CIGWELD

AN ESAB BRAND

100+ YEARS OF WELDING INNOVATION

BLUE VENOM

XF250 AC/DC
XF320 AC/DC

*CoolVenom Cooler Sold Separately

POWERED BY SiC SILICON CARBIDE INVERTER TECHNOLOGY

OPERATING MANUAL

CIGWELD
AN ESAB BRAND

WE APPRECIATE YOUR BUSINESS!

Congratulations on your new CIGWELD product. We are proud to have you as our customer and will strive to provide you with the best service and reliability in the industry. This product is backed by our extensive warranty and world-wide service network.

This Operating Manual has been designed to instruct you on the correct use and operation of your CIGWELD product. Your satisfaction with this product and its safe operation is our ultimate concern. Therefore please take the time to read the entire manual, especially the Safety Precautions. They will help you to avoid potential hazards that may exist when working with this product.

We have made every effort to provide you with accurate instructions, drawings, and photographs of the product(s) while writing this manual. However errors do occur and we apologise if there are any contained in this manual.

Due to our constant effort to bring you the best products, we may make an improvement that does not get reflected in the manual. If you are ever in doubt about what you see or read in this manual with the product you received, then check for a newer version of the manual on our website or contact our customer support for assistance.

YOU ARE IN GOOD COMPANY!

The Brand of Choice for Contractors and Fabricators Worldwide.

CIGWELD is a Market Leading Brand of Arc Welding Products for ESAB. We are a mainline supplier to major welding industry sectors in the Asia Pacific and emerging global markets including; Manufacturing, Construction, Mining, Automotive, Engineering, Rural and DIY.

We distinguish ourselves from our competition through market-leading, dependable products that have stood the test of time. We pride ourselves on technical innovation, competitive prices, excellent delivery, superior customer service and technical support, together with excellence in sales and marketing expertise.

Above all, we are committed to develop technologically advanced products to achieve a safer working environment for industry operators.

WARNING

Read and understand this entire Manual and your employer's safety practices before installing, operating, or servicing the equipment. While the information contained in this Manual represents the Manufacturer's best judgement, the Manufacturer assumes no liability for its use. Disclaimer: The images and values depicted in this manual are for illustration purposes only and may vary to actual values.

CIGWELD BLUEVENOM XF250/ XF320 AC/DC SiC OPERATING MANUAL NUMBER: 742053 FOR: P/N W1300250 P/N W1300320

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For Printing Material Specification refer to document 47x1915.
Publication Date: 05-04-2026

Revision Date:

RECORD THE FOLLOWING INFORMATION FOR WARRANTY PURPOSES:

Where Purchased:

Purchase Date:

Equipment Serial #:

BE SURE THIS INFORMATION REACHES THE OPERATOR. YOU CAN GET EXTRA COPIES FOR FREE BY DOWNLOADING FROM THE CIGWELD WEBSITE.

CAUTION

These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for arc welding and cutting equipment, we urge you to read our booklet, “Precautions and Safe Practices for Arc Welding, Cutting, and Gouging,” Booklet 0-5407. Do NOT permit untrained persons to install, operate, or maintain this equipment. Do NOT attempt to install or operate this equipment until you have read and fully understand these instructions. If you do not fully understand these instructions, contact your supplier for further information. Be sure to read the Safety Precautions before installing or operating this equipment.

USER RESPONSIBILITY

This equipment will perform in conformity with the description thereof contained in this manual and accompanying labels and/or inserts when installed, operated, maintained and repaired in accordance with the instructions provided. This equipment must be checked periodically. Malfunctioning or poorly maintained equipment should not be used. Parts that are broken, missing, worn, distorted or contaminated should be replaced immediately. Should such repair or replacement become necessary, the manufacturer recommends that a telephone or written request for service advice be made to the Authorised Distributor from whom it was purchased.

This equipment or any of its parts should not be altered without the prior written approval of the manufacturer. The user of this equipment shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, damage, improper repair or alteration by anyone other than the manufacturer or a service facility designated by the manufacturer.

READ AND UNDERSTAND THE OPERATING MANUAL BEFORE INSTALLING OR OPERATING. PROTECT YOURSELF AND OTHERS!

CIGWELD
AN ESAB BRAND

DECLARATION OF CONFORMITY

According to AS/NZS 3820:2020, Essential Safety Requirements for Electrical Equipment Radiocommunications Labelling (Electromagnetic Compatibility) Notice 2017

TYPE OF EQUIPMENT

Arc welding power source

TYPE DESIGNATION

BlueVenom XF250 AC/DC with serial number from: ZC618YYWW####

BlueVenom XF320 AC/DC with serial number from: ZC619YYWW####

BRAND NAME OR TRADEMARK

CIGWELD

MANUFACTURER OR HIS AUTHORISED REPRESENTATIVE ESTABLISHED WITHIN THE EEA NAME, ADDRESS, AND TELEPHONE NO:

CIGWELD Pty Ltd 71 Gower Street
Preston, Victoria, Australia, 3072
Phone: +61 3 9474 7400;
cigweld.com.au

THE FOLLOWING HAS BEEN USED IN THE DESIGN:

AS 1674.2:2025	Safety in welding and allied processes, Part 2: Electrical
AS 60974.1:2020	Arc Welding Equipment, Part 1: Welding Power Sources
AS/NZS 3760:2022	In-service safety inspection and testing of electrical equipment and RCDs
EN IEC 60974-10: 2021	Arc Welding Equipment, Part 10: EMC requirements

ADDITIONAL INFORMATION:

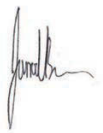
Restrictive use, Class A equipment, intended for use in location other than residential. This equipment is also in compliance with the essential requirements of EU Directives 2014/30/EU and 2014/35/EU.

BY SIGNING THIS DOCUMENT, THE UNDERSIGNED DECLARES AS MANUFACTURER,OR THE MANUFACTURER'S AUTHORISED REPRESENTATIVE, THAT THE EQUIPMENT IN QUESTION COMPLIES WITH THE SAFETY REQUIREMENTS STATED ABOVE.

PLACE/DATE

Preston
23-01-2026

SIGNATURE



Jarrod Brennan
General Manager

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SECTION 1:
ARC WELDING SAFETY INSTRUCTIONS AND WARNINGS

WARNING

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS KEEP AWAY UNTIL CONSULTING YOUR DOCTOR. DO NOT LOSE THESE INSTRUCTIONS. READ OPERATING/INSTRUCTION MANUAL BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT.

Welding products and welding processes can cause serious injury or death, or damage to other equipment or property, if the operator does not strictly observe all safety rules and take precautionary actions.

Safe practices have developed from past experience in the use of welding and cutting machinery/equipment. These practices must be learned through study and training before using this equipment. Some of these practices apply to equipment connected to power lines; other practices apply to engine driven equipment. Anyone not having extensive training in welding and cutting practices should not attempt to weld.

Safe practices are outlined in the Australian Standard AS 1674.2:2025 entitled: Safety in welding and allied processes Part 2: Electrical. This publication and other guides as to what you should learn before operating this equipment are listed at the end of these safety precautions.

HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.

1.01 ARC WELDING HAZARDS

WARNING

ARC RAYS can burn eyes and skin; NOISE can damage hearing.

Arc rays from the welding process produce intense heat and strong ultraviolet rays that can burn eyes and skin. Noise from some processes can damage hearing.

ARC RAYS AND NOISE

1. Use a Welding Helmet or Welding Faceshield fitted with a proper shade of filter (see ANSI Z49.1 and AS 1674 listed in Safety Standards) to protect your face and eyes when welding or watching the welding operation.
2. Wear approved safety glasses. Side shields recommended.
3. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
4. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.
5. Use approved ear plugs or ear muffs if noise level is high.
6. Never wear contact lenses while welding.

WARNING

ELECTRIC SHOCK 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 machine internal circuits are also live when power is on.

In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

ELECTRIC SHOCK

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers.
4. Disconnect input power or stop engine before installing or servicing this equipment. Lock input power disconnect switch open, or remove line fuses so power cannot be turned on accidentally.
5. Properly install and ground this equipment according to its Operating Manual and national, state, and local codes.
6. Turn off all equipment when not in use. Disconnect power to equipment if it will be left unattended or out of service.
7. Use fully insulated electrode holders. Never dip holder in water to cool it or lay it down on the ground or the work surface. Do not touch holders connected to two welding machines at the same time or touch other people with the holder or electrode.
8. Do not use worn, damaged, undersized, or poorly spliced cables.
9. Do not wrap cables around your body.
10. Ground the workpiece to a good electrical (earth) ground.
11. Do not touch electrode while in contact with the work (ground) circuit.
12. Use only well-maintained equipment. Repair or replace damaged parts at once.
13. In confined spaces or damp locations, do not use a welder with AC output unless it is equipped with a voltage reducer. Use equipment with DC output.
14. Wear a safety harness to prevent falling if working above floor level.
15. Keep all panels and covers securely in place.

RECOMMENDED PROTECTIVE FILTERS FOR ELECTRIC WELDING		
Description of process	**Approximate range of welding current in amps**	**Minimum shade number of filter(s)**
Manual Metal Arc Welding - covered electrodes (MMAW)	Less than or equal to 100 100 to 200 200 to 300 300 to 400 Greater than 400	8 10 11 12 13
Gas Metal Arc Welding (GWAW) (MIG) other than Aluminium and Stainless Steel	Less than or equal to 150 150 to 250 250 to 300 300 to 400 Greater than 400	10 11 12 13 14
Gas Metal Arc Welding (GMAW) (MIG) Aluminium and Stainless Steel	Less than or equal to 250 250 to 350	12 13
Gas Tungsten Arc Welding (GTAW) (TIG)	Less than or equal to 100 100 to 200 200 to 250 250 to 350 Greater than 350	10 11 12 13 14
Flux-cored Arc Welding (FCAW) - with or without shielding gas	Less than or equal to 300 300 to 400 400 to 500 Greater than 500	11 12 13 14
Air - Arc Gouging	Less than or equal to 400	12
Plasma - Arc Cutting	50 to 100 100 to 400 400 to 800	10 12 14
Plasma - Arc Spraying	—	15
Plasma - Arc Welding	Less than or equal to 20 20 to 100 100 to 400 400 to 800	8 10 12 14
Submerged - Arc Welding	—	2(5)
Resistance Welding	—	Safety Spectacles or eye shield

Refer to standard AS/NZS 1338.1:2012 for comprehensive information regarding the above table.

FUMES AND GASES

WARNING

FUMES & GASES CAN BE HAZARDOUS TO YOUR HEALTH.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes. Do not breathe the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals, consumables, coatings, and cleaners.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Shielding gases used for welding can displace air causing injury or death. Be sure the breathing air is safe.
6. Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapours to form highly toxic and irritating gases.
7. Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

WELDING

WARNING

WELDING CAN CAUSE FIRE OR EXPLOSION.

Sparks and spatter fly off from the welding arc. The flying sparks and hot metal, weld spatter, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode or welding wire to metal objects can cause sparks, overheating, or fire.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 35ft (10.7m) of the welding arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. Do not weld on closed containers such as tanks or drums.
8. Connect work cable to the work as close to the welding area as practical to prevent welding current from travelling long, possibly unknown paths and causing electric shock and fire hazards.
9. Do not use welder to thaw frozen pipes.
10. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.

FLYING SPARKS AND HOT METAL

WARNING

FLYING SPARKS & HOT METAL CAN CAUSE INJURY.

Sparks and spatter fly off from the welding arc. The flying sparks and hot metal, weld spatter, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode or welding wire to metal objects can cause sparks, overheating, or fire.

1. Wear approved face shield or safety goggles. Side shields recommended.
2. Wear proper body protection to protect skin.

CYLINDERS

WARNING

CYLINDERS CAN EXPLODE IF DAMAGED.

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

1. Protect compressed gas cylinders from excessive heat, mechanical shocks, and arcs.
2. Install and secure cylinders in an upright position by chaining them to a stationary support or equipment cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never allow a welding electrode to touch any cylinder.
5. Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
6. Turn face away from valve outlet when opening cylinder valve.
7. Keep protective cap in place over valve except when cylinder is in use or connected for use.
8. Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

MOVING PARTS

WARNING

Moving parts can cause injury.

Moving parts, such as fans, rotors, and belts can cut fingers and hands and catch loose clothing.

1. Keep all doors, panels, covers, and guards closed and securely in place.
2. Stop engine before installing or connecting unit.
3. Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
4. To prevent accidental starting during servicing, disconnect negative (-) battery cable from battery.
5. Keep hands, hair, loose clothing, and tools away from moving parts.
6. Reinstall panels or guards and close doors when servicing is finished and before starting engine.

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 & Safety code Sec. 25249.5 et seq.)

NOTE

Considerations About Welding and The Effects of Low Frequency Electric and Magnetic Fields.

WARNING

The procedures below are among those also normally recommended for pacemaker wearers. Consult your doctor for complete information.

The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, Biological Effects of Power Frequency Electric & Magnetic Fields - Background Paper, OTA-BP-E-63 (Washington, DC: U.S. Government Printing Office, May 1989): "...there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields and interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science-based advice on strategies to minimize or avoid potential risks."

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cable around the body.
4. Keep welding power source and cables as far away from body as practical.

1.02 PRINCIPAL SAFETY STANDARDS

Safety in welding and allied processes Part 1: Fire Precautions, AS 1674.1:2025 from SAI Global Limited, www.saiglobal.com.

Safety in welding and allied processes Part 2: Electrical, AS 1674.2:2025 from SAI Global Limited, www. saiglobal.com.

Filters for eye protectors - Filters for protection against radiation generated in welding and allied operations AS/NZS 1338.1:2012 from SAI Global Limited, www.saiglobal.com.

Welding Processes, Code of Practice, JULY 2020 - Safe Work Australia. This document provides "Practical guidance on how to manage health and safety risks associated with welding". **The latest version is available free of charge at: https://www.safeworkaustralia.gov.au/doc/model-code-practice-welding-processes.**

Other International Standards and Codes of Practice

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126.

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126.

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices for Occupation and Educational Eye and Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

SECTION 2: INTRODUCTION

2.01 HOW TO USE THIS MANUAL

This Operating Manual only applies to the Part Numbers listed on page 3. To ensure safe operation, read the entire manual, including the chapter on safety instructions and warnings.

Throughout this manual, the words WARNING, CAUTION, and NOTE may appear. Pay particular attention to the information provided under these headings. These special annotations are easily recognized as follows:

NOTE

An operation, procedure, or background information which requires additional emphasis or is helpful in efficient operation of the system.

CAUTION

A procedure which, if not properly followed, may cause damage to the equipment.

WARNING

An operation, procedure, or background information which requires additional emphasis or is helpful in efficient operation of the system.

ELECTRICAL WARNING

Gives information regarding possible electrical shock injury. Warnings will be enclosed in a box such as this.

DANGER

Means immediate hazards which, if not avoided, will result in immediate, serious personal injury or loss of life.

Additional copies of this manual may be purchased by contacting CIGWELD at the address and phone number for your location listed in the inside back cover of this manual. Include the Operating Manual number and equipment identification numbers.

Electronic copies of this manual can also be downloaded at no charge in Acrobat PDF format by going to the CIGWELD web site listed below and clicking on the Literature Library link:
cigweld.com.au

2.02 EQUIPMENT IDENTIFICATION

The units identification number (specification or part number), model, and serial number are located on the Data Plate which is fixed to the bottom of the welding machine. In some cases, the Data Plate may be attached to the rear panel. Equipment which does not have a control panel such as cable assemblies are identified only by the specification or part number printed on the shipping container. Record these numbers on the bottom of page 3 for future reference.

2.03 RECEIPT OF EQUIPMENT

When you receive the equipment, check it against the invoice to confirm it is complete and inspect the equipment for possible damage due to shipping. If there is any damage, notify the carrier immediately to file a claim. Furnish complete information concerning damage claims or shipping errors to the location listed on the back cover of this manual. Include all equipment identification numbers, as described above, along with a full description of the parts in error.

Move the equipment to the installation site before unboxing the unit. Use care to avoid damaging the equipment when using knives, breaker bars, hammers, etc, to unbox the machine and its accessories.

2.04 SYMBOL CHART

Note that only some of these symbols will appear on your model.

