



Instruction Manual



Oil-Lubricated Direct-Drive Reciprocating Air Compressors

Revision: 2021-09-01

Introduction

Thank-you and congratulations for purchasing a high-quality Puma oil-lubricated, direct-drive, reciprocating air compressor set. It has been designed and manufactured to provide many years of safe and reliable service if installed, operated and maintained in accordance with these instructions.

Please read and understand this manual before operating the compressor. Failure to do so could result in death, severe injury or substantial property damage.

If after reading this manual you still have any questions or concerns about your compressor, please contact your local authorised Puma dealer or Glenco Air & Power Pty Ltd before operating the unit.

This manual should be considered a permanent part of the compressor and should remain with it if resold.

Disclaimers

All information, illustrations and specifications in this manual are based on the latest information available at the time of publishing. The illustrations are intended as representative reference views only. Due to our policy of continuous product improvement, we may modify information, illustrations or specifications to explain or exemplify a product, service or maintenance improvement.

We reserve the right to make any change at any time without notice. Your compressor may differ slightly from the models pictured, including optional accessories.

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1.0 Safety

The air compressor set should only be operated by authorised persons. All users should follow the instructions and safety warnings as (a) described in this instruction manual, (b) shown on any decals affixed to the unit and (c) described in the Plant Risk Assessment that's also available from the manufacturer.

You must take reasonable care for the health and safety of both yourself and any others who may be affected by your actions. You should understand and follow all the safety rules and working instructions described herein. You should also use your own good judgement and common sense.

All users of the compressor and any other workers likely to be in the vicinity thereof should undergo training to achieve the requisite minimum level of operator competence before placing the unit into service.

Do not permit anyone to operate the compressor without proper instruction.

The compressor should be installed or operated in a horizontal position on a firm, level and stationary foundation such as a concrete floor that is strong enough to support its weight. The unit should not impede pedestrian or vehicular traffic.

Do not locate the compressor where chemicals, dust, dirt, fibres, oil, salt, water, or flammable or explosive liquids, gases or dusts may be present. The area should not be wet or damp. The unit should be kept away from other heat sources.

Electrical equipment can cause heat, sparks or flames that may ignite a flammable gas or vapour. Do not operate or repair the compressor in or near a flammable gas or vapour. Do not store flammable liquids or gases in the vicinity of the compressor.

High voltage electricity can cause death or serious injury. All electrical installation, maintenance or repair work should be performed by a licenced electrician.

Electric-powered compressors should be installed in a well-ventilated area preferably indoors. If it has to be located outdoors, the unit should be provided with weather protection against precipitation and direct sunlight.

Electric-powered compressors should be connected to a properly grounded electrical supply of adequate capacity. The electricity supply circuit should comply with the AS/NZS 3000:2018 Wiring Rules. It should include a fixed setting residual current device (RCD) with a rated operating residual current not exceeding 30 mA.

Do not operate an electric-powered compressor in wet conditions. Store it indoors.

Do not use the unit to compress any gas other than air.

Compressed air can contain carbon monoxide, hydrocarbons or other poisonous contaminants that can cause death or serious injury. The compressor is not designed, intended or approved to provide breathing air. Do not use compressed air for breathing air applications without proper treatment.

Before operating the compressor, check the safety of any hoses, piping and pneumatic equipment connected to the discharge air outlet coupling. Use only hoses, piping, fittings, air receivers, air tools, etc. connected to the compressor's discharge outlet that are safe for the unit's maximum discharge

pressure and temperature as marked on the air receiver tank's nameplate.

The compressor should not be operated beyond its specified design parameters, especially the maximum discharge pressure. Do not bypass or disable any of the unit's safety features.

Do not modify the compressor without written permission from the manufacturer.

Do not operate the compressor with any of its components damaged, malfunctioning, or partially or wholly removed.

Monitor the compressor and downstream compressed air system for any excessive noise, vibration, leaks or other abnormalities and repair any faults immediately.

Moving parts can cause serious injury. Keep clear of the compressor during operation. Do not operate it with the fan cowl removed. The compressor may start automatically. Disconnect the power supply before servicing.

Hot surfaces can cause serious injury. Do not touch the metal surface of any compressor component (including piping and tank) during or shortly after operation. Allow to cool before servicing.

Do not stand on the compressor or use it as a handhold.

High pressure air can cause death or serious injury. Do not bypass, modify or remove the safety valve. Do not operate the compressor with a faulty safety valve or pressure gauge. Do not direct a compressed air discharge stream onto a person's body. High pressure air can stir up dust and debris that may be harmful. Release air slowly when draining condensate water or depressurising the compressor. Do not connect the compressor to air handling parts that cannot withstand the compressor's maximum design pressure (refer to tank nameplate).

