

UNIMIG



REGULATORS & FLOWMETERS

Gas Regulators & Flowmeters | Operating Manual

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1. Safety

Welding 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 for all system components, especially the safety instructions and warning notices before the installation and operation of this equipment.

Product specifications and features are subject to change without notice. While every effort has been made to provide accurate and current information at the time of publication, this manual is intended as a general guide and is not exhaustive regarding safety, welding, or the operation and maintenance of this unit. Due to the many variables in the welding field and the evolving nature of both the field and the UNIMIG product line, Welding Guns of Australia Pty Ltd. does not guarantee the accuracy, completeness, authority, or authenticity of the information in this manual or provided by any UNIMIG employee during conversations or business dealings. The product owner assumes all liability for its use and maintenance. Welding Guns of Australia Pty Ltd. does not warrant this product or this document for fitness for any particular purpose, performance, accuracy, or suitability of application. Furthermore, Welding Guns of Australia Pty Ltd. accepts no liability for injury or damages, whether consequential or incidental, resulting from the use of this product or from the content of this document, nor does it accept third-party claims of such liability

Note:

- Observe the accident prevention regulations and any regional regulations.
- Safety and warning labels on the machine indicate any possible risks.
- Keep these labels clean and legible at all times.
- Technical changes due to further development in machine technology may lead to different welding behaviour.

Items in the manual that require particular attention in order to minimise damage and harm are indicated with the below symbols. Read these sections carefully and follow their instructions.

 **Note:** Gives the user a useful piece of information.

 **Caution:** Describes a situation that may result in damage to the equipment or system.

 **Warning:** Describes a potentially dangerous situation. If not avoided, it will result in personal damage or fatal injury.



Gas Cylinders

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

- Protect gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Ensure cylinders are secured upright to prevent tipping or falling over.
- Never allow the welding electrode, earth clamp, or electrical circuit to touch the gas cylinder, and don't 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. Stand to the side of the cylinder when opening the valve.
- Only use the correct gas, regulators, hoses, and fittings for your application and keep them in good condition.
- Keep full and empty cylinders separate.
- Keep ammonia-based leak detection solutions, oil and grease away from cylinders and valves.
- Never use force when opening or closing valves.
- Don't repaint or disguise markings and damage. If damaged, return cylinders immediately.
- When working with cylinders or operating cylinder valves, ensure that you wear appropriate protective clothing – gloves, boots and safety glasses.



Gas Buildup

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

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



PLEASE NOTE that under no circumstances should any equipment or parts be altered or changed in any way from the standard specification without written permission given by UNIMIG.

To do so will void the warranty.

2. Regulator Safety



This equipment is designed for use with welding grade (inert) shielding gases only.

This regulator/flowmeter is designed to reduce and control the flow of high-pressure gas from a cylinder down to a level that is suitable for the equipment it's supplying. Make sure the pressure regulator is designed for use with high pressure gas cylinders and that the connection nut thread matches the cylinder valve outlet.

Misuse of the equipment can lead to dangerous situations, which could result in accidents. It is crucial for users to avoid such scenarios. Prior to operating or handling the equipment, it is imperative to understand and adhere to the safety guidelines provided in this manual.

The following instructions detail specific practices for using regulators/flowmeters:

- 1.** Do not expose the regulator/flowmeter to inlet pressures exceeding its maximum specified limit.
- 2.** Do not pressurise a regulator/flowmeter if it exhibits any signs of damage, loose components, or appears to be in poor condition.
- 3.** Do not attempt to loosen or detach any parts from the regulator/flowmeter without first ensuring the gas pressure has been fully released. Pressurised gas can forcefully eject a dislodged part, creating a hazard.
- 4.** Do not open the cylinder unless a pressure regulator/flowmeter has been fitted.
- 5.** An opened valve should never be fully opened until resistance is encountered, but should be turned back at least half a turn to prevent the valve from becoming stuck in the open position. This can occur if the valve is left open for long periods of time.
- 6.** Ensure the cylinder valve is fully closed and any gas within the regulator/flowmeter's high and low-pressure chambers has been vented before removing the device from a cylinder.
- 7.** Do not use the regulator/flowmeter as a shut-off valve. To prevent gas flow when downstream equipment is not in use for an extended period, turn off the gas at the source and vent it from the system.
- 8.** Open the cylinder valve slowly and make sure to close it after finishing. When you shut the valve, turn it just enough to stop the gas completely. Do not over tighten.
- 9.** Do not attempt to repair or modify the regulator.

