

**CIGWELD**

**220AC/DC  
300AC/DC**

# TRANSTIG WELDING MACHINE



A-12030

# Operating Manual

Revision: AB  
Operating Features:

Issue Date: February 28, 2014

Manual No: 0-5293

**220AC/DC**

**300AC/DC**

<b>240</b> V	<b>1</b> PHASE	<b>220</b> AMP
-----------------	-------------------	-------------------

<b>415</b> V	<b>3</b> PHASE	<b>300</b> AMP
-----------------	-------------------	-------------------





## **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 Accredited Service Provider call +1300 654 674, or visit us on the web at [www.cigweld.com.au](http://www.cigweld.com.au)

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 Inc. 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.



## **WARNINGS**

---

*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 0-5293 for:

Cigweld Transtig 220AC/DC Inverter Plant	Part Number W1007220
Cigweld Transtig 220AC/DC Power Source (Packed)	Part Number W1007221
Cigweld Transtig 300AC/DC Power Source (Packed)	Part Number W1007301

Published by:  
CIGWELD Pty Ltd  
71 Gower Street  
Preston, Victoria, Australia, 3072

[www.cigweld.com.au](http://www.cigweld.com.au)

Copyright 2013, 2014 by  
CIGWELD

All rights reserved.

Reproduction of this work, in whole or in part, without written permission of the publisher is prohibited.

The publisher does not assume and hereby disclaims any liability to any party for any loss or damage caused by any error or omission in this Manual, whether such error results from negligence, accident, or any other cause.

Publication Date: July 29, 2013  
Revision AB Date: February 28, 2014

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

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

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

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

## TABLE OF CONTENTS

### SECTION 1:

#### **ARC WELDING SAFETY INSTRUCTIONS AND WARNINGS ..... 1-1**

1.01	Arc Welding Hazards.....	1-1
1.02	Principal Safety Standards.....	1-5
1.03	Declaration of Conformity.....	1-6

### SECTION 2:

#### **INTRODUCTION ..... 2-1**

2.01	How To Use This Manual .....	2-1
2.02	Equipment Identification.....	2-1
2.03	Receipt of Equipment.....	2-1
2.04	Symbol Chart.....	2-2
2.05	Description .....	2-3
2.06	User Responsibility.....	2-3
2.07	Transporting Methods.....	2-3
2.08	Packaged Items .....	2-3
2.09	Duty Cycle.....	2-4
2.10	Specifications .....	2-5
2.11	Optional Accessories .....	2-6

### SECTION 3:

#### **INSTALLATION, OPERATION AND SETUP ..... 3-1**

3.01	Environment .....	3-1
3.02	Location.....	3-1
3.03	Ventilation.....	3-1
3.04	Mains Supply Voltage Requirements .....	3-1
3.05	High Frequency Introduction .....	3-1
3.06	High Frequency Interference.....	3-2
3.07	Electromagnetic Compatibility .....	3-2
3.08	TRANSTIG 220AC/DC and 300AC/DC Power Source Controls, Indicators and Features.....	3-4
3.09	Setup for TIG (GTAW) Welding .....	3-11
3.10	TRANSTIG 220AC/DC and 300AC/DC - TIG (GTAW) Programming Mode ...	3-14
3.11	TIG (GTAW) Welding Secondary Parameters .....	3-18
3.12	GTAW Spot Welding Mode with DWELL Time (Stitch Mode).....	3-19
3.13	Tip Tronic Operation.....	3-20
3.14	Setup for STICK (MMAW) Welding .....	3-22
3.15	TRANSTIG 220AC/DC and 300AC/DC- STICK (MMAW)Programming Mode	3-24
3.16	User Specific Menus and Dead Man Switch Mode.....	3-27
3.17	MMAW (STICK) Dead Man Switch Mode.....	3-28
3.18	Special Function .....	3-30
3.19	Information Messages .....	3-32
3.20	Error Messages.....	3-33
3.21	Shielding Gas Regulator Operating Instructions .....	3-35
3.22	Foot Control, Part No. W4015800 (Optional Accessory) .....	3-38

## TABLE OF CONTENTS

<b>SECTION 4:</b>		
<b>BASIC WELDING GUIDE .....</b>		<b>4-1</b>
4.01	Stick (MMAW) Basic Welding Technique .....	4-1
4.02	Stick (MMAW) Welding Troubleshooting .....	4-12
4.03	TIG (GTAW) Basic Welding Technique .....	4-14
4.04	TIG (GTAW) Welding Problems.....	4-16
<b>SECTION 5:</b>		
<b>POWER SOURCE PROBLEMS AND ROUTINE SERVICE REQUIREMENTS .....</b>		<b>5-1</b>
5.01	Basic Troubleshooting .....	5-1
5.02	Power Source Problems .....	5-1
5.03	Routine Service and Calibration Requirements.....	5-2
5.04	Cleaning the Welding Power Source.....	5-4
<b>SECTION 6:</b>		
<b>KEY SPARE PARTS.....</b>		<b>6-1</b>
6.01	220AC/DC Power Source .....	6-1
6.02	300AC/DC Power Source .....	6-3
<b>APPENDIX A: CIRCUIT DIAGRAM OF 220AC/DC</b>		
<b>APPENDIX B: CIRCUIT DIAGRAM OF 300AC/DC</b>		
<b>CIGWELD - LIMITED WARRANTY TERMS</b>		
<b>TERMS OF WARRANTY – January 2013</b>		
<b>WARRANTY SCHEDULE – January 2013</b>		
<b>GLOBAL CUSTOMER SERVICE CONTACT INFORMATION</b>		



## 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



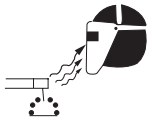
### WARNING

***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.

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE



## 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.

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.



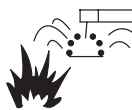


## WARNING

*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.



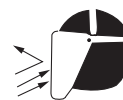
## WARNING

*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.



## 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.

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

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).

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

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

## 1.03 Declaration of Conformity

Manufacturer and Merchandiser of Quality Consumables and Equipment :  
Address:

CIGWELD  
71 Gower St, Preston  
Victoria 3072  
Australia



Description of equipment: CIGWELD Transtig 220AC/DC and 300AC/DC INVERTER Power Source 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:

\* AS 60974.10/ IEC 60974-10 EMC Directive applicable to arc welding equipment - generic emissions and regulations.

\* AS 60974.1-2006 /IEC 60974-1 applicable to welding equipment and associated accessories.

\* AS1674. Safety in welding and allied processes

\* 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 ii 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 un-crating the unit. Use care to avoid damaging the equipment when using bars, hammers, etc., to uncrate the unit.

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

## 2.04 Symbol Chart

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

	On		Single Phase		Wire Feed Function
	Off		Three Phase		Wire Feed Towards Workpiece With Output Voltage Off.
	Dangerous Voltage		Three Phase Static Frequency Converter-Transformer-Rectifier		Welding Gun
	Increase/Decrease		Remote		Purging Of Gas
	Circuit Breaker		Duty Cycle		Continuous Weld Mode
	AC Auxiliary Power		Percentage		Spot Weld Mode
	Fuse		Panel/Local		Spot Time
<b>A</b>	Amperage		Shielded Metal Arc Welding (SMAW)		Preflow Time
<b>V</b>	Voltage		Gas Metal Arc Welding (GMAW)		Postflow Time
<b>Hz</b>	Hertz (cycles/sec)		Gas Tungsten Arc Welding (GTAW)	 2 Step Trigger Operation Press to initiate wirefeed and welding, release to stop.	
<b>f</b>	Frequency		Air Carbon Arc Cutting (CAC-A)	 4 Step Trigger Operation Press and hold for preflow, release to start arc. Press to stop arc, and hold for preflow.	
	Negative		Constant Current		Burnback Time
	Positive		Constant Voltage Or Constant Potential		Disturbance In Ground System
	Direct Current (DC)		High Temperature	<b>IPM</b>	Inches Per Minute
	Protective Earth (Ground)		Fault Indication	<b>MPM</b>	Meters Per Minute
	Line		Arc Force		
	Line Connection		Touch Start (GTAW)		
	Auxiliary Power		Variable Inductance		
115V 15A 	Receptacle Rating- Auxiliary Power		Voltage Input		

Art# A-04937

## 2.05 Description

The CIGWELD TRANSTIG 220AC/DC and 300AC/DC are light weight constant current welding power sources incorporating the latest digital inverter technology to provide exceptional AC/DC arc characteristics. TIG welding features include torch trigger latch, pre & post flow gas control, pulse control, spot weld control, hot start control, up & down slope control. Lift TIG and HF TIG operating modes are available.

These units also have outstanding arc characteristics across a wide range of Manual Metal Arc Welding (MMAW) electrodes. MMAW welding features include a built in VRD, hot start control and arc force control. The units are equipped with digital amperage and voltage meters. The unit are also fully compliant to Australian Standard AS 60974.1 and IEC 60974.1.

The TRANSTIG 220AC/DC and TRANSTIG 300AC/DC provides excellent welding performance across a broad range of applications when used with the correct welding consumables and procedures. The following instructions detail how to correctly and safely set up the machine and give guidelines on gaining the best efficiency and quality from the Power Source. Please read these instructions thoroughly before using the unit.

## 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 an 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 unauthorized modification from standard specification, faulty maintenance, damage or improper repair by anyone other than appropriately qualified persons approved by CIGWELD.

## 2.07 Transporting Methods

This unit is equipped with a handle for carrying purposes.



**WARNING**

*ELECTRIC SHOCK can kill. DO NOT TOUCH live electrical parts. Disconnect input power conductors from de-energized supply line before moving the welding power source.*



**WARNING**

*FALLING EQUIPMENT can cause serious personal injury and equipment damage.*

Lift unit with handle on top of case.

Use handcart or similar device of adequate capacity.

If using a fork lift vehicle, place and secure unit on a proper skid before transporting.

## 2.08 Packaged Items

Transtig 220AC/DC Inverter Plant (Part No. W1007220)

- Transtig 220 AC/DC Inverter Power Source
- Comet Professional Argon Regulator/Flowmeter
- Tig Torch type 26 with flex head, trigger switch and 8 pin remote control connection with 4m lead
- Tig Torch Accessory kit that includes 1.6mm and 2.4mm tungstens with collets, collet bodies and No. 4, 5 & 6 Alumina nozzles
- Electrode Holder with 5m lead
- Work Clamp with 5m lead
- Shielding Gas Hose Assembly
- Shoulder Strap
- Product Bag
- Operating Manual

Transtig 220AC/DC Inverter Power Source (Part No. W1007221)

- Transtig 220 AC/DC Inverter Power Source
- Shoulder Strap
- Operating Manual
- Shielding Gas Hose Assembly

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

Transtig 300AC/DC Inverter Power Source (Part No. W1007301)

- Transtig 300 AC/DC Inverter Power Source
- Shoulder Strap
- Operating Manual
- Shielding Gas Hose Assembly

## 2.09 Duty Cycle

The rated duty cycle of a Welding Power Source, is a statement of the time it may be operated at its rated welding current output without exceeding the temperature limits of the insulation of the component parts. To explain the 10 minute duty cycle period the following example is used. Suppose a Welding Power Source is designed to operate at a 40% duty cycle, 170 amperes at 26.8 volts. This means that it has been designed and built to provide the rated amperage (170A) for 4 minutes, i.e. arc welding time, out of every 10 minute period (40% of 10 minutes is 4 minutes). During the other 6 minutes of the 10 minute period the Welding Power Source must idle and be allowed to cool. The thermal cut out will operate if the duty cycle is exceeded.

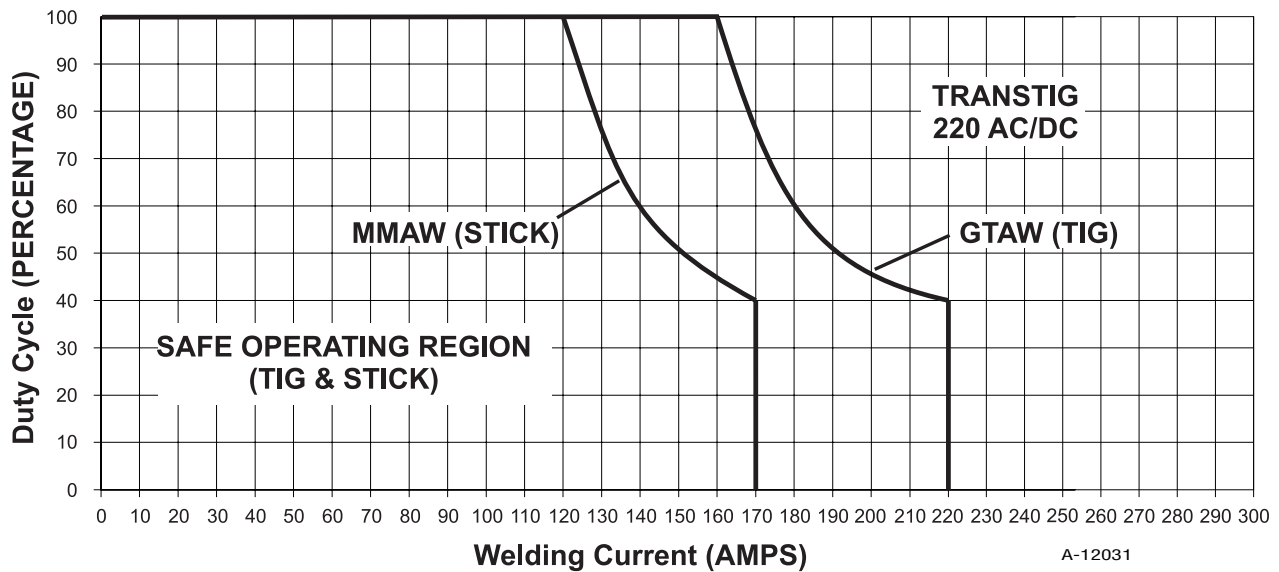


Figure 2-1: TRANSTIG 220AC/DC Duty Cycle

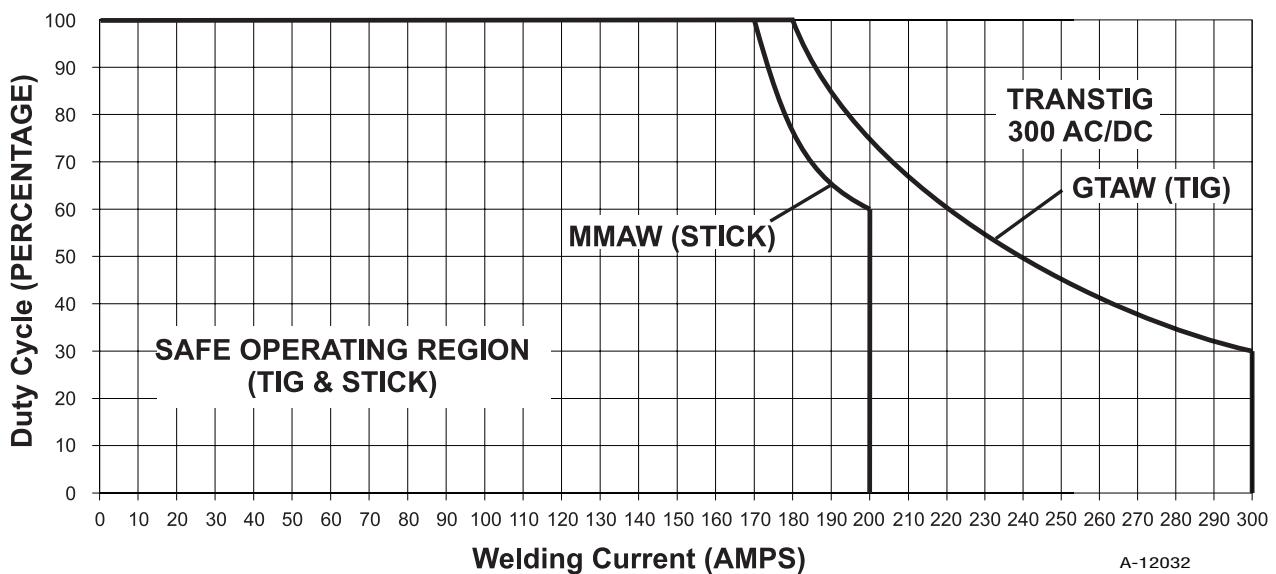


Figure 2-2: TRANSTIG 300AC/DC Duty Cycle



## 2.10 Specifications

Description	TRANSTIG 220 AC/DC	TRANSTIG 300 AC/DC
Packed Power Source Part Number	W1007221	W1007301
Power Source Mass	13.4 kg	16.3 kg
Power Source Dimensions	H 326mm x W 185mm x D 483mm	H 326mm x W 185mm x D 483mm
Power Source Part Number	W1007221	W1007301
Cooling	Fan Cooled	Fan Cooled
Welder Type	Inverter Power Source	Inverter Power Source
Australian Standards	AS 60974.1-2006 / IEC 60974-1	AS 60974.1-2006 / IEC 60974-1
Number of Phases	1	3
Nominal Supply Voltage	240V +/- 15%	415V +/- 15%
Nominal Supply Frequency	50/60Hz	50/60Hz
Welding Current Range (STICK Mode)	10 – 170A	10 – 200A
Welding Current Range (TIG Mode)	3 - 220A	5 - 300A
Factory Fitted Plug Rating	15A	Not applicable
Effective Input Current ( $I_{1\text{eff}}$ ) (note2)	14.7A	11.6A
Maximum Input Current ( $I_{1\text{max}}$ )	23.1A	17.1A
Generator Requirement (note4)	6kW (7.5 kVA @ 0.8PF)	13kW (16 kVA @ 0.8PF)
STICK (MMAW) Welding Output, 40°C, 10 min.	170A @ 40%, 26.8V 140A @ 60%, 25.6V 120A @ 100%, 24.8V	200A @ 60%, 28.0V 170A @ 100%, 26.8V
TIG (GTAW) Welding Output, 40°C, 10 min.	220A @ 40%, 18.8V 180A @ 60%, 17.2V 160A @ 100%, 16.4V	300A @ 30%, 22.0V 220A @ 60%, 18.8V 180A @ 100%, 17.2V
Open Circuit Voltage (VRD active)	<23V DC	<25V DC
Protection Class	IP23S	IP23S

Table 2-1: Power Source Specification

### **NOTE**

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

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

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

*Note 4: Generator Requirements at the Maximum Output Duty Cycle.*

*Due to large variations in performance and specifications of different brands and types of generators, Cigweld cannot guarantee full welding output power or duty cycle on every brand or type of generator.*

*Some small generators incorporate low cost circuit breakers on their outputs. These circuit breakers usually will have a small reset button, and will trip much faster than a switchboard type circuit breaker. This may result in not being able to achieve full output or duty cycle from the power source / generator combination. For this reason we recommend a generator that incorporates switchboard type circuit breakers.*

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

*Cigweld recommends that when selecting a generator, that the particular power source / generator combination be adequately trialed to ensure the combination performs to the users expectations.*

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

### 2.11 Optional Accessories

Part Number	Description
W4014604	TIG Torch 26F with 4m lead and remote control
BGSAK2	TIG Torch accessory kit
W4015800	Foot Control with 8m lead
646757	Electrode holder & Work Lead Set 5m 400A 50mm DINSE
646325	Electrode Holder & Work Lead Set 8m 400A 50mm DINSE
646763	Electrode Holder w / Deadman Switch & Work Lead Set 8m 400A 50mm DINSE
301526	Comet Edge Argon regulator/Flowmeter
704461	50mm Male DINSE cable connector
W7004913	Shielding Gas Hose Assembly
646265	NAKA Weld measurement gauge

Table 2-2: Options and Accessories



**CAUTION**

---

*TIG Torch 26F is rated for 200A DC @ 30%; 300 A DC @ 14%; 220A AC @ 16%.*

## SECTION 3: INSTALLATION, OPERATION AND SETUP

### 3.01 Environment

These units are designed for use in environments with increased hazard of electric shock as outlined in AS60974.1 and AS1674.2

- 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.
  3. In wet or damp hot locations where humidity or perspiration considerable 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:

- A. In areas, free from moisture and dust.
- B. Ambient temperature between 0° C to 40° C.
- C. In areas, free from oil, steam and corrosive gases.
- D. In areas, not subjected to abnormal vibration or shock.
- E. In areas, not exposed to direct sunlight or rain.
- F. Place at a distance of 300mm or more from walls or similar that could restrict natural air flow for cooling.
- G. The enclosure design of this power source meets the requirements of IP23S as outlined in AS60529. This provides adequate protection against solid objects (greater than 12mm), and direct protection from vertical drops. 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.

- H. Precautions must be taken against the power source toppling over. The power source must be located on a suitable horizontal surface in the upright position when in use.

### 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  $\pm 15\%$  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 as per the Specifications on page 2-5.



**WARNING**

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

### 3.05 High Frequency Introduction

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



**WARNING EXPLOSIVES**

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



## WARNING COMPUTER

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

### 3.06 High Frequency Interference

Interference may be transmitted by a high frequency initiated or stabilised arc welding machine in the following ways.

- 1. Direct Radiation:** Radiation from the machine can occur if the case is metal and is not properly grounded. It can occur through apertures such as open access panels. The shielding of the high frequency unit in the Power Source will prevent direct radiation if the equipment is properly grounded.
- 2. Transmission via the Supply Lead:** Without adequate shielding and filtering, high frequency energy may be fed to the wiring within the installation (mains) by direct coupling. The energy is then transmitted by both radiation and conduction. Adequate shielding and filtering is provided in the Power Source.
- 3. Radiation from Welding Leads:** Radiated interference from welding leads, although pronounced in the vicinity of the leads, diminishes rapidly with distance. Keeping leads as short as possible will minimise this type of interference. Looping and suspending of leads should be avoided wherever possible.
- 4. Re-Radiation from Unearthed Metallic Objects:** A major factor contributing to interference is re-radiation from unearthed metallic objects close to the welding leads. Effective grounding of such objects will prevent re-radiation in most cases.

### 3.07 Electromagnetic Compatibility



## WARNING

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

#### A. Installation and Use - Users Responsibility

The user is responsible for installing and using the welding equipment according to the manufacturer's instructions. If electromagnetic disturbances are detected then it shall be the responsibility of the user of the welding equipment to resolve the situation with the technical

assistance of the manufacturer. In some cases this remedial action may be as simple as earthing the welding circuit, see NOTE below. 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 60974-13 Arc Welding Equipment - Installation and use (under preparation).*

#### B. Assessment of Area

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

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

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

## C. Methods of Reducing Electromagnetic Emissions

### 1. Mains Supply

Welding equipment should be connected to the mains supply according to the manufacturer's recommendations. If interference occurs, it may be necessary to take additional precautions such as filtering of the mains supply. Consideration should be given to shielding the supply cable of permanently installed welding equipment in metallic conduit or equivalent. Shielding should be electrically continuous throughout 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.

