

TRADE PROFESSIONAL

POWERPULSE 250

DUAL PULSE SYNERGIC MST INVERTER WELDER

MANUAL

M

MIG

S

STICK

T

TIG



BOSSWELD

WELD LIKE A BOSS

Thank you for choosing a BOSSWELD POWERPULSE 250PFC Inverter MST 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 POWERPULSE 250 is a new inverter-based MIG/MMA/TIG Welding machine with Synergic Programs and Dual pulse functions. The MIG function allows you to weld with Gas Shielded wire applications giving excellent, professional welding results. Easy step-less adjustment of voltage and wire feed coupled with integrated digital meters allows easy setting of welding parameters. The POWERPULSE 250 features MIG welding with Synergic welding programs designed for ease of use with your selected gas mixture. The operator selects the gas mixture and wire diameter they are using then simply start welding. Once this is done the operator can make fine adjustments to the voltage for even greater control of the weld pool. The added Lift-Arc DC TIG capability delivers perfect arc ignition every time and a remarkably smooth stable arc produces high quality TIG welds. TIG functionality includes adjustable Down Slope & Post Gas as well as being gas solenoid-valve equipped. The stick welding (MMA) capability delivers easy electrode welding with high quality results, including cast Iron, stainless and low hydrogen. An additional feature is the Spool gun ready function that allows the simple connection of Spool Gun for the use of thin or softer wires that don't have the column strength to feed through MIG torches, such as aluminum wire. In the JOB mode, 100 different JOB records can be stored and called , improve the quality of welding process .

Arc welding with the POWERPULSE 250 machine t is suitable for all positions welding for various plates made of stainless steel, carbon steel, alloyed steel etc. Applications applied to pipe installment, petrochemical, architecture equipment, car repair, bicycle repair, handicraft and common steel fabrication.

The POWERPULSE 250 machines has built-in automatic protection functions to protect the machines from over-voltage, over-current and over-heat. If any one of the above problems happens, the alarm lamp on the front panel will light up and output current will be shut off automatically for the machine to protect itself and prolong the equipments life!



M **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

S **STICK**



- Easiest process to learn
- Best choice for quick repairs
- Slower than MIG welding
- Forgiving in dirty/rusty environments
- Not recommended for thin sheet metal welding

METAL TYPES
Mild steel, stainless steel & cast iron

T **TIG**



- Gives a better weld finish
- Accurate heat control
- Considered the most challenging process to learn
- Good way to weld thin material
- Argon gas is required

METAL TYPES
Mild steel, stainless steel & aluminium

| CONTENTS | PAGE |
|---|--------------|
| WARRANTY | 4 |
| BOX CONTENTS | 5 |
| WARNINGS | 6-8 |
| MACHINE CARE / SAFETY INSTRUCTIONS | 9 |
| WORK AREA SAFETY | 10 |
| MAINTENANCE & DISPOSAL / GAS BOTTLE | 11 |
| FRONT & REAR PANEL LAYOUT | 12 |
| MACHINE INSIDE | 13 |
| MACHINE CONTROLS PANEL | 14-18 |
| DUAL PULSE FUNCTION | 19 |
| WIRE SPOOL & WIRE FEED SET UP | 14 |
| MIG TORCH SETUP | 15 |
| LINER INSTALLATION / REPLACEMENT | 16 |
| DRIVE ROLLER SIZE | 25 |
| 2T / 4T TRIGGER CONTROL INFORMATION | 17 |
| WAVE CONTROL | 17 |
| MIG TORCH AND CONSUMABLE CARE | 18 |
| STICK / MMA WELDING SETUP | 19-20 |
| GENERAL MMA WELDING | 21 |
| GASLESS MIG WELDING SETUP | 22-24 |
| GAS MIG WELDING SETUP | 24-27 |
| GENERAL MIG WELDING | 28-31 |
| TIG WELDING SETUP | 32-33 |
| LIFT ARC TIG | 34 |
| TUNGSTEN PREPARATION | 35 |
| GENERAL TIG WELDING | 36 |
| BZ24 MIG TORCH PARTS BREAK DOWN | 37 |
| 26 TIG TORCH BREAKDOWN | 38 |
| HELPFUL INFORMATION & TROUBLE SHOOTING | 39-42 |



WARRANTY

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 899 710 for over the phone assistance.
- If the machine is not operational then return the item to the place of purchase.

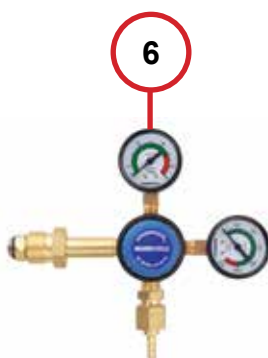
BOSSWELD MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHERS, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.



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

BOSSWELD POWERPULSE 250PFC Inverter MIG/MMA Welder Box Contents

1. BOSSWELD POWERPULSE 250PFC Inverter DC MIG Welder
2. 3 metre 36 Series MIG Torch
3. Welding cable with electrode holder
4. Earth cable with earth clamp
5. Gas Hose
6. Dual Stage Argon Regulator
7. Torch Spares
8. Drive Roller (spare – not shown)
9. Operating Manual (not shown)





ELECTRIC SHOCK CAN KILL.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and internal machine circuits are also live when power is on. In Mig/Mag welding, the wire, drive rollers, wire feed housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is dangerous.

- Never touch live electrical parts.
- Wear dry, hole-free gloves and clothes to insulate your body.
- Be sure to install the equipment correctly and ground the work or metal to be welded to a good electrical (earth) ground according to the operation manual.
- The electrode and work (or ground) circuits are electrically “hot” when the machine is ON. Do not touch these “hot” parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
- In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically “hot”.
- Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.
- Be Careful when using the equipment in small places, falling-off and wet circumstance.
- Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
- Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
- Never dip the electrode in water for cooling.
- Never simultaneously touch electrically “hot” parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
- When working above the floor level, use a safety belt to protect yourself from a fall should you get an electric shock!



ARC RAYS: Harmful to people’s eyes and skin.

Arc rays from the welding process produce intense visible and invisible ultraviolet and infrared rays that can burn eyes and skin.

- Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding.
- Use suitable clothing made from durable flame-resistant material to protect your skin and that of your coworkers from the arc rays.
- Protect other nearby personnel with suitable, non-flammable screening and /or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.



SELF-PROTECTION

- Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.
- Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.



WELDING SPARKS can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to explode. Flying sparks from the welding arc, hot work piece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding

- Remove fire hazards material from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.
- Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situation.
- When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been “cleaned”.
- Vent hollow castings or containers before heating, cutting or welding. They may explode.

- Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuff less trousers, high shoes and a cap over your hair. Wear earplugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail



Gas Cylinders and Gas Build up



- Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.
- Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.
- Cylinders should be located:
 - Away from areas where they may be struck or subjected to physical damage.
 - At a safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
- Never allow the electrode, electrode holder or any other electrically “hot” parts to touch a gas cylinder.
- Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Because gas cylinders are normally part of the welding process, be sure to treat them carefully. **CYLINDERS can explode if damaged.**

- Protect gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames sparks, and arcs.
- Insure cylinders are held secure and upright to prevent tipping or falling over.
- Never allow the welding electrode or earth clamp to touch the gas cylinder, do not drape welding cables over the cylinder.
- Never weld on a pressurised gas cylinder, it will explode and kill you.
- Open the cylinder valve slowly and turn your face away from the cylinder outlet valve and gas regulator.

The build up of gas can causes a toxic environment, deplete the oxygen content in the air resulting in death or injury. Many gases used in welding are invisible and odorless.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.



Electric and Magnetic Fields.

Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). The discussion on the effect of EMF is ongoing in the entire world. Up to now, no material evidences show that EMF may have effects on health. However, the research on the effect of EMF is still ongoing. Before any conclusion, we should minimize exposure to EMF as few as possible.

In order to minimize EMF, we should use the following procedures:

- Route the electrode and work cables together – Secure them with tape when possible.
- All cables should be put away and far from the operator.
- Never coil the power cable around your body.
- Make sure welding machine and power cable to be far away from the operator as far as possible according to the actual circumstance.
- Connect the work cable to the workpiece as close as possible to the area being welded.
- The people with heart-pacemaker should be away from the welding area.



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.



MACHINE CARE / SAFETY

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

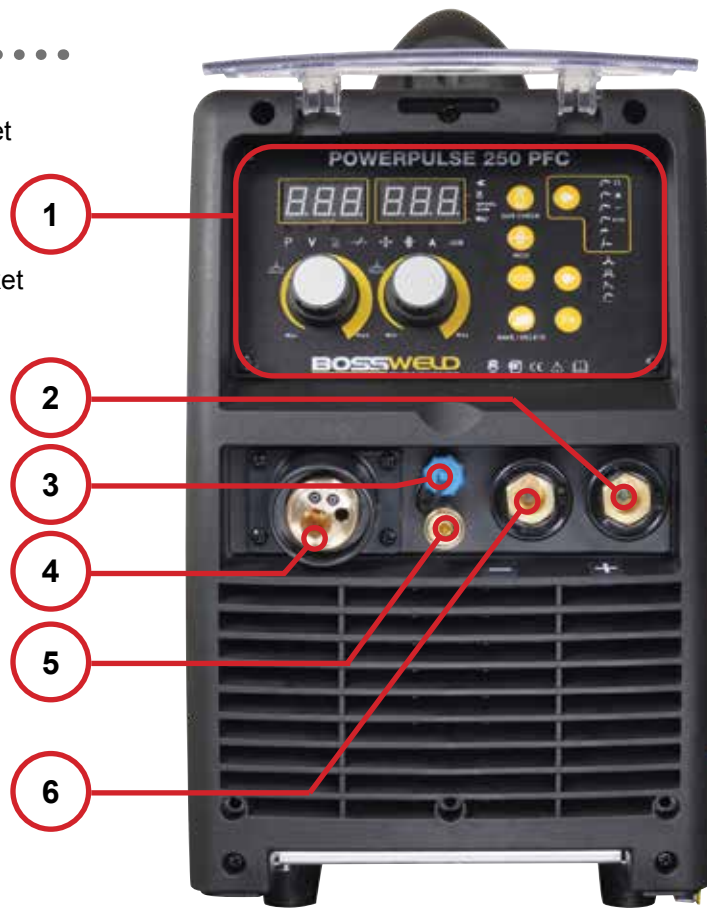
Recommended procedure is as follows:

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.

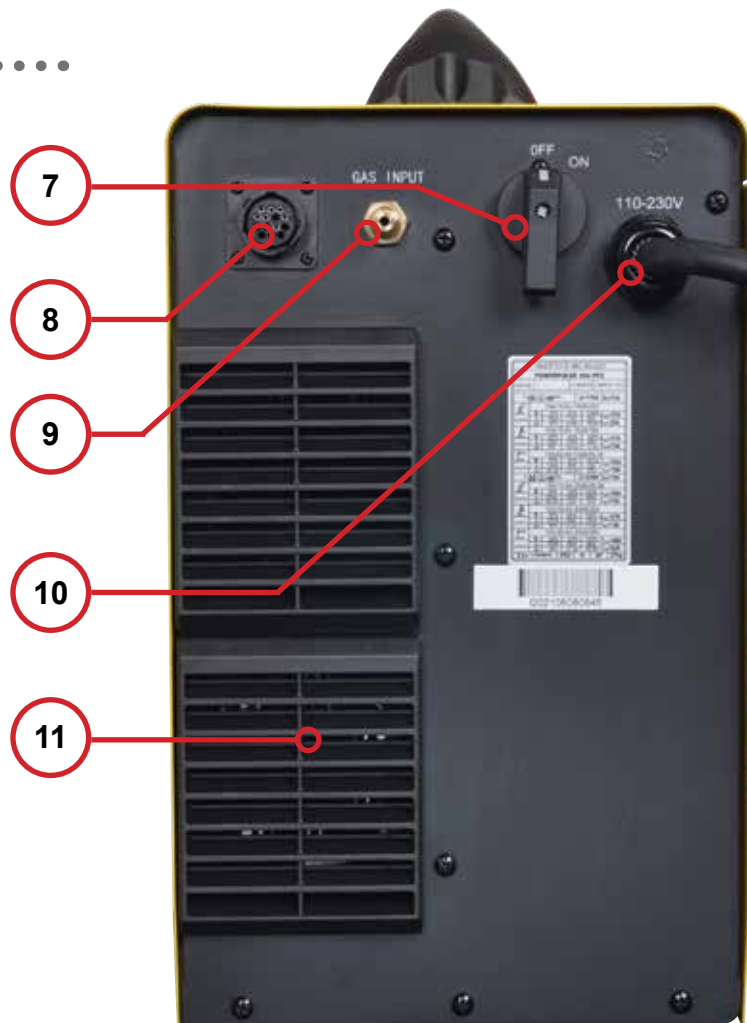
FRONT PANEL

1. Control Panel
2. Positive Output Connection Socket
3. Remote Connection Plug (9pin)
4. Euro Torch Connection
5. Quick Connect Gas Valve
6. Negative Output Connection Socket



