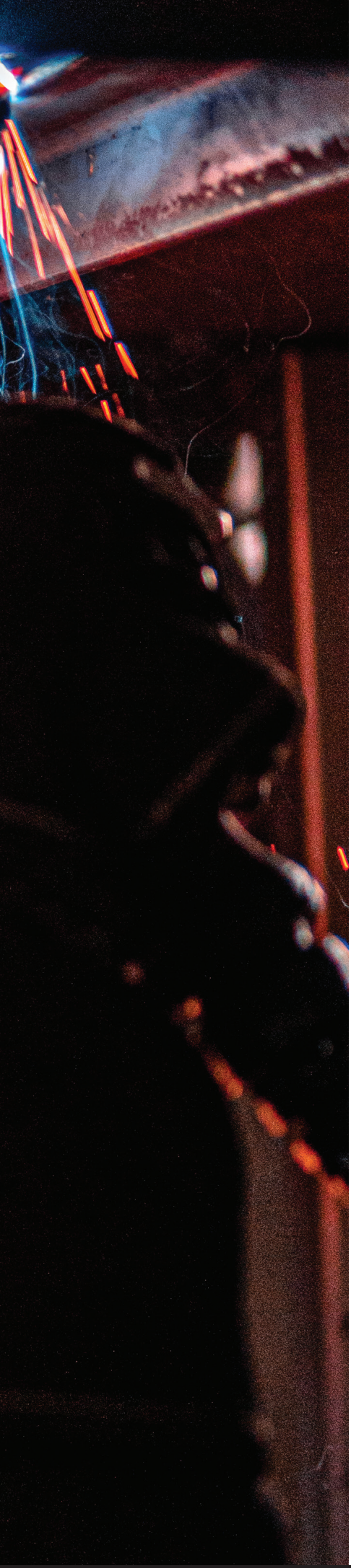
unimig®
VIPER 120 SYNERGIC

KUMJRVM120 | Operating Manual


UNIMIG



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SAFETY

Welding and cutting equipment can be dangerous to both the operator and people in or near the surrounding working area if the equipment is not correctly operated. Equipment must only be used under the strict and comprehensive observance of all relevant safety regulations.

Read and understand this instruction manual carefully before the installation and operation of this equipment.

Machine Operating Safety

- Do not switch the function modes while the machine is operating. Switching of the function modes during welding can damage the machine. Damage caused in this manner will not be covered under warranty.
- Disconnect the electrode-holder cable from the machine before switching on the machine, to avoid arcing should the electrode be in contact with the workpiece.
- Operators should be trained and or qualified.

Electric shock: It 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.

- Connect the primary input cable, according to Australian and New Zealand standards and regulations.
- Avoid all contact with live electrical parts of the welding/cutting circuit, electrodes and wires with bare hands.
- The operator must wear dry welding gloves while he/she performs the welding/cutting task.
- The operator should keep the workpiece insulated from himself/herself.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cable for wear and tear, replace the cable immediately if damaged, bare wiring is dangerous and can kill.
- Do not use damaged, undersized, or badly joined cables.
- Do not drape cables over your body.
- We recommend (RCD) safety switch is used with this equipment to detect any leakage of current to earth.

Fumes and gases are dangerous. Smoke and gas generated while 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 while welding or cutting, keep your head out of the fumes.
- Keep the working area well ventilated, use fume extraction or ventilation to remove welding/cutting fumes and gases.
- In confined or heavy fume environments always wear an approved air-supplied respirator.
- Welding/cutting 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/cut in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapours to form highly toxic and irritating gases.
- Materials such as galvanised, lead, or cadmium plated steel, containing elements that can give off toxic fumes when welded/cut. Do not weld/cut these materials unless the area is very well ventilated, and or wearing an air-supplied respirator.

Arc rays: harmful to people's eyes and skin. Arc rays from the welding/cutting process produce intense visible and invisible ultraviolet and infrared rays that can burn eyes and skin.

- Always wear a welding helmet with the correct shade of filter lens and suitable protective clothing, including welding gloves while the welding/cutting operation is performed.
- Measures should be taken to protect people in or near the surrounding working area. Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.

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

- The welding/cutting sparks & spatter may cause fire, therefore remove any flammable materials well away from the working area. Cover flammable materials and containers with approved covers if unable to be moved from the welding/cutting area.
- Do not weld/cut on closed containers such as tanks, drums, or pipes, unless they are correctly prepared according to the required Safety Standards to ensure that flammable or toxic vapours and substances are totally removed, these can cause an explosion even though the vessel has been “cleaned”. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- Do not weld/cut where the atmosphere may contain flammable dust, gas, or liquid vapours (such as petrol)
- Have a fire extinguisher nearby and know how to use it. Be alert that welding/cutting sparks and hot materials from welding/cutting can easily go through small cracks and openings to adjacent areas. Be aware that welding/cutting on a ceiling, floor, bulkhead, or partition can cause a fire on the hidden side.

Gas Cylinders. Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Because gas cylinders usually are part of the welding/cutting 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.
- Ensure cylinders are held secure and upright to prevent tipping or falling over.
- Never allow the welding/cutting electrode or earth clamp to touch the gas cylinder, do not drape welding cables over the cylinder.
- Never weld/cut 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.

Gas build-up. The build-up of gas can cause a toxic environment, deplete the oxygen content in the air resulting in death or injury. Many gases use in welding/cutting are invisible and odourless.

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

Electronic magnetic fields. MAGNETIC FIELDS can affect Implanted Medical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near any electric welding, cutting or heating operation.

Noise can damage hearing. Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

Hot parts. Items being welded/cut generate and hold high heat and can cause severe burns.

- Do not touch hot parts with bare hands. Allow a cooling period before working on the welding/cutting gun. Use insulated welding gloves and clothing to handle hot parts and prevent burns.

CAUTION

1. **Working Environment.**
   - **i.** The environment in which this welding/cutting equipment is installed must be free of grinding dust, corrosive chemicals, flammable gas or materials etc., and at no more than a maximum of 80% humidity.
   - **ii.** When using the machine outdoors, protect the machine from direct sunlight, rainwater and snow, etc.; the temperature of the working environment should be maintained within -10°C to +40°C.
   - **iii.** Keep this equipment 30cm distant from the wall.
   - **iv.** Ensure the working environment is well ventilated.
2. **Safety Tips.**
   - **i. Ventilation:** This equipment is small-sized, compact in structure, and of excellent performance in amperage output. The fan is used to dissipate heat generated by this equipment during the welding/cutting operation. Important: Maintain good ventilation of the louvres of this equipment. The minimum distance between this equipment and any other objects in or near the working area should be 30 cm. Good ventilation is of critical importance for the normal performance and service life of this equipment.
   - **ii. Thermal Overload Protection:** Should the machine be used to an excessive level, or in a high-temperature environment, poorly ventilated area or if the fan malfunctions the Thermal Overload Switch will be activated, and the machine will cease to operate. Under this circumstance, leave the machine switched on to keep the built-in fan working to bring down the temperature inside the equipment. The machine will be ready for use again when the internal temperature reaches a safe level.
   - **iii. Over-Voltage Supply:** Regarding the power supply voltage range of the machine, please refer to the "Main parameter" table. This equipment is of automatic voltage compensation, which enables the maintaining of the voltage range within the given range. In case that the voltage of input power supply amperage exceeds the stipulated value, it is possible to cause damage to the components of this equipment. Please ensure your primary power supply is correct.
   - **iv.** Do not come into contact with the output terminals while the machine is in operation. An electric shock may occur.

MAINTENANCE

Exposure to extremely dusty, damp, or corrosive air is damaging to the welding/cutting machine. To prevent any possible failure or fault of this welding/cutting equipment, clean the dust at regular intervals with clean and dry compressed air of required pressure.

Please note that: lack of maintenance can result in the cancellation of the guarantee; the guarantee of this welding/cutting equipment will be void if the machine has been modified, attempt to take apart the machine or open the factory-made sealing of the machine without the consent of an authorized representative of the manufacturer.

TROUBLESHOOTING

Caution: Only qualified technicians are authorized to undertake the repair of this welding/cutting equipment. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed in this manual.

ATTENTION! - CHECK FOR GAS LEAKAGE

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 8-10 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.
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.

Welding Guns Of Australia PTY LTD, authorised representatives or agents of Welding Guns Of Australia PTY LTD will not be liable or responsible for the loss of any gas.

