M150 INVERTER MIG WELDER GAS/GASLESS MANUAL

BOSSWELD WELD LIKE A BOSS
Thank you for choosing a BOSSWELD M150 Inverter DC MIG Welder

In this manual you will find instructions on how to set up your welder along with general welding information, safety information and helpful tips. We encourage you to go online to our website for more tips and troubleshooting as well as many welding resources.

The BOSSWELD M-150 is the latest in IGBT Inverter welder technology; this very portable MIG welder is easy to set up, easy to use, enabling the user to complete smooth welds with both Gas and Gasless MIG wire. Ideal for around the home, DIY workshop, or rural applications.

We truly hope you enjoy using your welder!

---

MIG

- Simple to learn
- MIG Wire is fed through the gun to create the weld pool
- Gas or flux prevents oxidisation in the weld
- Weld with or without gas
- Point and pull the trigger
- Great for maintenance, small projects & automotive repairs

**METAL TYPES**
Mild steel, stainless steel & aluminium
<table>
<thead>
<tr>
<th>CONTENTS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WARRANTY</td>
<td>4</td>
</tr>
<tr>
<td>BOX CONTENTS</td>
<td>5</td>
</tr>
<tr>
<td>WARNINGS</td>
<td>6</td>
</tr>
<tr>
<td>MACHINE CARE / SAFETY INSTRUCTIONS</td>
<td>7</td>
</tr>
<tr>
<td>WORK AREA SAFETY</td>
<td>8</td>
</tr>
<tr>
<td>MAINTENANCE &amp; DISPOSAL / GAS BOTTLE</td>
<td>9</td>
</tr>
<tr>
<td>FRONT &amp; REAR PANEL LAYOUT</td>
<td>10</td>
</tr>
<tr>
<td>MACHINE INSIDE</td>
<td>11</td>
</tr>
<tr>
<td>POWER SUPPLY WARNING</td>
<td>12</td>
</tr>
<tr>
<td>WIRE FEEDER SETUP</td>
<td>13</td>
</tr>
<tr>
<td>MIG TORCH SETUP</td>
<td>14</td>
</tr>
<tr>
<td>GASLESS MIG WELDING SETUP</td>
<td>16-17</td>
</tr>
<tr>
<td>GAS MIG WELDING SETUP</td>
<td>18-19</td>
</tr>
<tr>
<td>GENERAL MIG WELDING</td>
<td>20-22</td>
</tr>
<tr>
<td>COMMON WEAR PART</td>
<td>23</td>
</tr>
<tr>
<td>BZ15 MIG TORCH PARTS BREAK DOWN</td>
<td></td>
</tr>
<tr>
<td>DRIVE ROLLERS</td>
<td></td>
</tr>
<tr>
<td>BZ15 MIG TORCH REPLACEMENT</td>
<td></td>
</tr>
<tr>
<td>HELPFUL INFORMATION &amp; TROUBLE SHOOTING</td>
<td>24-27</td>
</tr>
</tbody>
</table>
This warranty is in addition to the statutory warranty provided under Australian Consumer Law, but does not include damage resulting from transport, misuse, neglect or if the product has been tampered with.

The product must be maintained as per this manual, and installed and used according to these instructions on an appropriate power supply. The product must be used in accordance with industry standards and acceptable practice.

This warranty covers the materials used to manufacture the machine and the workmanship used to produce the item. This Warranty does not cover damage caused by:

1. Normal wear and tear due to usage
2. Misuse /abuse or Neglect of the item
3. Transport / handling breakages
4. Lack of maintenance, care and cleaning
5. Environmental factors, such as usage in temperatures exceeding 40 degrees, above 1000mt sea level, rain, water, excessive damp, cold or humid conditions.
6. Improper setup or installation
7. Use on Incorrect voltage or non authorised electrical connections and plugs
8. Use of non standard parts
9. Repair, case opening, tampering with, modifications to any part of the item by non authorised BOSSWELD repairers.

This warranty covers the machine only and does not include Torches, Leads, Earth Clamps, Electrode holders, Plasma Torches, Tig Torches and any of the parts on those items unless there is a manufacturing fault.

1. REGISTRATION
Purchasers are encouraged to register for warranty on our website. www.bossweld.com.au/warranty

2. TIME PERIOD - 2 Years
A warranty claim must be made within 2 years from the date of purchase of this product. Any claim must include proof of purchase.

3. HOW TO MAKE A CLAIM - NEED SOME HELP?
• Visit our website www.bossweld.com.au/troubleshooting for many helpful tips and guides to assist with the setup and usage of your new machine. Still stuck….?
• Call the BOSSWELD Helpdesk on 1300 460 665 for over the phone assistance.
• If the machine is not operational then return the item to the place of purchase.

BOSSWELD 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.

DO NOT GRIND YOUR PLUG
This will void any warranty on your machine
1. BOSSWELD M150 Inverter MIG/MMA/TIG Welder
2. 3 metre 15 Series MIG Torch direct connect
3. Welding Earth Lead direct connect
4. Gas Hose
5. Dual Stage Argon Regulator
6. Cable / Lead Tidy
7. Torch Spares
8. Drive Roller (Installed in Machine 0.8-0.9 V Groove) - not shown.
   Gasless Drive Roller 0.8/0.9mm (for use with Gasless Wire) - not shown.
   * Gasless Drive roller has a jagged groove
WARNING

The device and packaging material are not toys! Children must not be allowed to play with the machine and its accessories. Plastic parts and packaging are choking risks for children.

- Open the packaging and remove the welder carefully.
- Check that the delivery is complete.
- If possible, store the packaging until the warranty period has expired.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

GLOVES AND PROTECTIVE CLOTHING
Use protective gloves and fire resistant protective clothing when welding. Avoid exposing skin to ultraviolet rays produced by the arc.