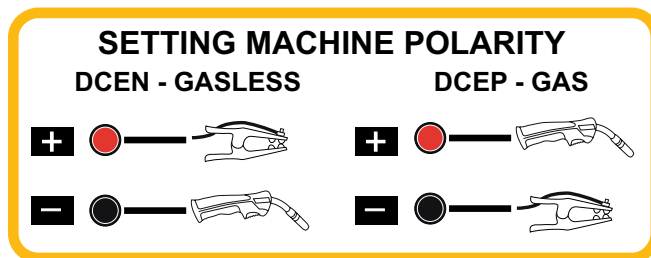
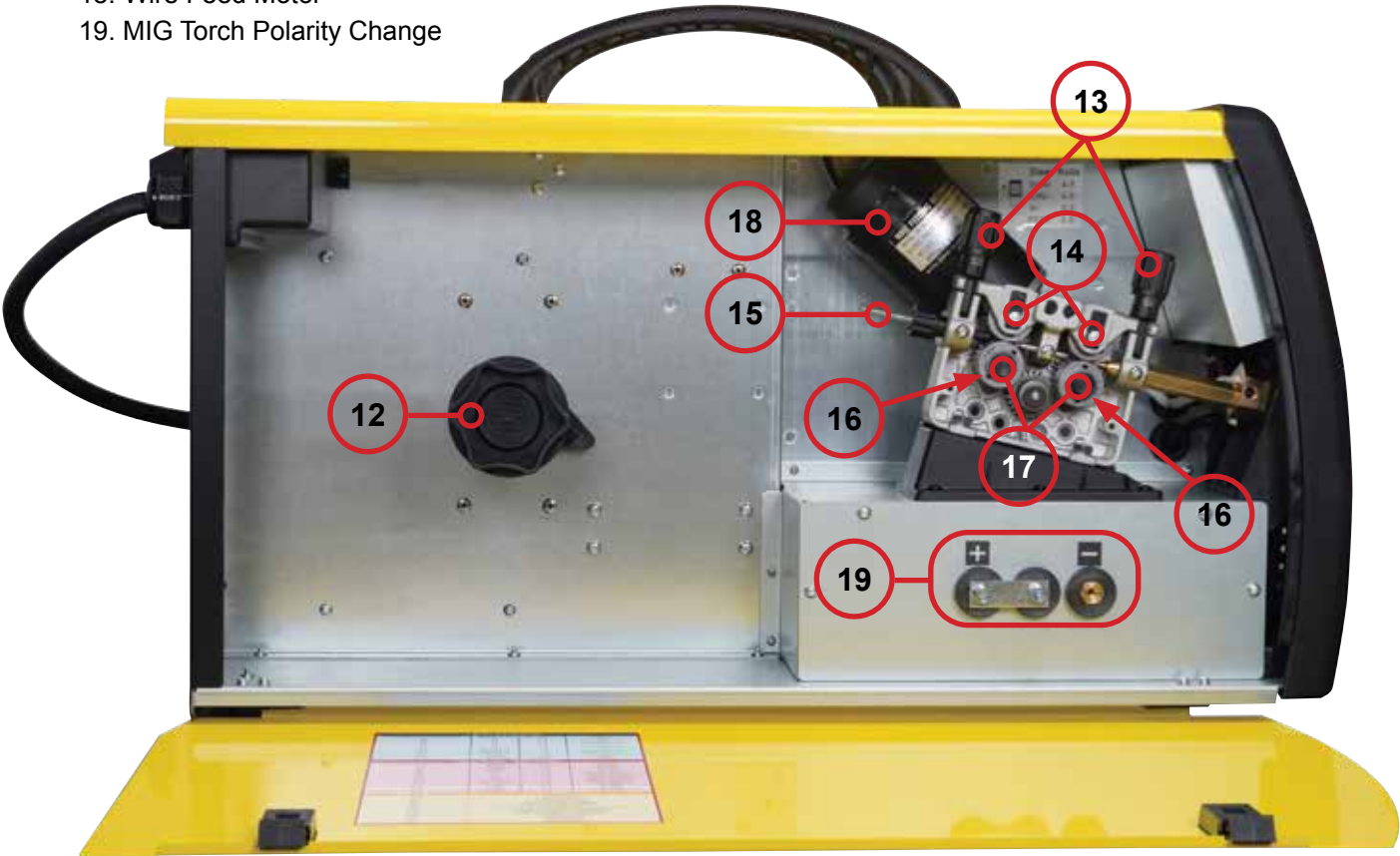
REAR PANEL

7. Mains Power Switch
8. Water Cooling connector
9. Gas Input
10. 240V AC Mains Power Cord
11. Cooling Fan



SIDE PANEL (DOOR OPEN)

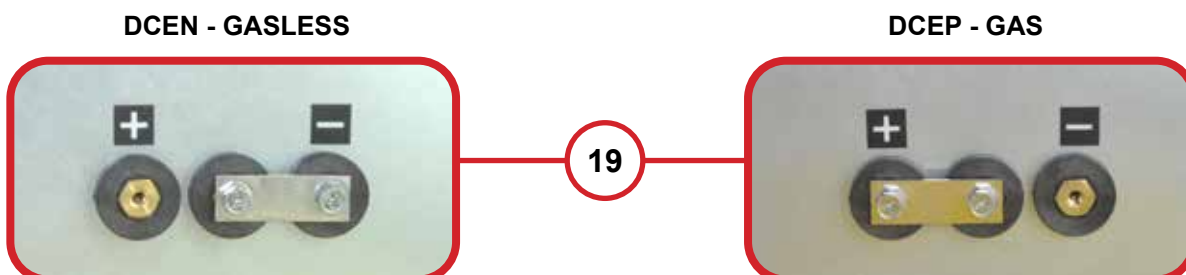
- 12. Spool Holder
- 13. Wire Feed Tensioning Adjustment
- 14. Wire Tension Arm and Support Roller
- 15. Wire Inlet
- 16. Drive Roller
- 17. Drive Roller Retainer Nut
- 18. Wire Feed Motor
- 19. MIG Torch Polarity Change

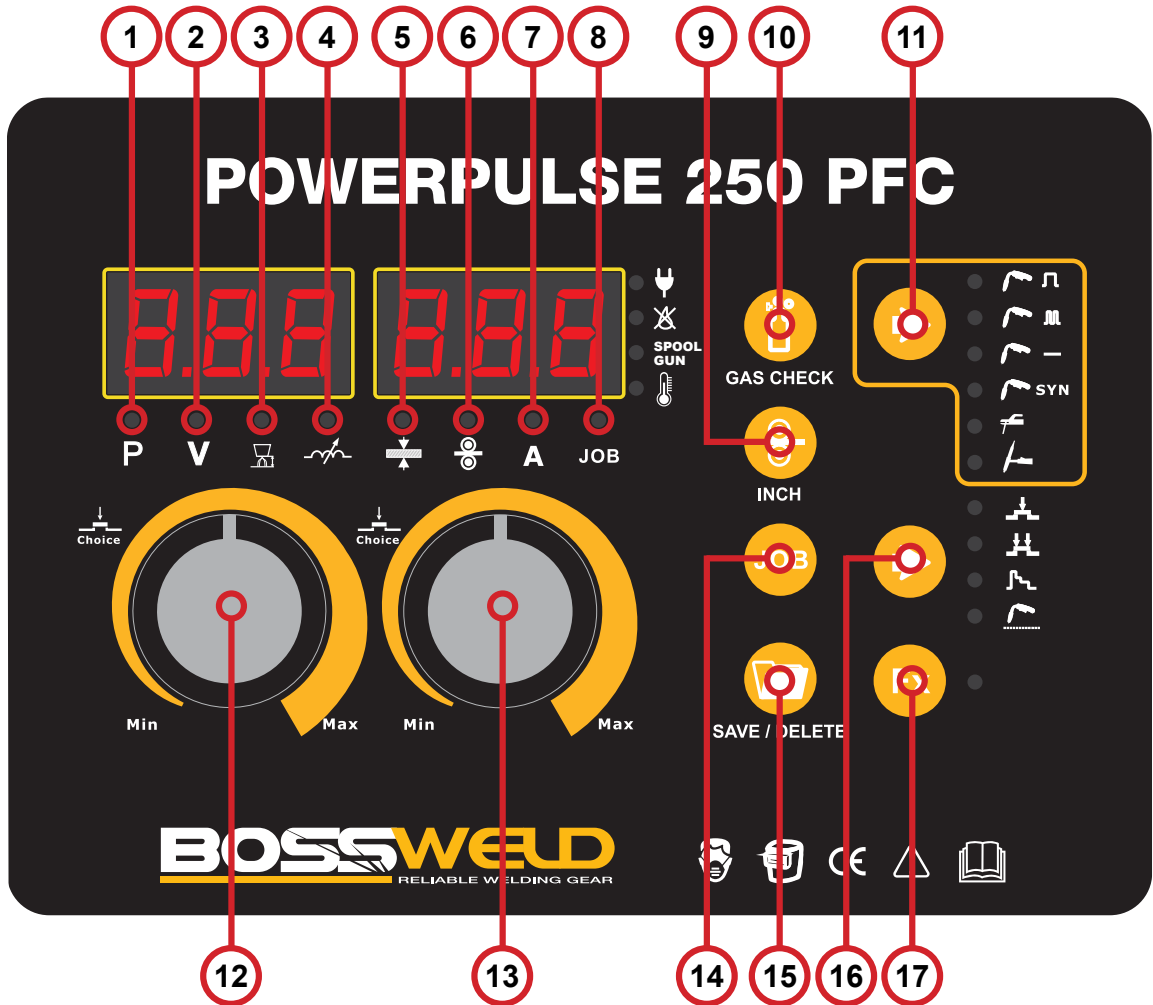


NOTE:

For flux cored wire, connect the Polar conversion line to Negative (-) Welding Output Terminal, connect the earth clamp to Positive (+) Welding Output Terminal;

For ordinary wire, connect the Polar conversion line to Positive (+) Welding Output Terminal, connect the earth clamp to Negative (-) Welding Output Terminal





- 1** **SYNERGIC PROGRAMS INDICATOR**
 Select from a list of Preset programs, This will set the machine for the correct wire size, wire type and gas being used, Program number will be displayed to the left digital display
- 2** **WELDING VOLTS INDICATOR**
 Value will be displayed on the left digital display.
- 3** **ARC LENGTH INDICATOR**
 Adjustable from -10.0 to +10.0
 The higher the value, the longer arc length, The lower the value the shorter the arc length. Value will be displayed on the left digital display.
- 4** **INDUCTANCE INDICATOR**
 Adjustable from -10.0% to +10.0%
 Value will be displayed on the left digital display.
- 5** **MATERIAL THICKNESS INDICATOR**
 Value will be displayed on the right digital display.
 This will vary depending on synergic program selection.
- 6** **WIRE SPEED INDICATOR**
 Value will be displayed on the right digital display.
- 7** **WELDING CURRENT INDICATOR**
 Value will be displayed on the right digital display.
- 8** **JOB INDICATOR**
 Saved job numbers will be displayed to the right digital display, Use R parameter dial (13)

9 WIRE INCH BUTTON
Press and hold to feed wire



10 GAS CHECK BUTTON
Press and hold to check gas flow



11 WELDING PROCESS BUTTON

- MIG-MAG Pulse Synergic
- MIG-MAG Dual Pulse Synergic
- MIG-MAG Manual
- MIG-MAG Synergic
- MMA
- TIG



12 L PARAMETER SELECT / ADJUSTMENT KNOB
Use this knob to select functions and adjust parameters



13 R PARAMETER SELECT / ADJUSTMENT KNOB
Use this knob to select functions and adjust parameters



14 JOB BUTTON
In the JOB mode, 100 different JOB records can be stored and called, Improve the quality of welding process.



15 PROGRAM SAVE / DELETE
Save current setting you need to press Job button first and then select a job number that is not being used this will be indicated by - - - on the left digital display, job number is displayed on the right digital display, or delete programmed job number



16 TRIGGER MODE SELECT BUTTON

- 2T

1. Press the trigger and Hold, The set pre-gas flow starts and the arc starts and will upslope to the amperage selected on the amperage dial.
2. When you want to finish the weld, release the trigger and the amperage will begin to downslope at the rate you have selected on the downslope dial, If you selected zero the arc will stop as soon as you release the trigger.



- 4T

1. Press the trigger and Hold, The set preflow gas starts and the arc starts.
2. Release the trigger and the amperage will upslope to the amperage selected on the amperage dial.
3. When you want to finish the weld, press and hold the trigger and the amperage will begin to downslope at the rate you have selected on the downslope dial, amperage will remain at this level until you release the trigger.
4. Once you have released the trigger the arc will stop and the postflow gas will continue for a pre set amount of time

- S4T

1. Press the trigger and Hold, The set preflow gas starts and the arc starts.

- SPOT WELD

1. Hold the torch in a vertical position above the job
2. Press and release the trigger
3. Hold the torch in position and wait until post gas flow end

17



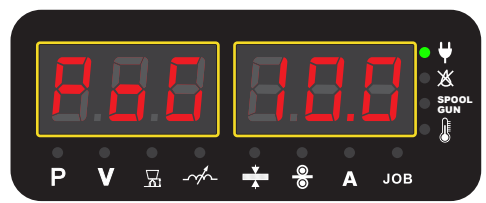
FUNCTION BUTTON

Press to scroll through weld function settings
Parameters will be displayed to both digital display
See below for function settings



PRE GAS

Selection for gas flow time prior to the arc starting
Adjustable from 0 - 5 sec



POST GAS

Selection for gas flow time after the arc finishes.
Adjustable from 0 - 10 sec



SLOW FEED TIME

Used to regulate the speed of wire feeding increasing.
Adjustable from 0 - 10 sec



BURNBACK

Control sets the amount of wire to 'burn back' after you release the trigger of your torch.
Adjustable from 0 - 10



SPOT WELD TIME

List the time during which welding current is applied to the metal sheets
Adjustable from 0 - 10 sec



DELTA PULSE CURRENT

The difference between base current and peak current in pulse welding.
Adjustable from 20-200Amps



DUAL PULSE FREQUENCY

Set pulse frequency, regulating the value of time T, ripple pattern of density regulation.
Adjustable from 0.5 - 3.0Hz



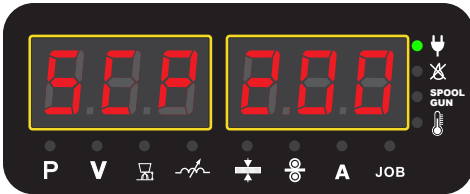
DUAL PULSE DUTY

Set strong pulse time (peak) for penetration and low-frequency cycle ratio (cooling)
Adjustable from 10 - 90%



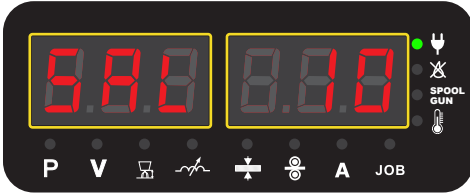
DUAL PULSE BASE CURRENT PERCENT

Sets the current of the low/ base pulse.
Adjustable from -10 - +10



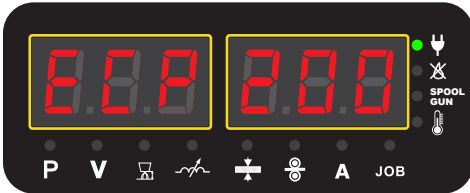
START CURRENT PERCENT

In 4T trigger mode, sets a welding current 10-200% of the main welding current activated when the trigger is held on to 'latch' the trigger before the main weld current is started. When trigger is released, the current will go through the upslope period if it is set, to the main welding current
Adjustable from 10 - 200%



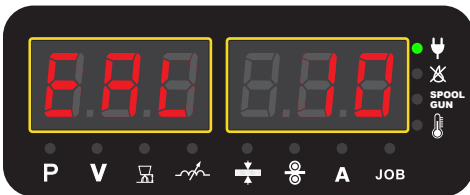
START CURRENT ARC LENGTH

Exists in S4T welding mode, excessive arc length will lead to spatters and unsightly welds, so it is necessary to set reasonable quantity.
Adjustable from -10 - +10



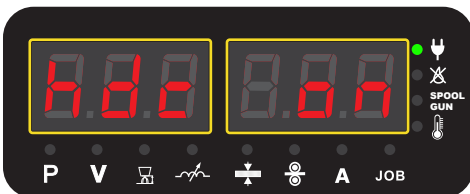
END CURRENT PERCENT

In 4T trigger mode, sets a welding current 10-200% of the main welding current activated when the trigger is held on to 'unlatch' the trigger before the weld is finished. If downslope is set, the current will go through the downslope period before going to the end current set.
Adjustable from 10 - 200%



