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CIGWELD**TRANSMIG 165** 
TURBO**TRANSMIG 135** 
TWIN TURBO**PORTAWELD 100**

Operating Manual

Product	Welder Process T ype	Part No.
Transmig 165	Gas/Gasless MIG Welder	706555
Transmig 135	Gas/Gasless MIG Welder	710003
PortaWeld 100	Gasless Wire Welder	710004

Transmig 165, Transmig 135, PortaWeld 100

Manufacturer and Merchandiser of Quality Consumables and Equipment: CIGWELD

Address:

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Australia



Description of equipment: Welding Equipment (Mig/Mag). CIGWELD Transmig 165, Transmig 135 & PortaWeld 100 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 limit for performance criteria A shall be +10% -50% for wire feed speed.
- * 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

These products are designed to a number of standards and technical requirements among them are:

- * AS3195 applicable to welding equipment and associated accessories for the Transmig 135 & PortaWeld 100.
- * AS1966-1 applicable to welding equipment and associated accessories for the Transmig 165.
- * AS/NZS 3652-(EMC Directive EN50199) applicable to arc welding equipment - generic emissions and regulations.
- * UL (Underwriters Laboratory) rating 94VO flammability testing for all printed - circuit boards used.
- * IEC 974-1 (BS 638-PT10)(EN 60 974-1) applicable to welding equipment and associated accessories.
- * 92/31/EEC-EMC Directive EN50199 applicable to arc welding equipment - generic emissions and regulations.
- * 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.

Transmig 165, Transmig 135, PortaWeld 100

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1. Introduction

1.1 Notes, Cautions and Warnings

Throughout this manual, notes, cautions, and warnings are used to highlight important information. These highlights are categorised as follows:

NOTE

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

CAUTION

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



WARNING

A procedure which, if not properly followed, may cause injury to the operator or others in the operating area.

1.2 Important Safety Precautions



WARNING

OPERATION AND MAINTENANCE OF WELDING ARC EQUIPMENT CAN BE DANGEROUS AND HAZARDOUS TO YOUR HEALTH.

To prevent possible injury, read, understand and follow all warnings, safety precautions and instructions before using the equipment. Call your local distributor if you have any questions.



GASES AND FUMES

Gases and fumes produced during the welding process can be dangerous and hazardous to your health.

- Keep all fumes and gases from the breathing area. Keep your head out of the welding fume plume.
- Use an air-supplied respirator if ventilation is not adequate to remove all fumes and gases.
- The kinds of fumes and gases from the welding arc depend on the kind of metal being used, coatings on the metal, and the different processes. You must be very careful when cutting or welding any metals which may contain one or more of the following:

Antimony	Beryllium	Cobalt	Manganes	Selenium
Arsenic	Cadmium	Copper	Mercury	Silver
Barium	Chromium	Lead	Nickel	Vanadium
- Always read the Material Safety Data Sheets (MSD's) that should be supplied with the material you are using. These MSDS's will give you the information regarding the kind and amount of fumes and gases that may be dangerous to your health.
- For information on how to test for fumes and gases in your workplace, refer to item 1 in Subsection 1.3, Publications in this manual.
- Use special equipment, such as water or down draft cutting tables, to capture fumes and gases.
- Do not use the welding torch in an area where combustible or explosive gases or materials are located.
- Phosgene, a toxic gas, is generated from the vapours of chlorinated solvents and cleansers. Remove all sources of these vapours.

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- Refer to the Victorian Occupational Health and safety (Confined Spaces) Regulations 1996 and Code of Practice or its equivalent for other states and / or countries.

ELECTRIC SHOCK

Electric Shock can injure or kill. The welding arc process uses and produces high voltage electrical energy. This electric energy can cause severe or fatal shock to the operator or others in the workplace.

- Never touch any parts that are electrically "live" or "hot."
- Wear dry gloves and clothing. Insulate yourself from the work piece or other parts of the welding circuit.
- Repair or replace all worn or damaged parts.
- Extra care must be taken when the workplace is moist or damp.
- Install and maintain equipment according to NEC code, refer to item 4 in Subsection 1.3, Publications.
- Disconnect power supply before performing any service or repairs.
- Read and follow all the instructions in the Operating Manual.

FIRE AND EXPLOSION

Fire and explosion can be caused by hot slag, sparks, or the welding arc.

- Be sure there is no combustible or flammable material in the workplace. Any material that cannot be removed must be protected.
- Ventilate all flammable or explosive vapours from the workplace.
- Do not cut or weld on containers that may have held combustibles.
- Provide a fire watch when working in an area where fire hazards may exist.
- Hydrogen gas may be formed and trapped under aluminium workpieces when they are cut underwater or while using a water table. **DO NOT** cut aluminium alloys underwater or on a water table unless the hydrogen gas can be eliminated or dissipated. Trapped hydrogen gas that is ignited will cause an explosion.

NOISE

Noise can cause permanent hearing loss. Plasma arc processes can cause noise levels to exceed safe limits. You must protect your ears from loud noise to prevent permanent loss of hearing.

- To protect your hearing from loud noise, wear protective earplugs and/or earmuffs. Protect others in the workplace.
- Noise levels should be measured to be sure the decibels (sound) do not exceed safe levels.
- For information on how to test for noise, see item 1 in Subsection 1.3, Publications, in this manual.