VIPER™ 120 SYNERGIC MIG Welder

Key Features:

- Synergic MIG Control
- 10 AMP Plug

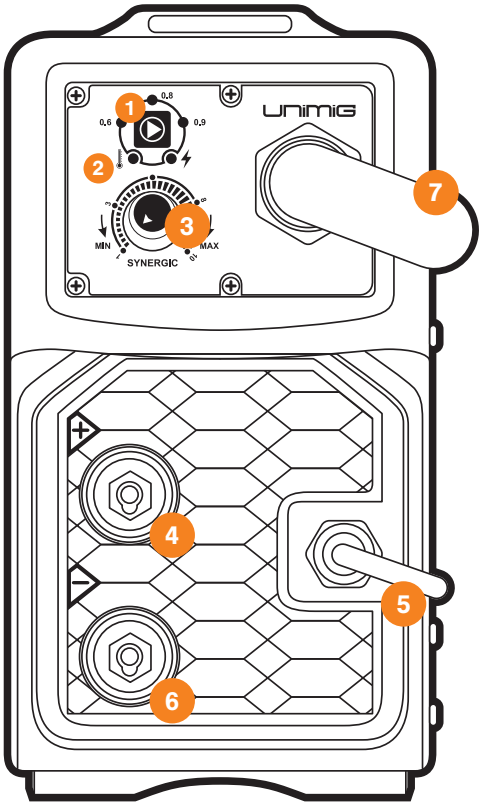
1 YEAR PRODUCT WARRANTY

TECHNICAL DATA	
SKU	KUMJRVM120
PRIMARY INPUT VOLTAGE	240V Single Phase
SUPPLY PLUG	10 AMP
RATED INPUT POWER (kVA)	4.15
Ieff (A)	6.5
RATED OUTPUT	40/16V-120A/20V
NO LOAD VOLTAGE (V)	49
PROTECTION CLASS	IP21S
INSULATION CLASS	F
POWER FACTOR	0.68
MINIMUM GENERATOR (kVA)	8.0
DINSE CONNECTOR	10/25
STANDARD	AS/NZ60974-1
WELDS	Mild Steel, Stainless Steel
WARRANTY (Years)	1

MIG SPECIFICATIONS	
MIG WELDING CURRENT RANGE	40-120A
MIG DUTY CYCLE @ 40°C	10% @ 120A
MIG WIRE SIZE RANGE	0.6-0.9mm
MIG WIRE SPOOL SIZE	1kg
MIG WELDING THICKNESS RANGE	1-6mm

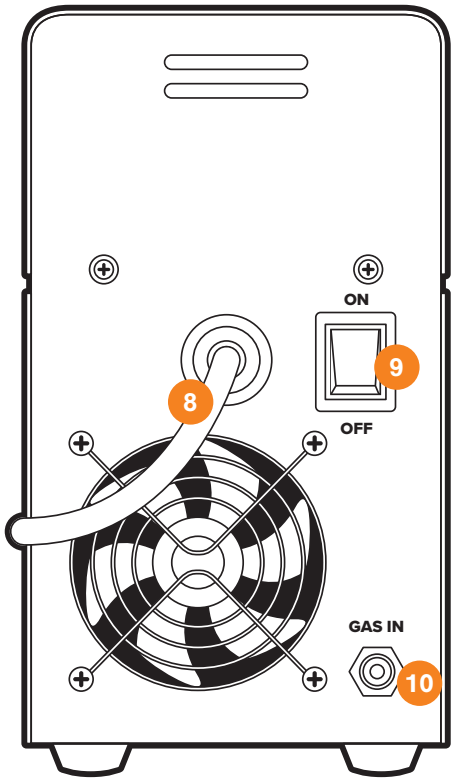
SIZE & WEIGHT	
DIMENSIONS (mm)	353x132x250mm
WEIGHT (kg)	5.2kg

MACHINE FEATURES	
MIG CONTROLS	Synergic
WIRE DRIVE	Standard
THERMAL OVERLOAD PROTECTION	Over Temperature Warning



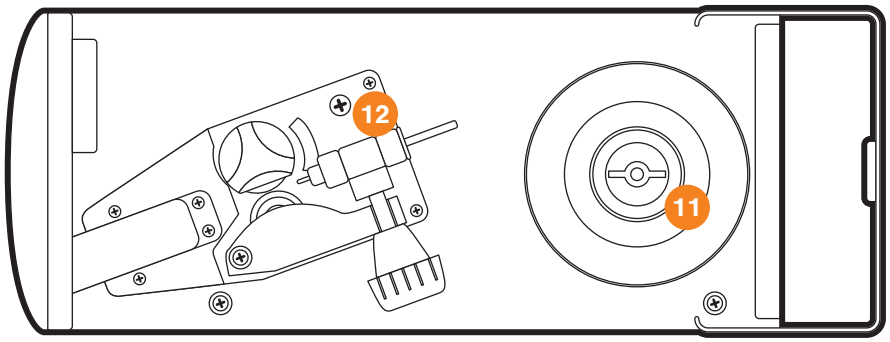
Front Panel Layout

1. Synergic MIG Programs
2. Thermal Overload LED
3. Synergic Control Knob
4. Positive Output (+)
5. Polarity Cable
6. Negative Output (-)
7. Direct Connect MIG Torch



Rear Panel Layout

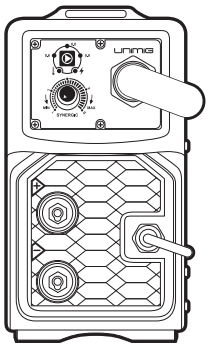
8. Power Cable
9. Power Switch
10. Gas Inlet



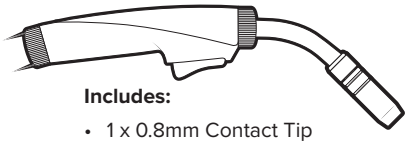
Interior Layout

11. Wire Spool Holder
12. Wire Feed Assembly

WHAT'S IN THE BOX



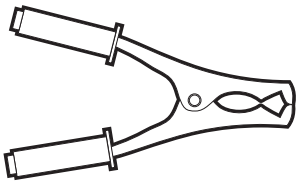
VIPER 120 SYENRGIC MIG Welder



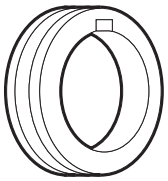
Includes:

- 1 x 0.8mm Contact Tip
- 1 x Tip Holder
- 1 x Gas Nozzle

2m Direct Connect MIG Torch



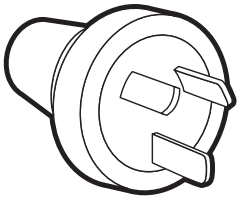
2m Earth Clamp & Lead



Includes:

- 1 x 0.6-0.8mm "V GROOVE" 25/9 - SOLID WIRE
- 1 x 0.8-0.9mm "F GROOVE" 25/9 - GASLESS WIRE

Drive Rollers

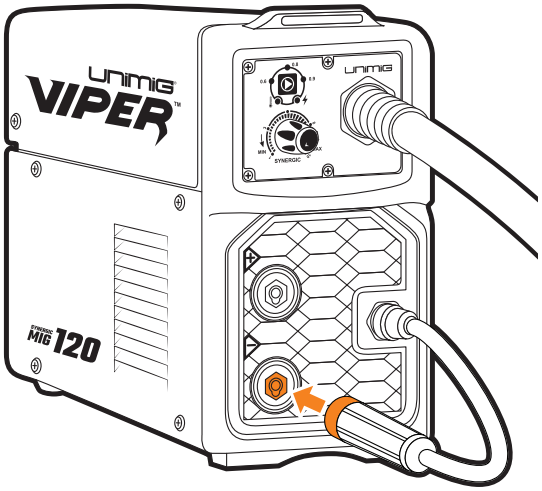


10 AMP Plug (Fitted)

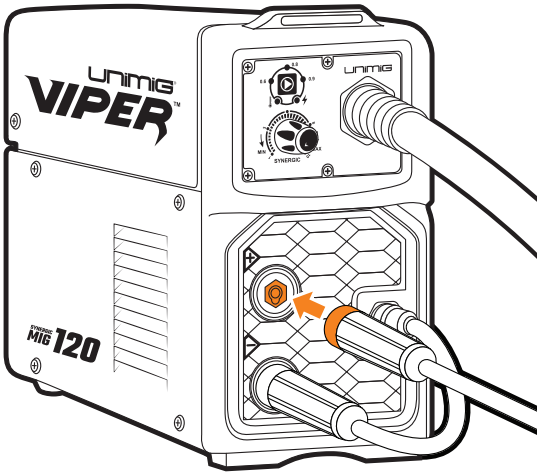
Operating Manual

SETUP FOR MIG (GASLESS)

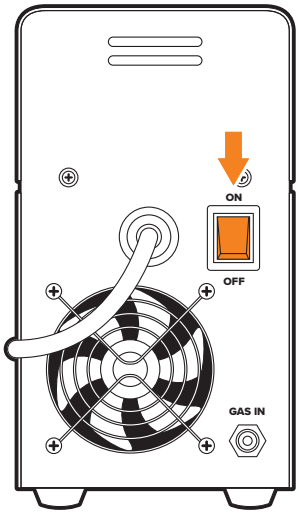
1. Connect the polarity cable to the **negative (-)** dinse connection, twist to lock in place.