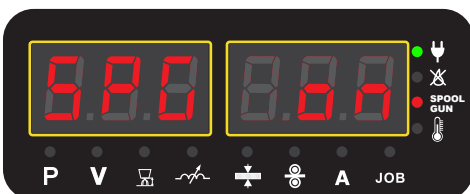
END CURRENT ARC LENGTH

Exists in S4T welding mode, excessive arc length will lead to spatters and unsightly welds, so it is necessary to set reasonable quantity.
Adjustable from -10 - +10



HYDRO-COOLING

Select water cooling ON or OFF



SPOOL GUN

Spool Gun ON or OFF



HOT START

Electrode preheating on the weld start. Makes electrode priming easier and prevents it from sticking when cold
Adjustable from 0 - 10



ARC FORCE

Also called Dig and Arc Control. Gives a power source variable additional amperage during low voltage (short arc length) conditions. Helps avoid "sticking" stick electrodes when a short arc length is used.
Adjustable from 0 - 10



DOWN SLOPE






Selection for the transition time from Peak Amperage to Finish Amperage.
Adjustable from 0 - 10






FUNCTION BUTTON

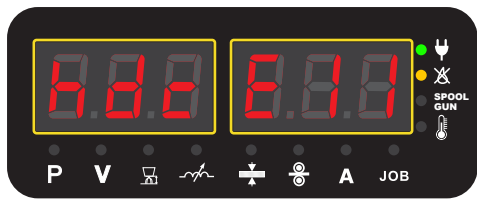
Press to the function button to exit settings

JOB SAVE -

- 1 Set Job parameters (welding function, welding mode, welding parameters, etc)
- 2 Press The JOB button  and display will show 
- 3 Use the R adjustment knob  to select a job number that is not being used this will be indicated by - - - on the left digital display, job number is displayed on the right digital display
- 4 Press the Save button 
- 5 Press The JOB button  to exit

JOB RECALL

- 1 Press The JOB button 
- 2 Select the required job number using the R adjustment knob  The display screen will flash showing the job number selected, and you can now weld with the preset parameters
- 3 Press The JOB button  to exit if you wish to weld with different parameters



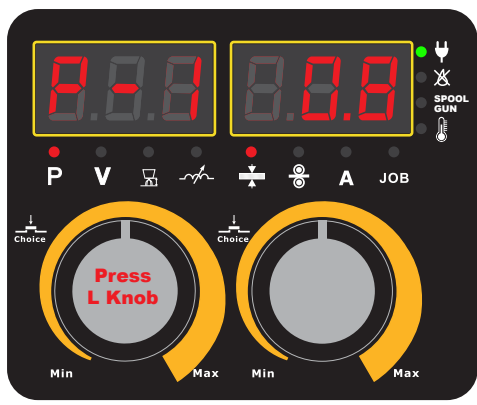
WATER COOLING SYSTEM ERROR INDICATOR

When using the integrated water cooler, the system is equipped with a pressure sensor. If the coolant pressure is insufficient, this indicator will light and the welding output will not be able to be active, in order to protect the torch and cooling system.



ALARM INDICATOR

Lights when over voltage, over current, input phase loss or electrical overheating (due to exceeding duty cycle) is detected and protection is activated. When protection is activated, welding output will be disabled until the safety system senses the overload has reduced sufficiently and indicator lamp goes out. May also trigger if machine experiences an internal power circuit failure.



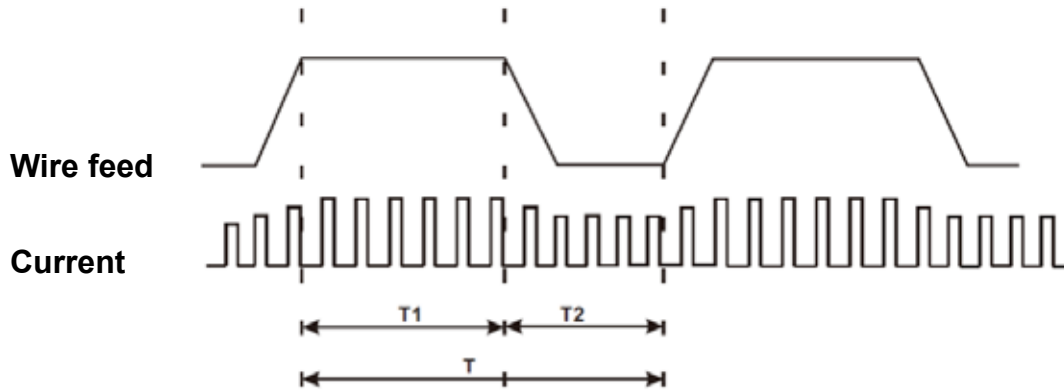
SYNERGIC FUNCTION

This makes the setup of MIG welding more simple, the operator simply sets the welding current like MMA or TIG welding and the machine calculates the optimal voltage and wire speed for the material type, wire type and size and shielding gas being used. Obviously other variables such as welding joint type and thickness, air temperature affect the optimal voltage and wire feed setting, so the program provides a voltage fine tuning function for the synergic program selected. Once the voltage is adjusted in a synergic program, it will stay fixed at this variation when the current setting is changed. To reset the voltage for a synergic program back to factory default, change to another program and back again.

The synergic programs are given a number from 1-17, this is accessed on the L display pressing the L knob, (indicator 'P' Light will come on). To select the relevant program for the welding application, check the chart printed on the inside door of the welding machine or further on in this manual.

Dual pulse function introduction

Dual pulse welding in single pulse welding with low frequency modulated pulse, low frequency pulse frequency 0.5-3.0Hz. Single pulse compared to dual pulse has the advantages of: without welding swing, weld automatic fish squamous and fish scale pattern density, the depth can be adjusted; to be more precise control of heat input. During the low current, cooling the molten pool, reduce workpiece deformation, reduce the hot cracking tendency; and periodically stirring molten pool, grain refinement, the hydrogen gas from the molten pool in precipitation to reduce the porosity and reduce welding defects. Dual pulse reference waveform as shown below:



DUAL PULSE FREQUENCY

Set low frequency pulse frequency, as shown in Figure regulating the value of time T, namely, fish scale pattern of density regulation.

DUAL PULSE DUTY

Dual pulse duty set strong pulse group time T1 and low-frequency cycle T ratio, namely the regulation of the proportion of the fish scale pattern in the protruding part and the groove.

| Synergic MIG Parameter | | | | |
|-------------------------------|-------------|------------------|-------------------------|--------------------------|
| PROGRAM NUMBER | WIRE TYPE | WIRE Φ (mm) | MATERIAL THICKNESS (mm) | GAS |
| P1 | Solid Fe | 0.8 | 1.0 > 4.0 | CO ₂ |
| P2 | Solid Fe | 0.8 | 0.9 > 4.7 | 80%Ar+20%CO ₂ |
| P3 | Solid Fe | 0.9 | 1.3 > 5.1 | CO ₂ |
| P4 | Solid Fe | 0.9 | 0.7 > 3.8 | 80%Ar+20%CO ₂ |
| P5 | Solid Fe | 1 | 0.9 > 5.8 | 80%Ar+20%CO ₂ |
| P6 | Solid Fe | 1 | 1.2 > 9.1 | CO ₂ |
| P7 | Solid Fe | 1.2 | 1.3 > 7.2 | CO ₂ |
| P8 | Solid Fe | 1.2 | 1.1 > 5.0 | 80%Ar+20%CO ₂ |
| P9 | Flux.c.w Fe | 1 | 1.1 > 8.0 | CO ₂ |
| P10 | Flux.c.w Fe | 1.2 | 1.1 > 8.0 | CO ₂ |
| P11 | SS ER316 | 1 | 1.1 > 5.8 | 98%Ar+2%CO ₂ |
| P12 | SS ER316 | 1.2 | 1.9 > 12.0 | 98%Ar+2%CO ₂ |
| P13 | Cu Si3 | 1 | 0.7 > 4.3 | Ar100% |
| P14 | Cu Si3 | 1.2 | 1.1 > 3.3 | Ar100% |
| Synergic Dual Pulse Parameter | | | | |
| PROGRAM NUMBER | WIRE TYPE | WIRE Φ (mm) | MATERIAL THICKNESS (mm) | GAS |
| P1 | AlMg5 | 0.9 | 0.8 > 6.0 | Ar100% |
| P2 | AlMg5 | 1 | 1.0 > 8.0 | Ar100% |
| P3 | AlMg5 | 1.2 | 0.7 > 11.0 | Ar100% |
| P4 | AlSi5 | 1 | 0.7 > 7.8 | Ar100% |
| P5 | AlSi5 | 1.2 | 0.8 > 8.0 | Ar100% |
| P6 | Al99.5 | 1.2 | 0.7 > 8.8 | Ar100% |
| P7 | Fe | 0.8 | 0.8 > 6.4 | 80%Ar+20%CO ₂ |
| P8 | Fe | 0.9 | 1.3 > 9.7 | 80%Ar+20%CO ₂ |
| P9 | Fe | 1 | 0.8 > 8.6 | 80%Ar+20%CO ₂ |
| P10 | Fe | 1.2 | 1.0 > 7.1 | 80%Ar+20%CO ₂ |
| P11 | SS ER316 | 1 | 1.0 > 8.5 | 98%Ar+2%CO ₂ |
| P12 | SS ER316 | 1.2 | 1.1 > 7.8 | 98%Ar+2%CO ₂ |
| P13 | Flux.c.w Fe | 1.2 | 2.6 > 11.2 | 80%Ar+20%CO ₂ |
| P14 | Flux.c.w SS | 1.2 | 1.9 > 17.4 | 80%Ar+20%CO ₂ |
| P15 | CuSi3 | 1 | 0.8 > 8.9 | Ar100% |
| P16 | CuSi3 | 1.2 | 1.1 > 8.9 | Ar100% |
| P17 | CuAl8 | 1.2 | 1.1 > 8.9 | Ar100% |

MMA FUNCTION - FRONT PANEL DESCRIPTION



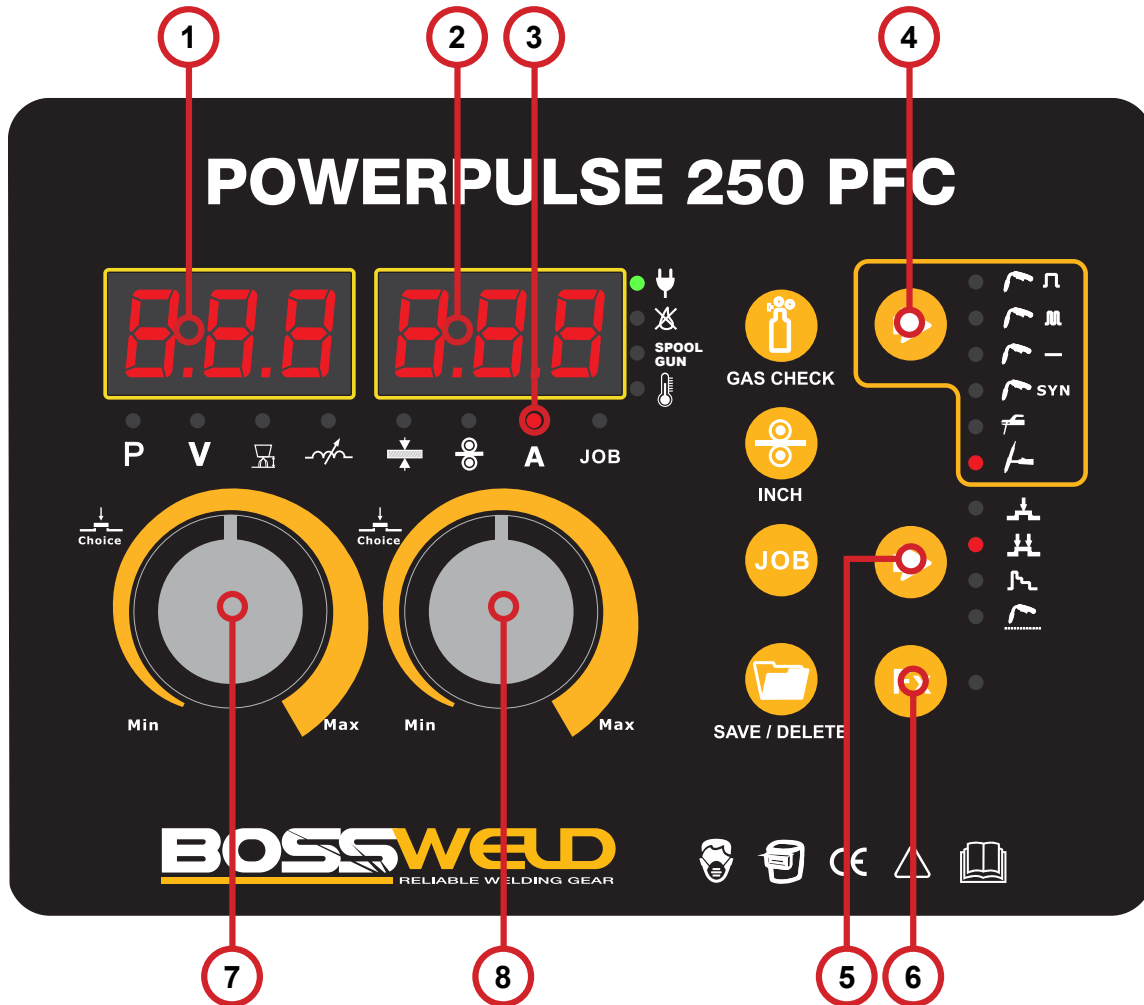
PANEL DESCRIPTION

1. Hot Start / Arc Force Parameter Code Display.
2. Welding Current.
3. Welding amperage Indicator Light.
4. MMA Function Select.
5. Hot Start / Arc force Parameter Select press to Enter and Exit.
6. Hot Start / Arc force Code Select turn Knob Left or Right.
7. Welding Current / Hot Start / Arc force, Turn Knob Left or Right to set to desired setting.

Set up installation for MMA Welding

1. Connection of Output Cables
 Connection of Output Cables Two sockets are available on this welding machine. For MMA welding the electrode holder is shown be connected to the positive socket, while the earth lead (work piece) is connected to the negative socket, this is known as DCEP. However various electrodes require a different polarity for optimum results and careful attention should be paid to the polarity, refer to the electrode manufacturers information for the correct polarity.
 DCEP: Electrode connected to "+" output socket.
 DCEN: Electrode connected to "-" output socket.
1. Turn the power source on and press the TIG/MMA/MIG button to select the MMA function.
3. Set the welding current relevant to the electrode type and size being used as recommended by the electrode manufacturer.
4. Set the Hot Start and Arc Force as required using the button and knobs.
5. Place the electrode into the electrode holder and clamp tight.
6. Strike the electrode against the work piece to create and arc and hold the electrode steady to maintain the arc.

