CFH flow rate
Inadequate post flow gas	Increase the post flow gas time
Alumina gas nozzle too small for size of tungsten being used	Increase the size of the alumina gas nozzle
5: Unstable Arc during DC welding	
Possible Reason	*Suggested Remedy*
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 5/64" - 13/64"
6: HF present but no welding power	
Possible Reason	*Suggested Remedy*
Incomplete welding circuit	Check earth lead is connected. Check all cable connections. If using a water cooled torch check that the power cable is not separated.
No gas	Check the gas is connected and cylinder valve open, check hoses, gas valve and torch are not restricted. Set the gas flow between 20 - 35 CFH flow rate
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

continued- TIG WELDING TROUBLE SHOOTING

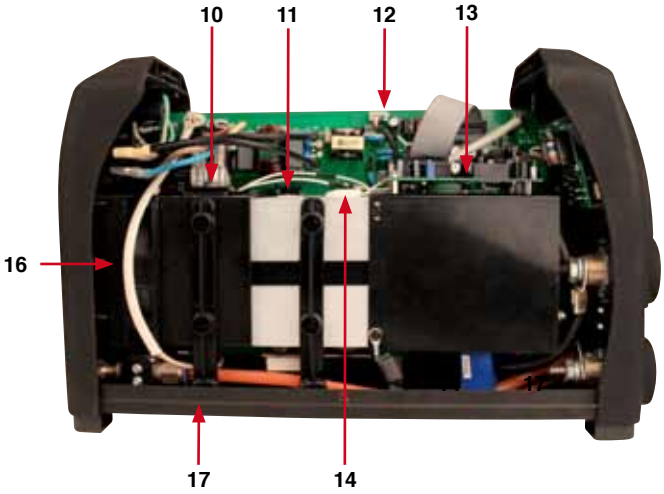
7: Arc wanders during DC welding	
Possible Reason	*Suggested Remedy*
Poor gas flow	Check and set the gas flow between 20 - 35 CFH flow rate
Incorrect arc length	Lower torch so that the tungsten is off of the work piece 5/64” - 13/64”
Tungsten incorrect or in poor condition	Check that correct type of tungsten is being used. Remove 25/64” 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
8: Arc difficult to start or will not start DC welding	
Possible Reason	*Suggested Remedy*
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 20 - 35 CFH flow rate
Tungsten is contaminated	Remove 25/64” 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
Loss of high frequency	Check torch and cables for cracked insulation or bad connections. Check spark gaps and adjust if necessary

STICK (Stick) WELDING TROUBLE SHOOTING

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

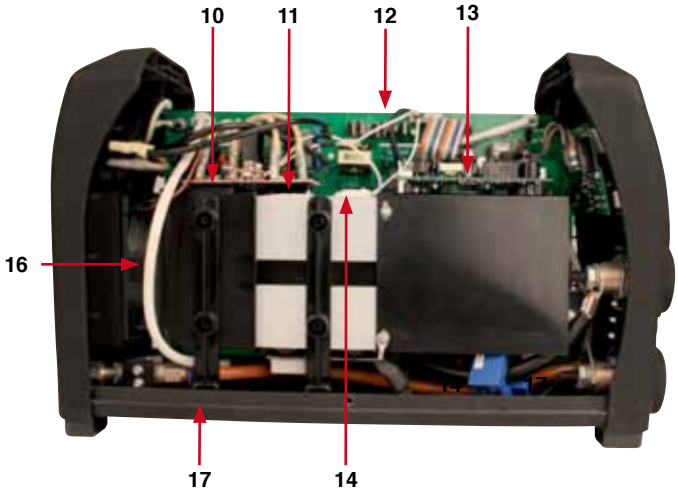
1: No arc	
Possible Reason	*Suggested Remedy*
Incomplete welding circuit	Check earth lead is connected. Check all cable connections.
Wrong mode selected	Check the MMA selector switch is selected
No power supply	Check that the machine is switched on and has a power supply
2: Porosity – small cavities or holes resulting from gas pockets in weld metal.	
Possible Reason	*Suggested Remedy*
Arc length too long	Shorten the arc length
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
3: Excessive Spatter	
Possible Reason	*Suggested Remedy*
Amperage too high	Decrease the amperage or choose a larger electrode
Arc length too long	Shorten the arc length
3: Weld sits on top, lack of fusion	
Possible Reason	*Suggested Remedy*
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
4: Lack of penetration	
Possible Reason	*Suggested Remedy*
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
5: Excessive penetration - burn through	
Possible Reason	*Suggested Remedy*
Excessive heat input	Reduce the amperage or use a smaller electrode
Incorrect travel speed	Try increasing the weld travel speed
6: Uneven weld appearance	
Possible Reason	*Suggested Remedy*
Unsteady hand, wavering hand	Use two hands where possible to steady up, practice your technique
7: Distortion – movement of base metal during welding	
Possible Reason	*Suggested Remedy*
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
8: Electrode welds with different or unusual arc characteristic	
Possible Reason	*Suggested Remedy*
Incorrect polarity	Change the polarity, check the electrode manufacturer for correct polarity