### 2. Maintenance of Welding Equipment

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

### 3. Welding Cables

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

### 4. Equipotential Bonding

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

### 5. Earthing of the Workpiece

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

### 6. Screening and Shielding

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

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

## 3.08 TRANSTIG 220AC/DC and 300AC/DC Power Source Controls, Indicators and Features

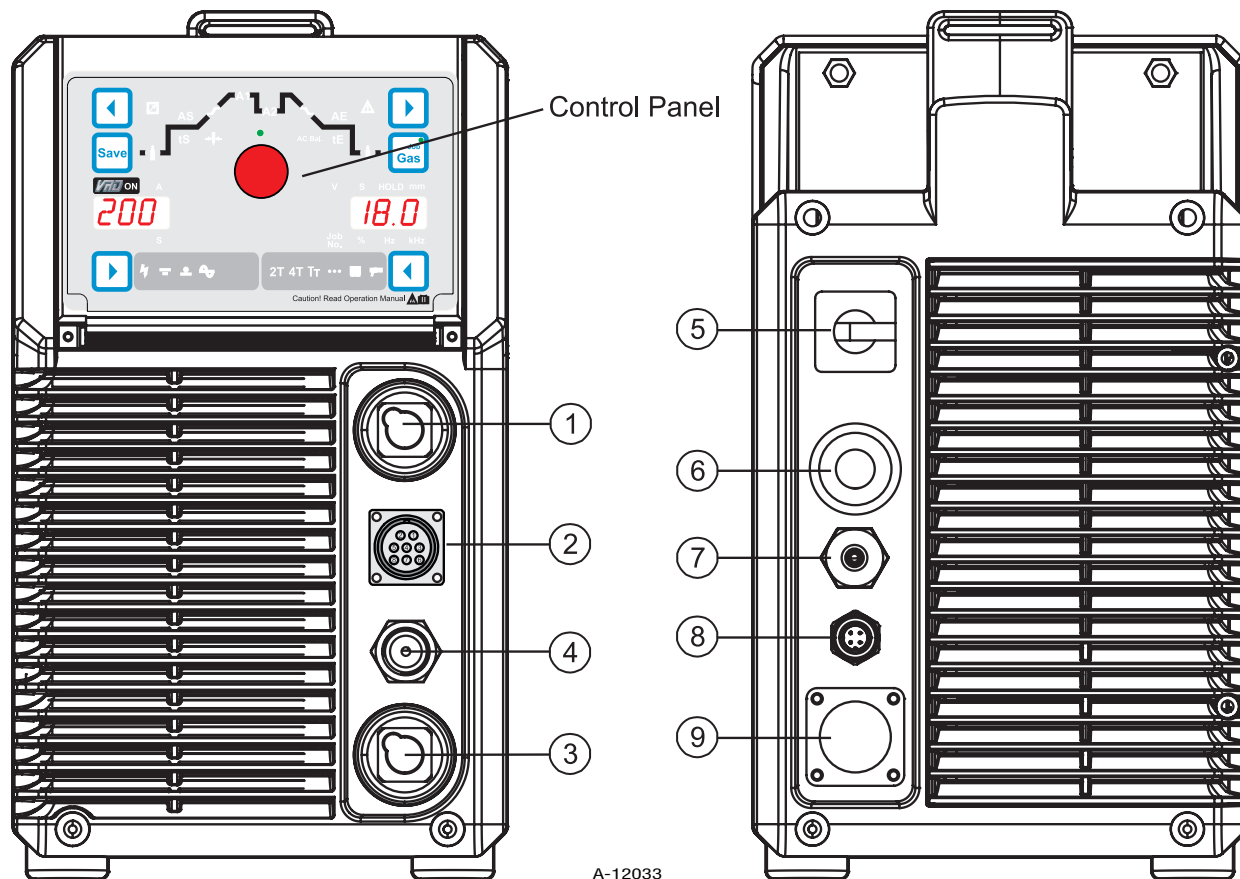


Figure 3-1: Controls on Front and Rear Panel

### 1. Electrode Welding Terminal

Electrode 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.

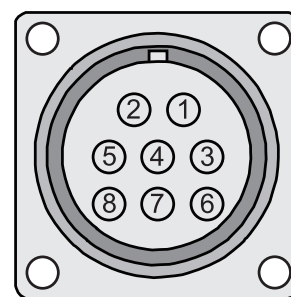
### 2. 8 Pin Control Socket

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

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

Socket Pin	Part Number / Description
1	Not used
2	Trigger Switch Input
3	Trigger Switch Input
4	Not used
5	Remote Control 5k ohm Potentiometers Maximum
6	Remote Control 5k ohm Potentiometers Minimum
7	Remote Control 5k ohm Potentiometer Wiper
8	Not used

Table 3-1: 8 Pin Interconnection Control Plug Configuration



A-12055

Figure 3-2: 8 Pin Control Socket

## 3. Worklead Welding Terminal

Worklead 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.

## 4. Shielding Gas Outlet

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

## 5. Main On/Off Switch

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



**WARNING**

---

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

---

## 6. Mains Supply Lead

The Transtig 220AC/DC is fitted with a heavy duty 15 Amp mains supply lead and plug.

The Transtig 300AC/DC is fitted with a heavy duty three phase mains supply lead.

## 7. Gas Inlet

The Shielding Gas Inlet connection is used to supply the appropriate shielding gas to the unit. The gas inlet is located on the rear of the Power Source.



**WARNING**

---

*Only Inert Shielding Gases specifically designed for welding applications should be used.*

---

## 8. Water Cooler Interface

The Water Cooler Interface is used to control a water cooler that may be attached to the unit. The Water Cooler Interface is located on the rear of the Power Source.

**NOTE**

---

*Water Cooler is available for 300AC/DC only.*

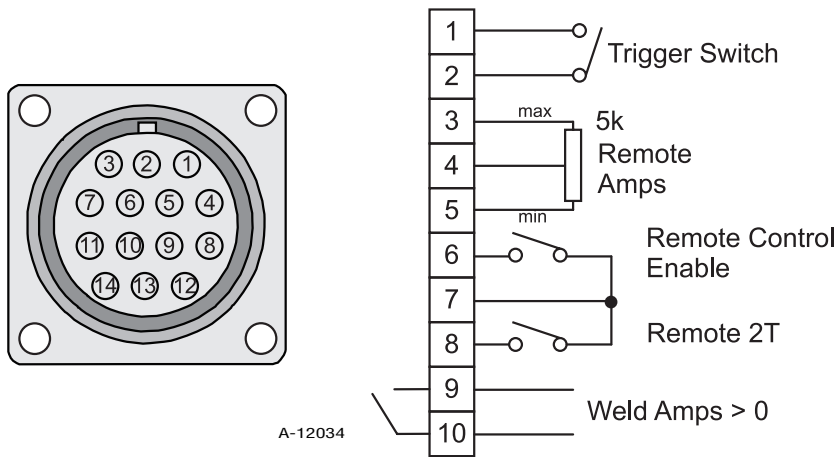
## 9. Remote Control Socket (Automation)

The 14 pin Automation Remote Control Socket is used to connect remote control devices to the welding power source.

To make connections, align keyway, insert plug, and rotate threaded collar fully clockwise.

The Automation Remote Control Socket is located on the rear of the Power Source.

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

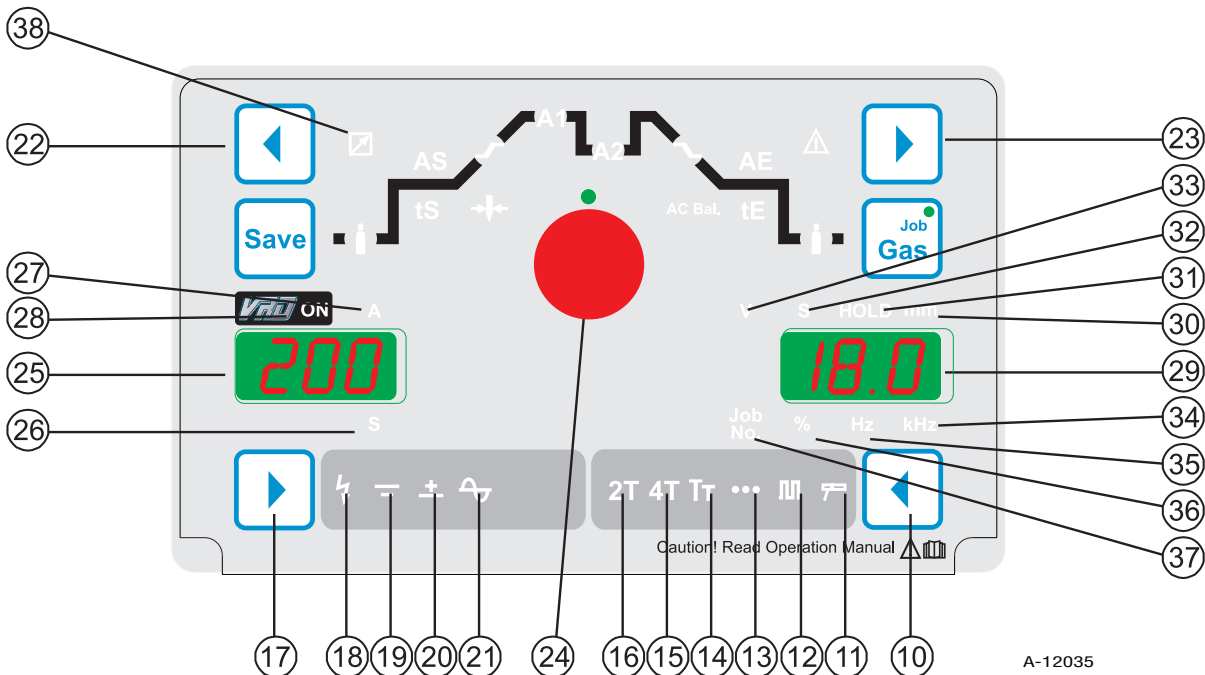


A-12034

Figure 3-3: 14 Pin Remote Control Socket

Socket Pin	Part Number / Description
1	Trigger Switch Input
2	Trigger Switch Input
3	Remote Control 5k ohm Potentiometers Maximum
4	Remote Control 5k ohm Potentiometers Wiper
5	Remote Control 5k ohm Potentiometers Minimum
6	Remote Control Enable (Short to common to enable remote control)
7	Common
8	Remote 2T (short to common to select remote control active in 2T operation mode only)
9	Volt free relay contact, Weld Amps > 0A
10	Volt free relay contact, Weld Amps > 0A
11	Not used
12	Not used
13	Not used
14	Not used

Table 3-2: 14 Pin Interconnection Control Plug Configuration



A-12035

Figure 3-4: Control Panel Weld Mode & Meter Displays



## 10. Welding Mode Button

Press the MODE button to select the Welding Process mode. Available modes are GTAW 2T, GTAW 4T, GTAW Spot, GTAW Pulse 2T, GTAW Pulse 4T, and MMAW.

## 11. MMAW indicator light

This light will illuminate when the power source is in MMAW welding mode.

## 12. Pulse indicator light

This light will illuminate when the power source is in GTAW Pulse 2T or 4T welding mode.

## 13. Spot indicator light

This light will illuminate when the power source is in GTAW SPOT welding mode.

## 14. Tiptronic indicator light (Refer to Section 3.12)

This light will illuminate when the power source is in TIPTRONIC welding mode and a saved job has been loaded.

## 15 4T (latch) indicator light

This light will illuminate when the power source is in GTAW 4T welding mode.

This mode of welding is mainly used for long welding runs to reduce operator fatigue. In this mode the operator can press and release the torch trigger and the output will remain active. To deactivate the power source, the trigger switch must again be depressed and released, thus eliminating the need for the operator to hold the torch trigger.

Note that when operating in GTAW (TIG mode), the power source will remain activated until the selected downslope time has elapsed.

## 16. 2T (normal) indicator light

This light will illuminate when the power source is in GTAW 2T welding mode.

In this mode, the torch trigger must remain depressed for the welding output to be active. Press and hold the torch trigger to activate the power source (weld). Release the torch trigger switch to cease welding.

## 17. Welding Type Button

Press the TYPE button to select the Welding Type mode.

In MMAW (Stick) mode, the available modes are Electrode DC-, Electrode DC+.

In GTAW (Tig) mode, the available modes are Electrode DC-, HF Electrode DC-, AC and HF AC.

## 18. HF (high frequency) indicator light

This light will illuminate when the power source is in GTAW 2T or 4T HF welding mode.

## 19. Electrode Negative indicator light

This light will illuminate when the power source is in Electrode Negative welding mode on the top welding terminal. (DC Output)

## 20. Electrode Positive indicator light

This light will illuminate when the power source is in Electrode Positive welding mode on the top welding terminal. (DC Output)

## 21. Electrode AC indicator light

This light will illuminate when the power source is in Electrode AC welding mode on the top welding terminal. (AC Output)

## 22. BACK Welding Parameter Button

Press the BACK welding parameter button to scroll left through the available welding parameters.

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

---

## 23. FORWARD Welding Parameter Button

Press the FORWARD welding parameter button to scroll right through the available welding parameters.

## 24. Multi Function Control

Turn the MULTI FUNCTION CONTROL to adjust the available welding parameters.

When not welding, the Multi Function Control is used to adjust all welding parameters, including welding amps. A short press on the Scroll Left or Scroll Right button will save the welding parameter value, then increment / decrement to the next available welding parameter. The welding parameter LED will illuminate and the Multi Function Control will then adjust the selected welding parameter. The parameter code and parameter value are shown on the meters and the LED's next to the meter indicate if the parameter is Amps, Seconds, mm, %, kHz or Hz.

During welding, adjustment of the Multi Function Control will adjust the selected parameter.

## 25. Digital Ammeter / Parameter Codes

The digital amperage meter is used to display both the pre-set current and actual output current of the power source. It is also used to display Welding Parameter Codes.

Depending on the Welding Parameter selected, the status indicator adjacent to the ammeter will illuminate to show the units of the welding parameter.

When welding, the amperage meter will display actual welding current.

At the completion of welding, the amperage meter will hold the last recorded amperage value for a period of approximately 10 seconds. The amperage meter will hold the value until; (1) any of the front panel controls are adjusted in which case the unit will revert to preview mode, (2) welding is recommenced, in which case actual welding amperage will be displayed, or (3) a period of 10 seconds elapses following the completion of welding in which case the unit will return to preview mode.

## 26. Seconds indicator light

This light will illuminate when Seconds are being shown on the Digital Ammeter Display.

## 27. Amps indicator light

This light will illuminate when Amps are being shown on the Digital Ammeter Display.

## 28. VRD (Voltage Reduction Device) indicator light

A VRD (voltage reduction device) is a hazard reducing device designed to reduce electric shock hazards present on the output of welding power source when operating in MMAW (stick) mode. Note that the presence of VRD should not be used as a substitute for the use of appropriate safety practices as indicated in section one of this manual.

The VRD indicator light only operates in MMAW (stick) mode.

The VRD light illuminates when the VRD function is active. Under this condition the open circuit voltage of the unit is limited to below 23V DC, thus reducing the potential of serious electric shock (such as when changing electrodes).

## 29. Digital Voltmeter / Parameter meter

The digital volt meter is used to display the actual output voltage of the power source. It is also used to display Welding Parameters.

Depending on the Programming Parameter selected, the status indicator adjacent to the volt meter will illuminate to show the units of the welding parameter.

When welding, the volt meter will display actual welding voltage.

At the completion of welding, the volt meter will hold the last recorded voltage value for a period of approximately 10 seconds. The volt meter will hold the value until; (1) any of the front panel controls are adjusted, (2) welding is recommenced, or (3) a period of 10 seconds elapses following the completion of welding.

## 30. mm indicator light

This light will illuminate when “mm” are being shown on the Digital Volt meter Display for electrode diameter size.

## 31. HOLD indicator light

This light will illuminate when the HOLD function is active on the Digital Display at the completion of welding.

## 32. Seconds indicator light

This light will illuminate when Seconds are being shown on the Digital Volt meter Display.

## 33. Volts indicator light

This light will illuminate when Volts are being shown on the Digital Volt meter Display.

## 34. kHz (frequency) indicator light

This light will illuminate when kHz (frequency) is being shown on the Digital Volt meter Display.

## 35. Hz (frequency) indicator light

This light will illuminate when Hz (frequency) is being shown on the Digital Volt meter Display.

## 36. % (percentage) indicator light

This light will illuminate when % (percentage) is being shown on the Digital Volt meter Display.

## 37. Job Number indicator light

This light will illuminate when Job Number is being shown on the Digital Volt meter Display.

## 38. Remote Control indicator light

This light will illuminate when the Remote Control is active.

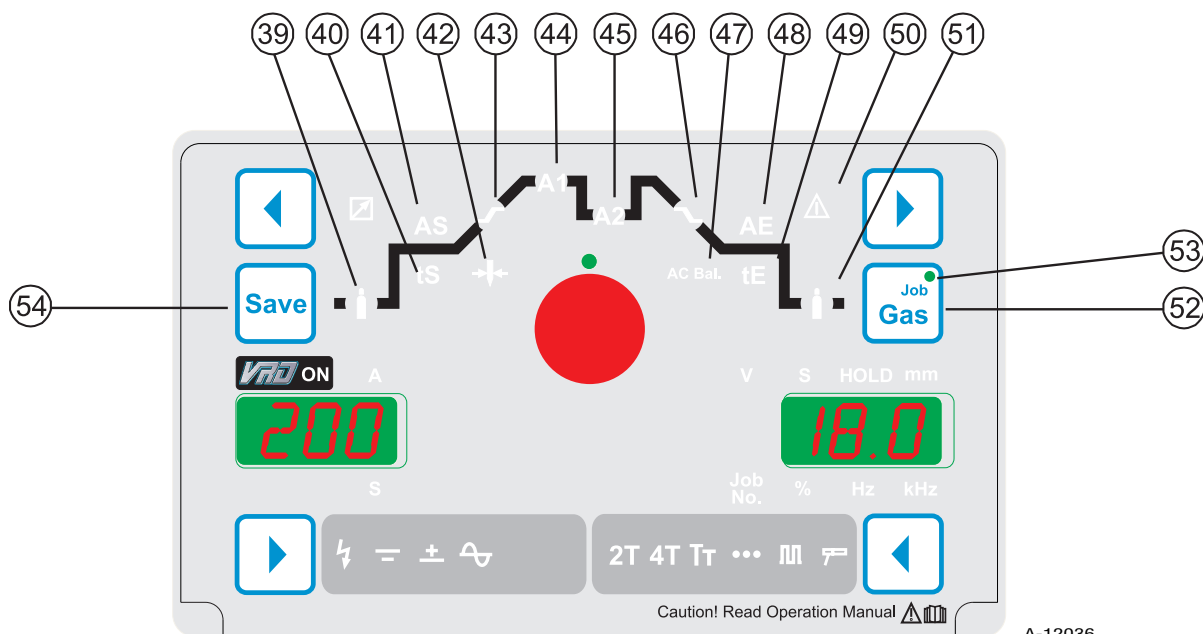


Figure 3-5: Control Panel

## 39. Pre Flow indicator light

This light will illuminate when the Pre Flow Welding Parameter is selected.

## 40. Initial Current time (GTAW) and Hot Start time (MMAW) indicator light

This light will illuminate when the Initial Current Time Welding Parameter is selected in GTAW mode, or when Hot Start Time Welding Parameter is selected in MMAW mode.

## **TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE**

---

### **41. Initial Current amps (GTAW) and Hot Start amps (MMAW) indicator light**

This light will illuminate when the Initial Current Amps Welding Parameter is selected in GTAW mode, or when Hot Start Amps Welding Parameter is selected in MMAW mode.

### **42. Electrode Diameter indicator light**

This light will illuminate when the Electrode Diameter Welding Parameter is selected.

### **43. Up Slope indicator light**

This light will illuminate when the Up Slope Welding Parameter is selected.

### **44. Base Current indicator light**

This light will illuminate when the Base Current Welding Parameter is selected.

### **45. Trough Current indicator light**

This light will illuminate when the Trough Current Welding Parameter is selected.

### **46. Down Slope indicator light**

This light will illuminate when the Down Slope Welding Parameter is selected.

### **47. AC Balance indicator light**

This light will illuminate when the AC Balance Welding Parameter is selected.

### **48. Crater Current indicator light**

This light will illuminate when the Crater Current Welding Parameter is selected.

### **49. Crater Current time indicator light**

This light will illuminate when the Crater Current Time Welding Parameter is selected.

### **50. Electrode Diameter Out-of-Range indicator light**

This light will illuminate when the set welding current is outside the normal operating range for the selected Electrode Diameter.

### **51. Post Flow indicator light**

This light will illuminate when the Post Flow Welding Parameter is selected.

### **52. Gas Purge Button**

Press and hold the GAS button to purge the gas line in all GTAW operating modes.

### **53. Tip Tronic indicator light (Refer to Section 3.13)**

This light will illuminate when an active TipTronic job is selected.

### **54. Save Tip Tronic Job Button**

Press the SAVE button to save the current TipTronic Job settings in the selected memory location

Up to 100 jobs can be saved arranged as 10 banks of 10 jobs.

## 3.09 Setup for TIG (GTAW) Welding

- A. Select a GTAW operation mode with the welding mode & welding type buttons (refer to Section 3.10 for further information).
- B. Connect the TIG Torch to the Electrode welding terminal (top). 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.
- C. Connect the work lead to the Worklead welding terminal (bottom). 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 bayonet terminal.*

- D. Connect the TIG torch trigger switch via the 8 pin socket located on the front of the power source as shown below. The TIG torch will require a trigger switch to operate in Lift TIG or HF TIG Mode.

### NOTE

*If the TIG torch has a remote TIG torch current control fitted then it will require to be connected to the 8 pin socket. (Refer to section 3.08 Remote Control Socket for further information).*

- E. Fit the welding grade shielding gas regulator/flowmeter to the shielding gas cylinder (refer to Section 3.19) then connect the shielding gas hose from the regulator/flowmeter outlet gas INLET on the rear of the Transtig 220 AC/DC or 300 AC/DC Power Source. Connect the gas hose from the TIG torch to the gas OUTLET on the front of the Transtig 220 AC/DC or 300 AC/DC Power Source.



### WARNING

*Before connecting the work clamp to the work make sure the mains power supply is switched off.*

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

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

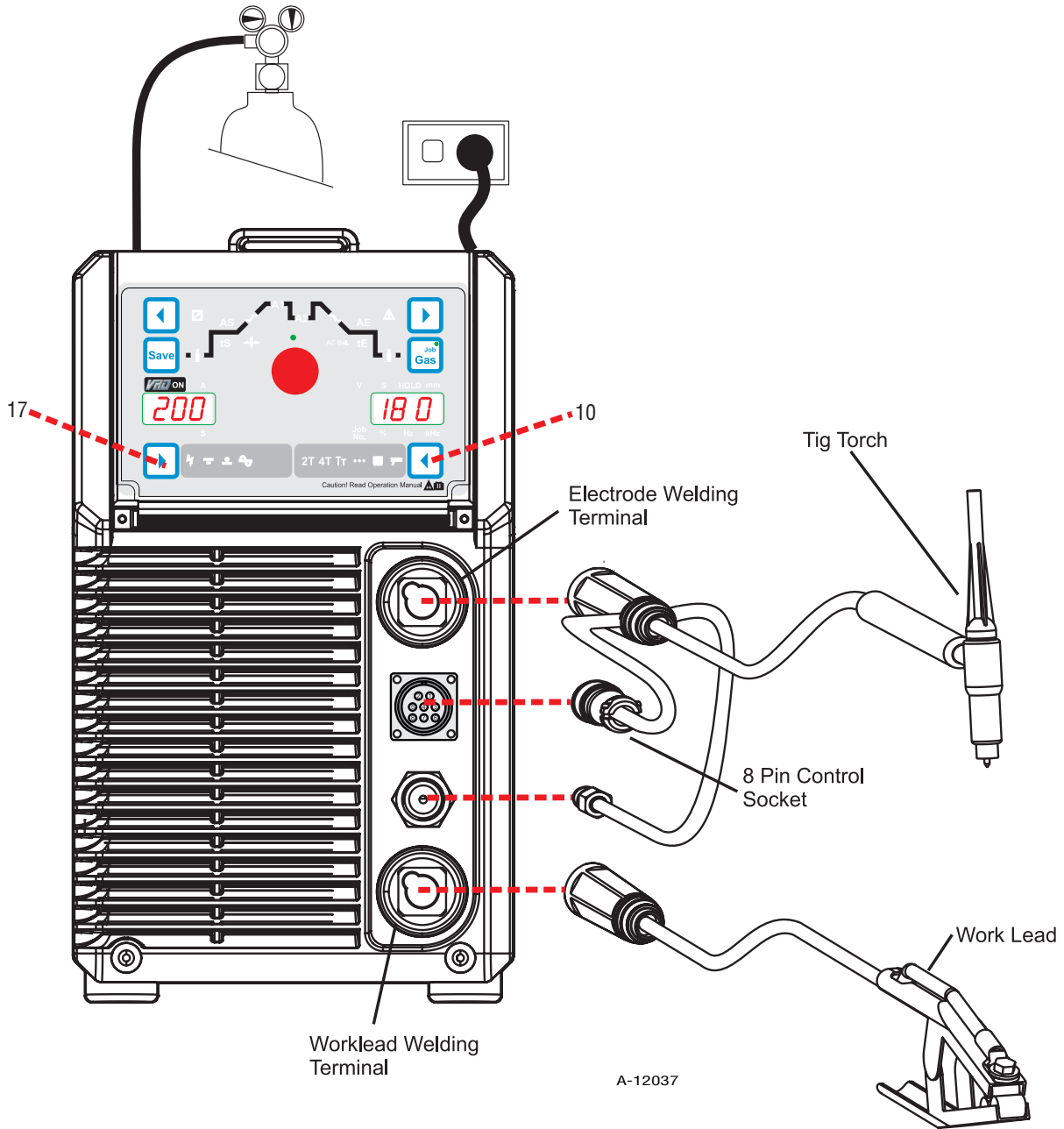
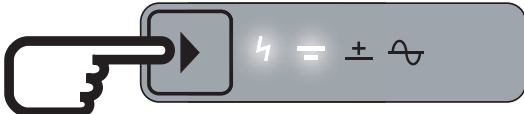










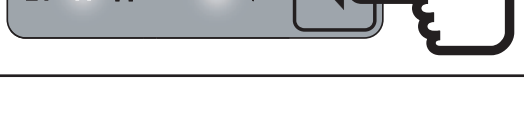
Figure 3-6: Setup for TIG Welding

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

- First, select a Welding Type by pressing the Weld Type (17) button.