TIG FUNCTION - FRONT PANEL DESCRIPTION



PANEL DESCRIPTION

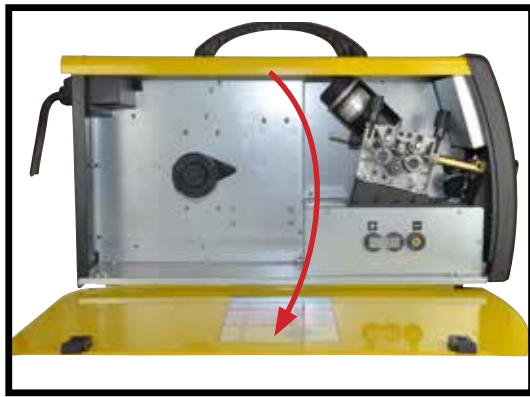
1. Down Slope / Hydro-cooling Parameter Code Display.
2. Welding Current. / Down Slope Time / Hydro-cooling ON/OFF Display
3. Welding Current Indicator Light
4. TIG Function Select.
5. 2T / 4T Trigger Select.
6. Down Slope / Hydro-cooling Parameter Select press to Enter and Exit.
7. Down Slope / Hydro-cooling Code Select turn Knob Left or Right.
8. Welding Current. / Down Slope Time / Hydro-cooling, Turn Knob Left or Right to set to desired setting.

Set up installation for DC TIG Welding

1. Insert the earth cable plug into the positive socket on the front of the machine and tighten it.
2. Plug the TIG torch into the negative socket on the front panel, and tighten it.
3. Connect the gas line of TIG Gun to outlet gas connector on the front of the machine . Check for Leaks!
4. Connect the control cable of torch switch to 9 pin socket on the front of the machine ..
5. Connect the gas regulator to the Gas Cylinder and connect the gas line to the Gas Regulator. Check for Leaks!
6. Connect the gas line to the machine inlet gas connector via the quick push lock connector located on the rear panel. Check for Leaks!
7. Connect the power cable of welding machine with the output switch in electric box on site
8. Carefully open the valve of the gas cylinder, set the required gas flow rate.
9. Select TIG function on the front panel.
10. Set torch operation 2T / 4T.
 - When 2T operation is selected press trigger Gas starts, touch and lift arc start, release trigger Gas and Arc stops.
 - When 4T operation is selected press and release trigger Gas starts, touch and lift arc start, press and release trigger Gas and Arc stops.

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.

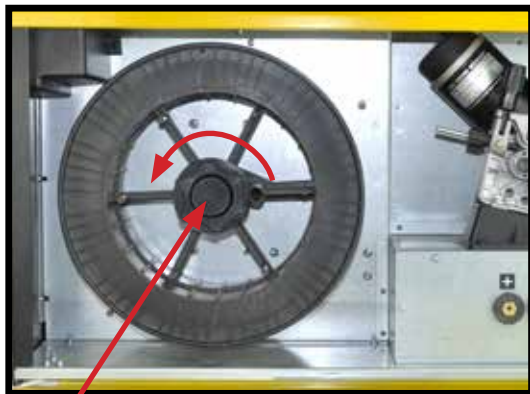
SET UP OF WIRE SPOOL & WIRE FEED UNIT



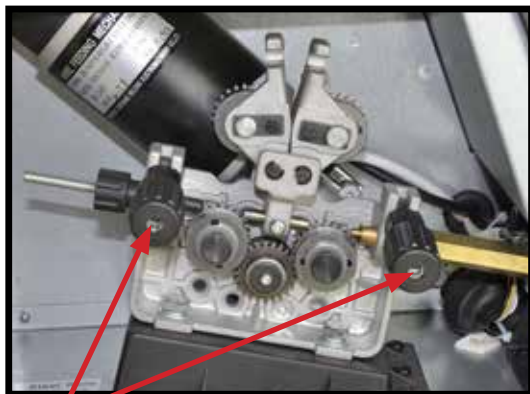
1 Open the side door of the machine.



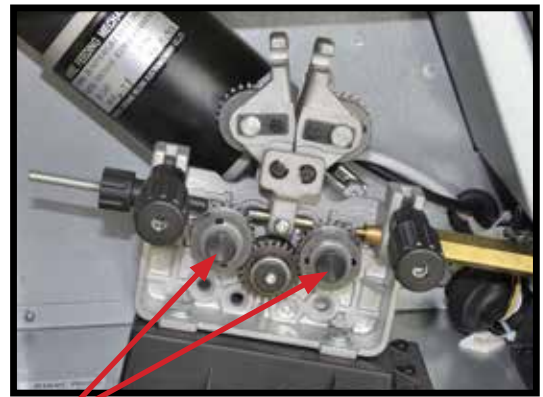
2 Remove the Spool Hub Nut and place spool of wire on Spool Hub.
Note: Wire to roll from over spool into wire feeder



3 Replace Spool Hub Nut and adjust firmly - without too much pressure.



4 Release the Wire Feed Tensioning Knobs by pulling them towards yourself.



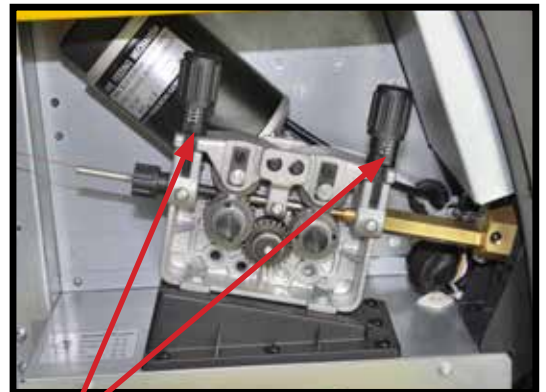
5 Remove the Drive Roller Cover. Check the Drive roller is matched to the wire size for the job **Note:** Correct wire side on roller to face into machine when fitting. Then replace the Drive Roller Cover.

See Page 25 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 out of the Euro connection Approx 3-5cm

Ensure you hold the spool and check tension to stop wire spool unraveling



7 Push the Wire Tensioning Arms up and lock into position, and turn the Wire Feed Tensioning Knobs to gently tighten.

Note: Pictures may vary from your machine model

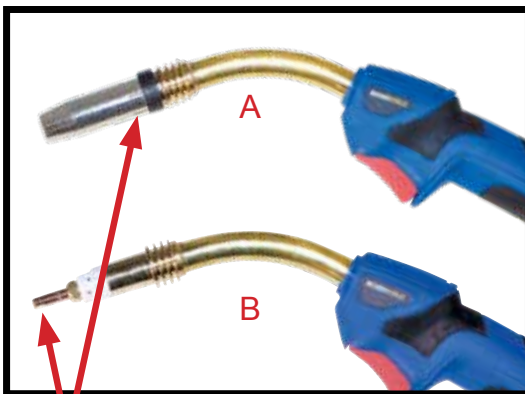
SET UP OF MIG TORCH



- 1** Attach the Euro Connect MIG torch to the machine feeding the wire into the liner.



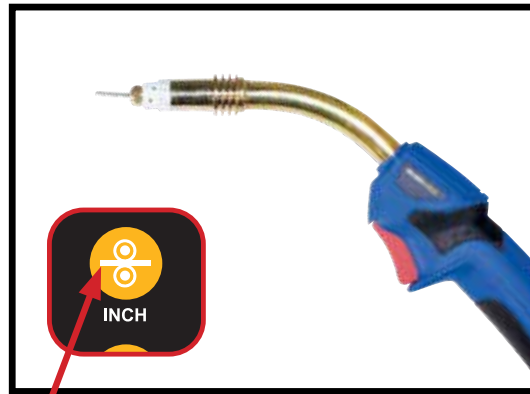
- 2** Tighten MIG Torch connector to machine.



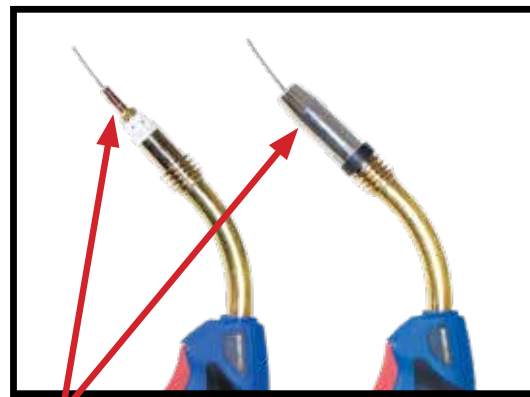
- 3** Remove nozzle (A) and tip (B) from torch.



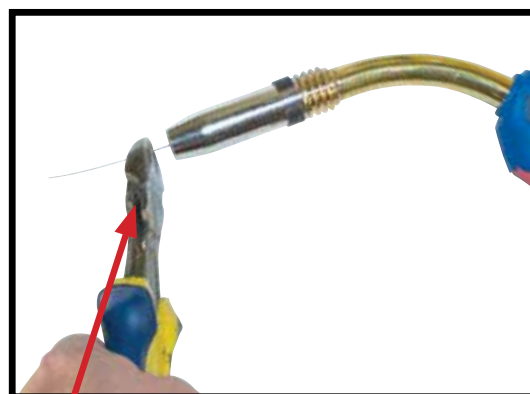
- 4** Plug machine into 240V and switch to the ON position on the back of machine.



- 5** Press the Wire Inch Button. This will feed the wire through the torch. Release button when wire appears at the end of the torch.

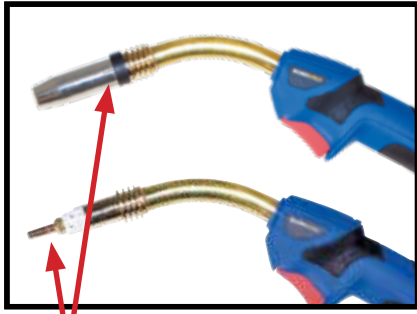


- 6** Re install tip over the wire and tighten using the tool supplied, Do NOT over tighten, or you may damage the tip holder and re-attach nozzle to torch.

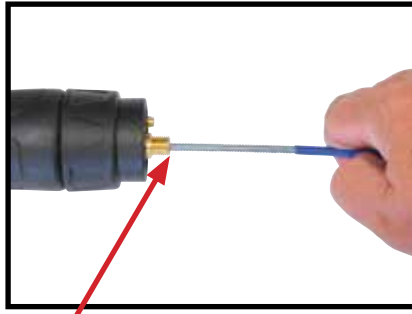


- 7** Trim wire to the end of the nozzle.

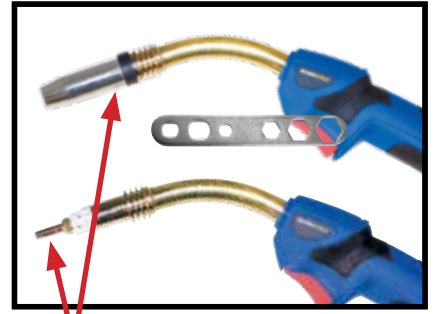
MIG TORCH LINER INSTALLATION / REPLACEMENT



1 Lay the MIG torch out straight and flat on the ground and remove the front end parts



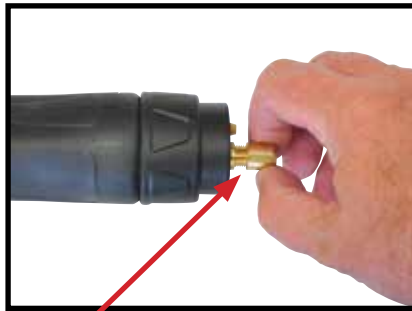
4 Carefully feed the new liner into the torch lead all the way out the end of the torch



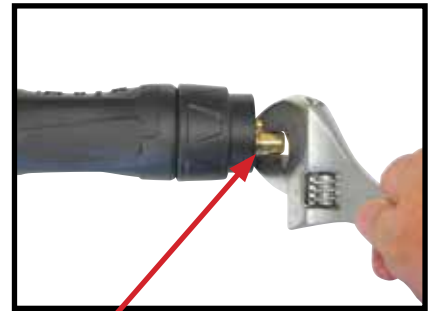
7 Re install tip and tighten using the tool provided and re attach nozzle to torch. Do NOT over tighten, or you may damage the tip holder



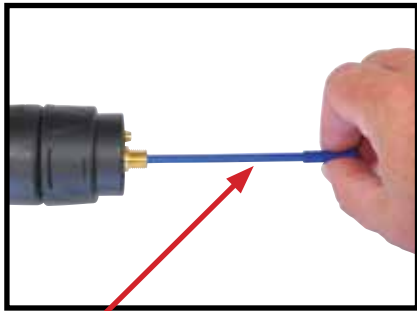
2 Remove the liner retaining nut from the euro torch end.