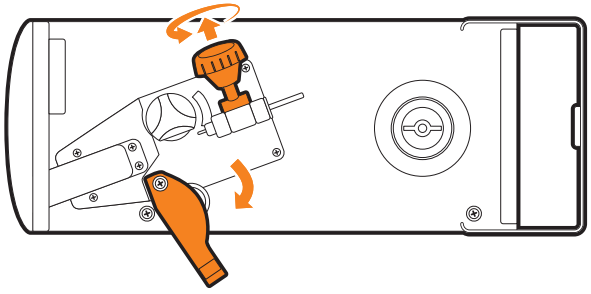
2. Connect the earth clamp to the **positive (+)** dinse connection, twist to lock in place.



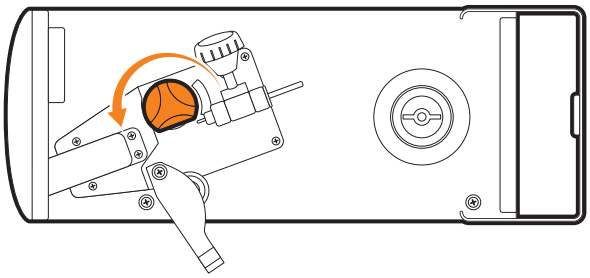
3. Connect the plug into a 10 AMP socket, then switch the machine ON.



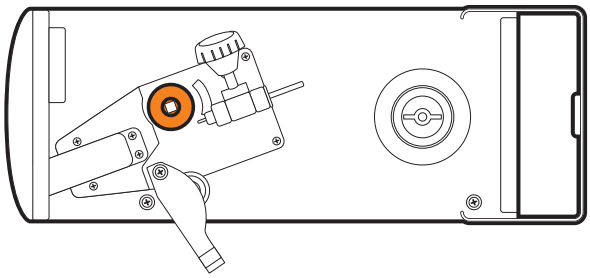
4. Pull up the roller tension knob to release the wire drive.



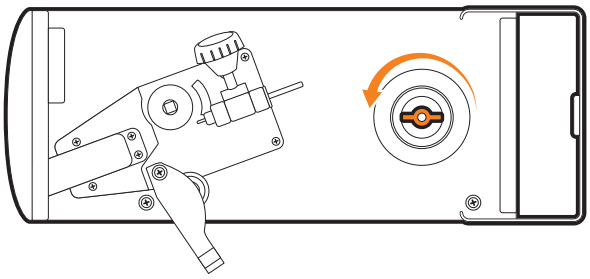
5 Unscrew the roller cap.



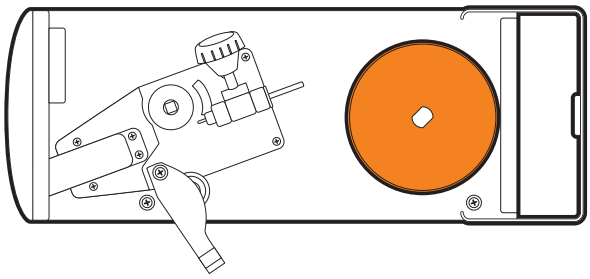
6 Ensure you have an Knurled (F Groove) drive roller installed. If not, fit correct roller and replace the roller cover.



7 Unscrew spool retaining nut and remove tension spring and spool holder bracket.

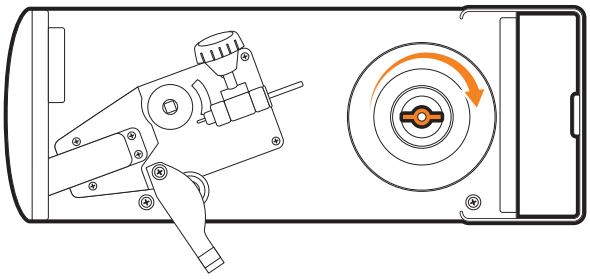


8 Place 1kg wire spool onto the spool holder.

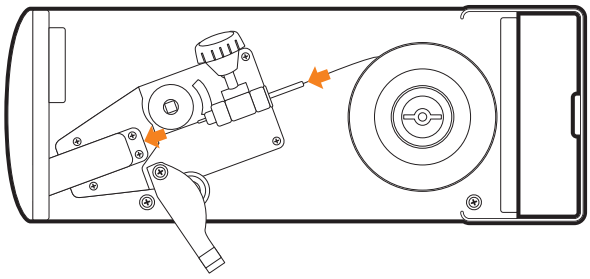


SETUP FOR MIG (GASLESS)

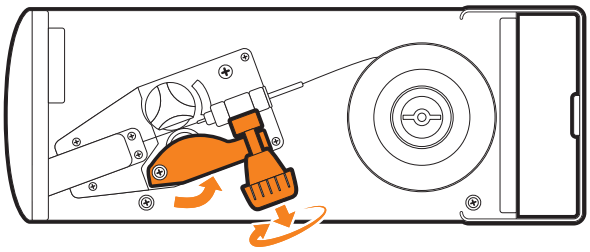
9 Replace tension spring and spool holder bracket, then tighten spool retaining nut.



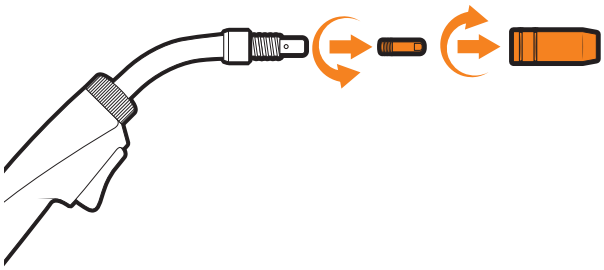
10 Feed wire through the inlet guide tube through to the outlet guide tube. Ensure that the wire passes through the roller.



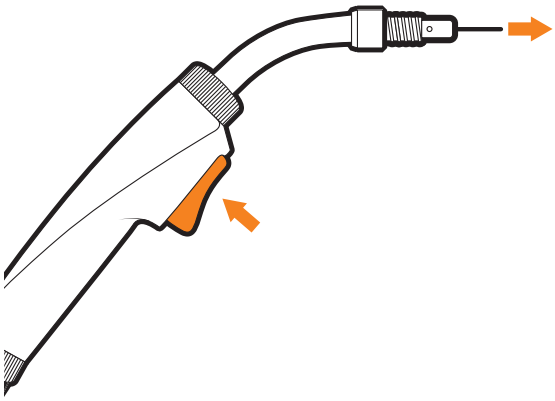
11 Pull down tension knob to lock wire in place. Twist to tighten.



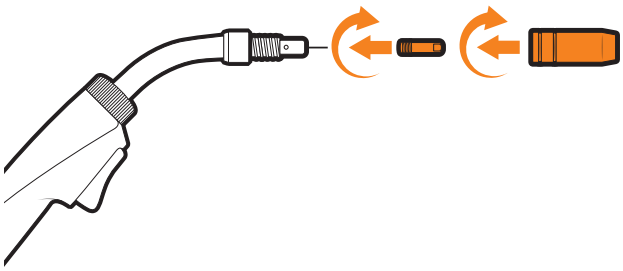
12 Remove front end consumables from the MIG torch.



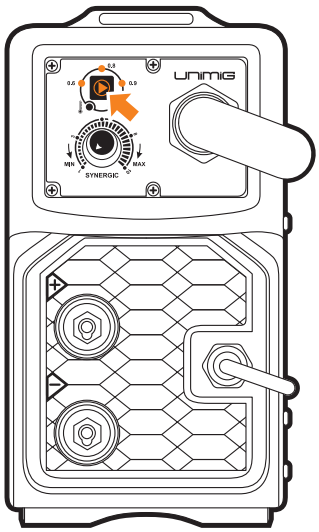
13 Hold down the torch trigger to feed wire through to the torch. If the wire slips or stops you will need to adjust the roller tension knob.



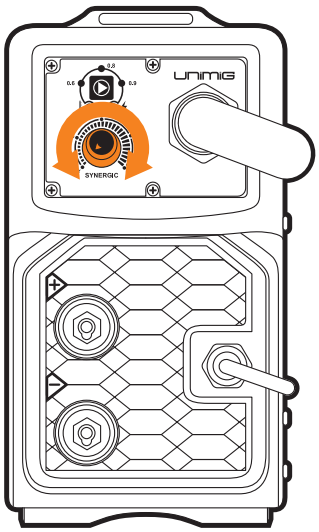
14 Replace front end consumables on the MIG torch.



15 Select wire size according to the wire spool installed.

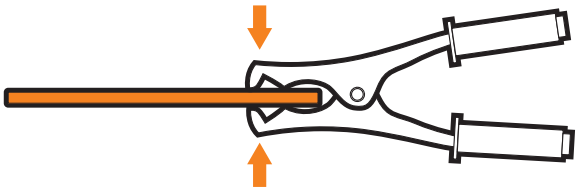


16 Adjust Synergic Power Knob according to material thickness. Use a higher value for thicker material, and a lower value for thinner material.