	ON
	OFF
	DANGEROUS VOLTAGE
	INCREASE/DECREASE
	CIRCUIT BREAKER
	AC AUXILIARY POWER
	FUSE
A	AMPERAGE
V	VOLTAGE
Hz	HERTZ (CYCLES/SEC)
f	FREQUENCY
—	NEGATIVE
+	POSITIVE
	DIRECT CURRENT (DC)
	PROTECTIVE EARTH (GROUND)
	LINE
	LINE CONNECTION
	AUXILIARY POWER
115V 15A	RECEPTACLE RATING- AUXILIARY POWER
1 ~	SINGLE PHASE
3 ~	THREE PHASE
	THREE PHASE STATIC FREQUENCY CONVERTER-TRANSFORMER-RECTIFIER
	REMOTE
X	DUTY CYCLE
%	PERCENTAGE
	SHIELDED METAL ARC WELDING (SMAW)
	GAS METAL ARC WELDING (GMAW)
	GAS TUNGSTEN ARC WELDING (GTAW)
	AIR CARBON ARC CUTTING (CAC-A)
	CONSTANT CURRENT
	CONSTANT VOLTAGE OR CONSTANT POTENTIAL
	HIGH TEMPERATURE
	FAULT INDICATION
	ARC FORCE
	TOUCH START (GTAW)
	VARIABLE INDUCTANCE
V	VOLTAGE INPUT
	WIRE FEED FUNCTION
	WIRE FEED TOWARDS WORKPIECE WITH OUTPUT VOLTAGE OFF
	WELDING GUN
	PURGING OF GAS
	CONTINUOUS WELD MODE
	SPOT WELD MODE
t	SPOT TIME
t1	PREFLOW TIME
t2	POSTFLOW TIME
PLATE THICKNESS CONTROL	AUTOSET PLATE THICKNESS PRE-SETS
200A DC	OUTPUT CURRENT
2 YEARS*	2-YEAR WARRANTY
t	BURNBACK TIME
	DISTURBANCE IN GROUND SYSTEM
IP M	INCHES PER MINUTE
MPM	METRES PER MINUTE
	SPOOL GUN
AUTO SET MIG	AUTOSET FOR MIG
	SINGLE PULSE
	DOUBLE PULSE
	PULSE FREQ. (PULSE SPEED)
A	PULSE BASE CURRENT
W	PULSE WIDTH

Table 2-1: Symbol chart

2.05 DESCRIPTION

Get your adrenalin pumping with the new **BlueVenom AC/DC SiC** range - a compact, high-performance TIG inverter built for welders who demand flawless results. Designed to deliver showcase-quality welds, it features precision-tuned synergic settings and multiple AC waveforms so you can jump straight into aluminium work and start stacking dimes from the first strike!

Utilizing High Frequency Start, just position the torch, pull the trigger, and fire a clean, instant arc protecting your tungsten and delivering sharper, cleaner welds every time.

The BlueVenom AC/DC SiC range incorporates **Power Factor Correction (PFC)** technology to maximise energy efficiency and maintain consistent output, even when used with extended lead lengths, delivering reliable performance wherever the job demands.

Effortless control starts with the intuitive 5-inch full-colour touchscreen, giving instant access to every welding parameter through a clean, streamlined interface. Sync settings to material thickness or take full manual control to fine-tune performance exactly your way.

Engineered with advanced **Silicon Carbide (SiC) Inverter technology**, the BlueVenom AC/DC SiC range is purpose built to perform with confidence on demanding projects. By reducing power losses, enhancing arc stability, and optimising thermal efficiency, it achieves smoother weld quality, improved reliability, and extended service life, within a compact, high-performance platform.

2.06 USER RESPONSIBILITY

This equipment will perform safely and reliably when installed, operated and maintained in accordance with the instructions herewith. Periodic checks are recommended as defective or poorly maintained equipment should not be used. Broken, missing, severely worn, distorted or contaminated parts should be replaced immediately.

Should a repair or replacement become necessary, it is recommended that the Authorised Distributor from whom the equipment was purchased, be contacted for service advice. The owner or user of this equipment shall have the responsibility for any malfunction which results from improper use, damage, faulty maintenance or repair/alteration by other than CIGWELD or an accredited service provider.

NOTE

Refer to the complete Warranty Schedule at the back of the manual.

2.07 WHAT'S IN THE BOX

BlueVenom XF250 AC/DC SiC (Part No. W1300250)

- BlueVenom XF250 AC/DC SiC Power Source
- DIMEX ELITE 8m 26F 'Flex Head' TIG Torch with Trigger Button and Remote Current Control
- Front End consumables for the TIG torch
- 250A Twist lock Electrode Holder with 3m Lead
- 3m Quick Connect Gas Hose
- 250A Earth Clamp with 3m Lead
- BlueJet Regulator/Flowmeter
- Operating Manual

BlueVenom XF320 AC/DC SiC (Part No. W1300320)

- BlueVenom XF320 AC/DC SiC Power Source
- DIMEX ELITE 8m 26F 'Flex Head' TIG Torch with Trigger Button and Remote Current Control
- Front End consumables on the TIG torch
- 400A Twist lock Electrode Holder with 3m Lead
- 3m Quick Connect Gas Hose
- 300A Earth Clamp with 3m Lead
- BlueJet Regulator/Flowmeter
- Operating Manual

2.08 TRANSPORTING METHODS

This unit is equipped with a handle for carrying purposes.

WARNING

FALLING EQUIPMENT can cause serious personal injury and equipment damage.

- Lift unit with handle on top of case.
- Use handcart or similar device of adequate capacity.
- If using a forklift vehicle, place and secure unit on a proper skid before transporting.

2.09 DUTY CYCLE

The rated duty cycle of a Welding Power Source, is a statement of the time it may be operated at its rated welding current output without exceeding the temperature limits of the insulation of the component parts. To explain the 10 minute duty cycle period the following example is used. Suppose a Welding Power Source is designed to operate at a 15% duty cycle, 90 amperes at 23.6 volts. This means that it has been designed and built to provide the rated amperage (90A) for 1.5 minutes, i.e. arc welding time, out of every 10 minute period (15% of 10 minutes is 1.5 minutes). During the other 8.5 minutes of the 10 minute period the Welding Power Source must idle and allowed to cool.

2.10 SPECIFICATIONS

DESCRIPTION	BLUEVENOM XF250 AC/DC SiC
Packaged Part Number	W1300250
Power Source Dimensions	(L) 660mm x (W) 190mm x (H) 370mm
Power Source Weight	16.8kg
Cooling	Fan Cooled
Welder Type	AC/DC TIG Inverter Power Source
Standards	AS 60974.1:2020 EN IEC 60974-10:2021
Number of Phases	Single Phase
Nominal Supply Voltage	230 VAC ± 10%
Nominal Supply Frequency	50/60Hz
Welding Current Range (Stick mode)	10-200A
Welding Current Range (TIG Mode)	5-250A (DC) 10-250A (AC)
Open Circuit Voltage (VRD On) Stick Weld Mode	<35V
Open Circuit Voltage (VRD Off) Stick Weld Mode	76V
Effective Input Current (I1eff) refer Note 2	14.9 Amps (230VAC)
Maximum Input Current (I1max)	29.0 Amps (230VAC)
Minimum Single Phase Generator Recommendation (refer Note 4)	8.5kVA@0.8PF
Stick (MMAW) Welding Output, 40°C, 10 min	200A @ 25%, 28.0V 130A @ 60%, 25.2V 100A @ 100%, 24.0V
TIG DC (GTAW) Welding Output, 40°C, 10 min	250A @ 28%, 20.0V 170A @ 60%, 16.8V 130A @ 100%, 15.2V
TIG AC (GTAW) Welding Output, 40°C, 10 min	250A @ 33%, 20.0V 185A @ 60%, 17.4V 145A @ 100%, 15.8V
Protection Class	IP23S

DESCRIPTION	BLUEVENOM XF320 AC/DC SiC
Packaged Part Number	W1300320
Power Source Dimensions	(L) 660mm x (W) 190mm x (H) 370mm
Power Source Weight	18.9kg
Cooling	Fan Cooled
Welder Type	AC/DC TIG Inverter Power Source
Standards	AS 60974.1:2020 EN IEC 60974-10:2021
Number of Phases	Three Phase
Nominal Supply Voltage	400 VAC ± 10%
Nominal Supply Frequency	50/60Hz
Welding Current Range (Stick mode)	10-320A
Welding Current Range (TIG Mode)	5-320A (DC) 10-320A (AC)
Open Circuit Voltage (VRD On) Stick Weld Mode	<35V
Open Circuit Voltage (VRD Off) Stick Weld Mode	85V
Effective Input Current (I1eff) refer Note 2	18.5 Amps (400VAC)
Maximum Input Current (I1max)	18.5 Amps (400VAC)
Minimum Single Phase Generator Recommendation (refer Note 4)	16.0kVA@0.8PF
Stick (MMAW) Welding Output, 40°C, 10 min	320A @ 100%, 32.8V
TIG AC/DC (GTAW) Welding Output, 40°C, 10 min	320A @ 100%, 22.8V
Protection Class	IP23S

Table 2-2: Specifications

NOTE 1: Due to variations that can occur in manufactured products, claimed performance, voltages, ratings, all capacities, measurements, dimensions and weights quoted are approximate only. Achievable capacities and ratings in use and operation will depend upon correct installation, use, applications, maintenance and service.

NOTE 2: The Effective Input Current should be used for the determination of cable size & supply requirements.

NOTE 3: Motor start fuses or thermal circuit breakers are recommended for this application. Check local requirements for your situation in this regard.

NOTE 4: Minimum Generator Recommendation at the Maximum Output Duty Cycle. Due to large variations in performance and specifications of different brands and types of generators, CIGWELD cannot guarantee full welding output power or duty cycle on every brand or type of generator. Some small generators incorporate low cost circuit breakers on their outputs. These circuit breakers usually will have a small reset button, and will trip much faster than a switchboard type circuit breaker. This may result in not being able to achieve full output or duty cycle from the power source / generator combination. For this reason we recommend a generator that incorporates switchboard type circuit breakers. CIGWELD recommends that when selecting a generator, that the particular power source / generator combination be adequately trialled to ensure the combination performs to the users expectations.

NOTE 5: CIGWELD reserves the right to change product performance and specifications without notice.

NOTE 6: If an extension lead is required to be used it is recommended to use a minimum size of 2.5mm^2 Heavy Duty Extension Lead. Longer extension leads may impact welding performance and operation.

2.11 OPTIONAL ACCESSORIES

We recommend genuine CIGWELD products.

The biggest range and best quality guaranteed performance.

PART NUMBER	DESCRIPTION
W4018240	CoolVenom 4LTR, 4L TIG Torch Water Cooler
W7007750	CoolVenom Interconnection Lead
W4022013	DIMEX ELITE 26, 4m TIG Torch with Remote Control
W4022014	DIMEX ELITE 26, 8m TIG Torch with Remote Control
W4022015	DIMEX ELITE 26F, 4m Flex Head TIG Torch with Remote Control
W4022016	DIMEX ELITE 26F, 8m Flex Head TIG Torch with Remote Control
W4022017	DIMEX ELITE 18, 4m TIG Torch with Remote Control, Water Cooled
W4022018	DIMEX ELITE 18, 8m TIG Torch with Remote Control, Water Cooled
W4022021	DIMEX ELITE 18F, 8m Flex Head TIG Torch with Remote Control, Water Cooled
CT1726K1	TIG Starter Kit 1 17/18/26 TIG Torches
W4015826	CIGWELD Foot Pedal, 8m
W7004913	Quick Connect Shielding Gas Hose, 3m
210254	BlueJet Argon Regulator/Flowmeter, 45LPM, 2 Gauge
201031	CutSkill Argon Regulator/Flowmeter, 30LPM
W4011507	SiC Trolley
646808	FLX Welding Leadset 4m, 25mm2 cable, 50mm2 DINSE, 250A Twistlock Electrode Holder
646810	FLX Welding Leadset 4m, 35mm2 cable, 50mm2 DINSE, 400A Twistlock Electrode Holder

Table 2-3: Accessories

TIG TUNGSTENS

PART NUMBER	DESCRIPTION
TUN16THR	TIG Tungsten 1.6mm Thoriated Red (DC Only) Pk 10
TUN24THR	TIG Tungsten 2.4mm Thoriated Red (DC Only) Pk 10
TUN24THR	TIG Tungsten 3.2mm Thoriated Red (DC Only) Pk 10
TUN16ZIR	TIG Tungsten 1.6mm Zirconiated White (AC Only) Pk 10
TUN24ZIR	TIG Tungsten 2.4mm Zirconiated White (AC Only) Pk 10
TUN32ZIR	TIG Tungsten 3.2mm Zirconiated White (AC Only) Pk 10
TUN16RE3	TIG Tungsten 1.6mm Rare Earth Purple (AC/DC) Pk 10
TUN24RE3	TIG Tungsten 2.4mm Rare Earth Purple (AC/DC) Pk 10
TUN32RE3	TIG Tungsten 3.2mm Rare Earth Purple (AC/DC) Pk 10
TUN16LAN	TIG Tungsten 1.6mm Lanthanated Gold (AC/DC) Pk 10
TUN24LAN	TIG Tungsten 2.4mm Lanthanated Gold (AC/DC) Pk 10
TUN32LAN	TIG Tungsten 3.2mm Lanthanated Gold (AC/DC) Pk 10

Table 2-4: TIG Tungstens

2.12 RELATED PRODUCTS

PART NUMBER	DESCRIPTION
456488M	ARC UP CTX 700F Premium TIG Welding Gloves - M
456488L	ARC UP CTX 700F Premium TIG Welding Gloves - L
456488XL	ARC UP CTX 700F Premium TIG Welding Gloves - XL
456483M	ARC UP CMX 700PRO Premium MIG Welding Gloves - M
456483L	ARC UP CMX 700PRO Premium MIG Welding Gloves - L
456483XL	ARC UP CMX 700PRO Premium MIG Welding Gloves - XL
456157M	ARC UP JTX 700 Premium Welding Jacket FR, Grey/Black - M
456157L	ARC UP JTX 700 Premium Welding Jacket FR, Grey/Black - L
456157XL	ARC UP JTX 700 Premium Welding Jacket FR, Grey/Black - XL
4561572XL	ARC UP JTX 700 Premium Welding Jacket FR, Grey/Black - XXL
WHAMXC090F	Arcmaster XC90F Var. Shade Auto Darkening Welding Helmet - Blax
WHAMXC170	Arcmaster XC70 Var. Shade Auto Darkening Welding Helmet - Mayhem
WHAMXC180	Arcmaster XC80 Var. Shade Auto Darkening Welding Helmet - Fallout
646770	ARC UP Welding Curtain - Dark Green, 1.8m x 1.8m
646777	ARC UP Welding Curtain - Red, 1.8m x 1.8m
646776	ARC UP Welding Curtain Frame, 1.8m x 1.8m
646801	ARC UP BTX 1800 Premium Welding Blanket, 1.8m x 1.8m
646802	ARC UP BTX 2000 Premium Welding Blanket, 2m x 2m
646803	ARC UP BTX 3000 Premium Welding Blanket, 3m x 3m
456170	ARC UP APX 100 Leather Welding Apron
457570	CX 100 Leather Welding Cushion
457571	CX 200 Aluminised Welding Cushion

Table 2-5: Related products

ARC UP CTX 700F Premium TIG Welding Gloves
P/N: 456488L (Large)

ARC UP CMX 700PRO Premium MIG Welding Gloves
P/N: 456483L (Large)

ARC UP JTX 700 Premium Welding Jacket, Grey/Black
P/N: 456157L (Large)

Arcmaster XC70 Welding Helmet (Mayhem)
P/N: WHAMXC170

ARC UP APX 100 Leather Welding Apron
P/N: 456170

CX 200 Aluminised Welding Cushion
P/N: 457571

SECTION 3: INSTALLATION

3.01 ENVIRONMENT

These units are designed for use in environments with increased hazard of electric shock.

A. Examples of environments with increased hazard of electric shock are:

1. In locations in which freedom of movement is restricted, so that the operator is forced to perform the work in a cramped (kneeling, sitting or lying) position with physical contact with conductive parts.
2. In locations which are fully or partially limited by conductive elements, and in which there is a high risk of unavoidable or accidental contact by the operator.

B. Environments with increased hazard of electric shock do not include places where electrically conductive parts in the near vicinity of the operator, which can cause increased hazard, have been insulated.

3.02 LOCATION

Be sure to locate the welder according to the following guidelines:

A. In areas, free from moisture and dust.

B. Ambient temperature between -10°C to 40°C.

C. In areas, free from oil, steam and corrosive gases.

D. In areas, not subjected to abnormal vibration or shock.

E. In areas, not exposed to direct sunlight or rain.

F. Place at a distance of 300mm or more from walls or similar that could restrict natural air flow for cooling.

3.03 VENTILATION

Since the inhalation of welding fumes can be harmful, ensure that the welding area is effectively ventilated.

3.04 MAINS SUPPLY VOLTAGE REQUIREMENTS

The Mains Supply Voltage should be within ± 15% of the rated Mains Supply Voltage. If actual Mains Supply Voltage is outside this range Welding Current may not be available and may cause internal components to fail.

Refer to Specifications in Section 2.10 for Supply Voltage information.