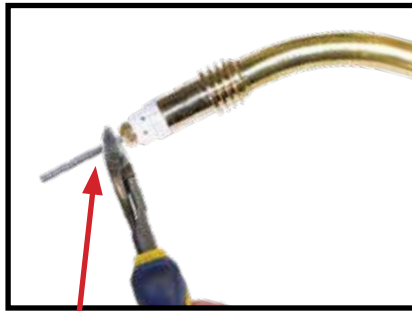
5 Fit the retaining nut and slightly tighten the nut about half way



8 Tighten the retaining nut up all the way.



3 Carefully remove the liner completely from the torch.



6 Snip the new liner 3mm past the end of the torch neck

Steel Liners



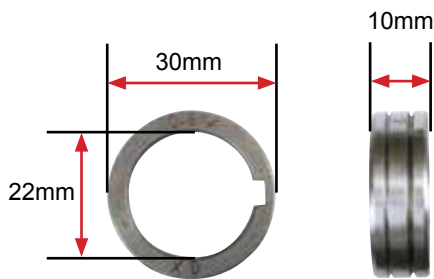
Teflon Liners for Aluminium



| PART NO. | DESCRIPTION | ORIGINAL REF |
|-----------|-----------------------------------|--------------|
| 92.04.B3 | Blue steel liner 0.6 - 0.8mm 3mt | 124.0011 |
| 92.04.B4 | Blue steel liner 0.6 - 0.8mm 4mt | 124.0012 |
| 92.04.B5 | Blue steel liner 0.6 - 0.8mm 5mt | 124.0015 |
| 92.04.R3 | Red steel liner 0.9 - 1.2mm 3mt | 124.0026 |
| 92.04.R4 | Red steel liner 0.9 - 1.2mm 4mt | 124.0031 |
| 92.04.R5 | Red steel liner 0.9 - 1.2mm 5mt | 124.0035 |
| 92.04.BT3 | Blue teflon liner 0.6 - 0.9mm 3mt | 126.0005 |
| 92.04.BT4 | Blue teflon liner 0.6 - 0.9mm 4mt | 126.0008 |
| 92.04.RT3 | Red teflon liner 0.9 - 1.2mm 3mt | 124.0011 |
| 92.04.RT4 | Red teflon liner 0.9 - 1.2mm 4mt | 124.0012 |
| 92.04.RT5 | Red teflon liner 0.9 - 1.2mm 5mt | 124.0015 |

Note: Pictures may vary from your machine model

MACHINE DRIVE ROLLER SIZE (NOTE: MACHINE WILL RUN UP TO 1.2MM WIRE)



| PART No: | DESCRIPTION |
|--|--|
| Knurled Drive Roller For Gasless Wire | |
| RK302210.08.10 | Drive Roller 0.8/1.0mm Knurled 30 x 22 x 10mm |
| RK302210.09.12 | Drive Roller 0.9/1.2mm Knurled 30 x 22 x 10mm |
| RK302210.10.12 | Drive Roller 1.0/1.2mm Knurled 30 x 22 x 10mm |
| U Grooved Drive Roller For Aluminium Wire | |
| RU302210.06.08 | Drive Roller 0.6/0.8mm U Groove 30 x 22 x 10mm |
| RU302210.08.09 | Drive Roller 0.8/0.9mm U Groove 30 x 22 x 10mm |
| RU302210.08.10 | Drive Roller 0.8/1.0mm U Groove 30 x 22 x 10mm |
| RU302210.09.12 | Drive Roller 0.9/1.2mm U Groove 30 x 22 x 10mm |
| V Grooved Drive Roller For Solid Wire | |
| RV302210.06.08 | Drive Roller 0.6/0.8mm V Groove 30 x 22 x 10mm |
| RV302210.08.10 | Drive Roller 0.8/1.0mm V Groove 30 x 22 x 10mm |
| RV302210.09.12 | Drive Roller 0.9/1.2mm V Groove 30 x 22 x 10mm |
| RV302210.10.12 | Drive Roller 1.0/1.2mm V Groove 30 x 22 x 10mm |

2T / 4T TRIGGER CONTROL

2T Trigger Control

1. Press the trigger and Hold
2. The set pre-gas flow starts and the arc starts and will upslope to the amperage selected on the amperage dial.
3. When you want to finish the weld, release the trigger and the amperage will begin to downslope at the rate you have selected on the downslope dial, If you selected zero the arc will stop as soon as you release the trigger.

4T Trigger Control

1. Press the trigger and Hold
2. The set preflow gas starts and the arc starts.
3. Release the trigger and the amperage will upslope to the amperage selected on the amperage dial
4. When you want to finish the weld, press and hold the trigger and the amperage will begin to downslope at the rate you have selected on the downslope dial, amperage will remain at this level until you release the trigger.
5. Once you have released the trigger the arc will stop and the postflow gas will continue for a pre set amount of time

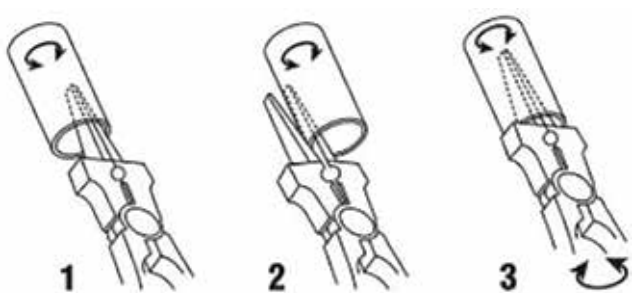
Proper MIG Torch inspection

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.

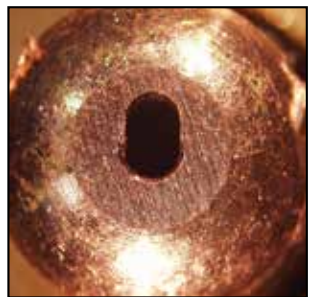
Consumables

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



Build up of spatter can cause damage to nozzle and tip



Keyholing of the contact tip

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

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

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

Handy 8 function welders pliers. Functions include, nozzle removal, tip removal, cleaning inside of nozzle and wire cutting.



MANUAL METAL ARC PROCESS (MMA WELDING)

When an arc is struck between the metal rod (electrode) and the workpiece, both the rod and workpiece surface melt to form a weld pool. Simultaneous melting of the flux coating on the rod will form gas and slag which protects the weld pool from the surrounding atmosphere. The slag will solidify and cool and must be chipped off the weld bead once the weld run is complete (or before the next weld pass is deposited). The process allows only short lengths of weld to be produced before a new electrode needs to be inserted in the holder. Weld penetration is low and the quality of the weld deposit is highly dependent on the skill of the welder.

TYPES OF ELECTRODES

Arc stability, depth of penetration, metal deposition rate and positional capability are greatly influenced by the chemical composition of the flux coating on the electrode. There are many types of Electrodes, and these are generally matched to the base metal. For example if welding Mild Steel then select a Mild Steel (General Purpose Electrode). Electrodes are identified by a universal numbering system (AWS Type code).

| Base Metal | Electrode Type | Type |
|---------------------|----------------------------|------|
| Mild Steel | Mild Steel General Purpose | 6013 |
| Stainless Steel | Stainless Steel 316L | 316L |
| Dissimilar Metals | Dissimilar 680 | 312 |
| Cast Iron | Nickel Arc 98 | Ni99 |
| High Strength Steel | Low Hydrogen | TC16 |

Electrodes are often packed in sealed packaging to keep moisture out. However, if a pack has been opened or damaged, it is essential that the electrodes are redried according to the manufacturer's instructions.

ARC FORCE

Also called Dig and Arc Control. Gives a power source variable additional amperage during low voltage (short arc length) conditions while welding. Helps avoid "sticking" stick electrodes when a short arc length is used.

POWER SOURCE

Electrodes can be operated with AC and DC power supplies. Not all DC electrodes can be operated on AC power sources; however AC electrodes may be used on either AC or DC

ELECTRODE SIZE SELECTION

Electrode size selection will be determined by the thickness of the section being welded. A thicker section will need a larger diameter electrode. The table below shows the maximum size of electrodes for average thicknesses of section (based on General Purpose 6013 Electrode).

| Average Metal Thickness | Electrode Size |
|-------------------------|----------------|
| 1.0 - 2.0mm | 2.0mm |
| 2.0 - 5.0mm | 2.6mm |
| 5.0 - 8mm | 3.2mm |
| 8.0mm + | 4.0mm |

WELDING CURRENT

Welding current level is determined by the size of electrode - the normal operating range and current are recommended by manufacturers. Typical operating ranges for a selection of electrode sizes are illustrated in the table. As a rule of thumb when selecting a suitable current level, an electrode will require about 40 Amps per millimeter (diameter). Therefore, the preferred current level for a 4mm diameter electrode would be 160 Amps, but the acceptable operating range is 140 to 180 Amps. It is important to match the machine to the job

| Amperage Selection Guide | |
|--------------------------|-----------------|
| Rod Size/ Gauge | Welding Current |
| 1.6mm | 40-50 Amps |
| 2.0mm | 50-75 Amps |
| 2.5mm | 75-105 Amps |
| 3.2mm | 105-140 Amps |
| 4.0mm | 140-160 Amps |

MACHINE SET UP GASLESS MIG WELDING

8. Select MIG mode



4. Connect Mig Torch to the Euro Connection terminal

NOTE: Ensure connector nut is tighten firmly

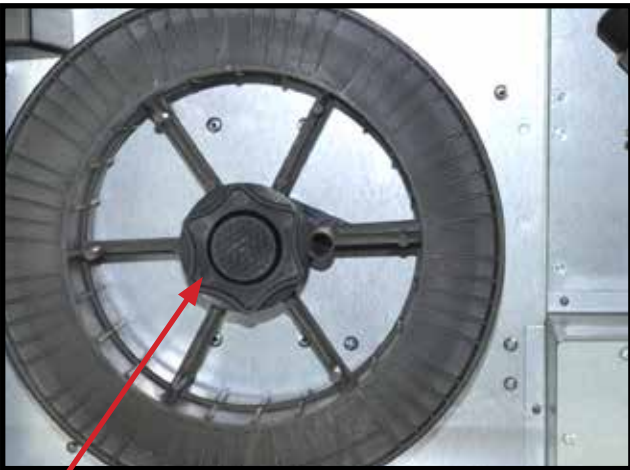
6. Connect earth Clamp to the **+** terminal



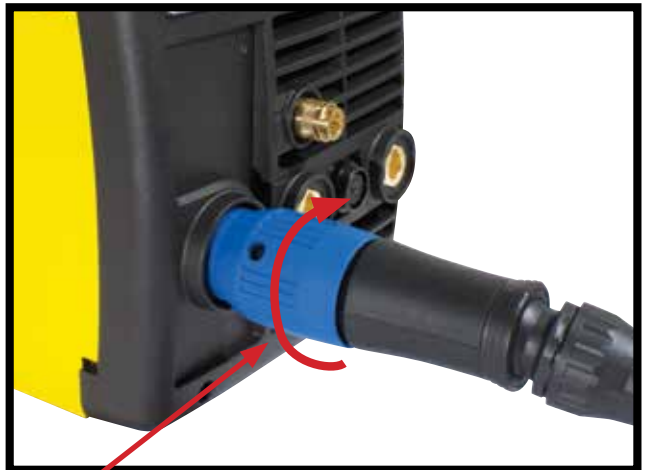
1 Plug the machine 15Amp input power lead into the wall socket, ensuring that the power switch on the machine is in the OFF position.



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



2 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 25
Note: Wire to roll from under spool into wire feeder



4 Install Euro connect MIG torch over the protruding wire, line up the spring connectors and screw the Euro connector nut up firmly.











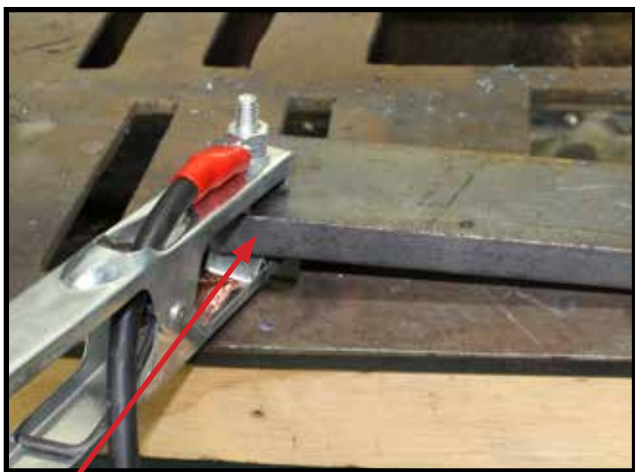
Note: Pictures may vary from your machine model

MACHINE SET UP GASLESS MIG WELDING CONTINUED



5 Ensure the polarity is correct for gasless welding, DCEN

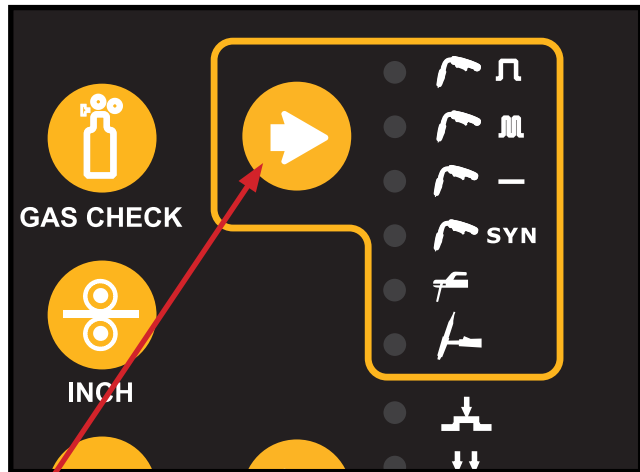
| SETTING MACHINE POLARITY | |
|--|--|
| DCEN - GASLESS | DCEP - GAS |
| +   | +   |
| -   | -   |



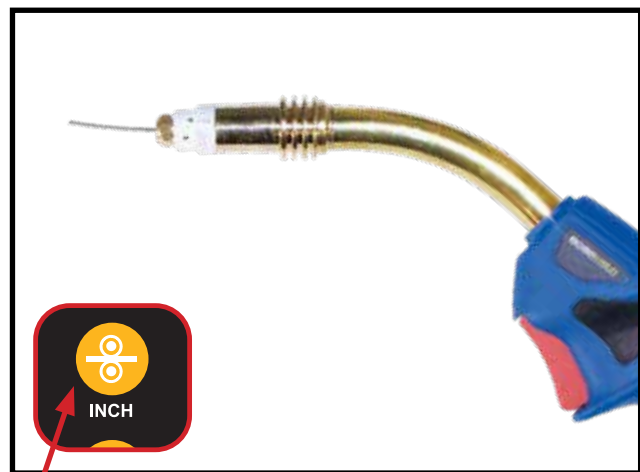
6 Fit the Earth lead Dinse Plug to the positive terminal for gasless welding and then connect earth clamp to the work piece ensuring that the clamp makes good contact with bare metal.



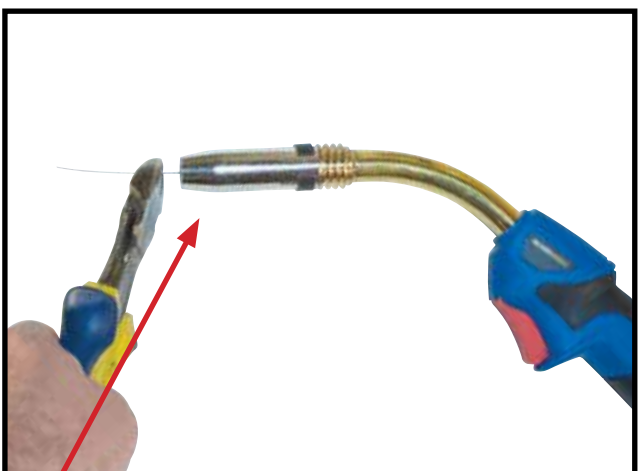
7 Switch the machine on using the mains power switch. Wait a few seconds whilst the machine powers up



8 Press the Welding Mode Selection Button to select MIG.



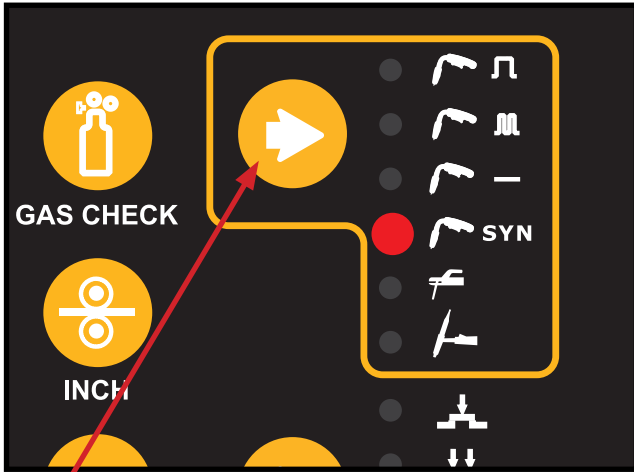
9 Remove nozzle and tip from torch and press the Wire Inch Button. This will feed the wire through the torch. Release button when wire appears at the end of the torch.