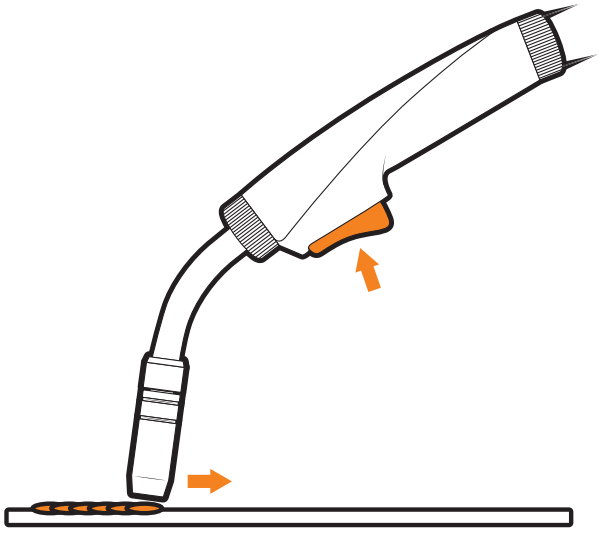


SETUP FOR MIG (GASLESS)

17 Connect earth clamp to your workpiece.

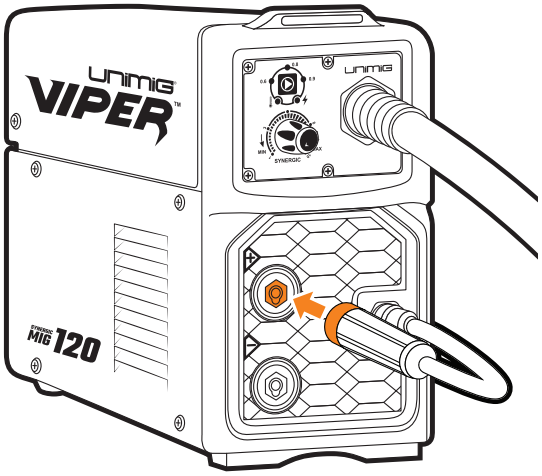


18 Line up the torch with your workpiece, then simply pull the trigger to initiate the weld. For gasless MIG, the drag method is recommended for optimum weld quality. Release trigger to end the weld.

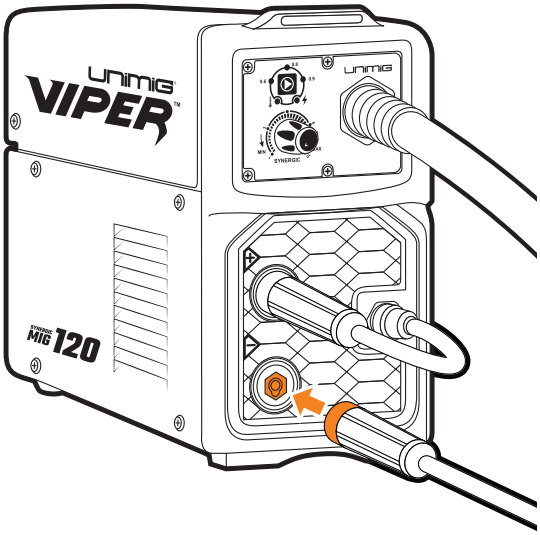


SETUP FOR MIG (GAS-SHIELDED)

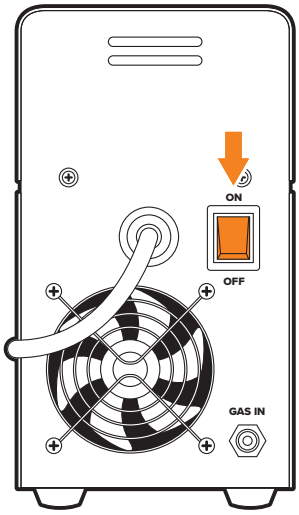
1. Connect the polarity cable to the **positive (+)** dinse connection, twist to lock in place.



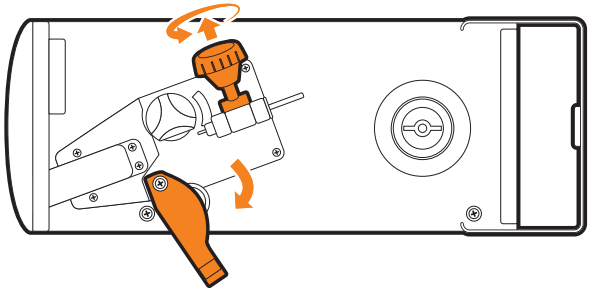
2. Connect the earth clamp to the **negative (-)** dinse connection, twist to lock in place.



3. Connect the plug into a 10 AMP socket, then switch the machine ON.

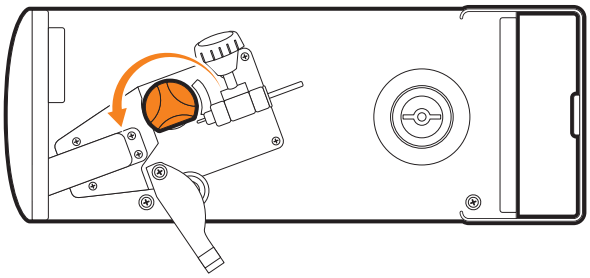


4. Pull up the roller tension knob to release the wire drive.

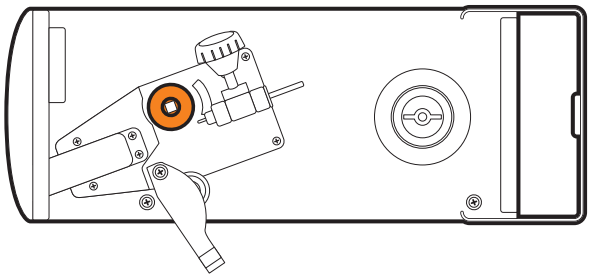


SETUP FOR MIG (GAS-SHIELDED)

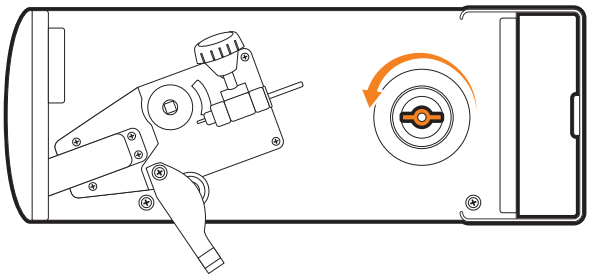
5 Unscrew the roller cap.



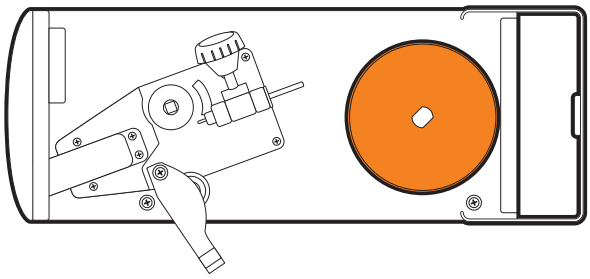
6 Ensure you have an V Groove drive roller installed. If not, fit correct roller and replace the roller cover.



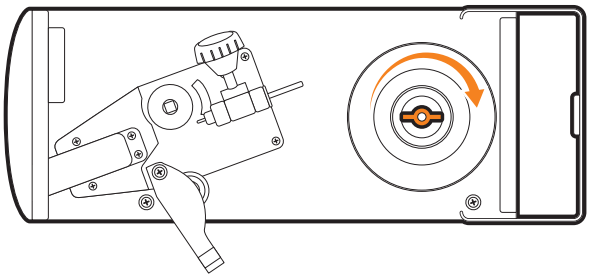
7 Unscrew spool retaining nut and remove tension spring and spool holder bracket.



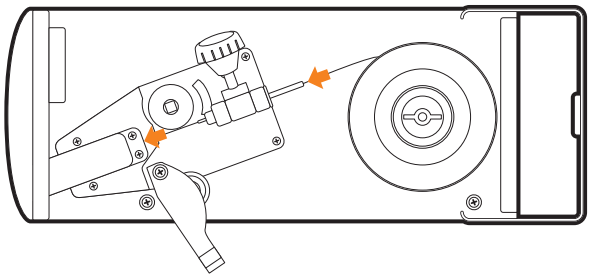
8 Place 1kg wire spool onto the spool holder.



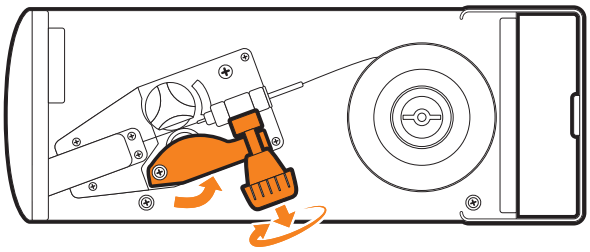
9 Replace tension spring and spool holder bracket, then tighten spool retaining nut.