SPARE PARTS IDENTIFICATION - RAZOR 160



Part Number	Description	Part Number	Description
1. 10043469	front plastic panel	11. 10007251	IGBT(FGH40N60□
2. 10043476	handle	12. 10043417	main PCB: W216-22(PN-55-A1)
3. 10004636	panel socket DKJ35-50	13. 10044929	control PCB: W21201-21(PN-234-A1)
4. 10004636	panel socket DKJ35-50	14. 10037764	thermal switch (TBT301G20)
5 .10043443	front panel adhesive sticker	15. 10043378	cover
6. 30000151	Amperage knob	16. 10037797	fan and wire: DC24V/2X2-130(4100rpm)
7. 10043418	power cord(without cable support)	17. 10042320	base plate
8. 10043460	rear plastic panel	18. 10016391	gas nozzle(front panel)
9. 10004957	ON/OFF switch	19. 10042342	gas nozzle(rear panel)
10. 10006650	Single-phase rectifier bridge(GBPC5010)	20. 10004697	air socket for torch switch(front panel)

SPARE PARTS IDENTIFICATION - RAZOR 200



Part Number	Description	Part Number	Description
1. 10043469	front plastic panel	11. 10029693	IGBT (FGH60N60SMD)
2. 10043476	handle	12. 10042799	main PCB: W209-22 (PN-55-A1)
3. 10004636	panel socket DKJ35-50	13. 10044929	control PCB: W21201-21 (PK-234-A0)
4. 10004636	panel socket DKJ35-50	14. 10037764	thermal switch (TBT301G20)
5 .10043442	front panel adhesive sticker	15. 10043379	cover
6. 30000151	Amperage knob	16. 10037796	fan and wire: DC24V/2X2-130(4500rpm)
7. 10043418	power cord(without cable support)	17. 10042320	base plate
8. 10043460	rear plastic panel	18. 10016391	gas nozzle(front panel)
9. 10004957	ON/OFF switch	19. 10042342	gas nozzle(rear panel)
10. 10037345	Single-phase rectifier bridge (GBPC3510 35A/1000V)	20. 10004697	air socket for torch switch(front panel)

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WARRANTY

JASIC Technologies America Inc ('Us', 'We') warrants that the following products under RAZORWELD supplied by Us and purchased by you from an Authorised RAZORWELD Dealer throughout the U.S.A & Canada 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.

RAZORWELD WELDING MACHINES		
RAZORWELD DIY Series (Power Source Only)	3 Years	(Clause 3)
RAZORWELD JASIC Inverter MIG (Power Source Only)	3 Years	(Clause 3)
RAZORWELD JASIC Inverter MIG SWF (Power Source / Separate Wire Feeder Only)	3 Years	(Clause 3)
RAZORWELD JASIC Inverter TIG (Power Source Only)	3 Years	(Clause 3)
RAZORWELD Water Cooler	1 Year	(Clause 3
RAZORWELD JASIC Series (Power Source Only)	3 Years	(Clause 3)
UNI-FLAME Regulators Argon/ Acetylene / Oxygen / LPG / Bobbin Flowmeter	1 Year	
UNI-FLAME Automatic Welding Helmet	2 Years	
RAZORWELD Automatic Welding Helmets	2 Years	
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 Manufacturer's Individual Warranty, Contact the manufacturer for details