**DO NOT USE OIL**

Never use oil, grease, or other petroleum-based substances on or near this regulator or flowmeter. The presence of oil can cause serious safety hazards, especially when regulators are used in applications involving high-pressure gases. Even with inert gases such as argon, contamination can lead to equipment malfunction, seal degradation, and dangerous cross-use if the regulator is later connected to flammable or oxidising gases. Always ensure all connections, fittings, and threads are clean and completely free of oil or grease before use. Failure to comply with this warning can result in fire, explosion, serious injury, or death.

User Responsibilities

This equipment will perform safely and reliably only if it is installed, operated, maintained, and repaired strictly according to the provided instructions. Regular checks are essential to ensure its ongoing safe and reliable operation.

Any necessary repairs, replacements, or adjustments must be carried out promptly. Do not use equipment that is defective. Immediate replacement is required for parts that are broken, missing, visibly worn, deformed, or contaminated.

Typically, the user will bear exclusive responsibility for any malfunctions resulting from improper usage, inadequate maintenance, or repairs conducted by individuals other than certified repair technicians.

3. Specifications

Regulator Specifications

Gas	Inlet Pressure	Outlet Pressure	Entry	SKU
Argon	20000 kPa	0-30L/min	Side Inlet	U11377
Argon	20000 kPa	0-30L/min	Vertical Inlet	U11376
Oxygen	20000 kPa	0-1000 kPa	Side Inlet	U11372
Oxygen	20000 kPa	0-1000 kPa	Vertical Inlet	U11263
Acetylene	2500 kPa	0-150 kPa	Side Inlet	U11374
Acetylene	2500 kPa	0-150 kPa	Vertical Inlet	U11373
CO ₂	2500 kPa	0-20L/min	Side Inlet	U11380
LPG (Propane)	2500 kPa	0-400 kPa	Side Inlet	U11375

Flowmeter Specifications

Gas	Inlet Pressure	Outlet Pressure	Entry	SKU
Argon	20000 kPa	0-25L/min	Side Inlet	U11259
Argon	20000 kPa	0-25L/min	Vertical Inlet	U11378

4. Installation

Before connecting a pressure regulator to a full cylinder always screw out (anticlockwise) the regulation screw. This ensures that there will be no gas flow through the regulator upon initially opening the cylinder valve, reducing strain on the regulator's internal safety component (known as a diaphragm) and increasing the lifespan of the regulator.

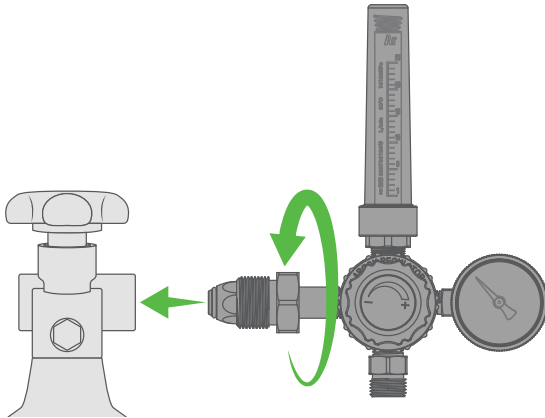
Remove the plastic dust seal from the cylinder valve. Before attaching the regulator/flowmeter, ensure the cylinder valve outlet is free from any impurities that could block the orifices or damage the seats. Briefly open then immediately close the valve, directing the outlet away from both people and any potential sources of ignition. Clean the outlet with a lint-free cloth.

If grit, dirt, oil or dirty water enters the cylinder valve outlet, this may cause damage to the valve internals and result in leakage.

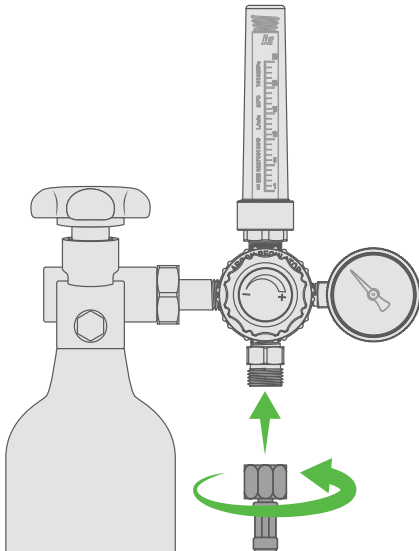


Match the regulator/flowmeter to cylinder. Never connect a regulator/flowmeter designed for a particular gas or gases to a cylinder containing any other gas.