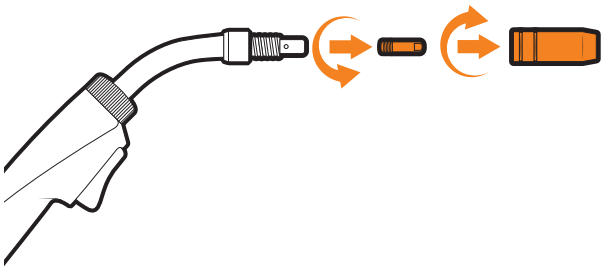
10 Feed wire through the inlet guide tube through to the outlet guide tube. Ensure that the wire passes through the roller.



11 Pull down tension knob to lock wire in place. Twist to tighten.

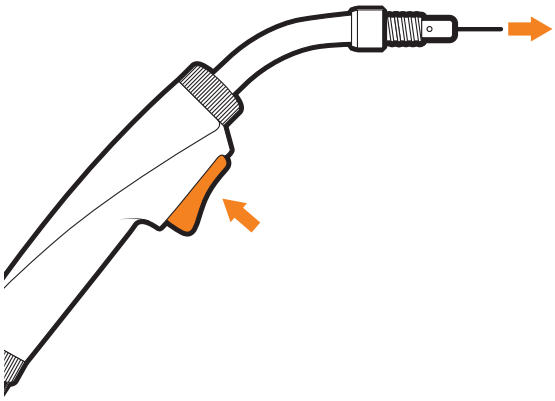


12 Remove front end consumables from the MIG torch.

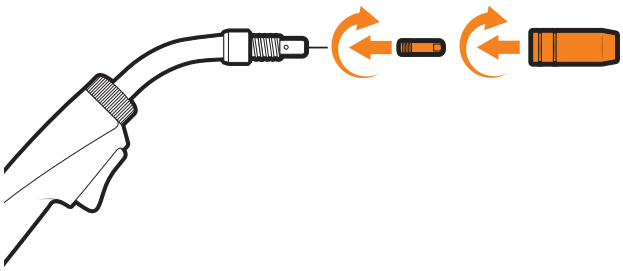


SETUP FOR MIG (GAS-SHIELDED)

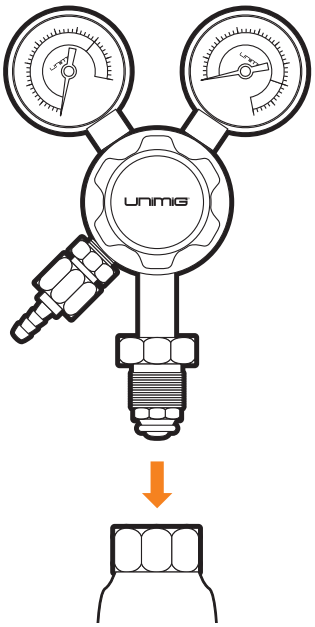
13 Hold down the torch trigger to feed wire through to the torch. If the wire slips or stops you will need to adjust the roller tension knob.



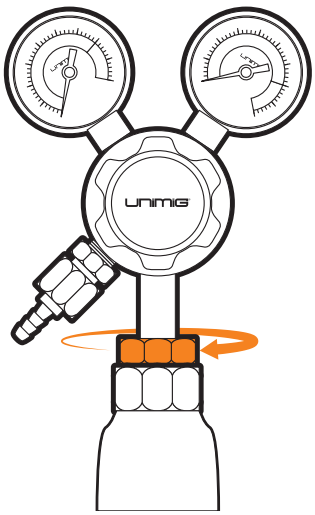
14 Replace front end consumables on the MIG torch.



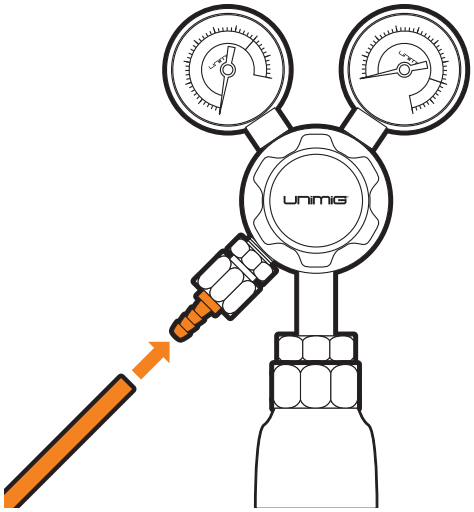
15 Place twin gauge argon regulator into your gas outlet.



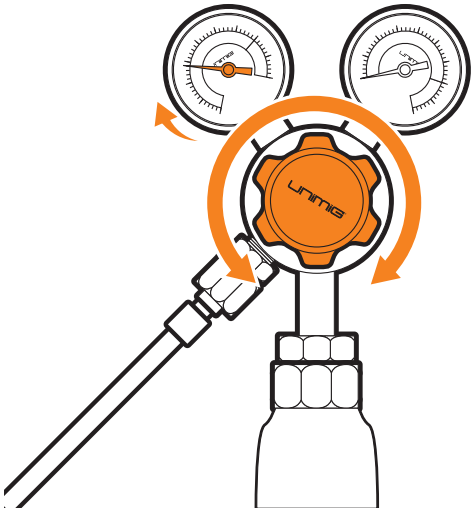
16 Tighten securely with wrench.



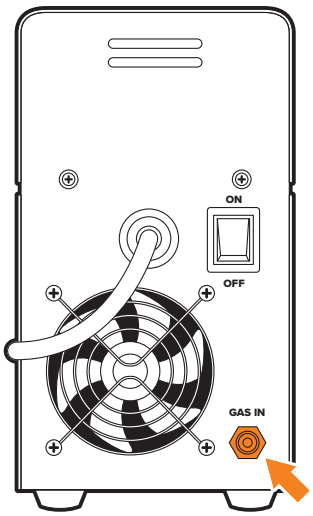
17 Connect gas hose the regulator outlet, and crimp in place.



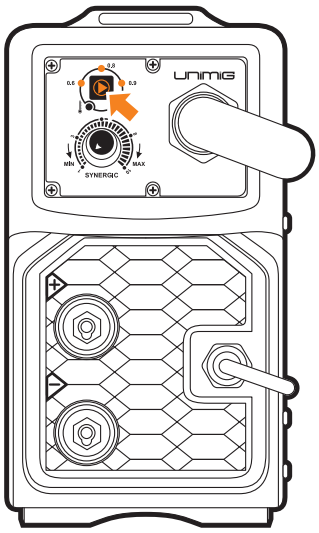
18 Adjust gas glow to 8-10L/min.



19 Connect gas hose to the gas inlet on the rear of the machine.

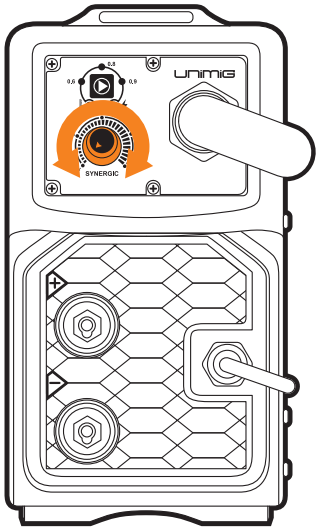


20 Select wire size according to the wire spool installed.

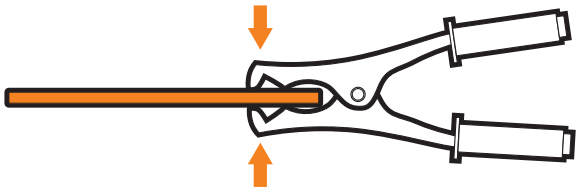


SETUP FOR MIG (GAS-SHIELDED)

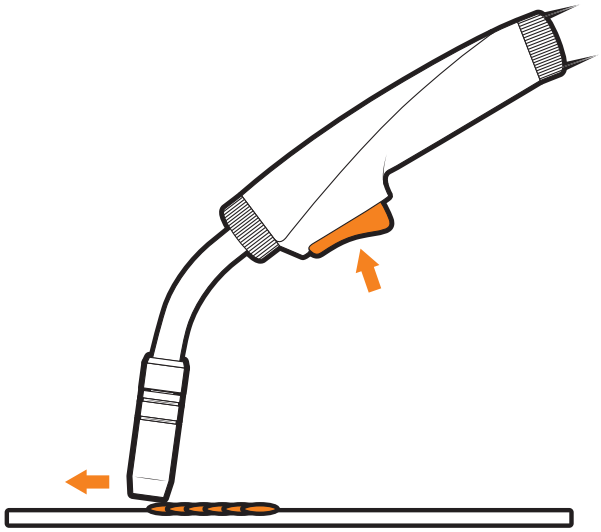
21 Adjust Synergic Power Knob according to material thickness. Use a higher value for thicker material, and a lower value for thinner material.