Welding Type	Welding Type Selection
DC HF TIG	
AC Lift TIG	
DC Lift TIG	
AC HF TIG	

- Then, select a Welding Mode by pressing the WELDING MODE (10) button.

Welding Mode	Welding Mode Selection
2T (Normal Mode)	
4T (Latch Mode)	
Tip Tronic (used to recall saved jobs)	
Spot Mode	
2T Pulse Welding (Normal Mode)	
4T Pulse Welding (Latch Mode)	

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

## 3.10 TRANSTIG 220AC/DC and 300AC/DC - TIG (GTAW) Programming Mode

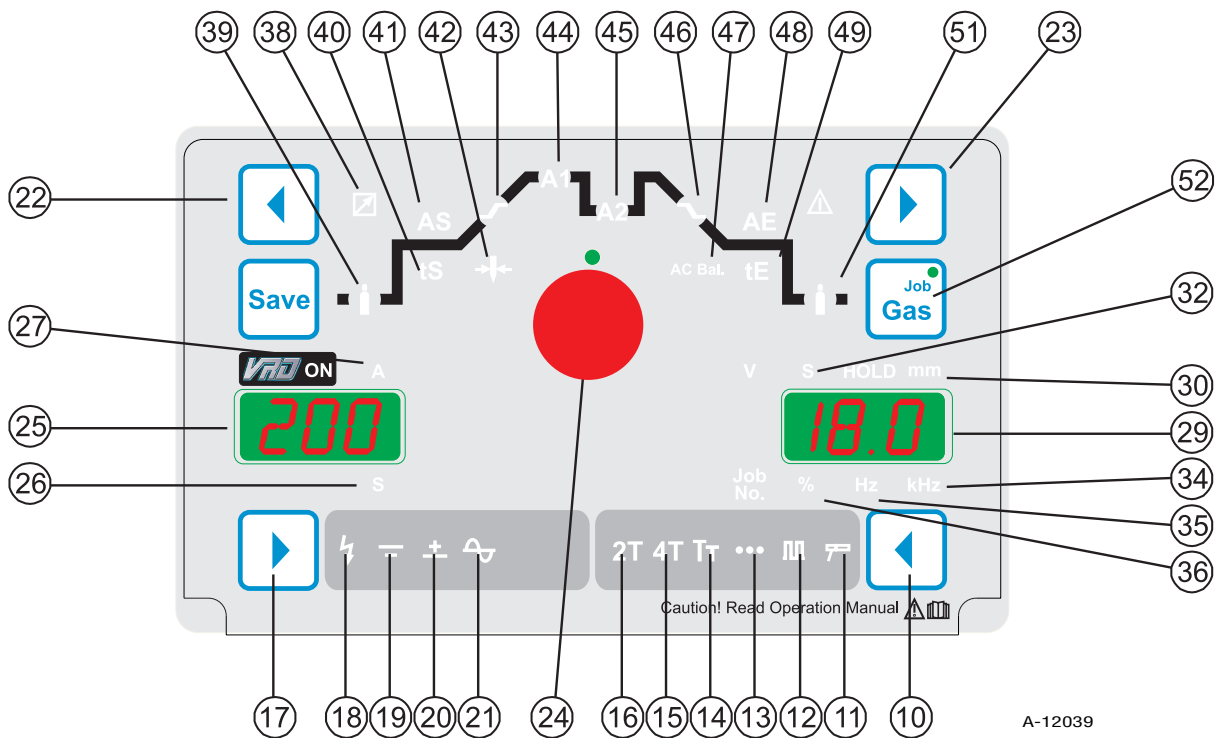


Figure 3-7: TIG Programming Mode

- Press the WELDING MODE (10) button to select the appropriate GTAW mode. Several GTAW operating modes are available.
  - 2T (normal mode). The 2T LED (16) will illuminate.
  - 4T (latch mode). The 4T LED (15) will illuminate.
  - Tiptronic. The TIPTRONIC Led (14) will illuminate
  - SPOT mode. The SPOT LED (13) will illuminate.
  - 2T PULSE (normal mode). The 2T LED (16) and PULSE Led (12) will illuminate.
  - 4T PULSE (latch mode). The 4T LED (15) and PULSE Led (12) will illuminate.
- Press the WELDING TYPE (17) button to select the welding output type. Several GTAW operating modes are available.
  - AC welding output mode. The AC Led (21) will illuminate.
  - DC Negative welding output mode. The DC Negative Led (19) will illuminate.
  - HF AC welding output mode. The HF Led (18) and the AC Led (21) will illuminate.
  - HF DC Negative welding output mode. The HF Led (18) and the DC Negative Led (19) will illuminate.



### WARNING

*In HF operating mode, high voltage pulses are generated within the power source, to provide contactless initiation of the GTAW welding arc. If HF operating mode is selected, high voltage will be present on the tungsten electrode when the trigger is pressed. Never touch the tungsten welding electrode of any parts in the welding circuit when the trigger is pressed.*

- Press the BACK button (22) or FORWARD button (23) so the Electrode Diameter Led (42) and mm LED (30) are illuminated.



## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

Use the Multi Function Control (24) to adjust the Electrode size being used.

- Press the BACK button (22) or FORWARD button (23) until the Base Current A1 Led (44) is illuminated.

Use the Multi Function Control (24) to adjust the Welding Current for the Electrode size being used. If the Welding Current does not match the normal operating range of the electrode the Electrode Diameter Out-of-Range indicator Led (50) will illuminate.

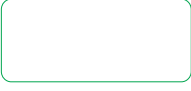





If the Electrode Diameter Out-of-Range indicator Led (50) is illuminated, it is still possible to weld.

Note that other parameters may need to be set, according to the operating mode selected, Please refer to the tables below.















GTAW Electrode Diameter (mm)	Nominal Welding Current (A) DC	Nominal Welding Current (A) AC
1.0	3 - 40 Amps	5 - 30 Amps
1.6	15 - 130 Amps	20 - 90 Amps
2.0	45 - 180 Amps	45 - 135 Amps
2.4	70 - 240 Amps	70 - 180 Amps
3.2	140 - 320 Amps	130 - 250 Amps
4.0 (not selectable on Transtig 220AC/DC)	220 - 450 Amps	200 - 320 Amps

Table 3-3: Normal Welding Current for GTAW Electrode size

Note that Normal recommended Welding Current AC Amps are dependent on the type of electrode and on the AC Balance Parameter setting.

Parameter	Range	LED Code (Left Display)	Parameter Value (Right Display)	Factory Setting
<b>Shielding Gas Pre-Flow time</b> This parameter operates in GTAW modes only and is used to provide gas to the weld zone prior to striking the arc, once the torch trigger switch has been pressed. This control is used to dramatically reduce weld porosity at the start of a weld.	0.1-10.0 seconds		S 	0.1
<b>Start Current AS</b> This parameter operates in GTAW modes only and is used to set the start current for TIG. In 4T mode the Initial Current remains on until the torch trigger switch is released after it has been depressed. In 2T mode the Initial Current remains on for the Start Current Time tS and then the Up Slope current ramp will commence.	5 – 200% of Welding Current A1 The maximum welding current in GTAW mode is limited to 220 for the Transtig 220AC/DC and 300A for the Transtig 300AC/DC	A  When A1=100A	S  %	50
<b>Start Current Time tS</b> (2T normal mode only) This parameter operates in 2T GTAW modes only and set the time the Start Current is active, after which the Up Slope current ramp will commence.	0 - 20 seconds		S 	0.1

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

<p><b>Up Slope Time</b></p> <p>This parameter operates in GTAW modes only and is used to set the time for the weld current to ramp up from Initial current to welding current.</p>	0 - 99%	 s	 %	5
<p><b>Welding Current A1</b></p> <p>Transtig 220AC/DC Transtig 300AC/DC</p>	3 - 220 A 5 - 300 A	 A	 V	100
<p><b>Trough Current A2</b></p> <p>This parameter operates in GTAW Pulse modes only and sets the GTAW TROUGH current. The lowest point in the pulse is called the Trough.</p>	1 – 200% of Welding Current A1 The maximum welding current in GTAW mode is limited to 220 for the Transtig 220AC/DC and 200A for the Transtig 300AC/DC	 A	 %	50
<p><b>Down Slope Time</b></p> <p>This parameter operates in GTAW modes only and is used to set the time for the weld current to ramp down to the crater current. This control is used to eliminate the crater that can form at the completion of a weld.</p>	0 – 99%	 s	 %	20
<p><b>Crater Current AE</b></p> <p>This parameter operates in GTAW modes only. This is the current at the end of the down slope current ramp. The welding current will remain at the Crater Current value until the Crater Current Time has elapsed, at which time the welding current will cease and the unit will enter Post Flow mode. This control is used to eliminate the crater that can form at the completion of a weld.</p>	5 – 200% of Welding Current A1 The maximum welding current in GTAW mode is limited to 220 for the Transtig 220AC/DC and 200A for the Transtig 300AC/DC	 A	 %	25
<p><b>Crater Current Time tE</b></p> <p>This parameter operates in GTAW modes only and is used to set the time for the crater current before entering post flow mode. This control is used to eliminate the crater that can form at the completion of a weld.</p>	0 – 20 seconds	 s	 s	0.2
<p><b>Shielding Gas Post-Flow time</b></p> <p>This parameter operates in GTAW modes only and is used to adjust the post gas flow time once the arc has extinguished. This control is used to dramatically reduce oxidation of the tungsten electrode.</p>	20 – 500%	 s	 %	100

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE















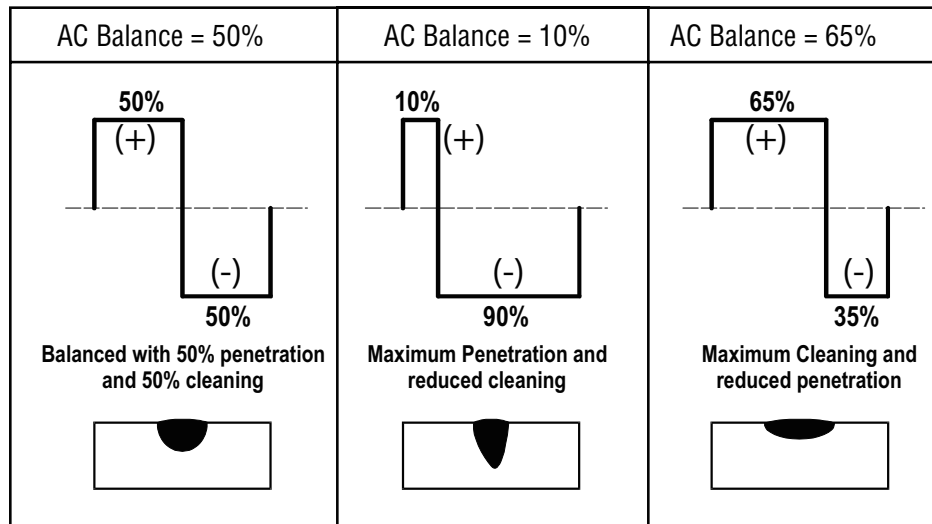
<p><b>AC balance</b> (AC Output Mode only)</p> <p>This parameter operates in AC GTAW modes and is used to set the penetration to cleaning action ratio for the AC weld current. Generally WAVE BALANCE is set to 50% for AC STICK welding. The WAVE BALANCE control changes the ratio of penetration to cleaning action of the AC TIG welding arc. Maximum weld penetration is achieved when the WAVE BALANCE control is set to 10%. Maximum cleaning of heavily oxidised aluminium or magnesium alloys is achieved when the WAVE BALANCE control is set to 65%.</p>	10 – 90% positive welding current		 35 %	35
<p><b>Electrode Diameter</b></p> <p>Transtig 220AC/DC Transtig 300AC/DC</p> <p>Set this parameter to the tungsten electrode size being used.</p>	1.0 – 3.2 1.0 – 4.0		 2.4 mm	2.4
<p><b>AC frequency</b></p> <p>This parameter operates in AC mode only and is used to set the frequency for the AC weld current</p>	30 – 200Hz		 60 Hz	60
<p><b>Spot Welding Time</b></p> <p>This parameter sets the spot welding time</p>	0.01 – 10.0 seconds		 1.0 s	1.0
<p><b>Spot Welding Dwell Time</b> (only available with Spot Welding Dwell Time enabled, refer to secondary parameters)</p> <p>This parameter sets the dwell (off) time between repeated spot welds (Refer to Section 3.12).</p>	0.09 – 60.0 seconds		 1.0 s	1.0
<p><b>Pulse Frequency</b></p> <p>This parameter sets the Pulse Frequency when in GTAW Pulse operating mode.</p>	0.2 – 2000Hz		 2.0 Hz	2
<p><b>Pulse Duty Factor</b></p> <p>This parameter sets the percentage “on” time of the Pulse Frequency for welding weld current when in Pulse operating mode</p>	1 – 99% of Welding Current A1		 50 %	50

Table 3-4: GTAW Main Parameters

AC BALANCE is used for aluminium welding in AC HF GTAW or AC LIFT GTAW operating modes. It is used to set the ratio of penetration to cleaning action for the AC GTAW welding arc.

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

Maximum weld penetration is achieved when the AC BALANCE is set to 10%. Maximum cleaning of heavily oxidised aluminium or magnesium alloys is achieved when the WAVE BALANCE is set to 90%.



A-12057

Table 3-5: AC GTAW Wave Balance

### 3.11 TIG (GTAW) Welding Secondary Parameters

Secondary parameters are available. These are required to be set separately.

- Press and hold the WELDING MODE (10) button then press the SAVE (54) button.
- Press the BACK button (22) or FORWARD button (23) to select the Parameter.
- Use the Multi Function Control (24) to adjust the parameter.
- Note that some parameters are only available in certain welding modes.

Note that even during welding, these settings can be adjusted and changed.

Parameter	Range	LED Code (Left Display)	Parameter Value (Right Display)	Factory Setting
<b>Ignition Peak Correction</b> The ignition peak current is set after ignition to provide stabilisation of the arc. A different peak current is saved for each selected tungsten electrode diameter.	10-200%	1 PE	100	100
<b>Plus terminal Correction</b> Ignition using the positive welding terminal is used for optimum dome formation in AC GTAW welding. A different plus terminal current is saved for each selected tungsten electrode diameter.	10 – 200 %	11 P	100	100
<b>AC Arc Type</b> This enables working with low noise arc with good re-ignition. For pure aluminium it may be necessary to switch to the ACH Hard Arc type	ACS (standard) ACH (hard)	AC	ACS	ACS

<b>Software Version Information</b>		<b>VEL</b>	<b>3.02</b>	3.02
<b>Slope On / Off</b> The up slope and down slope can be disabled. When this feature is set to OFF, current increase, current decrease, initial current and crater current are not available in the main parameters.	ON OFF	<b>SLO</b>	<b>On</b>	ON
<b>Spot Welding Dwell Time (enable / disable)</b> (refer main parameters)	ON OFF	<b>PSP</b>	<b>OFF</b>	OFF

Table 3-6: GTAW Secondary Parameters

## 3.12 GTAW Spot Welding Mode with DWELL Time (Stitch Mode)

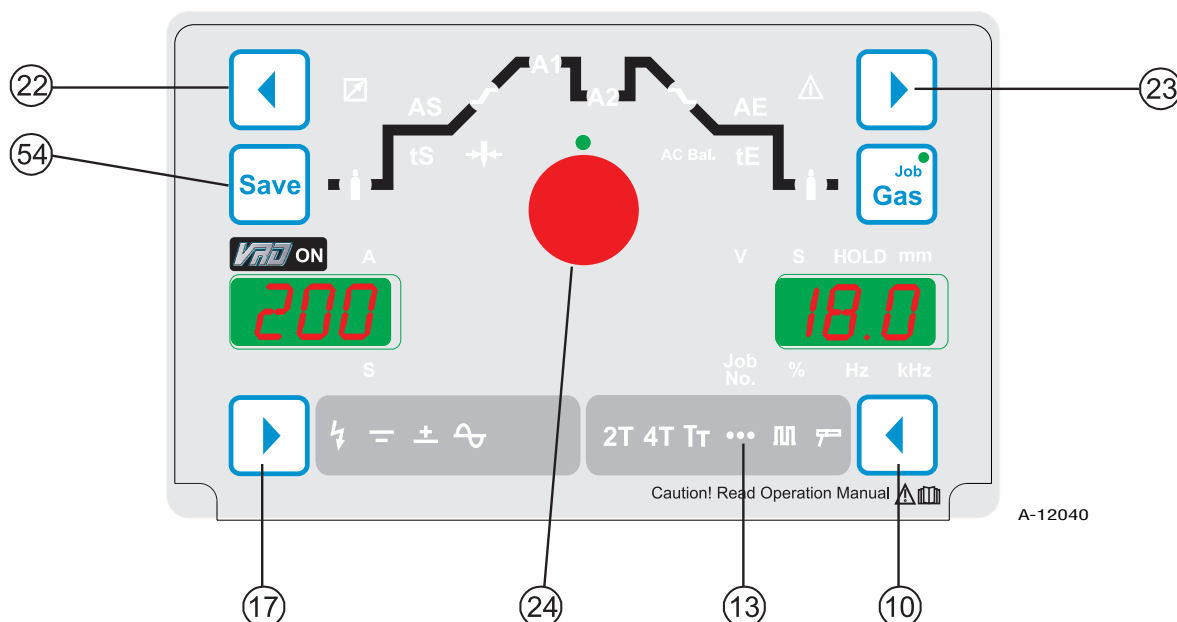


Figure 3-8: GTAW Spot Welding Mode with DWELL Time

To enable Spot Welding with Dwell Time (Stitch welding) the parameter “PSP” needs to be set to ON (refer secondary parameters) it is possible to have automated spot welds with this Stitch function.

In 2T mode, the stitch welds are repeated for as long as the trigger is held in.

In 4T mode, press and release the trigger to start the stitch welds, press and release the trigger to end the stitch welds

### The parameters tSP and tSO determine the spot time length and the dwell (off) time length

- Press the WELDING MODE (10) button to select GTAW SPOT mode. SPOT mode. The SPOT LED (13) will illuminate.
- Press the WELDING TYPE (17) button to select the welding output type
- Press the BACK button (22) or FORWARD button (23) so the Electrode Diameter Led (42) and mm LED (30) are illuminated.  
Use the Multi Function Control (24) to adjust the Electrode size being used.
- Press and hold the WELDING MODE (10) button then press the SAVE (54) button.

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

- Press the BACK button (22) or FORWARD button (23) to select the “PSP” Parameter.
- Use the Multi Function Control (24) to set “PSP” to ON (to enable stitch welding)
- Press the BACK button (22) or FORWARD button (23) until the Base Current A1 Led (44) is illuminated.

Use the Multi Function Control (24) to adjust the Welding Current for the Electrode size being used. If the Welding Current does not match the normal operating range of the electrode the Electrode Diameter Out-of-Range indicator Led (50) will illuminate.

- Press the BACK button (22) or FORWARD button (23) until the left display shows “tSP”.
- Use the Multi Function Control (24) to set the required SPOT “ON” time required.
- Press the BACK button (22) or FORWARD button (23) until the left display shows “tSO”.
- Use the Multi Function Control (24) to set the required SPOT “DWELL or OFF” time required.

If the Electrode Diameter Out-of-Range indicator Led (50) is illuminated, it is still possible to weld.

### 3.13 Tip Tronic Operation

In GTAW modes, up to 100 jobs can be saved. These are arranged as 10 jobs numbers, in 10 job sets.

These are shown on the meter displays. The first number on the display is the job set, the second is the job number. In the example, the job set is 2 and the job number is 9.

Saved TipTronic jobs can also be set as active or inactive.

Inactive jobs are skipped during TipTronic job selection.



#### TipTronic Operation

- Using the Welding Mode button (10) select TipTronic mode (14).
- Use the Multi Function Control (24) to select the job set number and the job number.

Note that if no TipTronic jobs are saved, it will not be possible to select any TipTronic jobs.

- Use the BACK button (22) or FORWARD button (22) to switch between TipTronic jobs and all main parameters.

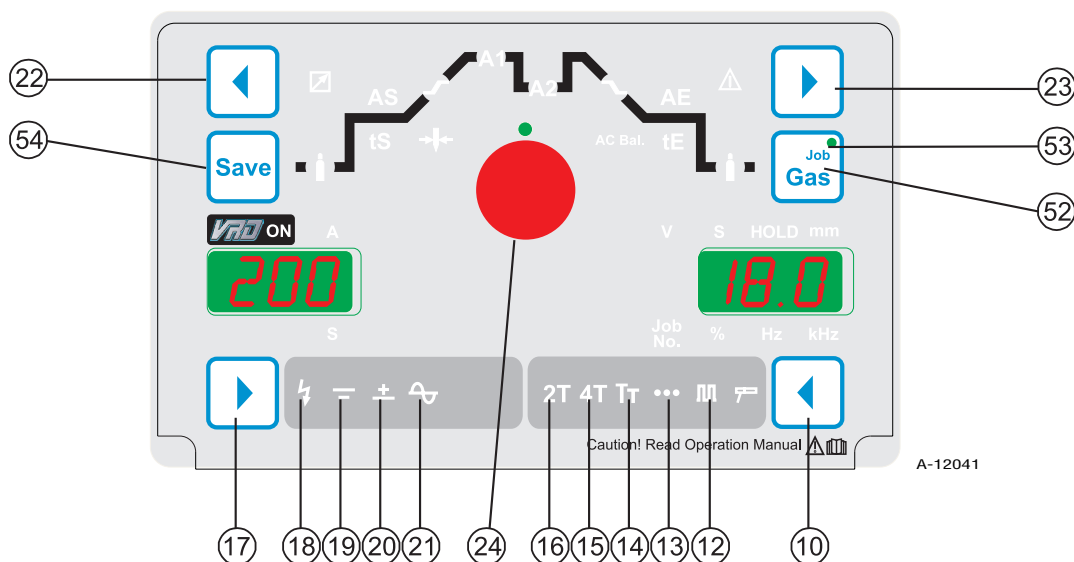


Figure 3-9: Tip Tronic Operation

- Set all the required GTAW welding parameters. Using the Welding Mode button (10) and the Welding Type button (17).

