

- b) Regulators should be removed from service and fully leak tested annually, and returned for refurbishment after a maximum of five years service. "Return for service" date is stamped on the regulator body to indicate when the unit is to be taken out of service.
- c) When regulators are part of a 'Pressure System' they must be replaced or refurbished in accordance with the 'Written Scheme of Examination' for that system.

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GCE (Gas Control Equipment) Ltd

Please read these operating instructions before attempting to use this equipment. Regulators are precision instruments, manufactured to EN ISO 2503 / EN ISO 7291, for reducing inlet pressure to a lower outlet pressure via one (single stage) or two (multistage) reduction. This regulator is intended for general industrial use, to be connected direct to a compressed gas cylinder, or acetylene cylinder or pressurised cylinder for liquid gases.

1. SAFETY REQUIREMENTS TO BE OBSERVED WHEN USING REGULATORS

- Never remove connections, gauges or relief valves from regulators or transpose their positions. Serious accidents can occur if fittings are removed or repositioned.
- Ensure regulator markings correspond with gas service in use (note these abbreviations; A=Acetylene, D=Compressed air, H=Hydrogen, N=CO₂, Nitrogen, Inert, O=Oxygen, P=LPG.).
- Ensure that the inlet pressure rating of the regulator is equal to or greater than that available from the gas source to which it is to be connected. Ensure also that the outlet pressure from the regulator is lower than the pressure rating of the downstream system.
- Once a regulator has been designated to a particular gas service it must not be changed.
- Never use tape, jointing paste or additional gaskets to seal inlet or outlet connections. Where O ring seals are specified use a proved replacement seals.
- Specific regulators are fitted with self re-seating pressure relief valve(s) to ensure that the regulator will not be over-pressurised. Never cover or block this regulator pressure relief valves, they are designed to safeguard the regulator (not the equipment downstream). Additional line pressure relief valves should be fitted to safeguard downstream pipework and equipment.
- If either inlet or outlet pressure gauges (where fitted) are not on zero prior to opening or after closing and bleeding down the system, remove the regulator from service.
- Work to BCGA codes of practice, copies can be obtained by telephoning +44 (0)2380 641488

2. SPECIFIC SAFETY REQUIREMENTS - OXYGEN SERVICE

- Many materials will support combustion freely in high pressure oxygen, even though they may be relatively inert at atmospheric pressure. The following are of significant importance;

- Oil or grease must never be allowed to come into contact with regulators, cylinders, valves or associated fittings. Equipment must not be handled with oily/greasy hands, gloves or rags.
- Non oxygen regulators must not be used in oxygen and similarly oxygen regulators must never be used with other gases. For example it is highly dangerous to change a regulator used on air service over to oxygen. Air may contain traces of oil, which could contaminate the internals of the regulator and render it unsafe for oxygen service.
- Replacement O rings must be of genuine original manufacture and cleaned to oxygen standards.
- Leak testing on oxygen systems must be done with approved leak detection fluids such as TL4. All surfaces should be dried and cleaned after such testing.

3. INSTALLATION AND SAFE OPERATION

3.1 CONNECTION TO THE GAS SUPPLY

- Cylinders should be securely located in the vertical position.
- Before attaching the regulator wipe the cylinder valve or manifold regulator block with a clean dry lint free cloth to remove any water/foreign matter.
- Before fitting, ensure the mating connection on the regulator and on the cylinder valve are not damaged or contaminated with oil, paint etc. O-rings or seals in particular should be undamaged with no evidence or cracks/tears, and should not be brittle or sticky.
- Oxygen and inert gas regulators have right-handed threads (i.e.: to tighten turn clockwise) while fuel gas regulators have left-handed threads (tighten anti-clockwise). Left handed threads **can** be identified as they have a notch cut into the hexagons.
- Ensure the pressure adjusting knob on the regulator is fully anticlockwise ("off"). Fit the regulators using the correct size spanner. Excess force should not be required or used as it could damage the threads or seats. Regulators fitted with an O-ring seal on the inlet require hand tightening only via the plastic cover over the inlet nut.
- Connect the outlet of the regulator to the downstream equipment, ensuring that line safety relief valves, flashback arrestors and hose check valves are fitted where appropriate.
- When regulators are supplied in the preset condition they will pass gas as soon as the cylinder valve is opened. It is therefore essential that the cylinder / manifold valve is opened slowly, and that the outlet is fitted with a line isolation valve.

3.2 OPERATING THE REGULATOR

- Prior to releasing gas into the system, check that the correct regulator for gas and pressure is being used, all gauge pointers at zero, pressure adjusting knob where fitted is screwed fully out (anti-clockwise) and that downstream valves are closed.
- When using Oxy /fuel systems, test the oxygen system first.
- Slowly** open the cylinder valve
- Ensure inlet pressure gauge / indicator where fitted is registering a pressure.

3.3 ADJUSTING THE REGULATOR

- Screw the pressure adjusting knob in a clockwise direction to increase pressure and in an anti-clockwise direction to decrease pressure until the required outlet pressure is indicated on the outlet pressure gauge or the bonnet calibration markings. Shielding Gas regulators may be fitted with a flow gauge calibrated in l/min and ft³/h. Operation of the pressure adjusting knob will control the flow of gas through the unit
- Open the downstream valves to commence the required operation.
- Further re-adjustment of outlet pressure may be required to ensure correct pressure, once the gas is flowing, and also as the supply (cylinder) pressure decreases. Repeat the operation as required.

3.4 CLOSING DOWN THE REGULATOR

- On termination of the operation, close downstream valves followed by the cylinder or pipeline valve. Open downstream valves to release the entrapped gas in that line until gauge pointers (where fitted) are at zero and no gas can be heard flowing.
- Release the regulator pressure adjusting knob by fully turning in an anti-clockwise direction and no spring resistance can be felt. Close all downstream valves from the regulator. If regulators are taken out of service for extended periods, it is advisable to ensure that the internal valve is not compressed against the seat where it could adhere. This can be achieved by turning the pressure adjusting knob clockwise until some resistance is felt and then continue to turn for one more full turn. Remember however, to fully release the pressure adjusting knob by turning fully anti-clockwise prior to returning the regulator to service.

4. SERVICING RECOMMENDATIONS

- Regulators should be regularly inspected for signs of damage / leakage. If it is suspected that the unit is not functioning correctly or is leaking it should be returned to the manufacturer for refurbishment or replacement with a new product. Pressure regulators are delicate precision instruments and no attempt should be made to remove/exchange components from them.