22 Connect earth clamp to your workpiece.



23 Line up the torch with your workpiece, then simply pull the trigger to initiate the weld. For gas-shielded MIG, the push method is recommended for optimum weld quality. Release trigger to end the weld.



MIG (Metal Inert Gas) Welding

MIG (metal inert gas) welding also known as GMAW (gas metal arc welding) or MAG (metal active gas welding), is a semi-automatic or automatic arc welding process in which a continuous and consumable wire electrode and a shielding gas are fed through a welding gun. A constant voltage, direct current power source is most commonly used with MIG welding.

There are four primary methods of metal transfer in MIG welding, called short circuit (also known as dip transfer) globular transfer, spray transfer and pulsed-spray, each of which has distinct properties and corresponding advantages and limitations. To perform MIG welding, the necessary equipment is a welding gun, a wire feed unit, a welding power supply, an electrode wire, and a shielding gas supply. Short circuit transfer is the most commonly used method whereby the wire electrode is fed continuously down the welding torch through to and exiting the contact tip. The wire touches the workpiece and causes a short circuit the wire heats up and begins to form a molten bead, the bead separates from the end of the wire and forms a droplet that is transferred into the weld pool. This process is repeated about 100 times per second, making the arc appear constant to the human eye.

Short Circuit Transfer

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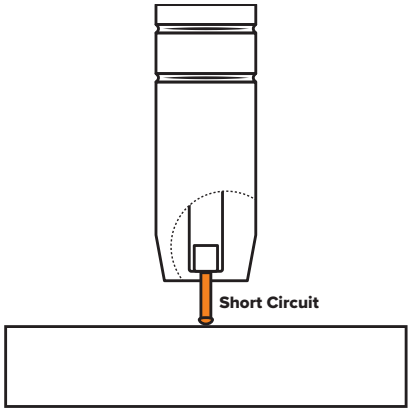
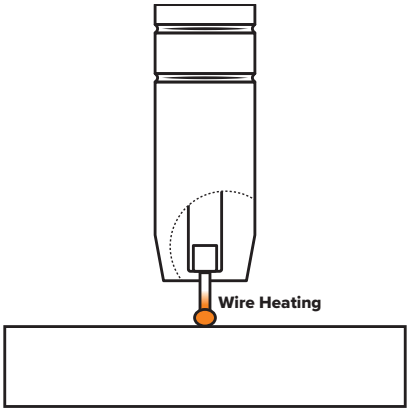
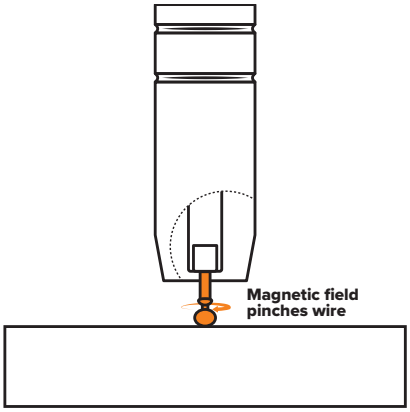


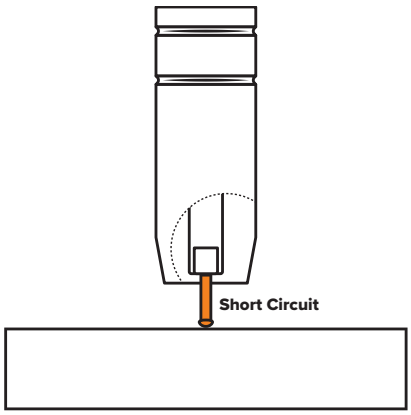
The wire approaches the work piece and touches the work creating a short circuit between the wire and the base metal, because there is no space between the wire and the base metal there is no arc and current flows through the wire.



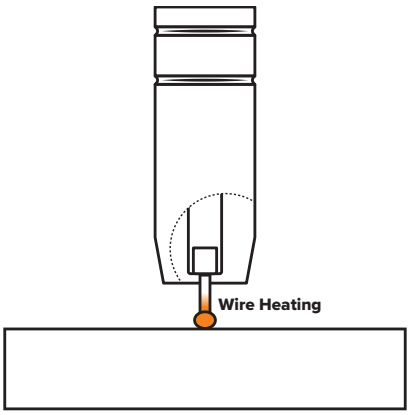
The wire cannot support all the current flow, resistance builds up and the wire becomes hot and weak and begins to melt.



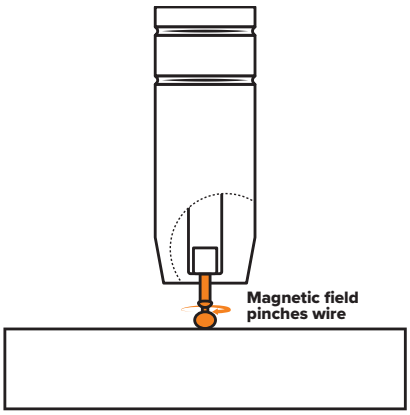
The current flow creates a magnetic field that begins to pinch the melting wire forming it into droplet.



The pinch causes the forming droplet to separate and fall towards the now creating weld pool.



An arc is created at the separation of the droplet and the heat and force of the arc flattens out the droplet into the weld pool. The heat of the arc melts the end of the wire slightly as it feeds towards the base metal.



The wire feed speed overcomes the heat of the arc and the wire again approaches the work to short circuit and repeat the cycle.

Basic MIG Welding

Good weld quality and weld profile depend on gun angle, the direction of travel, electrode extension (stick out), travel speed, the thickness of base metal, wire feed speed (amperage) and arc voltage. To follow are some basic guides to assist with your setup.

Gun Position - Travel Direction, Work Angle

Gun position or technique usually refers to how the wire is directed at the base metal, the angle and travel direction chosen. Travel speed and work angle will determine the characteristic of the weld bead profile and degree of weld penetration.

Push Technique

The wire is located at the leading edge of the weld pool and pushed towards the un-melted work surface. This technique offers a better view of the weld joint and direction of the wire into the weld joint. Push technique directs the heat away from the weld puddle, allowing faster travel speeds providing a flatter weld profile with light penetration - useful for welding thin materials. The welds are wider and flatter, allowing for minimal clean up / grinding time.

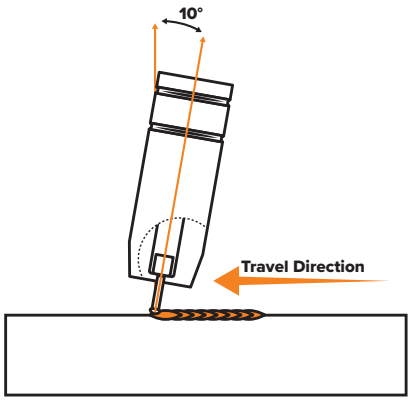
Perpendicular Technique

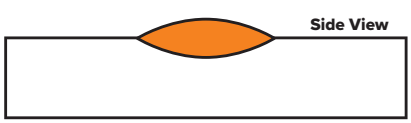
The wire is fed directly into the weld. This technique is used primarily for automated situations or when conditions make it necessary. The weld profile is generally higher, and deeper penetration is achieved.

Drag Technique

The gun and wire are dragged away from the weld bead. The arc and heat are concentrated on the weld pool. The base metal receives more heat, deeper melting, more penetration and the weld profile is higher with more build-up.

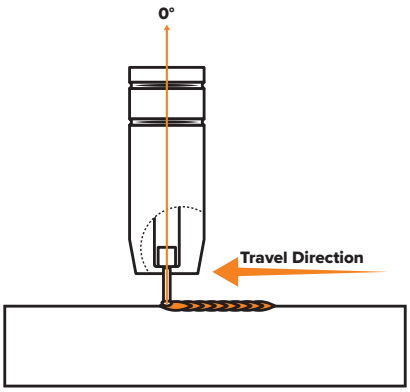
Push Technique

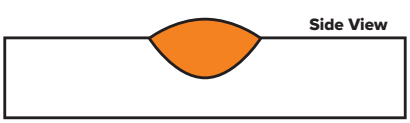




Flat, even weld profile, light penetration.

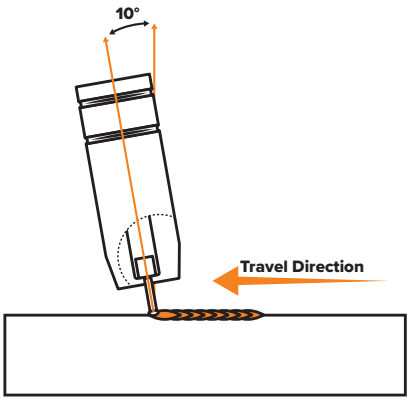
Perpendicular Technique

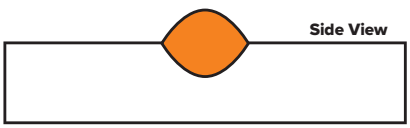




Narrower weld profile, even penetration.