Rusted, cracked or damaged air receiver tanks can explode and cause death or serious injury and must be replaced. Drain tank daily or after each use through valve located at bottom of tank. Release compressed air from the tank before servicing. Do not weld, drill or otherwise modify the air receiver tank.

Drain condensate from the air receiver tank only when it's depressurised. Monitor the drained condensate to check whether it poses a slip hazard, e.g. excessive condensate discharged onto a smooth, non-porous floor.

Keep children, pets and unauthorised persons away from the compressor at all times.

Before attempting to install, maintain, repair, store or transport the compressor, isolate and tag-out the power supply, carefully release any residual air pressure from the air receiver tank and any connected air hoses or piping, and disconnect the outlet air hose. And, if possible, allow the unit to cool down if it has been running.

During maintenance work, take care to prevent any body parts, clothing or tools from touching any hot or moving components of the compressor.

Carry out preventative maintenance on the compressor in accordance with the recommended schedule using only genuine spare parts.

Clean up any oil leak or spill immediately.

Clothing sleeves should be tight fitting, long hair should be tied back, jewellery and other loose articles should be removed, and loose gloves should not be worn when operating or maintaining the compressor.

Wear body protection such as tight-fitting gloves, long sleeves and safety boots and also eye protection such as glasses when performing any maintenance work on the compressor.

Wear eye protection such as glasses if working close to pressurised compressed air plant.

Wear protection such as a filter respirator and goggles when blowing down with compressed air. Avoid or minimise the generation of dust by compressed air blowing.

Wear personal protective equipment such as safety glasses, earmuffs and gloves when operating the compressor or using compressed air. Wear a face mask or respirator when spraying, blowing down or otherwise creating airborne mists or dust.

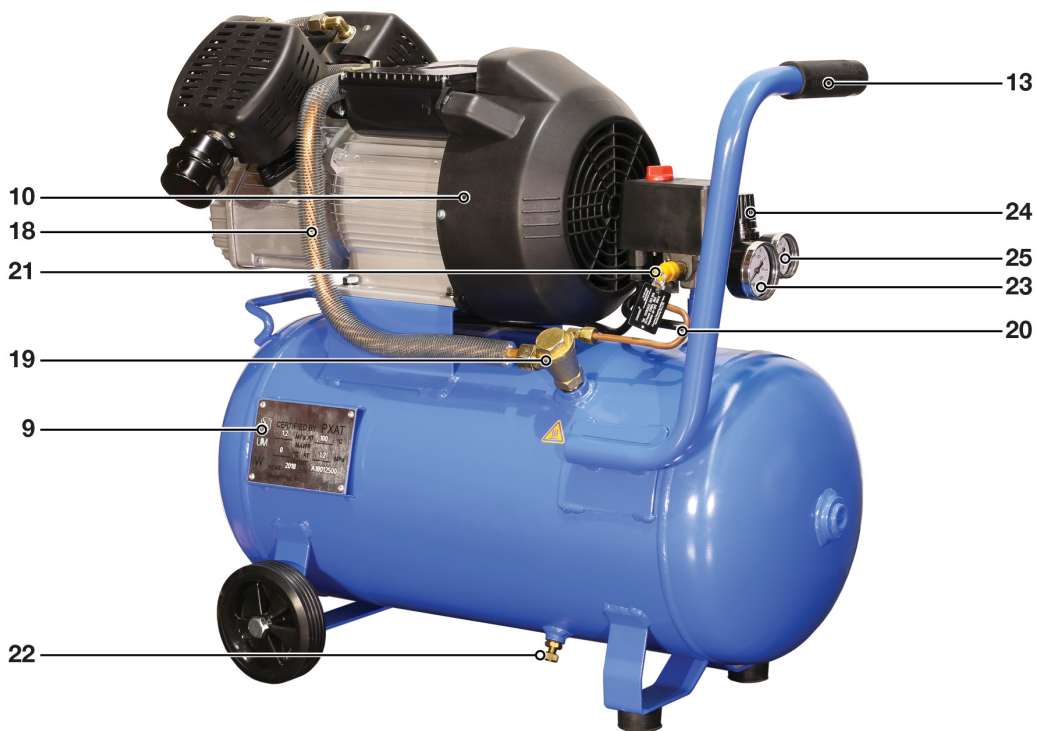
Wear appropriate eye, respiratory and body protection when spraying paint or other chemicals with compressed air. Refer to the chemical's MSDS for specific personal protective equipment (PPE) recommendations.

