

**250**

**350**

**4R**

# WELDSKILL MIG WELDING MACHINE

## WIREFEEDER (Optional)



Art # A-09908\_AB

# Operating Manual

Version No: AD

Issue Date: August 27, 2012

Manual No.: 0-5182

Operating Features:



## **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. To locate your nearest distributor or service provider call +1300 654 674, or visit us on the web at [www.victortechnologies.com](http://www.victortechnologies.com)

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.

## **YOU ARE IN GOOD COMPANY!**

### **The Brand of Choice for Contractors and Fabricators Worldwide.**

CIGWELD is the Market Leading Brand of Arc Welding Products for Victor Technologies. 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.*

Welding Power Supply

Operating Manual Number 0-5182 for:

WeldSkill 250 Compact MIG Plant (Asia)

Part Number W1003400

WeldSkill 350 Compact MIG Plant (Asia)

Part Number W1003500

WeldSkill 250 Compact MIG Plant (South Pacific)

Part Number W1004500

WeldSkill 350 Compact MIG Plant (South Pacific)

Part Number W1004600

WeldSkill 4R Wirefeeder Plant (Optional-All Regions)

Part Number W3000401

Published by:

CIGWELD Pty Ltd

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Publication Date: March 10, 2011

Version AD Date: August 27, 2012

### **Record the following information for Warranty purposes:**

Where Purchased: \_\_\_\_\_

Purchase Date: \_\_\_\_\_

Equipment Serial #: \_\_\_\_\_

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### CIGWELD LIMITED WARRANTY

Terms of Warranty – January 2011

Warranty Schedule – January 2011

### GLOBAL CUSTOMER SERVICE CONTACT INFORMATION



## 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. 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 AS1674.2-2007 entitled: Safety in welding and allied processes Part 2: Electrical. This publication and other guides 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



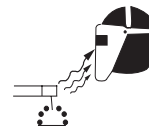
#### WARNING

#### ***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.*

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 Owner's 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.



#### 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.***

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.
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**

*FUMES AND 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.

**WARNING**

*WELDING can cause fire or explosion.*

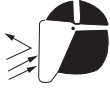
*Sparks and spatter fly off from the welding arc. The flying sparks and hot metal, weld spatter, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode or welding wire to metal objects can cause sparks, overheating, or fire.*

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 35 ft (10.7 m) 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.



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	8
	100 to 200	10
	200 to 300	11
	300 to 400	12
	Greater than 400	13
Gas Metal Arc Welding (GMAW) (MIG) other than Aluminium and Stainless Steel	Less than or equal to 150	10
	150 to 250	11
	250 to 300	12
	300 to 400	13
	Greater than 400	14
Gas Metal Arc Welding (GMAW) (MIG) Aluminium and Stainless Steel	Less than or equal to 250	12
	250 to 350	13
Gas Tungsten Arc Welding (GTAW) (TIG)	Less than or equal to 100	10
	100 to 200	11
	200 to 250	12
	250 to 350	13
	Greater than 350	14
Flux-cored Arc Welding (FCAW) -with or without shielding gas.	Less than or equal to 300	11
	300 to 400	12
	400 to 500	13
	Greater than 500	14
Air – Arc Gouging	Less than or equal to 400	12
Plasma-Arc Cutting	50 to 100	10
	100 to 400	12
	400 to 800	14
Plasma-Arc Spraying	—	15
Plasma-Arc Welding	Less than or equal to 20	8
	20 to 100	10
	100 to 400	12
	400 to 800	14
Submerged Arc Welding	—	2(5)
Resistance Welding	—	Safety Spectacles or eye shield

Refer to standard AS/NZS 1338.1:1992 for comprehensive information regarding the above table.

**WARNING**

*FLYING SPARKS AND HOT METAL can cause injury.*

*Chipping and grinding cause flying metal. As welds cool, they can throw off slag.*

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

**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.

**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*

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.

**ABOUT PACEMAKERS:**

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

## **1.02 Principal Safety Standards**

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.

Safety in welding and allied processes Part 1: Fire Precautions. AS 1674.1- 1997 from SAI Global Limited, [www.saiglobal.com](http://www.saiglobal.com).

Safety in welding and allied processes Part 2: Electrical, AS 1674.2- 2007 from SAI Global Limited, [www.saiglobal.com](http://www.saiglobal.com).

Filter for eye protectors - Filters for protection against radiation generated in welding and allied operations AN/NZS 1338.1:1992 from SAI Global Limited, [www.saiglobal.com](http://www.saiglobal.com).

**1.03 Declaration of Conformity**

Manufacturer: CIGWELD  
Address: 71 Gower St, Preston  
Victoria 3072  
Australia



Description of equipment: Welding Equipment (GMAW). WeldSkill 250, 350 MIG Power Source, Wirefeeder and associated accessories.

Serial numbers are unique with each individual piece of equipment and details description, parts used to manufacture a unit and date of manufacture.

The equipment conforms to all applicable aspects and regulations of the 'Low Voltage Directive' (Directive 73/23/EU, as recently changed in Directive 93/68/EU and to the National legislation for the enforcement of the Directive.

**National Standard and Technical Specifications**

The product is designed and manufactured to a number of standards and technical requirements among them are:

- IEC 60974-10 applicable to Industrial Equipment - generic emissions and regulations.
- AS 1674 Safety in welding and allied processes.
- AS 60974.1 / IEC 60974-1 applicable to welding equipment and associated accessories.

Extensive product design verification is conducted at the manufacturing facility as part of the routine design and manufacturing process, to ensure the product is safe and performs as specified. Rigorous testing is incorporated into the manufacturing process to ensure the manufactured product meets or exceeds all design specifications.

CIGWELD has been manufacturing and merchandising an extensive equipment range with superior performance, ultra safe operation and world class quality for more than 30 years and will continue to achieve excellence.

## SECTION 2: INTRODUCTION

### 2.01 How to Use This Manual

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:



#### **WARNING**

*A WARNING gives information regarding possible personal injury.*



#### **CAUTION**

*A CAUTION refers to possible equipment damage.*

#### **NOTE**

*A NOTE offers helpful information concerning certain operating procedures.*

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 Owner's Manual number and equipment identification numbers.

### 2.02 Equipment Identification

The unit's identification number (specification or part number), model, and serial number usually appear on a nameplate attached to the control panel. In some cases, the nameplate may be attached to the rear panel. Equipment which does not have a control panel such as gun and cable assemblies is identified only by the specification or part number printed on the shipping container. Record these numbers on the bottom of page i for future reference.

### 2.03 Receipt of Equipment

When you receive the equipment, check it against the invoice to make sure 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 in your area listed in the inside 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 uncrating the unit. Use care to avoid damaging the equipment when using bars, hammers, etc., to uncrate the unit.

## 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
<b>A</b>	Amperage
<b>V</b>	Voltage
<b>Hz</b>	Hertz (cycles/sec)
<b>f</b>	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
<b>X</b>	Duty Cycle
<b>%</b>	Percentage
	Panel/Local
	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
	Voltage Input

	Wire Feed Function
	Wire Feed Towards Workpiece With Output Voltage Off.
	Welding Gun
	Purging Of Gas
	Continuous Weld Mode
	Spot Weld Mode
	Spot Time
	Preflow Time
	Postflow Time
<b>2 Step Trigger Operation</b> Press to initiate wirefeed and welding, release to stop.	
<b>4 Step Trigger Operation</b> Press and hold for preflow, release to start arc. Press to stop arc, and hold for preflow.	
	Burnback Time
	Disturbance In Ground System
<b>IPM</b>	Inches Per Minute
<b>MPM</b>	Meters Per Minute

Art # A-04937

**2.05 Description**

The WeldSkill 250 and 350 MIG Power Sources are Gas Metal Arc Welders (GMAW – commonly known as MIG) with integrated wire feeder units. The Power Sources are designed to meet the broad operating needs of the modern user and meet the requirements of Australian Standard AS 60974.1 and International Standard IEC 60974-1.

The WeldSkill 250 and 350 MIG Power Sources provide excellent performance on mild steel, stainless steel, aluminium, silicon bronze and some hard facing wires with Argon based shielding gases. These Power Sources also provide excellent results on mild steel using Carbon Dioxide shielding gas.

The WeldSkill 250 and 350 MIG Power Sources are supplied as complete packages that are ready to weld (not including shielding gas, electrode wire and Hiderok™ welding helmet). The units can also be fitted with an optional remote wirefeeder which provides portability when welding in positions with limited access. The instructions in this manual detail how to correctly set up these machines and provide guidelines on gaining the best production efficiency from the power source. Please read this manual thoroughly before using your welder.

**2.06 User Responsibility**

This equipment will perform as per the information contained herein when installed, operated, maintained and repaired in accordance with the instructions provided. This equipment must be checked periodically. Defective equipment (including welding leads) should not be used. Parts that are broken, missing, plainly worn, distorted or contaminated, should be replaced immediately. Should such repairs or replacements become necessary, it is recommended that such repairs be carried out by appropriately qualified persons approved by CIGWELD. Advice in this regard can be obtained by contacting accredited CIGWELD Distributor.

This equipment or any of its parts should not be altered from standard specification without prior written approval of CIGWELD. The user of this equipment shall have the sole responsibility for any malfunction which results from improper use or unauthorised modification from standard specification, faulty maintenance, damage or improper repair by anyone other than appropriately qualified persons approved by CIGWELD.

**2.07 Packaged Items****WeldSkill 250 MIG Plant (Part No: W1004500)****(South Pacific Version)**

- WeldSkill 250 MIG Power Source (compact)
- Tweco WeldSkill Fabgun 250 MIG Torch
- Work lead
- WeldSkill Argon Regulator/Flowmeter
- Cylinder Chain
- 200mm Spool Adaptor
- Feed rolls: 0.6/0.8mm V Groove;  
0.9/1.2mm V Groove (fitted),  
1.0/1.2mm U Groove;  
0.8/0.9mm V Knurled, 1.2/1.6mm V Knurled.
- Contact tips: 0.6mm; 0.8mm, 0.9mm (fitted); 1.0mm, 1.2mm, 1.6mm
- Shielding Gas Hose Assembly
- Operating Manual

**WeldSkill 350 MIG Plant (Part No: W1004600)****(South Pacific Version)**

- WeldSkill 350 MIG Power Source (compact)
- Tweco WeldSkill Fabgun 400 MIG Torch
- Work lead
- WeldSkill Argon Regulator/Flowmeter
- Cylinder Chain
- 200mm Spool Adaptor
- Feed rolls: 0.6/0.8mm V Groove;  
0.9/1.2mm V Groove (fitted),  
1.0/1.2mm U Groove;  
1.2/1.6mm U Groove, 0.8/0.9mm V Knurled,  
1.2/1.6mm V Knurled.
- Contact tips: 0.6mm; 0.8mm, 0.9mm (fitted);  
1.0mm, 1.2mm, 1.6mm
- Shielding Gas Hose Assembly
- Operating Manual

**WeldSkill 250 MIG Plant (Part No: W1003400)****(Asia Version)**

- WeldSkill 250 MIG Power Source (compact)
- Mig Torch MB 26 style
- Work lead
- Cylinder Chain
- 200mm Spool Adaptor
- Feed rolls: 0.6/0.8mm V Groove;  
0.9/1.2mm V Groove (fitted),  
1.0/1.2mm U Groove;  
0.8/0.9mm V Knurled, 1.2/1.6mm V Knurled.
- Contact tips: 0.6mm; 0.8mm, 0.9mm  
(fitted);1.0mm, 1.2mm, 1.6mm
- Shielding Gas Hose Assembly
- Shielding Gas Adaptor
- Operating Manual