1. Attach the inlet of the regulator/flowmeter to the cylinder, securing it snugly with a proper wrench, but avoid over-tightening. Regulator connections can be fully threaded in by hand and then only require a fraction of a turn to achieve a gas tight seal.



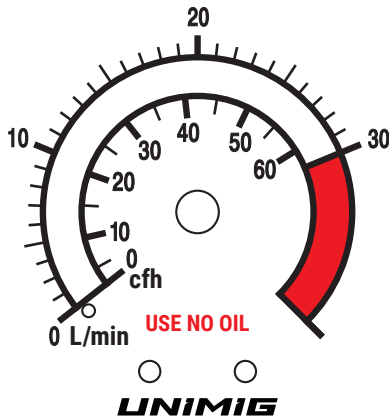
2. Secure the outlet hose tightly, then connect any downstream equipment.



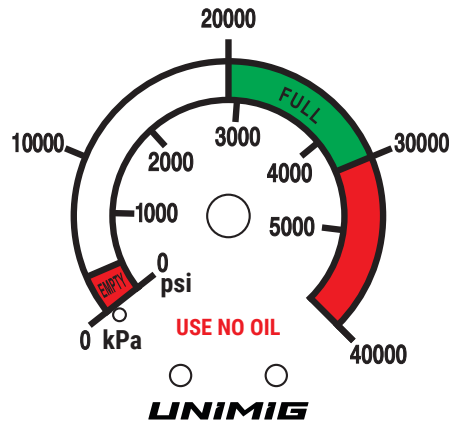
i For downstream equipment that is sensitive, consider the installation of an additional safety device if the regulator/flowmeter does not include a built-in pressure relief feature.

5. Regulator/Flowmeter Gauge Layout

5.1 Argon Regulator

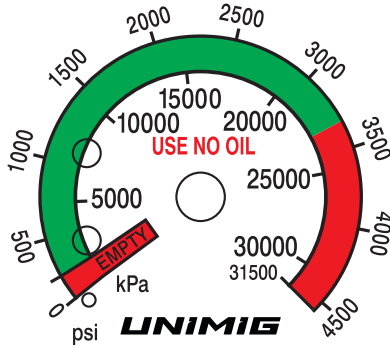


1. **Outer Scale: L/min (litres per minute)**
Range: 0 to 30 L/min
Displays gas flow in metric units
2. **Inner Scale: cfh (cubic feet per hour)**
Range: 0 to 60 cfh
Displays gas flow in imperial units
3. **White Zone: Normal Operating Range**
Range: 0 to 30 L/min
Indicates the full adjustable range of gas flow
4. **Red Zone: Overpressure/Excess Flow Warning**
Range: 30+ L/min
Indicates the gas flow is too high



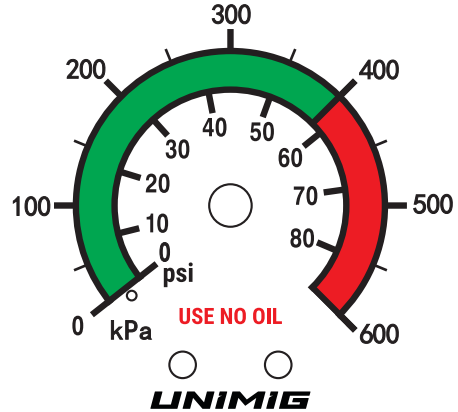
1. **Outer Scale: kPa (kilopascals)**
Range: 0 to 40000 kPa
2. **Inner Scale: psi (pressure in pounds per square inch)**
Range: 0 to 5000 psi
3. **Red Zone: Empty**
Range: 0 to 2000 kPa (approx.)
Indicates the cylinder is nearly empty
4. **White Zone: Transition**
Range: 2000 (approx.) to 20000 kPa
Displays the gas pressure in the cylinder
5. **Green Zone: Full**
Range: 20000 to 30000 kPa
Indicates the cylinder is at or near full
6. **Red Zone: Overpressure Warning**
Range: 30000 to 40000 kPa
Indicates the gas pressure is too high

