

# WELDCO™

## INSTRUCTION MANUAL

Inverter Welder ARC Welder

**MMA160**



### IMPORTANT:

This manual contains important information regarding the safety, operation, maintenance and storage of this product. Before use read carefully and understand all cautions, warnings, instructions and product labels. Failure to do so could result in serious personal injury and/or property damage.

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## Thank you for your Purchase.

Weldco would like to thank you for purchasing the MMA160 Inverter Welder.

This manual is designed to guide you through using your new machine.

Your inverter welder utilizes the latest in welding technology to ensure you receive professional results in a variety of applications.

## UNPACKING YOUR WELDER



### Contents:

- MMA inverter power source.
- Heavy Duty Earth Clamp and Lead.
- Heavy Duty Twist lock electrode holder and Lead.
- Manual

## Accessories



Please check all contents are correct and damage-free before first use, if any issues please contact your local dealer.

## WELDING HAZARDS AND SAFETY



Welding poses a variety of hazards to health and safety. Please ensure you have the correct safety equipment for yourself and those within the welding area. Your local distributor will be able to assist you with the correct protective helmet and gloves. Detailed documents can be located on the Worksafe website, [www.worksafe.govt.nz](http://www.worksafe.govt.nz), topic welding.

### WORK AREA

- Ensure your work area is clean, dry and free of trip hazards.
- The area is well-ventilated, and all flammable materials are removed to a safe distance.
- Never leave your welder powered up – unattended.

### FIRE RISK

- Due to the welding process producing molten metal including sparks and fumes maximum fire safety must always be obeyed. Ensure you have direct access to the correct fire extinguisher for your environment.
- Never weld tanks or containers that have or have held flammable liquid, gas or where the contents are under pressure. This should only be carried out by trained specialists.
- Ensure that the area is checked for smoldering materials as material will remain hot well after welding.

### ELECTRICITY CAN KILL

- Never weld or attempt to weld in wet or rainy environments. There is a serious risk of electrocution to the operator or those within the area.
- it is recommended that the welder be connected to an RCD.

### FUMES AND GASES

- Welding produces fumes and gases that can be harmful to the operator and those within the surrounding areas. Always ensure that there is plenty of ventilation and fresh air.
- Do not weld material that has been coated or contaminated with paint, varnish or rubber as they may give off harmful fumes or gas and increase the risk of fire and or explosion.

## PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING

The user must comply with occupational health and safety rules and wear appropriate protective equipment.

### BURNS

- The welding process causes the workpiece and surrounding items to become hot.
- It is always recommended that flame-resistant clothing be worn.
- Welding gloves **must** be worn to help prevent burns to hands and arms when handling hot objects.
- Avoid skin exposure to the Ultraviolet rays produced by the arc. It is recommended that skin be protected from these harmful rays. Serious burns are possible when this recommendation is not followed.
- Approved welding helmets **must** be worn by the operator and any personnel within 10m of the work area. It is also recommended that welding safety screens are installed to protect.
- It is always recommended that enclosed footwear with rubber soles be worn to protect from sparks and molten metal and to reduce the risk of electrocution.
- As welding produces gases and fumes many of which can be harmful it is recommended that the operator and those in the direct area wear respirators with the relevant protection.
- Always wear safety glasses when chipping the slag, scraping or preparing the workpiece.

## **ELECTROMAGNETIC AND RADIO FREQUENCIES – “PACEMAKERS”**

- Avoid contact with the energized workpiece.
- Always ensure you have adequate protection from electrocution and burns.
- Since the welder emits strong electromagnetic and radio frequencies. Persons fitted with **“PACEMAKERS”** or similar devices **MUST** consult their doctor before turning on the welder. This relates to both the operator and those nearby.

### **PRE-CHECKS**

The following items must be checked by the operator each time before powering up the power source.

- Ensure that the welder is damage-free and has no exposed wires.
- Check all welding cables, insulation and accessories are free of damage.
- The work area is checked and free of hazards
- All personal protective clothing and equipment are defect-free.
- Access to a Fire extinguisher and welding blanket.
- All flammable material has been removed.

### **WARNING!**

- Disconnect the power source before servicing and ensure the device has powered down.
- Contact your dealer or reseller immediately should your welder require servicing.
- It is not recommended that you remove the covers to carry out your own servicing – doing so will void the warranty.