Drag Technique

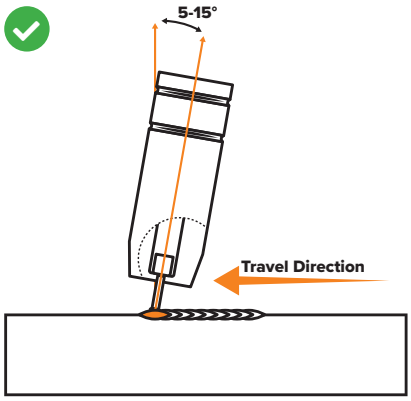




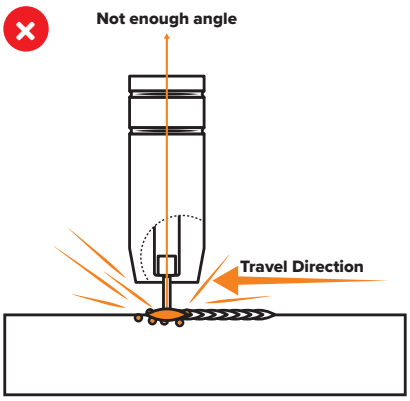
Narrower and higher weld profile, more penetration.

Travel Angle

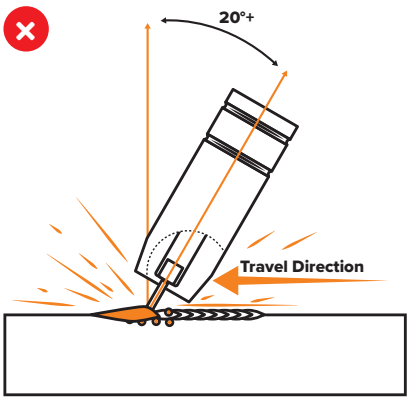
Travel angle is the right to left, relative to the direction of welding. A travel angle of 5°- 15° is ideal and produces the right level of control over the weld pool. A travel angle higher than 20° will give an unstable arc condition with poor weld metal transfer, less penetration, high levels of spatter, weak gas shield and poor quality finished weld.



Good level of control over the weld pool, even flat weld.



Less control over the weld pool, more spatter.

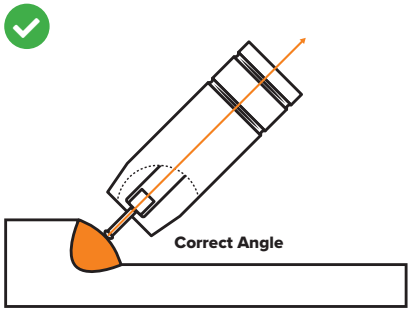


Poor control, unstable arc, less penetration, lots of spatter.

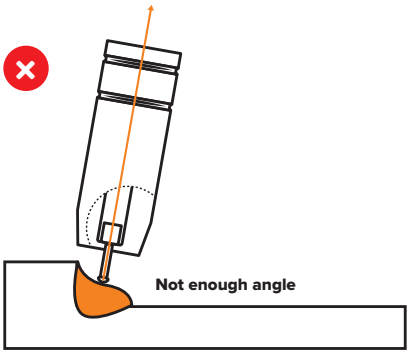
Angle to Work

The work angle is the forward back angle of the gun relative to the workpiece.

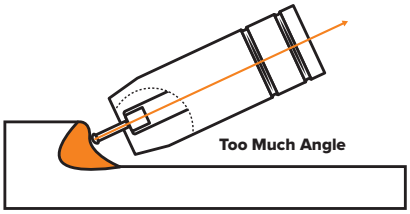
The correct work angle provides good bead shape, prevents undercut, uneven penetration, weak gas shield and poor quality finished weld.



Good level of control over the weld pool, even flat weld.



Less control over the weld pool, more spatter.

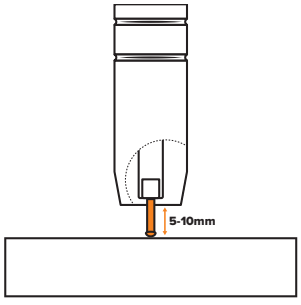


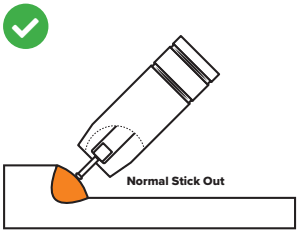
Poor control, unstable arc, less penetration, lots of spatter.

Stick Out

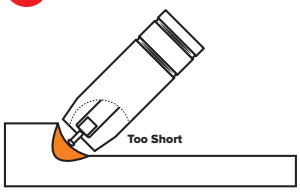
Stick out is the length of the unmelted wire protruding from the end of the contact tip.

A constant even stick out of 5-10mm will produce a stable arc, and an even current flow providing good penetration and even fusion. Too short stick out will cause an unstable weld pool, produce spatter and overheat the contact tip. Too long stick out will cause an unstable arc, lack of penetration, lack of fusion, and increase spatter.

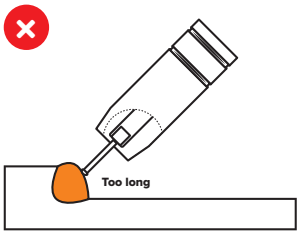




Even arc, good penetration even fusion, good finish.



Unstable arc, spatter, over heat contact tip.



Unstable arc, spatter, poor penetration and fusion.

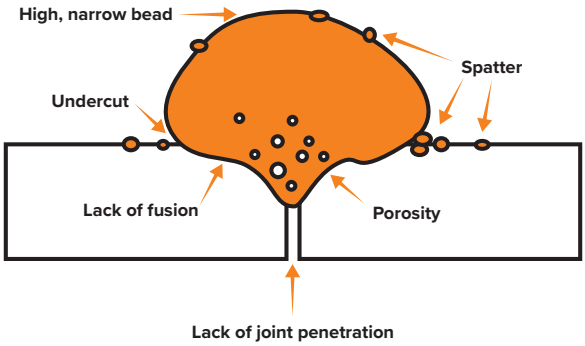
Travel Speed

Travel speed is the rate that the gun is moved along the weld joint and is usually measured in mm per minute. Travel speeds can vary depending on conditions and the welder's skill and is limited to the welder's ability to control the weld pool. Push technique allows faster travel speeds than Drag technique. The gas flow must also correspond with the travel speed, increasing with faster travel speed and decreasing at a slower speed. Travel speed needs to match the amperage and will decrease as the material thickness and amperage increase.

Travel Speed Too Fast

A too fast travel speed produces too little heat per mm of travel resulting in less penetration and reduced weld fusion, the weld bead solidifies very quickly trapping gases inside the weld metal causing porosity. Undercutting of the base metal can also occur, and an unfilled groove in the base metal is created when the travel speed is too fast to allow molten metal to flow into the weld crater created by the arc heat.

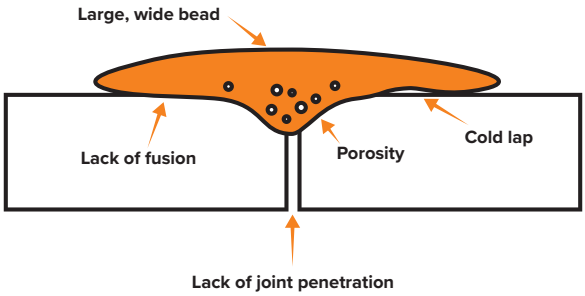
Travel Speed Too Fast



Travel Speed Too Slow

A too slow travel speed produces a large weld with a lack of penetration and fusion. The energy from the arc dwells on top of the weld pool rather than penetrating the base metal. This produces a wider weld bead with more deposited weld metal per mm than is required resulting in a weld deposit of poor quality.

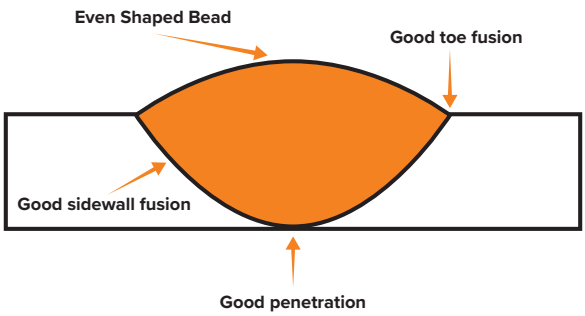
Travel Speed Too Slow



Correct Travel Speed

The correct travel speed keeps the arc at the leading edge of the weld pool allowing the base metal to melt sufficiently to create good penetration, fusion and wetting out of the weld pool producing a weld deposit of good quality.

Correct Travel Speed



Wire types and sizes

Use the correct wire type for the base metal being welded. Use stainless steel wire for stainless steel, aluminium wires for aluminium and steel wires for steel.