Do not spray flammable liquids in a confined area. Do not smoke while spraying and do not spray where sparks, flames or other ignition sources (including the compressor) are present.

Do not direct paint or other sprayed material at the compressor. Locate compressor as far away from the spraying area as possible to minimise overspray accumulating on the compressor or clogging its air filter(s).

2.0 Product Familiarisation

The major components and primary controls of a typical Puma oil-lubricated, direct-drive air compressor set are identified in Figure 2-1 below. Users should familiarise themselves with their own compressor's features.



Item	Description	Item	Description
1	Compressor Pump	15	Rubber Foot Mount
2	Air Filter	16	Cylinder Discharge Pipe
3	Oil Fill Cap & Breather	17	Cold Start Valve
4	Oil Level Sight Glass	18	Compressor Pump Discharge Pipe
5	Electric Motor	19	Non-Return Valve
6	Overload Reset Button	20	Unloading Line
7	Air Receiver Tank	21	Safety Valve
8	Tank Grab Handle	22	Drain Valve
9	Air Receiver Tank Nameplate	23	Air Receiver Pressure Gauge
10	Fan Cowl	24	Pressure Regulator
11	Wheel Mounting Bracket	25	Outlet Pressure Gauge
12	Wheel	26	Discharge Outlet Coupling
13	Lifting Handle	27	Pressure Switch
14	Foot Mounting Bracket		

Figure 2-1 240 Volt Oil-Lubricated Direct-Drive Air Compressor

3.0 Application and Function

Your Puma air compressor set is a portable air-cooled, reciprocating type fitted with an oil-lubricated, single-stage compressor pump. It is supplied as a compact, self-contained, air receiver tank-mounted unit that is automatically regulated and driven by a 240 Volt electric motor that is directly coupled to the compressor pump.

The compressor is intended to provide compressed air in a multitude of applications, for example, to power hand-held pneumatic tools, operate air dusters and spray guns, and inflate tyres. It is commonly used as the primary source of compressed air for home garages, small business workrooms, mobile service vehicles, and onsite timber carpentry and fencing construction.

Select the correct size compressor for your application by adding up the air consumption of the pneumatic tools and devices that you wish to operate simultaneously and then choose a compressor whose free-air-delivery (FAD) output is at least 10 to 25% higher.

Air discharged from an oil-lubricated compressor contains small amounts of oil, water and particulates amongst other contaminants. Many applications require treatment of the compressor's output air to make it suitable for the end use. Air quality treatments such as filtration and drying are the most common requirements together with pressure regulation. The practice of using in-line compressed air lubricators or daily direct oiling to protect pneumatic tools is commonly recommended nowadays; check the instruction manual supplied with your pneumatic tool for specific guidelines. Failing to install appropriate compressed air treatment equipment will likely result in damage to pneumatic devices or spray-painted finishes.

Where installed, compressed air filtration or drying equipment should be located downstream from the air receiver tank and ahead of any pressure regulator. Lubricators, on the other hand, should be installed as the last stage of treatment and located behind or downstream from any pressure regulator.

Please contact your Puma dealer or Glenco Air & Power Pty Ltd for specialist advice about compressed air treatment products.

The basic principle of the compressor's operation is as follows:

- On the downward suction stroke of the compressor pump piston, air at atmospheric pressure enters the cylinder through the inlet air filter and the inlet valve located in the cylinder head.
- On the upward compression stroke, the piston compresses the air to the final discharge pressure and forces it out through the outlet valve in the cylinder head, past the non-return valve and then into the air receiver tank.

The requisite power to drive the compressor pump is provided by the directly coupled electric motor.

The pressure switch turns on the motor when the air receiver tank is at or below the minimum "cut-in" pressure. The compressor then operates continuously until the tank pressure reaches the maximum "cut-out" level whereupon the pressure switch turns off the motor. Air can then be heard leaking out from underneath the pressure switch for a short time while the unloader valve releases air pressure trapped in the discharge line between the compressor pump and the non-return valve. This allows the compressor to re-start more easily without being under load from the outset.

The pressure switch is factory pre-set with cut-in and cut-out pressures of approximately 800 kPa (116 psi) and 1,000 kPa (145 psi), respectively. This range is ideal for the majority of compressed air applications supplied by an electric air compressor. Most pneumatic tools are designed for a supply pressure of 620 kPa (90 psi), although some nail guns – for example – require up to 830 kPa (120 psi). The pressure switch should not be adjusted to a higher cut-out pressure.

If the pressure switch does not shut off the compressor pump discharge into the air receiver tank at the cut-off pressure setting, the safety valve will protect the air tank against over pressurising by automatically releasing air when the pressure exceeds a pre-set value.