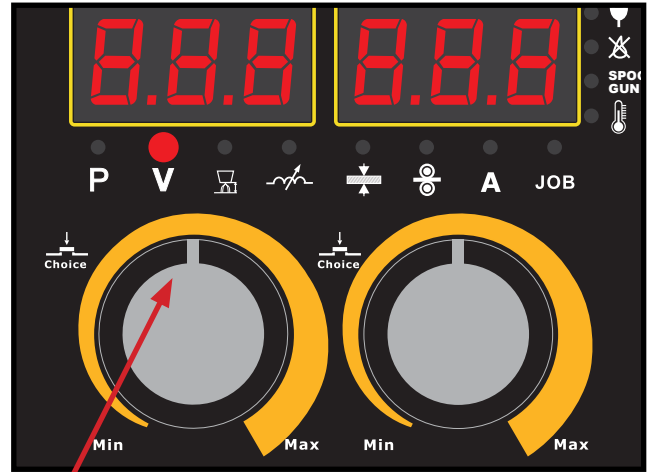
10 Re install tip and nozzle to torch and trim wire to the end of the nozzle.

Note: Pictures may vary from your machine model

MACHINE SET UP GASLESS MIG WELDING CONTINUED



11 Select Synergic or Manual Mode, If manual mode is selected press the Adjustment dial to switch from Voltage and Wire speed settings



12 You can adjust the Inductance by pressing the MIG/MMA Adjustment button, and use the Adjustment knob to change the parameter.

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.

MACHINE SET UP GAS MIG WELDING




14 & 15. Fit gas regulator to bottle and install gas hose to the inlet on the back panel of welder. Turn on regulator and set gas flow to between 10-15 L/min depending on your welding environment.

8. Select MIG mode



4. Connect Mig Torch to the Euro Connection terminal
NOTE: Ensure connector nut is tighten firmly



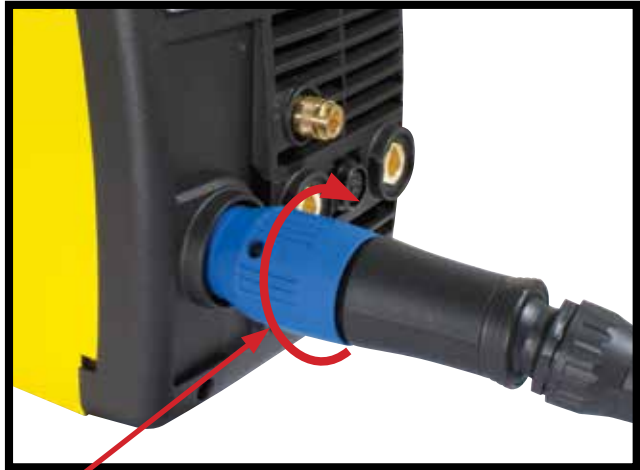
6. Connect earth Clamp to the  terminal

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.

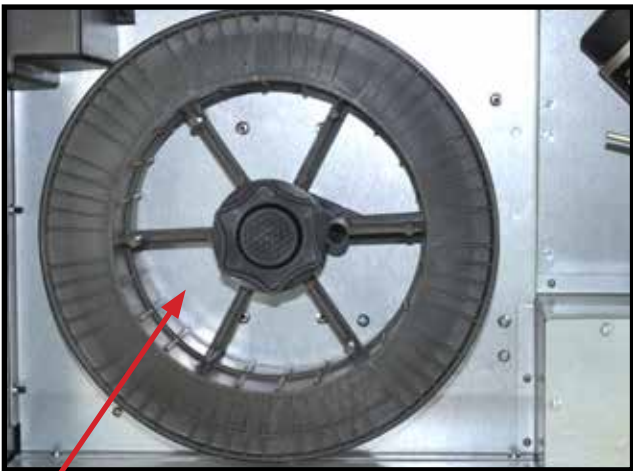
Note: Pictures may vary from your machine model



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.



4 Install Euro connect MIG torch over the protruding wire, line up the spring connectors and screw the Euro connector nut up firmly.



2 Open wire feed side panel and install wire into machine ensuring the drive roller is matched to the wire size and type. Refer to "Drive Feed Roller Selection" on page 25 Note: Wire to roll from under spool into wire feeder



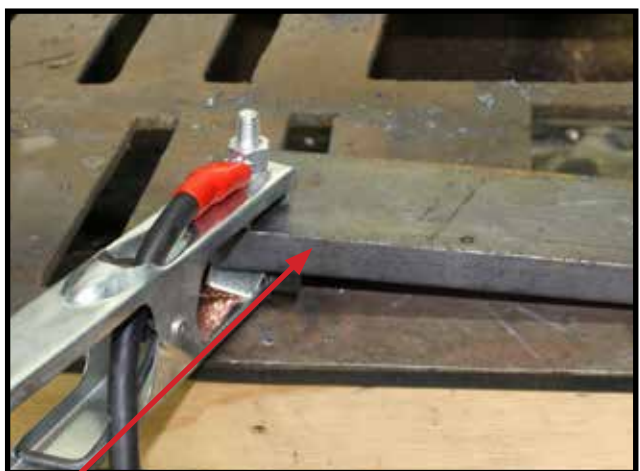
5 Ensure the polarity is correct for gas welding, DCEP

SETTING MACHINE POLARITY

| DCEN - GASLESS | | DCEP - GAS | |
|----------------|--|------------|--|
| + | | + | |
| - | | - | |



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



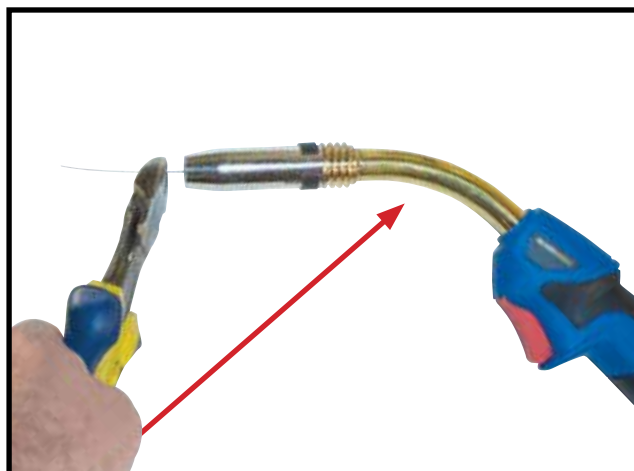
6 Fit the Earth lead Dinse Plug to the positive terminal for gasless welding and then connect earth clamp to the work piece ensuring that the clamp makes good contact with bare metal.

Note: Pictures may vary from your machine model

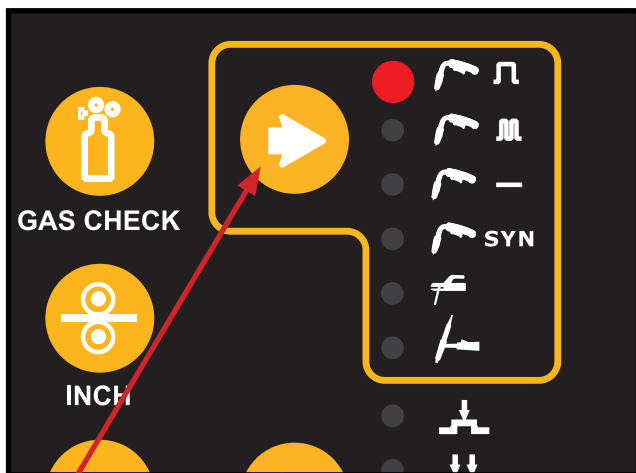
MACHINE SET UP GAS MIG WELDING CONTINUED



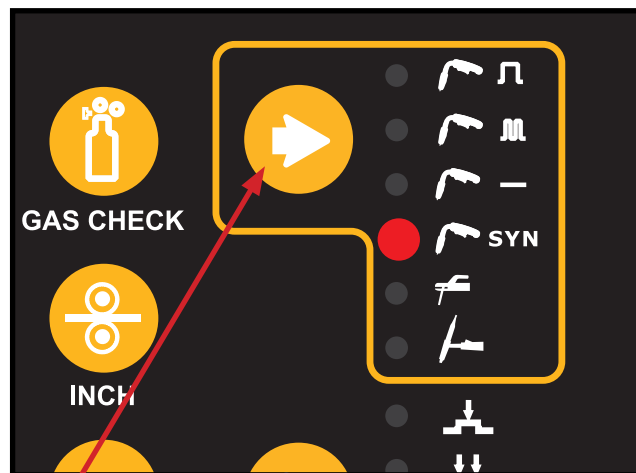
7 Switch the machine on using the mains power switch. Wait a few seconds whilst the machine powers up



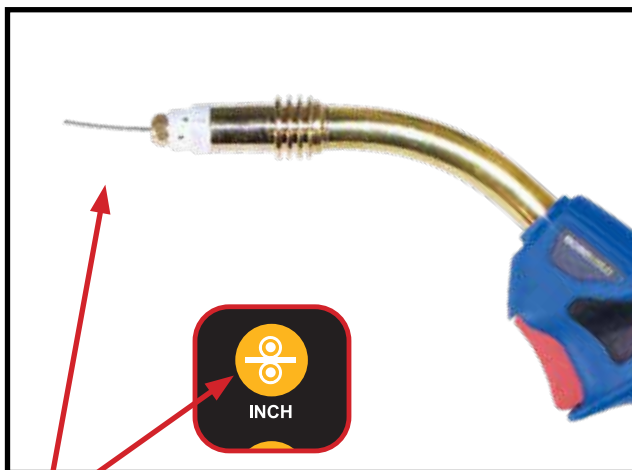
10 Re install tip and nozzle to torch and trim wire to the end of the nozzle. The multifunction digital display will show two numbers. On the left is the wire speed, on the right is welding voltage. These values are adjusted by rotating the Welding Parameter Adjustment Knobs below them.



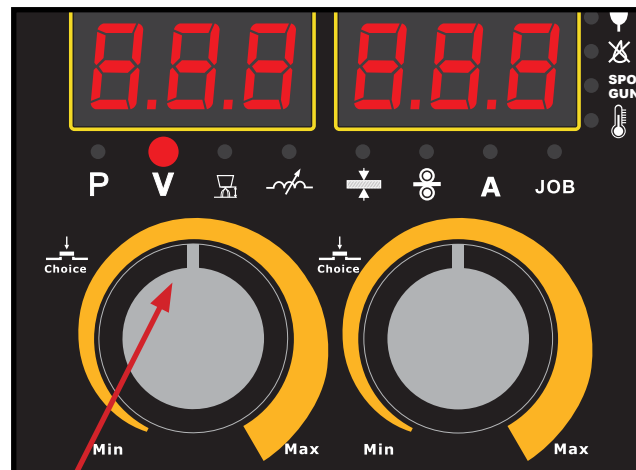
8 Press the Welding Mode Selection Button to select MIG.



11 Select Synergic or Manual Mode, If manual mode is selected press the Adjustment dial to switch from Voltage and Wire speed settings



9 Remove nozzle and tip from torch and press the Wire Inch Button. This will feed the wire through the torch. Release button when wire appears at the end of the torch.



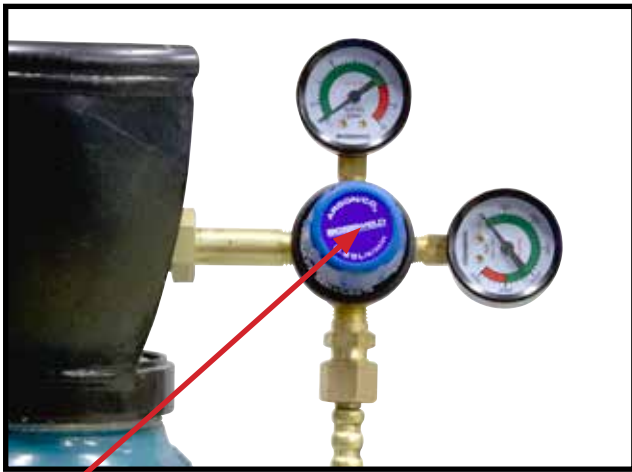
12 You can adjust the Inductance by pressing the MIG/MMA Adjustment button, and use the Adjustment knob to change the parameter.

Note: Pictures may vary from your machine model

MACHINE SET UP GAS MIG WELDING CONTINUED



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



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

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.

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.

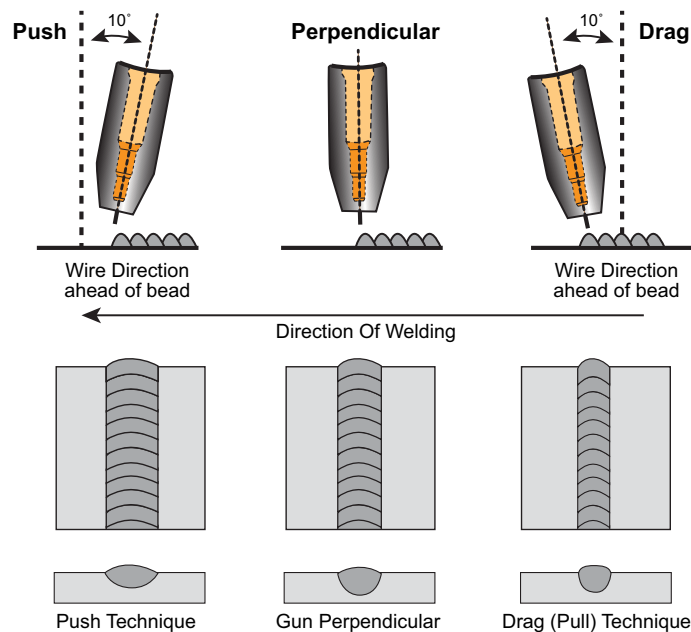
BASIC MIG WELDING GUIDE

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, “stubby” 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

| | | Carbon Steel | | | | | | |
|---------------------------|----------------------|------------------------|---------|---------|------------------------|-------------------------|---------|---------|
| | | Mig Wire, Gas Shielded | | | | Gasless, Flux Core Wire | | |
| | | 0.6mm | 0.8mm | 0.9mm | 1.2mm | 0.8mm | 0.9mm | 1.2mm |
| MATERIAL THICKNESS | 0.8 | 30-45 | | | | | | |
| | 1.0 | 45-60 | 50-60 | | | | | |
| | 1.2 | 60-75 | 70-80 | | | 50-65 | | |
| | 1.6 | 70-105 | 90-110 | 90-110 | | 70-90 | 75-90 | |
| | 2.0 | | 120-130 | 120-130 | | 90-105 | 95-120 | |
| | 3.0 | | 135-150 | 135-150 | | 110-135 | 120-135 | |
| | 4.0 | | 145-160 | 160-190 | | 135-150 | 135-160 | 135-160 |
| | 6.0 | | | 175-210 | 190-220 | | 145-165 | 150-170 |
| | 8.0 | | | 215-230 | 225-235 | | 150-175 | 160-190 |
| | 10.0 | | | 220-240 | 230-250 | | | 200-230 |
| | 12.0 | | | 240+ | 250+ | | | 240+ |
| Gas | Argon/Co2 - Co2 | | | | NO GAS | | | |
| | | Stainless Steel | | | Aluminium | | | |
| | | Mig Wire, Gas Shielded | | | Mig Wire, Gas Shielded | | | |
| | | 0.8mm | 0.9mm | 1.2mm | 0.8mm | 0.9mm | 1.0mm | 1.2mm |
| MATERIAL THICKNESS | 0.8 | | | | | | | |
| | 1.0 | 40-50 | | | | | | |
| | 1.2 | 50-60 | | | 50-70 | | | |
| | 1.6 | 65-80 | | | 75-95 | 90-110 | | |
| | 2.0 | 75-90 | | | 85-105 | 90-115 | | |
| | 3.0 | 95-120 | 125-135 | | 110-130 | 110-135 | 120-140 | |
| | 4.0 | 140-155 | 145-155 | | | 135-150 | 140-160 | 145-170 |
| | 6.0 | | 175-190 | | | 150-175 | 155-180 | 165-190 |
| | 8.0 | | 200-210 | 220-250 | | | 185-220 | 190-230 |
| | 10.0 | | 220-240 | 240-265 | | | | 220-250 |
| | 12.0 | | 235+ | 250+ | | | | 250+ |
| Gas | Argon/o2 - Argon/Co2 | | | Argon | | | | |