WELDING HELMET
Under no circumstances should the welder be operated unless the operator is wearing a welding helmet to protect the eyes and face. There is serious risk of eye damage if a helmet is not used. The sparks and metal projectiles can cause serious damage to the eyes and face. The light radiation produced by the arc can cause damage to eyesight, and burns to skin. Never remove the welding helmet whilst welding.

SAFETY GLASSES
After welding use appropriate safety glasses when brushing, chipping or grinding the slag from the weld.

OTHER PERSONS
Ensure that other persons are screened from the welding arc and are at least 15 metres away from the work piece. Always ensure that the welding arc is screened from onlookers, or people just passing by. Use screens if necessary, or non-reflecting welding curtain. Do not let children or animals have access to the welding equipment or to the work area.

SWITCHING OFF
When the operator has finished welding they must switch the welder off. DO NOT put the electrode holder down with the welder switched ON. When leaving the welder unattended, move the ON/OFF switch to the OFF position and disconnect the welder from the electrical mains supply. Do not leave hot material unattended after welding.

FUMES & GASES ARE DANGEROUS
Smoke and gas generated whilst welding or cutting can be harmful to people’s health. Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Do not breathe the smoke and gas generated whilst welding or cutting, keep your head out of the fumes
- Keep the working area well ventilated, use fume extraction or ventilation to remove welding fumes and gases.
- In confined or heavy fume environments always wear an approved air-supplied respirator. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near de-greasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapours to form highly toxic and irritating gases.
- Materials such as galvanized, lead, or cadmium plated steel, containing elements that can give off toxic fumes when welded. Do not weld these materials unless the area is very well ventilated, and or wearing an air supplied respirator.
Keep the welding cables, earth clamp and electrode holder in good condition. Failure to do this can result in poor welding quality, which could be dangerous in structural situations. Prior to use, check for breakage of parts and any other conditions that may affect operation of the welder. Any part of the welder that is damaged should be carefully checked to determine whether it will perform its intended function whilst being safe for the operator. Any part that is damaged should be properly repaired, or replaced by an authorised service centre.

**IMPROPER USE**
It is hazardous to use the welding machine for any work other than that for which it was designed e.g. do not use welder for thawing pipes.

**HANDLING**
Ensure the handle is correctly fitted. As welding machines can be heavy, always use safe lifting practices when lifting.

**POSITION AND HANDLING**
To reduce risk of the machine being unstable / danger of overturning, position the welding machine on a horizontal surface that is able to support the machine weight. Operators MUST NOT BE ALLOWED to weld in raised positions unless safety platforms are used.

---

**SAFETY INSTRUCTIONS**

**WARNING**
The user of this welder is responsible for their own safety and the safety of others. It is important to read, understand and respect the contents of this user guide. When using this welder, basic safety precautions, including those in the following sections must be followed to reduce the risk of fire, electric shock and personal injury. Ensure that you have read and understood all of these instructions before using this welder. Persons who are not familiar with this user guide should not use this welder. Keep this booklet in a safe place for future reference.

**TRAINING**
The operator should be properly trained to use the welding machine safely and should be informed about the risks relating to arc welding procedures. This user guide does not attempt to cover welding technique. Training should be sought from qualified / experienced personnel on this aspect, especially for any welds requiring a high level of integrity for safety.

**SERIOUS FIRE RISK**
The welding process produces sparks, droplets of fused metal, metal projectiles and fumes. This constitutes a serious fire risk. Ensure that the area in which welding will be undertaken is clear of all inflammable materials. It is also advisable to have a fire extinguisher, and a welding blanket on hand to protect work surfaces.
WORK AREA

Ensure a clear, well lit work area with unrestricted movement for the operator.

The work area should be well ventilated, as welding emits fumes which can be dangerous.

Always maintain easy access to the ON/OFF switch of the welder, and the electrical mains supply.

Do not expose the welder to rain and do not operate in damp or wet locations.

Where welding must be undertaken in environments with increased risk of electric shock, confined spaces or in the presence of flammable or explosive materials, it is important that the environment be evaluated in advance by an “expert supervisor”. It is also recommended that welding in these circumstances be carried out in the presence of persons trained to intervene in emergencies.

AVOID ELECTRICAL CONTACT

Use adequate electrical insulation with regard to the electrode, the work piece and any accessible earthed metal parts in the vicinity. Avoid direct contact with the welding circuit. The no load voltage between the earth clamp and the electrode can be dangerous under certain circumstances.

Note: For additional protection from electric shock. It is recommended that this welder be used in conjunction with a residual current device (RCD) with rated residual current of 30MA or less. In general the use of extension leads should be avoided. If used however, ensure that the extension lead is used with the welder is of a suitable current rating and heavy duty in nature that MUST have an earth connection. If using the welder outdoors, ensure that the extension lead is suitable for outdoor use. Always keep extension leads away from the welding zone, moisture and any hot materials.

WELDING SURFACES

Do not weld containers or pipes that hold, or have held, flammable liquids or combustible gases or pressure. Do not weld on coated, painted or varnished surfaces as the coatings may ignite, or can give off dangerous fumes.

WORK PIECE

When welding, the work piece will remain at high temperature for a relatively long period. The operator must not touch the weld or the work piece unless wearing welding gloves. Always use pliers or tongs. Never touch the welded material with bare hands until it has completely cooled.

VOLTAGE BETWEEN ELECTRODE HOLDERS OR TORCHES

Working with more than one welding machine on a single work piece, or on work pieces that are connected, may generate a dangerous accumulation of no-load voltage between two different electrode holders or torches, the value of which may reach double the allowed limit.
MAINTENANCE

WARNING
Before starting any cleaning, or maintenance procedures on the welding machine, make sure that it is switched OFF and disconnected from the mains supply.
There are no user serviceable parts inside the welder. Refer to a qualified service personnel if any internal maintenance is required. After use, wipe the welder down with a clean soft dry cloth.
Regular inspection of the supply cord is required and if damaged is suspected, it must be immediately replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

STORAGE/ TRANSPORT
Store the welder and accessories out of children’s reach in a dry place. If possible store the welder in the original packaging. The appliance must unconditionally be secured against falling or rolling over during transport.