Puma air receiver tanks are designed and manufactured to comply with the requirements of all Australian Workplace Health and Safety Regulations. A copy of the Manufacturer's Data Report (as per AS 4458) is available from your Puma dealer or Glenco Air & Power Pty Ltd upon request.

The non-return valve is a one-way valve that allows air to enter the tank from the compressor pump, but prevents the reverse of this flow.

A cowl covers the cooling fan and also the electric motor either partially or wholly. It is a critical safety device.

A drain valve is fitted at or near the bottom of the air receiver tank to permit the release of water condensate that would otherwise corrode the tank and damage pneumatic devices.

The pressure within the air receiver tank is indicated on its pressure gauge. The compressor's maximum output pressure is limited by the adjustable pressure regulator; it should be set to the maximum pressure required for the specific application – for example 620 kPa or 90 psi for a standard pneumatic tool – to reduce compressed air consumption, electricity use, noise, and compressor wear and tear.

4.0 Receipt and Inspection

Use proper and safe lifting techniques to unload the boxed compressor and move it to the operating site. If its packed weight is more than 16 kg, it is recommended to handle the compressor with a two-person lift or else use a mechanical lifting aid.

Inspect the compressor upon receipt for any shipping damage or missing parts. If any problems are apparent, make an appropriate note on the delivery receipt before signing and then contact your Puma dealer immediately. Do not operate the unit if it has been damaged during shipping, handling or use.

Read the compressor model label to verify it is the correct one as ordered.

5.0 Installation

5.1 Handling

Remove the air compressor from its shipping carton before use.

Portable wheel-mounted units should preferably be handled using a joint lift by two persons or alternately with the help of a mechanical lifting aid. Avoid injury and do not attempt to lift a compressor by yourself if it is too heavy or bulky.

Compressors have a high centre of gravity due to the elevated position of the compressor pump and motor, which are relatively heavy components compared to the air receiver tank. Take care when lifting or handling that the compressor does not tip over.

5.2 Electric Air Compressors

Select a clean, dry and well-lit area preferably indoors with plenty of space for proper ventilation, cooling air flow and accessibility. Locate the compressor at least 300 mm (1 ft) from walls for ventilation or preferably no less than 600 mm (2 ft) to allow for maintenance access. Ensure that the power supply is clearly identified and accessible. Always provide sunshade and shelter from moisture if the compressor has to be located outdoors.

5.3 Assembly

Assemble the rubber foot mounts onto their mounting brackets using the supplied fasteners if not already supplied pre-assembled from the factory.

For wheel-mounted models, assemble the supplied axles and wheels onto their mounting brackets. Apply a small amount of lubricant to the rubbing surfaces of the axle and wheel hub bore. Tighten the axle nuts to 17 Nm (12.5 lbf-ft). Place the compressor on a firm, level surface that is strong enough to support its weight. Take care to prevent movement of the compressor during operation and possible straining of the flexible electrical cord or air hose. Do not place on an incline during use as this will interfere with the compressor pump's splash lubrication system.

Assemble the air filter(s) onto the compressor pump and hand tighten without tools. Do not use excessive torque as this may damage the air filter or compressor pump cylinder head.

5.4 Checking and Adding Oil

The unit is supplied with its initial fill of lubricating oil in the compressor pump, which is sealed with a temporary oil plug for shipping from the factory as shown in Figure 5.1.

BEFORE using the compressor for the first time:

- (a) Remove the temporary oil plug and discard it.
- (b) Check the oil level and add oil if necessary. Refer to Section 7.3 *Lubricating Oil*.
- (c) Install the Oil Fill Cap & Breather by screwing it clockwise into the compressor pump and tightening by hand. See Figure 5.2.