ARC RAYS

Arc Rays can injure your eyes and burn your skin. The welding arc process produces very bright ultra violet and infra red light. These arc rays will damage your eyes and burn your skin if you are not properly protected.

- To protect your eyes, always wear a welding helmet or shield. Also always wear safety glasses with side shields, goggles or other protective eye wear.
- Wear welding gloves and suitable clothing to protect your skin from the arc rays and sparks.
- Keep helmet and safety glasses in good condition. Replace lenses when cracked, chipped or dirty.
- Protect others in the work area from the arc rays. Use protective booths, screens or shields.

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- Use the shade of lens as recommended in the Operating Manual.

1.3 Publications

Refer to the following standards or their latest revisions for more information:

1. OSHA, SAFETY AND HEALTH STANDARDS, 29CFR 1910, obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
2. ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING, obtainable from the American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126
3. NIOSH, SAFETY AND HEALTH IN ARC WELDING AND GAS WELDING AND CUTTING, obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
4. ANSI Standard Z87.1, SAFE PRACTICES FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018
5. ANSI Standard Z41.1, STANDARD FOR MEN'S SAFETY-TOE FOOTWEAR, obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018
6. ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018
7. AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES, obtainable from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126
8. NFPA Standard 51, OXYGEN-FUEL GAS SYSTEMS FOR WELDING, CUTTING AND ALLIED PROCESSES, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
9. NFPA Standard 70, NATIONAL ELECTRICAL CODE, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
10. NFPA Standard 51B, CUTTING AND WELDING PROCESSES, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
11. CGA Pamphlet P-1, SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS, obtainable from the Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202
12. CSA Standard W117.2, CODE FOR SAFETY IN WELDING AND CUTTING, obtainable from the Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3
13. NWSA booklet, WELDING SAFETY BIBLIOGRAPHY obtainable from the National Welding Supply Association, 1900 Arch Street, Philadelphia, PA 19103
14. American Welding Society Standard AWSF4.1, RECOMMENDED SAFE PRACTICES FOR THE PREPARATION FOR WELDING AND CUTTING OF CONTAINERS AND PIPING THAT HAVE HELD HAZARDOUS SUBSTANCES, obtainable from the American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126
15. ANSI Standard Z88.2, PRACTICE FOR RESPIRATORY PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018

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2. Electromagnetic Compatibility**WARNING**

Extra precautions for Electromagnetic Compatibility may be required when these welding power sources are used in a domestic situation.

2.1 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 1. 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 1

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

2.2 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

- i) Other supply cables, control cables, signalling and telephone cables; above, below and adjacent to the welding equipment.
- ii) Radio and television transmitters and receivers.
- iii) Computer and other control equipment.
- iv) Safety critical equipment, e.g. guarding of industrial equipment.
- v) The health of people around, e.g. the use of pacemakers and hearing aids.
- vi) Equipment used for calibration and measurement.
- vii) 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.
- viii) The time of day that welding or other activities are to be carried out.

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.

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3. Electromagnetic Compatibility - Methods of Reducing Emissions**3.1 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.

3.2 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.

3.3 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.

3.4 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.

3.5 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.

3.6 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.

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4.5 Duty Cycle

Duty Cycle is the amount of arc-on time (actual welding or cutting time) during any 10 minute period that a machine can operate at it's rated output without damaging internal components. For example, the Transmig 165 is designed for 20% duty cycle at 150 amps. This means that it has been designed and built to provide the rated amperage, 150 amps, for 2 minutes out of every 10 minute period (20% of 10 minutes is 2 minutes). During the other 8

minutes of the 10 minute period the Transmig 165 must idle and be allowed to cool. The thermal cutout will operate if the duty cycle is exceeded. Note that all duty cycles are calculated for a maximum ambient temperature of 40°C as per AS1966. Duty cycles must be reduced, ie reduce the arc-on time, when the ambient temperature exceeds 40°C.

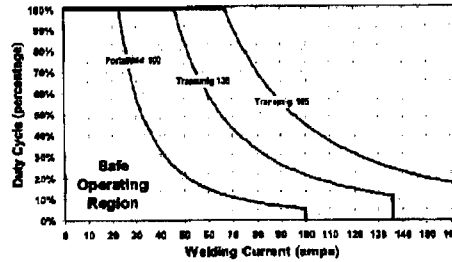


Figure 1 - Duty cycle curves

4.6 Terms Of Warranty - March 2002

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

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

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

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

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

3. The Warranty in Clause 2;

Is conditional upon:

The Customer notifying CIGWELD or our Accredited Distributor in writing of its claim within seven (7) days of becoming aware of the basis thereof, and at its own expense returning the goods which are the subject of the claim to CIGWELD or nominated Accredited Distributor/Accredited Service Agent.

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 Agents, 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.

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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.

4.7 Transmig 165, Transmig 135, PortaWeld 100 Warranty Schedule - March 2002

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.

PRODUCT	WARRANTY PERIOD
Transmig 165, Transmig 135, PortaWeld 100	
Main Welding Transformer and Inductor (Power Magnetics).....	3 years
Original Main Power Rectifiers, Control P.C. Board.....	1 year
All other circuits and components including, but not limited to, relays, switches, contactors, solenoids, fans, power switch semi-conductors.....	1 year
MIG Torch.....	3 months

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



WARNING 1

For the purpose of safety and performance and to protect your CIGWELD Equipment Warranty always use genuine CIGWELD replacement parts and accessories.