Do NOT select TipTronic mode (14) at this stage.

As an example, we may select HF, AC, 4T Pulse GTAW (LED's 18, 21, 16 and 12 will be illuminated).

- Press the SAVE button (54).

The display will show the Job Number identification, the job set and job number.

- Use the Multi Function Control (24) to select the job set number and the job number.
- Press and hold the SAVE button (54) until all LED's illuminate briefly to indicate a Save has been completed.

Note that you can interrupt the Save process, by simply briefly pushing the SAVE button (54)



### Load a TipTronic Job

- Using the Welding Mode button (10) select TipTronic mode (14).
- Use the Multi Function Control (24) to select the job set number and the job number.



### Set a TipTronic Job as Inactive

- Press the SAVE button (54).  
The display will show the Job Number identification, the job set and job number.
- Use the Multi Function Control (24) to select the job set number and the job number.
- Press the GAS button (52).
- The TipTronic job is now inactive. Note that the JOB LED (53) will extinguish.
- To exit this mode, press the SAVE button (54).



### Set a TipTronic Job as Active

- Press the SAVE button (54).  
The display will show the Job Number identification, the job set and job number.
- Use the Multi Function Control (24) to select the job set number and the job number.
- Press the GAS button (52).
- The TipTronic job is now active. Note that the JOB LED (53) will illuminate.
- To exit this mode, press the SAVE button (54).



### Copy a TipTronic Job to another Job Number

- Using the Welding Mode button (10) select TipTronic mode (14).
- Use the Multi Function Control (24) to select the "source" job set number and the job number.

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

In our example we are copying from Job Number 2-9.

- Press the SAVE button (54).



- Use the Multi Function Control (24) to select the “destination” job set number and the job number. In our example we are copying to Job Number 6-7.
- Press and hold the SAVE button (54) until all LED’s illuminate briefly to indicate a Save has been completed



### 3.14 Setup for STICK (MMAW) Welding

- Connect the Electrode Holder lead to the Electrode welding terminal (top). If in doubt, consult the electrode manufacturer. 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.
- Connect the work lead to the Worklead welding terminal (bottom). If in doubt, consult the electrode manufacturer. 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.
- Select STICK and electrode positive mode with the welding mode and welding type buttons (refer to Section 3.15 for further information)



**WARNING**

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



**CAUTION**

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



**CAUTION**

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



# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

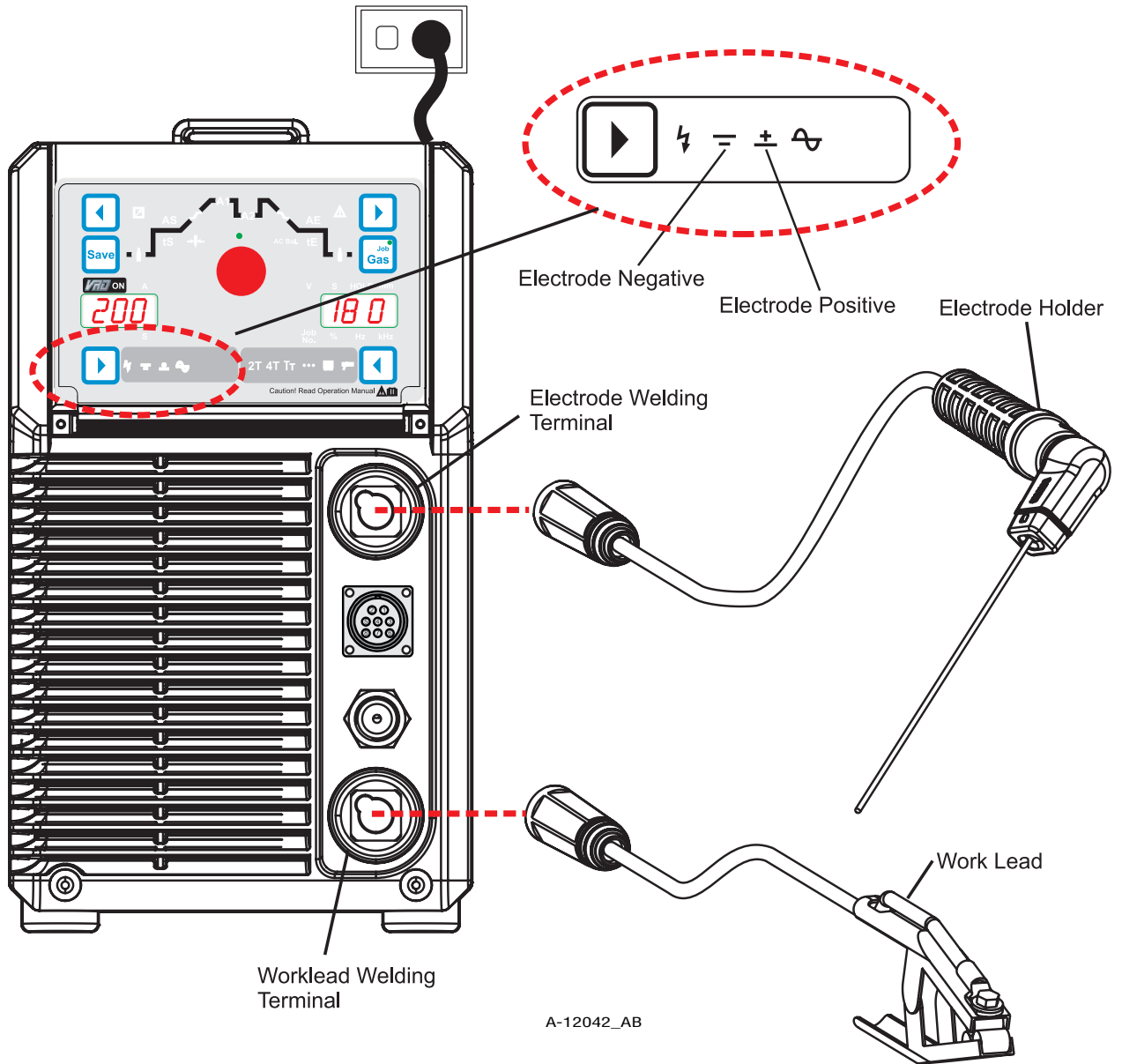


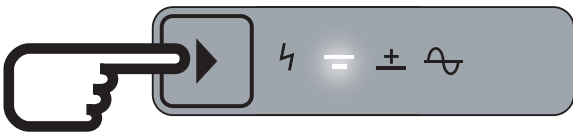
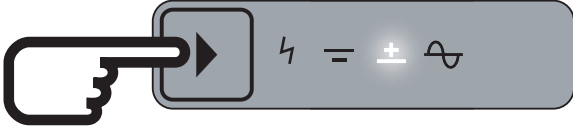
Figure 3-10: Setup for Manual Arc Welding.

- First, select Stick Mode by pressing the Welding Mode (10) button.

Welding Type	Welding Mode Selection
Stick Mode	

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

- Then, select Welding Type by pressing the welding Type (17) button.

Welding Type	Welding Type Selection
DC Negative Stick	
DC Positive Stick	

### 3.15 TRANSTIG 220AC/DC and 300AC/DC- STICK (MMAW) Programming Mode

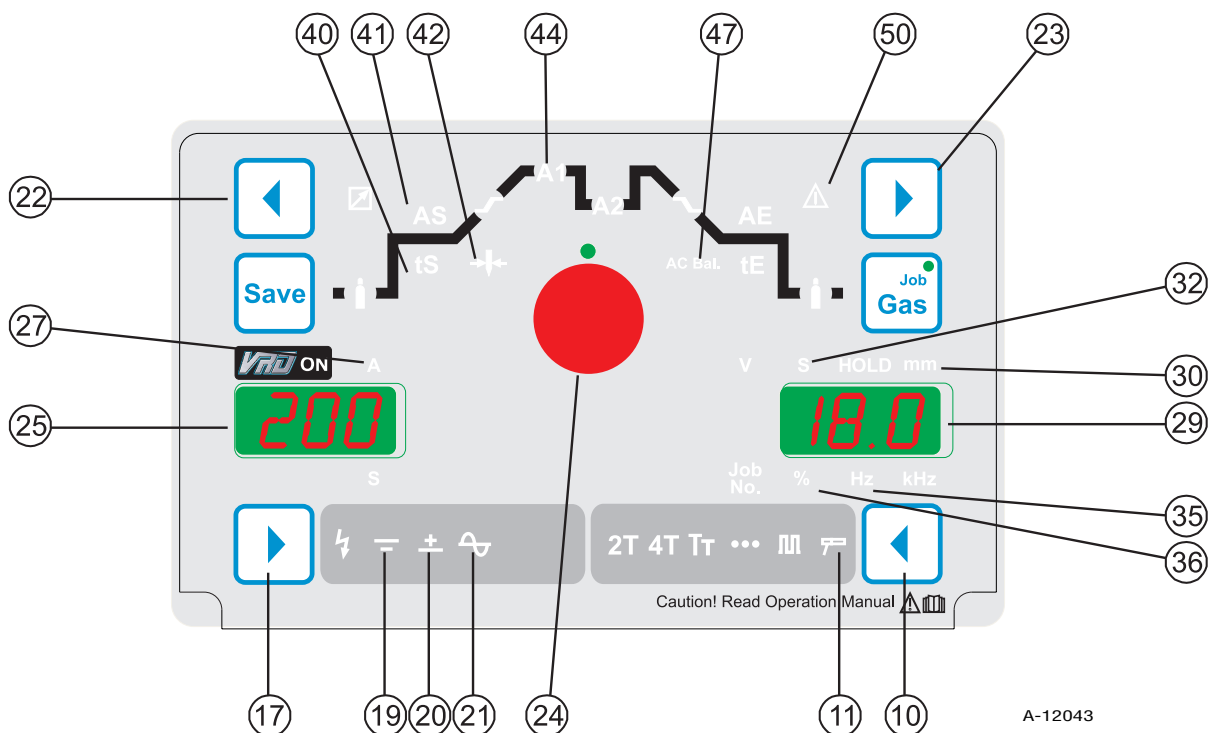


Figure 3-11: Stick Programming Mode

- Press the WELDING MODE (10) button to select MMAW mode. The MMAW Led (11) will illuminate.
- Following MMAW operating modes are available.
  - DC Negative mode. DC Negative Led (19) will illuminate.
  - DC Positive mode. DC Positive Led (20) will illuminate.
- Press the BACK button (22) or FORWARD button (23) so the Electrode Diameter Led (42) and mm LED (30) are illuminated.
  - Use the Multi Function Control (24) to adjust the Electrode size being used.
- Press the BACK button (22) or FORWARD button (23) so the Hot Start Amps Led (41) and % Led (36) are illuminated.
  - Use the Multi Function Control (24) to adjust the Hot Start Amps percentage.
- Press the BACK button (22) or FORWARD button (23) so the Hot Start Time Led (40) and Seconds Led (32) are illuminated.

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

Use the Multi Function Control (24) to adjust the Hot Start Amps Time.

- Press the BACK button (22) or FORWARD button (23) until the Base Current A1 Led (44) is illuminated.

Use the Multi Function Control (24) to adjust the Welding Current for the Electrode size being used. If the Welding Current does not match the normal operating range of the electrode the Electrode Diameter Out-of-Range indicator Led (50) will illuminate.

If the Electrode Diameter Out-of-Range indicator Led (50) is illuminated, it is still possible to weld.

MMAW Electrode Diameter (mm)	Nominal Welding Current (A)
1.5	20 - 40 Amps
2.0	35 - 60 Amps
2.5	45 - 100 Amps
3.2	75 - 140 Amps
4.0	130 - 190 Amps
5.0 (not selectable on Transtig 220AC/DC)	180 - 260 Amps

Table 3-7: Normal Welding Current for MMAW Electrode sizes









Parameter	Range	LED Code (Left Display)	Parameter Value (Right Display)	Factory Setting
<b>Welding Current A1</b> Transtig 220AC/DC Transtig 300AC/DC	10 - 170A 10 - 200A	A 		100
<b>Electrode Diameter</b> Transtig 220AC/DC Transtig 300AC/DC Set this parameters to the electrode size being used.	1.5 - 4.0 1.5 - 5.0		mm 	2.5
<b>Hot Start AS</b> This parameter operates in MMAW mode and is used to improve the start characteristics for stick electrodes by adding current on top of the welding current. e.g. HOT START current = 125 amps when welding current = 100 amps & HOT START = 125%	5 - 200% of Welding Current A1 The maximum welding current in MMAW mode is limited to 170 for the Transtig 220AC/DC and 200A for the Transtig 300AC/DC	A  When A1=100A	 %	125
<b>Hot Start Time tS</b> This parameter sets the time period for when the Hot Start current is added to the welding current at the start of the weld.	0 - 20 seconds		S 	1.0

Table 3-8: MMAW Main Parameters

Secondary parameters are available. These are required to be set separately.

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

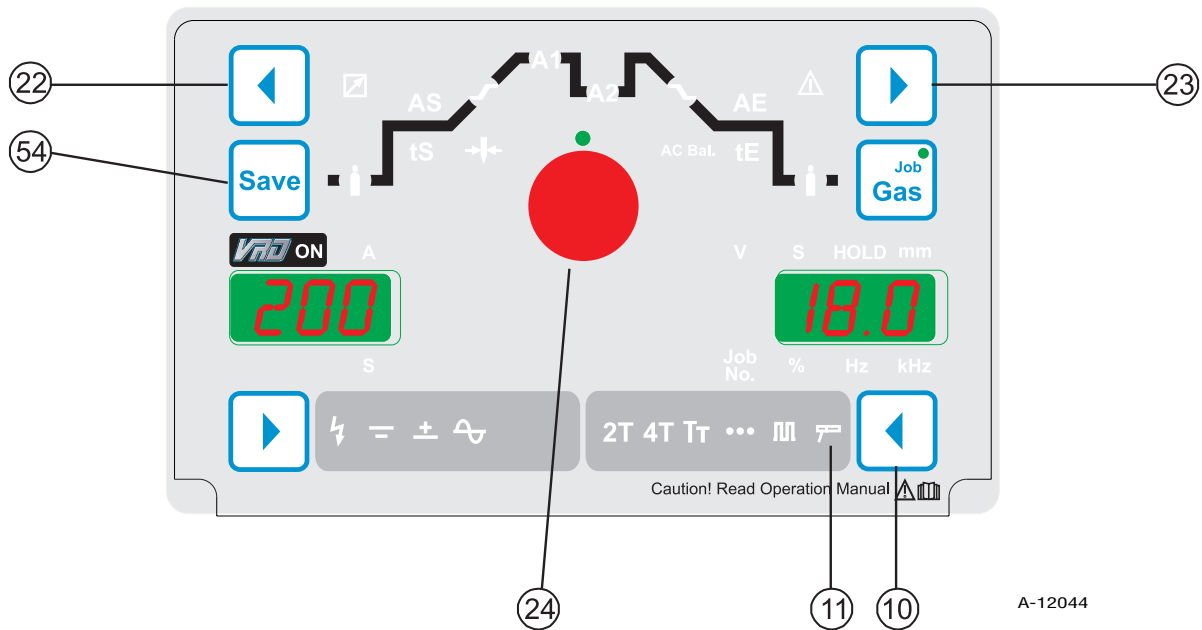


Figure 3-12: Stick Programming Mode

Press and hold the WELDING MODE (10) button then press the SAVE (54) button.

The Arc Dynamic Parameter is selected. In the left hand AMPS display dAr is displayed. In the right hand VOLTS display, the value of the parameter is displayed.

Use the Multi Function Control (24) to adjust the Arc Dynamic parameter.

Press the BACK button (22) or FORWARD button (23) to select the Software Version Number. In the left hand AMPS display rEL is displayed. In the right hand VOLTS display, the Software Version Number is displayed.

Note that even during welding, these settings can be adjusted and changed.

Parameter	Range	LED Code (Left Display)	Parameter Value (Right Display)	Factory Setting
<b>Arc Dynamic (Arc Force)</b> Arc Force is effective in MMAW Mode only. Arc Force control provides an adjustable amount of Arc Force (or "dig"). This feature can be particularly beneficial in providing the operator the ability to compensate for variability in joint fit-up in certain situations with particular electrodes. In general increasing the Arc Force control toward 200% (maximum Arc Force) allows greater penetration control to be achieved.	0 – 200% The welding current increases automatically as the welding voltage is reduced. The Arc Dynamic percentage indicates the ratio between the main current and the automatic increase.	dAr	100	100
<b>Software Version Information</b>		rEL	3.02	3.02

Table 3-9: MMAW Secondary Parameters

**3.16 User Specific Menus and Dead Man Switch Mode**

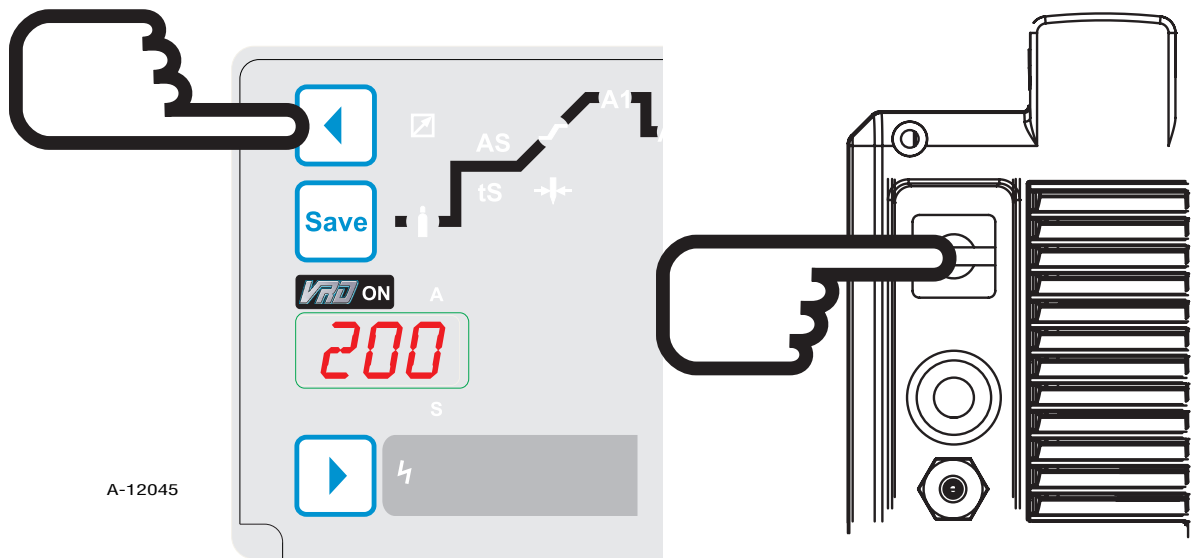


Figure 3-13: User Specific Menus and Dead Man Switch Mode

- Switch off the power to the unit.  
Press and hold the BACK Welding Parameter Button (22) .  
Switch on the power to the unit.  
The User Specific Menus are activated.  
After the User Specific Menu items have been set, switch the power off to the unit to save the settings.

Menu item	Range	LED Code (Left Display)	Parameter Value (Right Display)	Factory Setting
<p><b>C02 – Water Pump Error Message Display</b> Set this to “ON” if a water cooler without a suitable interface lead is being used.</p> <p>Set this to “OFF” if a water cooler with a suitable interface lead is being used.</p>	ON OFF	C02	On	ON
<p><b>C06 – Downslope Mode</b> When set to “ON” in 4T mode, the downslope will continue even if the trigger is released during the downslope time.</p> <p>When set to “OFF” in 4T mode, the downslope will stop as soon as the trigger is released during the downslope time.</p>	ON OFF	C06	OFF	OFF

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE





<p><b>C08 – Foot Control Minimum Current (GTAW AC mode only)</b> When set to “ON” the increased Foot Control Minimum current is disabled and the minimum current on any electrode is 5A.</p> <p>When set to “OFF” the increased Foot Control Minimum current is enabled. The minimum currents are: electrode 1.0 – 2.0mm (10A) electrode 2.4mm (15A) electrode 3.2mm (20A)</p>	<p>ON OFF</p>			<p>OFF</p>
<p><b>C09 – Dead Man Switch (MMAW mode only)</b> When set to “ON” Dead Man Switch operating mode is enabled.</p> <p>When set to “OFF” Dead Man Switch operating mode is disabled.</p>	<p>ON OFF</p>			<p>OFF</p>

Table 3-10: User Specific Menus

### 3.17 MMAW (STICK) Dead Man Switch Mode

A special trigger mode called “Dead Man Switch” mode is available on the 220AC/DC and 300AC/DC when welding with MMAW (STICK) electrodes. In this mode, there will be no output voltage at all from the Power Source until the trigger is pressed. This provides the greatest level of safety for the operator, and is mandatory on some work sites.

While the Dead Man Switch function greatly increases operator safety, standard welding safety procedures should still be followed.

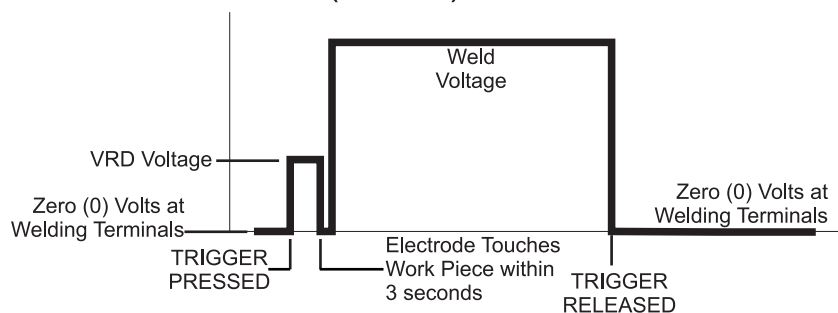
When the trigger is pressed, the VRD voltage is activated and the user can start welding as normal. For extra safety, if welding has not commenced within 3 seconds after the trigger is pressed, the Power Source will turn off the VRD, and the trigger must be released & pressed again to start welding.

If the trigger is released during welding, all welding power is shut off within the time limits of normal VRD operation.

A special MMAW (STICK) electrode holder is required for use with a Power Source fitted with the Dead Man Switch function. This electrode holder has a trigger switch attached to it, and a control cable that connects to the remote control socket of the Power Source.

The Dead Man Switch function is active in both 2T and 4T MMAW (STICK) mode.

## 2T MMAW (STICK) with Dead Man Switch



## 4T MMAW (STICK) with Dead Man Switch

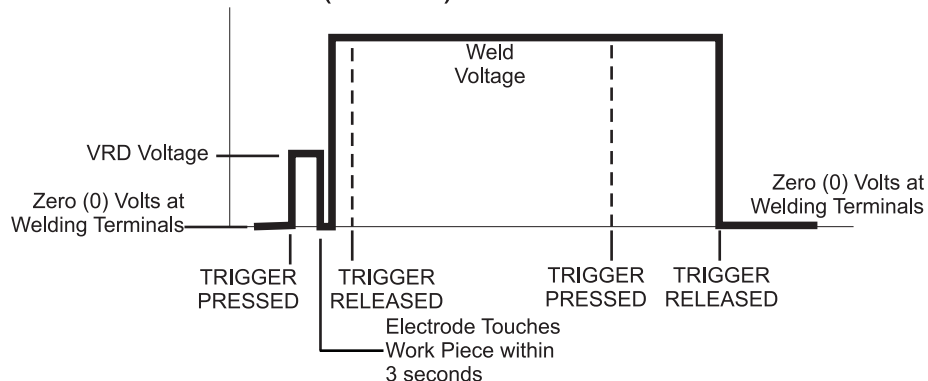


Figure 3-14: Dead Man Switch Function in Both 2T and 4T MMAW (STICK) Mode

Welding with the Dead Man Switch is as follows:

### 2T MODE

1. Press the trigger on the electrode holder.
2. The Power Source will now output the VRD volts and the VRD led will be lit.
3. Touch the MMAW (Stick) Electrode to the work and commence welding as usual.
4. Release the trigger to cease welding.