**WeldSkill 350 MIG Plant (Part No: W1003500)****(Asia Version)**

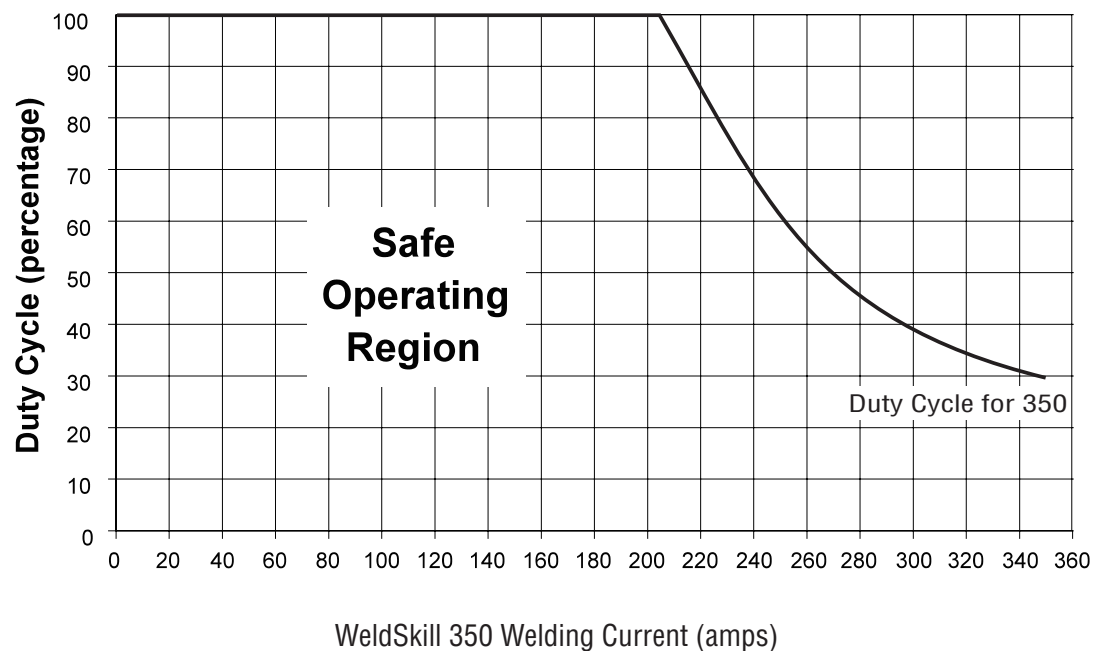
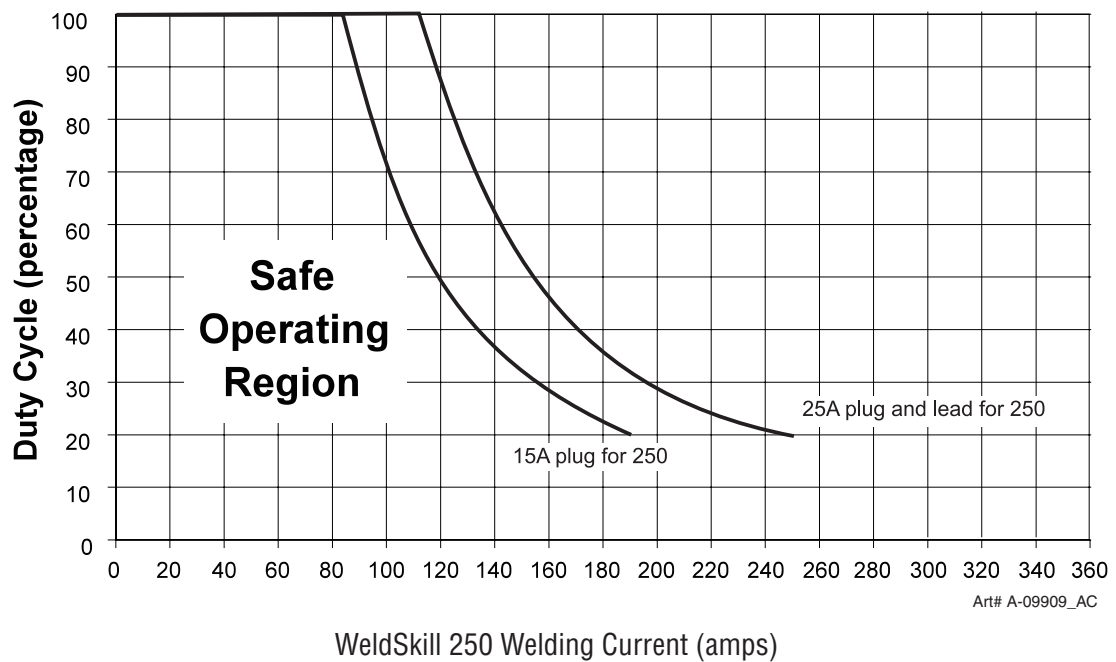
- WeldSkill 350 MIG Power Source (compact)
- MIG Torch MB 36 style
- Work lead
- Cylinder Chain
- 200mm Spool Adaptor
- Feed rolls: 0.6/0.8mm V Groove;  
0.9/1.2mm V Groove (fitted),  
1.0/1.2mm U Groove;  
1.2/1.6mm U Groove, 0.8/0.9mm V Knurled,  
1.2/1.6mm V Knurled.
- Contact tips: 0.6mm; 0.8mm, 0.9mm  
(fitted);1.0mm, 1.2mm, 1.6mm
- Shielding Gas Hose Assembly
- Shielding Gas Adaptor
- Operating Manual

**WeldSkill 4R Wirefeeder Plant (Part No: W3000401)****(All Regions)**

- WeldSkill 4R Wirefeeder
- 8m Interconnection Lead (fitted)
- 200mm Spool Adaptor
- Shielding Gas Adaptor
- Operating Manual



## 2.08 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 30% duty cycle, 350 amperes at 31.5 volts. This means that it has been designed and built to provide the rated amperage (350A) for 3 minutes, i.e. arc welding time, out of every 10 minute period (30% of 10 minutes is 3 minutes). During the other 7 minutes of the 10 minute period the Welding Power Source must idle and be allowed to cool. The thermal cutout will operate if the duty cycle is exceeded.

## 2.09 WeldSkill 250 MIG Power Source Specifications

Description	WeldSkill 250 MIG	
Plant Part Numbers	W1003400 & W1004500	
Plant Dimensions	H 1050mm x W 470mm x D 1020mm	
Power Source Mass	100kg	
Cooling	Fan Cooled	
Energy Input (Refer NOTE below)	This Column applies to the Factory Fitted 2.5mm <sup>2</sup> (20A) Primary Lead with 15A Supply Plug	This Column applies to a 4.0mm <sup>2</sup> (25A) Primary Lead with a 25A Supply Plug.
Input Cable Requirements	Factory Fitted	4.0mm <sup>2</sup> 2 core + earth heavy duty R90 insulation type
Nominal Supply Voltage	240VAC $\pm$ 10%	240VAC $\pm$ 10%
Number of Phases	1	1
Nominal Supply Frequency	50Hz	50Hz
Effective Input Current ( $I_{1\text{eff}}$ )	♥15 Amps	♥24 Amps
Maximum Input Current ( $I_{1\text{max}}$ )	33 Amps	54 Amps
Single Phase Generator Requirement	♣ 8kVA	♣13kVA
Welding Current Range	50 – 190A	50 – 270A
Open Circuit Voltage Range	22 to 46 V	22 to 46 V
MIG (GMAW) Welding Output, 40°C, 10 min.	190A @ 20%, 23.5V 110A @ 60%, 19.5V 85A @ 100%, 18.3V	250A @ 20%, 26.5V 144A @ 60%, 21.2V 112A @ 100%, 19.6V
Operating Temperature Range	0°C - 40°C	0°C - 40°C
Number of Output Voltage Switch Settings	12	
Protection Class	IP21S	

Table 2-1 WeldSkill 250 Power Source Specification

- ♥ The Effective Input Current should be used for the determination of cable size & supply requirements.

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

- ♣ Generator Requirements at the Maximum Output Duty Cycle.

Reduced output ratings apply with the supplied 15A primary lead. To achieve the maximum rated output & duty cycle ratings the 20A primary lead must be replaced with a larger primary lead as specified in section 3.04. This must be carried out by a qualified electrical tradesperson.

**NOTE**

*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.*

## 2.10 WeldSkill 350 MIG Power Source Specifications

Description	WeldSkill 350 MIG
Plant Part Numbers	W1003500 & W1004600
Plant Dimensions	H 1050mm x W 470mm x D 1020mm
Power Source Mass	112kg
Cooling	Fan Cooled
Input Cable Requirements	1.5mm <sup>2</sup> + 3 core & earth heavy duty R90 insulation type
Nominal Supply Voltage	415VAC $\pm$ 10%
Number of Phases	3
Nominal Supply Frequency	50Hz
Effective Input Current ( $I_{1\text{eff}}$ )	♥14 Amps
Maximum Input Current ( $I_{1\text{max}}$ )	25 Amps
Three Phase Generator Requirement	♣18kVA
Welding Current Range	35 – 380A
Open Circuit Voltage Range	17 to 42 V
MIG (GMAW) Welding Output, 40°C, 10 min.	350A @ 30%, 31.6V 250A @ 60%, 26.3V 205A @ 100%, 24.4V
Operating Temperature Range	0°C - 40°C
Number of Output Voltage Switch Settings	24
Protection Class	IP21S

Table 2-2 WeldSkill 350 Power Source Specification

- ♥ The Effective Input Current should be used for the determination of cable size & supply requirements.  
Motor start fuses or thermal circuit breakers are recommended for this application. Check local requirements for your situation in this regard.
- ♣ Generator Requirements at the Maximum Output Duty Cycle.

**NOTE**

*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.*

## 2.11 WeldSkill 4R Wirefeeder Specifications

Description	WeldSkill 4R Wirefeeder
Wirefeeder Plant Part Number	W3000401
Wirefeeder Plant Dimensions	H 490mm x W 420mm x D 670mm
Wirefeeder Plant Mass	25kg
Wire Feed Motor Voltage	24VDC
Gas Solenoid Voltage	36VAC
Minimum Wire Speed	2 m/min
Maximum Wire Speed	22 m/min
Operating Temperature Range	0°C – 40°C
Interconnection Plug	12 pin
Interconnection Length	8 metre

Table 2-3 WeldSkill 4R Wirefeeder Specification

## 2.12 Optional Accessories

Part Number	Description
7977729	Feed Roll 0.6/0.8mm V Groove - hard wire
7977703	Feed Roll 0.9/1.2mm V Groove - hard wire
7977346	Feed Roll 1.2/1.6mm V Groove - hard wire
7977733	Feed Roll 0.8/ 0.9mm U Groove - soft wire
7977730	Feed Roll 1.0/1.2mm U Groove - soft wire
7977348	Feed Roll 1.2/1.6mm U Groove - soft wire
7977734	Feed Roll 0.8/0.9mm V Knurled - flux cored
7977347	Feed Roll 1.2/1.6mm V Knurled - flux cored
FAB250X12	MIG Torch 250A Euro (South Pacific Only)
FAB400X12	MIG Torch 400A Euro (South Pacific Only)
210254	WeldSkill Regulator/Flowmeter (South Pacific Only)

Table 2-4 Optional Accessories for WeldSkill 250, 350 MIGs and 4R Wirefeeder

## SECTION 3: INSTALLATION

### 3.01 Environment

These units are not 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, or
3. In wet or damp hot locations where humidity or perspiration considerably reduces the skin resistance of the human body and the insulation properties of accessories.

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:

1. In areas, free from moisture and dust.
2. Ambient temperature between 0°C to 40°C.
3. In areas, free from oil, steam and corrosive gases.
4. In areas, not subjected to abnormal vibration or shock.
5. In areas, not exposed to direct sunlight or rain.
6. Place at a distance of 300mm or more from walls or similar that could restrict natural air flow for cooling.
7. The enclosure design of this power source meets the requirements of IP21S as outlined in AS 60529. This provides adequate protection against solid objects, and direct protection from vertical drops as outlined in the aforementioned standard. Under no circumstances should the unit be operated or connected in a micro environment that will exceed the stated conditions. For further information please refer to AS 60529.

### 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 10% of the rated Mains supply voltage. Too low a voltage may cause poor welding performance. Too high a supply voltage will cause components to overheat and possibly fail.

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 for each Power Source as per the Specifications on pages 2-6 and 2-7.

The WeldSkill 250 MIG Power Source is supplied with a 20 Amp input lead and is designed for a 240 VAC supply voltage.

The following Mains Current Circuit recommendations are required to obtain the maximum welding current and duty cycle from these welding products:

Mains Supply Voltage Setting	Mains Supply Lead Size	Minimum Mains Current Circuit Size	Machines Duty Cycle
240V	2.5 mm <sup>2</sup>	15 Amp	190 A @ 20%
240V	4 mm <sup>2</sup>	25 Amp	250 A @ 20%

Table 3-1 WeldSkill 250 Supply Requirements

#### NOTE

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

The WeldSkill 350 MIG Power Source is supplied with a 15 Amp input lead and is designed for a 415 VAC supply voltage.

The WeldSkill 350 MIG Power Source is suitable for below Mains supply voltages:

Mains Supply Voltage Setting	Mains Supply Lead Size	Minimum Mains Current Circuit Size	Machines Duty Cycle
415V	1.5 mm <sup>2</sup>	15 Amp	350A @ 30%

Table 3-2 WeldSkill 350 Supply Requirements

#### NOTE

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



#### WARNING

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

### 3.05 Installation and 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, see NOTE. 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.

#### NOTE

*The welding circuit may or may not be earthed for safety reasons. Changing the earthing arrangements should only be authorised by a person who is competent to assess whether the changes will increase the risk of injury, e.g. by allowing parallel welding current return paths which may damage the earth circuits of other equipment. Further guidance is given in IEC 974-13 Arc Welding Equipment - Installation and use (under preparation).*

### 3.06 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.

### 3.07 Methods of Reducing Electromagnetic Emissions

#### A. 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 its 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.

**B. 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 stabilizing devices should be adjusted and maintained according to the manufacturer's recommendations.

**C. 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.

**D. Equipotential Bonding**

Bonding of all metallic components in the welding installation and adjacent to it should be considered. However, metallic components bonded to the workpiece 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.

**E. Earthing of the Workpiece**

Where the workpiece is not bonded to earth for electrical safety, nor connected to earth because of its 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.

**F. 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.





## SECTION 4: OPERATION

### 4.01 Power Source Front Panel

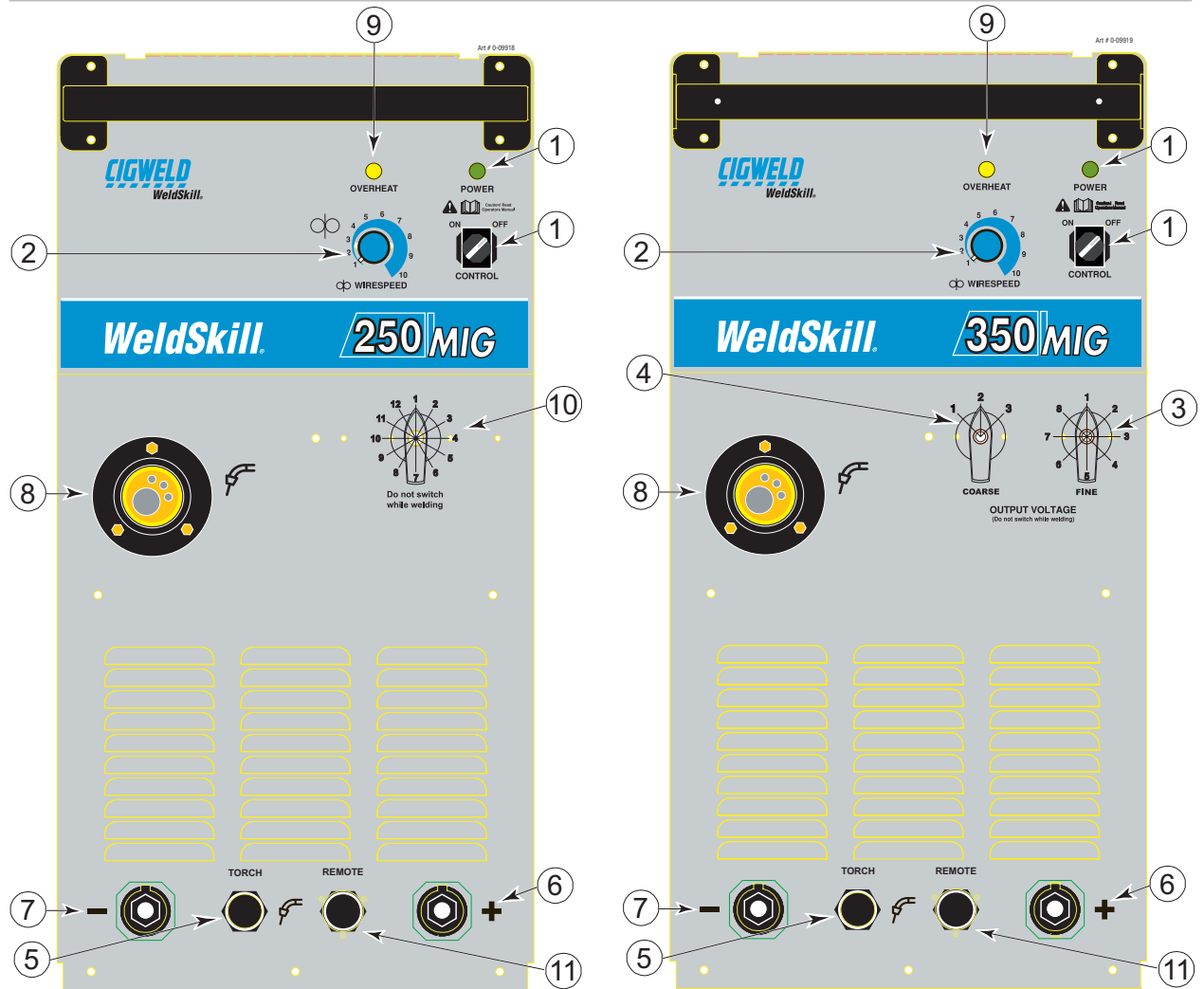


Figure 4-1 WeldSkill 250 & 350 MIG Front Panel

#### 1. POWER ON INDICATOR/MAIN POWER CONTROL SWITCH

The Power ON Indicator illuminates when the Main Power Control Switch ON/OFF knob is in the ON position and the correct mains voltage is present.