5. Safe Practices For The Use Of Welding Equipment

In many situations the "striking" voltage can be hazardous. Any person touching simultaneously the electrode lead/terminal and the work lead/terminal may receive a serious electrical shock. Additional precautions must be exercised where two Welding Power Sources are being used close to each other because, under certain conditions, the voltages between the welding terminals of the two Welding Power Sources could be two times the specified open circuit voltage.

It is essential that the Welding Power Source be correctly installed, if necessary, by a qualified electrician and maintained in sound mechanical and electrical condition. It is also important that the Welding Power Source be switched off when not in use.

5.1 Precautions to be Taken by Operators

- ◆ Whenever practicable, all parts of the welding circuit should be isolated from earth and other conducting material and under no circumstances should any earthing conductor of the electrical installation be used in place of the work lead.

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- ◆ The Mains supply voltage should be switched off before connecting or disconnecting welding leads. Welding lead connections must have clean contact surfaces and must be securely tightened. Poor connections will result in overheating and loss of welding current. All parts of the welding circuit, including the return paths, are to be considered electrically alive, so the operator must ensure that no part of the body is placed in such a position that it will provide a path for an electric current.
- ◆ Welding operators should avoid direct contact with the work to be welded or against any metal in contact with the work. When this cannot be avoided the operator must not touch any exposed portion of the MIG Torch with any part of the body. Should this occur, the operator will risk completing the electrical circuit through the body.
- ◆ When welding in confined spaces, where reasonable movement is restricted, particular care must be taken to ensure that the area is well ventilated and the operator is under constant observation by a person who can immediately switch off the power and give assistance in an emergency.
- ◆ During pauses between welding runs, MIG Torch should be so placed that they cannot make electrical contact with persons or conductive objects.
- ◆ The welding leads, both the MIG Torch lead and the work lead, must be protected from damage. Damaged leads must not be used.
- ◆ Keep combustible materials away from the welding area. Have a suitable fire extinguisher handy.
- ◆ Do not stand on damp ground when welding.

5.2 Personal Protection

The radiation from an electric arc during the welding process can seriously harm eyes and skin. It is essential that the following precautions be taken:

- ◆ Gloves should be flameproof gauntlet type to protect hands and wrists from heat burns and harmful radiations. They should be kept dry and in good repair.
- ◆ Protective clothing must protect the operator from burns, spatter and harmful radiation. Woollen clothing is preferable to cotton because of its greater flame resistance. Clothing should be free from oil or grease. Wear leggings and spats to protect the lower portion of the legs and to prevent slag and molten metal from falling into boots or shoes.
- ◆ Face Shield

It is recommended to use a welding face shield, conforming to the relevant standards, when electric arc welding. Use a welding face shield in serviceable condition and fitted with an eye filter lens to safely reduce harmful radiation from the arc as described below.

Approximate Welding Current Range	Electrode Diameter	Suggested Filter Lens
30 to 100 amps	0.6mm Hard wire	Shade 8
50 to 165 amps	0.8mm Hard wire	Shade 10
70 to 165 amps	0.9mm Hard & Soft wire	Shade 10
90 to 165 amps	0.8 -- 0.9 Flux cored wire	Shade 10
110 to 165 amps	1.0mm Soft wire	Shade 10
120 to 165 amps	1.2 Flux cored wire	Shade 10

Table 1 - Filter lens size verses welding current/electrode size

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Protective filter lenses are provided to reduce the intensity of radiation entering the eye thus filtering out harmful infra-red, ultra-violet radiation and a percentage of the visible light. Such filter lenses are incorporated within face shields.

To prevent damage to the filter lenses from molten or hard particles an additional hard clear glass or special clear external cover lens is provided. This cover lens should always be kept in place and replaced before the damage impairs your vision while welding.

6. Resuscitation for Electric Shock Victims

Electric shock may kill immediately. Early resuscitation is required if a life is to be saved. Every Second Counts! Electrical currents may:

- ◆ Stop the heart;
- ◆ Cause contraction of the muscles of the body;
- ◆ Paralyse breathing due to paralysis of the centre of respiration in the brain;
- ◆ Cause burns.

The victims often cannot free themselves from the current and may not be able to breathe due to fixation of the chest.

6.1 Resuscitation

Efficient resuscitation requires training which is available from the St John's Ambulance Association, Red Cross and other sources.

1 Don't become a victim. Switch off power if possible. If not, remove victim from contact, using some insulating material.



2 If unconscious, place victim on their side and clear vomit and other foreign matter from mouth. Check for breathing by look, listen and feel. If not breathing, commence expired air resuscitation (E.A.R.). This should take no longer than 3 or 4 seconds.



3 Place victim flat on their back on a hard surface, open airway - using head tilt and jaw support as shown.



4 Begin artificial breathing - 5 full breaths in 10 seconds, sealing nostrils with cheek or holding nose closed.



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5 Check carotid pulse in neck. If pulse is present, continue E.A.R.
15 breaths per minute for adults.
20 breaths per minute for children.



6 If pulse is absent and you have been trained, begin cardio pulmonary resuscitation (C.P.R).
Cardiac Compression - depress lower end of breast bone (sternum) 4cm to 5cm, less for small children.
One rescuer - 2 breaths, 15 compressions in 15 seconds, i.e. 4 cycles per minute.
Two rescuers - 1 breath, 5 compressions in 5 seconds, i.e. 12 cycles per minute.