The Welding Power Source must be:

- Correctly installed, if necessary, by a qualified electrician.
- Correctly earthed (electrically) in accordance with local regulations.
- Connected to the correct size power point and fuse as per the Specifications in Section 2.10.

IMPORTANT NOTE!

This product has been fitted with a supply plug as indicated in Section 2.10. Note that the welding output range applicable with the fitted supply plug is detailed in Section 2.10.

WARNING

Any electrical work must be carried out by a qualified Electrical Tradesperson.

3.05 GENERATORS

Refer to Note 4 on page 18 for recommendations when using with a Generator.

3.06 EXTENSION LEADS

If an extension lead is required, it is recommended to use a minimum size of 2.5mm2 Heavy Duty Extension Lead for the XF250AC/DC SiC and 4.0mm2 for the XF320 AC/DC SiC. Longer extension leads may impact welding performance and operation.

3.07 ELECTROMAGNETIC COMPATIBILITY

WARNING

Extra precautions for Electromagnetic Compatibility may be required when this Welding Power Source is used in a domestic situation.

A. INSTALLATION AND USE - USERS RESPONSIBILITY

The user is responsible for installing and using the welding equipment according to the manufacturer's instructions. If electromagnetic disturbances are detected then it shall be the responsibility of the user of the welding equipment to resolve the situation with the technical assistance of the manufacturer. In some cases this remedial action may be as simple as earthing the welding circuit. In other cases it could involve constructing an electromagnetic screen enclosing the Welding Power Source and the work, complete with associated input filters. In all cases, electromagnetic disturbances shall be reduced to the point where they are no longer troublesome.

B. ASSESSMENT OF AREA

Before installing welding equipment, the user shall make an assessment of potential electromagnetic problems in the surrounding area. The following shall be taken into account

1. Other supply cables, control cables, signalling and telephone cables; above, below and adjacent to the welding equipment.
2. Radio and television transmitters and receivers.
3. Computer and other control equipment.
4. Safety critical equipment, e.g. guarding of industrial equipment.
5. The health of people around, e.g. the use of pacemakers and hearing aids.
6. Equipment used for calibration and measurement.
7. The time of day that welding or other activities are to be carried out.
8. The immunity of other equipment in the environment: the user shall ensure that other equipment being used in the environment is compatible: this may require additional protection measures.

   The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

C. METHODS OF REDUCING ELECTROMAGNETIC EMISSIONS

1. **Mains Supply**

   Welding equipment should be connected to the mains supply according to the manufacturer's recommendations. If interference occurs, it may be necessary to take additional precautions such as filtering of the mains supply. Consideration should be given to shielding the supply cable of permanently installed welding equipment in metallic conduit or equivalent. Shielding should be electrically continuous throughout it's length. The shielding should be connected to the Welding Power Source so that good electrical contact is maintained between the conduit and the Welding Power Source enclosure.

2. **Maintenance of Welding Equipment**
The welding equipment should be routinely maintained according to the manufacturer's recommendations.
All access and service doors and covers should be closed and properly fastened when the welding equipment is in operation. The welding equipment should not be modified in any way except for those changes and adjustments covered in the manufacturer's instructions. In particular, the spark gaps of arc striking and stabilising devices should be adjusted and maintained according to the manufacturer's recommendations.

3. **Welding Cables**
The welding cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.

4. **Equipotential Bonding**
Bonding of all metallic components in the welding installation and adjacent to it should be considered. However Metallic components bonded to the work piece will increase the risk that the operator could receive a shock by touching the metallic components and the electrode at the same time. The operator should be insulated from all such bonded metallic components.

5. **Earthing of the Workpiece**
Where the workpiece is not bonded to earth for electrical safety, nor connected to earth because of it's size and position, e.g. ship's hull or building steelwork, a connection bonding the workpiece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthing of the workpiece increasing the risk of injury to users, or damage to other electrical equipment. Where necessary, the connection of the workpiece to earth should be made by direct connection to the workpiece, but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitance, selected according to national regulations.

6. **Screening and Shielding**
Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening the entire welding installation may be considered for special applications.

3.08 HIGH FREQUENCY ARC INITIATION OR STABILISATION WHERE FITTED)

The importance of correct installation of high frequency welding equipment cannot be over emphasized. Interference due to high frequency initiated or stabilised arc is almost invariably traced to improper installation. The following information is intended as a guide for personnel installing high frequency welding machines

WARNING

The high frequency section of this machine has an output similar to a radio transmitter. The machine should NOT be used in the vicinity of blasting operations due to the danger of premature firing.

WARNING

It is also possible that operation close to computer installations may cause computer malfunction.

Direct Radiation: Radiation from the machine can occur if the case is metal and is not properly grounded. It can occur through apertures such as open access panels. The shielding of the high frequency unit in the Power Source will prevent direct radiation if the equipment is properly grounded. Arrange cables to one side and away from the operator.

Transmission via the Supply Lead: Without adequate shielding and filtering, high frequency energy may be fed to the wiring within the installation (mains) by direct coupling. The energy is then transmitted by both radiation and conduction. Adequate shielding and filtering is provided in the Power Source.

Radiation from Welding Leads: Radiated interference from welding leads, although pronounced in the vicinity of the leads, diminishes rapidly with distance. Keeping leads as short as possible will minimise this type of interference. Looping and suspending of leads should be avoided wherever possible from body as practical.

Re-Radiation from Unearthed Metallic Objects: A major factor contributing to interference is reradiation from unearthed metallic objects close to the welding leads. Effective grounding of such objects will prevent re-radiation in most cases.

SECTION 4: OPERATION

4.01 OVERVIEW

Conventional operating procedures apply when using the Welding Power Source, i.e. connect work lead directly to workpiece and electrode lead is used to hold electrode (Consult the electrode manufacturers information for the correct polarity). The welding current range and plate thickness values should be used as a guide only. Current delivered to the arc is dependent on the welding arc voltage, and as welding arc voltage varies between different classes of electrode, welding current at any one setting would vary according to the type of electrode in use. The operator should use the welding current range values as a guide, then finally adjust the current setting to suit the application.

4.02 POWER SOURCE CONTROLS,INDICATORS AND FEATURES

Figure 4-1: Power Source Controls, Indicators and Features

1. Control Panel.
2. Remote Control Socket 8 Pin.
3. Positive Output Welding Terminal.
4. TIG Torch Shielding Gas Outlet.
5. Negative Output Welding Terminal.
6. Water Cooler Socket 14 Pin.
7. TIG Shielding Gas Inlet.
8. Power On/Off Switch.
9. Fan On Demand.

1 CONTROL PANEL

Figure 4-2: Control Panel

A. 5” LCD Touchscreen Display

The BlueVenom XF250 AC/DC SiC and BlueVenom XF320 AC/DC SiC are equipped with a 5” full colour LCD touchscreen display, enabling you to toggle through the many features and advanced settings with ease! In any welding mode the top of the screen displays the required input voltage for this device. The BlueVenom XF250 AC/DC Sic requires a 230V single phase input, while the BlueVenom XF250 AC/DC Sic requires a 400V three phase input.

B. USB Port – Software Update

This USB Port is used to update the welding machine’s software. Refer to the corresponding service manual on how to update the software.

C. Menu Button

The Menu Button is used to perform several different functions.

In any welding mode, press the Menu Button to first expand the available welding modes. The Control Knob can then be rotated to select the desired mode and then pressed to confirm. The Menu Button can continue to be pressed to cycle through and expand the available Mode Parameters and selected with the Control Knob in the same way.

In any welding mode the Menu Button can be pressed and held for 3 seconds to enter the System Settings screen. Press the button again to exit. Refer to section 4.03 for more information on the System Settings.

D. Left Button

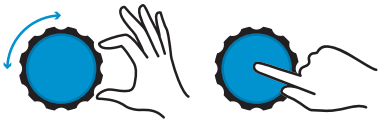
The Left Button is used to perform several different functions.

When in any welding mode, press the Left Button to cycle through the available Weld Parameters. This highlights the parameter and displays its value in the centre of the screen. Adjust the parameter by rotating the Control Knob. If left inactive for several seconds, the display will revert the back to the default option.

In the System settings screen, the Left Button can be pressed to scroll up through the available settings.

In the Save Settings screen, press the Left Button to delete a saved job. In the following confirmation screen the button can be pressed again to cancel, or the Right Button can be pressed to confirm.

E. Control Knob



The Control Knob is used to perform several different types of functions.

When in any welding mode, rotate the Control Knob to adjust the highlighted parameter’s value. If any Mode Parameter is expanded, rotate the Control Knob to highlight the desired option and press to confirm.

In the System Settings screen, rotate the Control Knob to adjust the system language or units of measurement when highlighted. If Factory reset is highlighted, press to reset the welding machine to factory settings.

In the Save Settings screen, rotate the Control Knob to scroll through the previously saved jobs.

F. Right Button

The Right Button is used to perform several different functions.

When in any welding mode, press the Right Button to cycle through the available Weld Parameters. This highlights the parameter and displays its value in the centre of the screen. Adjust the parameter by rotating the Control Knob. If left inactive for several seconds, the display will revert the back to the default option.

In the System settings screen, the Right Button can be pressed to scroll down through the available settings.

In the Save Settings screen, press the Right Button to load a saved job. If the Left Button is pressed to delete a saved job, the Right Button can be pressed to confirm deletion.

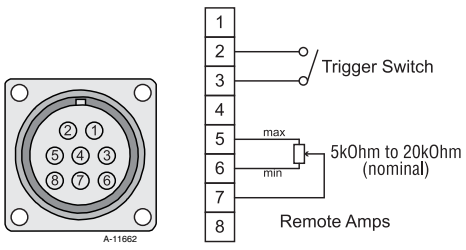
G. Save Button

The Save Button is used to save and load weld settings from memory. Press to enter the Save Settings screen and press again to exit. Hold the Save Button for 3 seconds to save the current settings to memory. Refer to section 4.04 for more information on Save Settings.

2 REMOTE CONTROL SOCKET 8 PIN

The 8 pin receptacle is used to connect a trigger switch or remote control to the welding Power Source circuitry:

To make connections, align keyway, insert plug, and rotate threaded collar fully clockwise. The socket information is included in the event the supplied cable is not suitable, and it is necessary to wire a plug or cable to interface with the 8 pin receptacle.



SOCKET PIN	DESCRIPTION
1	Not used
2	Trigger Switch Input
3	Trigger Switch Input
4	Not used
5	Remote Control Potentiometer Maximum
6	Remote Control Potentiometer Minimum
7	Remote Control Potentiometer Wiper
8	Not connected

3 POSITIVE OUTPUT WELDING TERMINAL

The positive welding terminal is used to connect the welding output of the power source to the appropriate welding accessory such as the Electrode Holder lead or Work Lead. Positive welding current flows from the power source via this twist & lock terminal, known as a DINSE Connector. It is essential, that the male plug is inserted and turned securely to achieve a sound electrical connection.

CAUTION

Loose welding terminal connections can cause overheating and result in the male plug being fused in the Dinse terminal.

4 TIG TORCH SHIELDING GAS OUTLET

The Shielding Gas Outlet located on the front panel is a 5/8"-18 UNF female gas fitting and is utilised for the connection of a suitable TIG Torch.

5 NEGATIVE OUTPUT WELDING TERMINAL

The negative welding terminal is used to connect the welding output of the power source to the appropriate welding accessory such as the TIG Torch or Work Lead. Most General Purpose electrodes are connected with work lead (Earth Clamp) to negative. Consult the electrode manufacturer's information for the correct polarity. Welding current flows from the workpiece via this twist & lock terminal, known as a DINSE Connector to the power source. It is essential, that the male DINSE type plug is inserted and turned securely to achieve a sound electrical connection.

CAUTION

Loose welding terminal connections can cause overheating and result in the male plug being fused in the Dinse terminal.

6 WATER COOLER SOCKET 14 PIN

The 14 pin receptacle is used to connect the compatible CoolVenom 4LTR water cooler to the welding Power Source. To make the connection, align the keyway, insert the plug, and rotate the threaded collar fully clockwise. Refer to section 4.05 for more information on the CoolVenom 4LTR water cooler.

7 TIG SHIELDING GAS INTLET

The Gas Inlet connection is used to supply the appropriate TIG welding gas to the unit. Refer to Section 5.05 for TIG setup details. Ensure that the shielding gas hose connection is sufficiently tight at the regulator connection and the quick connect fitting "locks" into place correctly on the rear of the power source.

8 POWER ON/OFF SWITCH

This Switch is located on the rear of the Power Source and turns mains power OFF and ON.

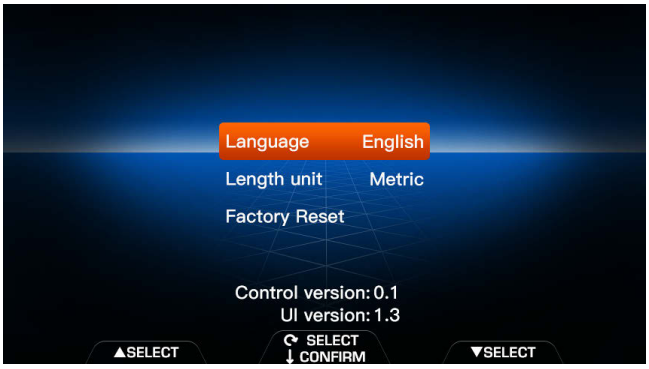
WARNING

When the front digital displays are lit, the machine is connected to the Mains supply voltage and the internal electrical components are at Mains voltage.

9 FAN ON DEMAND

The BlueVenom XF250 AC/DC and XF320 AC/DC are is fitted with a fan on demand feature. Fan on demand automatically switches the cooling fan off when it is not required. This has two main advantages; (1) to minimize power consumption, and (2) to minimise the amount of contaminants such as dust that are drawn into the power source. Note that the fan will only operate when required for cooling purposes and will automatically switch off when not required.

4.03 SYSTEM SETTINGS



While in any welding mode, press and hold the Setting Button for 3 seconds to enter the System Settings screen. Press the Left and Right Buttons to highlight the desired setting, then Rotate the Control Knob to adjust the setting. This screen cannot be accessed while in the Saved Settings screen. To exit the System Settings screen, press the Menu Button.

Language

With the Language setting highlighted, rotate the Control Knob to change to the desired language. The languages available are English, French, German, Italian and Spanish. The factory setting for language is English.

Unit

With the Length Unit setting highlighted, rotate the Control Knob to the left to change to the units to Metric and rotate to the right for Imperial. This setting changes the displayed Plate Thickness and Electrode Diameter units.

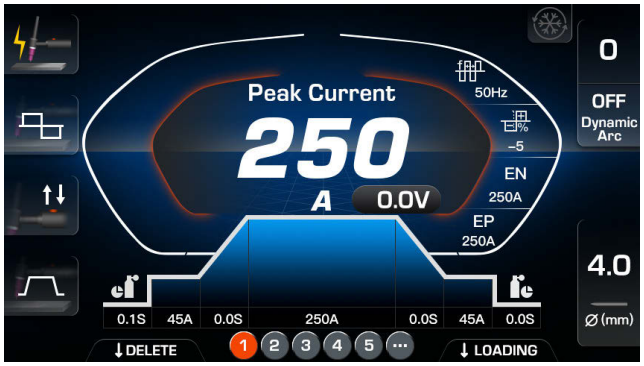
Factory Reset

With the Factory Reset setting highlighted, press the Control Knob to reset to factory settings. Note that this will also reset the system language, units and remove any jobs saved to memory.

Software Version

Below the adjustable settings the welding machine's software version is displayed.

4.04 SAVE SETTINGS



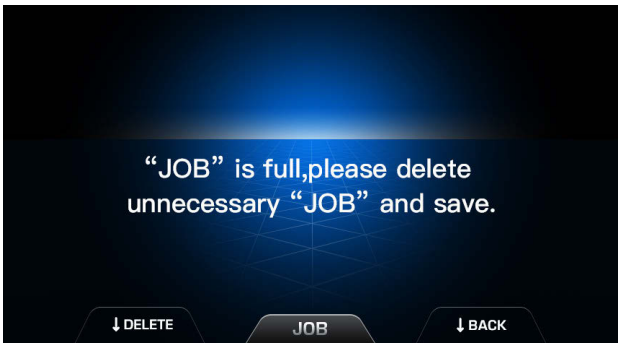
The BlueVenom XF250 AC/DC SiC and BlueVenom XF320 AC/DC SiC can save up to 100 jobs to memory.

To enter the Save Settings screen, press the Save Button while in any welding mode. This screen displays jobs saved to memory along with the job's Mode and Weld Parameters. This screen cannot be accessed while in the System Settings screen. To exit the Save Settings screen, press the Save Button.

Save Job

To save the current weld settings to memory, press and hold the Save Button until the Save Settings screen appears. The job will save to the next free memory slot. For example, if memory slots 1 and 3 are filled, the next job saved will fill memory slot 2.