#### WARNING

*When the light is lit, the machine is connected to the Mains supply voltage and the internal electrical components are at Mains voltage potential.*

#### 2. WIRESPEED CONTROL

The Wirespeed Control knob controls the welding current via the electrode wirefeed rate. ie the speed of the wirefeed motor.

**3. VOLTAGE CONTROL SWITCH - FINE (WELDSKILL 350 ONLY)**

The Fine Voltage Control switch increases the welding voltage (in smaller increments than the Coarse switch) as it is rotated in a clockwise direction.

**CAUTION**

---

*The Coarse & Fine Voltage Control switches MUST NOT BE SWITCHED during the welding process.*

**4. VOLTAGE CONTROL SWITCH - COARSE (WELDSKILL 350 ONLY)**

The Coarse Voltage Control increases the welding voltage (in larger increments than the Fine switch) as it is rotated in a clockwise direction.

**CAUTION**

---

*The Coarse & Fine Voltage Control switches MUST NOT BE SWITCHED during the welding process.*

**5. TORCH POLARITY LEAD**

This lead selects the welding voltage polarity of the electrode wire. Plug it into the positive welding terminal (+) when using steel, stainless steel or aluminium electrode wire. Plug the Torch Polarity Lead into the negative welding terminal (-) when using gasless electrode wire. If in doubt, consult the manufacturer of the electrode wire for the correct polarity.

**6. POSITIVE WELDING TERMINAL**

Positive Welding Terminal. Welding current flows from the Power Source via heavy duty bayonet type terminals. It is essential, however, that the male plug is inserted and turned securely to achieve a sound electrical connection.

**7. NEGATIVE WELDING TERMINAL**

Negative Welding Terminal. Welding current flows from the Power Source via heavy duty bayonet type terminals. It is essential, however, 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 terminal.*

**8. MIG TORCH ADAPTOR (Euro Style)**

The MIG torch adaptor is the connection point for the MIG welding torch. Connect the torch by pushing the torch connector into the brass torch adaptor firmly and screwing the plastic torch nut clockwise to secure in position. To remove the MIG Torch simply reverse these directions.

**9. OVERHEAT INDICATOR**

This welding power source is protected by a self resetting thermostat. The overheat indicator will illuminate if the duty cycle of the power source has been exceeded. Should the overheat indicator illuminate the output of the power source will be disabled. Once the power source cools down this indicator will go OFF and the overheat condition will automatically reset. Note that the mains power switch should remain in the on position such that the fan continues to operate thus allowing the unit to cool sufficiently. Do not switch the unit off should a overheat condition be present.

## 10. VOLTAGE CONTROL SWITCH (WELDSKILL 250 ONLY)

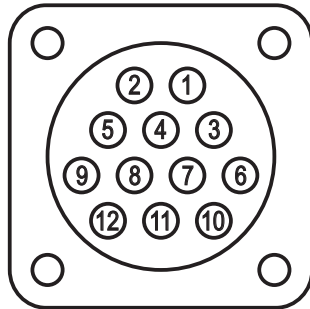
The Voltage Control Switch is a 12 position that increases the welding voltage as it is rotated in a clockwise direction.



**CAUTION**

*The Voltage Control switch MUST NOT BE SWITCHED during the welding process.*

## 11. REMOTE SOCKET



POWER SOURCE 12 PIN REMOTE SOCKET

Art # A-09921\_AB

12 PIN	
1	trigger
2	Motor Positive (24VDC)
3	Motor Negative
4	CW of remote wirespeed pot
5	ACW of remote wirespeed pot
6	wiper of 5k remote wirespeed pot
7	trigger
8	solenoid
9	solenoid
10	no connection
11	no connection
12	no connection

Figure 4-2 WeldSkill 250 & 350 MIG Remote Socket



**CAUTION**

*The Voltage Control Switch must not be switched whilst welding.*

## 4.02 Power Source Internal Welding Controls

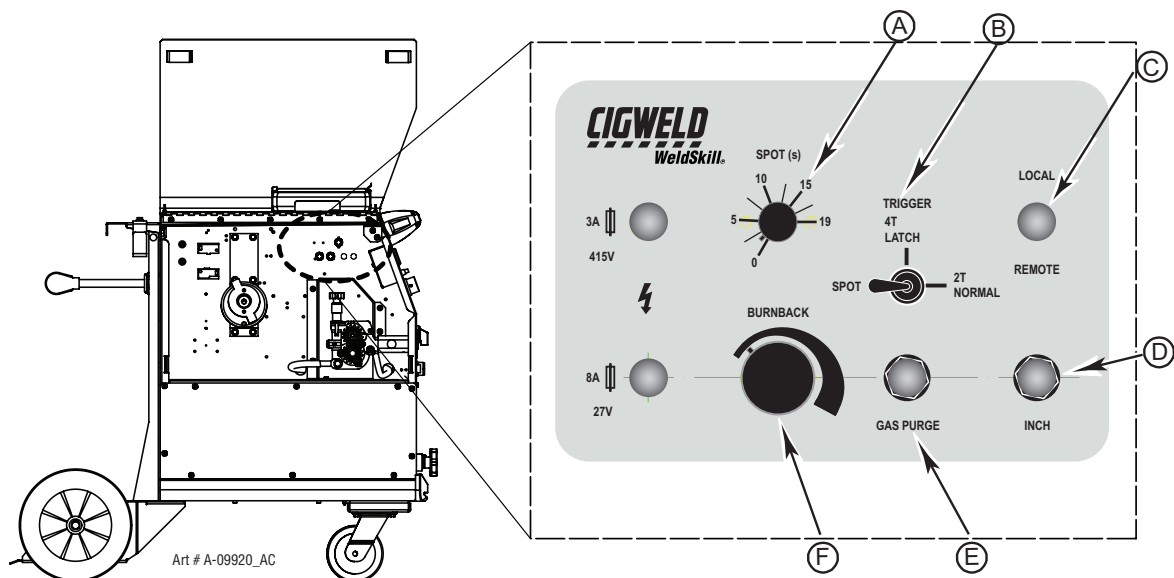
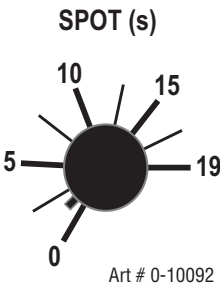


Figure 4-3 Internal welding controls

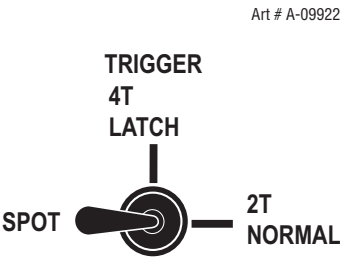
A. SPOT TIME



When the TRIGGER MODE SELECTOR switch is switched to the SPOT position, the SPOT TIME control adjusts the duration of a single spot weld.

B. TRIGGER MODE SWITCH

The Trigger Mode Selector switch selects the desired welding mode.



Mode	Functional Description
NORMAL (2T)	This mode of welding is used to weld two or more components together with a continuous weld. Pressing and holding the MIG torch trigger switch will activate the power source such that welding can commence. Releasing the MIG torch trigger switch will de-activate the power source.
SPOT	<p>This mode of welding is used to produce short welding runs of a pre-set duration. This duration is set using the Spot Time Control (A). Pressing and holding the MIG torch trigger switch will activate the power source until such time as the desired Spot time has elapsed after which the power source will de-activate.</p> <p>The spot time period is set by the SPOT TIME control (A) located in the wiredrive compartment.</p>
LATCH (4T)	This mode of welding is mainly used for long weld runs. The MIG torch trigger switch is depressed (and released) to activate the power source, and then depressed (and released) a second time to de-activate the power source. This obviates the need for the operator to depress the trigger for the complete length of the weld run.

Table 4-1 Trigger Mode Switch Functional Description

C. LOCAL/REMOTE MODE SWITCH

The Local/Remote switch is used to switch between local and Remote modes.

Local Mode

Set the switch in the Local position when using the power source only (With no optional external wirefeeder).

Remote Mode

Set the switch in the Remote position when using an optional remote wirefeeder. This will enable the wirefeeder and allow the wirespeed to be controlled from the remote wirefeeder wirespeed control. The other controls such as trigger mode, inch, gas purge, spot, burnback will still be controlled from the power source.

**D. WIRE INCH SWITCH**

**INCH**

Art # 0-10094

The Wire Inch Switch is used to feed the MIG wire through the MIG torch. When the push button switch is pressed down, the electrode wire is fed through the Wirefeed system & MIG torch. No gas flows and welding voltage is not present when the Wire Inch Switch is activated.


**WARNING**


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*Keep torch away from eyes and face.*

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**E. GAS PURGE**

**GAS PURGE**

Art # A-10095

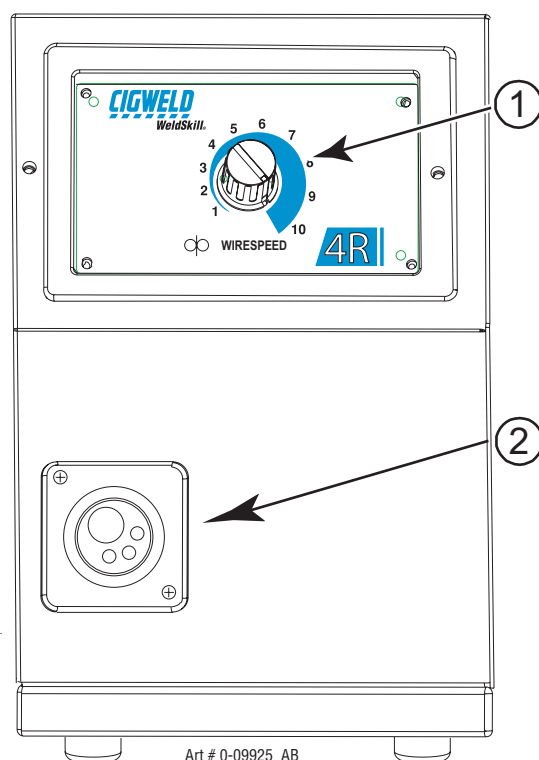
The Gas Purge Switch is used to purge gas (or impurities such as air) out of the gas system. When the push button switch is pressed, the shielding gas flows through the Wirefeed system & out of the MIG torch nozzle. The Wirefeed motor does not operate and welding voltage is not present when the Gas Purge Switch is activated.

**F. BURNBACK**
**BURNBACK**


Art # A-10093

Burnback time is used to adjust the amount of MIG wire protruding from the MIG torch contact tip (stick out) after the completion of welding. Rotating the Burnback control in a clockwise direction increases the Burnback time. Rotating the Burnback control in an anticlockwise direction reduces the Burnback time.

### 4.03 4R Wirefeeder Front Panel



#### 1. WIRESPPEED CONTROL

The Wirespeed Control Knob controls the welding current via the electrode wirefeed rate, ie the speed of the wirefeed motor.

#### 2. MIG TORCH ADAPTOR (Euro Style)

The MIG torch adaptor is the connection point for the MIG welding torch. Connect the torch by pushing the torch connector into the brass torch adaptor firmly and screwing the plastic torch nut clockwise to secure in position. To remove the MIG Torch simply reverse these directions.

### 4.04 Shielding Gas Regulator Operating Instructions



#### **WARNING**

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

#### **NOTE**

*WeldSkill Argon Regulator / Flowmeter is not included in Asia Versions Part Nos W1003400 and W1003500.*

#### **Shielding Gas Regulator Safety**

This regulator 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 are listed below.

1. NEVER subject the regulator to inlet pressure greater than its rated inlet pressure.

2. NEVER pressurize a regulator 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 until the gas pressure has been relieved. Under pressure, gas can dangerously propel a loose part.
3. DO NOT remove the regulator from a cylinder without first closing the cylinder valve and releasing gas in the regulator high and low pressure chambers.
4. DO NOT use the regulator as a control valve. When downstream 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.

### User Responsibilities

This equipment will perform safely and reliably only when installed, operated and maintained, and repaired in accordance with the instructions provided. Equipment must be checked periodically and repaired, replaced, or reset as necessary for continued safe and reliable performance. Defective equipment should not be used. Parts that are broken, missing, obviously worn, distorted, or contaminated should be replaced immediately.

The user of this equipment will generally have the sole responsibility for any malfunction, which results from improper use, faulty maintenance, or by repair by anyone other than an accredited repairer.