There will be 0V on the Power Source welding terminals and the VRD light will be off.

### 4T MODE

1. Press the trigger on the electrode holder.
2. The Power Source will now output the VRD volts and the VRD led will be lit.
3. Touch the MMAW (Stick) Electrode to the work and commence welding as usual.
4. Release the trigger and continue welding.
5. Press and release the trigger to cease welding.

There will be 0V on the Power Source welding terminals and the VRD light will be off.

In both 2T and 4T modes, if the MMAW (Stick) electrode is not touched to the work piece within three seconds, the welding output will be inhibited. Release the trigger to reset, and press the trigger again to reactivate the VRD.



*Approval from a mine site manager, or work site manager must be obtained in writing before the Dead Man Switch function is altered. Only a suitably qualified electrical tradesperson or Cigweld Service Agent should make any changes to the Power Source.*

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

## 3.18 Special Function

### Soft Reset

- Press and hold the BACK button (22).
- Press the SAVE button (54).
- All control panel LED's will light up briefly to confirm the Soft Reset has been completed,.

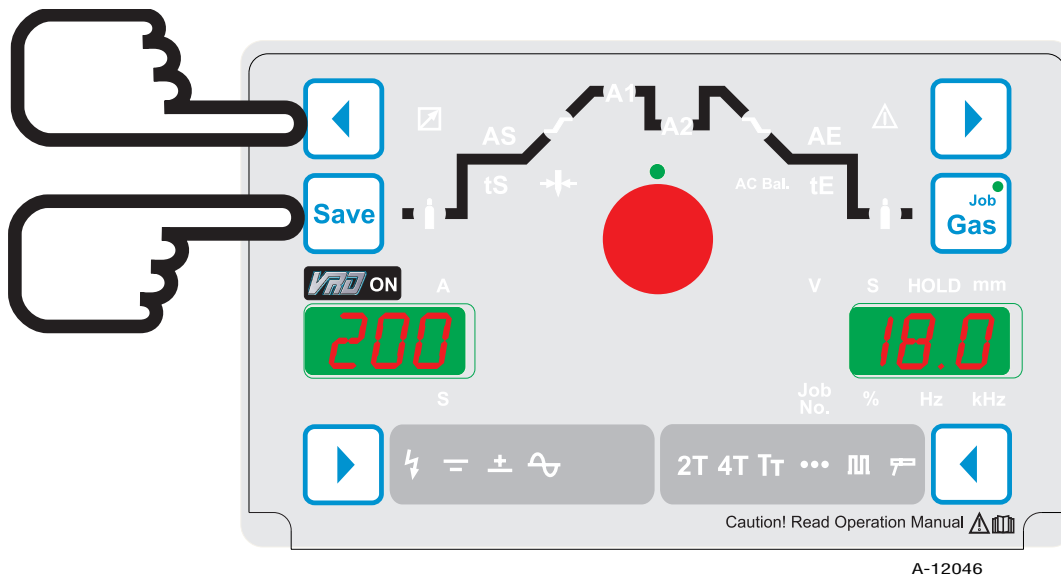


Figure 3-15: Soft Reset

### Master Reset



*All saved TipTronic jobs will be erased.  
All welding and secondary parameters will be restored to the factory setting.*

- Press and hold the BACK button (22).
- Press and hold the SAVE button (54).
- All control panel LED's will light up briefly to confirm the Soft Reset has been completed. After 5 seconds all the control panel LED's will light again briefly to confirm the Master Reset has been completed.

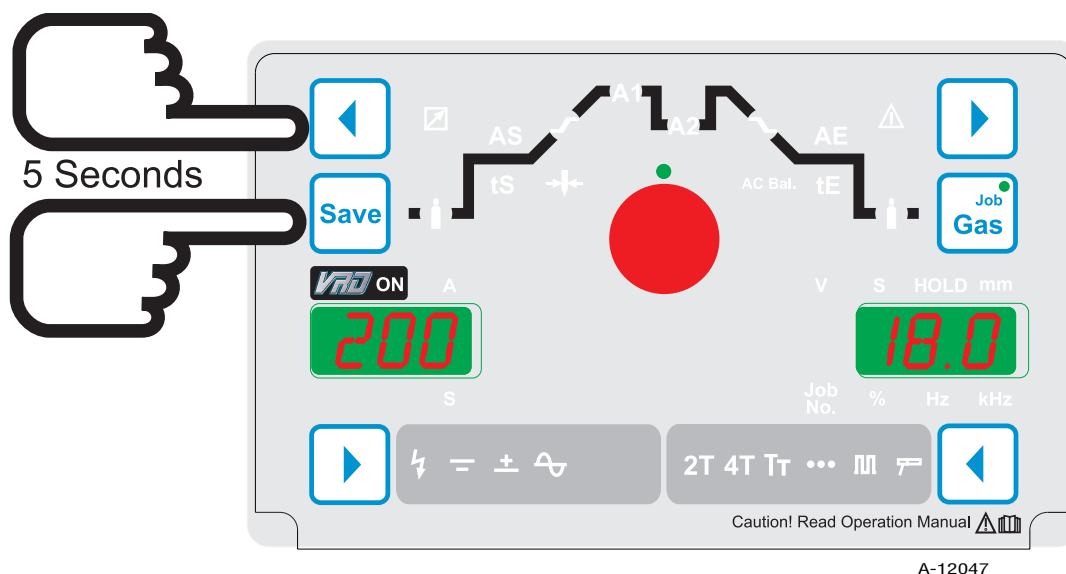


Figure 3-16: Master Reset



## Control Panel Test

- Press and hold the BACK button (22).
- Press the FORWARD button (23).
- All control panel LED's and meter displays will light up for approximately 4 seconds.

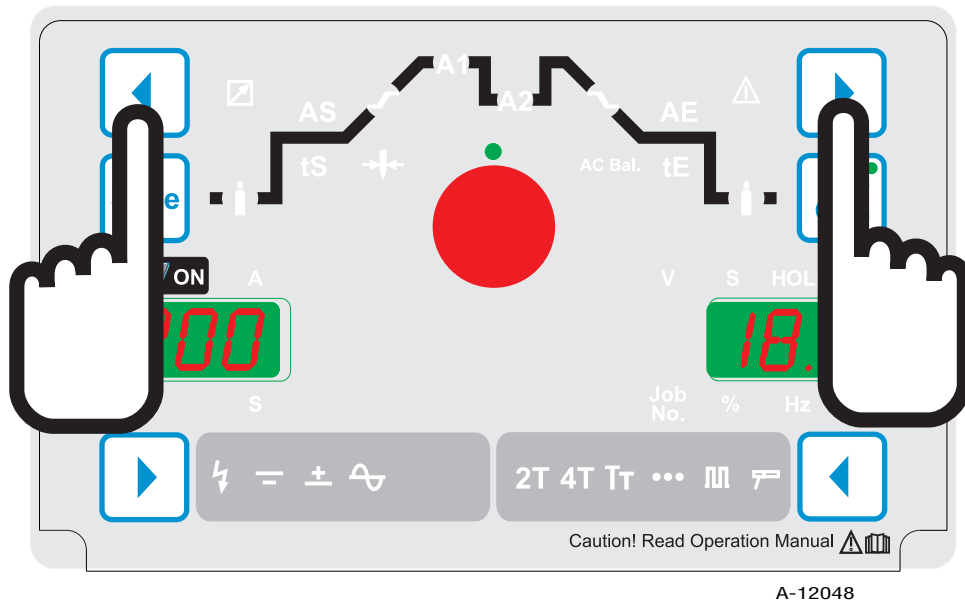


Figure 3-17: Control Panel Test

## Fan Test

- Press and hold the BACK button (22).
- Press the WELDING TYPE button (17).
- The fan will run for approximately 30 seconds.
- If the BACK button (22) and WELDING TYPE button (17) are pressed again while the fan is running, the fan test is halted.

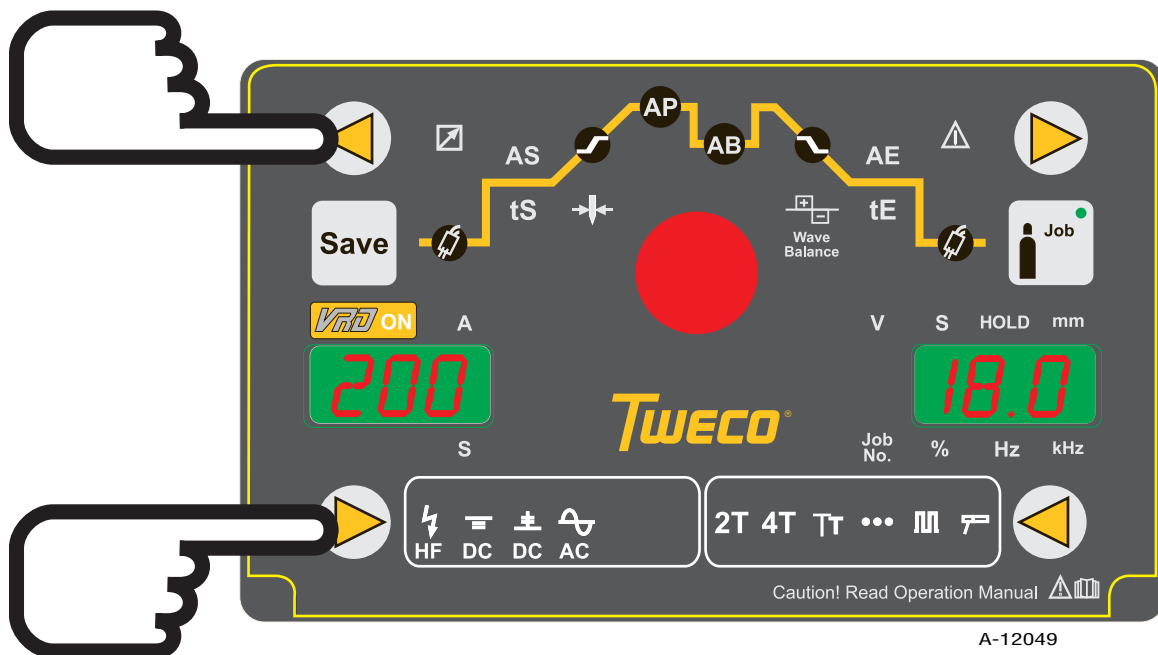


Figure 3-18: Fan Test

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

## Water Pump Test

Only for water pump with Net Connection interface

- Press and hold the FORWARD button (22).
- Press the WELDING TYPE button (17).
- The Water Cooler (Net Connection type) will run for approximately 30 seconds.

If there is an error, or no pump is connected, the error message

**E05 -00**

will be displayed after approximately 5 seconds.

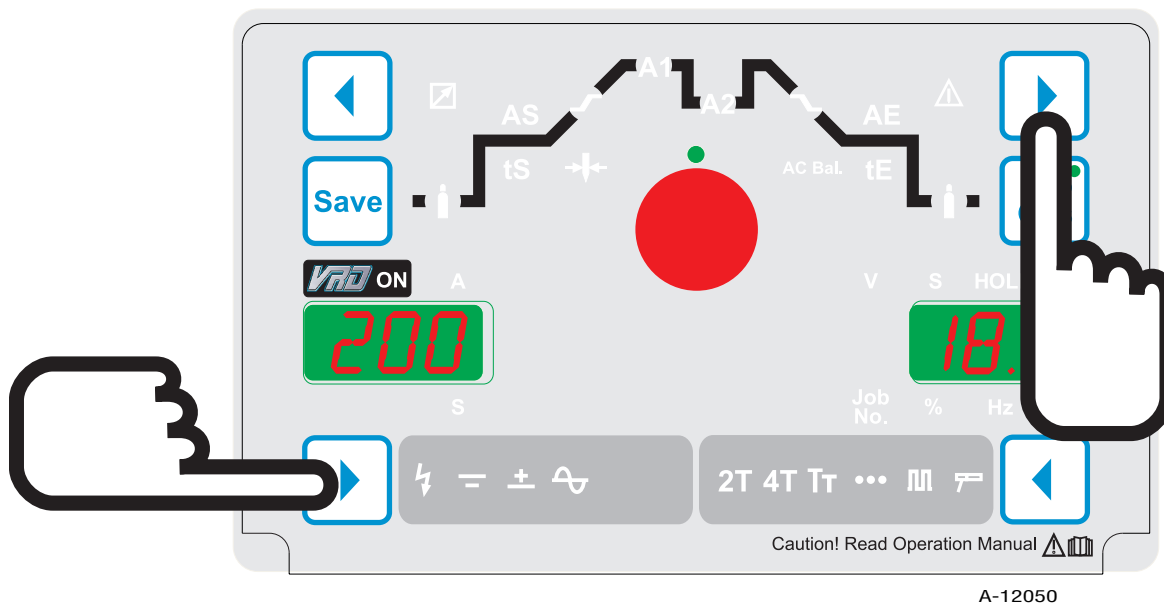


Figure 3-19: Water Pump Test

## 3.19 Information Messages

If a message has been displayed, the power source may only function to a limited capacity. The cause of the condition must be remedied as soon as possible.

Message Code	Note	Cause	Possible Remedy
<b>H01</b>	Mains Supply Under Voltage	Mains Supply Voltage is too low	Check Mains Supply Voltage
<b>H03</b>	Fans	Fan Fault	Have an Accredited CIGWELD Service Provider check the power source.
<b>H04</b>	PFC Input Stage	PFC Input Stage is Faulty	Have an Accredited CIGWELD Service Provider check the power source.

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

<b>H05</b>	EEProm checksum error	Communication with EEPROM is faulty	Switch machine off, then back on. Perform a master reset. If the problem continues have an Accredited CIGWELD Service Provider check the power source.
<b>H06</b>	EEProm read / write error	Communication with EEPROM is faulty	Switch machine off, then back on. Perform a master reset. If the problem continues have an Accredited CIGWELD Service Provider check the power source.














Table 3-11: Information Messages

### 3.20 Error Messages

If a message has been displayed, have an Accredited CIGWELD Service Provider check the power source.

Message Code	Error	Cause	Possible Remedy
<b>E01 -01</b>	Thermal Overload of Output Diodes	Duty Cycle has been exceeded	Leave the power source switched ON and allow it to cool.
<b>E01 -02</b>	Thermal Overload of Primary Module	Duty Cycle has been exceeded	Leave the power source switched ON and allow it to cool.
<b>E01 -03</b>	Thermal Overload of Transformer	Duty Cycle has been exceeded	Leave the power source switched ON and allow it to cool.
<b>E01 -05</b>	Thermal Overload of PFC Module	Duty Cycle has been exceeded	Leave the power source switched ON and allow it to cool.
<b>E02 -00</b>	Mains Supply Over Voltage	Mains Supply Voltage is too high	Check Mains Supply Voltage
<b>E05 -00</b>	Water Pump (in water cooled operation) Torch Monitor (in gas cooled operation)	Defective connection cable or water cooler Water cooled GTAW torch connected	Check the Net Connection water cooler cable and the water cooler. Use a gas cooled torch
<b>E06 -00</b>	Secondary Over Voltage	Initial Voltage is too high	Have an Accredited CIGWELD Service Provider check the power source
<b>E09 -00</b>	Voltage Detection	Voltage Detection Error	Have an Accredited CIGWELD Service Provider check the power source
<b>E09 -01</b>	Voltage Detection plug socket	Voltage Detection Error in module 2	Have an Accredited CIGWELD Service Provider check the power source
<b>E10 -00</b>	Torch / Remote Control	Remote Control, Torch or connections defective	Check or replace Torch or Remote Control

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

Message Code	Error	Cause	Possible Remedy
	Power Section Fault	Power Section start up Fault	Have an Accredited CIGWELD Service Provider check the power source
	Temperature Sensor Secondary Diode	Defective Thermal Sensor	Have an Accredited CIGWELD Service Provider check the power source
	Temperature Sensor Primary Module	Defective Thermal Sensor	Have an Accredited CIGWELD Service Provider check the power source
	Temperature Sensor Transformer	Defective Thermal Sensor	Have an Accredited CIGWELD Service Provider check the power source
	Temperature Sensor PFC	Defective Thermal Sensor	Have an Accredited CIGWELD Service Provider check the power source
	Internal Supply Voltage	Internal Supply Voltage Fault	Have an Accredited CIGWELD Service Provider check the power source
	Current Detection	Current Detection Fault	Have an Accredited CIGWELD Service Provider check the power source
	Shutdown due to over current	Mains Supply Current is too high	Have an Accredited CIGWELD Service Provider check the power source
	HF Ignition Faulty	HF Ignition Faulty	Have an Accredited CIGWELD Service Provider check the power source
	Mains Supply Under Voltage	Mains Supply Voltage is too low	Check Mains Supply Voltage
	The Electrode is shorted to work piece when machine is turned ON	VRD defective, or short circuit between torch and work piece	Switch OFF and ON the power source to clear the error code
	Configuration Error	Defective PCB, incorrect system software	Have an Accredited CIGWELD Service Provider check the power source
	Control Panel identification	Control Panel identification error	Have an Accredited CIGWELD Service Provider check the power source


	Power Module	Power Module not symmetrical	Have an Accredited CIGWELD Service Provider check the power source
---	--------------	------------------------------	--

Table 3-12: Error Message

## 3.21 Shielding Gas Regulator Operating Instructions



**WARNING**

---

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

---

### 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 handling 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 reliable 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.*

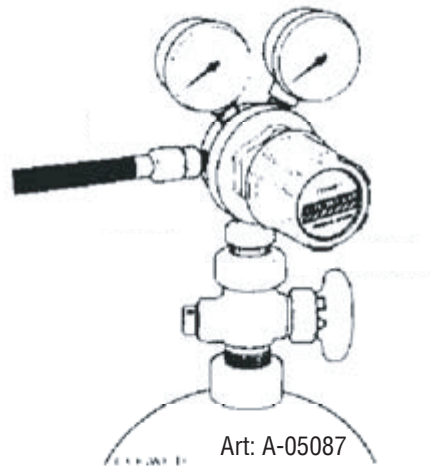


Figure 3-20: Fit Regulator to Cylinder

## 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 lint free 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

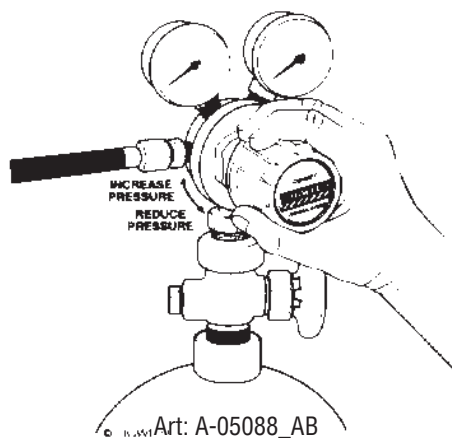


Figure 3-21: Adjust Flow Rate

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 counter clockwise, 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.

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

## 3.22 Foot Control, Part No. W4015800 (Optional Accessory)

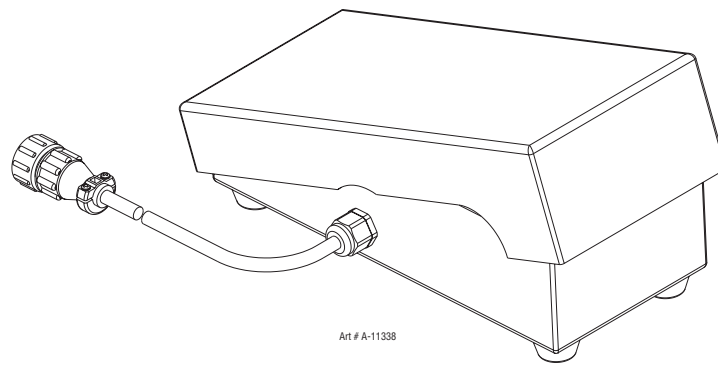


Figure 3-22: Foot Control

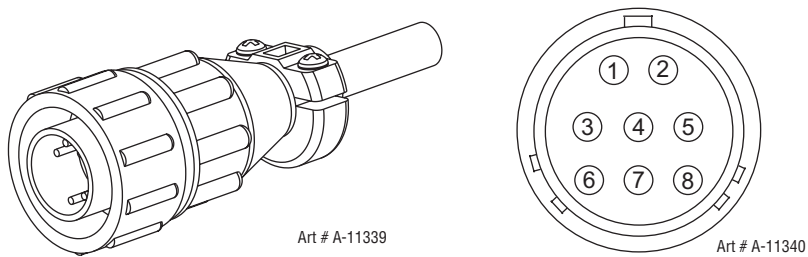


Figure 3-23: 8 Pin Control Plug

Pin	Description
1	Not Used
2	Trigger Switch
3	Trigger Switch
4	Not Used
5	Potentiometer Maximum
6	Potentiometer Minimum
7	Potentiometer Wiper
8	Not Used

Table 3-13: 8 Pin Socket

### Description

The CIGWELD Foot Control is a foot operated switch and potentiometer which starts and stops the welding process and controls welding current through operation of the foot pedal. Refer to list below for compatible Cigweld power sources.

### Installation

Attach the 8-pin connector on the end of the cable to the 8-pin receptacle on the front of the welding machine. To complete the connection, align the keyway, insert the plug, and rotate the threaded collar fully clockwise.

### Foot Control Operation

Press the foot pedal to start the machine output functions. The foot control potentiometer controls the welding current up to the level set on the welding power source. Note that the maximum current must be set on the power source by the operator **prior** to the foot control being connected. With the foot control connected, the power source will only display minimum preview Amps until the foot control is depressed then it displays actual welding current when welding. Pressing the pedal to increases the welding current; letting up on the pedal decreases the welding current. Releasing the pedal completely extinguishes the arc and initiates the post-flow shielding gas timer (where fitted).



## **TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE**

---

Note that some power sources may require the remote/local switch set to remote, the maximum setting of the power source will be determined by the respective front panel control, irrespective of the remote control device setting. As an example, if the output current on the power source front panel is set to 50% of the available current and the remote control device is set to 100% output or maximum, the maximum achievable output from the unit will be 50%. Should 100% output be required, the respective front panel control must be set to 100% or maximum, in which case the remote device will then be able to control between 1-100% output.

This foot control is compatible with the following Cigweld power sources:

WeldSkill 200AC/DC Part No: W1006202

Transmig 175i Part No: W1005176

Transmig 200i Part No: W1005202

Transmig 250i Part No: W1003251

Transtig 200AC/DC Part No: 700719

Transtig 220AC/DC Part No: W1007221

Transtig 300AC/DC Part No: W1007301

Note 1: Some power sources other than specified as above may not function with the foot control.

Note 2: The foot control will only work correctly when power source trigger mode 2T (Normal) is selected.



**SECTION 4:  
BASIC WELDING GUIDE****4.01 Stick (MMAW) Basic Welding Technique****Size of Electrode**

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

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

**Storage of Electrodes**

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

**Electrode Polarity**

Electrodes are generally connected to the ELECTRODE HOLDER with the Electrode Holder connected positive polarity. The WORK LEAD is connected negative polarity and is connected to the work piece. If in doubt consult the electrode data sheet or your nearest Accredited CIGWELD Distributor.