If all 100 memory slots are full a screen will appear stating the memory is full and the job cannot be saved to memory.

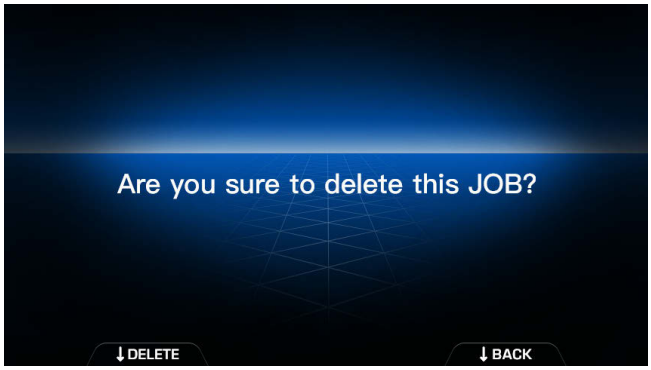


Load Job

To load a saved job from memory, enter the Saved Settings screen. Next rotate the Control Knob to scroll through the available jobs. With the desired job highlighted, press the Right Button to load the job.

Delete Job

To delete a saved job from memory, enter the Save Settings screen. Next rotate the Control Knob to scroll through the available jobs. With the desired job highlighted, press the Left Button and a screen to confirm the job deletion will be displayed. Press the Right Button to confirm deletion or the Left Button to cancel, returning to the Saved Settings screen.



4.05 COOLVENOM 4LTR WATER COOLER

The CoolVenom 4LTR water cooler (sold separately) is a TIG torch water cooler, compatible with the BlueVenom XF250 AC/DC and BlueVenom XF320 AC/DC.

The CoolVenom water cooler is designed to regulate the temperature of water cooled TIG torches during high-amperage or extended-duty welding applications. It continuously circulates coolant through the torch to dissipate heat, preventing overheating and ensuring stable welding performance.

Refer to the CoolVenom 4LTR operation manual for installation and operation processes.

4.06 START / END PARAMETERS

The BlueVenom XF250 AC/DC and BlueVenom XF320 AC/DC offer further control by allowing the operator to adjust the stand and end characteristics of TIG welds. An initial Pre Current can be set (preventing the electrode from sticking to the workpiece) and then slowly ramped to the peak current over the Up Slope time (reducing heat stress on the welding plate).

To end the weld the operator sets a Post Current and Down Slope time, slowly reducing the current and allowing the operator to fill any craters formed during welding. Figure 4-3 gives an overview of how each parameter affects the start and end of a weld. The parameters available depend on the TIG welding mode and trigger mode selected, refer to Section 5.02 for details.

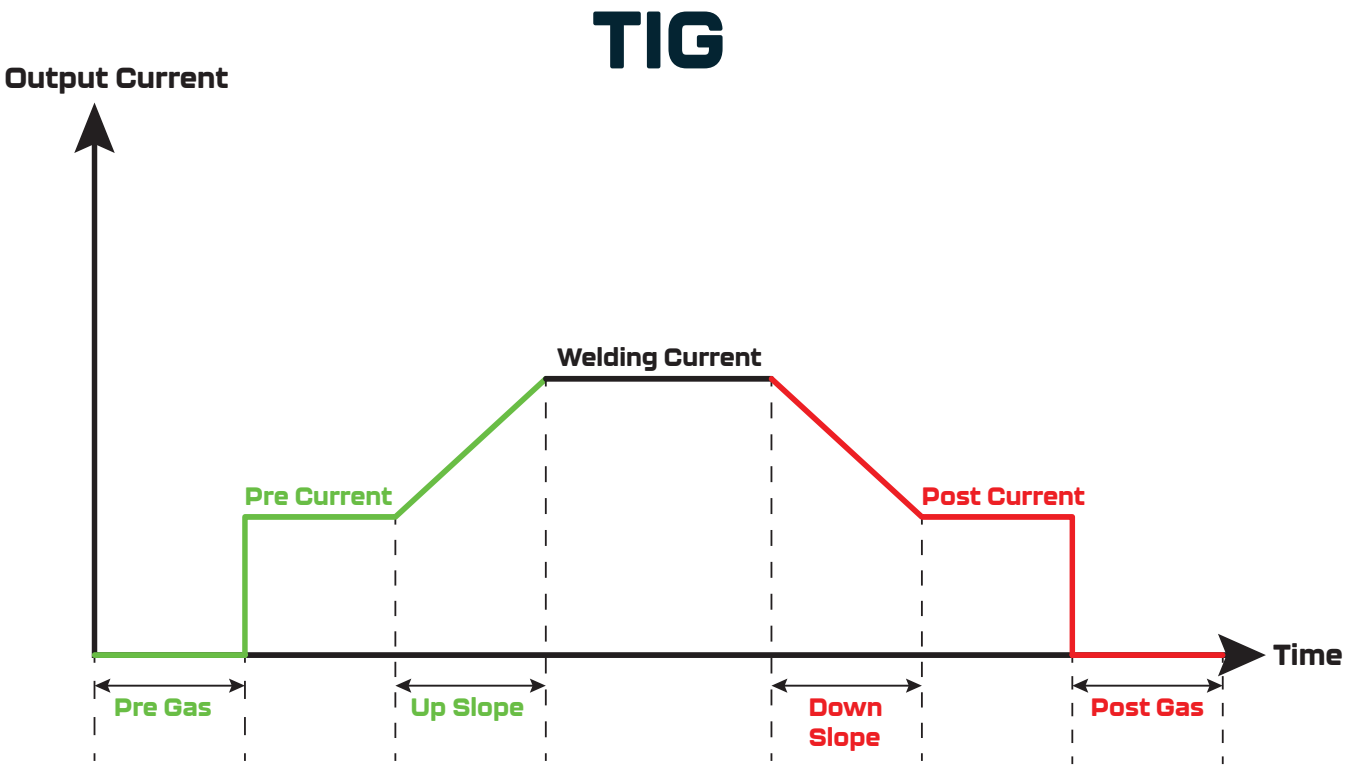


Figure 4-3: TIG - Start / End Parameters

SECTION 5:
TIG (GTAW) WELDING

5.01 TIG MODE SETUP

Figure 5-1: TIG Parameters

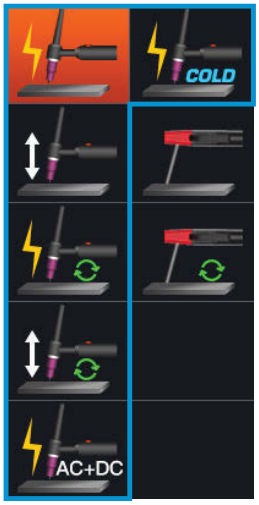


Figure 5-2: TIG Welding Modes

1 Mode Parameters

These two areas display the welding Mode Parameters. Press the MENU Button until the desired parameter is expanded. Rotate the Control Knob to scroll through the options and press to confirm. Refer to section 5.02 for the available TIG Mode Parameters. When entering a TIG mode a pop-up will appear, displaying the remote control options for TIG operation. The operator can select either a TIG Torch or Foot Pedal for remotely adjust the Welding Current. If using a Foot Pedal, the available Trigger Mode is limited to 2T.

2 Weld Parameters

This area displays the TIG mode's Weld Parameters, including Synergic, Mixed, AC and General Parameters. Press the Left and Right Parameter Buttons to cycle through the available parameters and rotate the Control Knob to adjust the highlighted parameter. Refer to section 5.03 for the available TIG Weld Parameters.

3 Torch Water Cooling

Water cooling to a compatible TIG torch is available on the BlueVenom XF250 AC/DC Sic and BlueVenom XF320 AC/DC Sic. To turn on/off water cooling, press the Menu Button until the icon is highlighted, then rotate and press the Control Knob to select the desired option. Refer to section 4.05 for more information on water cooling.

5.02 TIG - MODE PARAMETERS

PARAMETER	OPTIONS AVAILABLE	DESCRIPTION
TIG Mode	TIG Manual TIG Synergic TIG Mixed TIG Cold Weld	**TIG Manual** This is the standard mode found on most TIG welders. In this mode the operator has complete control over the Weld Control parameters **TIG Synergic** This mode utilizes pre-installed weld settings referred to as Synergic Lines. The operator simply selects the remaining Mode Parameters, and a recommended Welding current and Plate Thickness is set. **TIG Mixed** In this mode the output current switches between an AC waveform and direct current, mixing the cleaning properties of AC TIG and penetrating power of DC TIG. **TIG Cold Weld** Cold Welding uses ultra-short pulses to weld metals together. This generates less heat than traditional TIG welding, perfect for thin delicate metals.
Arc Start	HF LIFT	TIG Manual and TIG Synergic modes have the option of using a HF or Lift arc starting method. When selecting the TIG mode the symbol next to the TIG torch indicates the arc starting method. **HF** High frequency start (HF) creates an arc between the troch tip and work piece using a high-voltage / low-current pulse. The high voltage ionizes the air to create plasma, allowing the main arc to initiate. To initiate an arc, simply place the torch tip above the workpiece and press the torch trigger. **Lift** Lift-arc creates an arc by pressing the torch tip to the workpiece, pressing the trigger and then lifting the torch. The welder senses the low resistance between the torch tip and the workpiece, then as the torch is lifted and resistance increases, the output current begins to flow.

PARAMETER	OPTIONS AVAILABLE	DESCRIPTION
Trigger	2T 4T 8T* SPOT** MULTI**	**2T** In this mode, the trigger must remain depressed for the welding output to be active. Release the trigger switch to cease welding. **4T – Latch Mode** In this mode the operator can press and release the trigger begin welding. This is ideal for long weld periods to reduce strain and fatigue. Press and release the trigger again to cease welding. Additionally operator has control over the Pre and Post Current durations directly. When initiating the weld, the output will remain at the Pre Current as long as the trigger is held. When welding ends, the output will remain at the Post Current as long as the trigger is held. Releasing the trigger will begin the Up Slope process or stop welding respectively. **8T*** This mode acts the same as 4T mode with an additional Secondary Welding Current. A short trigger press will switch the output to the Secondary parameters, continue to short press to alternate between the primary and secondary parameters. To cease welding, hold the trigger until the machine reduces the output to the End Current or stops welding. **Single Spot**** This mode is used for Spot Welding. Press the trigger to output the Welding Current for a short interval. **Multi Spot**** This mode is used for continuous Spot Welding. Press and hold the trigger to repeatedly Spot Weld with a short interval between each Spot Weld. Release the trigger to cease welding. **Not available in TIG Mixed and TIG Cold Weld modes.* ***Only available in HF TIG Manual mode*
Waveform	DC Square Wave Square-Sine Square-Triangle Sine Wave Sine-Square Sine-Triangle Triangle Wave Triangle-Sine Triangle-Square	This the waveform of the output Welding Current. Select up to 9 different AC waveforms, offering greater control over the welding process. TIG Synergic mode only offers DC, square wave and sine wave.

PARAMETER	OPTIONS AVAILABLE	DESCRIPTION
Pulse	No Pulse Pulse Super Pulse	**Pulse** When enabled the output signal is pulsed between the Peak Current and Base Current. Utilizing the pulse function can improved weld quality, offering better control over the welding process, especially when working with challenging materials or in demanding welding applications. **Super Pulse** This mode functions the same as Pulse mode, while adding a boost to the rising edge of each pulse. This helps improve low-frequency pulse performance, below 10Hz. *Not available in TIG Cold Weld, Spot and Multi Spot modes*
Electrode Diameter	1.6mm 2.0mm 2.4mm 3.2mm 4.0mm	The Electrode Diameter parameter is used to set the Welding Current range. This ensures enough current is used to create a stable arc, but not so much as to damage the electrode.
Filler Material	SS/CS (DC) Bronze/SilBrnz (DC) Al 5356 (Square Wave) Al 4043 (Square Wave) Al (Sine Wave)	The Filler Material parameter is used to set the Synergic Welding Current and Plate Thickness to ensure a reliable weld. The options available depend on the output waveform selected. *Only available in TIG Synergic mode.*
Joint Type	Fillet Weld Lap Weld Butt Weld Vertical Weld	The Joint Type parameter is used to set the Synergic Welding Current and Plate Thickness to ensure a reliable weld. *Only available in TIG Synergic mode.*

Table 5-1: TIG Mode Parameters

5.03 TIG - WELD PARAMETERS

Figure 5-3: TIG Parameters

1 TIG Synergic/Mixed Parameters

This area displays the Synergic Parameters if HF/Lift TIG Synergic mode is selected, or the Mixed Parameters if TIG Mixed mode is selected.

SYNERGIC PARAMETERS

PARAMETER	OPTIONS AVAILABLE	DESCRIPTION
Joint Type	Fillet Weld Lap Weld Butt Weld Vertical Weld	The Joint Type parameter is used to set the Synergic Welding Current and Plate Thickness to ensure a reliable weld.
Filler Material	SS/CS (DC) Bronze/SilBrnz (DC) Al 5356 (Square Wave) Al 4043 (Square Wave) Al (Sine Wave)	The Filler Material parameter is used to set the Synergic Welding Current and Plate Thickness to ensure a reliable weld. The options available depend on the output waveform selected.
Plate Thickness	N/A	TIG Synergic mode displays a recommended Plate Thickness for the set weld parameters. This parameter cannot be directly adjusted, intended to be used as a reference, and changes based on the Joint Type, Filler Material and Electrode Diameter.

MIXED PARAMETERS

PARAMETER	VALUE RANGE	DEFAULT VALUE	DESCRIPTION
AC Time	0.01 – 1.00s	0.10s	AC Time is the amount of time the output current operates as the selected AC Waveform.
DC Time	0.01 – 1.00s	0.10s	DC Time is of amount of time the output current operates as direct current.

2 AC Waveform Parameters

AC Parameters are displayed if an AC waveform is selected on any TIG mode.

AC WAVEFORM PARAMETERS			
PARAMETER	**VALUE RANGE**	**DEFAULT VALUE**	**DESCRIPTION**
AC Frequency	50 – 250Hz	50Hz	AC Frequency adjusts the frequency of the selected AC Waveform. Low frequencies below 100Hz produce a wider arc cone and more heat, suitable for thick materials. Higher frequencies above 150Hz produce a focused narrow arc, suitable for thin materials.
Balance	-5 – 5	0	Balance is used for aluminium welding in AC TIG mode, adjusting the duty cycle of the output waveform. Increasing the value increases the AC outputs cleaning actions, whereas decreasing the value increases weld penetration.
Electrode Negative	Min – Max Current	Peak Current	Electrode Negative allows precise control of the output current when the AC Waveform is in negative polarity. Adjusting this value will also adjust the Peak Current in response.
Electrode Positive	Min – Max Current	Peak Current	Electrode Positive allows precise control of the output current when the AC Waveform is in positive polarity. Adjusting this value will also adjust the Peak Current in response.

3 General Weld Parameters

This section is present for each welding mode, and available options depend on the Mode Parameters selected.

GENERAL WELD PARAMETERS			
PARAMETER	**VALUE RANGE**	**DEFAULT VALUE**	**DESCRIPTION**
Pre Gas	0.0 – 2.0s	0.3s	Pre Gas is a short burst of shielding gas prior to the arc initiating, reducing the risk of contamination at the start of the weld.
Pre Current*	Min – Max Current	30A	Pre Current is the output current after a weld is first initiated. This often set higher than the Welding Current, preventing the electrode from sticking and ensuring adequate fusion while the weld plate is still cool. Refer also Section 4.06. **Pre Current is a fixed value in TIG Synergic mode.*

GENERAL WELD PARAMETERS			
PARAMETER	**VALUE RANGE**	**DEFAULT VALUE**	**DESCRIPTION**
Up Slope	0.0 – 10.0s	0.0s	Up Slope is the time it takes to adjust the output current from the Pre Current to the Peak Current. This is used to reduce the heat stress placed on the welding plate. Refer also Section 4.06.
Peak Current	Min – Max Current	50A	Peak Current is the Welding Current, and in pulsed mode this is the higher current of the Pulse Cycle. The Peak Current in the pulse cycle generates more heat, allowing for better fusion and penetration into the base metal.
Secondary Peak Current	Min – Peak Current	Peak Current	Secondary Peak Current is the alternate Peak Current in 8T Trigger Mode. *Only available in 8T Trigger Mode.*
Base Current	Min – Peak Current	30A	Base Current is the lower current of the Pulse Cycle. It helps reduce heat buildup, minimizing the risk of distortion and burn-through. *Only available if pulse is enabled*
Secondary Base Current	Min - Base Current	Base Current	Secondary Base Current is the alternate Base Current in 8T Trigger Mode. *Only available in 8T Trigger Mode.*
Pulse Frequency	0.5 – 999Hz	1Hz	Pulse Frequency is the number of times per second that the output current cycles between the Peak Current and Base Current. Higher frequencies result in more rapid cycling between the two current levels. *Only available if pulse is enabled.*
Pulse Width	15 – 95%.	50%	Pulse Width is the amount of time the output current remains at the Peak Current level before returning to the Base Current level. This is measured as a percentage of the Pulse Frequency. *Only available if pulse is enabled.*
Down Slope	0.0 – 10.0s	0.0s	Down Slope is the time it takes to reduce the Peak Current to the Post Current when welding has ended. This time is often used to fill the crater and smoothly finish the weld. Refer also Section 4.06.