5.2 Argon Flowmeter



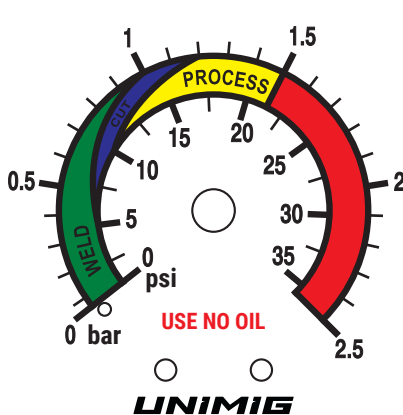
1. **Outer Scale: psi (pressure in pounds per square inch)**
Range: 0 to 4500 psi
2. **Inner Scale: kPa (kilopascals)**
Range: 0 to 31500 kPa
3. **Red Zone: Empty**
Range: 0 to 200 psi (approx.)
Indicates the cylinder is nearly empty
4. **Green Zone: Transition**
Range: 0 to 3400 psi (approx.)
Displays the gas pressure in the cylinder
5. **Red Zone: Overpressure Warning**
Range: 3400 (approx.) to 4500 psi
Indicates the gas pressure is too high

5.3 LPG Regulator

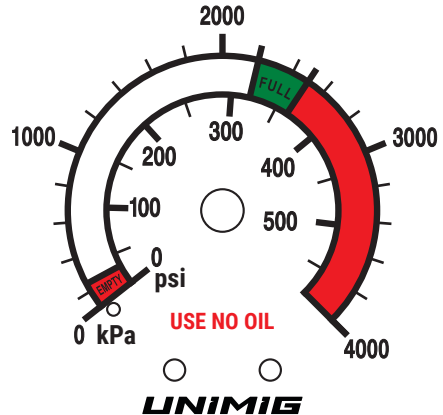


1. **Outer Scale: bar (pressure in bar)**
Range: 0 to 600 kPa
Displays gas pressure in kPa
2. **Inner Scale: psi (pounds per square inch)**
Range: 0 to 90 psi
Displays gas pressure in psi
3. **Green Zone: Normal Operating Range**
Range: 0 to 400 kPa
Safe operating range for LPG use
4. **Red Zone: Overpressure/Excess Flow Warning**
Range: 400 to 600 kPa
Indicates the gas flow is too high

5.4 Acetylene Regulator

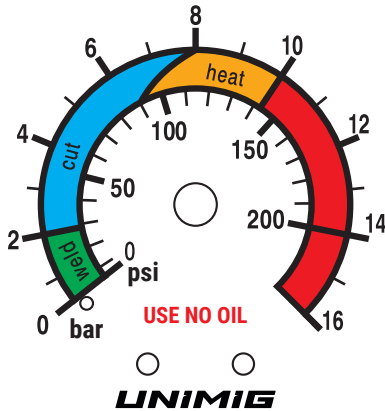


1. **Outer Scale: bar (pressure in bar)**
Range: 0 to 2.5 bar
Displays gas pressure in bar
2. **Inner Scale: psi (pressure in pounds per square inch)**
Range: 0 to 35 psi
Displays gas pressure in psi
3. **Green Zone: Weld**
Range: 0 to 0.9 bar
Safe operating range for gas welding, which uses lower acetylene pressure
4. **Blue Zone: Cut**
Range: 0.5 to 1.2 bar
Safe operating range for gas cutting, which uses higher acetylene pressure
5. **Yellow Zone: Process**
Range: 0.8 to 1.5 bar
Safe operating range for heating operations (e.g. using a heating torch)
6. **Red Zone: Overpressure/Excess Flow Warning**
Range: 1.5 to 2.5 bar
Indicates the gas flow is too high

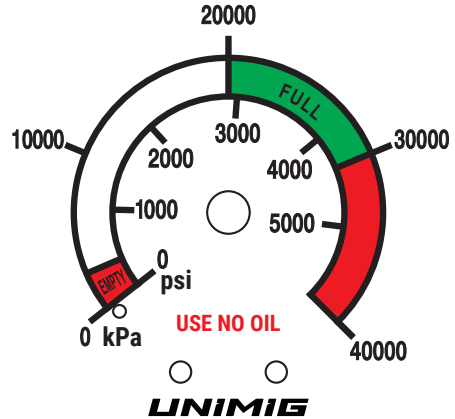


1. **Outer Scale: kPa (kilopascals)**
Range: 0 to 4000 kPa
2. **Inner Scale: psi (pressure in pounds per square inch)**
Range: 0 to 600 psi
3. **Red Zone: Empty**
Range: 0 to 220 kPa (approx.)
Indicates the cylinder is nearly empty
4. **White Zone: Transition**
Range: 220 (approx.) to 2200 kPa
Displays the gas pressure in the cylinder
5. **Green Zone: Full**
Range: 2200 to 2500 kPa
Indicates the cylinder is at or near full
6. **Red Zone: Overpressure Warning**
Range: 2500 to 4000 kPa
Indicates the gas pressure is too high