7 Check for return of pulse and breathing after 1 minute and at least every 2 minutes. Continue uninterrupted until trained assistance is available. When breathing and pulse return, turn on side and continue observation.



7. Product Specifications

7.1 MIG Torch

Product	Transmig 165	Transmig 135	PortaWeld 100
Torch Type	150A MIG Torch with Tweco Consumables	125A MIG Torch with Tweco Consumables	100A MIG Torch with Tweco Consumables
Torch Cable Length	3.0 metres	2.0 metres	2.0 metres

7.2 Product Contents

	Transmig 165	Transmig 135	PortaWeld 100
Power Source	✓	✓	✓
Welding Torch	✓	✓	✓
Regulator / Flowmeter	✓	✓	-
Work Lead	✓	✓	✓
Operating Manual	✓	✓	✓
0.9 Flux Cored Wire	✓	✓	✓
Face Shield	-	✓	✓
Wire Brush/Chipping Hammer	-	✓	✓
Feed Roller 0.8/0.9 Hard (fitted)	-	-	✓
Feed Roller 0.6/0.9 Hard (fitted)	✓	✓	-

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7.3 Welding Power Source

	Transmig 165	Transmig 135	PortaWeld 100
Plant Assembly part number	706555	710003	710004
Plant Mass	33kg	27kg	22kg
Plant Dimensions (packed)	H375mm x W290mm x D560mm	H375mm x W290mm x D560mm	H350mm x W245mm x D530mm
Maximum Open Circuit Voltage	34V DC	26V DC	26V DC
Welding Arc Voltage Range	15 to 21V DC	16.5 to 19.5V DC	14 to 15.3V DC
Output Current Range	30 to 165A DC	30 to 155A DC	30 to 100A DC
Rated Output Duty Cycle	150A @ 20%	120A @ 15%	80A @ 8%
100% Duty Cycle Output Rating	67A DC	46A DC	23A DC
Duty Cycle Period	5 or 10 minutes	5 or 10 minutes	5 or 10 minutes
Number of Output Voltage Settings	6	4	2
Electrode Wire Size Range	Hard Soft Flux Cored	0.6 - 0.9 0.8 - 0.9 0.8 - 0.9	- - 0.8 - 0.9
Wire Speed Range	1.0 to 13.0 m/min	1.0 to 13.0 m/min	1.0 to 10.0 m/min
Wire Spool Size Diameter	100mm - 200mm	100mm - 200mm	100mm
Operating Temperature Range	0°C to 40°C	0°C to 40°C	0°C to 40°C
Number of Phases	1 \emptyset	1 \emptyset	1 \emptyset
Frequency	50 / 60Hz	50 / 60Hz	50 / 60Hz
Mains Supply Voltage	240V	240V	240V
Rated Input Current (At 100% Duty Cycle)	10A	8.1A	2.9A
Rated kVA (At 100% Duty Cycle)	2.4kVA	1.95kVA	0.7kVA
Maximum Input Current	28A	24A	13A
* Generator Requirements (At Maximum Welding Current)	6.7kVA	5.8kVA	3.1kVA
Flexible Supply Cable Size	10A Heavy Duty	10A Heavy Duty	10A Heavy Duty
Thermal Protection	Self Resetting Thermostat	Self Resetting Thermostat	Self Resetting Thermostat
Minimum 240V Mains Circuit to suit factory fitted 10 amp Plug & Lead	16A 99A @ 45%	16A 93A @ 25%	13A 100A @ 5%
Minimum 240V Mains Circuit to achieve the maximum weld current	28A 165A @ 16%	24A 135A @ 12%	13A 100A @ 5%
Supply Power @ Maximum Output	6.7kVA	5.8kVA	3.1kVA
+ Recommended Primary Circuit Size	30A	24A	13A

⊙ To achieve these ratings, the 10 Amp plug and lead (as supplied) must be replaced with a plug and lead suitable for Maximum Input Current. This must be carried out by a qualified electrical tradesperson.

+ Motor start fuses or thermal circuit breakers are recommended for this application.

* Generator Requirements at the Maximum Output Duty Cycle.

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8. Installation Recommendations

8.1 Environment

These products are NOT designed for use in environments with increased hazard of electric shock.

- a) Examples of environments with increased hazard of electric shock are -
- i) 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;
 - ii) In locations which are fully or partially limited by conductive elements, and in which there is a high risk of unavoidable or accidental contact by the operator, or
 - iii) In wet or damp hot locations where humidity or perspiration considerably reduces the skin resistance of the human body and the insulation properties of accessories.
- b) Environments with increased hazard of electric shock do not include places where electrically conductive parts in the near vicinity of the operator, which can cause increased hazard, have been insulated.

8.2 Location

Be sure to locate the Power Source according to the following guidelines:

- a) In areas, free from moisture and dust.
- b) In areas, free from oil, steam and corrosive gases.
- c) In areas, not subjected to abnormal vibration or shock.
- d) In areas, not exposed to direct sunlight or rain.
- e) In areas, with an ambient temperature of between 0 °C and 40 °C
- f) Place at a distance of 30cm or more from walls or similar that could restrict natural air flow for cooling.
- g) The minimum ground clearance for these products is 100mm

8.3 Ventilation

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

8.4 Mains Supply Voltage Requirements

The Mains supply voltage should be within $\pm 10\%$ of the rated Mains supply voltage. Too low a voltage may cause poor welding performance or the wirefeeder malfunction. Too high a supply voltage will cause components to overheat and possibly fail.