## **STORAGE, TRANSPORTATION AND MAINTENANCE**

- Your welder contains sensitive electronics and needs to be stored in a dust and moisture-free environment.
- Periodically your welder should be blown down using dry compressed air to remove any dust and metal fillings.
- Once your power source and welder have cooled down. Remove your accessories for storage – wipe both the welder and accessories down with a clean cloth to remove any contaminants.
- Store your welder in a dry safe environment.
- When transporting ensure that the power source, accessories and wire are secure.
- Cylinders need to be stored and transported as per NZ regulations and safe operating procedures.

## TECHNICAL DESCRIPTION

### COMPLIANCE PLATE

|                                                                                   |                               |       |                               |              |                                                                                    |                                                                                   |                 |                              |       |
|-----------------------------------------------------------------------------------|-------------------------------|-------|-------------------------------|--------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------|------------------------------|-------|
| <b>WELDCO</b><br><b>MMA160</b><br>INVERTER DC MMA WELDER                          |                               |       |                               |              | PART NO.                                                                           |                                                                                   | <b>WDC0894</b>  |                              |       |
|                                                                                   |                               |       |                               |              | STANDARD                                                                           |                                                                                   | EN 60974-1:2022 |                              |       |
|                                                                                   |                               |       |                               |              |  |                                                                                   |                 |                              |       |
|  | 10A/10.4V-160A/16.4V          |       |                               |              |   | 10A/20.4V-160A/26.4V                                                              |                 |                              |       |
|                                                                                   | <b>X</b>                      | 19%   | 60%                           | 100%         |                                                                                    | <b>X</b>                                                                          | 8%              | 60%                          | 100%  |
|  | <b>I<sub>2</sub></b>          | 160A  | 90A                           | 70A          |   | <b>I<sub>2</sub></b>                                                              | 160A            | 60A                          | 45A   |
| <b>U<sub>0</sub>=72.5V</b>                                                        | <b>U<sub>2</sub></b>          | 16.4V | 13.6V                         | 12.8V        | <b>U<sub>0</sub>=72.5V</b>                                                         | <b>U<sub>2</sub></b>                                                              | 26.4V           | 22.4V                        | 21.8V |
| <b>U<sub>1</sub>=230V</b>                                                         | <b>I<sub>1max</sub>=23.0A</b> |       | <b>I<sub>1eff</sub>=10.0A</b> |              | <b>U<sub>1</sub>=230V</b>                                                          | <b>I<sub>1max</sub>=34.0A</b>                                                     |                 | <b>I<sub>1eff</sub>=9.6A</b> |       |
|  | 1~50/60Hz                     |       |                               | <b>IP21S</b> |   |  | <b>2.7kg</b>    |                              |       |

### Duty Cycle

The welder's duty cycle is the number of minutes in a 10-minute period the power source can safely produce the set welding current (actual arc on). If this is exceeded the machine will enter thermal overload, turning the welding current off and protecting the welder. This is indicated by the light on the front panel **(12)**.

For example:

- At 60 amps the welder will **ARC** continuously for **6 mins** and needs to rest for **4 mins**.
- At 45 amps the welder will **ARC** continuously or 100% of the time.

The duty cycle is tested at 40 degrees Celsius, if the welder is operating at a lower temperature e.g. 20 degrees Celsius the duty cycle will be higher.

### INPUT PLUG

The MMA160 is fitted with a **10amp plug**. This machine is designed to work with **10amp** domestic wall sockets. It is important that the machine is plugged directly into the mains plug. If an extension cord must be used a minimum 2.5mm wire thickness is required and no more than 10m in length.

Using unsuitable extension cords will reduce the input voltage (known as a voltage drop) and this will void the warranty of your machine.

### OPERATING ENVIRONMENT

- Operating temperature: -10°C~40°C.
- Transportation and storage: -25°C~55°C.
- Relative air humidity: 40°C ≤ 50%; 20°C ≤ 90%.
- The dust, acids, corrosive gases and substances in the ambient air must be not higher than the normal level.
- The altitude must be less than 1km.
- Good ventilation around the machine, at a distance of at least 50cm around.
- The power source must be kept on a level surface to reduce the risk of the machine falling.