**Effects of Arc Welding Various Materials****A. High tensile and alloy steels**

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

Hydrogen controlled Electrodes must be used for this application. Use Ferrocraft 61 or 16TXP for normal strength (500 MPa) steels, and Alloycraft range for higher strength steels.

**B. Austenitic manganese steels**

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

**C. Cast Iron**

Most types of cast iron, except white iron, are weldable. White iron, because of its extreme brittleness, generally cracks when attempts are made to weld it. Trouble may also be experienced when welding white-heart malleable, due to the porosity caused by gas held in this type of iron. Suitable Electrode types are Castcraft 55 or Castcraft 100.

**D. Copper and alloys**

The most important factor is the high rate of heat conductivity of copper, making preheating of heavy sections necessary to give proper fusion of weld and base metal. Suitable Electrode types are Bronzecraft AC-DC electrodes.

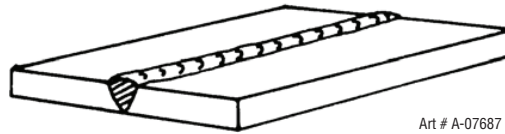
**Arc Welding Practice**

The techniques used for arc welding are almost identical regardless of what types of metals are being joined. Naturally enough, different types of electrodes would be used for different metals as described in the preceding section.

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

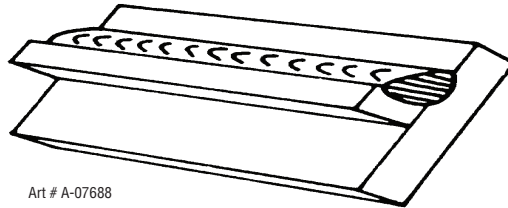
## Welding Position

The electrodes dealt with in this publication can be used in most positions, i.e. they are suitable for welding in flat, horizontal, vertical and overhead positions. Numerous applications call for welds to be made in positions intermediate between these. Some of the common types of welds are shown in Figures 4-5 through 4-12.



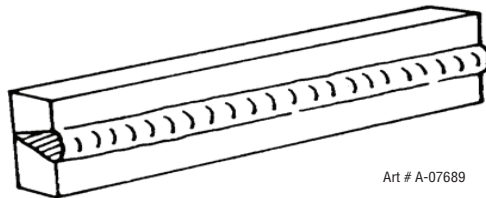
Art # A-07687

Figure 4-1: Flat Position, Down Hand Butt Weld



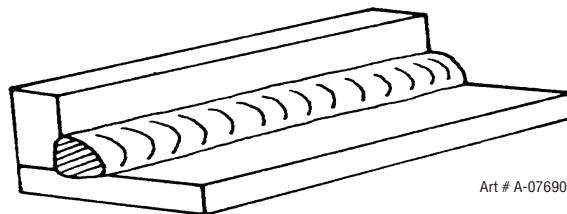
Art # A-07688

Figure 4-2: Flat Position, Gravity Fillet Weld



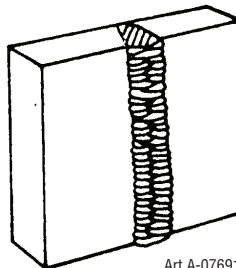
Art # A-07689

Figure 4-3: Horizontal Position, Butt Weld



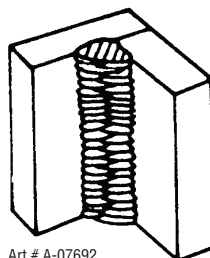
Art # A-07690

Figure 4-4: Horizontal-Vertical (HV) Position



Art A-07691

Figure 4-5: Vertical Position, Butt Weld



Art # A-07692

Figure 4-6: Vertical Position, Fillet Weld

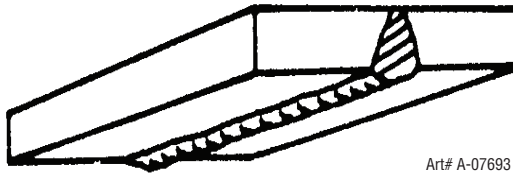


Figure 4-7: Overhead Position, Butt Weld

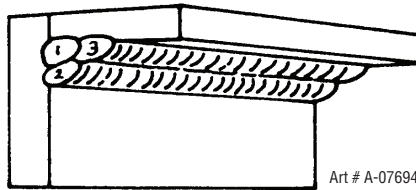


Figure 4-8: Overhead Position, Fillet Weld

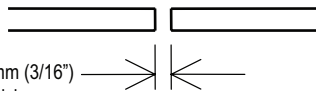
**Joint Preparations**

In many cases, it will be possible to weld steel sections without any special preparation. For heavier sections and for repair work on castings, etc., it will be necessary to cut or grind an angle between the pieces being joined to ensure proper penetration of the weld metal and to produce sound joints.

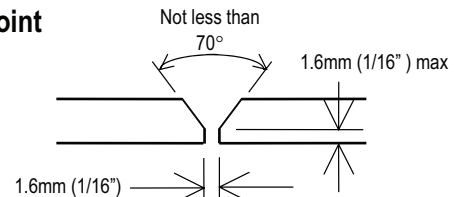
In general, surfaces being welded should be clean and free of rust, scale, dirt, grease, etc. Slag should be removed from oxy-cut surfaces. Typical joint designs are shown in Figure 4-9.

**Open Square Butt Joint**

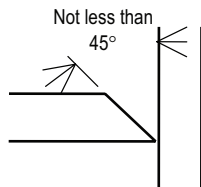
Gap varies from 1.6mm (1/16") to 4.8mm (3/16") depending on plate thickness



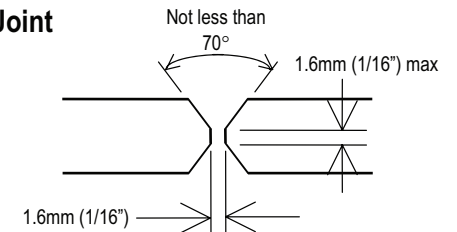
**Single Vee Butt Joint**



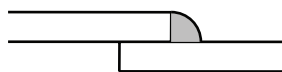
**Single Vee Butt Joint**



**Double Vee Butt Joint**



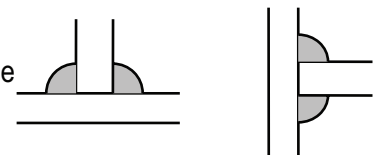
**Lap Joint**



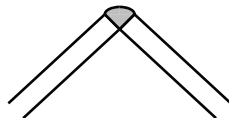
**Fillet Joint**



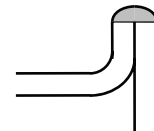
**Tee Joints**  
(Fillet both sides of the joint)



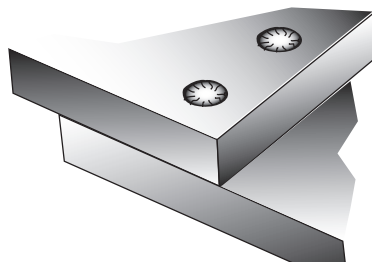
**Corner Weld**



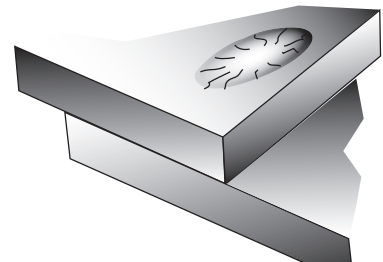
**Edge Joint**



**Plug Weld**



**Plug Weld**



Art # A-07695\_AE

Figure 4-9: Typical Joint Designs for Arc Welding

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

## Arc Welding Technique - A Word to Beginners

For those who have not yet done any welding, the simplest way to commence is to run beads on a piece of scrap plate. Use mild steel plate about 6.0mm thick and a 3.2mm electrode. Clean any paint, loose scale or grease off the plate and set it firmly on the work bench so that welding can be carried out in the downhand position. Make sure that the work clamp is making good electrical contact with the work, either directly or through the work table. For light gauge material, always clamp the work lead directly to the job, otherwise a poor circuit will probably result.

### The Welder

Place yourself in a comfortable position before beginning to weld. Get a seat of suitable height and do as much work as possible sitting down. Don't hold your body tense. A taut attitude of mind and a tensed body will soon make you feel tired. Relax and you will find that the job becomes much easier. You can add much to your peace of mind by wearing a leather apron and gauntlets. You won't be worrying then about being burnt or sparks setting alight to your clothes.

Place the work so that the direction of welding is across, rather than to or from, your body. The electrode holder lead should be clear of any obstruction so that you can move your arm freely along as the electrode burns down. If the lead is slung over your shoulder, it allows greater freedom of movement and takes a lot of weight off your hand. Be sure the insulation on your cable and electrode holder is not faulty, otherwise you are risking an electric shock.

### Striking the Arc

Practice this on a piece of scrap plate before going on to more exacting work. You may at first experience difficulty due to the tip of the electrode "sticking" to the work piece. This is caused by making too heavy a contact with the work and failing to withdraw the electrode quickly enough. A low amperage will accentuate it. This freezing-on of the tip may be overcome by scratching the electrode along the plate surface in the same way as a match is struck. As soon as the arc is established, maintain a 1.6mm to 3.2mm gap between the burning electrode end and the parent metal. Draw the electrode slowly along as it melts down.

Another difficulty you may meet is the tendency, after the arc is struck, to withdraw the electrode so far that the arc is broken again. A little practice will soon remedy both of these faults.

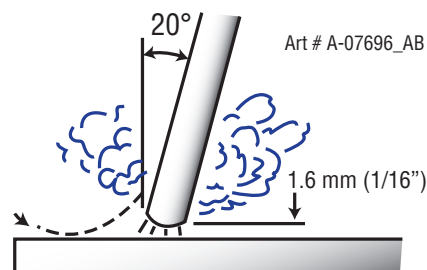


Figure 4-10: Striking an Arc

### Arc Length

The securing of an arc length necessary to produce a neat weld soon becomes almost automatic. You will find that a long arc produces more heat. A very long arc produces a crackling or spluttering noise and the weld metal comes across in large, irregular blobs. The weld bead is flattened and spatter increases. A short arc is essential if a high quality weld is to be obtained although if it is too short there is the danger of it being blanketed by slag and the electrode tip being solidified in. If this should happen, give the electrode a quick twist back over the weld to detach it. Contact or "touch-weld" electrodes such as Ferrocraft 21 do not stick in this way, and make welding much easier.

### Rate of Travel

After the arc is struck, your next concern is to maintain it, and this requires moving the electrode tip towards the molten pool at the same rate as it is melting away. At the same time, the electrode has to move along the plate to form a bead. The electrode is directed at the weld pool at about 20° from the vertical. The rate of travel has to be adjusted so that a well-formed bead is produced.

If the travel is too fast, the bead will be narrow and strung out and may even be broken up into individual globules. If the travel is too slow, the weld metal piles up and the bead will be too large.

## Making Welded Joints

Having attained some skill in the handling of an electrode, you will be ready to go on to make up welded joints.

### A. Butt Welds

Set up two plates with their edges parallel, as shown in Figure 4-11, allowing 1.6mm to 2.4mm gap between them and tack weld at both ends. This is to prevent contraction stresses from the cooling weld metal pulling the plates out of alignment. Plates thicker than 6.0mm should have their mating edges bevelled to form a 70° to 90° included angle. This allows full penetration of the weld metal to the root. Using a 3.2mm Ferrocrafter 21 electrode at 100 amps, deposit a run of weld metal on the bottom of the joint.

Do not weave the electrode, but maintain a steady rate of travel along the joint sufficient to produce a well-formed bead. At first you may notice a tendency for undercut to form, but keeping the arc length short, the angle of the electrode at about 20° from vertical, and the rate of travel not too fast, will help eliminate this. The electrode needs to be moved along fast enough to prevent the slag pool from getting ahead of the arc. To complete the joint in thin plate, turn the job over, clean the slag out of the back and deposit a similar weld.

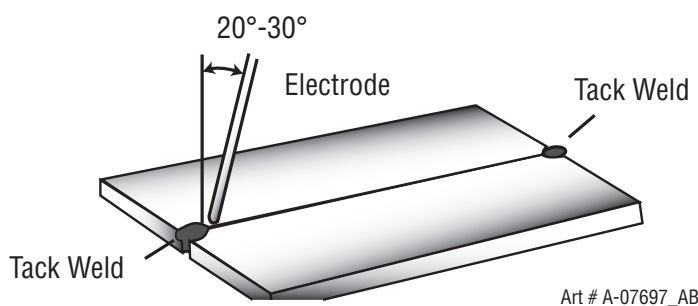


Figure 4-11: Butt Weld

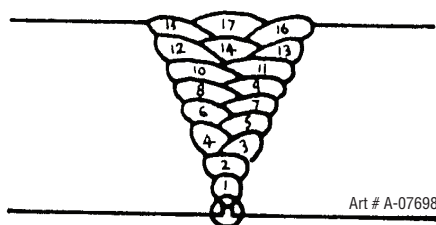


Figure 4-12: Weld Build up Sequence

Heavy plate will require several runs to complete the joint. After completing the first run, chip the slag out and clean the weld with a wire brush. It is important to do this to prevent slag being trapped by the second run. Subsequent runs are then deposited using either a weave technique or single beads laid down in the sequence shown in Figure 4-12. The width of weave should not be more than three times the core wire diameter of the electrode. When the joint is completely filled, the back is either machined, ground or gouged out to remove slag which may be trapped in the root, and to prepare a suitable joint for depositing the backing run. If a backing bar is used, it is not usually necessary to remove this, since it serves a similar purpose to the backing run in securing proper fusion at the root of the weld.

### B. Fillet Welds

These are welds of approximately triangular cross-section made by depositing metal in the corner of two faces meeting at right angles. Refer to Figure 4-4.

A piece of angle iron is a suitable specimen with which to begin, or two lengths of strip steel may be tacked together at right angles. Using a 3.2mm Ferrocrafter 21 electrode at 100 amps, position angle iron with one leg horizontal and the other vertical. This is known as a horizontal-vertical (HV) fillet. Strike the arc and immediately bring the electrode to a position perpendicular to the line of the fillet and about 45° from the vertical. Some electrodes require to be sloped about 20° away from the perpendicular position

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

to prevent slag from running ahead of the weld. Refer to Figure 4-13. Do not attempt to build up much larger than 6.4mm width with a 3.2mm electrode, otherwise the weld metal tends to sag towards the base, and undercut forms on the vertical leg. Multi-runs can be made as shown in Figure 4-14. Weaving in HV fillet welds is undesirable.

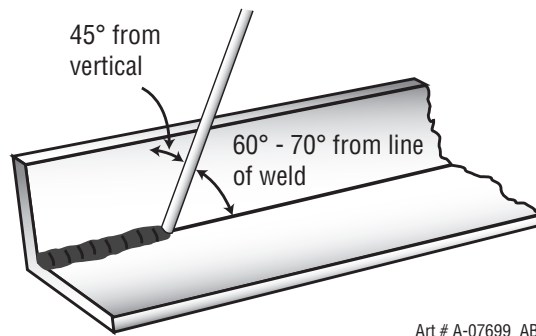


Figure 4-13: Electrode Position for HV Fillet Weld

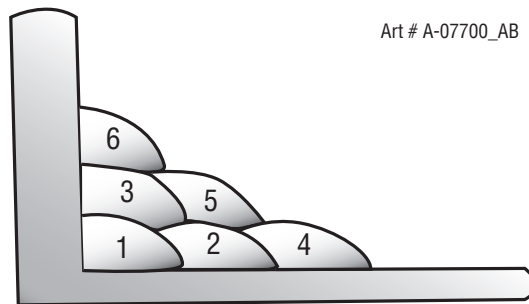


Figure 4-14: Multi-runs in HV Fillet Weld

### C. Vertical Welds

#### 1. Vertical Up

Tack weld a three feet length of angle iron to your work bench in an upright position. Use a 3.2mm Ferrocraft 21 electrode and set the current at 100 amps. Make yourself comfortable on a seat in front of the job and strike the arc in the corner of the fillet. The electrode needs to be about 10° from the horizontal to enable a good bead to be deposited. Refer Figure 4-15. Use a short arc, and do not attempt to weave on the first run. When the first run has been completed de-slag the weld deposit and begin the second run at the bottom. This time a slight weaving motion is necessary to cover the first run and obtain good fusion at the edges. At the completion of each side motion, pause for a moment to allow weld metal to build up at the edges, otherwise undercut will form and too much metal will accumulate in the centre of the weld. Figure 4-16 illustrates multi-run technique and Figure 4-17 shows the effects of pausing at the edge of weave and of weaving too rapidly.

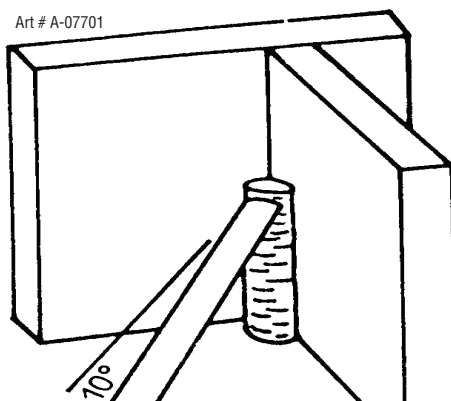


Figure 4-15: Single Run Vertical Fillet Weld



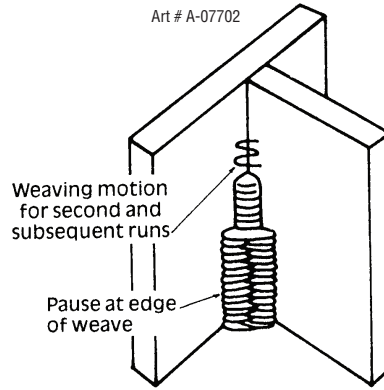


Figure 4-16: Multi Run Vertical Fillet Weld

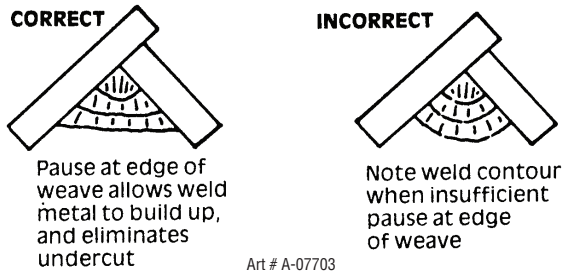


Figure 4-17: Examples of Vertical Fillet Welds

## 2. Vertical Down

The Ferrocraft 21 electrode makes welding in this position particularly easy. Use a 3.2mm electrode at 100 amps. The tip of the electrode is held in light contact with the work and the speed of downward travel is regulated so that the tip of the electrode just keeps ahead of the slag. The electrode should point upwards at an angle of about 45°.

## 3. Overhead Welds

Apart from the rather awkward position necessary, overhead welding is not much more difficult than downhand welding. Set up a specimen for overhead welding by first tacking a length of angle iron at right angles to another piece of angle iron or a length of waste pipe. Then tack this to the work bench or hold in a vice so that the specimen is positioned in the overhead position as shown in the sketch. The electrode is held at 45° to the horizontal and tilted 10° in the line of travel (Figure 4-18). The tip of the electrode may be touched lightly on the metal, which helps to give a steady run. A weave technique is not advisable for overhead fillet welds. Use a 3.2mm Ferrocraft 12XP electrode at 100 amps, and deposit the first run by simply drawing the electrode along at a steady rate. You will notice that the weld deposit is rather convex, due to the effect of gravity before the metal freezes.

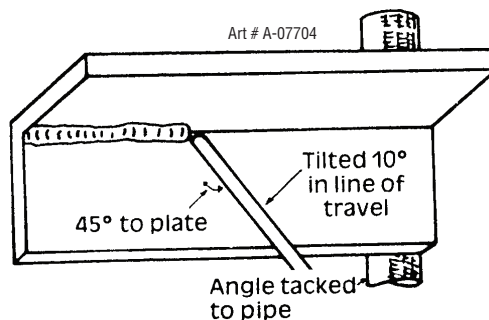


Figure 4-18: Overhead Fillet Weld

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

## Distortion

Distortion in some degree is present in all forms of welding. In many cases it is so small that it is barely perceptible, but in other cases allowance has to be made before welding commences for the distortion that will subsequently occur. The study of distortion is so complex that only a brief outline can be attempted here.

### The Cause of Distortion

Distortion is caused by:

#### A. Contraction of Weld Metal:

Molten steel shrinks approximately 11 per cent in volume on cooling to room temperature. This means that a cube of molten metal would contract approximately 2.2 per cent in each of its three dimensions. In a welded joint, the metal becomes attached to the side of the joint and cannot contract freely. Therefore, cooling causes the weld metal to flow plastically, that is, the weld itself has to stretch if it is to overcome the effect of shrinking volume and still be attached to the edge of the joint. If the restraint is very great, as, for example, in a heavy section of plate, the weld metal may crack. Even in cases where the weld metal does not crack, there will still remain stresses "Locked-up" in the structure. If the joint material is relatively weak, for example, a butt joint in 2.0mm sheet, the contracting weld metal may cause the sheet to become distorted.

#### B. Expansion and Contraction of Parent Metal in the Fusion Zone:

While welding is proceeding, a relatively small volume of the adjacent plate material is heated to a very high temperature and attempts to expand in all directions. It is able to do this freely at right angles to the surface of the plate (i.e., "through the weld", but when it attempts to expand "across the weld" or "along the weld", it meets considerable resistance, and to fulfil the desire for continued expansion, it has to deform plastically, that is, the metal adjacent to the weld is at a high temperature and hence rather soft, and, by expanding, pushes against the cooler, harder metal further away, and tends to bulge (or is "upset". When the weld area begins to cool, the "upset" metal attempts to contract as much as it expanded, but, because it has been "upset" it does not resume its former shape, and the contraction of the new shape exerts a strong pull on adjacent metal. Several things can then happen.

The metal in the weld area is stretched (plastic deformation), the job may be pulled out of shape by the powerful contraction stresses (distortion), or the weld may crack, in any case, there will remain "locked-up" stresses in the job. Figures 4-19 and 4- 20 illustrate how distortion is created.

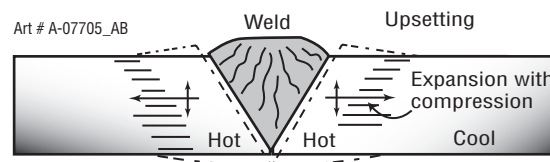


Figure 4-19: Parent Metal Expansion

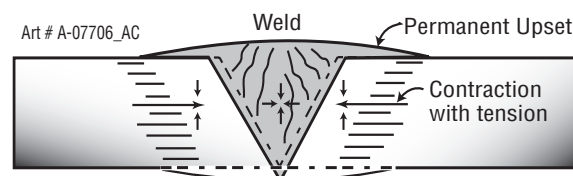


Figure 4-20: Parent Metal Contraction

## Overcoming Distortion Effects

There are several methods of minimizing distortion effects.

#### A. Peening

This is done by hammering the weld while it is still hot. The weld metal is flattened slightly and because of this the tensile stresses are reduced a little. The effect of peening is relatively shallow, and is not advisable on the last layer.

## B. Distribution of Stresses

Distortion may be reduced by selecting a welding sequence which will distribute the stresses suitably so that they tend to cancel each other out. See Figures 4-20 through 4-23 for various weld sequences. Choice of a suitable weld sequence is probably the most effective method of overcoming distortion, although an unsuitable sequence may exaggerate it. Simultaneous welding of both sides of a joint by two welders is often successful in eliminating distortion.

## C. Restraint of Parts

Forcible restraint of the components being welded is often used to prevent distortion. Jigs, positions, and tack welds are methods employed with this in view.