8.5 Minimum 240V Mains Current Circuit Requirements

These products are supplied with a 10 Amp input lead (and 10A plug) and is designed for 240V operation.

CAUTION 1

CIGWELD advises that you should avoid the use of extension leads, as this can reduce the Mains Supply Voltage below 10% of the rated Mains Supply Voltage.

Transmig 165, Transmig 135, PortaWeld 100

The Welding Power Source must be:

- ◆ Correctly installed, if necessary, by a qualified electrical trades-person.
- ◆ Correctly earthed (electrically) in accordance with local regulations.
- ◆ Connected to the correct size 240V Mains Current Circuit as per the Welding Power Source specifications.



WARNING 2

CIGWELD advises that this equipment be electrically connected by a qualified electrical trades-person.

The following 240V Mains Current Circuit recommendations are required to obtain the maximum welding current and duty cycle from these welding products:

Model	Mains Supply Lead Size	Minimum 240V Mains Current Circuit Size	Weld Current
Transmig 165	2.5 mm ²	28 Amps	165A @ 16%
Transmig 135	2.5 mm ²	24 Amps	135A @ 12%
PortaWeld 100	1.5 mm ²	13 Amps	100A @ 5%

Table 2 - 240V Mains Current Circuit sizes to achieve maximum weld current

9. Product Set Up

9.1 Transmig 165 & Transmig 135

- a) Remove all packaging materials.
- b) Connect the work lead to the negative (-) socket (positive + for Flux Cored Wire)
- c) Connect the *TORCH* lead to the positive (+) socket (negative - for Flux Cored Wire).
- d) Ensure that the gas cylinder is secured to a building pillar, wall bracket or otherwise securely fixed in an upright position.
- e) Fit the gas Regulator/Flowmeter to the gas cylinder.
- f) Connect the gas hose from the rear of the Power Source to the Regulator/Flowmeter outlet.
- g) Dual groove feed roller is supplied as standard with the Power Source. These can accommodate 0.6mm and 0.9mm diameter hard wires.
- h) Fit the electrode wire spool to the wire reel hub located behind the electrode wire compartment door. The wire should feed from the top of the spool.
- i) Fit the MIG torch to the wire feed unit by undoing two small phillips head screws that are closest to the feed roll. Remove the plastic cover from the wire feed unit and the nut from the torch adaptor then pass the black torch wire and the threaded brass torch adaptor through the front panel.
- j) Pass the threaded brass torch adaptor through the wire feed unit.
- k) Connect the short welding cable from the reverse polarity block between the torch nut and the wire drive unit brass hexagon tube. Tighten torch nut to obtain a good electrical connection.
- l) Connect the two black torch trigger leads to the torch trigger terminals.
- m) Fit the gas hose to the nipple in the MIG torch. Remove the contact tip from the torch.
- n) Lift up the wire feeder pressure lever and pass the electrode wire through the inlet guide, between the rollers, through the outlet guide and into the torch.

Transmig 165, Transmig 135, PortaWeld 100

10.1 Power switch with In-built Indicator Light

With the switch in the *STANDBY* position, the auxiliary power and the fan are turned off.



WARNING 4

The machine is connected to the Mains supply voltage when it is plugged into an power point and the internal electrical components are at Mains voltage potential.

The critical component for thermal protection is the rectifier stack and main transformer, which are fitted with thermal overload cut out devices. If the overload operates then the machine should be left to cool for approximately 15 minutes before resuming welding.

The thermal overload will not operate and there will be no danger of transformer damage if the Power Source is operated within its duty cycle, refer to section 4.5 for an explanation of duty cycle and section 7 for the specifications.

10.2 Coarse & Fine Output Voltage Control Switch

The Output Voltage Control Switches sets the voltage level to the welding terminals.

CAUTION 2

The Output Voltage Control switches MUST NOT BE SWITCHED during the welding process.

10.3 Torch Polarity Lead

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

10.4 Positive and Negative Welding Terminals

These Terminals are located in the wire feed compartment beneath the wire drive unit. Welding current flows from the Power Source via these heavy duty terminals. It is essential, however, that sound electrical connection are made.

CAUTION 3

Loose welding terminal connections can cause overheating.

10.5 Wirespeed Control

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

10.6 Wirefeeder Drive Roller Pressure Adjustment

The moveable roller applies pressure to the grooved roller via screw adjustable spring pressure. The adjustable spring screw should be adjusted to a minimum pressure that will provide satisfactory wire feed without slippage. If slipping occurs, and inspection of the wire contact tip reveals no wear, distortion or burn-back jam, the conduit liner should be checked for kinks and clogging by metal flakes and swarf. If this is not the cause of slipping, the feedroll pressure can be increased by rotating the adjustable spring screw clockwise. The use of excessive pressure may cause rapid wear of the feed roller, motor shaft and motor bearings.

NOTE 2

Genuine TWECO contact tips and liners should be used. Many non-genuine liners use inferior materials which can cause wire feed problems.

Transmig 165, Transmig 135, PortaWeld 100

11. PortaWeld 100

11.1 Power switch with in-built Indicator Light

With the switch in the *STANDBY* position, the auxiliary power and the fan are turned off.