GENERAL WELD PARAMETERS			
PARAMETER	**VALUE RANGE**	**DEFAULT VALUE**	**DESCRIPTION**
Post Current*	Min – Max Current	50A	Post Current is the ending output current, used to fill the weld joint and avoid creating a crater at the end of the weld. Refer also Section 4.06. **Post Current is a fixed value in TIG Synergic mode.*
Post Gas	0.0 – 5.0s	2.0s	Post Gas continues to emit shielding gas after welding has ended, reducing the risk of contamination at the end of the weld.
Dynamic Arc ON/OFF	On/Off	Off	Dynamic Arc permits the output current to change in response to arc voltage fluctuations. This is used to maintain consistent heat input as arc length varies. *Not available if using pulse, mixed waveforms, spot welding or TIG COLD modes.*
Dynamic Arc Value	1 – 100A/V	1A/V	Dynamic Arc Value permits the output current to change, per change of 1V. For example, with a Dynamic Arc Value of 20A/V if the machine senses a 1V increase to the arc voltage, the output current will reduce by 20A to compensate. *Not available if using pulse, mixed waveforms, spot welding or TIG COLD modes.*
Time On	0.1 – 10s (Single Spot) 0.1 – 10s (Multi Spot) 0.1 – 10s (TIG Cold Spot)	0.1s (Spot/Multi Spot) 0.02s (TIG Cold Weld)	Time On sets the duration of the welding time in Spot, Multi Spot and TIG Cold Weld modes. The maximum duration depends on the mode being used. *Only available in Spot, Multi Spot and TIG Cold Weld modes.*
Time Off	0.1 – 10s	0.1s	Time Off sets the duration between welds (where the machine is not welding) in Multi Spot and TIG Cold Weld modes. *Only available in Multi Spot and TIG Cold Weld modes.*

Table 5-2: TIG Weld Parameters

5.04 TIG WELDING BASICS

Gas Tungsten Arc Welding (GTAW) or TIG (Tungsten Inert Gas) as it is commonly referred to, is a welding process in which fusion is produced by an electric arc that is established between a single tungsten (non-consumable) electrode and the work piece. Shielding is obtained from a welding grade shielding gas or welding grade shielding gas mixture which is generally Argon based. A filler metal may also be added manually in some circumstances depending on the welding application.

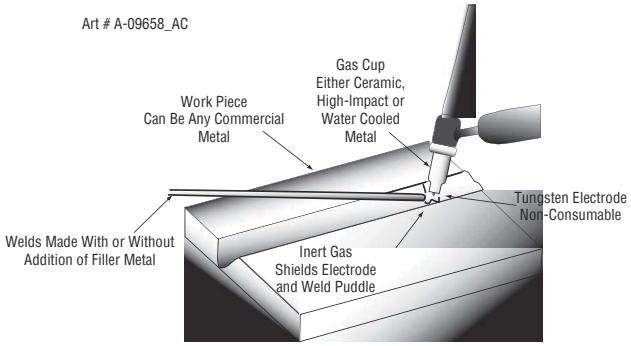


Figure 5-4: TIG Welding Application Shot

TYPES OF WELDING JOINTS

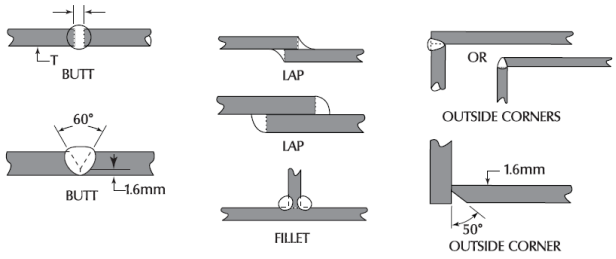


Figure 5-5: Welding Joints

GENERAL GUIDE FOR TIG WELDING

METAL THICKNESS	JOINT TYPE	TUNGSTEN ELECTRODE DIAMETER	FILLER ROD DIAMETER (IF REQUIRED)	AMPERAGE	ARGON GAS FLOW RATE AMPERAGE (L/MIN*)
1.0mm	Butt / Corner Lap / Fillet	1.0mm	1.6mm	30 - 45 35 - 50	5 - 7
1.2mm	Butt / Corner Lap / Fillet	1.0mm	1.6mm	40 - 60 45 - 70	5 - 7
1.6mm	Butt / Corner Lap / Fillet	1.6mm	1.6mm	60 - 85 70 - 95	7
3.2mm	Butt / Corner Lap / Fillet	2.4mm 3.2mm	2.4mm	125 - 150 130 - 160	10
5.0mm	Butt / Corner Lap / Fillet	3.2mm 4.0mm	3.2mm	180 - 225 190 - 240	10
6.0mm	Butt / Corner Lap / Fillet	4.0mm 4.8mm	4.8mm	240 - 280 250 - 320	13

*Flow rates are for welding grade argon only, see manufacturers' recommendations for mixtures. Size and shape of gas nozzle has an effect on the flow required for effective gas cover.

Table 5-3: TIG Welding Guide

CIGWELD TIG WELDING FILLER RODS SELECTION CHART

DESCRIPTION	CLASS.	DIA.	PACK	PART NO	APPLICATION
COMWELD SUPER STEEL	R2 (AUS/NZ STD) ER70S-2 (AWS STD)	1.6mm 2.4mm	5kg Pack 5kg Pack	321370 321373	Comweld Super Steel is a copper coated 'triple deoxidised' steel welding rod recommended for the high quality Gas Tungsten Arc (TIG) welding of carbon and carbon-Manganese steels. Comweld Super Steel is deoxidised with Titanium, Aluminium and Zirconium in addition to Manganese and Silicon for improved weld deposit quality. It is the ideal choice for TIG welding rusty or mill scaled plates and pipes and the root pass welding of pipes, tanks and heavy walled root toughness and radiographic soundness are achieved under high dilution.
COMWELD LW1-6	R6 (AUS/NZ STD) ER70S-6 (AWS STD)	1.6mm 2.4mm	5kg Pack 5kg Pack	321417 321418	Comweld LW1-6 is a copper coated, low carbon steel filler rod suitable for Gas Tungsten Arc (TIG) welding of a wide range of mild and medium strength steels. Comweld LW1-6 is recommended for the TIG welding of steel pipes, plates and castings with a tensile strength in the 500 MPa class. It is tolerant to surface rust and mill scale and is ideal for root pass welding applications where tough and ductile welds are produced. Please Note: A suitable shielding gas is required
COMWELD 308L	R308L (AUS/NZ STD) ER308L (AWS STD)	1.6mm 2.4mm	5kg Pack 5kg Pack	321406 321407	Comweld 308L stainless steel is a high quality low carbon rod for the Gas or Gas Tungsten Arc (TIG) welding of a wide range of low carbon and stabilised 300 series stainless steels. It is recommended for the critical welding of 304 and 304L stainless steels in corrosion resistant and cryogenic applications.
COMWELD 309L	R309L (AUS/NZ STD) ER309L (AWS STD)	1.6mm 2.4mm	5kg Pack 5kg Pack	321403 321404	Comweld 309L stainless steel is a high quality low carbon rod for the Gas or Gas Tungsten Arc (TIG) welding of highly alloyed 309 or 309L type stainless steels. Comweld 309L is also suitable for the dissimilar joining of other 300 series austenitic stainless steels to ferritic steels.
COMWELD 316L	R316L (AUS/NZ STD) ER316L (AWS STD)	1.6mm 2.4mm	5kg Pack 5kg Pack	321400 321401	Comweld 316L stainless steel is a high quality low carbon rodfor the Gas or Gas Tungsten Arc (TIG) welding of Molybdenum bearing stainless steels; in particular matching 316 and 316L alloys. Comweld 316L is also suitable for the general welding of other 300 series stainless steels including 302 and 304; as well as ferritic stainless steels grades such as 409, 444 and 3Cr12.

CIGWELD TIG WELDING FILLER RODS SELECTION CHART					
DESCRIPTION	**CLASS.**	**DIA.**	**PACK**	**PART NO**	**APPLICATION**
COMWELD 316LSI	R316LSi (AUS/NZ STD) ER316LSi (AWS STD)	1.6mm 2.4mm	5kg Pack 5kg Pack	321426 321427	Comweld 316LSi is a bare, corrosion-resistant, chromiumnickel-molybdenum rod for welding austenitic stainless alloys of the 18% Cr-8% Ni and 18% Cr-10% Ni-3% Mo types. Comweld 316LSi has good general corrosion resistance, particularly to corrosion in acid and chlorinated environments. The alloy has a low carbon content which makes it particularly recommended when there is a risk of intergranular corrosion. The higher silicon content improves the welding properties such as wetting. The alloy is widely used in the chemical and food-processing industries, as well as in shipbuilding and various types of architectural structure.
COMWELD AL5356	R5356 (AUS/NZ STD) ER5356 (AWS STD)	1.6mm 2.4mm 3.2mm	2.5kg Pack 2.5kg Pack 2.5kg Pack	321640 321641 321642	Comweld AL5356 is a high quality, Aluminium - nominal 5% Magnesium alloy rod suitable for the Gas or Gas Tungsten Arc (TIG) welding of a wide range of cast and wrought Aluminium alloys.It produces intermediate deposit strength and good ductility and corrosion resistance for the Gas or Gas Tungsten Arc Welding (GTAW / TIG) of a wide rangeof 3XXX, 5XXX, 6XXX and 5XX Aluminium alloys. See CIGWELD Aluminium Alloy Selection Chart for detailed welding consumable selection criteria for a wide range of Aluminium alloy parent metals.
COMWELD AL4043	R4043 (AUS/NZ STD) ER4043 (AWS STD)	1.6mm 2.4mm 3.2mm	2.5kg Pack 2.5kg Pack 2.5kg Pack	321610 321611 321612	Comweld AL4043 is a premium quality Aluminium - nominal 5% Silicon alloy rod used extensively for the repair welding (fractures and blow holes etc) of selected aluminium alloy castings. Its lower weld deposit strength and excellent crack resistance make it suitable for the Gas or Gas Tungsten Arc (GTAW / TIG) welding of cast (mainly 4XX & 6XX series) alloys and wrought (selected 1XXX, 5XXX & 6XXX series) aluminium alloys, except where an accurate colour match is required after anodising.

Table 5-4: Welding Filler Rods Selection Chart

TIG Welding is generally regarded as a specialised process that requires operator competency. While many of the principles outlined in the previous Arc Welding section are applicable a comprehensive outline of the TIG Welding process is outside the scope of this Operating Manual. For further information please refer to **cigweld.com.au** or contact **Cigweld.**

5.05 TIG REGULATOR/ FLOWMETER

SHIELDING GAS CONNECTION

WARNING

This equipment is designed for use with welding grade (Inert) shielding gases only.

A Preset Argon Regulator/Flowmeter and Gas Hose Kit comes with the machine plant. Connect the gas regulator onto the gas cylinder/bottle by hand, keeping the round sight gauge in the vertical position. Then tighten the nut with a spanner, but do-not over tighten. Connect the gas hose to the threaded outlet on the regulator (Figure 5-3) and tighten with a spanner. Connect the other end of the gas hose to gas inlet fitting on the rear panel of the welding machine using the supplied Quick Connect fittings. Check for any leaks with soapy water in a squeeze bottle, and look for bubbles (when the gas is on), this will highlight any gas leaks.

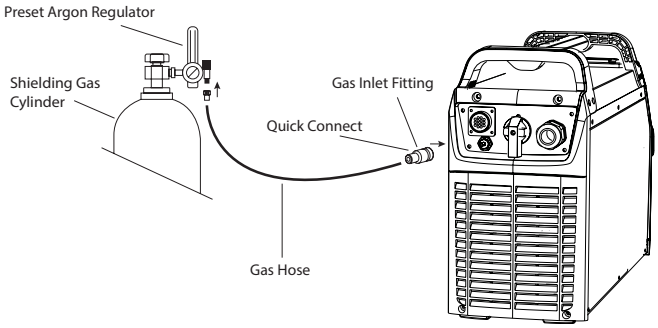


Figure 5-6: Fit Regulator/flowmeter to Cylinder

This regulator/flowmeter is designed to reduce and control high pressure gas from a cylinder or pipeline to the working pressure required for the equipment using it.

If the equipment is improperly used, hazardous conditions are created that may cause accidents. It is the users responsibility to prevent such conditions. Before handing or using the equipment, understand and comply at all times with the safe practices prescribed in this instruction.

SPECIFIC PROCEDURES for the use of regulators/ flowmeters are listed below.

1. **NEVER** subject the Regulator/Flowmeter to an inlet pressure greater than its rated inlet pressure.
2. **NEVER** pressurize a Regulator/Flowmeter that has loose or damaged parts or is in a questionable condition. NEVER loosen a connection or attempt to remove any part of a Regulator/Flowmeter until the gas pressure has been relieved. Under pressure, gas can dangerously propel a loose part.
3. **DO NOT** remove the Regulator/Flowmeter from a cylinder without first closing the cylinder valve and releasing gas in the Regulator/Flowmeter high and low pressure chambers.
4. **TURN OFF** When equipment is not in use for extended periods of time, shut off the gas at the cylinder valve and release the gas from the equipment.
5. **OPEN** the cylinder valve SLOWLY. Close after use.

CAUTION

Match regulator/flowmeter to cylinder. NEVER CONNECT a regulator/flowmeter designed for a particular gas or gases to a cylinder containing any other gas.

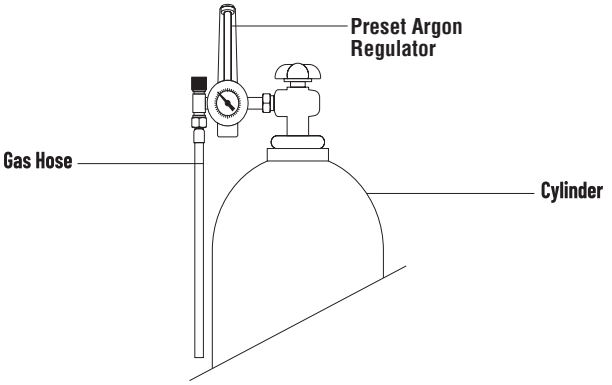


Figure 5-7: Fit Regulator/flowmeter to Cylinder

INSTALLATION

1. Remove cylinder valve plastic dust seal. Clean the cylinder valve outlet of impurities that may clog orifices and damage seats before connecting the Regulator/Flowmeter. Crack the valve (open then close) momentarily, pointing the outlet away from people and sources of ignition. Wipe with a clean lint free cloth.
2. Match Regulator/Flowmeter to cylinder. Before connecting, check that the Regulator/Flowmeter label and cylinder marking agree and that the Regulator/Flowmeter inlet and cylinder outlet match. NEVER CONNECT a Regulator/Flowmeter designed for a particular gas or gases to a cylinder containing any other gas.
3. Connect the Regulator/Flowmeter inlet connection to cylinder or pipeline and tighten it firmly but not excessively, with a suitable spanner.
4. Connect and tighten the outlet hose firmly and attach the hose to the welding machine with the Quick Connect fitting. Ensure no gas leakage. The flowmeter must be in the vertical position to read accurately.
5. The regulator/flowmeter has a self-reseating relief valve– not designed to protect downstream equipment. To protect sensitive downstream equipment a separate safety device may be necessary.

OPERATION

With the Regulator/Flowmeter connected to cylinder or pipeline:

1. Stand to one side of Regulator/Flowmeter and slowly open the cylinder valve. If opened quickly, a sudden pressure surge may damage internal Regulator/Flowmeter parts.
2. Since the regulator is a preset type, no adjustments to the regulator are necessary. Before opening the cylinder valve, be sure that the flow adjusting valve is in a finger-tight “OFF” position (clockwise).
3. Slowly and carefully, open the cylinder valve until the maximum pressure registers on the high pressure gauge.

CAUTION

DO NOT purge oxidising or flammable gases in the presence of flame, lit cigarettes, or other sources of ignition or in a confined space.

Close equipment valve(s) after purging, and test all connections for leaks with a suitable leak detection solution or soapy water. Never use a flame when testing for leaks.