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

| Welding current | Welding Volt | Wave control | Wire Speed | | |
|-----------------|--------------|--------------|-------------|-------|-------|
| | | | (Wire Size) | 0.6mm | 0.8mm |
| 40A | 13~15V | 1-2 | 2--3 | | |
| 60A | 14~16V | 2-4 | 3--5 | 2--3 | |
| 80A | 15~17V | 3-5 | 6--8 | 3--5 | 2--3 |
| 100A | 16~19V | 3-5 | 8--10 | 3--6 | 3-5 |
| 120A | 17~20V | 4-6 | | 4--7 | 3--5 |
| 140A | 19~21V | 5-10 | | 5--8 | 3--5 |
| 160A | 20~22V | 5-10 | | 6--9 | 4--7 |
| 180A | 21~23V | 5-10 | | | 6--9 |

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 to 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.

GMAW (MIG) WELDING CONTINUED

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

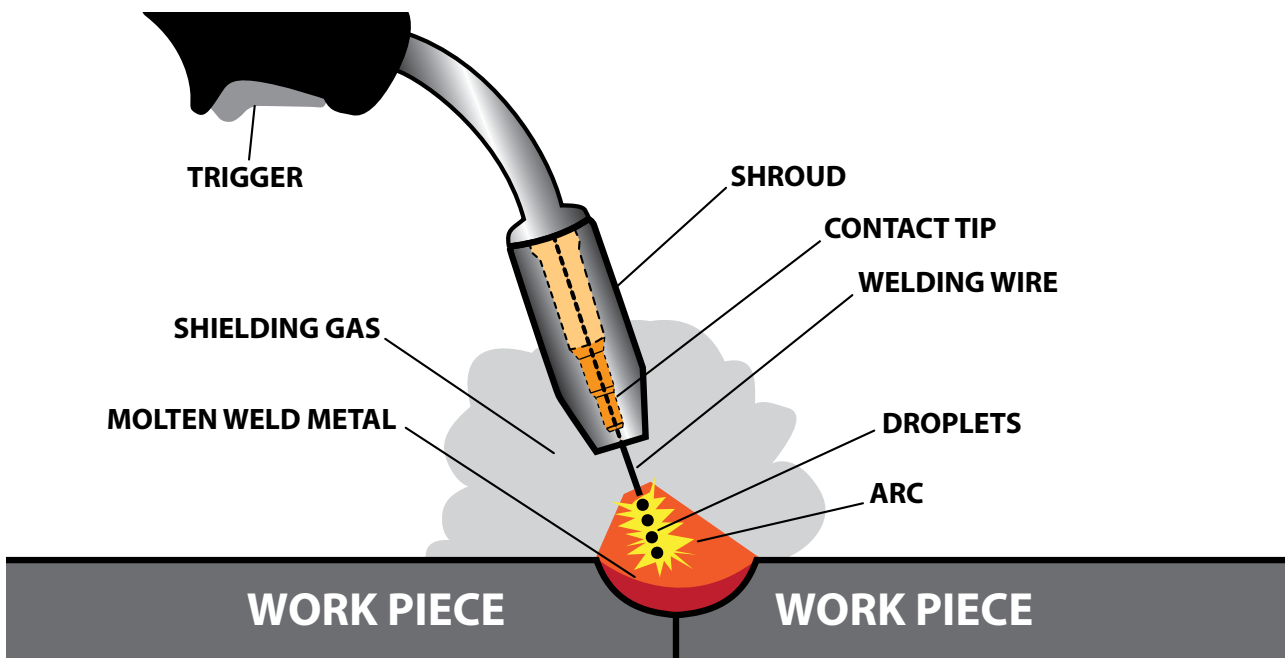
The shielding gas will have a substantial effect on the stability of the arc and metal transfer and the behaviour of the weld pool, in particular, its penetration. General purpose shielding gases for MIG welding are mixtures of argon, oxygen and CO₂, and special gas mixtures may contain helium.

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.

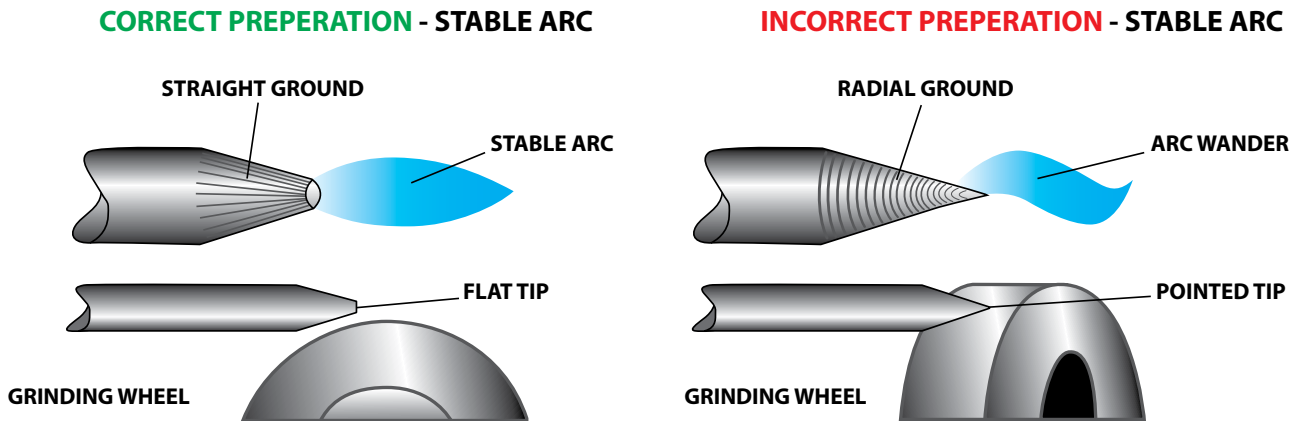
Argon based gases, compared with CO₂, are generally more tolerant to parameter settings and generate lower spatter levels with the dip transfer mode. However, there is a greater risk of lack of fusion defects because these gases are colder. As CO₂ cannot be used in the open arc (pulsed or spray transfer)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

| WELDING GAS SELECTION CHART GUIDE | | |
|---|--|--|
|  MIG MIG WELDING |  ARGON |  Ar-CO₂-O₂ |
| | MILD STEEL | X |
| STAINLESS STEEL | X | ✓ |
| LOW ALLOY STEEL | X | ✓ |
| GALVANISED STEEL | X | ✓ |
| ALUMINIUM | ✓ | X |



TUNGSTEN PREPARATION & GRINDING

Grinding creates the greatest hazard as the exposed tungsten/thoria area is greatly increased and fine particles of potentially radioactive dust are released into the atmosphere. It is recommended that a dedicated grindstone with local dust extraction is used, and a simple filter mask is worn. If the grinding wheel is not fitted with a protective viewing screen, eye protection must be worn.



Note: Do not use wheel for other jobs or tungsten can become contaminated and cause lower weld quality

TIG WELDING

Tungsten inert gas (TIG) welding became an overnight success in the 1940s for joining magnesium and aluminium. Using an inert gas shield instead of a slag to protect the weldpool, the process was a highly attractive replacement for gas and manual metal arc welding. TIG has played a major role in the acceptance of aluminium for high quality welding and structural applications.

PROCESS CHARACTERISTICS

In the TIG process the arc is formed between a pointed tungsten electrode and the workpiece in an inert atmosphere of argon or helium. The small intense arc provided by the pointed electrode is ideal for high quality and precision welding. Because the electrode is not consumed during welding, the welder does not have to balance the heat input from the arc as the metal is deposited from the melting electrode. When filler metal is required, it must be added separately to the weldpool.

POWER SOURCE

TIG must be operated with a constant current power source - either DC or AC. A constant current power source is essential to avoid excessively high currents being drawn when the electrode is short-circuited onto the workpiece surface. This could happen either deliberately during arc starting or inadvertently during welding. If, as in MIG welding, a flat characteristic power source is used, any contact with the workpiece surface would damage the electrode tip or fuse the electrode to the workpiece surface. In DC, because arc heat is distributed approximately one-third at the cathode (negative) and two-thirds at the anode (positive), the electrode is always negative polarity to prevent overheating and melting. However, the alternative power source connection of DC electrode positive polarity has the advantage in that when the cathode is on the workpiece, the surface is cleaned of oxide contamination. For this reason, AC is used when welding materials with a tenacious surface oxide film, such as aluminium.

ARC STARTING

The welding arc can be started by scratching the surface, forming a short-circuit. It is only when the short-circuit is broken that the main welding current will flow. However, there is a risk that the electrode may stick to the surface and cause a tungsten inclusion in the weld.





TIG WELDING - CONTINUED

This risk can be minimised using the 'lift arc' technique where the short-circuit is formed at a very low current level. The most common way of starting the TIG arc is to use HF (High Frequency). HF consists of high voltage sparks of several thousand volts which last for a few microseconds. The HF sparks will cause the electrode - workpiece gap to break down or ionise. Once an electron/ion cloud is formed, current can flow from the power source.

Note: As HF generates abnormally high electromagnetic emission (EM), welders should be aware that its use can cause interference especially in electronic equipment. As EM emission can be airborne, like radio waves, or transmitted along power cables, care must be taken to avoid interference with control systems and instruments in the vicinity of welding.

HF is also important in stabilising the AC arc; in AC, electrode polarity is reversed at a frequency of about 50 times per second, causing the arc to be extinguished at each polarity change. To ensure that the arc is reignited at each reversal of polarity, HF sparks are generated across the electrode/workpiece gap to coincide with the beginning of each half-cycle.

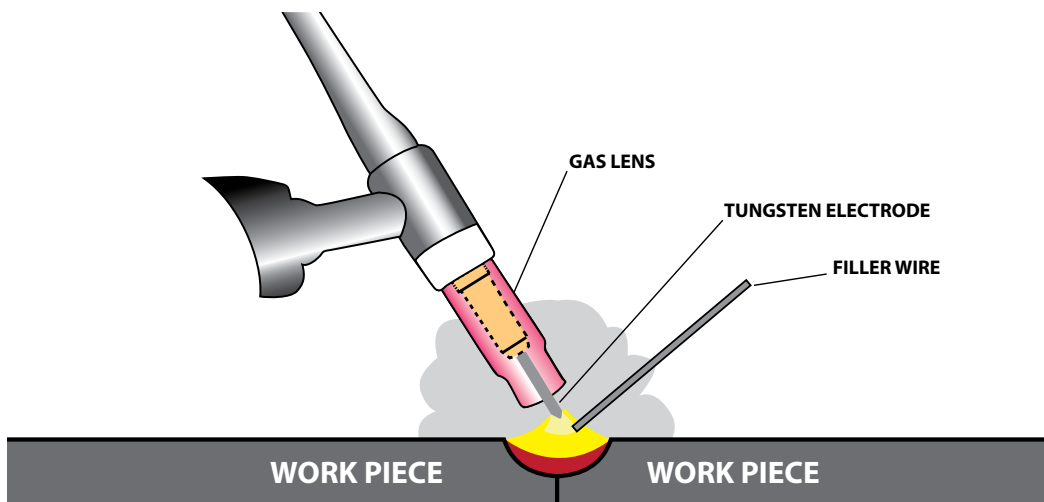
WELDING GAS SELECTION CHART GUIDE

| M MIG MIG WELDING |  ARGON | |  MIG GAS Ar-CO ₂ -O ₂ | | T TIG TIG WELDING |  ARGON | |  MIG GAS Ar-CO ₂ -O ₂ | |
|---------------------------------------|---|------------------------------------|---|------------------------------------|---------------------------------------|---|------------------------------------|---|---|
| | ARGON | Ar-CO ₂ -O ₂ | ARGON | Ar-CO ₂ -O ₂ | | ARGON | Ar-CO ₂ -O ₂ | | |
| MILD STEEL | X | ✓ | ✓ | X | MILD STEEL | ✓ | X | ✓ | X |
| STAINLESS STEEL | X | ✓ | ✓ | X | STAINLESS STEEL | ✓ | X | ✓ | X |
| LOW ALLOY STEEL | X | ✓ | ✓ | X | LOW ALLOY STEEL | ✓ | X | ✓ | X |
| GALVANISED STEEL | X | ✓ | ✓ | X | ALUMINIUM | ✓ | X | ✓ | X |
| ALUMINIUM | ✓ | X | ✓ | X | | | | | |

APPLICATIONS

TIG is applied in all industrial sectors but is especially suitable for high quality welding. In manual welding, the relatively small arc is ideal for thin sheet material or controlled penetration (in the root run of pipe welds). Because deposition rate can be quite low (using a separate filler rod) MMA or MIG may be preferable for thicker material and for fill passes in thick-wall pipe welds.

TIG is also widely applied in mechanised systems either autogenously or with filler wire. However, several 'off the shelf' systems are available for orbital welding of pipes, used in the manufacture of chemical plant or boilers. The systems require no manipulative skill, but the operator must be well trained. Because the welder has less control over arc and weldpool behaviour, careful attention must be paid to edge preparation (machined rather than hand-prepared), joint fit-up and control of welding parameters.