WARNING 5

The machine is connected to the Mains supply voltage when it is plugged into a power point and the internal electrical components are at Mains voltage potential.

The critical component for thermal protection is the rectifier stack, which is fitted with thermal overload cut out device. If the overload operates then the machine should be left to cool for approximately 15 minutes before resuming welding.

The thermal overload will not operate and there will be no danger of transformer damage if the Power Source is operated within its duty cycle, refer to section 4.5 for an explanation of duty cycle and section 7 for the specifications.

11.2 Output Voltage Control Switch

The Output Voltage Control Switch sets the voltage level to the welding terminals.

CAUTION 4

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

11.3 Wirespeed Control

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

11.4 Wirefeeder Drive Roller Pressure Adjustment

The moveable roller applies pressure to the grooved roller via screw adjustable spring pressure. The adjustable spring screw should be adjusted to a minimum pressure that will provide satisfactory wire feed without slippage. If slipping occurs, and inspection of the wire contact tip reveals no wear, distortion or burn-back jam, the conduit liner should be checked for kinks and clogging by metal flakes and swarf. If this is not the cause of slipping, the feedroll pressure can be increased by rotating the adjustable spring screw clockwise. The use of excessive pressure may cause rapid wear of the feed roller, motor shaft and motor bearings.

NOTE 3

Genuine TWECO contact tips and liners should be used. Many non-genuine liners use inferior materials which can cause wire feed problems.

12. Basic Welding Technique

12.1 Setting of the Power Source

The setting of these products require some practice by the operator, the welding Power Source having two control settings that have to balance.

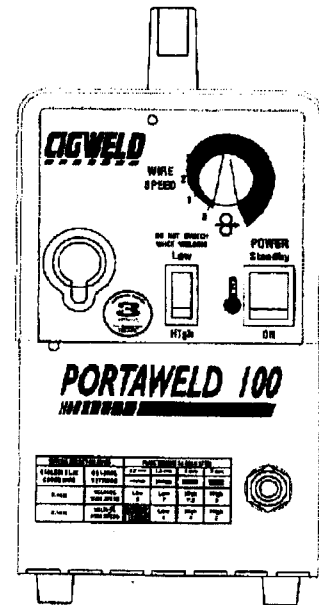


Figure 4 - PortaWeld 100 controls

Transmig 165, Transmig 135, PortaWeld 100

These are the Wirespeed control and the Voltage Control switch. The welding current is determined by the Wirespeed control, the current will increase with increased Wirespeed, resulting in a shorter arc. Less wire speed will reduce the current and lengthen the arc. Increasing the welding voltage hardly alters the welding current level, but lengthens the arc. By decreasing the voltage, a shorter arc is obtained with little change in welding current.

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

A satisfactory weld cannot be obtained if the wirespeed and voltage switch settings are not adjusted to suit the electrode wire diameter and dimensions of the workpiece.

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

12.2 Position of MIG Torch

The angle of MIG torch to the weld has an effect on the width of the weld run. Refer to Figure 5.

12.3 Distance from the MIG Torch Nozzle to the Work Piece

The electrode stick out from the MIG Torch nozzle should be between 2.0mm to 5.0mm. This distance may vary depending on the type of joint that is being welded.

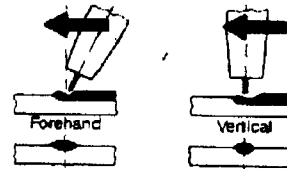


Figure 5 - MIG Torch angle

12.4 Mig Torch Travel Speed

Speed at which a weld travels influences the width of the weld and penetration of the welding run.

12.5 Electrode Wire Size Selection

The choice of electrode wire size in conjunction with shielding gas used depends on:

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

13. Routine Maintenance & Inspection

The only routine maintenance required for these products is a thorough cleaning and inspection by a CIGWELD Accredited Service Agent, with the frequency depending on the usage and the operating environment.



WARNING 6

DO NOT attempt to disassemble this equipment when it is connected to Mains Supply Voltage, ie connected to 240V, as lethal voltages are present within these products

Transmig 165, Transmig 135, PortaWeld 100

Special maintenance is not necessary for the control unit parts in the Power Source. If these parts are damaged for any reason, replacement is recommended by a CIGWELD Accredited Service Agent.

CAUTION 5

Do not blow air into the Power Source during cleaning. Blowing air into the Power Source can cause metal particles to interfere with sensitive electronic components and cause damage to the Power Source.

To clean the Power Source, disconnect it from the Mains Supply Voltage, ie 240V supply, then open the enclosure and use a vacuum cleaner to remove any accumulated dirt and dust. The Power Source should also be wiped clean. If necessary, solvents that are recommended for cleaning electrical apparatus may be used.

Only a CIGWELD Accredited Service Agent should carry out troubleshooting and repairing these products.



WARNING 7

Disconnect the power source from the Mains supply voltage before disassembling.

14. Basic Troubleshooting

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

If major components are faulty, then the Power Source should be returned to a CIGWELD Accredited Service Agent for repair.

14.1 Solving Problems Beyond the Welding Terminals

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

a) Porosity

When there is a gas problem the result is usually porosity within the weld metal. Porosity always stems from some contaminant within the molten weld pool which is in the process of escaping during solidification of the molten metal.