5.5 Oxygen Regulator

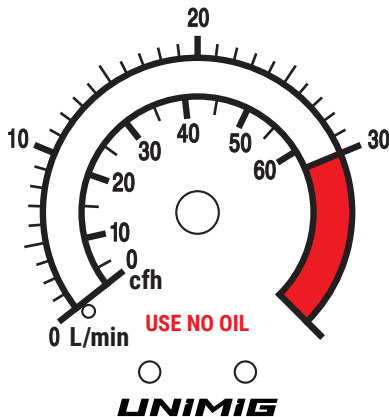


1. **Outer Scale: bar (pressure in bar)**
Range: 0 to 16 bar
Displays gas pressure in bar
2. **Inner Scale: psi (pressure in pounds per square inch)**
Range: 0 to 200 psi
Displays gas pressure in psi
3. **Green Zone: Weld**
Range: 0 to 2 bar
Safe operating range for gas welding, which uses lower oxygen pressure
4. **Blue Zone: Cut**
Range: 2 to 8 bar
Safe operating range for gas cutting, which uses higher acetylene pressure
5. **Orange Zone: Heat**
Range: 6 to 10 bar
Safe operating range for heating operations (e.g. using a heating torch)
6. **Red Zone: Overpressure/Excess Flow Warning**
Range: 10+ bar
Indicates the gas flow is too high

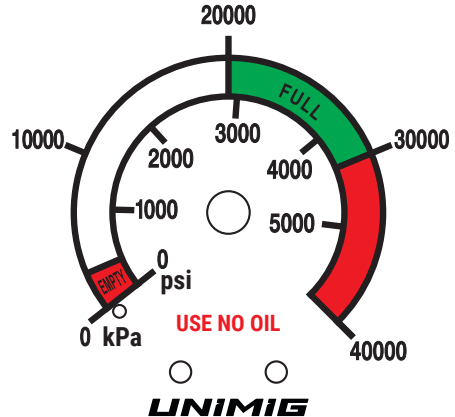


1. **Outer Scale: kPa (kilopascals)**
Range: 0 to 40000 kPa
2. **Inner Scale: psi (pressure in pounds per square inch)**
Range: 0 to 5000 psi
3. **Red Zone: Empty**
Range: 0 to 2000 kPa (approx.)
Indicates the cylinder is nearly empty
4. **White Zone: Transition**
Range: 2000 (approx.) to 20000 kPa
Displays the gas pressure in the cylinder
5. **Green Zone: Full**
Range: 20000 to 30000 kPa
Indicates the cylinder is at or near full
6. **Red Zone: Overpressure Warning**
Range: 30000 to 40000 kPa
Indicates the gas pressure is too high

5.6 CO₂ Regulator



1. **Outer Scale: L/min (litres per minute)**
Range: 0 to 30 L/min
Displays gas flow in metric units
2. **Inner Scale: cfh (cubic feet per hour)**
Range: 0 to 60 cfh
Displays gas flow in imperial units
3. **White Zone: Normal Operating Range**
Range: 0 to 30 L/min
Indicates the full adjustable range of gas flow
4. **Red Zone: Overpressure/Excess Flow Warning**
Range: 30+ L/min
Indicates the gas flow is too high



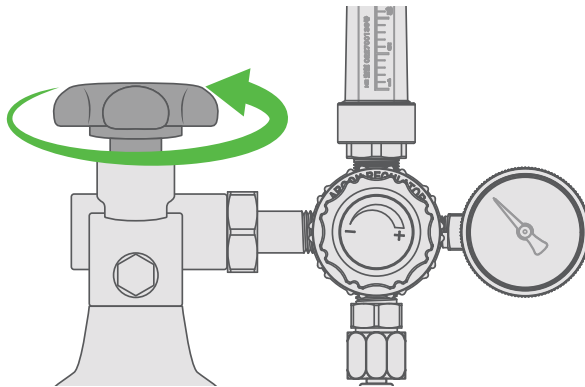
1. **Outer Scale: kPa (kilopascals)**
Range: 0 to 40000 kPa
2. **Inner Scale: psi (pressure in pounds per square inch)**
Range: 0 to 5000 psi
3. **Red Zone: Empty**
Range: 0 to 2000 kPa (approx.)
Indicates the cylinder is nearly empty
4. **White Zone: Transition**
Range: 2000 (approx.) to 20000 kPa
Displays the gas pressure in the cylinder
5. **Green Zone: Full**
Range: 20000 to 30000 kPa
Indicates the cylinder is at or near full
6. **Red Zone: Overpressure Warning**
Range: 30000 to 40000 kPa
Indicates the gas pressure is too high