## MACHINE LAYOUT

|   |                           |    |                               |
|---|---------------------------|----|-------------------------------|
| 1 | Control Panel             | 7  | VRD ON / OFF Indicator        |
| 2 | WELD MODE selector        | 8  | Alarm Indicator               |
| 3 | SETTING selector          | 9  | Positive Output Terminal +    |
| 4 | Display Panel             | 10 | Negative Output Terminal -    |
| 5 | Parameter Increase Button | 11 | ON / OFF Switch               |
| 6 | Parameter Decrease Button | 12 | 10amp 230 Volt Input Plug     |
|   |                           | 13 | Ready to weld indicator light |



## SET UP FOR MMA (STICK) WELDING.



*Please ensure you have all relevant safety equipment and PPE ready.*

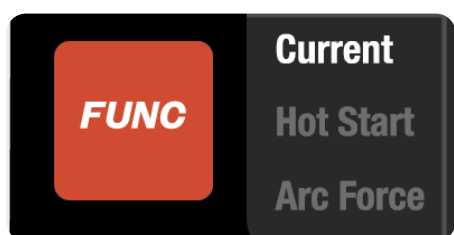
This setup is for the most common electrode positive setting for General-purpose rods. Please check your electrode packaging to confirm.

- Connect the Earth clamp cable to the **NEGATIVE** terminal **(10)** on the front of the machine. Connect the Earth clamp to the workpiece. The earth clamp must make strong contact with bare metal – remove paint, rust or other contaminants to ensure strong contact. Failure to do so will reduce your welding performance.
- Connect the Electrode Holder cable to the **POSITIVE** terminal **(9)** on the front of the machine.  
**Ensure that the plug is secure in the socket to reduce any chance of arcing from a loose connection.**
- Ensure the main power switch **(11)** is in the OFF position. Plug the 10amp plug into the 10amp wall socket. Turn power to the ON position on both the wall socket and the power source. The front panel will illuminate, and the cooling fan will start.

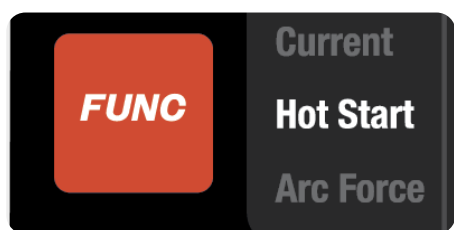


Once the machine has powered up the default setting is for MMA if the **MMA** light is not illuminated press the **WELD MODE selector (3)** to select **MMA**.

- Your Weldco Inverter welder is fitted with a “Voltage Reduction Device” (**VRD**). The **VRD** reduces the open circuit voltage to safer levels. The VRD default is OFF. To activate this feature, press the WELD MODE selector (**3**) one more time after **MMA** is illuminated and the green **VRD** light (**7**) will illuminate. To turn **OFF VRD** cycle the WELD MODE selector until MMA is shown and the green VRD light (**7**) is off



- To set the welding current to the recommended level for the selected electrode type and size, refer to the electrode manufacturer's recommendations. Ensure the **CURRENT** indicator is illuminated, then adjust the welding current by pressing the **Parameter Increase (5)** or **Parameter Decrease (6)** button. The selected amperage will be displayed on the **Amperage Display (4)**.



- To adjust the **HOT START**, press the **FUNCTION** selector button until the **HOT START** is illuminated. Hot Start will supply an initial burst of current, improving arc starting, and reducing the chance of the electrode sticking. Increase or decrease **HOT START** by pressing the parameter increase or decrease buttons. Lock in by pressing the **FUNCTION** selector button again.



- To adjust the **ARC FORCE**, press the **FUNCTION** selector button until the **ARC FORCE** is illuminated. Arc Force is like Hot Start but works during the welding process, not just at Arc ignition. Increasing arc force will supply an increased burst of current, improve arc starting, and reduce the chance of the electrode sticking. Increase or decrease **ARC FORCE** by pressing the parameter increase or decrease buttons. Lock in by pressing the **FUNCTION** selector button again.

- Insert the electrode into the Twistlock electrode holder and tighten it firmly. Once the electrode contacts the workpiece (also any metal connected to the workpiece) the electrode will strike an arc, for this reason, do not rest the fitted electrode on the work area.
- With your PPE on, Strike the workpiece with the electrode (like striking a match) and hold the electrode slightly off the workpiece to maintain a constant arc.
- To stop the weld quickly lift the electrode from the workpiece (stopping the electrical circuit).
- It is important to chip away the “SLAG” before continuing to weld and for weld inspection – allowing the weld to cool slightly will make “SLAG” removal easier.

## SET UP FOR DC LIFT TIG WELDING.

**Optional accessories are required.**

This machine is designed to weld Mild steel and Stainless steel only.

To weld Aluminium Alternating current (AC) is required.



Please ensure you have all relevant safety equipment and PPE ready.