Contaminants range from no gas around the welding arc to dirt on the work piece surface. Porosity can be reduced by checking the following points:

1. Gas cylinder contents and flow meter. - Ensure that the gas cylinder is not empty and the flow meter is correctly adjusted to 15 litres per minute.
2. Gas leaks. - Check for gas leaks between the regulator/cylinder connection and in the gas hose to the Power Source.
3. Internal gas hose in the Power Source. - Ensure the hose from the solenoid valve to the Mig torch adaptor has not fractured and that it is connected to the Mig torch adaptor.
4. Welding in a windy environment. - Shield the weld area from the wind or increase the gas flow.
5. Welding dirty, oily, painted, oxidised or greasy plate. - Clean contaminates off the plate.

Transmig 165, Transmig 135, PortaWeld 100

- | | |
|--|--|
| 6. Distance between the MIG torch nozzle and the work piece. | - Keep the distance between the MIG torch nozzle and the work piece to a minimum. Refer to section 12.3 on page 20. |
| 7. Maintain the MIG torch in good working order. | - Ensure that the gas holes are not blocked and gas is exiting out of the torch nozzle. Refer to WARNING 6.
Do not restrict gas flow by allowing spatter to build up inside the Mig torch nozzle. |



WARNING 8

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

- b) Inconsistent wire feed
Wire feeding problems can be reduced by checking the following points:
- | | |
|--|--|
| 1. Wire spool brake is too tight. | - Feed roller driven by motor in the cabinet will slip. |
| 2. Wire spool brake is too loose. | - Wire spool can unwind and tangle. |
| 3. Worn or incorrect feed roller size. | - Use 'U' groove drive feed roller matched to the aluminium wire size you are welding.
Use 'V' groove drive feed roller matched to the steel wire size you are welding.
Use 'knurled V' groove drive feed roller matched to the flux cored wire size you are welding. |
| 4. Misalignment of inlet/outlet guides. | - Wire will rub against the misaligned guides and reduces wire feedability. |
| 5. Liner blocked with swarf. | - Swarf is produced by the wire passing through the feed roller, if excessive pressure is applied to the pressure roller adjuster.

Swarf can also be produced by the wire passing through an incorrect feed roller groove shape or size.

Swarf is fed into the liner where it accumulates thus reducing wire feedability. |
| 6. Incorrect or worn contact tip. | - The contact tip transfers the weld current to the electrode wire. If the hole in the contact tip is too large then arcing may occur inside the contact tip resulting in the electrode wire jamming in the contact tip.

When using soft electrode wire such as aluminium it may become jammed in the contact tip due to expansion of the wire when heated. A contact tip designed for soft electrode wires should be used. |
| 7. Poor work lead contact to work piece. | - If the work lead has a poor electrical |

Transmig 165, Transmig 135, PortaWeld 100

contact to the work piece then the connection point will heat up and result in a reduction of power at the arc.

8. Bent liner.

- This will cause friction between the wire and the liner thus reducing wire feedability

14.2 Welding Problems

FAULT	CAUSE	REMEDY
1 Undercut.	A Welding arc voltage too high. B Incorrect torch angle C Excessive heat input	A Reduce voltage by reducing the voltage selection switch position or increase the wire feed speed. B Adjust angle C Increase the torch travel speed and/or reduce welding current by reducing the voltage selection switch position or reducing the wire feed speed.
2 Lack of penetration.	A Welding current too low B Joint preparation too narrow or gap too tight C Shielding gas incorrect	A Increase welding current by increasing wire feed speed and increasing voltage selection switch position. B Increase joint angle or gap C Change to a gas which gives higher penetration
3 Lack of fusion.	Voltage too low	Increase voltage by increasing voltage selection switch position.
4 Excessive spatter.	A Voltage too high B Voltage too low	A Lower voltage by reducing the voltage selection switch or increase wirespeed control. B Raise voltage by increasing the voltage selection switch or reduce wirespeed control.
5 Irregular weld shape.	A Incorrect voltage and current settings. Convex, voltage too low. Concave, voltage too high. B Wire is wandering C Incorrect shielding gas D Insufficient or excessive heat input	A Adjust voltage and current by adjusting the voltage selection switch and the wirespeed control. B Replace contact tip C Check shielding gas. D Adjust the wirespeed control or the voltage selection switch.

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Welding Problems (continued)

FAULT	CAUSE	REMEDY
6 Weld cracking.	A Weld beads too small B Weld penetration narrow and deep C Excessive weld stresses D Excessive voltage E Cooling rate too fast	A Decrease travel speed B Reduce current and voltage and increase Mig torch travel speed or select a lower penetration shielding gas. C Increase weld metal strength or revise design D Decrease voltage by reducing the voltage selection switch. E Slow the cooling rate by preheating part to be welded or cool slowly.
7 Cold weld puddle.	A Faulty rectifier unit B Loose welding cable connection. C Low Primary Voltage	A Have an Accredited CIGWELD Service Agent to test then replace the faulty component. B Check all welding cable connections. C Contact supply authority
8 Arc does not have a crisp sound that short arc exhibits when the wirefeed speed and voltage are adjusted correctly.	The MIG torch has been connected to the wrong voltage polarity on the front panel.	Connect the MIG torch to the positive (+) welding terminal for solid wires and gas shielded flux cored wires. Refer to the electrode wire manufacturer for the correct polarity.