ADJUSTING FLOW RATE

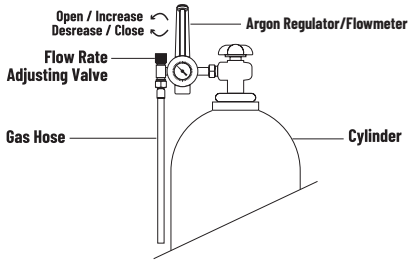


Figure 5-8: Adjust Flow Rate

With the Regulator/Flowmeter ready for operation, adjust working flow rate as follows:

1. Slowly turn adjusting valve in anti-clockwise direction to open and increase until the bobbin in the flow tube indicates the required flow rate.

NOTE

It may be necessary to re-check the shielding Gas Regulator/Flowmeter flow rate following the first weld sequence due to back pressure present within shielding gas hose assembly.

2. To reduce flow rate, allow the welding grade shielding gas to discharge from regulator by opening the downstream valve. Bleed welding grade shielding gas into a well ventilated area and away from any ignition source. Turn adjusting screw clockwise, until the required flow rate is indicated on the gauge. Close downstream valve.

SHUTDOWN

Close cylinder valve whenever the Regulator/ Flowmeter is not in use. To shut down for extended periods (more than 30 minutes).

1. Close cylinder valve tightly.
2. Remove the gas from the machine and hose by pressing the Gas Purge button on the front of the machine, or by pressing the trigger on the MIG Gun. Bleed gas into a well ventilated area.
3. After gas is drained completely turn off the machine.
4. Before transporting cylinders that are not secured on a cart designed for such purposes, remove regulators/flowmeters.

5.06 TIG WELDING

A. Select a TIG mode with the process selection control (refer to Section 5.01 for further information).

B. Connect the TIG Torch to the negative welding terminal (-). Refer to Note below for Optional TIG Torch information. Welding current flows from the power source via Dinse type terminals. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

C. Connect the TIG torch trigger switch and remote current control if applicable via the 8 pin socket located on the front of the Power Source. The TIG torch will require a trigger switch to weld in TIG Mode.

D. Connect the work lead to the positive welding terminal (+). Welding current flows from the Power Source via Dinse type terminals. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

E. Connect the Argon Regulator/Flowmeter to the Welding Grade Argon Shielding Gas Cylinder then connect the TIG Torch gas hose to regulator. Before turning on shielding gas check that all fittings are tight and the gas valve on the TIG torch is turned off. Before commencing to TIG weld open TIG torch gas valve to allow sufficient shielding gas flow when welding. Refer to Section 5.04 for recommended Shielding Gas flow rates and other TIG Welding information.

WARNING

Secure the welding grade shielding gas cylinder in an upright position by chaining it to a suitable stationary support to prevent falling or tipping.

Open Gas Cylinder Valve carefully.

WARNING

Before connecting the work clamp to the work piece and inserting the electrode in the TIG torch make sure the Mains power supply is switched OFF.

CAUTION

Remove any packaging material prior to use. Do not block the air vents at the front or rear of the Welding Power Source.

NOTE

If the TIG torch has a trigger switch or a remote TIG torch current control fitted then it will require to be connected to the 8 pin socket. (Refer to section 4.02.2 Remote Control Socket for further information).

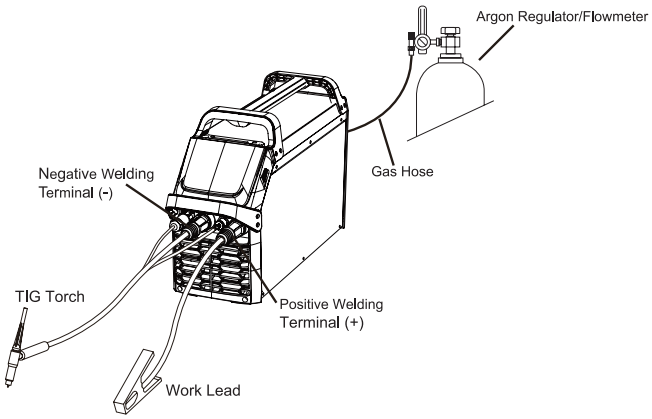


Figure 5-9: Setup For TIG (GTAW) Welding

5.07 TIG WELDING ISSUES - CAUSE & REMEDY

FAULT	CAUSE	REMEDY
Excessive bead build up or poor penetration or poor fusion at edges of weld.	Welding current is too low.	Increase weld current and/or faulty joint preparation.
Weld bead too wide and flat or undercut at edges of weld or excessive burn through.	Welding current is too high.	Decrease weld current.
Weld bead too small or insufficient penetration or ripples in bead are widely spaced apart.	Travel speed too fast.	Increase travel speed.
Weld bead too wide or excessive bead build up or excessive penetration in butt joint.	Travel speed too slow.	Increase travel speed.
Uneven leg length in fillet joint.	Wrong placement of filler rod.	Re-position filler rod.
Electrode melts or oxidises when an arc is struck.	A. Torch lead connected to positive welding terminal.	A. Connect torch lead to negative welding terminal.
	B. No shielding gas flowing to welding region.	B. Check the shielding gas lines for kinks or breaks and shielding gas cylinder contents.
	C. Torch is clogged with dust or dirt.	C. Clean torch.
	D. Shielding gas hose is damaged.	D. Replace shielding gas hose.
	E. Shielding gas regulator turned off.	E. Turn On Shielding Gas and adjust Shielding Gas flow rate for the welding job.
	F. The electrode is too small for the welding current.	F. Increase electrode diameter or reduce the welding current.
Dirty weld pool	A. Electrode contaminated by contact with work piece or filler rod material.	A. Clean the electrode by grinding off the contaminates.
	B. Work piece surface has foreign material on it.	B. Clean surface.
	C. Shielding gas contaminated with air.	C. Check shielding gas lines for cuts and loose fitting or change shielding gas cylinder.
Poor weld finish	Inadequate shielding gas.	A. Increase shielding gas flow or check shielding gas line for shielding gas flow problems.

FAULT	CAUSE	REMEDY
Arc start is not smooth.	A. Tungsten electrode is too large for the welding current.	A. Select the right size tungsten electrode. Refer to Table 5-3 Cigweld Tungsten Electrode Selection Chart.
	B. The wrong electrode is being used for the welding job.	B. Select the right size tungsten electrode type. Refer to Table 5-3 Cigweld Tungsten Electrode Selection Chart.
	C. Shielding gas flow rate is too high.	C. Select the right shielding gas flow rate for the welding job.
	D. Incorrect shielding gas is being used.	D. Select the correct shielding gas.
	E. Poor work clamp connection to work piece.	E. Improve connection to work piece.
Arc flutters during TIG welding.	A. Tungsten electrode is too large for the welding current.	A. Select the right size tungsten electrode. Refer to Table 5-3 Cigweld Tungsten Electrode Selection Chart.

Table 5-5: TIG (GTAW) Welding Problems

SECTION 6:
MMA (STICK) WELDING

6.01 MMA (STICK) MODE SETUP

Figure 6-1: MMA Parameters

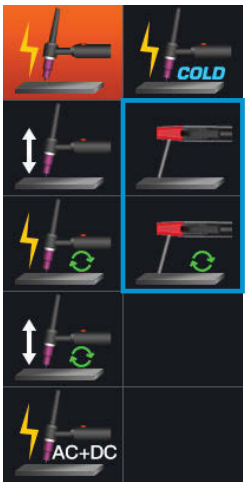


Figure 6-2: MMA Welding Modes

1 Mode Parameters

These two areas display the welding Mode Parameters. Press the Menu Button until the desired parameter is expanded. Rotate the Control Knob to scroll through the options and press to confirm. Refer to section 6.02 for the available MMA Mode Parameters.

2 Weld Parameters

This area displays the TIG mode's Weld Parameters. Press the Left and Right Parameter Button to scroll through the available options and rotate the Control Knob to adjust the highlighted parameter. Refer to Section 6.03 for the available Weld Parameters.

3 VRD Indicator

Green VRD text will be displayed at the top of the screen when the Voltage Reduction Device is active. When inactive the text will disappear.

VRD activates when no arc is present and while the output terminals are live. VRD reduces the Open Circuit Voltage below 35V to reduce the risk of electric shock if the operator comes into contact with the welding terminals or electrodes. When a welding arc is present, VRD deactivates as to not impede welding performance.

6.02 MMA (STICK) MODE PARAMETERS

PARAMETER	OPTIONS AVAILABLE	DESCRIPTION
MMA Mode	MMA Manual MMA Synergic	**MMA Manual** This is the standard mode found on most MMA welders. In this mode the operator has complete control over the Weld Control parameters. **MMA Synergic** Utilizes pre-installed weld settings referred to as Synergic Lines. The operator simply selects the remaining Electrode Diameter, Electrode Material, Joint Type, and a recommended Welding current and Plate Thickness is set.
Pulse	On Off	When enabled the output signal is pulsed between the Peak Current and Base Current. Utilizing the pulse function can improved weld quality, offering better control over the welding process, especially when working with challenging materials or in demanding welding applications.
Electrode Diameter	1.6mm 2.0mm 2.4mm 3.2mm 4.0mm	The Electrode Diameter parameter is used to set the Synergic Welding Current and Plate Thickness to ensure an optimal weld. The available options are dependent on the Electrode Material selected.

Table 6-1: MMA (Stick) Mode Parameters

6.03 MMA (STICK) WELD PARAMETERS

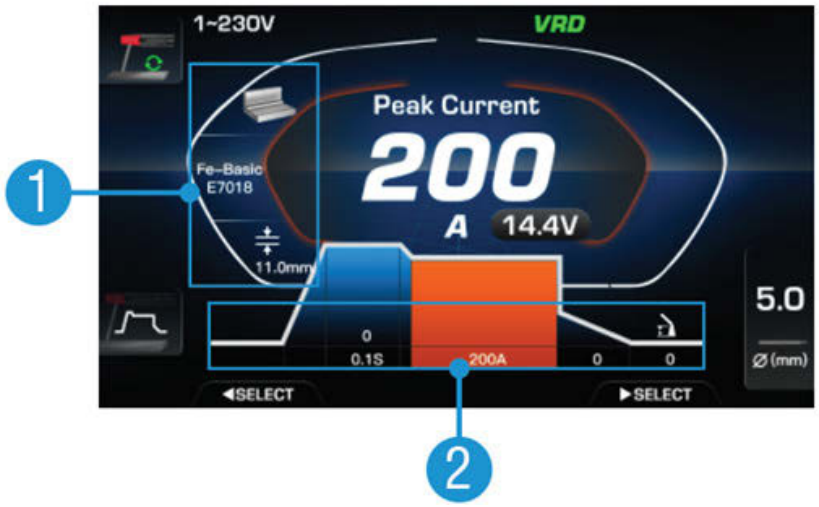


Figure 6-3: MMA Weld Parameters

1 MMA Synergic Parameters

This area displays the Synergic Parameters if MMA Synergic mode is selected.

MMA SYNERGIC PARAMETERS		
PARAMETER	**OPTIONS AVAILABLE**	**DESCRIPTION**
Joint Type	Fillet Weld Lap Weld Butt Weld Vertical Weld Horizontal Weld	The Joint Type parameter is used to set the Synergic Welding Current and Plate Thickness to ensure a reliable weld, based on the joining method used.
Electrode Material	CS-Low H E7018 CS-Rutile E6013 SS E316L/E308L	The Electrode Material parameter is used to set the Synergic Welding Current and Plate Thickness to ensure a reliable weld, based on the material's properties.
Plate Thickness	N/A	MMA Synergic mode displays a recommended Plate Thickness for the set weld parameters. This parameter cannot be directly adjusted, intended to be used as a reference, and changes based on the Joint Type, Electrode Material and Electrode Diameter.

2 General Weld Parameters

This section is present for each welding mode, and available options depend on the Mode Parameters selected.

GENERAL WELD PARAMETERS			
PARAMETER	**VALUE RANGE**	**DEFAULT VALUE**	**DESCRIPTION**
Hot Start	0 – 10	0	The Hot Start improves the arc start characteristics by momentarily increasing the output current to a high level, preventing the electrode from sticking. Refer also Section 4.06.
Hot Start Time	0.0 – 2.0s	0.1s	Hot Start Time is the time in seconds that the Hot Start setting will run for.
Welding Current	10A – Max Current	50A	Welding Current is the current output to the electrode. If pulse is enabled this is the higher current of the pulse cycle, generating more heat, allowing for better fusion and penetration into the base metal.
Base Current	10A – Peak Current	10A	Base Current is the lower current of the Pulse Cycle. It helps reduce heat buildup, minimizing the risk of distortion and burn-through. *Only available when pulse is enabled*
Pulse Width	15 – 95%.	50%	Pulse Width is the amount of time the output current remains at the Peak Current level before returning to the Base Current level. This is measured as a percentage of the Pulse Frequency. *Only available when pulse is enabled*
Pulse Frequency	0.5 – 300Hz	1Hz	Pulse Frequency is the number of times per second that the output current cycles between the Peak Current and Base Current. Higher frequencies result in more rapid cycling between the two current levels. *Only available when pulse is enabled*
Arc Force	0 – 10	0	Arc Force provides an automatic boost to the Welding Current when the electrode gets too close to the work piece. This assists in stabilizing the arc, preventing the arc from cutting out and the electrode sticking.
Arc Length	-10 – 0	0	Arc Length adjusts the length of the welding arc, determining the width and size of the arc cone. As Arc Length decreases, the Arc Cone becomes narrower, the arc is more focused resulting in a smaller weld bead. Conversely, as Arc Length increases, the arc cone becomes wider resulting in a larger, flatter weld bead.

Table 6-2: MMA (Stick) Weld Parameters

6.04 STICK WELDING BASICS

Metal arc welding electrodes consist of a core wire surrounded by a flux coating. This flux coating, applied to the core wire by an extrusion process, serves the following key functions:

A. To provide a gaseous shield for the weld metal, preserving it from contamination by the atmosphere whilst in a molten state.

B. To steady the arc by providing an arc stabilising bridge for the flow of the welding current.

C. To provide deoxidisers for the removal of oxygen from the weld metal and weld pool.

D. To provide a cleansing action on the work piece and a protective slag cover over the weld metal to prevent the formation of oxides while the metal is solidifying. The slag also helps to produce a bead of the desired contour.

E. To introduce alloys into the weld deposits in special type electrodes.

Stick Electrode Types

Arc Welding electrodes are classified into a number of groups depending on their applications. There are a great number of electrodes used for specialised industrial purposes which are not of particular interest for everyday general work. These include some low hydrogen types for high tensile steel, cellulose types for welding large diameter pipes, etc. The range of electrodes dealt with in this publication will cover the vast majority of applications likely to be encountered; are all easy to use and all will work on even the most basic of welding machines.

CIGWELD ELECTRODE SELECTION CHART

DESCRIPTION	CLASS.	DIA.	PACK	PART NO	APPLICATION
SATINCRAFT 13	B E4313 A (AUS/NZ STD) E6013 (AWS STD)	2.5mm 2.5mm 3.2mm 3.2mm 4mm	2.5kg Pack 5kg Pack 2.5kg Pack 5kg Pack 5kg Pack	612182 611182 612183 611183 611184	A high performance General Purpose (GP) welding electrode suitable for all positional welding, except vertical-down, for use on, mild and galvanised steel pipes, plates, angle iron, RHS, tubes and grid mesh.
WELDSKILL GP GENERAL PURPOSE WELDING	B E4313 A (AUS/NZ STD) E6013 (AWS STD)	2.0mm 2.0mm 2.0mm 2.5mm 2.5mm 2.5mm 2.5mm 3.2mm 3.2mm 3.2mm	25 Rod Handypack 1.0kg Pack 2.5kg Pack 20 Rod Handypack 1.0kg Pack 2.5kg Pack 5.0kg Pack 1.0kg Pack 2.5kg Pack 5.0kg Pack	WEG0220 WEG1020 WEG2520 WEG0225 WEG1025 WEG2525 WEG5025 WEG1032 WEG2532 WEG5032	A user-friendly General Purpose (GP) electrode offering a quiet, smooth arc action with a 6013 classification (min. strength rating of 60,000PSi). Ideal for welding thin section mild, galvanised and rusty steels and weld joints with poor fit-up. Great for use on vertical down fillet welding applications. Weldskill GP produces smooth professional mitre fillet welds in all positions with very low spatter levels, it features positive re-strike (hot or cold) and a self-releasing slag.