### CAUTION

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

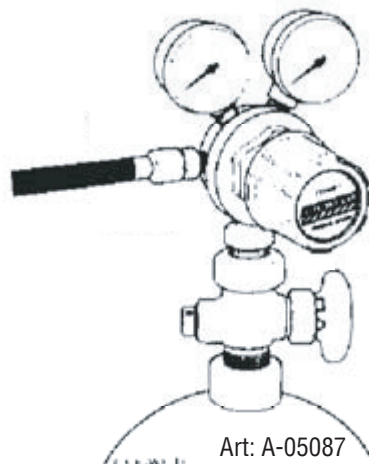


Figure 4-4 Fit Regulator to Cylinder

### 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.  
  
Crack the valve (open then close) momentarily, pointing the outlet away from people and sources of ignition. Wipe with a clean lintless cloth.
2. Match regulator to cylinder. Before connecting, check that the regulator label and cylinder marking agree and that the regulator inlet and cylinder outlet match. NEVER CONNECT a regulator designed for a particular gas or gases to a cylinder containing any other gas.
3. Connect the regulator 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 down-stream equipment.

5. To protect sensitive down-stream equipment a separate safety device may be necessary if the regulator is not fitted with a pressure relief device.

### Operation

With the regulator connected to cylinder or pipeline, and the adjustment screw/knob fully disengaged, pressurize as follows:

1. Stand to one side of regulator and slowly open the cylinder valve. If opened quickly, a sudden pressure surge may damage internal regulator parts.
2. With valves on downstream equipment closed, adjust regulator to approximate working pressure. It is recommended that testing for leaks at the regulator connection points be carried out using a suitable leak detection solution or soapy water.
3. Purge air or other unwanted welding grade shielding gas from equipment connected to the regulator by individually opening then closing the equipment control valves. Complete purging may take up to ten seconds or more, depending upon the length and size of the hose being purged.

### Adjusting Flow Rate

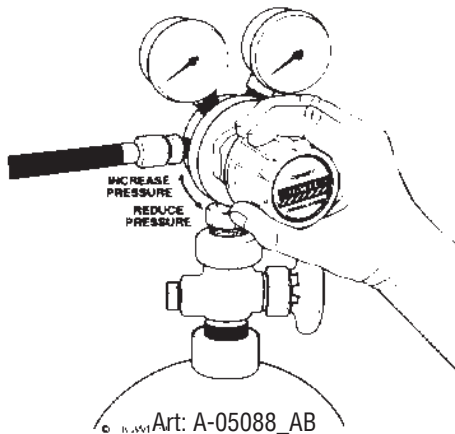


Figure 4-5 Adjust Flow Rate

With the regulator ready for operation, adjust working flow rate as follows:

1. Slowly turn adjusting screw/knob in (clockwise) direction until the outlet gauge indicates the required flow rate.

### NOTE

*It may be necessary to re-check the shielding gas regulator 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 counterclockwise, until the required flow rate is indicated on the gauge. Close downstream valve.

### Shutdown

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

1. Close cylinder or upstream valve tightly.
2. Open downstream equipment valves to drain the lines. Bleed gas into a well ventilated area and away from any ignition source.
3. After gas is drained completely, disengage adjusting screw and close downstream equipment valves.
4. Before transporting cylinders that are not secured on a cart designed for such purposes, remove regulators.



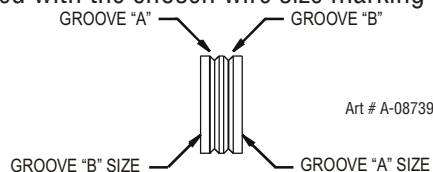
## SECTION 5:

### SET UP FOR THE WELDSKILL 250 & 350 POWER SOURCE

#### 5.01 Setup For The WeldSkill 250 & 350 MIG Power Source

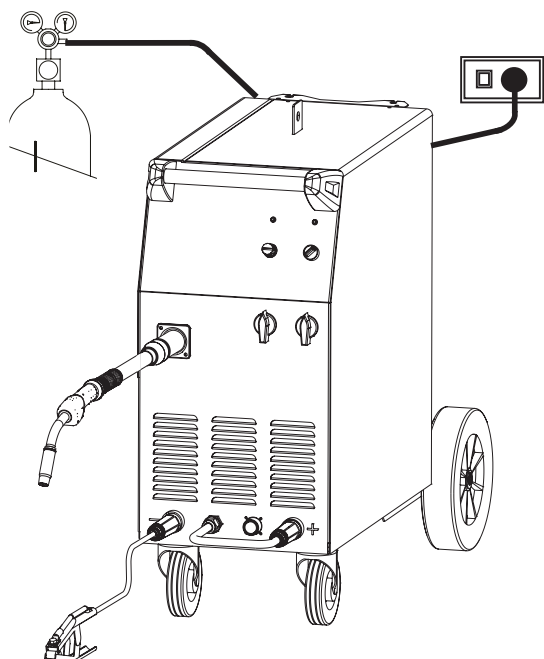
##### Power Source Connections

- A. Remove all packaging materials.
- B. Connect the work lead to the negative welding terminal (-) [positive welding terminal (+) for flux cored electrode wire]. If in doubt, consult the electrode wire manufacturer.
- C. Position a gas cylinder on the rear tray of the Power Source and lock securely to the Power Source cylinder bracket with the chain provided. If this arrangement is not used or the Power Source is not fitted with a gas cylinder tray then ensure that the gas cylinder is secured to a building pillar, wall bracket or otherwise securely fixed in an upright position.
- D. Connect the TORCH power cable to the positive welding terminal (+) [negative welding terminal (-) for flux cored electrode wire]. If in doubt, consult the electrode wire manufacturer.
- E. Fit the gas regulator and flowmeter to the gas cylinder then connect the gas hose from the rear of the Power Source to the Flowmeter outlet.
- F. Dual groove feed rollers are supplied as standard. They can accommodate 0.9/1.2mm diameter hard wires. Select the roller required with the chosen wire size marking facing outwards.

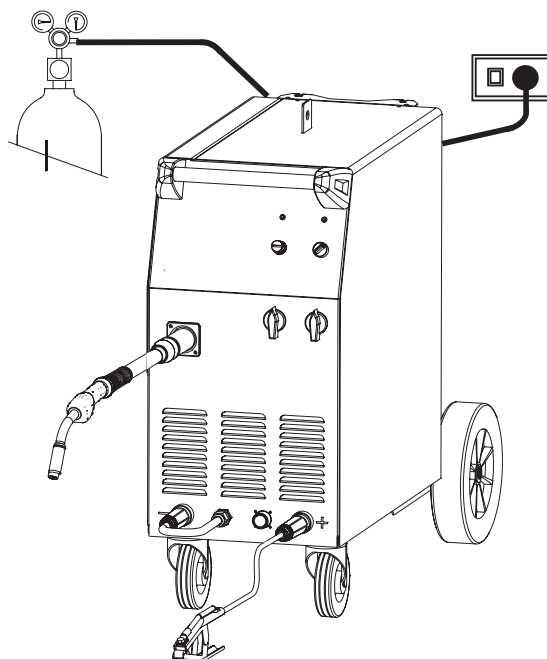


- G. Fit the electrode wire spool to the wire reel hub. (Note that there is an adaptor supplied when using 200mm diameter wire spools). Ensure that the drive dog-pin engages the mating hole in the wire spool. Push the spool securing clip into place to retain the wire spool securely. The electrode wire should feed from the bottom of the spool.
- H. MIG Torch, EURO MIG Torch Connection

Fit the MIG Torch to the Power Source by pushing the torch connector into the brass torch adaptor and screwing the plastic torch nut clockwise to secure the torch to the torch adaptor. Remove the contact tip from the torch handset.

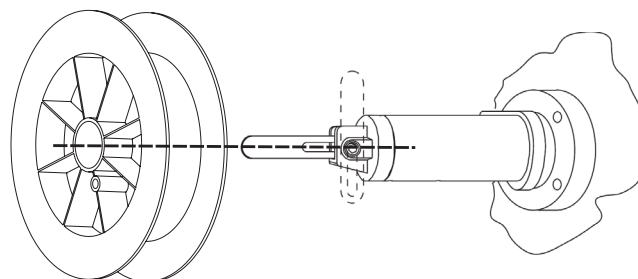


Setup for MIG (GMAW) Welding with  
Gas Shielded Shielded MIG Wire



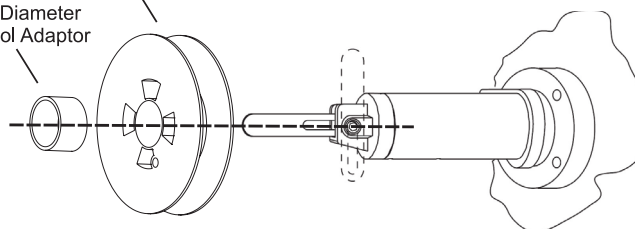
Setup for MIG (GMAW) Welding  
with Gas Gasless MIG Wire

300mm Diameter  
Wire Spool



300mm Wire spool installation

200mm Diameter  
Wire Spool  
200mm Diameter  
Wire Spool Adaptor



200mm Wire spool installation

Art# 0-09923\_AD

Figure 5-1 WeldSkill 250 & 350 Setup and Spool Hub

### Inserting Wire Into The Wire Feed Mechanism

Lift up the wire feeder pressure lever and pass the electrode wire through the inlet guide, between the rollers, through the centre guide, between the rollers, through the outlet guide and into the MIG torch.

**WARNING**

***DO NOT WEAR GLOVES WHILE THREADING THE WIRE OR CHANGING THE WIRE SPOOL.***

- B. Lower the pressure lever and with the torch lead reasonably straight, feed the electrode wire through the torch. Fit the appropriate contact tip, eg a 0.9mm tip for 0.9mm wire.
- C. Press the Torch switch to feed the wire through the torch.

**WARNING**

*The electrode wire will be at welding voltage potential whilst it is being fed through the wirefeeder system if the wire is fed by using the TORCH SWITCH.*

### Drive Roller Pressure Adjustment

The moveable rollers apply pressure to the grooved feed rollers via a scaled adjustable tension screw. These devices should be adjusted to a minimum pressure that will provide satisfactory WIREFEED without slippage. If slipping occurs, and inspection of the wire contact tip reveals no wear, distortion or burn back jam, the conduit liner should be checked for kinks and clogging by metal flakes and swarf. If it is not the cause of slipping, the feedroll pressures can be increased by rotating the scaled tension screws clockwise. The use of excessive pressure may cause rapid wear of the feed rollers, shafts and bearing.

## 5.02 Wire Reel Brake

The wire reel hub incorporates a friction brake which is adjusted during manufacture for optimum breaking. If it is considered necessary, adjustment can be made by turning the large nut inside the open end of the hub clockwise to tighten the brake. Correct adjustment will result in the wire reel circumference continuing no further than 20mm after release of the trigger. The electrode wire should be slack without becoming dislodged from wire spool.

**CAUTION**

*Overtension of brake will cause rapid wear of mechanical WIREFEED parts, overheating of electrical component and possibly an increased incidence of electrode wire Burnback into contact tip.*

## 5.03 Setup For The WeldSkill 250 & 350 MIG Power Source When Fitted With Wirefeeder

### Power Source Connections

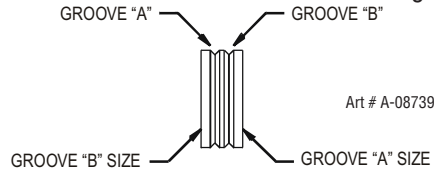
- A. Remove all packaging materials.
- B. Connect the work lead to the negative welding terminal (-) [positive welding terminal (+) for flux cored electrode wire]. If in doubt, consult the electrode wire manufacturer.
- C. Position a gas cylinder on the rear tray of the Power Source and lock securely to the Power Source cylinder bracket with the chain provided. If this arrangement is not used or the Power Source is not fitted with a gas cylinder tray then ensure that the gas cylinder is secured to a building pillar, wall bracket or otherwise securely fixed in an upright position.

### Wirefeeder Connections

- A. Connect the welding power cable from the Wirefeeder's interconnection cables to the positive welding terminal (+) [negative welding terminal (-) for flux cored electrode wire]. If in doubt, consult the elec-

trode wire manufacturer. (Power Source Torch Polarity Lead not required to be connected when using wirefeeder)

- B. Connect the control cable from the Wirefeeder to the control socket on the Power Source.
- C. Fit the gas regulator and flowmeter to the gas cylinder then connect the gas hose from the rear of the Wirefeeder to the Flowmeter outlet.
- D. Dual groove feed rollers are supplied as standard. They can accommodate 0.9/1.2mm diameter hard wires. Select the roller required with the chosen wire size marking facing outwards.



- E. Fit the electrode wire spool to the wirefeeder wire reel hub. (Note that there is an adaptor supplied when using 200mm diameter wire spools). Ensure that the drive dog-pin engages the mating hole in the wire spool. Push the spool securing clip into place to retain the wire spool securely. The electrode wire should feed from the bottom of the spool.
- F. MIG Torch, EURO MIG Torch Connection

Fit the MIG Torch to the Wirefeeder by pushing the torch connector into the brass torch adaptor and screwing the plastic torch nut clockwise to secure the torch to the torch adaptor. Remove the contact tip from the torch handset.