DISPOSAL

DISPOSING OF THE PACKAGING
Recycling packaging reduces the need for landfill and raw materials. Reuse of the recycled material decreases pollution in the environment. Please recycle packaging where facilities exist. Check with your local council authority for recycling advice.

DISPOSING OF THE WELDER
Welders that are no longer usable should not be disposed of with household waste but in an environmentally friendly way. Please recycle where facilities exist. Check with your local council authority for recycling advice.

GAS BOTTLE

ATTENTION! - CHECK FOR GAS LEAKS
At initial set up and at regular intervals we recommend to check for gas leakage
Recommended procedure is as follows:
1. Connect the regulator and gas hose assembly and tighten all connectors and clamps.
2. Slowly open the cylinder valve.
3. Set the flow rate on the regulator to approximately 10-15 l/min.
4. Close the cylinder valve and pay attention to the needle indicator of the contents pressure gauge on the regulator, if the needle drops away towards zero there is a gas leak. Sometimes a gas leak can be slow and to identify it will require leaving the gas pressure in the regulator and line for an extended time period. In this situation it is recommended to open the cylinder valve, set the flow rate to 8-10 l/min, close the cylinder valve and check after a minimum of 15 minutes. Ensuring adequate ventilation fore small spaces.
5. If there is a gas loss then check all connectors and clamps for leakage by brushing or spraying with / soapy water, bubbles will appear at the leakage point.
6. Tighten clamps or fittings to eliminate gas leakage.

IMPORTANT! - We strongly recommend that you check for gas leakage prior to operation of your machine. We recommend that you close the cylinder valve when the machine is not in use. BOSSWELD, authorised representatives or agents of BOSSWELD will not be liable or responsible for the loss of any gas.
FRONT PANEL
1. Wire Speed / Voltage Table
2. Power Indicator Light
3. Overload error indicator
4. Welding Speed Adjustment
5. Welding Voltage Control Knob
6. MIG Torch
7. Welding Earth Lead

REAR PANEL
8. Mains Power Switch
9. Gas Input
10. 240V AC Mains Power Cord
11. Cooling Fan
12. 15 Amp Input Plug
SIDE PANEL (DOOR OPEN)

A. Spool Hub
B. Spool Hub Nut
C. Drive Roller Cover
D. Drive Roller
E. Guide Tube
F. Wire Feed Tensioning Knob
G. Wire Tensioning Arm
H. Idle Roller
I. Inlet tube
J. Wire Feed inching
K. Polarity Switching Terminal

SETTING MACHINE POLARITY
DCEN - GASLESS
DCEP - GAS

DCEN Polarity Switching Terminal
Set for Gasless Welding
DCEP Polarity Switching Terminal
Set for Gas Welding
Note:
This unit must be connected to a 15 amp power supply. This may require a dedicated circuit.

DO NOT GRIND YOUR PLUG
This will void any warranty on your machine

DUTY CYCLE:

The term duty cycle indicates the percentage welding time available at the output current for each 10 min period over 4 hours.

The specification plate on the machine list three given ratings at a given current and voltage.

NOTE: Amps refer to the Current setting

<table>
<thead>
<tr>
<th>Amperage</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>15%</td>
<td>75 Amps</td>
</tr>
<tr>
<td>60%</td>
<td>78 Amps</td>
</tr>
<tr>
<td>100%</td>
<td>60 Amps</td>
</tr>
<tr>
<td>150 Amps</td>
<td>21.5 V</td>
</tr>
<tr>
<td>60 Amps</td>
<td>17.8 V</td>
</tr>
</tbody>
</table>

For example, this means when the machine is set at a current of 150 Amps it can only weld for one and half minutes in a ten minute period.

The power source is protected by a built in temperature protection device. This will activate if the machine is operated in excess of its amperage and duty cycle rating.

Diagram Below shows approx amperage on welding voltage dial

This light indicates over temperature / duty cycle exceeded

Approx 75 Amps

Approx 15 Amps

Approx 150 Amps
1. Open the side door of the machine.

2. Remove the Spool Hub Nut and place spool of wire on Spool Hub.

3. Replace Spool Hub Nut and adjust firmly - without too much pressure. 
   Note: Wire to roll from under spool into wire feeder

4. Release the Wire Feed Tensioning Knob by pulling it down.

5. Remove the Drive Roller Cover. Check the Drive roller is matched to the wire size for the job. 
   Note: Correct wire side on roller to face into machine when fitting. Then replace the Drive Roller Cover.
   See Page 16 for drive roller size and type.

6. Take the end of the wire and feed into the Guide tube until it passes to the Inlet Tube, and into the torch liner. Approx 3-5cm
   Ensure you hold the spool and check tension to stop wire spool unraveling

7. Put down Wire Tensioning Arm so it locks into position, and turn the Wire Feed Tensioning Knob to gently tighten.

Note: Pictures may vary from your machine model
SET UP OF MIG TORCH

3. Remove nozzle (A) and tip (B) from torch.

4. Plug machine into 240V and switch to the ON position on the back of machine.

4. Press the wire feed button and the wire feeder will push the wire through the torch and out the torch nozzle.
   **NOTE:** make sure your torch is straight and has no kinks while you feed the wire through it.

6. Re install tip over the wire and tighten using the tool supplied. Do NOT over tighten, or you may damage the tip holder and re-attach nozzle to torch.