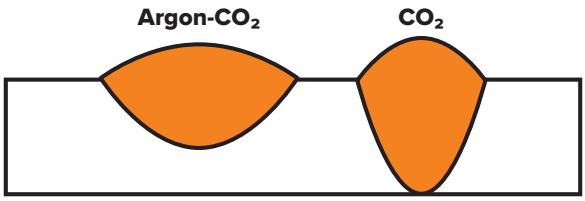
Use a smaller diameter wire for thin base metals. For thicker materials use a larger wire diameter and larger machine, check the recommended welding capability of your machine.

Gas selection

The purpose of the gas in the MIG process is to protect/shield the wire, the arc and the molten weld metal from the atmosphere. Most metals when heated to a molten state will react with the air in the atmosphere, without the protection of the shielding gas the weld produced would contain defects like porosity, lack of fusion and slag inclusions. Additionally, some of the gas becomes ionised (electrically charged) and helps the current flow smoothly.

- The correct gas flow is also critical in protecting the welding zone from the atmosphere.
- Too low flow will give inadequate coverage and result in weld defects and unstable arc conditions.
- Too high flow can cause air to be drawn into the gas column and contaminate the weld zone.

Use the correct shielding gas. Co2 is suitable for steel and offers good penetration characteristics; the weld profile is narrower and slightly more raised than the weld profile obtained from Argon Co2 mixed gas. Argon Co2 mix gas offers better weldability for thin metals and has a wider range of setting tolerance on the machine. Argon 80% Co2 20% is a good all-round mix suitable for most applications.



VIPER 120 SYNERGIC MIG Torch Consumables

SKU	Description	QTY
PCTH14	TIP HOLDER	2

SKU	Description	QTY
PGNS15	NOZZLE SPRING	2

SKU	Description	QTY
PCT0008-06	CONTACT TIPS - Steel 0.6mm	10
PCT0008-08	CONTACT TIPS - Steel 0.8mm	10
PCT0008-09	CONTACT TIPS - Steel 0.9mm	10

SKU	Description	QTY
PGN15CON	GAS NOZZLE - Conical	2
PGN15CYL	GAS NOZZLE - Cylindrical	2
PGN15SPOT	GAS NOZZLE - Spot	2
PGN15TAP	GAS NOZZLE - Tapered	2

Drive Roller Selection

The importance of smooth, consistent wire feeding during MIG welding cannot be emphasised enough. The smoother the wire feed, the better the welding will be. Feed rollers or drive rollers are used to feed the wire mechanically along the length of the welding gun.

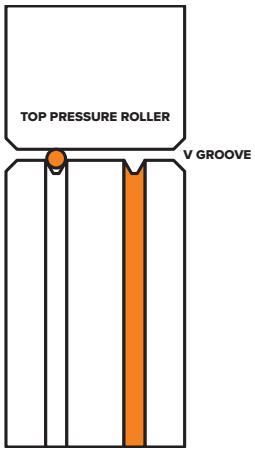
Feed rollers are designed to be used for certain types of welding wire, and they have different types of grooves machined in them to accommodate the different types of wire. The wire is held in the groove by the top roller of the wire drive unit and is referred to as the pressure roller; pressure is applied by a tension arm that can be adjusted to increase or decrease the pressure as required. The type of wire will determine how much pressure can be applied and what type of drive roller is best suited to obtain optimum wire feed.

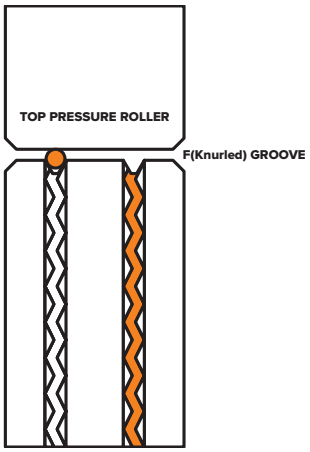
Solid Hard Wire (V Groove)

Steel or Stainless Steel require a drive roller with a **V** shape groove for optimum grip and drive capability. Solid wires can have more tension applied to the wire from the top pressure roller that holds the wire in the groove, and the V shape groove is more suited for this. Solid wires are more forgiving to feed due to their higher cross-sectional column strength; they are stiffer and don't bend so easily.

Flux Core / Gasless Wire (Knurled/F Groove)

These wires are made up of a thin metal sheath that has fluxing, and metal compounds layered onto it and then rolled into a cylinder to form the finished wire. The wire cannot take too much pressure from the top roller as it can be crushed and deformed if too much pressure is applied. A **Knurled/F Groove** drive roller has been developed, and it has small serrations in the groove, the serrations grip the wire and assist in driving it without too much pressure from the top roller. The downside to the knurled wire feed roller on flux-cored wire is it will slowly over time bit by bit eat away at the surface of the welding wire, and these small pieces will eventually go down into the liner. This will cause clogging in the liner and added friction that will lead to welding wire feed problems. A U groove wire can also be used for flux core wire without the wire particles coming off the wire surface. However, it is considered that the knurled roller will give a more positive feed of flux core wire without any deformation of the wire shape.





Roller Diameter: 30/22

V Groove Roller (Steel Wire)

SKU	Description
U51002	VIPER 120 ROLLER - 25/9 - 0.6/0.8 V GROOVE
U51003	VIPER 120 ROLLER - 25/9 - 0.8/0.9 V GROOVE

Knurled/F Groove (Flux-Cored Wire)

SKU	Description
U51004	VIPER 120 ROLLER - 25/9 - 0.8/0.9 F GROOVE

WARNING: There are extremely dangerous voltage and power levels present inside this unit. Do not attempt to diagnose or repair unit by removing external cover unless you are an authorised repair agent for UNIMIG.

MIG TROUBLESHOOTING

1. Excessive Spatter.

- **Wire feed speed set too high.** Select lower wire feed speed.
- **Voltage too high.** Select a lower voltage setting.
- **Wrong polarity set.** Select the correct polarity for the wire being used - see machine setup guide.
- **Stick out too long.** Bring the torch closer to the work.
- **Contaminated base metal.** Remove materials like paint, grease, oil, and dirt, including mill scale from base metal.
- **Contaminated MIG wire.** Use clean dry rust free wire. Do not lubricate the wire with oil, grease etc.
- **Inadequate gas flow or too much gas flow.** Check the gas is connected, check hoses, gas valve and torch are not restricted. Set the gas flow between 6-12 l/min flow rate. Check hoses and fittings for holes, leaks etc.

2. Porosity: Small cavities or holes resulting from gas pockets in weld metal.

- **Wrong gas.** Check that the correct gas is being used.
- **Inadequate gas flow or too much gas flow.** 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.
- **Moisture on the base metal.** Remove all moisture from base metal before welding.
- **Contaminated base metal.** Remove materials like paint, grease, oil, and dirt, including mill scale from base metal.
- **Contaminated MIG wire.** Use clean dry rust free wire. Do not lubricate the wire with oil, grease etc.
- **Gas nozzle clogged with spatter, worn or out of shape.** Clean or replace the gas nozzle.
- **Missing or damaged gas diffuser.** Replace the gas diffuser.
- **MIG torch Euro connect O-ring missing or damaged.** Check and replace the O-ring.

3. Wire stubbing during welding.

- **Holding the torch too far away.** Bring the torch closer to the work and maintain stick out of 5-10mm.
- **Welding voltage set too low.** Increase the voltage.
- **Wire Speed set too high.** Decrease the wire feed speed.

4. Lack of fusion: Failure of weld metal to fuse completely with base metal or a proceeding weld bead.

- **Contaminated base metal.** Remove materials like paint, grease, oil, and dirt, including mill scale from base metal.
- **Not enough heat input.** Select a higher voltage range and /or adjust the wire speed to suit.
- **Improper welding technique.** Keep the arc at the leading edge of the weld pool. Gun angle to work should be between 5 & 15°. Direct the arc at the weld joint. Adjust work angle or widen groove to access bottom during welding. Momentarily hold arc on side walls if using weaving technique.

5. Excessive penetration: Weld metal melting through base metal.

- **Too much heat.** Select a lower voltage range and /or adjust the wire speed to suit. Increase travel speed.

6. Lack of penetration: Shallow fusion between weld metal and base metal

- **Poor incorrect joint preparation.** Material too thick. Joint preparation and design needs to allow access to bottom of groove while maintaining proper welding wire extension and arc characteristics. Keep the arc at the leading edge of the weld pool and maintain the gun angle at 5 & 15° keeping the stick out between 5-10mm.
- **Not enough heat input.** Select a higher voltage range and /or adjust the wire speed to suit. Reduce travel speed.
- **Contaminated base metal.** Remove materials like paint, grease, oil, and dirt, including mill scale from base metal.

7. No wire feed.

- **Wrong mode selected.** Check that the TIG/MMA/MIG selector switch set to MIG position.
- **Wrong torch selector switch.** Check that the STANDARD/SPOOL GUN selector switch is set to STANDARD position for MIG welding and SPOOL GUN when using the spool gun.

8. Inconsistent/interrupted wire feed .

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

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UNIMIG®

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