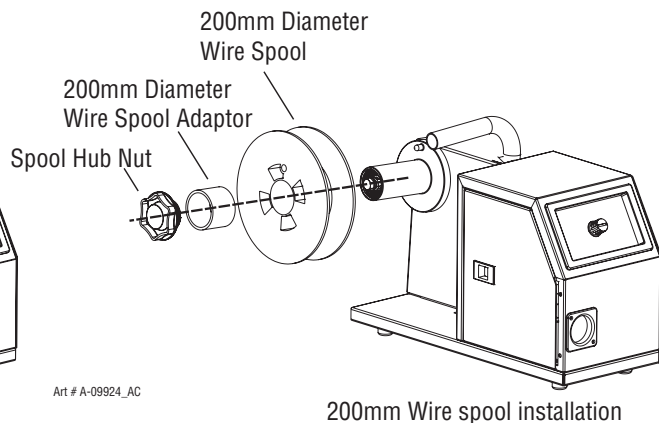
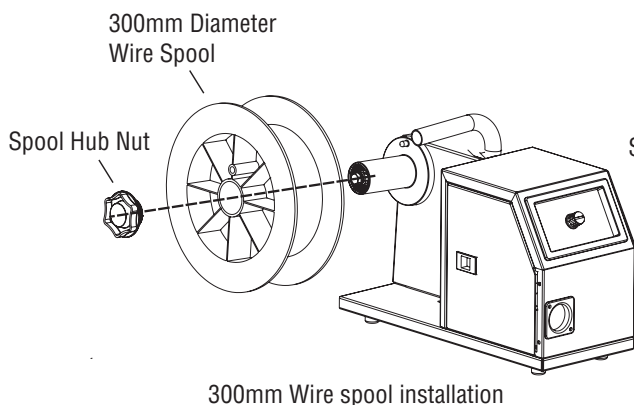
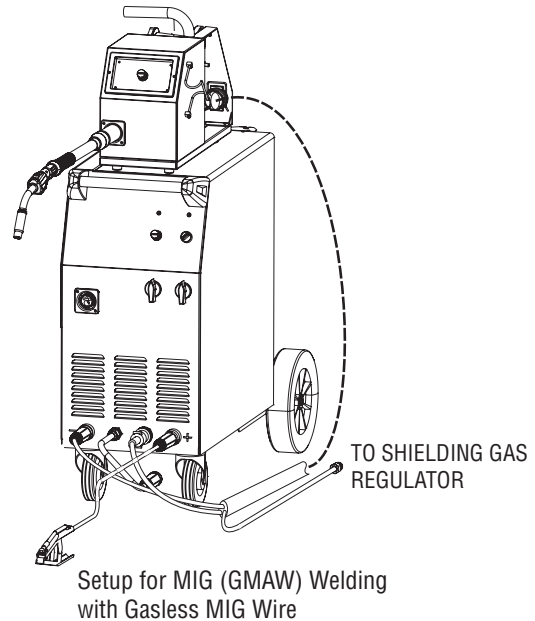
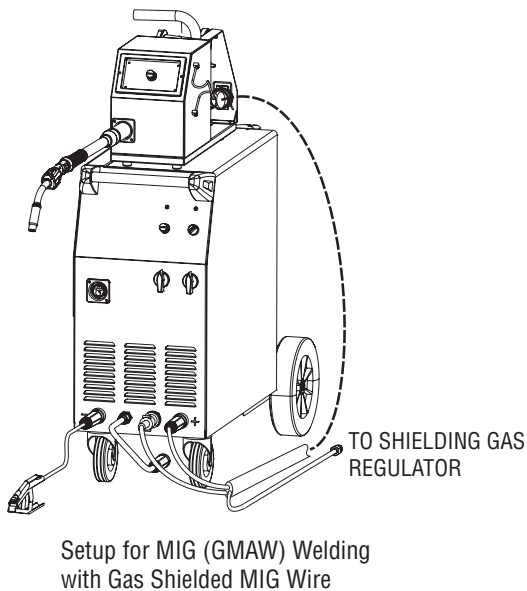


Figure 5-2 WeldSkill 250 & 350 WF Setup and WF Spool Hub

**Inserting Wire Into The Wire Feed Mechanism**

- A. Lift up the wire feeder pressure lever and pass the electrode wire through the inlet guide, between the rollers, through the centre guide, between the rollers, through the outlet guide and into the MIG torch.

**WARNING**

---

*DO NOT WEAR GLOVES WHILE THREADING THE WIRE OR CHANGING THE WIRE SPOOL.*

---

- B. Lower the pressure lever and with the torch lead reasonably straight, feed the electrode wire through the torch. Fit the appropriate contact tip, eg a 0.9mm tip for 0.9mm wire.
- C. Press the Torch switch to feed the wire through the torch.

**WARNING**

---

*The electrode wire will be at welding voltage potential whilst it is being fed through the wirefeeder system if the wire is fed by using the TORCH SWITCH.*

---

**Drive Roller Pressure Adjustment**

The moveable rollers apply pressure to the grooved feed rollers via a scaled adjustable tension screw. These devices should be adjusted to a minimum pressure that will provide satisfactory WIREFEED without slippage. If slipping occurs, and inspection of the wire contact tip reveals no wear, distortion or burn back jam, the conduit liner should be checked for kinks and clogging by metal flakes and swarf. If it is not the cause of slipping, the feed roll pressures can be increased by rotating the scaled tension screws clockwise. The use of excessive pressure may cause rapid wear of the feed rollers, shafts and bearing.

**5.04 Wire Reel Brake**

The wire reel hub incorporates a friction brake which is adjusted during manufacture for optimum breaking. If it is considered necessary, adjustment can be made by turning the large nut inside the open end of the hub clockwise to tighten the brake. Correct adjustment will result in the wire reel circumference continuing no further than 20mm after release of the trigger. The electrode wire should be slack without becoming dislodged from wire spool.

**CAUTION**

---

*Overtension of brake will cause rapid wear of mechanical WIREFEED parts, overheating of electrical component and possibly an increased incidence of electrode wire Burnback into contact tip.*

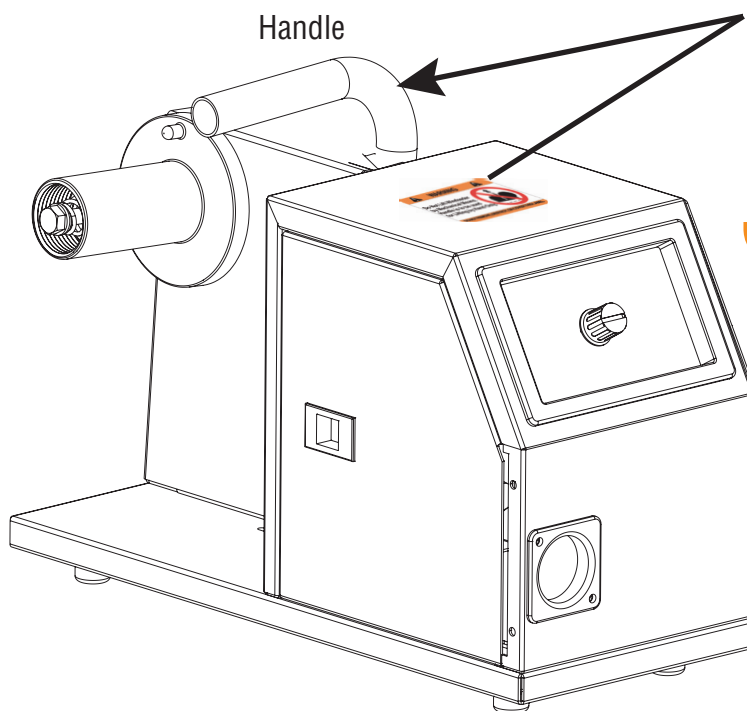
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## 5.05 How to Lift WELDSKILL 4R Wirefeeder

**WARNING**

*DO NOT lift the WELDSKILL 4R Wirefeeder by the Handle using mechanical means. The WELDSKILL 4R Wirefeeder may fall from a hook/mechanical hoist as the small bracket on the handle is not designed to secure a lifting hook/mechanical hoist in the corner of the Handle. The Handle is designed for lifting by hand only.*

The WELDSKILL 4R Wirefeeder Handle is designed for lifting the Wirefeeder by hand only.

**WARNING**

**Do Not Lift Wirefeeder by Mechanical Means. Handle is to be used for Lifting by Hand Only.**



**DO NOT REMOVE, DESTROY, OR COVER THIS LABEL**

Art # A-11480

## SECTION 6: BASIC WELDING GUIDE

### 6.01 MIG (GMAW/FCAW) Basic Welding Technique

Two different welding processes are covered in this section (GMAW and FCAW), with the intention of providing the very basic concepts in using the MIG mode of welding, where a welding gun is hand held, and the electrode (welding wire) is fed into a weld puddle, and the arc is shielded by an inert welding grade shielding gas or inert welding grade shielding gas mixture.

**GAS METAL ARC WELDING (GMAW):** This process, also known as MIG welding, CO<sub>2</sub> welding, Micro Wire Welding, short arc welding, dip transfer welding, wire welding etc., is an electric arc welding process which fuses together the parts to be welded by heating them with an arc between a solid continuous, consumable electrode and the work. Shielding is obtained from an externally supplied welding grade shielding gas or welding grade shielding gas mixture. The process is normally applied semiautomatically; however the process may be operated automatically and can be machine operated. The process can be used to weld thin and fairly thick steels, and some non-ferrous metals in all positions.

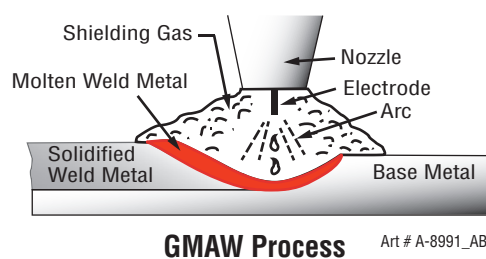


Figure 6-1

**FLUX CORED ARC WELDING (FCAW):** This is an electric arc welding process which fuses together the parts to be welded by heating them with an arc between a continuous flux filled electrode wire and the work. Shielding is obtained through decomposition of the flux within the tubular wire. Additional shielding may or may not be obtained from an externally supplied gas or gas mixture. The process is normally applied semiautomatically; however the process may be applied automatically or by machine. It is commonly used to weld large diameter electrodes in the flat and horizontal position and small electrode diameters in all positions. The process is used to a lesser degree for welding stainless steel and for overlay work.

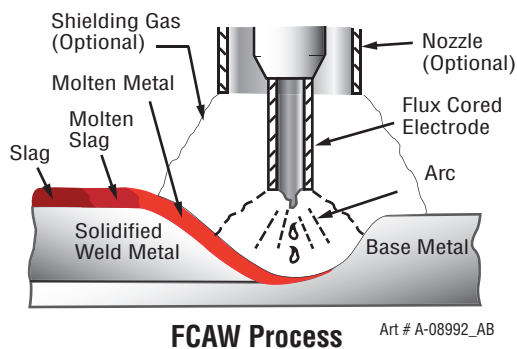


Figure 6-2

## Position of MIG Torch

The angle of MIG torch to the weld has an effect on the width of the weld.

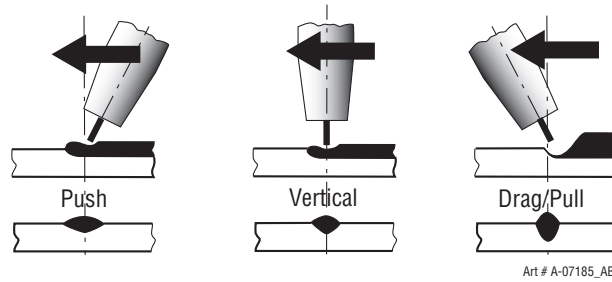


Figure 6-3

The welding gun should be held at an angle to the weld joint. (see Secondary Adjustment Variables below)

Hold the gun so that the welding seam is viewed at all times. Always wear the welding helmet with proper filter lenses and use the proper safety equipment.

**CAUTION**

*Do not pull the welding gun back when the arc is established. This will create excessive wire extension (stick-out) and make a very poor weld.*

The electrode wire is not energized until the gun trigger switch is depressed. The wire may therefore be placed on the seam or joint prior to lowering the helmet.

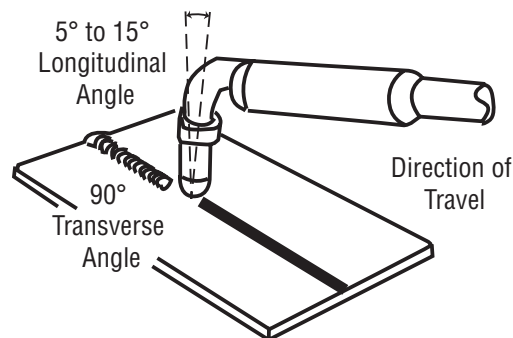


Figure 6-4

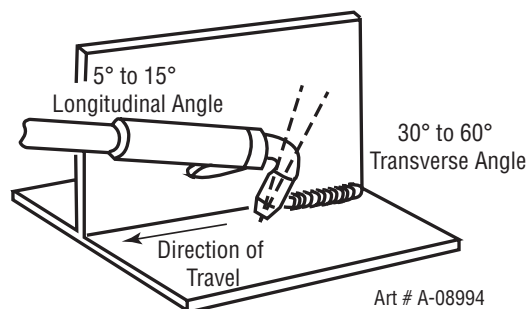
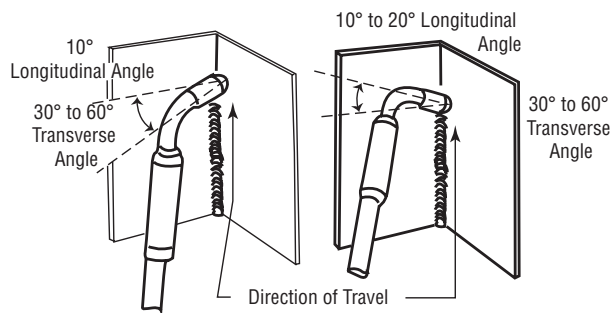


Figure 6-5

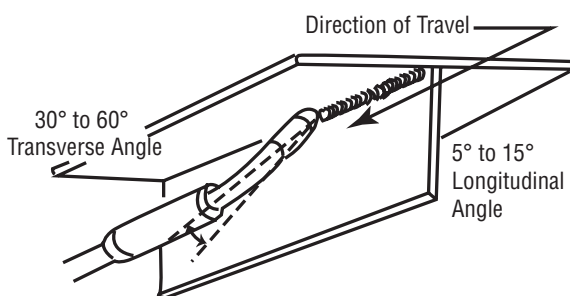




Vertical Fillet Welds

Art # A-08995

Figure 6-6



Art # A-08996

Figure 6-7

### Distance from the MIG Torch Nozzle to the Work Piece

The electrode wire stick out from the MIG Torch nozzle should be between 10mm to 20.0mm. This distance may vary depending on the type of joint that is being welded.

### Travel Speed

The speed at which the molten pool travels influences the width of the weld and penetration of the welding run.

### MIG Welding (GMAW) Variables

Most of the welding done by all processes is on carbon steel. The items below describe the welding variables in short-arc welding of 24gauge (0.024", 0.6mm) to 1/4" (6.4mm) mild sheet or plate. The applied techniques and end results in the GMAW process are controlled by these variables.