6. Operation

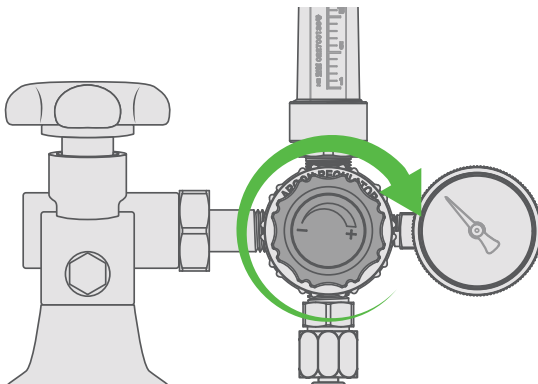
6.1 Pressurising the Regulator

Once the regulator/flowmeter is connected to the cylinder with the regulation screw completely disengaged, follow these steps to pressurise:

1. Position yourself to the side of the regulator/flowmeter and gradually open the cylinder valve. Rapid opening can cause a sudden pressure increase, potentially damaging the internal components of the regulator/flowmeter.



2. Ensure all valves on the downstream equipment are closed, then set the regulator/flowmeter to the desired working pressure.



It's advisable to perform a leak test at the connection points of the regulator/flowmeter using an appropriate leak detection solution or soapy water.

3. Purge any air or non-essential welding grade shielding gas from the system attached to the regulator/flowmeter by briefly opening and then closing each control valve. The duration of the purge process could last as long or longer than ten seconds, depending on both the length and diameter of the hose being cleared.

! Do not purge flammable or oxidising gases when flames, lit cigarettes, or other sources of ignition are present. Open each downstream valve in turn, closing each valve before opening the next if more than one regulator is being used. This prevents explosive gas mixtures from occurring in the gas hose between regulators and equipment.

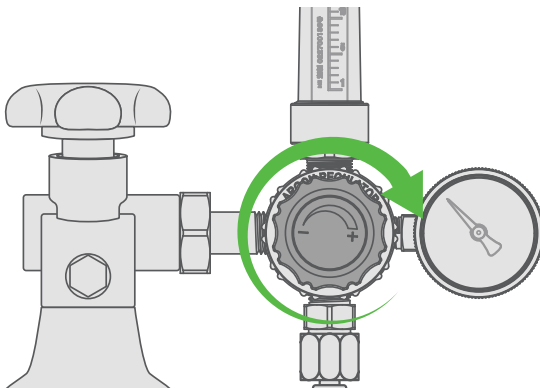
4. Close all valves after purging and test all connections for leaks. Use an appropriate leak detection solution or soapy water.

! Never use flames to locate gas leaks.

6.2 Adjusting the Pressure

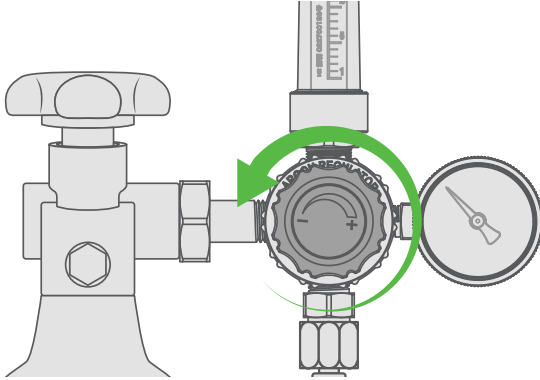
To adjust the operational flow rate of the regulator/flowmeter:

1. Slowly turn the regulator/flowmeter's regulation screw (clockwise) until the outlet gauge shows the desired flow rate.



i It might be necessary to re-evaluate the flow rate of the shielding gas through the regulator/flowmeter after completing an initial series of welds, as back pressure within the shielding gas hose assembly can affect readings.