## D. Presetting

It is possible in some cases to tell from past experience or to find by trial and error (or less frequently, to calculate) how much distortion will take place in a given welded structure. By correct pre-setting of the components to be welded, constructional stresses can be made to pull the parts into correct alignment. A simple example is shown in Figure 4-21.

## E. Preheating

Suitable preheating of parts of the structure other than the area to be welded can be sometimes used to reduce distortion. Figure 4-22 shows a simple application. By removing the heating source from b and c as soon as welding is completed, the sections b and c will contract at a similar rate, thus reducing distortion.

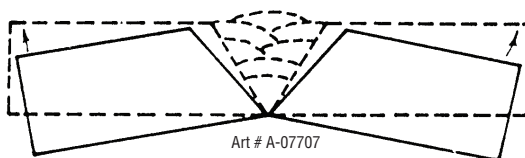
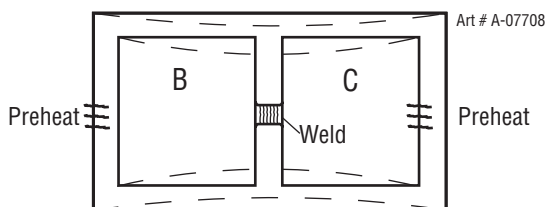


Figure 4-21: Principle of Presetting



Dotted lines show effect if no preheat is used

Figure 4-22: Reduction of Distortion by Preheating

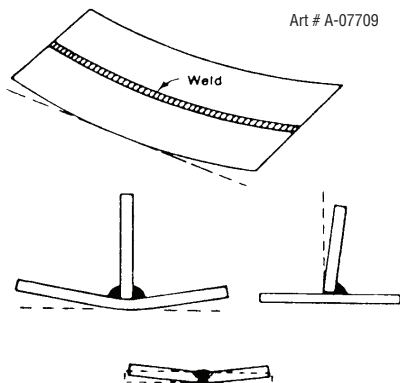


Figure 4-23: Examples of Distortion

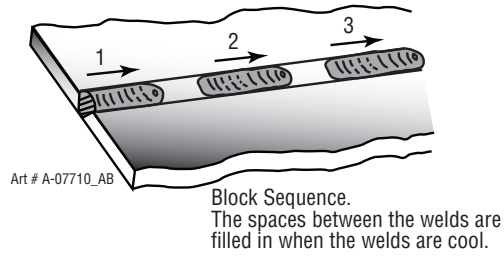


Figure 4-24: Welding Sequence

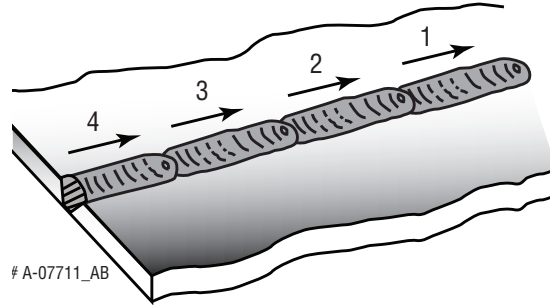


Figure 4-25: Step back Sequence

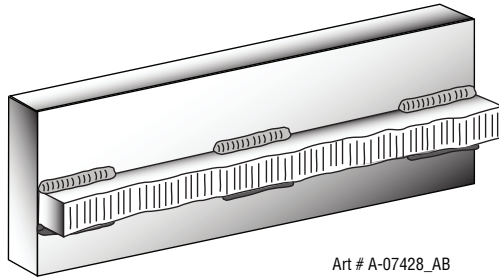


Figure 4-26: Chain Intermittent Welding

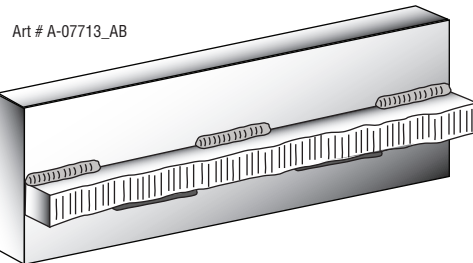


Figure 4-27: Staggered Intermittent Welding

# TRANSTIG 220 AC/DC AND 300AC/DC POWER SOURCE

## Electrode Selection Chart

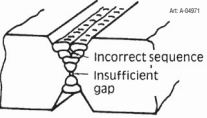
CIGWELD Electrode Selection Chart				
Description	Diameter	Pack	Part No.	Application
Satincraft 13	2.5mm	1kg	322135	General purpose electrode suitable for all positional welding and galvanised steel.
	2.5mm	2.5kg	612182	
	3.2mm	1kg	322136	
	3.2mm	2.5kg	612183	
	4.0mm	5kg	611184	
Ferrocrafft 12XP	2.0mm	1kg	322128	General purpose, Xtra performance electrode recommended for all positional (inc. Vertical down) welding of mild and galvanised steel.
	2.0mm	2.5kg	612231	
	2.5mm	1kg	322129	
	2.5mm	2.5kg	612232	
	3.2mm	1kg	322138	
	3.2mm	2.5kg	612233	
WeldSkill GP	2.0mm	1 kg	WEG1020	User-friendly GP electrode for welding thin section mild and galvanised steels. Excellent for vertical down fillet welding applications.
	2.0mm	2.5 kg	WEG2520	
	2.5mm	1 kg	WEG1025	
	2.5mm	2.5 kg	WEG2525	
	2.5mm	5 kg	WEG5025	
	3.2mm	1 kg	WEG1032	
	3.2mm	2.5 kg	WEG2532	
	3.2mm	5 kg	WEG5032	
Ferrocrafft 16 Twincoat	2.5mm	2.5 kg	612752	Hydrogen Controlled type offering exceptional AC/DC performance in all welding positions.
	2.5mm	5 kg	611752	
	3.2mm	2.5 kg	612753	
	3.2mm	5 kg	611753	
	4.0mm	5 kg	611754	
Satinchrome 308L-17	2.5mm	2.5 kg	611602	Stainless Steel type for 19Cr/10Ni stainless grades including 201, 202, 301, 302, 303, 304, 304L, 305, 308, etc
	3.2mm	2.5 kg	611603	
	4.0mm	2.5 kg	611604	
Satinchrome 309Mo-17	2.5mm	2.5 kg	611692	Stainless Steel type for 309 and 309L grades. It is also suitable for welding of dissimilar welding of other 300 series stainless steels.
	3.2mm	2.5 kg	611693	
	4.0mm	2.5 kg	611694	
Satinchrome 316L-17	2.0mm	2,5 kg	611661	Stainless Steel type for welding of matching Mo bearing grades, 316 and 316L.
	2.5mm	2.5 kg	611662	
	3.2mm	2.5 kg	611663	
	2.5/3.2mm	Blisterpack	322215	
	4.0mm	2.5 kg	611664	
Weldall	2.5mm	2.5 kg	611702	High alloy stainless steel type for welding of unknown steels, repair of die or tool steels and for joining dissimilar steels. (Not recommended for cast iron).
	3.2mm	2.5 kg	611703	
	2.5/3.2mm	Blisterpack	322216	
	4.0mm	2.5 kg	611704	
Castcraft 55	3.2mm	2.5 kg	611723	For repair and maintenance welding of S.G. cast iron, meehanites and other cast irons. It produces high strength weld than Castcraft 100.
	4.0mm	2.5 kg	611724	
Castcraft 100	2.5mm	2.5 kg	611732	Soft, Ductile Nickel type electrode for repair and maintenance welding of a wide range of cast irons. It has better "wetting" action than Castcraft 55.
	3.2mm	2.5 kg	611733	
	2.5/3.2mm	Blisterpack	322217	
	4.0mm	2.5 kg	611734	

Table 4-1: CIGWELD Electrode Selection Chart

Further information on CIGWELD electrodes can be found at the website [www.cigweld.com.au](http://www.cigweld.com.au)

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

## 4.02 Stick (MMAW) Welding Troubleshooting

FAULT	CAUSE	REMEDY
1 Welding current varying	ARC FORCE parameter is set at a value that causes the welding current to vary excessively with the arc length.	Reduce the ARC FORCE parameter until welding current is reasonably constant while prohibiting the electrode from sticking to the work piece when you “dig” the electrode into the workpiece.
2 A gap is left by failure of the weld metal to fill the root of the weld.	A Welding current too low B Electrode too large for joint. C Insufficient gap.	A Increase welding current. B Use smaller diameter electrode. C Allow wider gap.
3 Non-metallic particles are trapped in the weld metal.	A Non-metallic particles may be trapped in undercut from previous run. B Joint preparation too restricted. C Irregular deposits allow slag to be trapped. D Lack of penetration with slag trapped beneath weld bead. E Rust or mill scale is preventing full fusion. F Wrong electrode for position in which welding is done.	A If a bad undercut is present clean slag bout and cover with a run from a smaller gauge electrode. B Allow for adequate penetration and room for cleaning out the slag. C If very bad, chip or grind out irregularities. D Use smaller electrode with sufficient current to give adequate penetration. Use suitable tools to remove all slag from comers. E Clean joint before welding. F Use electrodes designed for position in which welding is done, otherwise proper control of slag is difficult.
 <p>Figure 1-Example of insufficient gap or incorrect sequence</p>		
4 A groove has been formed in the base metal adjacent to the toe of a weld and has not been filled by the weld metal (undercut).	A Welding current is too high. B Welding arc is too long. C Angle of the electrode is incorrect. D Joint preparation does not allow correct electrode angle. E Electrode too large for joint. F Insufficient deposit time at edge of weave.	A Reduce welding current. B Reduce the length of the welding arc. C Electrode should not be inclined less than 45° to the vertical face. D Allow more room in joint for manipulation of the electrode. E Use smaller gauge electrode. F Pause for a moment at edge of weave to allow weld metal buildup.

## TRANSTIG 220 AC/DC AND 300AC/DC POWER SOURCE

<p>5 Portions of the weld run do not fuse to the surface of the metal or edge of the joint.</p>	<p>A Small electrodes used on heavy cold plate.                  B Welding current is too low.                  C Wrong electrode angle.                  D Travel speed of electrode is too high.                  E Scale or dirt on joint surface.</p>	<p>A Use larger electrodes and preheat the plate.                  B Increase welding current.                  C Adjust angle so the welding arc is directed more into the base metal.                  D Reduce travel speed of electrode.                  E Clean surface before welding.</p>
---	---	---

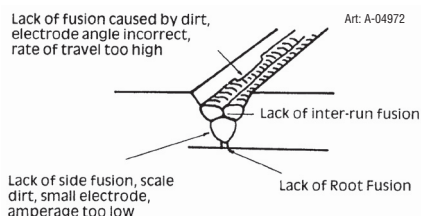


Figure 2: Example of Lack of Fusion

<p>6 Gas pockets or voids in weld metal (porosity)</p>	<p>A High levels of sulphur in steel.                  B Electrodes are damp.                  C Welding current is too high.                  D Surface impurities such as oil, grease, paint, etc.                  E Welding in a windy environment.                  F Electrode damaged ie flux coating incomplete.</p>	<p>A Use an electrode that is designed for high sulphur steels.                  B Dry electrodes before use.                  C Reduce welding current.                  D Clean joint before welding.                  E Shield the weld area from the wind.                  F Discard damaged electrodes and only use electrodes with a complete flux coating.</p>
--	--	--

<p>7 Crack occurring in weld metal soon after solidification commences</p>	<p>A Rigidity of joint.                  B Insufficient throat thickness.                  C Weld current is too high.</p>	<p>A Redesign to relieve weld joint of severe stresses or use crack resistance electrodes.                  B Travel slightly slower to allow greater build up in throat.                  C Decrease welding current.</p>
--	--	--

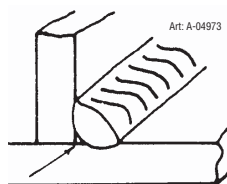
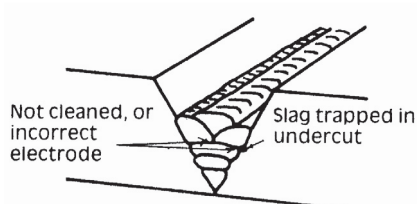


Figure 3: Example of Slag Inclusion

Table 4-2: Welding Problems MMAW (Stick)

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

## 4.03 TIG (GTAW) Basic Welding Technique

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

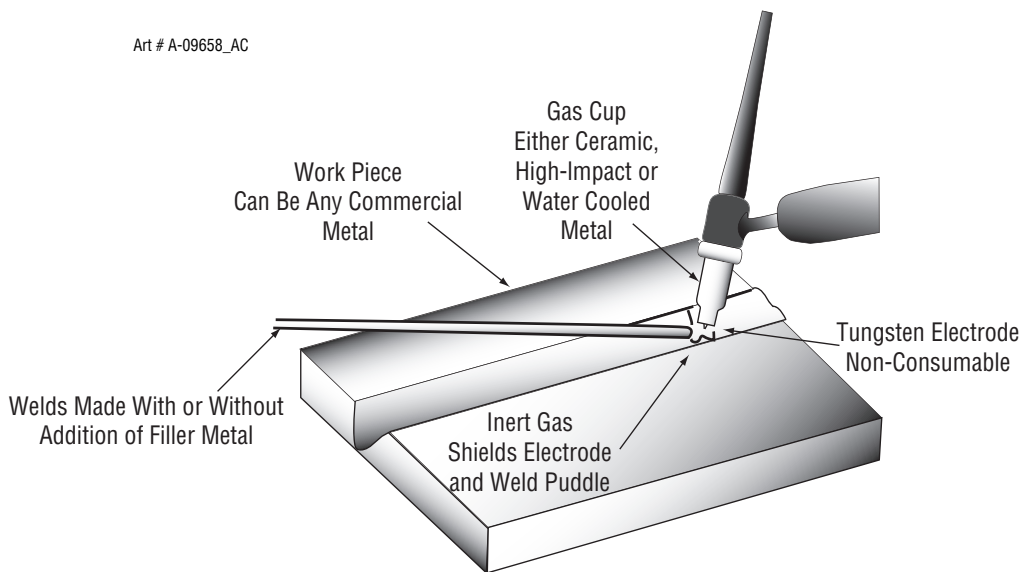


Figure 4-28: TIG Welding Application Shot

### Tungsten Electrode Current Ranges

Electrode Diameter	DC Current (Amps)
0.040" (1.0mm)	30-60
1/16" (1.6mm)	60-115
3/32" (2.4mm)	100-165
1/8" (3.2mm)	135-200
5/32" (4.0mm)	190-280
3/16" (4.8mm)	250-340

Table 4-3: Current Ranges for Various Tungsten Electrode Sizes

### Guide for Selecting Filler Wire Diameter

Filler Wire Diameter	DC Current Range (Amps)
1/16" (1.6mm)	20-90
3/32" (2.4mm)	65-115
1/8" (3.2mm)	100-165
3/16" (4.8mm)	200-350

Table 4-4: Filler Wire Selection Guide



## TRANSTIG 220 AC/DC AND 300AC/DC POWER SOURCE

### Tungsten Electrode Types

Electrode Type (Ground Finish)	Welding Application	Features	Colour Code
Thoriated 2%	DC welding of mild steel, stainless steel and copper	Excellent arc starting, Long life, High current carrying capacity	Red
Zirconated 1%	High quality AC welding of aluminium, magnesium and their alloys.	Self cleaning, Long life, Maintains balled end, High current carrying capacity.	White
Ceriated 2%	AC & DC welding of mild steel, stainless steel, copper, aluminium, magnesium and their alloys	Longer life, More stable arc, Easier starting, Wider current range, Narrower more concentrated arc.	Grey

Table 4-5: Tungsten Electrode Types

### TIG Welding Filler Rods

Comweld Rod	Aust Std	AWS Std	Part No. 1.6mm	Part No. 2.4mm	Part No. 3.2mm	Type/Application
LW1	R4	ER70S-4	321412	321412	—	For mild-medium strength steels. Pipes, tubing, roll cages, etc.
LW1-6	R6	ER70S-6	321418	321418	—	
Supersteel	R2	ER70S-2	321373	321373	—	
CrMo1	RB2	ER80S-B2	—	321379	—	For welding of high strength Cr-Mo steels used at elevated temperatures.
CrMo2	RB3	ER90S-B3	—	321383	—	
308L	R308L	ER308L	321406	321407	—	For stainless steels. Stainless pipes, tubing, architectural uses, etc.
309L	R309L	ER309L	321403	321404	—	
316L	R316L	ER316L	321400	321401	—	
AL4043	R4043	R4043	321610	321611	321612	For cast and wrought aluminium alloys.
AL5356	R5356	R5356	321640	321641	321642	

Table 4-6: TIG Welding Filler Rods

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

Base Metal Thickness	AC Current for Aluminium	Tungsten Electrode Diameter	Filler Rod Diameter (if required)	Argon Gas Flow Rate Litres/min	Joint Type
1.0mm	30-45	1.0mm	1.6mm	5-7	Butt/Corner Lap/Fillet
	35-50				
1.2mm	40-60	1.0mm	1.6mm	5-7	Butt/Corner Lap/Fillet
	45-70				
1.6mm	60-85	1.6mm	1.6mm	7	Butt/Corner Lap/Fillet
	70-95				
3.2mm	125-150	2.4mm	2.4mm	10	Butt/Corner Lap/Fillet
	130-160	3.2mm			
4.8mm	180-225	3.2mm	3.2mm	10	Butt/Corner Lap/Fillet
	190-240	4.0mm			
6.4mm	240-280	4.0mm	4.8mm	13	Butt/Corner Lap/Fillet
	250-320	4.8mm			

Table 4-6: Aluminium Welding Rate

Base Metal Thickness	DC Current for Mild Steel	DC Current for Stainless Steel	Tungsten Electrode Diameter	Filler Rod Diameter (if required)	Argon Gas Flow Rate Litres/min	Joint Type
1.0mm	35-45	20-30	1.0mm	1.6mm	5-7	Butt/Corner Lap/Fillet
	40-50	25-35				
1.2mm	45-55	30-45	1.0mm	1.6mm	5-7	Butt/Corner Lap/Fillet
	50-60	35-50				
1.6mm	60-70	40-60	1.6mm	1.6mm	7	Butt/Corner Lap/Fillet
	70-90	50-70				
3.2mm	80-100	65-85	1.6mm	2.4mm	7	Butt/Corner Lap/Fillet
	90-115	90-110				
4.8mm	115-135	100-125	2.4mm	3.2mm	10	Butt/Corner Lap/Fillet
	140-165	125-150				
6.4mm	160-175	135-160	3.2mm	4.0mm	10	Butt/Corner Lap/Fillet
	170-200	160-180				

Table 4-7: Stainless and Mild Steel Welding Rate

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

**4.04 TIG (GTAW) Welding Problems**

FAULT	CAUSE	REMEDY
1 Excessive bead build up or poor penetration or poor fusion at edges of weld.	Welding current is too low	Increase weld current and/or faulty joint preparation.
2 Weld bead too wide and flat or undercut at edges of weld or excessive burn through.	Welding current is too high	Decrease weld current.
3 Weld bead too small or insufficient penetration or ripples in bead are widely spaced apart.	Travel speed too fast	Reduce travel speed.
4 Weld bead too wide or excessive bead build up or excessive penetration in butt joint.	Travel speed too slow	Increase travel speed.
5 Uneven leg length in fillet joint	Wrong placement of filler rod	Re-position filler rod.
6 Electrode melts or oxidises when an arc is struck.	A Torch lead connected to positive welding terminal. B No gas flowing to welding region. C Torch is clogged with dust or dirt. D Gas hose is cut. E Gas passage contains impurities. F Gas regulator turned off. G The electrode is too small for the welding current. H Power source is set for STICK welding.	A Connect torch lead to negative welding terminal. B Check the gas lines for kinks or breaks and gas cylinder contents. C Clean torch. D Replace gas hose. E Disconnect gas hose from the rear of Power Source then raise gas pressure and blow out impurities. F Turn on. G Increase electrode diameter or reduce the welding current. H Set Power Source to a GTAW operating mode.
7 Dirty weld pool	A Electrode contaminated by contact with work piece or filler rod material. B Work piece surface has foreign material on it. C Gas contaminated with air.	A Clean the electrode by grinding off the contaminates. B Clean surface. C Check gas lines for cuts and loose fitting or change gas cylinder.

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

8 Poor weld finish	Inadequate shielding gas.	Increase gas flow or check gas line for gas flow problems.
9 Arc start is not smooth.	A Tungsten electrode is too large for the welding current. B The wrong electrode is being used for the welding job. C Gas flow rate is too high. D Incorrect shielding gas is being used. E Poor work clamp connection to work piece.	A Select the right size tungsten electrode. Refer to Table 4-3 CIGWELD Tungsten Electrode Selection Chart. B Select the right tungsten electrode type. Refer to Table 4-5 CIGWELD Tungsten Electrode Selection Chart. C Select the right rate for the welding job. Refer to Table 4-7. D Select the right shielding gas. E Improve connection to work piece.
10 Arc flutters during TIG welding.	Tungsten electrode is too large for the welding current.	Select the right size tungsten electrode. Refer to Table 4-3 CIGWELD Tungsten Electrode Selection Chart.

**SECTION 5:  
POWER SOURCE PROBLEMS AND ROUTINE SERVICE  
REQUIREMENTS**

**5.01 Basic Troubleshooting**



**WARNING**

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

**If major complex subassemblies are faulty, then the Welding Power Source must be returned to an accredited CIGWELD Service Provider for repair. The basic level of troubleshooting is that which can be performed without special equipment or knowledge. Refer also to section 4 for solving welding problems.**

**5.02 Power Source Problems**

<b>FAULT</b>	<b>CAUSE</b>	<b>REMEDY</b>
1 Mains supply voltage is ON, Control panel LED's are illuminated however unit will not commence welding when the torch trigger switch is depressed.	A Power source is not in the correct mode of operation. B Faulty torch trigger.	A Set the power source to the correct mode of operation with the process selection switch. B Repair or replace torch trigger switch/lead.
2 Mains supply voltage is ON. Indicator light is not lit and welding arc cannot be established.	A Primary control fuse is blown. B Broken connection in primary circuit.	A Replace primary control fuse. B Have an Accredited CIGWELD Service Provider check primary circuit.
3 Error Code E01 is displayed and unit will not commence welding when the torch trigger switch is depressed.	Duty cycle of power source has been exceeded.	Leave the power source switched ON and allow it to cool. Note that fault indicator must be extinguished prior to commencement of welding.
4 Welding output continues when torch trigger released	A Trigger mode selection is in 4T (LATCH) mode B Torch trigger leads shorted	A Change to 2T (NORMAL) mode B Repair or replace Torch / trigger lead
5 Welding output voltage is present when the torch trigger switch is depressed but arc cannot be established.	Poor or no work lead contact.	Clean work clamp area and ensure good electrical contact.
6 Welding output voltage is not present when torch trigger depressed	Faulty trigger switch / lead	Repair or replace Torch / trigger lead
7 TIG electrode melts when arc is struck.	TIG torch is connected to the Worklead terminal.	Connect the TIG torch to the Electrode terminal.
8 Arc flutters during TIG welding.	Tungsten electrode is too large for the welding current.	Select the correct size of tungsten electrode.
9 No HF output in HF mode	HF Circuit faulty	Have an Accredited CIGWELD Service Provider check HF circuit.

# TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

10 Error Code is displayed	Refer to the error code list, section 3.16	Refer to the error code list, section 3.16
----------------------------	--	--

Table 5-1: Power Source Problem

## 5.03 Routine Service and Calibration Requirements



### WARNING

*There are extremely dangerous voltage and power levels present inside this Inverter 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.*

### 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 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.

#### A. Testing Schedule

1. For transportable equipment, at least once every 3 months; and
2. 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.