#### Preselected Variables

Preselected variables depend upon the type of material being welded, the thickness of the material, the welding position, the deposition rate and the mechanical properties. These variables are:

- Type of electrode wire
- Size of electrode wire
- Type of gas (not applicable to self shielding wires FCAW)
- Gas flow rate (not applicable to self shielding wires FCAW)

#### Primary Adjustable Variables

These control the process after preselected variables have been found. They control the penetration, bead width, bead height, arc stability, deposition rate and weld soundness. They are:

- Arc Voltage
- Welding current (wire feed speed)
- Travel speed

### Secondary Adjustable Variables

These variables cause changes in primary adjustable variables which in turn cause the desired change in the bead formation. They are:

1. Stick-out (distance between the end of the contact tube (tip) and the end of the electrode wire). Maintain at about 10mm stick-out
2. Wire Feed Speed. Increase in wire feed speed increases weld current, Decrease in wire feed speed decreases weld current.

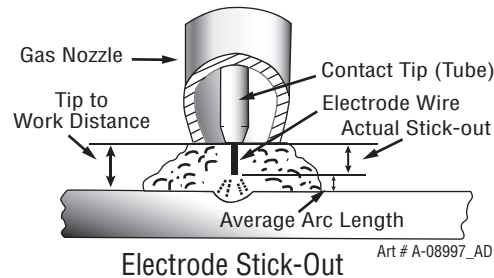


Figure 6-8

3. Nozzle Angle. This refers to the position of the welding gun in relation to the joint. The transverse angle is usually one half the included angle between plates forming the joint. The longitudinal angle is the angle between the centre line of the welding gun and a line perpendicular to the axis of the weld. The longitudinal angle is generally called the Nozzle Angle and can be either trailing (pulling) or leading (pushing). Whether the operator is left handed or right handed has to be considered to realize the effects of each angle in relation to the direction of travel.

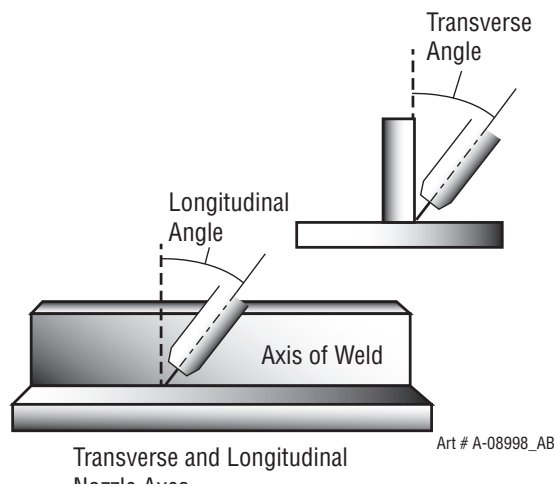


Figure 6-9

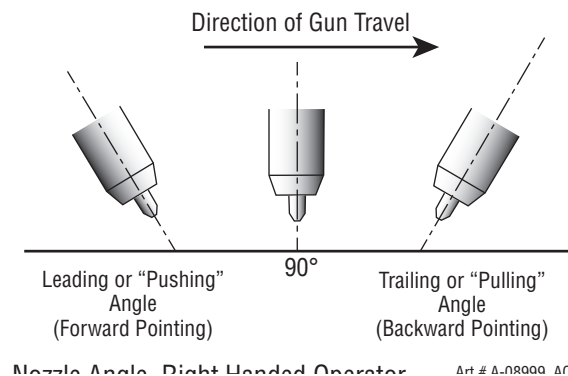


Figure 6-10

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**Establishing the Arc and Making Weld Beads**

Before attempting to weld on a finished piece of work, it is recommended that practice welds be made on a sample metal of the same material as that of the finished piece.

The easiest welding procedure for the beginner to experiment with MIG welding is the flat position. The equipment is capable of flat, vertical and overhead positions.

For practicing MIG welding, secure some pieces of 16 or 18 gauge (0.06" 1.5mm or 0.08" 2.0mm) mild steel plate 6" x 6" (150 x 150mm). Use 0.024" (0.8mm) flux cored gasless wire or a solid wire with shielding gas.

**Setting of the Power Source**

Power source and Wirefeeder setting requires some practice by the operator, as the welding plant has two control settings that have to balance. These are the Wirespeed control (refer to section 3.06.4) and the welding Voltage Control (refer to section 3.06.10). The welding current is determined by the Wirespeed control, the current will increase with increased Wirespeed, resulting in a shorter arc. Less wire speed will reduce the current and lengthen the arc. Increasing the welding voltage hardly alters the current level, but lengthens the arc. By decreasing the voltage, a shorter arc is obtained with a little change in current level.

When changing to a different electrode wire diameter, different control settings are required. A thinner electrode wire needs more Wirespeed to achieve the same current level.

A satisfactory weld cannot be obtained if the Wirespeed and Voltage settings are not adjusted to suit the electrode wire diameter and the dimensions of the work piece.

If the Wirespeed is too high for the welding voltage, "stubbing" will occur as the wire dips into the molten pool and does not melt. Welding in these conditions normally produces a poor weld due to lack of fusion. If, however, the welding voltage is too high, large drops will form on the end of the wire, causing spatter. The correct setting of voltage and Wirespeed can be seen in the shape of the weld deposit and heard by a smooth regular arc sound. Refer to the Weld Guide located on the inside of the wirefeed compartment door for setup information.

**Electrode Wire Size Selection**

The choice of Electrode wire size and shielding gas used depends on the following

- Thickness of the metal to be welded
- Type of joint
- Capacity of the wire feed unit and Power Source
- The amount of penetration required
- The deposition rate required
- The bead profile desired
- The position of welding
- Cost of the wire



## SECTION 7: SERVICE

### 7.01 Routine Service and Calibration Requirements



#### WARNING

*There are extremely dangerous voltage and power levels present inside this Power Source. Do not attempt to open or repair unless you are an accredited CIGWELD Service Provider. Disconnect the Welding Power Source from the Mains Supply Voltage before disassembling.*

#### 1. Routine Inspection, Testing & Maintenance

The inspection and testing of the power source and associated accessories shall be carried out in accordance with Section 5 of AS 1674.2 - 2007: Safety in Welding and Allied Processes-Part 2 Electrical. This includes an insulation resistance test and an earthing test to ensure the integrity of the unit is compliant with Cigweld's original specifications.

If equipment is to be used in a hazardous location or environments with a high risk of electrocution as outlined in AS 1674.2 - 2007, then the above tests should be carried out prior to entering this location.

#### Testing Schedule

- a) For transportable equipment, at least once every 3 months; and
- b) For fixed equipment, at least once every 12 months.

The owners of the equipment shall keep a suitable record of the periodic tests and a system of tagging, including the date of the most recent inspection.

A transportable power source is deemed to be any equipment that is not permanently connected and fixed in the position in which it is operated.

#### Insulation Resistance

Minimum insulation resistance for in-service Cigweld Power Sources shall be measured at a voltage of 500V between the parts referred to in Table 7-1 below. Power sources that do not meet the insulation resistance requirements set out below shall be withdrawn from service and not returned until repairs have been performed such that the requirements outlined below are met.

Components to be Tested	Minimum Insulation Resistance (MΩ)
Input circuit (including any connected control circuits) to welding circuit (including any connected control circuits)	5
All circuits to exposed conductive parts	2.5
Welding circuit (including any connected control circuits) to any auxiliary circuit which operates at a voltage exceeding extra low voltage	10
Welding circuit (including any connected control circuits) to any auxiliary circuit which operates at a voltage not exceeding extra low voltage	1
Separate welding circuit to separate welding circuit	1

Table 7-1: Minimum Insulation Resistance Requirements: Cigweld Power Sources

#### Earthing

The resistance shall not exceed 1Ω between any metal of a power source where such metal is required to be earthed, and -

- a) The earth terminal of a fixed power source; or
- b) The earth terminal of the associated plug of a transportable power source

Note that due to the dangers of stray output currents damaging fixed wiring, the integrity of fixed wiring supplying Cigweld welding power sources should be inspected by a licensed electrical worker in accordance with the requirements below -

- a) For outlets/wiring and associated accessories supplying transportable equipment - at least once every 3 months; and
- b) For outlets/wiring and associated accessories supplying fixed equipment - at least once every 12 months.

### **General Maintenance Checks**

Welding equipment should be regularly checked by an accredited Cigweld Service Provider to ensure that:

- Flexible cord is of the multi-core tough rubber or plastic sheathed type of adequate rating, correctly connected and in good condition.
- Welding terminals are in suitable condition and are shrouded to prevent inadvertent contact or short circuit.
- The Welding System is clean internally, especially from metal filing, slag, and loose material.

### **Accessories**

Accessory equipment, including output leads, electrode holders, torches, wire feeders and the like shall be inspected at least monthly by a competent person to ensure that the equipment is in a safe and serviceable condition. All unsafe accessories shall not be used.

### **Repairs**

- If any parts are damaged for any reason, it is recommended that replacement be performed by an accredited Cigweld Service Provider.

## **2. Power Source Calibration**

### **Schedule**

Output testing of all Cigweld Power Sources and applicable accessories shall be conducted at regular intervals to ensure they fall within specified levels. Calibration intervals shall be as outlined below -

- a) For transportable equipment, at least once every 3 months; and
- b) For fixed equipment, at least once every 12 months.

If equipment is to be used in a hazardous location or environments with a high risk of electrocution as outlined in AS 1674.2 - 2007, then the above tests should be carried out prior to entering this location.

### **Calibration Requirements**

Where applicable, the tests outlined in Table 7-2 below shall be conducted by an accredited CIGWELD service agent.

Testing Requirements
Output current (A) to be checked to ensure it falls within applicable Cigweld power source specifications
Output Voltage (V) to be checked to ensure it falls within applicable Cigweld power source specifications
Motor Speed (RPM) of wire drive motors to be checked to ensure it falls within required Cigweld power source / wire feeder specifications

Table 7-2: Calibration Parameters

Periodic calibration of other parameters such as wave balance (AC), timing functions and high frequency start is not required unless a specific fault has been identified.

### **Calibration Equipment**

All equipment used for Power Source calibration shall be in proper working condition and be suitable for conducting the measurement in question. Only test equipment with valid calibration certificates (NATA certified laboratories) shall be utilized.

## 7.02 Cleaning the Feed Rolls

Clean the grooves in the drive rolls frequently. This can be done by using a small wire brush. Also wipe off, or clean the grooves on the upper feed roll. After cleaning, tighten the feed roll retaining knobs.

## 7.03 Basic Troubleshooting



### WARNING

*There are 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 Provider for repair.

The basic level of troubleshooting is that which can be performed without special equipment or knowledge and without removing the covers from the Wirefeeder.

## 7.04 Solving Problems Beyond the Welding Terminals

The general approach to fix Gas Metal Arc Welding (GMAW) problems is to start at the wire spool then work through to the MIG torch. There are two main areas where problems occur with GMAW, Porosity and Inconsistent wire feed.

## 7.05 Solving Problems Beyond the Welding Terminals - Porosity

When there is a shielding gas problem the result is usually porosity within the weld metal. Porosity always stems from some contaminant within the molten weld pool which is in the process of escaping during solidification of the molten metal. Contaminants range from no shielding gas around the welding arc to dirt on the work piece surface. Porosity can be reduced by checking the following points.

FAULT	CAUSE
1 Shielding gas cylinder contents and flow meter.	Ensure that the shielding gas cylinder is not empty and the flow meter is correctly adjusted to 15 litres per minute.
2 Gas leaks.	Check for shielding gas leaks between the regulator/cylinder connection and in the shielding gas hose to the Power Source.
3 Internal shielding gas hose in the Power Source.	Ensure the hose from the solenoid valve to the torch adaptor has not fractured and that it is connected to the torch adaptor.
4 Welding in a windy environment.	Shield the weld area from the wind or increase the shielding gas flow.
5 Welding dirty, oily, painted, oxidised or greasy plate.	Clean contaminates off the work piece.
6 Distance between the MIG torch nozzle and the work piece.	Keep the distance between the MIG torch nozzle and the work piece to a minimum.
7 Maintain the MIG torch in good working order.	A Ensure that the shielding gas holes are not blocked and shielding gas is exiting out of the torch nozzle. B Do not restrict shielding gas flow by allowing spatter to build up inside the torch nozzle. C Check that the MIG torch O-rings are not damaged.

**CAUTION**

*Disengage the drive roll when testing for shielding gas flow by ear.*

## 7.06 Solving Problems Beyond the Welding Terminals – Inconsistent Wire Feed

Wire feeding problems can be reduced by checking the following points.

FAULT	CAUSE
1 Wire spool brake is too tight	Feed roller driven by motor in the cabinet will slip.
2 Wire spool brake is too loose	Wire spool can unwind and tangle.
3 Worn or incorrect feed roller size	A Use 'U' groove drive feed roller matched to the aluminium wire size you are welding. B Use 'V' groove drive feed roller matched to the hard wire size you are welding. C Use 'knurled V' groove drive feed roller matched to the flux cored wire size you are welding.
4 Mis-alignment of inlet/outlet guides	Wire will rub against the mis-aligned guides and reduces wire feedability.
5 Liner blocked with swarf	A Increased amounts of swarf are produced by the wire passing through the feed roller when excessive pressure is applied to the pressure roller adjuster. B Swarf can also be produced by the wire passing through an incorrect feed roller groove shape or size. C Swarf is fed into the conduit liner where it accumulates thus reducing wire feedability.
6 Incorrect or worn contact tip	A The contact tip transfers the weld current to the electrode wire. If the hole in the contact tip is too large then arcing may occur inside the contact tip resulting in the wire jamming in the contact tip. B When using soft wire such as aluminium it may become jammed in the contact tip due to expansion of the wire when heated. A contact tip designed for soft wires should be used.
7 Poor work lead contact to work piece	If the work lead has a poor electrical contact to the work piece then the connection point will heat up and result in a reduction of power at the arc.
8 Bent liner	This will cause friction between the wire and the liner thus reducing wire feedability



## 7.07 Welding Problems

FAULT	CAUSE	REMEDY
1 Undercut	A Welding arc voltage too high.  B Incorrect torch angle C Excessive heat input	A Reduce voltage by reducing the Voltage Control switch positions or turn the Wirespeed control knob anticlockwise. B Adjust angle C Increase the torch travel speed or reduce welding current by reducing the Voltage Control switch positions and turn the Wirespeed control knob anti-clockwise.
2 Lack of penetration	A Welding current too low  B Joint preparation too narrow or gap too tight C Shielding gas incorrect	A Increase welding current by increasing the Wirespeed control knob clockwise and increasing Voltage Control switch positions. B Increase joint angle or gap C Change to a gas which gives higher penetration
3 Lack of fusion	Arc voltage too low	Increase Arc voltage by increasing the Voltage Control switch positions.
4 Excessive spatter	A Arc voltage too high  B Arc voltage too low	A Lower voltage by reducing the Voltage Control switch positions or turn the Wirespeed control knob anti-clockwise. B Raise voltage by increasing the Voltage Control switches or turn the Wirespeed control knob clockwise.
5 Irregular weld shape	A Incorrect voltage and current settings. Convex, Arc voltage too low Concave, voltage too high B Wire is wandering C Incorrect shielding gas D Insufficient or excessive heat input	A Adjust voltage and current by adjusting the Voltage Control switch positions and the Wirespeed control knob. B Replace contact tip C Check gas selection D Adjust the Wirespeed control knob or the Voltage Control switch.
6 Arc does not have a crisp sound that short arc exhibits when the wirefeed speed and voltage are adjusted correctly	The MIG torch has been connected to the wrong voltage polarity on the front panel	Connect the MIG torch to the positive welding terminal (+) for solid wires and gas shielded flux cored wires.