7. Trim wire to the end of the nozzle.

**NOTE:** Wire speed will run a full speed when the trigger is pressed without making and arc.

Note: Pictures may vary from your machine model.
Proper MIG Torch inspection
Prior to welding, ensure all connections are tight and that consumables and equipment are in good condition and free from damage. Start with the front of the gun and work your way back to the feeder. A tight neck connection is essential to carry the electrical current from the welding cable to the front-end consumables. Also, be sure to visually inspect the handle and trigger to check there are no missing screws or damage. The cable should be free of cuts, kinks and damage along the outer cover. Cuts in the cable can expose the internal copper wiring and create a potential safety hazard to the welding operator. In addition, these issues can lead to electrical resistance that causes heat buildup — and ultimately cable failure.

Consumables
MIG gun front-end consumables are exposed to heat and spatter and therefore often require frequent replacement. However, performing some simple maintenance can help extend consumable life and improve gun performance and weld quality. The gas diffuser provides gas flow to the weld pool and also connects to the neck and carries the electrical current to the contact tip. Make sure all connections are tight, and check the diffuser’s O-rings for cracks, cuts or damage. The nozzle’s main role is to focus the shielding gas around the weld pool. Watch for spatter buildup in the nozzle, which can obstruct gas flow and lead to problems due to inadequate shielding coverage. Use MIG pliers to clean spatter from the nozzle. The contact tip is the last point of contact between the welding equipment and the welding wire. Keyholing of the contact tip is a concern to watch for with this consumable. This occurs when the wire passing through the tip wears an oblong-shaped slot into the diameter of the tip. Keyholing can put the wire out of center and cause problems such as an erratic arc. If you are experiencing wire feeding issues, try changing the contact tip or switching to a larger-size contact tip. Tips that look worn should be replaced.

Spatter removal from inside and outside the nozzle using MIG pliers

Final thoughts
Taking the time for preventative maintenance can pay off in less downtime in the long run. Along with that, always remember to properly store your MIG gun consumables to help you achieve the best results and extend the life of your equipment. When not in use, the MIG gun should be stored in a coiled position, either hanging or lying flat, such as on a shelf. Do not leave MIG gun on the floor of the shop, where there is a chance the cable could be run over, kinked or damaged.

WELDING PRODUCTS TO HELP PROLONG, MAINTAIN AND PRODUCE BETTER WELDS

Bossweld Aerosol Anti Spatter Spray (Part No: 800041)
This silicon free spatter release coating is a colourless film which stops weld spatter from sticking to welding equipment, work pieces & fixtures. Easily removed before painting or finishing.

Bossweld Tip Dip Gel (Part No: 800055)
Non toxic water based dipping gel for the prevention of weld spatter adherence to MIG torch parts. This silicon free compound is used to prolong the life of nozzles & tips.

Bossweld 8 Ways MIG Welding Pliers (Part No: 800074)
Handy 8 function welders pliers. Functions include, nozzle removal, tip removal, cleaning inside of nozzle and wire cutting.
Set up the wire feed unit as per section “Set up Wire Feed Unit”.

* Gasless Drive roller has a jagged groove

Correct wire side on roller to face into machine when fitting.

Open wire feed side panel and install Gasless wire into machine ensuring the drive roller is matched to the wire size and type. Refer to “Drive Feed Roller Selection” on page 16.

Note: Wire to roll from under spool into wire feeder

Ensure the polarity is correct for gasless welding, DCEN

**MACHINE DRIVE ROLLER SIZE**

(Note: Machine will run up to 1.0mm wire)

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RK301019.06.08</td>
<td>Drive Roller 0.6/0.8mm Knurled 30 x 10 x 19mm</td>
</tr>
<tr>
<td>RK301019.08.09*</td>
<td>Drive Roller 0.8/0.9mm Knurled 30 x 10 x 19mm</td>
</tr>
<tr>
<td>RK301019.08.10</td>
<td>Drive Roller 0.8/1.0mm Knurled 30 x 10 x 19mm</td>
</tr>
<tr>
<td>RU301019.08.10</td>
<td>Drive Roller 0.8/1.0mm U Groove 30 x 10 x 19mm</td>
</tr>
<tr>
<td>RV301019.06.08</td>
<td>Drive Roller 0.6/0.8mm V Groove 30 x 10 x 19mm</td>
</tr>
<tr>
<td>RV301019.08.09*</td>
<td>Drive Roller 0.8/0.9mm V Groove 30 x 10 x 19mm</td>
</tr>
<tr>
<td>RV301019.08.10</td>
<td>Drive Roller 0.8/1.0mm V Groove 30 x 10 x 19mm</td>
</tr>
<tr>
<td>RV301019.09.10</td>
<td>Drive Roller 0.9/1.0mm V Groove 30 x 10 x 19mm</td>
</tr>
</tbody>
</table>

* Denotes driver rollers supplies with machine

- Gasless Drive roller has a jagged groove
**MACHINE SET UP GASLESS MIG WELDING CONTINUED**

5. Connect earth clamp to the work piece ensuring that the clamp makes good contact with bare metal.

6. Switch the machine on using the mains power switch. Wait a few seconds whilst the machine powers up.

7. Remove nozzle and tip from torch and press the wire feed button inside the machine door, this will feed the wire through the torch. Release button when wire appears at the end of the torch. **NOTE:** make sure your torch is straight and has no kinks while you feed the wire through it.

8. Re install tip and nozzle to torch and trim wire to the end of the nozzle.

9. Refer to the chart on the front of the machine, and set your voltage and wires speed dials to the according settings, once you start to weld you can make finer adjustment to suit.

**NOTE:**
Wire speed will run a full speed when the trigger is pressed without making and arc.

**NOTE:**
It is advisable to run a few test welds using scrap or offcut materials, in order to tune the machine to the correct settings prior to welding the job.

**Note:** Pictures may vary from your machine model.
MACHINE SET UP GAS MIG WELDING

1. Plug the machine 15Amp input power lead into the wall socket, ensuring that the power switch on the machine is in the OFF position.