BZ24 BOSSWELD BINZEL STYLE MIG TORCH COMPLETE

| PART NO. | DESCRIPTION |
|------------|--------------------------|
| 92.ER.24.3 | BZ Style 24 MIG Torch 3m |
| 92.ER.24.4 | BZ Style 24 MIG Torch 4m |
| 92.ER.24.5 | BZ Style 24 MIG Torch 5m |



| PART NO. | DESCRIPTION | ORIGINAL REF |
|-------------|---|--------------|
| 92.02.24.CO | Adjustable conical nozzle ϕ 12.5 mm | 145.0075 |
| 92.02.24.CL | Adjustable cylindrical nozzle ϕ 17mm | 145.0022 |
| 92.02.24.10 | Adjustable tapered nozzle ϕ 10mm | 145.0123 |



| PART NO. | DESCRIPTION | ORIGINAL REF |
|-------------|---------------|--------------|
| 92.05.24.M6 | Tip Holder M6 | 142.0003 |



| PART NO. | DESCRIPTION | ORIGINAL REF |
|-----------|---------------------------|--------------|
| 92.05.24 | Gas Diffuser - Ceramic | 012.0017 |
| 92.05.24R | Gas Diffuser - Red Rubber | N/A |



| PART NO. | DESCRIPTION | ORIGINAL REF |
|----------|-------------|--------------|
| 92.06.24 | Swan Neck | 012.0001 |



| PART NO. | DESCRIPTION | ORIGINAL REF |
|-------------|-------------------------------------|--------------|
| 92.04.BNL12 | Brass swan neck liner 1.2mm (250mm) | 120.0018 |
| 92.04.BNL16 | Brass swan neck liner 1.6mm (250mm) | 120.0041 |



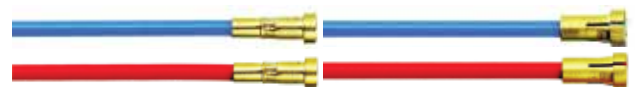
| PART NO. | DESCRIPTION | ORIGINAL REF |
|--------------|------------------------------|--------------|
| 92.09.HANDLE | Ergonomic handle with screws | N/A |
| 92.09.BWT | Trigger | N/A |



| PART NO. | DESCRIPTION | ORIGINAL REF |
|-------------|---|--------------|
| 92.01.15.06 | Contact tip 0.6mm x M6 x 6mm dia x 25mm long | 140.0008 |
| 92.01.15.08 | Contact tip 0.8mm x M6 x 6mm dia x 25mm long | 140.0059 |
| 92.01.15.09 | Contact tip 0.9mm x M6 x 6mm dia x 25mm long | 140.0177 |
| 92.01.15.10 | Contact tip 1.0mm x M6 x 6mm dia x 25mm long | 140.0253 |
| 92.01.25.06 | Contact tip heavy duty 0.6mm x M6 x 8mm dia x 25mm long | 140.0005 |
| 92.01.25.08 | Contact tip heavy duty 0.8mm x M6 x 8mm dia x 25mm long | 140.0051 |
| 92.01.25.09 | Contact tip heavy duty 0.9mm x M6 x 8mm dia x 25mm long | 140.0169 |
| 92.01.25.10 | Contact tip heavy duty 1.0mm x M6 x 8mm dia x 25mm long | 140.0242 |
| 92.01.25.12 | Contact tip heavy duty 1.2mm x M6 x 8mm dia x 25mm long | 140.0379 |
| 92.01.25.14 | Contact tip heavy duty 1.4mm x M6 x 8mm dia x 25mm long | 140.0516 |
| 92.01.25.16 | Contact tip heavy duty 1.6mm x M6 x 8mm dia x 25mm long | 140.0555 |
| 92.01.M6A09 | Contact tip 0.9mm x M6 Al x 8mm dia x 28mm long | 141.0004 |
| 92.01.M6A10 | Contact tip 1.0mm x M6 Al x 8mm dia x 28mm long | 141.0006 |
| 92.01.M6A12 | Contact tip 1.2mm x M6 Al x 8mm dia x 28mm long | 141.0072 |

Steel Liners

Teflon Liners for Aluminium



| PART NO. | DESCRIPTION | ORIGINAL REF |
|-----------|-----------------------------------|--------------|
| 92.04.B3 | Blue steel liner 0.6 - 0.8mm 3mt | 124.0011 |
| 92.04.B4 | Blue steel liner 0.6 - 0.8mm 4mt | 124.0012 |
| 92.04.B5 | Blue steel liner 0.6 - 0.8mm 5mt | 124.0015 |
| 92.04.R3 | Red steel liner 0.9 - 1.2mm 3mt | 124.0026 |
| 92.04.R4 | Red steel liner 0.9 - 1.2mm 4mt | 124.0031 |
| 92.04.R5 | Red steel liner 0.9 - 1.2mm 5mt | 124.0035 |
| 92.04.BT3 | Blue teflon liner 0.6 - 0.9mm 3mt | 126.0005 |
| 92.04.BT4 | Blue teflon liner 0.6 - 0.9mm 4mt | 126.0008 |
| 92.04.RT3 | Red teflon liner 0.9 - 1.2mm 3mt | 124.0011 |
| 92.04.RT4 | Red teflon liner 0.9 - 1.2mm 4mt | 124.0012 |
| 92.04.RT5 | Red teflon liner 0.9 - 1.2mm 5mt | 124.0015 |

BOSSWELD 26 SERIES 200AMP TIG TORCH SPARE PARTS

| PART NO. | DESCRIPTION |
|--------------------|---|
| 95.26.4.1.SW.DA50 | Tig Torch 26, 4mt, 1 pc, Switch, Dinse 50 |
| 95.26.8.1.SW.DA50 | Tig Torch 26, 8mt, 1 pc, Switch, Dinse 50 |
| 95.26F.4.1.SW.DA50 | Tig Torch 26 Flex, 4mt, 1pc, Switch, Dinse 50 |
| 95.26F.8.1.SW.DA50 | Tig Torch 26 Flex, 8mt, 1pc, Switch, Dinse 50 |



| PART NO. | DESCRIPTION |
|----------|-----------------|
| 9957Y04 | Back Cap Short |
| 9557Y05 | Back Cap Medium |
| 955Y02 | Back Cap Long |



| PART NO. | DESCRIPTION |
|----------|-------------------------------------|
| 9518CG | Torch Body Front Insulator |
| 9554N01 | Torch Body Front Insulator Lens Cup |



| PART NO. | DESCRIPTION |
|----------|--------------|
| 9510N21 | Collet 0.5mm |
| 9510N22 | Collet 1.0mm |
| 9510N23 | Collet 1.6mm |
| 9510N24 | Collet 2.4mm |
| 9510N25 | Collet 3.2mm |
| 9510N20 | Collet 4.0mm |



| PART NO. | DESCRIPTION |
|----------|-------------------|
| 9510N29 | Collet Body 0.5mm |
| 9510N30 | Collet Body 1.0mm |
| 9510N31 | Collet Body 1.6mm |
| 9510N32 | Collet Body 2.4mm |
| 9510N28 | Collet Body 3.2mm |
| 95406488 | Collet Body 4.0mm |



| PART NO. | DESCRIPTION |
|----------|--------------------|
| 9510N50 | Alumin Cup Size 4 |
| 9510N49 | Alumin Cup Size 5 |
| 9510N48 | Alumin Cup Size 6 |
| 9510N47 | Alumin Cup Size 7 |
| 9510N46 | Alumin Cup Size 8 |
| 9510N45 | Alumin Cup Size 10 |
| 9510N44 | Alumin Cup Size 12 |



| PART NO. | DESCRIPTION |
|----------|----------------------------|
| 95WP26 | Torch Head |
| 954WP26V | Torch Head with Valve |
| 95WP26F | Flex Torch Head |
| 95WP26FV | Flex Torch Head with Valve |



| PART NO. | DESCRIPTION |
|----------|-----------------------|
| 9545V24 | Gas Lens Collet 1.0mm |
| 9545V25 | Gas Lens Collet 1.6mm |
| 9545V26 | Gas Lens Collet 2.4mm |
| 9545V27 | Gas Lens Collet 3.2mm |
| 9545V28 | Gas Lens Collet 4.0mm |



| PART NO. | DESCRIPTION |
|----------|-------------------------------------|
| 9554N18 | Gas Len Alumin Cup Size 4 - 6.0mm |
| 9554N17 | Gas Len Alumin Cup Size 5 - 8.0mm |
| 9554N16 | Gas Len Alumin Cup Size 6 - 9.5mm |
| 9554N15 | Gas Len Alumin Cup Size 7 - 11.0mm |
| 9554N14 | Gas Len Alumin Cup Size 8 - 12.7mm |
| 9554N19 | Gas Len Alumin Cup Size 11 - 17.5mm |

HELPFUL INFORMATION

Filler Metal

Solid Mild Steel wire

Notes

- 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.

Gasless Flux cored Mild Steel Wire
(Known as GS)

- 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.
- Produces smoke and splatters.

Drive Feed Roller Selection

It is important that correct drive roller is used to get the best results.

Solid mild steel
Stainless steel wire

“V” groove Roller. Roller has a small V shaped groove to guide the wire.

Flux cored wire

“V Knurled” roller (assists in gripping as wire is soft)

Aluminium wire

“U” groove Roller (assist in gripping as wire is softest)

Polarity

Machine can be used in both DC + and DC - modes

Wire Type -Gas shield wire
(solid or CO2 shielded flux)

“-” earth

Self-shielded
Flux core Wire

“+” earth

Aluminium

3m only for push torch, Teflon liner, “U” groove roller, alloy tips or one size larger, argon shielding wire

TROUBLE SHOOTING

| Issue | Possible Reason | Suggested Remedy |
|---|--|--|
| Power indicator is not lit, fan does not work and no output current | <ul style="list-style-type: none"> Welder is not plugged into power supply Circuit breaker may have operated Main power switch may not be in the ON position | <ul style="list-style-type: none"> Check that the welder is plugged into the 240V mains outlet and is switched on. Check that the mains fuse or breaker has not operated. Check that the main switch on the rear of the unit is in the on position. |
| Power indicator is lit, fan works, no output current | <ul style="list-style-type: none"> Output connectors may be disconnected or damaged Welding cables or earth clamp not connected properly | <ul style="list-style-type: none"> Check output connectors are connected properly and are not damaged Check connections and that workpiece is free of paint and rust at connection point |
| Over temperature indicator is on, no output current | <ul style="list-style-type: none"> Duty cycle of the unit has been exceeded. . | <ul style="list-style-type: none"> Allow the unit to cool for 20 minutes |
| Output current is not stable. | <ul style="list-style-type: none"> Earth clamp connection loose Mains Voltage is not constant Loose welding cables Leads reversed | <ul style="list-style-type: none"> Check earth clamp is connected to work piece properly. Change the Main Supply to an alternative Check the welding connectors are tight in the sockets. Check Leads are not reversed and correct +/- |
| Hot Welding Clamp | Welding clamp rated current is too small, | Replace with larger size welding clamp. |
| Excessive Spatter | <ul style="list-style-type: none"> Wire feed speed set too high Voltage too high Wrong polarity set Stick out too long Contaminated base metal Contaminated MIG wire Inadequate gas flow or too much gas flow Worn contact tip | <ul style="list-style-type: none"> Select lower wire feed speed Select a lower voltage setting Select the correct polarity for the wire being used Bring the torch closer to the work Remove materials like paint, grease, oil, and dirt, including mill scale from base metal Use clean dry rust free wire. Do not lubricate the wire with oil, grease etc 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. Protect the welding zone from wind and drafts Change contact tip. |
| Porosity - small cavities or holes resulting from gas pockets in weld metal | <ul style="list-style-type: none"> Wrong gas Inadequate gas flow or too much gas flow Moisture on the base metal Contaminated base metal Contaminated MIG wire Loose gas connection | <ul style="list-style-type: none"> Check that the correct gas is being used 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 Remove all moisture from base metal before welding Remove materials like paint, grease, oil, and dirt, including mill scale from base metal Use clean dry rust free wire. Do not lubricate the wire with oil, grease etc. Check and tighten connection. |

TROUBLE SHOOTING - CONTINUED

| Issue | Possible Reason | Suggested Remedy |
|--|--|---|
| Porosity - small cavities or holes resulting from gas pockets in weld metal | <ul style="list-style-type: none"> • Gas nozzle clogged with spatter, worn or out of shape • Missing or damaged gas diffuser • MIG torch euro connect O-Ring missing or damaged | <ul style="list-style-type: none"> • Clean or replace the gas nozzle • Replace the gas diffuser • Check and replace the O-Ring |
| Wire stubbing during welding | <ul style="list-style-type: none"> • Holding the torch too far away • Welding voltage set too low • Wire speed set too high | <ul style="list-style-type: none"> • 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 preceding weld bead | <ul style="list-style-type: none"> • Contaminated base metal • Not enough heat input • Improper welding technique • Too much heat | <ul style="list-style-type: none"> • 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 <p>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</p> <p>Adjust work angle or widen groove to access bottom during welding, Momentarily hold arc on side walls if using weaving technique</p> <ul style="list-style-type: none"> • Select a lower voltage range and /or adjust the wire speed to suit Increase travel speed |
| Excessive Penetration – weld metal melting through base meta | Poor in incorrect joint preparation | <ul style="list-style-type: none"> • Material too thick. Joint preparation and design needs to allow access to bottom of groove while maintaining proper welding wire extension and arc characteristics <p>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</p> |
| Lack of Penetration – shallow fusion between weld metal and base metal | <ul style="list-style-type: none"> • Not enough heat input • Contaminated base metal | <ul style="list-style-type: none"> • 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 |

MIG WIRE FEED TROUBLE SHOOTING

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

| Issue | Possible Reason | Suggested Remedy |
|--------------------------------------|---|---|
| No wire feed | <ul style="list-style-type: none"> • Wrong mode selected | <ul style="list-style-type: none"> • Check that the TIG/MMA/MIG selector switch set to MIG position |
| Inconsistent / interrupted wire feed | <ul style="list-style-type: none"> • 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) • Wrong size liner • 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 | <ul style="list-style-type: none"> • 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, it is recommended to replace the liner. • Install the correct size liner • 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. |

OPERATIONAL ENVIRONMENT

- Height above sea level $\leq 1000\text{m}$
- Operation temperature range $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
- Air relative humidity is below 90% (20°C)
- Preferably site the machine above floor level, ensure the maximum angle does not exceed 15 degrees.
- Protect the machine against heavy rain and against direct sunshine.
- The content of dust, acid, corrosive gas in the surrounding air or substance must not exceed normal standards.
- Take care that there is sufficient ventilation during welding.
There must be at least 30cm free distance between the machine and wall.



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- ELECTRODES
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- WELDING MACHINES
- TORCH SPARE PARTS
- WELDING ACCESSORIES
- MIG WIRE
- GAS EQUIPMENT
- WELDING SAFETY
- MIG TORCHES
- TIG TORCHES
- WELDING CABLE

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