7 Weld cracking	A Weld beads too small B Weld penetration narrow and deep  C Excessive weld stresses  D Excessive voltage  E Cooling rate too fast	A Decrease torch travel speed B Reduce current and voltage and increase the MIG Torch travel speed or select a lower penetration shielding gas. C Increase weld metal strength or revise design D Decrease voltage by reducing the Voltage Control switches. E Slow the cooling rate by preheating part to be welded or cool slowly.
8 Cold weld puddle	A Faulty rectifier unit  B Loss of a phase in the Mains supply voltage. C Loose welding cable connection.  D Low Mains supply voltage	A Have an Accredited CIGWELD Service Provider test then replace the faulty component. B Check mains power  C Check all welding cable connections.  D Contact supply authority

## 7.08 Power Source / Wirefeeder Problems

FAULT	CAUSE	REMEDY
1 Mains supply voltage is ON. Indicator light is not lit and welding arc can not be established.	A Primary fuse is blown. B Broken connection in primary circuit.	A Replace primary fuse. B Have an Accredited CIGWELD Service Provider check primary circuit.
2 Mains indicator light is not lit but welding arc can be established.	Burnt out Indicator light.	Have an Accredited CIGWELD Service Provider replace Indicator light.
3 Mains supply voltage is ON and power Indicator is lit however unit will not commence welding when the torch trigger switch is depressed.	A Faulty torch trigger B Circuit breaker tripped	A Repair or replace torch trigger switch/leads B Reset Circuit Breaker(s)
4 Mains supply voltage is ON, no wire feed but gas flows from the MIG Torch when the torch trigger switch is depressed.	A Electrode wire stuck in conduit liner or contact tip (burn-back jam). B Faulty control PCB	A Check for clogged / kinked MIG Torch conduit liner or worn contract tip. Replace faulty components. B Have an Accredited CIGWELD Service Provider investigate the fault.

5 Wire feeds when the torch trigger switch is depressed but arc cannot be established.	<p>A Mig torch polarity lead is not connected into a welding output terminal.</p> <p>B Poor or no work lead contact.</p>	<p>A Connect the MIG torch polarity lead to either the positive welding output terminal or negative output terminal as required.</p> <p>B Clean work clamp area and ensure good electrical contact.</p>
6 Inconsistent wire feed	<p>A Worn or dirty contact tip</p> <p>B Worn feed roll.</p> <p>C Excessive back tension from wire reel hub.</p> <p>D Worn, kinked or dirty conduit liner</p>	<p>A Replace if necessary.</p> <p>B Replace if necessary.</p> <p>C Reduce brake tension on spool hub</p> <p>D Clean or replace conduit liner</p>
7 No gas flow	<p>A Gas hose is cut.</p> <p>B Gas passage contains impurities.</p> <p>C Gas regulator turned off.</p> <p>D Empty Cylinder</p>	<p>A Replace or repair.</p> <p>B Disconnect gas hose from the rear of Power Source or wirefeeder then raise gas pressure and blow out impurities.</p> <p>C Turn on.</p> <p>D Replace cylinder.</p>
8 Gas flow continues after the torch trigger switch has been released.	Gas valve has jammed open due to impurities in the gas or the gas line.	Have an Accredited CIGWELD Service Provider repair or replace gas valve.
9 Wire does not feed when torch trigger depressed	<p>A Faulty trigger switch / lead</p> <p>B Circuit breaker tripped</p>	<p>A Repair or replace Torch / trigger lead</p> <p>B Reset Circuit Breaker(s)</p>
10 Wire continues to feed when torch trigger released	<p>A Power Source in 4T (LATCH) mode</p> <p>B Torch trigger leads shorted</p>	<p>A Change to 2T (NORMAL) mode</p> <p>B Repair or replace Torch / trigger lead</p>
11 Wire feeds when the torch trigger switch is depressed but arc can not be established and OVERHEAT led is illuminated	Power Source Overtemperature Protection circuit has operated	Cease welding and allow Power Source to Cool for 10 minutes. Overheat led will extinguish when the Power Source has cooled sufficiently.



## APPENDIX 1: KEY SPARE PARTS

WELDSKILL 250 MIG SPARE PARTS	
Part No	Description
W7004501	Contactor
W7004502	PCB Control
W7004503	Solenoid Valve, 36VAC
W7004505	Switch, On/Off, 415V
W7004506	Fan Assembly, 220V
W7004540	Wire Drive Assembly
W7004541	Local Remote Switch
W7004513	Control Transformer
W7004515	Inch/Purge switch
W7004518	Switch 2T/4T/Spot
W7004526	Main Transformer
W7004527	Auxiliary Contact
W7004528	Inductor
W7004529	Rectifier Assembly (includes thermostat) 300A
W7004530	Switch Voltage 12 Position
W7004531	Capacitor 22000uF, 110V

Table A1-1

WELDSKILL 350 MIG SPARE PARTS	
Part No	Description
W7004500	Main Transformer
W7004501	Contactor
W7004502	PCB Control
W7004503	Solenoid Valve, 36VAC
W7004505	Switch, On/Off, 415V
W7004506	Fan Assembly, 220V
W7004507	Inductor Assembly
W7004508	Rectifier Assembly (includes thermostat) 400A
W7004509	Switch, Coarse Voltage
W7004510	Switch, Fine Voltage
W7004540	Wire Drive Assembly
W7004541	Local Remote Switch
W7004513	Control Transformer
W7004515	Inch/Purge switch
W7004518	Switch 2T/4T/Spot

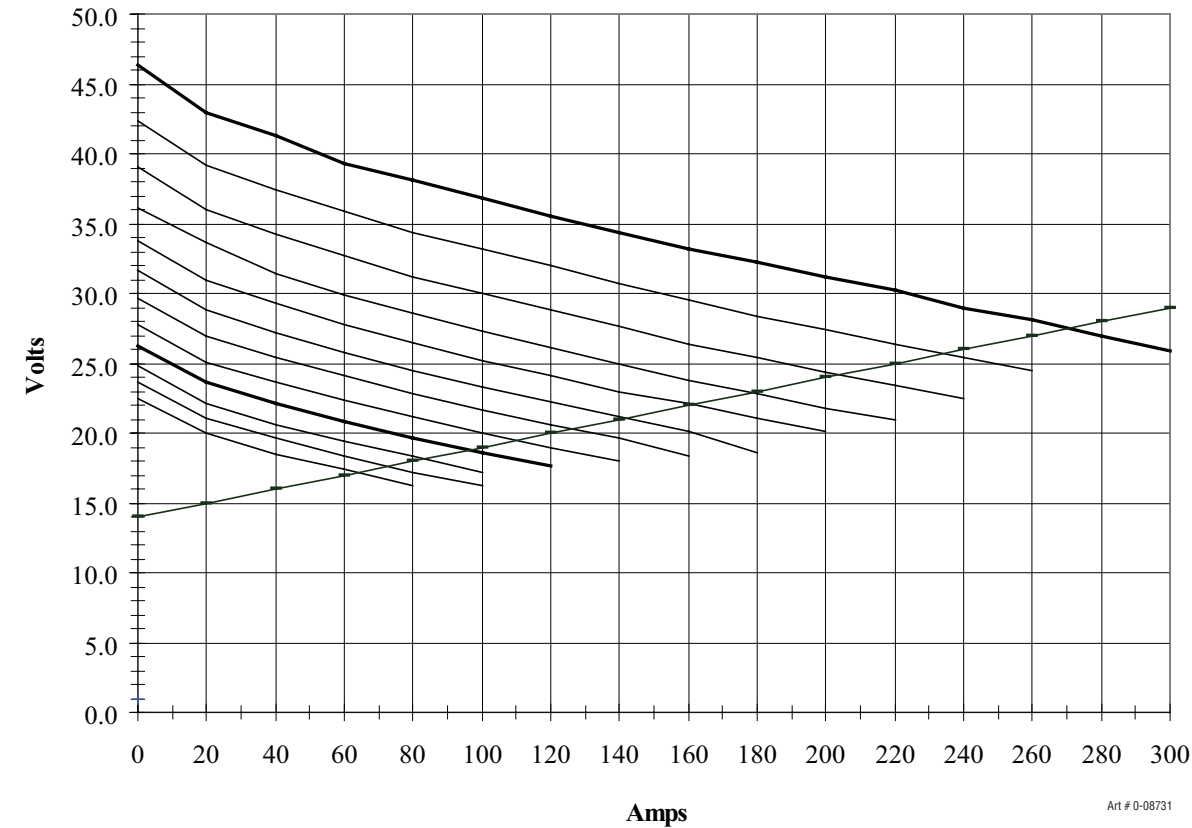
Table A1-2

WELDSKILL 4R WIREFEEDER SPARE PARTS	
Part No	Description
W7004540	Wire Drive Assembly
W7004503	Solenoid Valve, 36VAC