2. Correct wire side on roller to face into machine when fitting.
   Open wire feed side panel and install Gas wire into machine ensuring the drive roller is matched to the wire size and type. Refer to “Drive Feed Roller Selection” on page 16 Notes: Wire to roll from under spool into wire feeder

3. Set up the wire feed unit as per section “Set up Wire Feed Unit”.

4. Ensure the polarity is correct for gas welding, DCEP

5. Connect earth clamp to the work piece ensuring that the clamp makes good contact with bare metal.

6. Switch the machine on using the mains power switch. Wait a few seconds whilst the machine powers up.
7. Remove nozzle and tip from torch and press the wire feed button inside the machine door, this will feed the wire through the torch. Release button when wire appears at the end of the torch. **NOTE:** make sure your torch is straight and has no kinks while you feed the wire through it.

8. Re install tip and nozzle to torch and trim wire to the end of the nozzle.

9. Fit gas regulator to the gas bottle and install gas hose to the gas inlet on the back panel of welder.

10. Turn on regulator and set gas flow to between 10-15 L/min depending on your welding environment.

11. Refer to the chart on the front of the machine, and set your voltage and wires speed dials to the according settings, once you start to weld you can make finer adjustment to suit.

**NOTE:**
Wire speed will run a full speed when the trigger is pressed without making and arc.

**NOTE:**
It is advisable to run a few test welds using scrap or offcut materials, in order to tune the machine to the correct settings prior to welding the job.

**Note:** Pictures may vary from your machine model
The welding power supply has two control settings that have to balance. These are voltage control switches and the wire speed control. The welding amperage is determined by the voltage settings, the wire diameter, gas selection and the wire feed speed. The amperage will increase with higher voltage selection on the machine and higher wire feed speed. This is typically used for welding thick sections of steel. When welding thin sections of steel, a lower voltage selection and lower wire feed speed is required.

- When changing to a different wire diameter different control settings are required. A thinner wire needs more wire speed to achieve the same current level.
- A satisfactory weld cannot be obtained if the wire speed and voltage switch settings are not adjusted to suit the wire diameter and thickness of the material being welded.
- If the wire speed is too high for the welding voltage, “stubbing” will occur as the wire dips into the molten pool. If the wire speed is too slow for the welding voltage, large drops will form on the end of the electrode wire, causing spatter. Suppose that wire speed is constant, if the welding voltage is too high, large drops will form on the end of the electrode wire, causing spatter; if the voltage is too low, the wire will not melt.

**POSITION OF MIG GUN**

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

**Distance from the MIG Gun Nozzle to the Work Piece**

The electrode stick out from the MIG gun nozzle should be between 2.0mm to 5.0mm when welding with gas shielded wire. An increased distance of 5mm to 10mm is required when welding with Gasless wire. This distance will vary depending on the type of joint that is being weld.

**Travel Speed**

Speed at which a weld travels influences the width of the weld and penetration of the welding run. Welding thin steel will have a faster travel speed than welding thick steel.

**Wire Size Selection**

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

- Thickness of the metal to be welded.
- Type of joint configuration
- Capacity of the wire feed unit and power supply.
- The amount of penetration required.
- The deposition rate required.
- The bead profile desired
- The position of welding and cost of the wire.
- Location of welding
## Welding Wire Selection Guide

### Carbon Steel

<table>
<thead>
<tr>
<th>Material Thickness</th>
<th>Welding Wire</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mig Wire, Gas Shielded</td>
</tr>
<tr>
<td></td>
<td>0.6mm</td>
</tr>
<tr>
<td>0.8</td>
<td>30-45</td>
</tr>
<tr>
<td>1.0</td>
<td>45-60</td>
</tr>
<tr>
<td>1.2</td>
<td>60-75</td>
</tr>
<tr>
<td>1.6</td>
<td>70-105</td>
</tr>
<tr>
<td>2.0</td>
<td>120-130</td>
</tr>
<tr>
<td>3.0</td>
<td>135-150</td>
</tr>
<tr>
<td>4.0</td>
<td>145-160</td>
</tr>
<tr>
<td>6.0</td>
<td>175-210</td>
</tr>
<tr>
<td>8.0</td>
<td>215-230</td>
</tr>
<tr>
<td>10.0</td>
<td>220-240</td>
</tr>
<tr>
<td>12.0</td>
<td>240+</td>
</tr>
<tr>
<td>Gas</td>
<td>Argon/Co2 - Co2</td>
</tr>
</tbody>
</table>

### Stainless Steel

<table>
<thead>
<tr>
<th>Material Thickness</th>
<th>Welding Wire</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mig Wire, Gas Shielded</td>
</tr>
<tr>
<td></td>
<td>0.8mm</td>
</tr>
<tr>
<td>0.8</td>
<td>40-50</td>
</tr>
<tr>
<td>1.0</td>
<td>50-60</td>
</tr>
<tr>
<td>1.2</td>
<td>65-80</td>
</tr>
<tr>
<td>1.6</td>
<td>75-90</td>
</tr>
<tr>
<td>2.0</td>
<td>95-120</td>
</tr>
<tr>
<td>3.0</td>
<td>140-155</td>
</tr>
<tr>
<td>4.0</td>
<td>175-190</td>
</tr>
<tr>
<td>6.0</td>
<td>200-210</td>
</tr>
<tr>
<td>8.0</td>
<td>220-240</td>
</tr>
<tr>
<td>10.0</td>
<td>235+</td>
</tr>
<tr>
<td>12.0</td>
<td></td>
</tr>
<tr>
<td>Gas</td>
<td>Argon/Co2 - Argon/Co2</td>
</tr>
</tbody>
</table>

### Aluminium

<table>
<thead>
<tr>
<th>Material Thickness</th>
<th>Welding Wire</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mig Wire, Gas Shielded</td>
</tr>
<tr>
<td></td>
<td>0.8mm</td>
</tr>
<tr>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>8.0</td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
</tr>
<tr>
<td>12.0</td>
<td></td>
</tr>
<tr>
<td>Gas</td>
<td>Argon/Co2 - Argon/Co2</td>
</tr>
</tbody>
</table>