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

• SELLER MAKES NO WARRANTIES EXPRESSED OR IMPLIED, INCLUDING BUT NOT BY WAY OF LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY AND ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, ON ANY ORDER EXCEPT THAT SELLER WARRANTS TITLE TO ALL GOODS FURNISHED BY SELLER AND EXCEPT THAT SELLER WARRANTS FOR A PERIOD OF ONE YEAR FROM THE DATE MARK LOCATED ON THE SELLER'S IDENTIFICATION TAG THAT ALL GOODS DESCRIBED ON SELLER'S ACKNOWLEDGMENT OF PURCHASER'S PURCHASE ORDER WILL BE MANUFACTURED IN ACCORDANCE WITH THE SPECIFICATIONS, IF ANY, SET FORTH IN SAID PURCHASE ORDER AND EXPRESSLY ACCEPTED IN SELLER'S ACKNOWLEDGMENT SUBJECT TO SELLER'S STANDARD MANUFACTURING VARIATIONS AND PRACTICES. IN THE CASE OF COMPONENTS OR ACCESSORIES FURNISHED BY SUPPLIERS TO SELLER, PURCHASER'S WARRANTY FROM SELLER SHALL BE LIMITED TO THE WARRANTY OF THE COMPONENT OR ACCESSORY SUPPLIER. THE FOREGOING WARRANTIES ARE THE SOLE AND EXCLUSIVE WARRANTIES APPLICABLE TO THE GOODS DELIVERED, AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY, ARE HEREBY EXPRESSLY DISCLAIMED AND NEGATED. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, PURCHASER ACKNOWLEDGES THAT SELLER'S PRODUCTS ARE NOT PACKAGED OR PROTECTED FOR LONG PERIODS OF STORAGE AND THUS MAY CORRODE OR RUST OVER TIME..

WARRANTY / RETURNS / EXCHANGES

We understand that sometimes a product may need to be returned. If you have purchased from the RAZORWELD Authorised Dealer Network, to assist you in following the correct procedure enclosed is the returns policy.

Our Returns Policy includes the rights you have under the American consumer Law and other relevant laws.
. 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 JASIC Technologies America Inc of any alleged defect, shortage in quantity, damage or failure to comply with the description or quote.
• You shall also afford JASIC Technologies America Inc 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 JASIC Technologies America Inc has agreed in writing that you are entitled to reject, JASIC Technologies America Inc 's liability is limited to, at the discretion of JASIC Technologies America Inc either replacing the Goods or repairing the Goods except where you have acquired Goods as a consumer within the meaning of the relevant State legislation and trade act policies 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) JASIC Technologies America inc 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.

• JASIC Technologies America Inc Accepts no responsibility for products lost, damaged or mislaid whilst in transit
• JASIC Technologies America Inc 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, JASIC Technologies America Inc is entitled to choose between providing you with a repair, replacement or other suitable remedy.

PURCHASER'S REMEDIES :

WITH RESPECT TO ANY CLAIM ARISING OUT OF ANY ORDER, ANY GOODS DELIVERED PURSUANT TO ANY ORDER AND EXPRESSLY ACCEPTED IN SELLER'S ACKNOWLEDGMENT, OR SELLER'S PERFORMANCE IN CONNECTION WITH ANY ORDER, INCLUDING, WITHOUT LIMITATION, ANY CLAIM ARISING OUT OF ANY RECALL, DEFECT OR ALLEGED DEFECT IN ANY GOODS OR SERVICES FURNISHED BY SELLER, SHALL BE LIMITED EXCLUSIVELY TO THE RIGHT OF REPAIR OR REPLACEMENT OF SUCH GOODS OR SERVICES, AT SELLER'S OPTION. WITHOUT IN ANY WAY LIMITING THE GENERALITY OF THE FOREGOING, IN NO EVENT SHALL SELLER BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, ANY LOSS OF ANTICIPATED PROFITS INCURRED BY PURCHASER WITH RESPECT TO ANY GOODS OR SERVICES FURNISHED BY SELLER, OR ANY DAMAGES ARISING FROM INJURIES TO PERSONS AS A RESULT OF PURCHASER'S OR A THIRD PARTY'S NEGLIGENCE. SELLER'S WARRANTY DOES NOT COVER FAILURES RESULTING FROM THE IMPROPER INSTALLATION, MOUNTING DESIGN OR APPLICATION OR FROM CORROSION. THE PROVISIONS OF THIS PARAGRAPH ARE A MATERIAL TERM OF THIS TRANSACTION.

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 on (+1) 253-859-6277, 253-859-6278 or e-mail service@razorweld.com

• 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 RAZORWELD 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-authorised electrical connections
- Improper installation
- Use of non-authorised/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 RAZORWELD Dealers

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

MIG Welding Torches and Consumables to suit, such as:

Gas Nozzles, 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 Conduit Nipple, Central Plug, Printed Circuit Board, Gun Plug House, Cable Support, Gas Connector, Handle To Suit PP36 with Knobs, & Electrodes, Arc Leads, Welding Cable, Electrode Holder, Earth Clamps

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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, Arc Leads, Welding Cable, Electrode Holder, Earth 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 Dealer (such as purchases from unauthorized retailers and purchases over the Internet from unauthorized 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 JASIC Technologies America Inc

REMEMBER TO RETAIN YOUR ORIGINAL INVOICE FOR PROOF OF PURCHASE.

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Razorweld

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