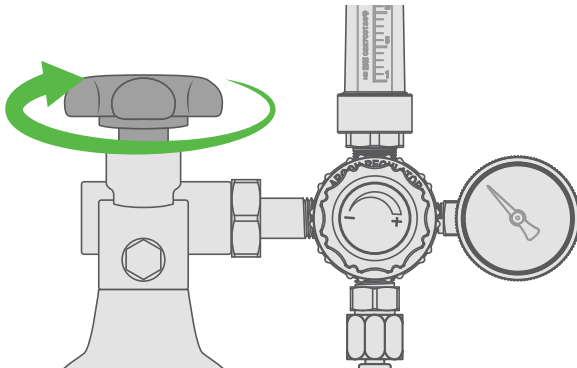
2. To decrease the flow rate, first ensure the welding-grade shielding gas is safely vented from the regulator/flowmeter by opening the downstream valve. Direct the released gas to a well-ventilated area, away from any potential sources of ignition. Then, adjust the screw (anticlockwise) until the gauge reflects the desired flow rate. Finally, shut the downstream valve.



6.3 Shutdown

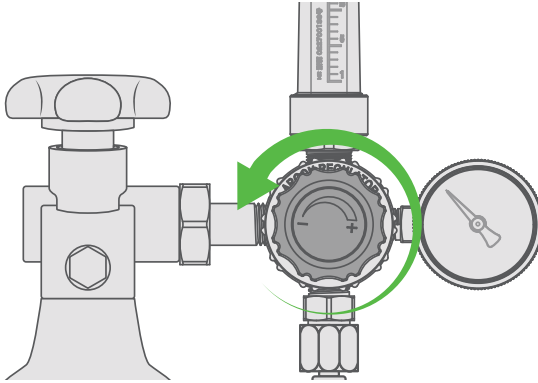
Always close the cylinder valve when the regulator/flowmeter is not in use. For shutdowns lasting longer than 30 minutes, follow these steps:

1. Close the gas cylinder or upstream valve.



2. Open downstream equipment valves to purge the lines, directing the gas to a well-ventilated area, and away from ignition sources.

3. Once the gas is fully vented, turn the regulation screw to its closed position and close the valves on the downstream equipment.



4. Prior to moving cylinders that are not fixed on a specifically designed cart, detach the regulators/flowmeters.

Carbon Dioxide (CO₂) Regulators

⚠️ CO₂ CAN CAUSE ASPHYXIATION IN HIGH CONCENTRATIONS. ENSURE REGULATORS ARE USED IN A WELL-VENTILATED AREA.

CO₂ regulators are equipped with pressure relief valves to protect against minor component failures. However, these valves are not safety devices for downstream equipment protection. They are not intended to replace primary pressure relief systems or bursting discs, as may be required by local legislation.

To minimise the risk of asphyxiation from CO₂ leaks or discharge through pressure relief valves, always operate the equipment in a well-ventilated area.

7. Warranty Period

Gas regulators (excluding seat assembly, pressure gauges, Elastomer seals & O-rings)	5 years
Regulator seat assemblies, pressure gauges, Elastomer seals & O-rings	12 months

8. Regulators



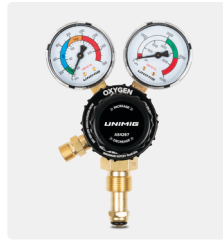
**Argon Regulator
(Vertical Inlet)**

U11376



**Argon Regulator
(Side Inlet)**

U11377



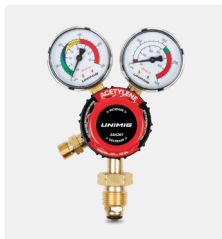
**Oxygen Regulator
(Vertical Inlet)**

U11263



**Oxygen Regulator
(Side Inlet)**

U11372



**Acetylene
Regulator
(Vertical Inlet)**

U11374



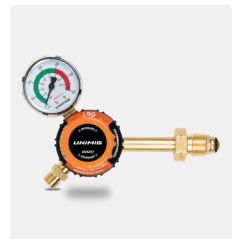
**Acetylene
Regulator
(Side Inlet)**

U11373



**CO₂ Regulator
(Side Inlet)**

U11280



**LPG Regulator
(Side Inlet)**

U11375

9. Flowmeters



**Dual Stage
Argon
Flowmeter
(Vertical Inlet)**

U11378



**Dual Stage
Argon
Flowmeter
(Side Inlet)**

U11259

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