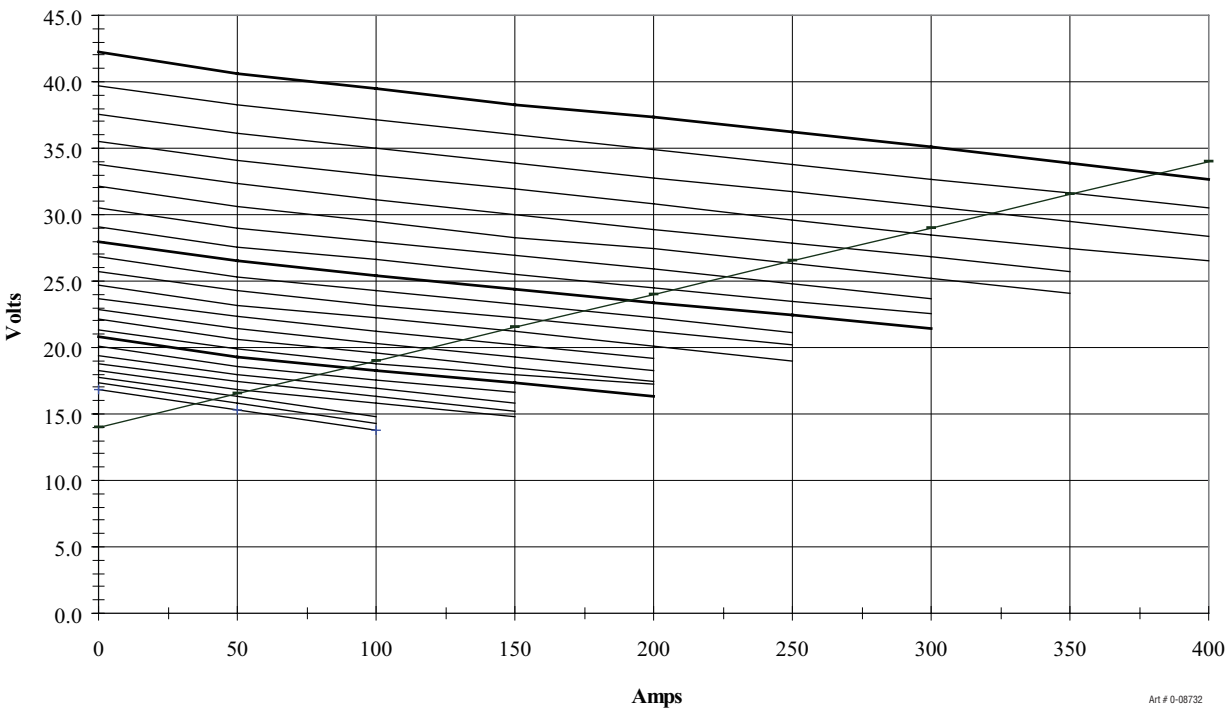
Table A1-3

APPENDIX 2:  
VOLT/AMP CURVES

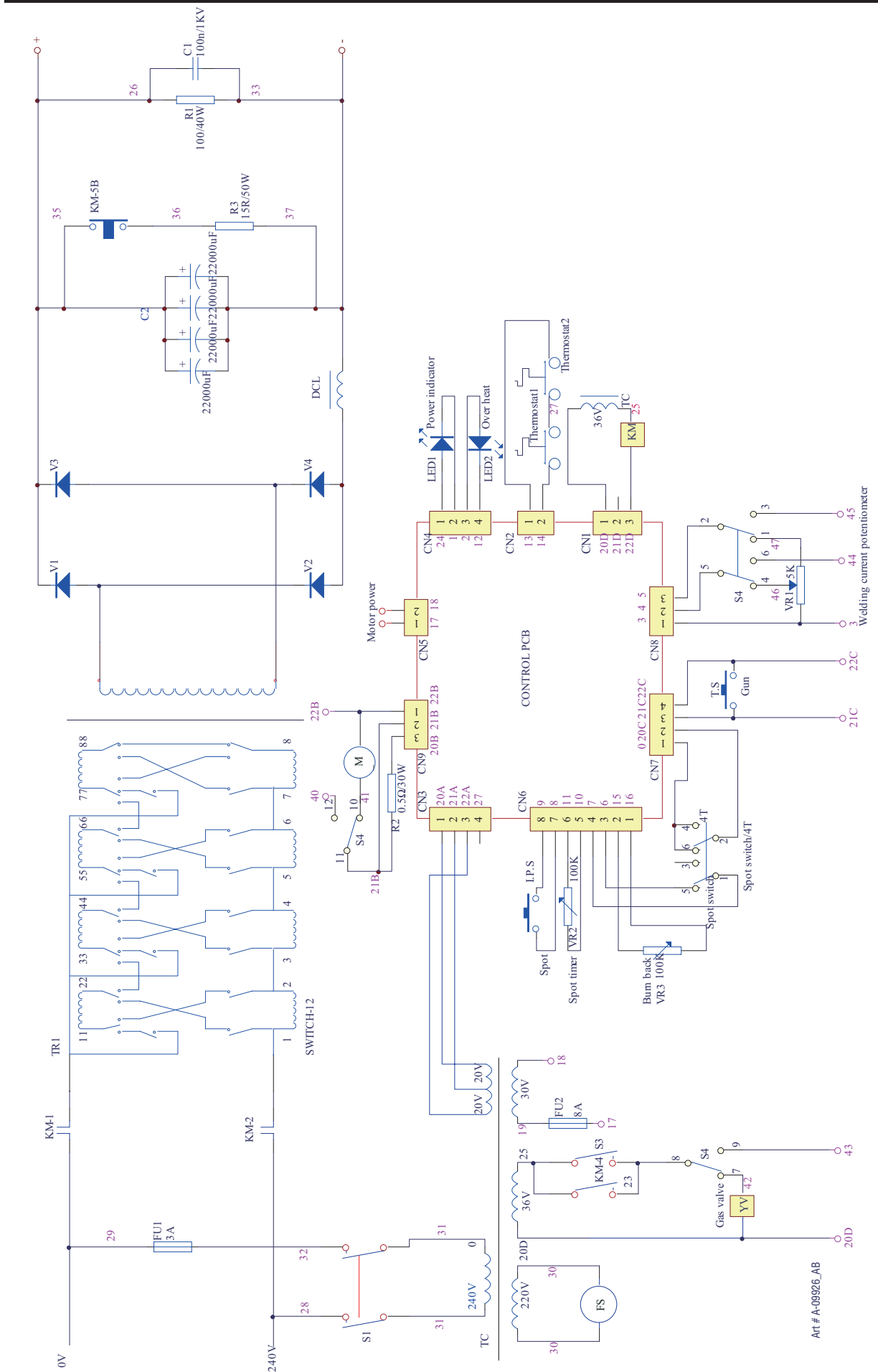
WeldSkill 250 VA Curve



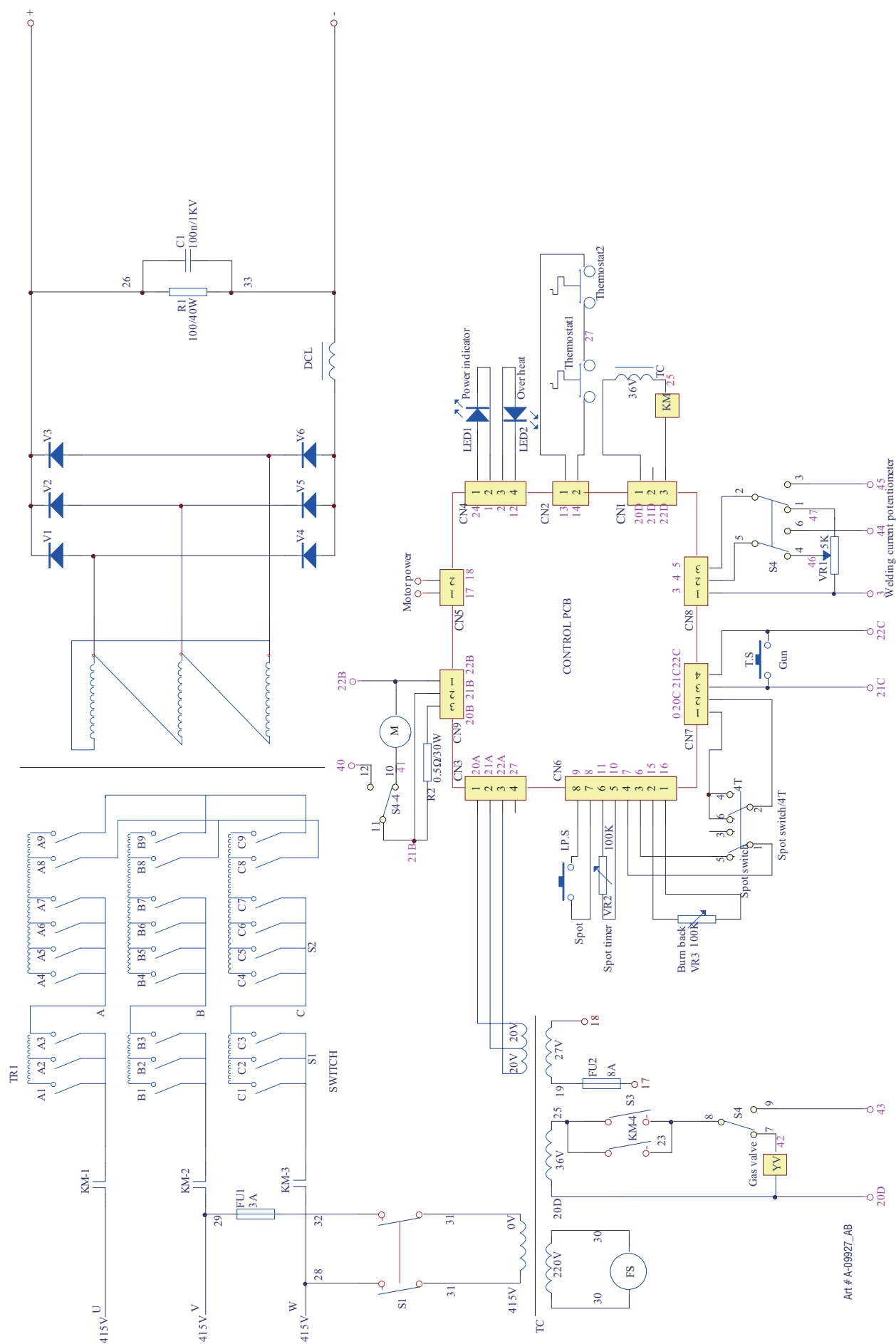
WeldSkill 350 VA Curve



## APPENDIX 3: WELDSKILL 250 MIG POWER SOURCE CIRCUIT DIAGRAM

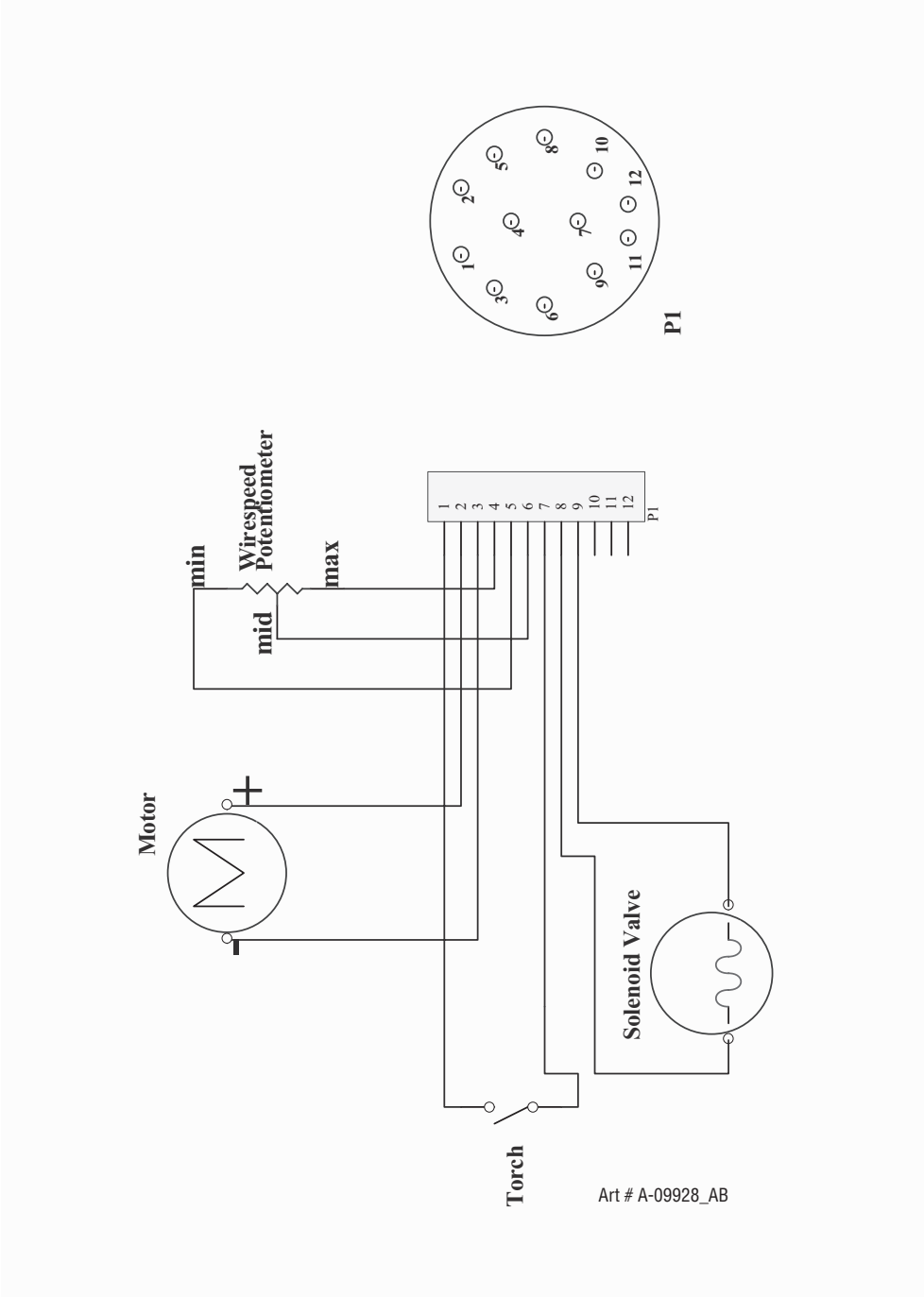


## APPENDIX 4: WELDSKILL 350 MIG POWER SOURCE CIRCUIT DIAGRAM





APPENDIX 5:  
4R WIREFEEDER CIRCUIT DIAGRAM





# **CIGWELD LIMITED WARRANTY**

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LIMITED WARRANTY: CIGWELD, A Victor Technologies Company, hereafter, "CIGWELD" warrants to customers of its authorized 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 authorized 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-AUTHORIZED PERSONS.

The warranty is effective for the time stated below beginning on the date that the authorized distributor delivers the products to the Purchaser. Notwithstanding 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 authorized distributor.

# TERMS OF WARRANTY – JANUARY 2011

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1. The Trade Practices Act 1974 (Commonwealth) and similar State Territory legislation relating to the supply of goods and services, protects consumers' interests by ensuring that consumers are entitled in certain situations to the benefit of various conditions, warranties, guarantees, rights and remedies (including warranties as to merchantability and fitness for purpose) associated with the supply of goods and services. A consumer should seek legal advice as to the nature and extent of these protected interests. In some circumstances, the supplier of goods and services may legally stipulate that the said conditions, warranties, guarantees, rights and remedies are limited or entirely excluded. The warranties set out in Clause 2 shall be additional to any non excludable warranties to which the Customer may be entitled pursuant to any statute.

2. Subject to Clause 3. CIGWELD gives the following warranties to the Customer:

Insofar as they are manufactured or imported by CIGWELD, goods will upon delivery be of merchantable quality and reasonably fit for the purpose for which they are supplied by CIGWELD.

CIGWELD will repair or, at its option, replace those of the goods which, upon examination, are found by CIGWELD to be defective in workmanship and/or materials.

CIGWELD reserves the right to request documented evidence of date of purchase.

3. The Warranty in Clause 2;

Is conditional upon:

The Customer notifying CIGWELD or our Accredited Distributor 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. The goods being used in accordance with the Manufacturer's Operating Manuals, and under competent supervision.

Does not apply to:

Obsolete goods sold at auction, second-hand goods and prototype goods.

Breakdown or malfunction caused by accident, misuse or normal wear and tear.

Repairs or replacement made other than by CIGWELD or Accredited Service Providers, unless by prior arrangement with CIGWELD.

Replacement parts or accessories which may affect product safety or performance and which are not manufactured, distributed or approved by CIGWELD.

4. CIGWELD declares that, to the extent permitted by law, it hereby limits its liability in respect of the supply of goods which are not of a kind ordinarily acquired for personal, domestic or household use or consumption to any one or more of the following (the choice of which shall be at the option of CIGWELD).

The replacement of the goods or the supply of equivalent goods.

The repair of goods.

The payment of cost of replacing the goods or acquiring equivalent goods.

The payment of the cost of having goods repaired.

5. Except as provided in Clauses 2 to 4 above, to the extent permitted by statute, CIGWELD hereby excludes all liability for any loss, damage, death or injury of any kind whatsoever occasioned to the Customer in respect of the supply of goods including direct, indirect, consequential or incidental loss, damage or injury of any kind.

## WARRANTY SCHEDULE – JANUARY 2011

These warranty periods relate to the warranty conditions in clause 2. All warranty periods are from date of sale from the Accredited Distributor of the equipment. Notwithstanding 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 Accredited Distributor. Unless otherwise stated the warranty period includes parts and labour. CIGWELD reserves the right to request documented evidence of date of purchase.

<b>WELDSKILL 250 AND 350 MIG POWER SOURCES WELDSKILL 4R WIREFEEDER</b>	<b>WARRANTY PERIOD</b>	
	<b>PARTS</b>	<b>LABOUR</b>
Original main power rectifier, main power magnetics and control printed circuit boards	1 Year	1 Year
All other circuits and components including, but not limited to, relays, switches, contactors, solenoids, fans and power switch.	1 Year	1 Year
<b>WELDSKILL 250 AND 350 MIG ACCESSORIES</b>	<b>WARRANTY PERIOD</b>	
MIG torch and work lead.	3 Months	
MIG 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	

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





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***CIGWELD***