**Note:**
1. The above amperage range is to be used as a guide only
2. Welding travel speed will affect the end weld result
3. For additional information on gas selection, consult your distributor

### MIG Welding Setting Guides

<table>
<thead>
<tr>
<th>Welding current</th>
<th>Welding Volt</th>
<th>Wire Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Wire Size)</td>
<td>0.6mm</td>
<td>0.8mm</td>
</tr>
<tr>
<td>40A</td>
<td>13~15V</td>
<td>2~3</td>
</tr>
<tr>
<td>60A</td>
<td>14~16V</td>
<td>3~5</td>
</tr>
<tr>
<td>80A</td>
<td>15~17V</td>
<td>6~8</td>
</tr>
<tr>
<td>100A</td>
<td>16~19V</td>
<td>8~10</td>
</tr>
<tr>
<td>120A</td>
<td>17~20V</td>
<td>4~7</td>
</tr>
<tr>
<td>140A</td>
<td>19~21V</td>
<td>5~8</td>
</tr>
<tr>
<td>160A</td>
<td>20~22V</td>
<td>6~9</td>
</tr>
<tr>
<td>180A</td>
<td>21~23V</td>
<td>6~9</td>
</tr>
</tbody>
</table>
GMAW (MIG) WELDING

Metal inert gas (MIG) welding is an attractive alternative to MMA (stick welding), offering high deposition rates and high productivity.

PROCESS CHARACTERISTICS

MIG welding is a versatile technique suitable for both thin sheet and thick section components. An arc is struck between the end of a wire electrode and the workpiece, melting both of them to form a weld pool. The wire serves as both heat source (via the arc at the wire tip) and filler metal for the joint. The wire is fed through a copper contact tube (contact tip) which conducts welding current into the wire. The weld pool is protected from the surrounding atmosphere by a shielding gas fed through a nozzle surrounding the wire. Shielding gas selection depends on the material being welded and the application. The wire is fed from a reel by a motor drive, and the welder moves the welding torch along the joint line. Wires may be solid (simple drawn wires), or cored (composites formed from a metal sheath with a powdered flux or metal filling). Consumables are generally competitively priced compared with those for other processes. The process offers high productivity, as the wire is continuously fed.

Manual MIG welding is often referred as a semi-automatic process, as the wire feed rate and arc length are controlled by the power source, but the travel speed and wire position are under manual control. The process can also be mechanised when all the process parameters are not directly controlled by a welder, but might still require manual adjustment during welding. When no manual intervention is needed during welding, the process can be referred to as automatic. The process usually operates with the wire positively charged and connected to a power source delivering a constant voltage. Selection of wire diameter (usually between 0.6 and 1.6mm) and wire feed speed determine the welding current, as the burn-off rate of the wire will form an equilibrium with the feed speed.

SHIELDING GAS

In addition to general shielding of the arc and the weld pool, the shielding gas performs a number of important functions:

- forms the arc plasma
- stabilises the arc roots on the material surface
- ensures smooth transfer of molten droplets from the wire to the weld pool

The shielding gas will have a substantial effect on the stability of the arc and metal transfer and the behaviour of the weld pool, in particular, its penetration. General purpose shielding gases for MIG welding are mixtures of argon, oxygen and CO2, and special gas mixtures may contain helium. The gases which are normally used for the various materials are:

- Steels: CO2, argon +2 to 5% oxygen, argon +5 to 25% CO2.
- Non-ferrous (e.g. Aluminium, copper or nickel alloys): Argon, argon / helium.

Argon based gases, compared with CO2, are generally more tolerant to parameter settings and generate lower spatter levels with the dip transfer mode. However, there is a greater risk of lack of fusion defects because these gases are colder. As CO2 cannot be used in the open arc (pulsed or spray transfer) modes due to high back-plasma forces, argon based gases containing oxygen or CO2 are normally employed.
**BZ15 BOSSWELD BINZEL STYLE MIG TORCH SPARES**

### Part No. Description

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>92.05.15</td>
<td>Tip holder with spring l/hand</td>
</tr>
<tr>
<td>92.02.15.CO</td>
<td>Adjustable conical nozzle ø 12mm</td>
</tr>
<tr>
<td>92.02.15.CL</td>
<td>Adjustable cylindrical nozzle ø 19mm</td>
</tr>
<tr>
<td>92.02.15.10</td>
<td>Adjustable tapered nozzle ø 10mm</td>
</tr>
<tr>
<td>92.01.15.06</td>
<td>Contact tip 0.6mm x M6 x 6mm dia x 25mm long</td>
</tr>
<tr>
<td>92.01.15.08</td>
<td>Contact tip 0.8mm x M6 x 6mm dia x 25mm long</td>
</tr>
<tr>
<td>92.01.15.09</td>
<td>Contact tip 0.9mm x M6 x 6mm dia x 25mm long</td>
</tr>
<tr>
<td>92.01.15.10</td>
<td>Contact tip 1.0mm x M6 x 6mm dia x 25mm long</td>
</tr>
<tr>
<td>92.01.25.06</td>
<td>Contact tip heavy duty 0.6mm x M6 x 8mm dia x 25mm long</td>
</tr>
<tr>
<td>92.01.25.08</td>
<td>Contact tip heavy duty 0.8mm x M6 x 8mm dia x 25mm long</td>
</tr>
<tr>
<td>92.01.25.09</td>
<td>Contact tip heavy duty 0.9mm x M6 x 8mm dia x 25mm long</td>
</tr>
<tr>
<td>92.01.25.10</td>
<td>Contact tip heavy duty 1.0mm x M6 x 8mm dia x 25mm long</td>
</tr>
<tr>
<td>92.01.M6A09</td>
<td>Contact tip 0.9mm x M6 Al x 8mm dia x 28mm long</td>
</tr>
<tr>
<td>92.01.M6A10</td>
<td>Contact tip 1.0mm x M6 Al x 8mm dia x 28mm long</td>
</tr>
<tr>
<td>92.ER.M150DC</td>
<td>Bossweld MIG Torch BZ15 x 2.5mt Direct-Con</td>
</tr>
</tbody>
</table>