CIGWELD ELECTRODE SELECTION CHART					
DESCRIPTION	**CLASS.**	**DIA.**	**PACK**	**PART NO**	**APPLICATION**
WELDSKILL HS HIGHER STRENGTH	B E4916 U A H10 (AUS/NZ STD) E7016 H8 (AWS STD)	2.5mm 3.2mm	1.0kg Pack 1.0kg Pack	WEL1025 WEL1032	Higher Strength (HS) Hydrogen Controlled welding electrodes with a 7016 classification (min. strength rating of 70,000 PSi), well suited to welding steels under stress or with higher load bearing. The full covering slag is easy to control and remove.
WELDSKILL WELDIT ALL DISSIMILAR STEEL WELDING	B ES312-17 (AUS/NZ STD) E312-17 (AWS STD)	2.5mm 2.5mm 3.2mm 3.2mm	10 Rod Handypack 1.0kg Pack 10 Rod Handypack 1.0kg Pack	WEW0225 WEW1025 WEW0232 WEW1032	WELDiT ALL is a highly alloyed stainless steel electrode that is extremely resistant to cracking (min. strength of 110,000PSi) it provides smooth, stable running in all positions (except vertical down) especially on low current settings. WELDit ALL is recommended for the repair and maintenance of all steels, particularly those of unknown composition. It is suitable for; Joining dissimilar steels, such as stainless steel to carbon steel, Repairing die or tool steels, as a protective overlay against corrosion and as an intermediate or buffer layer prior to hard surfacing. Not Recommended for Welding Cast Irons
WELDSKILL HARDA HARDFACING	1855-A4 (AUS/NZ STD) --	3.2mm	1.0kg Pack	WEH1032	HARDA is designed for hard surfacing of steel components subjected to wet or dry hard particle abrasion and low to moderate impact loading. The air hardening (~55RHc), low alloy steel deposit of WELDSKILL HARDA remains crack free on most steels and is therefore recommended for hard surfacing components subject to flexing during service. Typical applications include the surfacing of agricultural points, shears and tynes, grader and dozer blades, conveyor screws and post hole augers etc
WELDSKILL CAST2STEEL CAST IRONS & CAST TO STEEL	-- ENiFe-CI (AWS STD)	2.5mm 2.5mm 3.2mm 3.2mm	10 Rod Handypack 1.0kg Pack 10 Rod Handypack 1.0kg Pack	WEC0225 WEC1025 WEC0232 WEC1032	CAST2STEEL is a Nickel-Iron electrode designed for higher strength repair and maintenance welding of SG, Austenitic, Meehanites and Grey cast irons. It produces a soft stable arc with minimal penetration and spatter. The ductile Nickel-Iron weld deposit is machinable with the higher strength required for welding S.G. irons. Cast2Steel is also used to weld Cast Iron to Mild and Low Alloy Steels.

Table 6-3: Electrode Selection chart

6.05 STICK WELDING

A. Select Stick mode with the process selection control.

B. Connect the Electrode Holder lead to the positive welding terminal (+). If in doubt, consult the electrode manufacturer. Welding current flows from the Power Source via Dinse type terminals. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

C. Connect the work lead to the negative welding terminal (-). If in doubt, consult the electrode manufacturer. Welding current flows from the power source via Dinse type terminals. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

WARNING

Before connecting the work clamp to the work and inserting the electrode in the electrode holder make sure the Mains power supply is switched off.

CAUTION

Remove any packaging material prior to use. Do not block the air vents at the front or rear of the Welding Power Source.

NOTE

Consult the electrode manufacturer's information for the correct polarity.

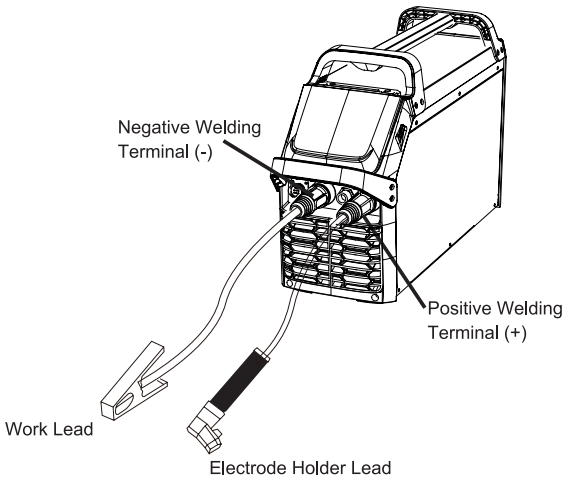


Figure 6-4: Setup For STICK (MMAW) Welding

Storage of Stick Electrodes

Always store electrodes in a dry place and in their original containers.

Stick Electrode Size

The electrode size is determined by the thickness of metals being joined and can also be governed by the type of welding machine available. Small welding machines will only provide sufficient current (amperage) to run the smaller size electrodes.

For most work, a 2.5mm electrode will be quite sufficient. A 2.5mm electrode will give just as strong a joint but may require a few more weld runs to be put down to fill the joint.

For thin sections, it is necessary to use smaller electrodes otherwise the arc may burn holes through the job. A little practice will soon establish the most suitable electrode for a given application.

Electrode Polarity

Electrodes are connected to the Electrode Holder, and the Work Lead is connected to the work piece.

Consult the Electrode manufacturer's information for the correct polarity.

STICK Welding Practice

Techniques used for arc welding are almost identical regardless of what types of metals are being joined. Naturally enough,

different types of electrodes would be used for different metals as described in the next section.

STICK Welding Different Metals

A. High tensile and alloy steels

The two most prominent effects of welding these steels are the formation of a hardened zone in the weld area, and, if suitable precautions are not taken, the occurrence in this zone of under-bead cracks may result. Hardened zone and under-bead cracks in the weld area may be reduced by using the correct electrodes, preheating, using higher current settings, using larger electrodes sizes, short runs for larger electrode deposits or tempering in a furnace.

B. Austenitic manganese steels

The effect on manganese steel of slow cooling from high temperatures is to embrittle it. For this reason it is absolutely essential to keep manganese steel cool during welding by quenching after each weld or skip welding to distribute the heat.

C. Cast Iron

Most types of cast iron, except white iron, are weldable. White iron, because of its extreme brittleness, generally cracks when attempts are made to weld it. Trouble may also be experienced when welding white-heart malleable, due to the porosity caused by gas held in this type of iron.

D. Copper and alloys

The most important factor is the high rate of heat conductivity of copper, making preheating of heavy sections necessary to give proper fusion of weld and base metal.

Welding Position

The electrodes dealt with in this publication can be used in most positions, i.e. they are suitable for welding in flat, horizontal, vertical and overhead positions. Numerous applications call for welds to be made in positions intermediate between these. Some of the common types of welds are shown in Figures 6-3 through 6-10.

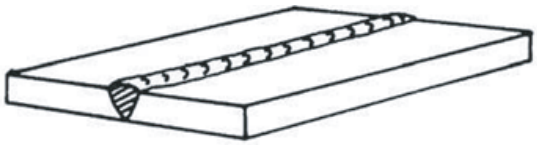


Figure 6-5: Flat position, down hand butt weld

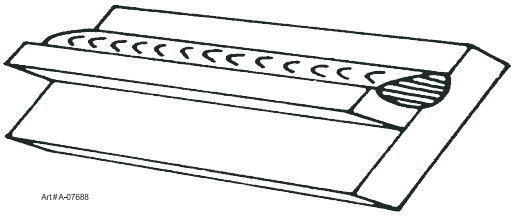


Figure 6-6: Flat position, gravity fillet weld

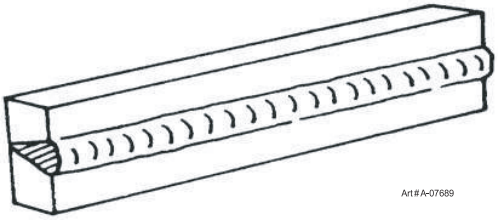


Figure 6-7: Horizontal position, butt weld

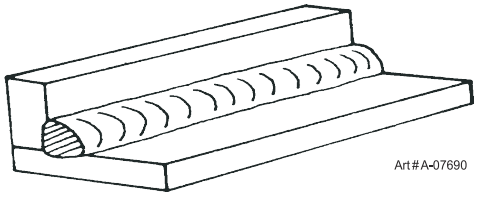


Figure 6-8: Flat position, down hand fillet weld

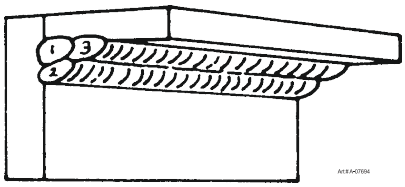


Figure 6-9: Overhead position fillet, weld

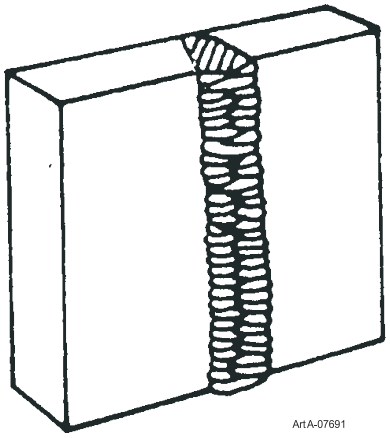


Figure 6-10: Vertical position, butt weld

Figure 6-11: Overhead position, butt weld

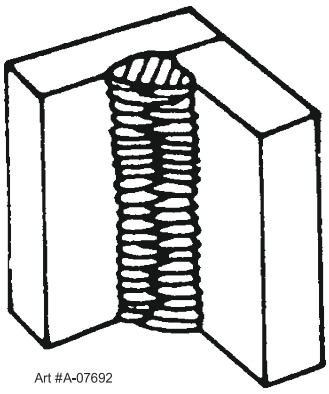


Figure 6-12: Vertical position, fillet weld

6.06 STICK WELDING ISSUES - CAUSE & REMEDY

	DESCRIPTION	POSSIBLE CAUSE	REMEDY
1.	Gas pockets or voids in weld metal (Porosity).	A. Electrodes are damp.	A. Dry electrodes before use.
		B. Welding current is too high.	B. Reduce welding current.
		C. Surface impurities such as oil, grease, paint, etc.	C. Clean joint before welding.
2.	Crack occurring in weld metal soon after solidification commences.	A. Rigidity of joint.	A. Redesign to relieve weld joint of severe stresses or use crack resistance electrodes.
		B. Insufficient throat thickness.	B. Travel slightly slower to alloy greater build-up in throat.
		C. Cooling rate is too high.	C. Preheat plate and cool slowly.
3.	A gap is left by failure of the weld metal to fill the root of the weld.	A. Welding current is too low.	A. Increase welding current.
		B. Electrode too large for joint.	B. Use smaller diameter electrode.
		C. Insufficient gap.	C. Allow wider gap.
		D. Incorrect sequence.	D. Use correct build-up sequence.

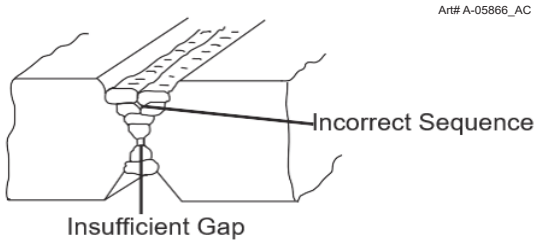


Figure 6-13: Example of Insufficient Gap or Incorrect Sequence

4.	Portions of the weld run do not fuse to the surface of the metal or edge of the joint.	A. Small electrodes used on heavy cold plate.	A. Use larger electrodes and preheat the plate.
		B. Welding current is too low.	B. Increase welding current.
		C. Wrong electrode angle.	C. Adjust angle so the welding arc is directed more into the base metal.
		D. Travel speed of electrode is too high.	D. Reduce travel speed of electrode.
		E. Scale or dirt on joint surface.	E. Clean surface before welding.

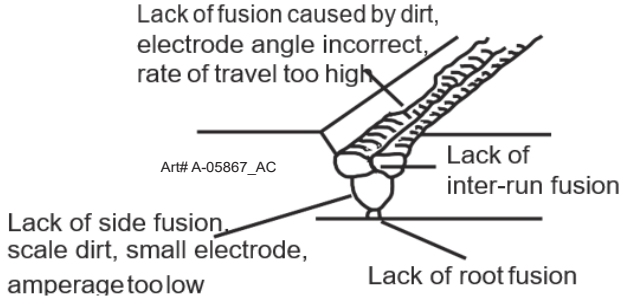


Figure 6-14: Example of Lack of Fusion

	DESCRIPTION	POSSIBLE CAUSE	REMEDY
5.	A groove has been formed in the base metal adjacent to the toe of a weld and has not been filled by the weld metal (undercut).	A. Welding current is too high.	A. Reduce welding current.
		B. Welding current is too low.	B. Reduce the length of the welding arc.
		C. Angle of the electrode is incorrect.	C. Electrode should not be inclined less than 45° to the vertical face.
		D. Joint preparation does not allow correct electrode angle.	D. Allow more room in joint for manipulation of the electrode.
		E. Electrode too large for joint.	E. Use smaller gauge electrode.
		F. Insufficient deposit time at edge of weave.	F. Pause for a moment atedge of weave to allow weld metal build-up.

Figure 6-15: Examples of undercut

6.	Non-metallic particles are trapped in the weld metal (slag inclusion.)	A. Non-metallic particles may be trapped in undercut from previous run.	A. If bad undercut is present, clean slag out and cover with a run from a smaller diameter electrode.
		B. Joint preparation too restricted.	B. Allow for adequate penetration and room for cleaning out the slag.
		C. Irregular deposits allow slag to be trapped.	C. If very bad, chip or grind out irregularities.
		D. Lack of penetration with slag trapped beneath weld bead.	D. Use smaller electrode with sufficient current to give adequate penetration. Use suitable tools to remove all slag from corners.
		E. Rust or mill scale is preventing full fusion.	E. Clean joint before welding.
		F. Wrong electrode for position in which welding is done.	F. Use electrodes designed for position in which welding is done, otherwise proper control of slag is difficult.

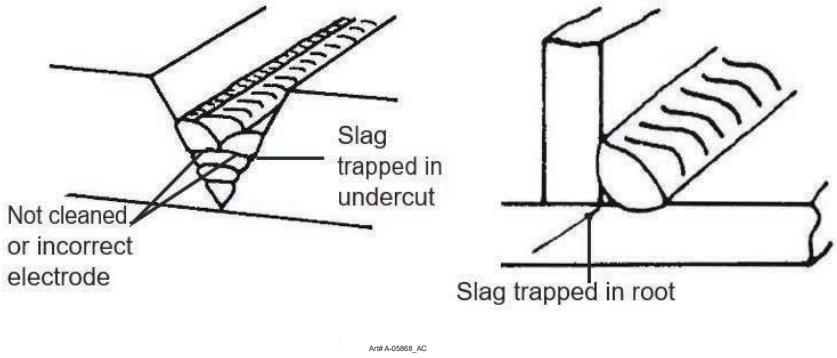


Figure 6-16: Examples of Slag Inclusion

Table 6-4: Welding Problems

SECTION 7: ROUTINE SERVICE REQUIREMENTS AND POWER SOURCE PROBLEMS

7.01 A ROUTINE MAINTENANCE & INSPECTION

ELECTRICAL WARNING

There are extremely dangerous voltage and power levels present inside this product. Do not attempt to open or repair unless you are a qualified electrical tradesperson. Disconnect the Welding Power Source from the Mains Supply Voltage before disassembling.

Welding equipment should be regularly checked by a qualified electrical tradesperson to ensure that:

- The main earth wire of the electrical installation is intact.
- Power point for the Welding Power Source is effectively earthed and of adequate current rating.
- Plugs and cord extension sockets are correctly wired.
- Flexible cord is of the 3-core tough rubber or plastic sheathed type of adequate rating, correctly connected and in good condition.
- Welding terminals are shrouded to prevent inadvertent contact or short circuit.
- The frame of the Welding Power Source is effectively earthed.
- Welding leads and electrode holder are in good condition.
- The Welding Power Source is clean internally, especially from metal filing, slag, and loose material. If any parts are damaged for any reason, replacement is recommended.

7.02 CLEANING THE WELDING POWER SOURCE

To clean the Welding Power Source, open the enclosure and use a vacuum cleaner to remove any accumulated dirt, metal filings, slag and loose material. Keep surfaces clean as accumulated foreign material may reduce the welders output welding current.

CAUTION

Do not use compressed air to clean the Welding Power Source. Compressed air can force metal particles to lodge between live electrical parts and earthed metal parts within the Welding Power Source. This may result in arcing between this parts and their eventual failure.

7.03 BASIC TROUBLESHOOTING

ELECTRICAL WARNING

There are extremely dangerous voltage and power levels present inside this product. Do not attempt to open or repair unless you are a qualified electrical tradesperson and you have had training in power measurements and troubleshooting techniques.

If major complex subassemblies are faulty, then the Welding Power Source must be returned to an Accredited CIGWELD Service Agent for repair.

The basic level of troubleshooting is that which can be performed without special equipment or knowledge.