- Connect the Earth clamp cable to the **POSITIVE** terminal **(9)** on the front of the machine. Connect the Earth clamp to the workpiece. The earth clamp must make strong contact with bare metal – remove paint, rust or other contaminants to ensure strong contact. Failure to do so will reduce your welding performance.
- Connect the Optional Weldco VALVE Tig Torch (WDC0818) to the **NEGATIVE** terminal **(10)** on the front of the machine.

**Ensure that the plug is secure in the socket to reduce any chance of arcing from a loose connection.**

- Connect the Optional Weldco Argon Regulator (WDC0812) to the argon cylinder and connect the gas line from the Tig torch to the regulator. With the valve of the TIG torch open turn on the argon cylinder and set the regulator to between 6-10 L/min. Close the valve on the TIG torch.

**It is good practice to test for leaks. Close the cylinder valve. If there are no leaks the regulator will maintain the set L/min and cylinder pressure. Always turn off your cylinder valve when not in use.**

- Ensure the main power switch **(11)** is in the OFF position. Plug the 10amp plug into the 10amp wall socket. Turn power to the ON position on both the wall socket and the power source. The front panel will illuminate, and the cooling fan will start.



- Once the machine has powered up the default setting is for MMA. To select TIG press the **WELD MODE** selector (3) to select **TIG**.
- Your Inverter welder is fitted with a “Voltage Reduction Device” (VRD). The VRD is not used for TIG welding.



- To set the welding current to the recommended level for the selected Tungsten size. refer to the tungsten manufacturer for recommendations. Ensure the **CURRENT** indicator is illuminated, then adjust the welding current by pressing the **Parameter Increase (5)** or **Parameter Decrease (6)** button. The selected amperage will be displayed on the **Amperage Display (4)**.  
HOT START and ARC FORCE is not used in LIFT TIG.

- Open the valve on the argon cylinder.
- Open the valve on the TIG torch gas will flow.
- With your welding helmet and PPE on, rest your ceramic cup on the workpiece roll your hand holding the torch so the tungsten contacts the workpiece, and roll your hand back to lift the tungsten off your torch to maintain a 2-4mm gap from the workpiece (this is called rocking the cup). The welder will send the pulse to start the welding current once the electrical field is detected.



- To stop the weld quickly lift the TIG torch from the workpiece (stopping the electrical circuit).
- Once you have finished welding or if you need to reposition the workpiece CLOSE the valve on the TIG Torch to save gas. Do not rest the torch on the workpiece or connected metal or the tungsten will spark.
- CLOSE the cylinder valve and turn OFF your machine.



### **WARNING!**

**PLEASE CHECK YOUR ARGON CYLINDER VALVE IS CLOSED AFTER USE.**

## MAINTENANCE

- Each welding machine is thoroughly tested and accurately calibrated before leaving the factory. Do not modify or adjust the equipment unless authorised by our company.
- Carry out all maintenance procedures with care. Loose, damaged, or incorrectly positioned wiring may create a safety hazard and could result in equipment failure or personal injury.
- All servicing and repairs must be performed by **Approved Weldco Technicians**.
- Always switch OFF the main input power and disconnect the machine from the power supply before carrying out any maintenance or repair work.
- If a fault occurs and no authorised service technician is available, contact your local dealer or distributor for assistance.
- For common operating issues, refer to the troubleshooting chart below before requesting service.
- All accessories and leads must be inspected regularly by the user.
- Any repairs must be done by **Approved Weldco Technicians**.



### Warning!

**Due to the high voltage in the main circuit of the welder,  
DO NOT remove the cover except for Approved Weldco Technicians.  
Failure to do so could result in electrocution leading to injury or death.**

## WARRANTY

Your Weldco power source is covered by Weldco's 24-month warranty covering faulty materials and manufacturing. During this time should your Weldco power source fail please contact your authorized Weldco distributor.

This warranty does not cover freight or goods serviced by unauthorized personnel.

Weldco will inspect your power source for faulty material or workmanship and will only be replaced if repair is not possible.