14.3 Power Source Problems

FAULT	CAUSE	REMEDY
1 Mains supply voltage is ON. Welding arc can not be established.	A Primary fuse is blown. B Broken connection in primary circuit.	A Replace primary fuse. B Have an Accredited CIGWELD Service Agent check primary circuit.
2 Mains indicator light is not lit but welding arc can be established.	A Indicator light is open circuit. B Internal 1A Fuse blown	A Have an Accredited CIGWELD Service Agent replace On Switch. B Replace Fuse
3 Mains supply voltage is ON and but when the torch trigger switch is depressed nothing happens.	Torch trigger switch leads are disconnected.	Reconnect.

Transmig 165, Transmig 135, PortaWeld 100

Power Source Problems (continued)

FAULT	CAUSE	REMEDY
4 Mains supply voltage is ON, no wire feed but gas flows from the MIG Torch when the torch trigger switch is depressed.	A Electrode wire stuck in conduit liner or contact tip (burn-back jam). B Faulty control PCB	A Check for clogged / kinked MIG Torch conduit or worn contract tip. Replace faulty component(s). B Have an Accredited CIGWELD Service Agent investigate the fault.
5 Wire feeds when the torch trigger switch is depressed but arc can not be established.	Poor or no work lead connection.	Clean work clamp area and ensure good electrical contact.
6 Jerky wire feed	A Worn or dirty contact tip B Worn feed roll. C Excessive back tension from wire reel hub. D Worn, kinked or dirty conduit liner	A Replace B Replace C Reduce brake tension on spool hub D Clean or replace conduit liner
7 No gas flow	A Gas hose is cut. B Gas passage contains impurities. C Gas regulator turned off.	A Replace or repair. B Disconnect gas hose from the rear of Transmig 165/135 then raise gas pressure and blow out the impurities. C Turn on.
8 Gas flow continues after the torch trigger switch has been released.	Gas valve has jammed open due to impurities in the gas or the gas line.	Have an Accredited CIGWELD Service Agent repair or replace gas valve.

15. Circuit Diagrams

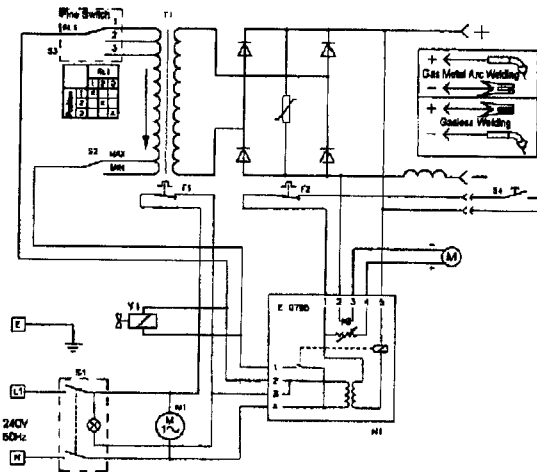


Figure 6 - Transmig 165 Circuit Diagram

Transmig 165, Transmig 135, PortaWeld 100

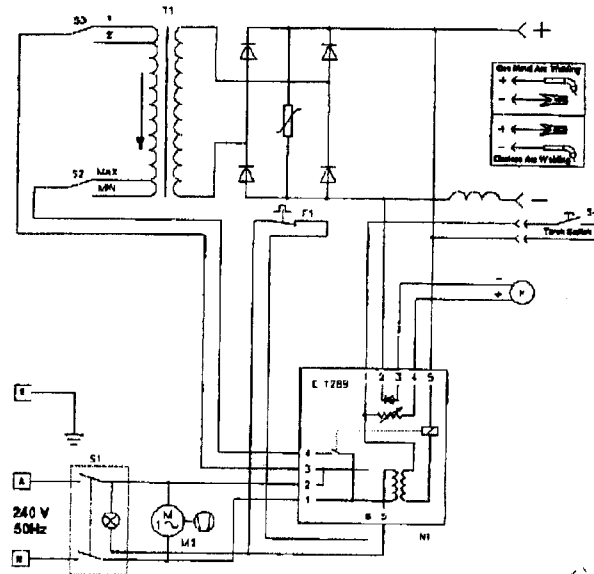


Figure 7 - Transmig 135 Circuit Diagram

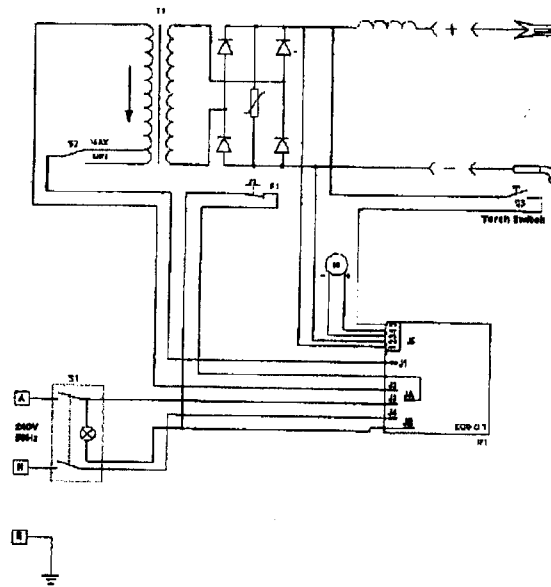


Figure 8 - PortaWeld 100 Circuit Diagram