7.04 BLUEVENOM XF250/XF320 ERROR CODES

Figure 7.1: Warning Screen Example

ERROR CODE	CAUSE	REMEDY
E01 **E02** **E03** **E04** **E09**	Over-heating	Duty cycle of the Power Source has been exceeded. Leave the power source switched ON with the fan running and allow it to cool. Check front and rear Panel Air Louvres are clean and not blocked by any dirt or obstacles. If damaged, they should be replaced by an accredited CIGWELD Service Provider. Check that the fan is running normally during welding. If the fan is not running during welding it may be faulty and need replacing. Contact an accredited CIGWELD Service Provider. Note this unit has Fan on Demand fitted. Refer to Section 4 for further details.
E10	Phase loss	Input Power Supply is outside the parameters of the machine. Contact a Qualified Electrician to check the input Power Supply.
E11	No water	Connected Water Cooler's coolant level is below the minimum threshold. Add coolant to the Water Cooler. If the issue persists the unit may be faulty and need replacing. Contact an accredited CIGWELD Service Provider.
E34	Output terminal short circuit	The positive and negative output terminals have short circuited while in Stick welding mode. Turn off the welder and wait for it to power down. Move the electrodes or remove any material causing the short circuit.
E40	Internal communication error	A communication error occurred between the LCD Panel and the Control Board. Turn off the machine and wait at least 15 seconds before powering on. If the issue persists after powering on, the LCD touchscreen may be faulty and need replacing. Contact an accredited CIGWELD Service Provider.

Table 7-1: Error Codes

SECTION 8: TIG TORCH FRONT END CONSUMABLES

8.01 TIG TORCH CONSUMABLES

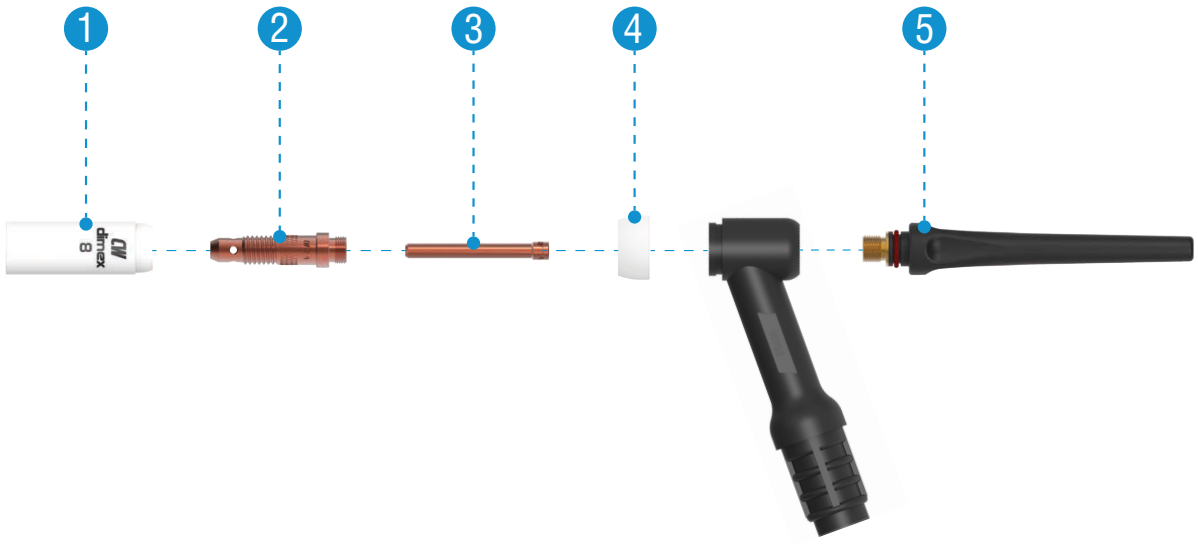


Figure 8-1:TIG Standard Consumables Parts

17/18/26 TIG TORCH CONSUMABLES - STANDARD

ITEM	PART NUMBER	DESCRIPTION
1	CW10N50	Ceramic Cup 6mm #4
	CW10N49	Ceramic Cup 8mm #5
	CW10N48	Ceramic Cup 10mm #6
	CW10N47	Ceramic Cup 11mm #7
	CW10N46	Ceramic Cup 13mm #8
	CW10N45	Ceramic Cup 16mm #10
	CW10N44	Ceramic Cup 19mm #12
2	CW10N31	Collet Body - Standard 1.6mm
	CW10N32	Collet Body - Standard 2.4mm
	CW10N28	Collet Body - Standard 3.2mm

17/18/26 TIG TORCH CONSUMABLES - STANDARD		
ITEM	**PART NUMBER**	**DESCRIPTION**
3	CW10N23	Collet - Standard 1.6mm
	CW10N24	Collet - Standard 1.6mm
	CW10N25	Collet - Standard 1.6mm
4	CW18CG	Insulator
5	CW57Y02	Back Cap Long
	CW57Y05	Back Cap Medium
	CW57Y04	Back Cap Short

Table 8-1: TIG Torch Consumables - Standard

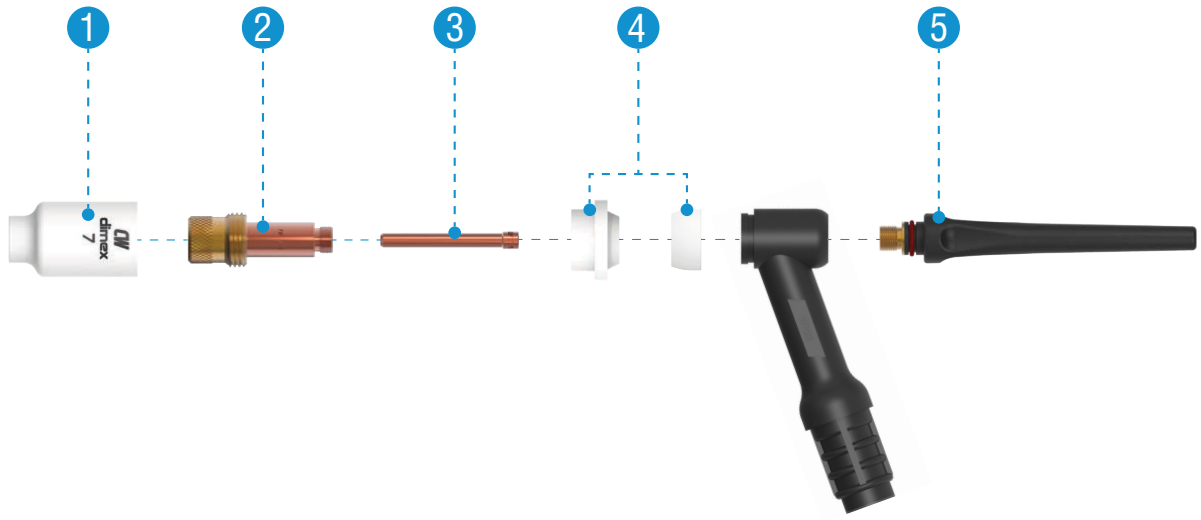


Figure 8-2:TIG Gas Lens Consumables Parts

17/18/26 TIG TORCH CONSUMABLES - GAS LENS		
ITEM	**PART NUMBER**	**DESCRIPTION**
1	CW54N18	Ceramic Cup - Gas Lens 6mm #4
	CW54N17	Ceramic Cup - Gas Lens 8mm #5
	CW54N16	Ceramic Cup - Gas Lens 10mm #6
	CW54N15	Ceramic Cup - Gas Lens 11mm #7
	CW54N14	Ceramic Cup - Gas Lens 13mm #8
	CW54N19	Ceramic Cup - Gas Lens 17mm #11
2	CW45V25	Collet Body - Gas Lens 1.6mm
	CW45V26	Collet Body - Gas Lens 2.4mm
	CW45V27	Collet Body - Gas Lens 3.2mm
3	CW10N23	Collet - Standard 1.6mm
	CW10N24	Collet - Standard 2.4mm
	CW10N25	Collet - Standard 3.2mm
4	CW54N01	Insulator - Gas Lens (Use with CW18CG)
	CW18CG	Insulator
5	CW57Y02	Back Cap Long
	CW57Y05	Back Cap Medium
	CW57Y04	Back Cap Short

Table 8-2: TIG Torch Consumables - Gas Lens

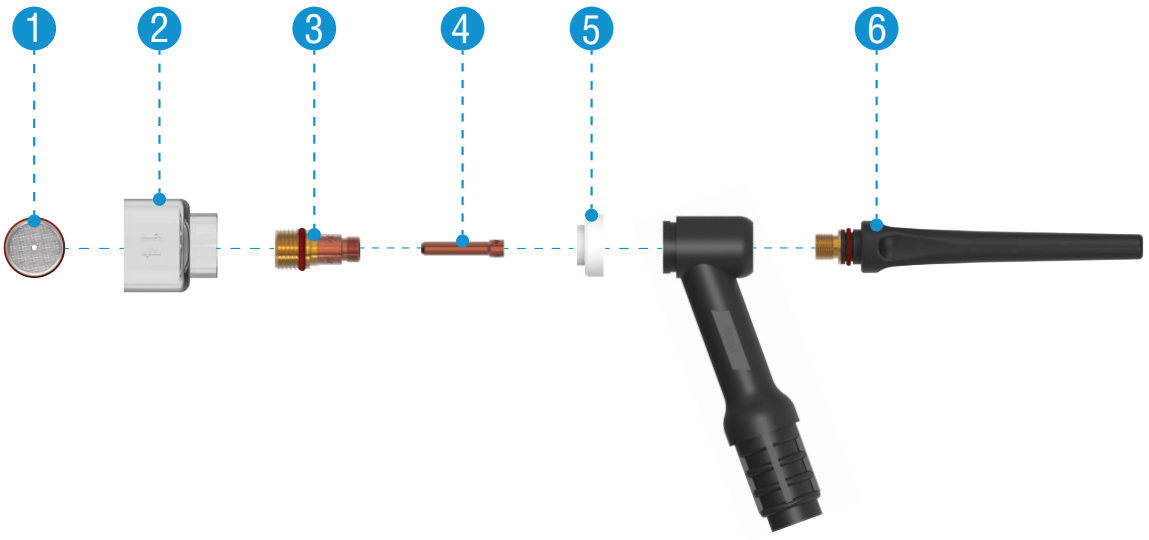


Figure 8-3:TIG Quartz Consumables Parts

17/18/26 TIG TORCH CONSUMABLES - QUARTZ		
ITEM	PART NUMBER	DESCRIPTION
1	CW53NQ12-16	Screen Pack 1.6MM #12
	CW53NQ14-16	Screen Pack 1.6MM #14
	CW53NQ16-16	Screen Pack 1.6MM #16
	CW53NQ24-16	Screen Pack 1.6MM #24
	CW53NQ12-24	Screen Pack 2.4MM #12
	CW53NQ14-24	Screen Pack 2.4MM #14
	CW53NQ16-24	Screen Pack 2.4MM #16
	CW53NQ24-24	Screen Pack 2.4MM #24
	CW53NQ12-32	Screen Pack 3.2MM #12
	CW53NQ14-32	Screen Pack 3.2MM #14
	CW53NQ16-32	Screen Pack 3.2MM #16
	CW53NQ24-32	Screen Pack 3.2MM #24
2	CW53NQCN-12	Quartz Champagne Cup 21mm #12
	CW53NQCN-14	Quartz Champagne Cup 24mm #14
	CW53NQCN-16	Quartz Champagne Cup 27mm #16
	CW53NQCN-24	Quartz Champagne Cup 40mm #24
3	CW4GL116NQ	Collet Body - Gas Lens, Quartz 1.6mm
	CW4GL332NQ	Collet Body - Gas Lens, Quartz 2.4mm
	CW4GL418NQ	Collet Body - Gas Lens, Quartz 3.2mm
4	CW10N23S	Collet - Stubby 1.6mm
	CW10N24S	Collet - Stubby 2.4mm
	CW10N25S	Collet - Stubby 3.2mm
5	CW18CG20GS	Insulator - Stubby
6	CW57Y02	Back Cap Long
	CW57Y05	Back Cap Medium
	CW57Y04	Back Cap Short

Table 8-3: TIG Torch Consumables - Quartz

BONUS!
Using this setup of insulator, stubby collet and gas lens collet body, you can also fit 9/20 gas lens nozzles onto a 17/18/26 series Torch!

SECTION 9: WARANTY

CIGWELD
AN ESAB BRAND

LIMITED WARRANTY TERMS

LIMITED WARRANTY: CIGWELD Pty Ltd, An ESAB Brand, hereafter, “CIGWELD” warrants to customers of its Authorised distributors hereafter “Purchaser” that its products will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within the time period applicable to the CIGWELD products as stated below, CIGWELD shall, upon notification thereof and substantiation that the product has been stored, installed, operated, and maintained in accordance with CIGWELD’s specifications, instructions, recommendations and recognized standard industry practice, and not subject to misuse, repair, neglect, alteration, or accident, correct such defects by suitable repair or replacement, at CIGWELD’s sole option, of any components or parts of the product determined by CIGWELD to be defective.

CIGWELD MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHERS, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: CIGWELD SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, SUCH AS, BUT NOT LIMITED TO, LOST PROFITS AND BUSINESS INTERRUPTION.

The remedies of the Purchaser set forth herein are exclusive and the liability of CIGWELD with respect to any contract, or anything done in connection therewith such as the performance or breach thereof, or from the manufacture, sale, delivery, resale, or use of any goods covered by or furnished by CIGWELD whether arising out of contract, negligence, strict tort, or under any warranty, or otherwise, shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based. No employee, agent, or representative of CIGWELD is Authorised to change this warranty in any way or grant any other warranty.

PURCHASER’S RIGHTS UNDER THIS WARRANTY ARE VOID IF REPLACEMENT PARTS OR ACCESSORIES ARE USED WHICH IN CIGWELD’S SOLE JUDGEMENT MAY IMPAIR THE SAFETY OR PERFORMANCE OF ANY CIGWELD PRODUCT. PURCHASER’S RIGHTS UNDER THIS WARRANTY ARE VOID IF THE PRODUCT IS SOLD TO PURCHASER BY NON-Authorised PERSONS.

The warranty is effective for the time stated below beginning on the date that the Authorised distributor delivers the products to the Purchaser. Not with standing the foregoing, in no event shall the warranty period extend more than the time stated plus one year from the date CIGWELD delivered the product to the Authorised distributor.

Any claim under this warranty must be made within the warranty period which commences on the date of purchase of the product. To make a claim under the warranty, take the product (with proof of purchase from a CIGWELD Accredited Seller) to the store where you purchased the product or contact CIGWELD Customer Care 1300 654 674 for advice on your nearest Service Provider. CIGWELD reserves the right to request documented evidence of date of purchase. CIGWELD or our Accredited Distributor must be notified in writing of its claim within seven (7) days of becoming aware of the basis thereof, and at its own expense returning the goods which are the subject of the claim to CIGWELD or nominated Accredited Distributor/Accredited Service Provider

This warranty is given.
CIGWELD Pty Ltd A.B.N. 56007226815
71 Gower Street, Preston Victoria, Australia, 3072
Phone: 1300 654 674
Email: support@cigweld.com
Website: cigweld.com.au

This warranty is provided in addition to other rights and remedies you have under law: Our goods come with guarantees which cannot be excluded under the Australian Consumer Law. You are entitled to replacement or refund for a major failure and to compensation for 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.

Please note that the information detailed in this statement supersedes any prior published data produced by CIGWELD.

WARRANTY SCHEDULE - BLUEVENOM AC/DC SIC INVERTER

WARRANTY	WARRANTY PERIOD (PARTS AND LABOUR)
BlueVenom AC/DC SiC Power Source	5 Years

ACCESSORIES	WARRANTY PERIOD
TIG Torch, electrode holder lead and work lead	3 Months
TIG Torch consumable items	NIL
Gas Regulator/Flowmeter (excluding seat assembly, pressure gauges, elastomer seals and “O” rings	1 Year
Regulator seat assemblies and pressure gauges	6 Months
Elastomer seals and “O” rings used in the equipment	3 Months

CIGWELD LIMITED WARRANTY DOES NOT APPLY TO;

- Obsolete goods sold at auction, second-hand goods and prototype goods.
- Consumable Parts for TIG, Plasma welding, Plasma cutting and Oxy fuel torches, O-rings, fuses, filters or other parts that fail due to normal wear.

Notes:

* No employee, agent, or representative of CIGWELD is Authorised to change this warranty in any way or grant any other warranty, and CIGWELD shall not be bound by any such attempt. Correction of non-conformities, in the manner and time provided herein, constitutes fulfilment of CIGWELD’s obligations to purchaser with respect to the product.
* This warranty is void, and seller bears no liability hereunder, if purchaser used replacement parts or accessories which, in CIGWELD’s sole judgment, impaired the safety or performance of any CIGWELD product and if the unit is altered or serviced by an unauthorised CIGWELD Service Provider. Purchaser’s rights under this warranty are void if the product is sold to purchaser by unAuthorised persons.

NOTES:

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