**BZ15 BOSSWELD BINZEL STYLE DIRECT CONNECT MIG TORCH**

Please note:
This replacement torch must be replaced by Bossweld or an authorised service centre
Failure to do so will void your machine warranty.
# HELPFUL INFORMATION

<table>
<thead>
<tr>
<th>Filler Metal</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid Mild Steel wire</td>
<td>• Use Industry standard - copper coated ER70S-6 Steel MIG Wire. This requires a shielding gas (CO2 or argon/CO2 mix), excellent results on panel steel.</td>
</tr>
<tr>
<td>Gasless Flux cored Mild Steel Wire (Known as GS)</td>
<td>• Use Industry standard flux cored ER71T-GS Steel MIG Wire. This does not require a shielding gas. • Suitable for outside use where gas shield can be blown away or not available. • Suitable for seldom use or when bottle hire is not practical or too costly for small jobs and infrequent use. • Great on galvanised materials • Not suitable for panel steel • Leaves chalky residue. This is normal. • Producers smoke and splatters.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drive Feed Roller Selection</th>
<th>It is important that correct drive roller is used to get the best results.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Solid mild steel</td>
<td>“V” groove Roller. Roller has a small V shaped groove to guide the wire.</td>
</tr>
<tr>
<td>-Stainless steel wire</td>
<td></td>
</tr>
<tr>
<td>Flux cored wire</td>
<td>“V Knurled” roller (assists in gripping as wire is soft)</td>
</tr>
<tr>
<td>Aluminium wire</td>
<td>“U” groove Roller (assist in gripping as wire is softest)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Polarity</th>
<th>Machine can be used in both DC + and DC - modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire Type - Gas shield wire (solid or CO2 shielded flux)</td>
<td>“-” earth</td>
</tr>
<tr>
<td>Self-shielded Flux core Wire</td>
<td>“+” earth</td>
</tr>
<tr>
<td>Aluminium</td>
<td>3m only for push torch, Teflon liner, “U” groove roller, alloy tips or one size larger, argon shielding wire</td>
</tr>
</tbody>
</table>
### TROUBLE SHOOTING