**Note: The warranty is for the power source only. Leads and accessories are consumables and only replaced with failures due to materials and manufacture.**

## TROUBLESHOOTING

### Troubleshooting Guide

| Problem                                                                           | Possible Cause                              | Solution                                                                                |
|-----------------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------------|
| 1. Power is ON, LCD display is illuminated, but the cooling fan is not operating. | Fan obstructed by debris.                   | Remove any obstruction from the fan.                                                    |
|                                                                                   | Cooling fan motor is damaged.               | Replace the cooling fan motor.                                                          |
| 2. Power is ON, but the LCD display is OFF and the cooling fan does not operate.  | No input power.                             | Check that the machine is connected to a suitable power supply.                         |
|                                                                                   | Input voltage is too high or too low.       | Verify that the input voltage is within the machine's specified operating range.        |
| 3. No open-circuit (no-load) output voltage.                                      | Internal machine fault.                     | Inspect the main circuit, PR1 and PR2. Repair or replace faulty components as required. |
| 4. No welding current output.                                                     | Welding leads are not connected correctly.  | Ensure the welding leads are securely connected to the machine's output terminals.      |
|                                                                                   | Welding lead is damaged.                    | Repair or replace the welding lead.                                                     |
|                                                                                   | Work (earth) lead is loose or disconnected. | Check and secure the work clamp and cable connection.                                   |

|                                                                         |                                                                               |                                                                                                 |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| 5. Arc is difficult to strike or the electrode sticks to the workpiece. | Loose or poor electrical connection.                                          | Inspect and tighten all cable and connector connections.                                        |
|                                                                         | Workpiece is contaminated with oil, rust, paint or dirt.                      | Clean the workpiece before welding.                                                             |
| 6. Welding arc is unstable.                                             | Arc Force setting is too low.                                                 | Increase the Arc Force setting.                                                                 |
| 7. Welding current cannot be adjusted.                                  | Front panel current control potentiometer is faulty or has a poor connection. | Inspect the potentiometer and its wiring. Repair or replace if necessary.                       |
| 8. Insufficient weld penetration (MMA).                                 | Welding current is set too low.                                               | Increase the welding current.                                                                   |
|                                                                         | Arc Force setting is too low.                                                 | Increase the Arc Force setting.                                                                 |
| 9. Arc blow.                                                            | Airflow disturbing the arc.                                                   | Shield the welding area from drafts or wind.                                                    |
|                                                                         | Electrode angle is incorrect.                                                 | Adjust the electrode angle.                                                                     |
|                                                                         | Electrode is damaged or of poor quality.                                      | Replace the electrode.                                                                          |
|                                                                         | Magnetic arc blow.                                                            | Angle the electrode opposite to the direction of the arc blow.                                  |
|                                                                         |                                                                               | Reposition the work clamp or use an additional work lead on the opposite side of the workpiece. |
|                                                                         |                                                                               | Use a shorter arc length where possible.                                                        |
| 10. Error code displayed on the screen.                                 | Over-temperature protection: Excessive welding current.                       | Reduce the welding current.                                                                     |
|                                                                         | Over-temperature protection: Duty cycle exceeded.                             | Allow the machine to cool by observing the recommended duty cycle.                              |
|                                                                         | Over-current protection: Abnormal current detected in the main circuit.       | Inspect and repair the main circuit and driver PCB.                                             |

| Error Type                        | Error Code | Description                                              |
|-----------------------------------|------------|----------------------------------------------------------|
| <b>Thermal Protection</b>         | <b>E01</b> | Over-temperature protection activated (Thermal Relay 1). |
|                                   | <b>E02</b> | Over-temperature protection activated (Thermal Relay 2). |
|                                   | <b>E03</b> | Over-temperature protection activated (Thermal Relay 3). |
|                                   | <b>E04</b> | Over-temperature protection activated (Thermal Relay 4). |
|                                   | <b>E09</b> | General over-temperature protection (default program).   |
| <b>Power Source</b>               | <b>E10</b> | Input phase loss detected.                               |
|                                   | <b>E13</b> | Input voltage below the allowable operating range.       |
|                                   | <b>E14</b> | Input voltage above the allowable operating range.       |
|                                   | <b>E15</b> | Over-current protection activated.                       |
| <b>Operating Panel / Switches</b> | <b>E20</b> | Operating panel button fault detected during power-up.   |
|                                   | <b>E21</b> | Operating panel fault detected during power-up.          |
|                                   | <b>E22</b> | Torch fault detected during power-up.                    |
|                                   | <b>E23</b> | Torch fault detected during normal operation.            |
|                                   | <b>E41</b> | Internal communication error.                            |



**Warning!** Protect the machine from rapid power switching. When the machine senses that the power is turned on and off rapidly the unit will turn off. The power indicator light will not turn on. Allow the machine to rest for a few minutes and normal operation should continue. If this does not rectify the issue, please contact your approved Weldco Technician.

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New Zealand

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