#### B. Insulation Resistance

Minimum insulation resistance for in-service CIGWELD Inverter Power Sources shall be measured at a voltage of 500V between the parts referred to in Table 5-2 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 (M Ω)
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 5-2: Minimum Insulation Resistance Requirements: CIGWELD Inverter Power Sources

#### C. Earthing

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

1. The earth terminal of a fixed power source; or

2. 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 -

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

### D. General Maintenance Checks

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

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

### E. 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.

### F. Repairs

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

## Power Source Calibration

### A. Schedule

Output testing of all CIGWELD Inverter 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 -

1. For transportable equipment, at least once every 3 months; and
2. 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.

### B. Calibration Requirements

Where applicable, the tests outlined in Table 5-3 below shall be conducted by an accredited CIGWELD service provider.

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
Accuracy of digital meters to be checked to ensure it falls within applicable CIGWELD power source specifications

Table 5-3: Calibration Parameters

Periodic calibration of other parameters such as timing functions are not required unless a specific fault has been identified.

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

---

### C. 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.

## 5.04 Cleaning the Welding Power Source



### **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. Disconnect the Welding Power Source from the Mains Supply Voltage before disassembling.*

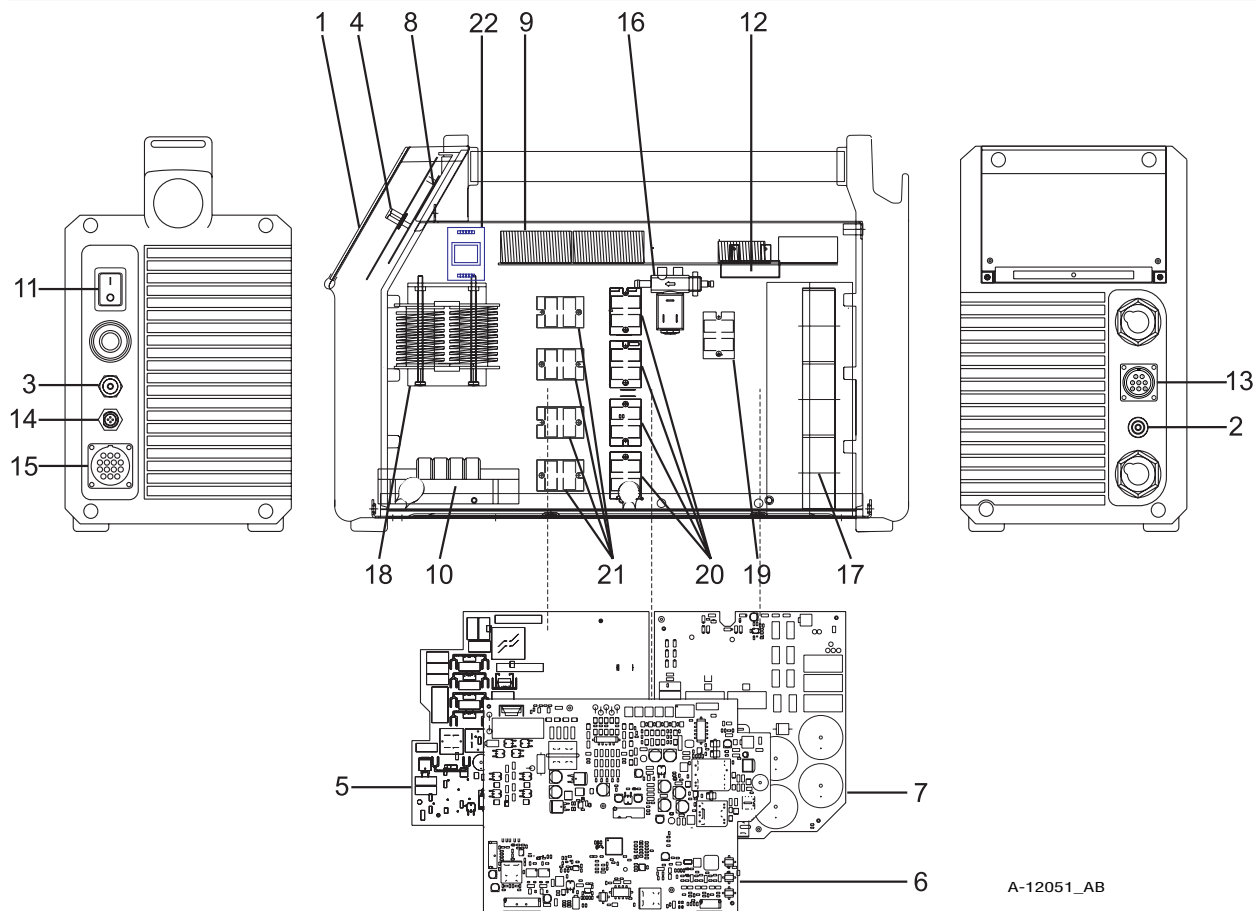
---

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



SECTION 6:  
KEY SPARE PARTS

6.01 220AC/DC Power Source



A-12051\_AB

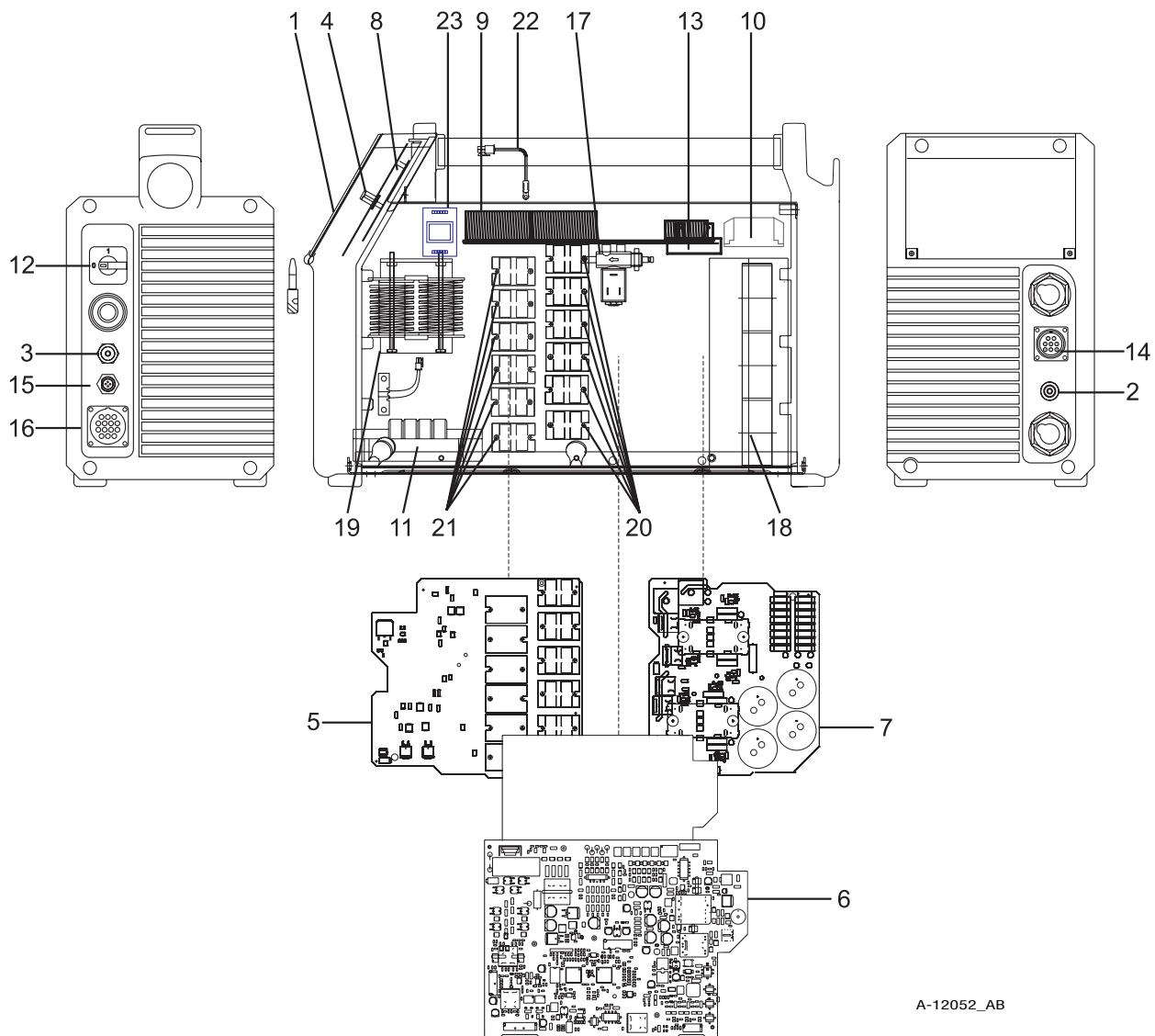
Figure 6-1: Transtig 220AC/DC Spare Parts

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

Transtig 220AC/DC Spare Parts		
Item	Part Number	Description
1	W7006300	Cover Control Panel
2	W7006301	Gas Outlet, Front Panel
3	W7006302	Gas inlet, Rear Panel
4	W7006303	Knob, Control
5	W7006304	PCB Secondary Rectifier
6	W7006305	PCB Control
7	W7006306	PCB Primary Inverter
8	W7006307	PCB Display
9	W7006308	PCB NEFI-NTC
10	W7006309	Transformer, Inverter
11	W7006310	Switch, On / Off
12	W7006311	Rectifier, Bridge, Mains Supply
13	W7006314	Cable Assy, 8 pin remote
14	W7006313	Cable Assy, 4 pin CAN
15	W7006312	Cable Assy, 14 pin remote
16	W7006315	Solenoid 24VDC
17	W7006316	Fan 12VDC
18	W7006317	Inductor HF
19	W7006318	PFC Module 500V 50A
20	W7006319	IGBT
21	W7006320	Diode, Output
22	W7006321	HF Filter
23	704461	Dinse plug male 50mm <sup>2</sup> (not shown)

Table 6-1: Transtig 220AC/DC Spare Parts

## 6.02 300AC/DC Power Source



A-12052\_AB

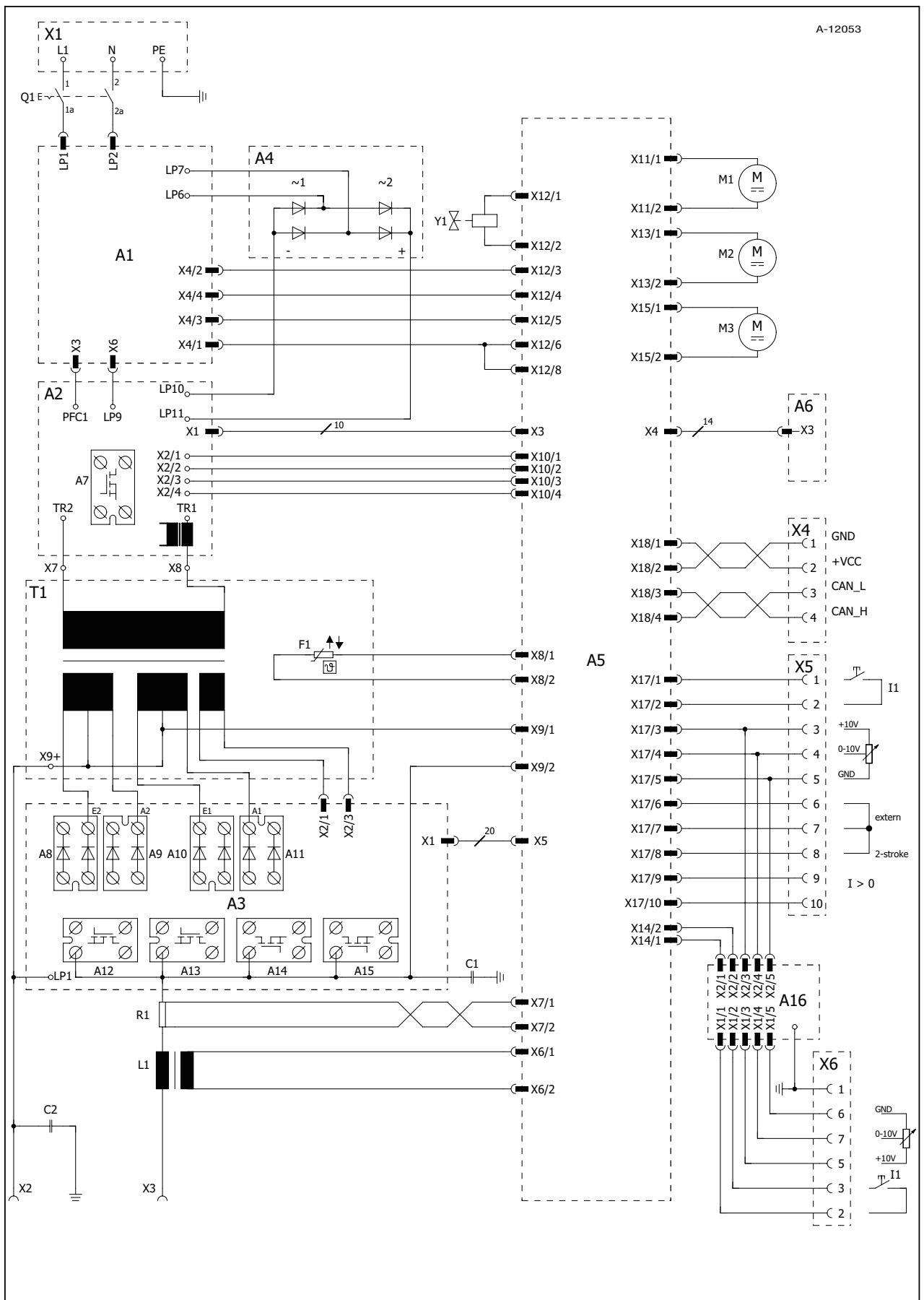
Figure 6-2: Transtig 300AC/DC Spare Parts

## TRANSTIG 220AC/DC AND 300AC/DC POWER SOURCE

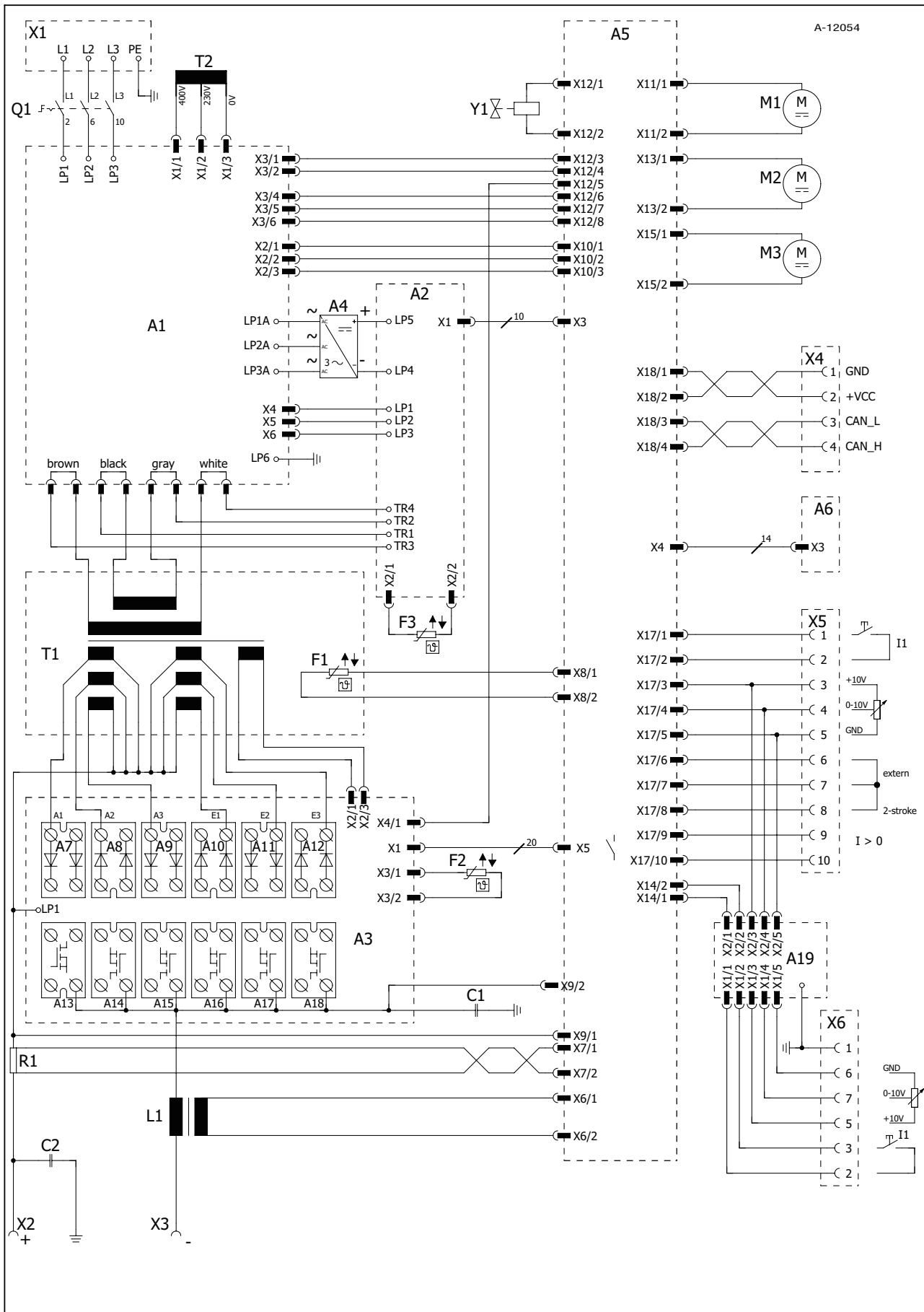
Transtig 300AC/DC Spare Parts		
Item	Part Number	Description
1	W7006300	Cover Control Panel
2	W7006301	Gas Outlet, Front Panel
3	W7006302	Gas inlet, Rear Panel
4	W7006303	Knob, Control
5	W7006323	PCB Secondary Rectifier
6	W7006330	PCB Control
7	W7006322	PCB Primary Inverter
8	W7006307	PCB Display
9	W7006324	PCB NEFI-1300
10	W7006325	Transformer, Control
11	W7006326	Transformer, Inverter
12	W7006327	Switch, On / Off,3 pole
13	W7006328	Rectifier, Bridge, B6 36A Mains Supply
14	W7006314	Cable Assy, 8 pin remote
15	W7006313	Cable Assy, 4 pin CAN
16	W7006312	Cable Assy, 14 pin remote
17	W7006315	Solenoid 24VDC
18	W7006316	Fan 12VDC
19	W7006317	Inductor HF
20	W7006319	IGBT
21	W7006320	Diode, Output
22	W6000000	Thermal Sensor
23	W7006321	HF Filter
24	704461	Dinse plug male 50mm <sup>2</sup> (not shown)

Table 6-2: Transtig 300AC/DC Spare Parts

APPENDIX A: CIRCUIT DIAGRAM OF 220AC/DC



## APPENDIX B: CIRCUIT DIAGRAM OF 300AC/DC



## **CIGWELD - LIMITED WARRANTY TERMS**

---

LIMITED WARRANTY: CIGWELD Pty Ltd, 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 2013

---

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 nonexcludable 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 2013

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>TRANSTIG 220AC/DC and TRANSTIG 300AC/DC POWER SOURCE</b>	<b>WARRANTY PERIOD</b>	
	<b>PARTS</b>	<b>LABOUR</b>
Original main power magnetics.	3 Year	2 Year
Original main power rectifiers, printed circuit boards and power switch semiconductors.	2 Year	2 Year
All other circuits and components including, but not limited to, relays, switches, contactors, solenoids, fans and electric motors.	1 Year	1 Year
<b>ACCESSORIES</b>	<b>WARRANTY PERIOD</b>	
TIG torch, electrode holder lead and work lead.	3 Months	
TIG torch consumable items.	NIL	
Gas regulator/flowmeter (excluding seat assembly, pressure gauges, elastomer seals and "O" rings).	1 Year	
Regulator seat assemblies and pressure gauges.	6 Months	
Elastomer seals and "O" rings used in the equipment.	3 Months	

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

## Australia Terms of Warranty – 2013

Effective 1st January 2012, all warranties against defects (also known as a manufacturer's warranty) supplied with goods or services must comply with the new Australian consumer law regulations (2010).

This Warranty Statement should be read in conjunction with the Warranty Schedule contained in the operating instructions of the product. This schedule contains the warranty period applicable to the product

Any claim under this warranty must be made within the warranty period which commences on the date of purchase of the product. To make a claim under the warranty, take the product (with proof of purchase from a Cigweld Accredited Seller) to the store where you purchased the product or contact Cigweld Customer Care 1300 654 674 for advice on your nearest Service Provider.

All costs associated with lodging the warranty claim including the return of goods to Cigweld or our Nominated Accredited Distributor/Accredited Service Provider are the responsibility of the consumer.

This warranty is given.  
Cigweld Pty Ltd  
A.B.N. 56007226815  
71 Gower Street, Preston  
Victoria, Australia, 3072  
Phone: 1300 654 674  
Email: [enquiries@cigweld.com.au](mailto:enquiries@cigweld.com.au)  
Website: [www.cigweld.com.au](http://www.cigweld.com.au)

This warranty is provided in addition to other rights and remedies you have under law: Our goods come with guarantees which cannot be excluded under the Australian Consumer Law. You are entitled to replacement or refund for a major failure and to compensation for other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Failures due to incorrect use are not covered by this warranty and consumers are reminded to only use the product in accordance with the Operating Instruction supplied with the product. Additional copies of Operating Instructions are available from Cigweld Customer Care 1300 654 674 or the Website.



## GLOBAL CUSTOMER SERVICE CONTACT INFORMATION

---

### **CIGWELD, Australia**

71 Gower Street  
Preston, Victoria  
Australia, 3072  
Telephone: 61-3-9474-7400  
Fax: 61-3-9474-7391  
Email: [enquiries@cigweld.com.au](mailto:enquiries@cigweld.com.au)

### **Victor Technologies USA**

2800 Airport Road  
Denton, Tx 76207 USA  
Telephone: (940) 566-2000  
800-426-1888  
Fax: 800-535-0557  
Email: [sales@thermalarc.com](mailto:sales@thermalarc.com)

### **Victor Technologies Canada**

2070 Wyecroft Road  
Oakville, Ontario  
Canada, L6L5V6  
Telephone: (905)-827-1111  
Fax: 905-827-3648

### **Victor Technologies Europe**

Europe Building  
Chorley North Industrial Park  
Chorley, Lancashire  
England, PR6 7Bx  
Telephone: 44-1257-261755  
Fax: 44-1257-224800

### **PT. Victor Technologies Utama Indonesia**

Jl. Angsana II Blok AE No. 28  
Delta Silicon I, Cikarang - Sukaresmi  
Bekasi, 17550  
Indonesia  
Tel: +62 21 8990 6095  
Fax: +62 21 8990 6096 / 1867  
<http://www.Victortechologies.com>

### **Victor Technologies, China**

No 100 Lao Hongjing Rd  
Minhang District  
Shanghai, PR, 200235  
Telephone: 86-21-64072626  
Fax: 86-21-64483032

### **Victor Technologies Asia Sdn Bhd**

Lot 151, Jalan Industri 3/5A  
Rawang Integrated Industrial Park - Jln Batu Arang  
48000 Rawang Selangor Darul Ehsan  
West Malaysia  
Telephone: 603+ 6092 2988  
Fax : 603+ 6092 1085

### **Victor Technologies Italy**

OCIM, S.r.L.  
Via Benaco, 3  
20098 S. Giuliano  
Milan, Italy  
Tel: (39) 02-98 80320  
Fax: (39) 02-98 281773

### **Victor Technologies International**

2070 Wyecroft Road  
Oakville, Ontario  
Canada, L6L5V6  
Telephone: (905)-827-9777  
Fax: 905-827-9797