<table>
<thead>
<tr>
<th>Issue</th>
<th>Possible Reason</th>
<th>Suggested Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power indicator is not lit, fan does not work and no output current</td>
<td>• Welder is not plugged into power supply</td>
<td>• Check that the welder is plugged into the 240V mains outlet and is switched on.</td>
</tr>
<tr>
<td></td>
<td>• Circuit breaker may have operated</td>
<td>• Check that the mains fuse or breaker has not operated.</td>
</tr>
<tr>
<td></td>
<td>• Main power switch may not be in the ON position</td>
<td>• Check that the main switch on the rear of the unit is in the on position.</td>
</tr>
<tr>
<td>Power indicator is lit, fan works, no output current</td>
<td>• Output connectors may be disconnected or damaged</td>
<td>• Check output connectors are connected properly and are not damaged.</td>
</tr>
<tr>
<td></td>
<td>• Welding cables or earth clamp not connected properly</td>
<td>• Check connections and that workpiece is free of paint and rust at connection point</td>
</tr>
<tr>
<td>Over temperature indicator is on, no output current</td>
<td>• Duty cycle of the unit has been exceeded.</td>
<td>• Allow the unit to cool for 20 minutes</td>
</tr>
<tr>
<td>Output current is not stable.</td>
<td>• Earth clamp connection loose</td>
<td>• Check earth clamp is connected to work piece properly.</td>
</tr>
<tr>
<td></td>
<td>• Mains Voltage is not constant</td>
<td>• Change the Main Supply to an alternative</td>
</tr>
<tr>
<td></td>
<td>• Loose welding cables</td>
<td>• Check the welding connectors are tight in the sockets.</td>
</tr>
<tr>
<td></td>
<td>• Leads reversed</td>
<td>• Check Leads are not reversed and correct +/-</td>
</tr>
<tr>
<td>Hot Welding Clamp</td>
<td>Welding clamp rated current is too small,</td>
<td>Replace with larger size welding clamp.</td>
</tr>
<tr>
<td>Excessive Spatter</td>
<td>• Wire feed speed set too high</td>
<td>• Select lower wire feed speed</td>
</tr>
<tr>
<td></td>
<td>• Voltage too high</td>
<td>• Select a lower voltage setting</td>
</tr>
<tr>
<td></td>
<td>• Wrong polarity set</td>
<td>• Select the correct polarity for the wire being used</td>
</tr>
<tr>
<td></td>
<td>• Stick out too long</td>
<td>• Bring the torch closer to the work</td>
</tr>
<tr>
<td></td>
<td>• Contaminated base metal</td>
<td>• Remove materials like paint, grease, oil, and dirt, including mill scale from base metal</td>
</tr>
<tr>
<td>Contaminated MIG wire</td>
<td>• Inadequate gas flow or too much gas flow</td>
<td>• Use clean dry rust free wire. Do not lubricate the wire with oil, grease etc</td>
</tr>
<tr>
<td></td>
<td>• Worn contact tip</td>
<td>• Check the gas is connected, check hoses, gas valve and torch are not restricted. Set the gas flow between 6-12 l/min flow rate. Check hoses and fittings for holes, leaks etc. Protect the welding zone from wind and drafts</td>
</tr>
<tr>
<td>Porosity - small cavities or holes resulting from gas pockets in weld metal</td>
<td>• Wrong gas</td>
<td>• Check that the correct gas is being used</td>
</tr>
<tr>
<td></td>
<td>• Inadequate gas flow or too much gas flow</td>
<td>• Check the gas is connected; check hoses, gas valve and torch are not restricted. Set the gas flow between 10 - 15 l/min flow rate. Check hoses and fittings for holes, leaks etc. Protect the welding zone from wind and drafts</td>
</tr>
<tr>
<td></td>
<td>• Moisture on the base metal</td>
<td>• Remove all moisture from base metal before welding</td>
</tr>
<tr>
<td></td>
<td>• Contaminated base metal</td>
<td>• Remove materials like paint, grease, oil, and dirt, including mill scale from base metal</td>
</tr>
<tr>
<td></td>
<td>• Contaminated MIG wire</td>
<td>• Use clean dry rust free wire. Do not lubricate the wire with oil, grease etc.</td>
</tr>
<tr>
<td></td>
<td>• Loose gas connection</td>
<td>Check and tighten connection.</td>
</tr>
<tr>
<td>Issue</td>
<td>Possible Reason</td>
<td>Suggested Remedy</td>
</tr>
<tr>
<td>-------</td>
<td>----------------</td>
<td>------------------</td>
</tr>
</tbody>
</table>
| Porosity - small cavities or holes resulting from gas pockets in weld metal | • Gas nozzle clogged with spatter, worn or out of shape  
• Missing or damaged gas diffuser  
• MIG torch euro connect O-Ring missing or damaged | • Clean or replace the gas nozzle  
• Replace the gas diffuser  
• Check and replace the O-Ring |
| Wire stubbing during welding | • Holding the torch too far away  
• Welding voltage set too low  
• Wire speed set too high | • Bring the torch closer to the work and maintain stick out of 5-10mm  
• Increase the voltage  
• Decrease the wire feed speed |
| Lack of Fusion – failure of weld metal to fuse completely with base metal or a proceeding weld bead | • Contaminated base metal  
• Not enough heat input  
• Improper welding technique | • Remove materials like paint, grease, oil, and dirt, including mill scale from base metal  
• Select a higher voltage range and/or adjust the wire speed to suit  
Keep the arc at the leading edge of the weld pool. Gun angle to work should be between 5 & 15° Direct the arc at the weld joint Adjust work angle or widen groove to access bottom during welding. Momentarily hold arc on side walls if using weaving technique |
| Excessive Penetration – weld metal melting through base metal | • Too much heat | • Select a lower voltage range and/or adjust the wire speed to suit  
Increase travel speed |
| Lack of Penetration – shallow fusion between weld metal and base metal | Poor in incorrect joint preparation  
• Not enough heat input  
• Contaminated base metal | • Material too thick. Joint preparation and design needs to allow access to bottom of groove while maintaining proper welding wire extension and arc characteristics Keep the arc at the leading edge of the weld pool and maintain the gun angle at 5 & 15° keeping the stick out between 5-10mm  
• Select a higher voltage range and/or adjust the wire speed to suit  
Reduce travel speed  
• Remove materials like paint, grease, oil, and dirt, including mill scale from base metal |
| No gas flow | • Gas Regulator is off or pressure too low  
• Something caught in the valve  
• Solenoid valve is damaged, | • Check Regulator  
• Remove  
• Contact BOSSWELD hotline |
## MIG WIRE FEED TROUBLESHOOTING

The following chart addresses some of the common WIRE FEED problems during MIG welding.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Possible Reason</th>
<th>Suggested Remedy</th>
</tr>
</thead>
</table>
| Inconsistent / interrupted wire feed | • Adjusting wrong dial  
• Wrong polarity selected  
• Incorrect wire speed setting  
• Voltage setting incorrect  
• MIG torch lead too long  
• MIG torch lead kinked or too sharp angle being held  
• Contact tip worn, wrong size, wrong type  
• Liner worn or clogged (the most common causes of bad feeding)  
• Blocked or worn inlet guide tube  
• Wire misaligned in drive roller groove  
• Incorrect drive roller size  
• Wrong type of drive roller selected  
• Worn drive rollers  
• Drive roller pressure too high  
• Too much tension on wire spool hub  
• Wire crossed over on the spool or tangled  
• Contaminated MIG wire | • Be sure to adjust the wire feed and voltage dials for MIG welding. The amperage dial is for MMA and TIG welding mode.  
• Select the correct polarity for the wire being used - see machine set up.  
• Adjust the wire feed speed  
• Adjust the voltage setting Small diameter wires and soft wires like aluminium don't feed well through long torch leads - replace the torch with a lesser length torch.  
• Remove the kink, reduce the angle or bend  
• Replace the tip with correct size and type  
• Try to clear the liner by blowing out with compressed air as a temporary cure  
• Clear or replace the inlet guide tube  
• Locate the wire into the groove of the drive roller  
• Fit the correct size drive roller e.g. 0.8mm wire requires 0.8mm drive roller.  
• Fit the correct type roller (e.g. knurled rollers needed for flux cored wires).  
• Replace the drive rollers Can flatten the wire electrode causing it to lodge in the contact tip - reduce the drive roller pressure.  
• Reduce the spool hub brake tension  
• Remove the spool untangle the wire or replace the wire.  
• Use clean dry rust free wire. Do not lubricate the wire with oil, grease etc. |

For Further Tips and Information please visit Bossweld TV

Scan here to visit Bossweld TV
OTHER PRODUCTS IN OUR RANGE

• ELECTRODES
• TIG RODS
• WELDING HELMETS
• WELDING MACHINES
• TORCH SPARE PARTS
• WELDING ACCESSORIES

• MIG WIRE
• GAS EQUIPMENT
• WELDING SAFETY
• MIG TORCHES
• TIG TORCHES
• WELDING CABLE