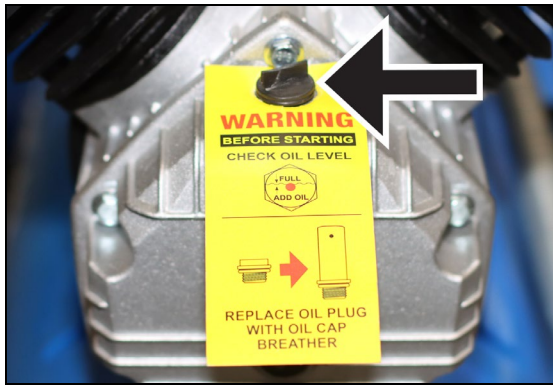


Figure 5-1 Temporary Oil Plug

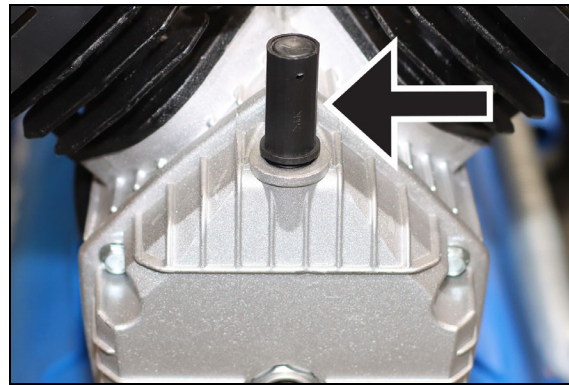


Figure 5-2 Oil Fill Cap & Breather

5.5 Ambient Temperature

The air compressor is designed for operation in ambient temperatures of between 0°C (32°F) and 40°C (104°F).

Where possible in hot areas, the compressor should be operated in the shade to prevent additional heat load due to solar radiation.

In cold areas subject to sub-zero temperatures, take precautions to prevent water condensate freezing inside the compressor and possibly causing damage. Store the compressor indoors when not in use if possible. Drain the condensate daily from the air receiver tank and leave the drain valve open when the compressor is not in use. Also, check that the safety valve is not frozen closed before using the compressor.

5.6 Noise Considerations

Check the State or Territory Workplace Health and Safety Regulations or Local Council Regulations regarding acceptable noise levels and permissible operating times depending upon the location of use. To prevent excessive noise, ensure that the compressor's air filters and rubber foot mounts are installed and in good working condition.

5.7 Discharge and Condensate Piping

All piping, fittings, air receiver tanks, and so on connected to the compressor discharge must be certified safe for the unit's discharge pressure and temperature. Do not use PVC plastic in the compressed air discharge line. Use pipe thread sealant on all threads and assemble joints tightly to prevent air leaks and energy wastage.

Mainline piping used to convey air throughout a system should be sized to accommodate the maximum flow rate of the compressor, which is also referred to as its free air delivery. A basic guide to the selection of minimum pipe size diameter for a given flow rate and pipeline length is given in Table 5-1, or one can refer to the detailed selection guides that are available for the various types of proprietary compressed air piping systems. Branch piping should be sized in a similar manner, but the design flow rate should instead be based on the total air consumption of the tools or appliances running off that branch.

To allow for vibration and to prevent piping stresses being transmitted to the compressor, the

connection between the unit's discharge outlet coupling and the mainline piping system should be made using a flexible air hose.

The minimum air hose internal diameter (ID) can be selected in accordance with Table 5-2 or by referring to the hose manufacturer's guidelines, and again with consideration as to whether the hose is a main distribution line or a branch line.

One should always err to the larger size when selecting compressed air pipes or hoses, as a too-small line increases pressure drop and energy loss. A larger air line is more energy efficient, provides additional air storage capacity and reduces the magnitude of air pressure fluctuations during use.

Flow (L/m)	Length of Pipeline (metres)							
	7.5	15	22.5	30	45	60	75	90
142	½"	½"	½"	½"	½"	½"	½"	½"
283	½"	½"	½"	¾"	¾"	¾"	¾"	¾"

Flow (L/m)	Length of Hose (metres)		
	10	20	30
283	¾"	¾"	¾"

If installing a condensate discharge line from the tank drain valve, the piping must be at least one size larger than the connection, as short and direct as possible, and routed to a suitable drain point or waste container. Condensate contains traces of compressor lubricating oil and other substances that should not be discharged into drains or sewers without pre-treatment.

5.8 Electrical Connection

All electrical installation and service work must be performed by a licenced electrician in accordance with the applicable regulations.

The required size of electrical wiring between the power supply and the electric motor varies according to motor power and other factors. Adequately sized wiring must be installed to protect against excessive voltage drop during compressor start-up and running. If connecting other electrical equipment to the same circuit, consider the total electrical load when selecting the proper wire size. Overheating, short circuiting and fire damage may result from undersize wiring.

The compressor must be installed and operated with a power cord or cable that has a properly connected grounding wire of adequate size.

Portable electric generators are not recommended for operating compressors unless they have ample generating capacity to provide the requisite starting and running currents without appreciable voltage or frequency drop.

5.8.1 240 Volt Air Compressors

These models are shipped pre-wired with a compliant flexible electrical supply lead and three-pin plug ready for “plug and play” installation.

The compressor’s electrical supply lead should be plugged directly into a suitable power point. Avoid using extension leads because they can damage the electric motor due to under-voltage supply. This is the most common cause of compressor failure and is not covered by warranty. Always use additional air hose or pipe instead of an electrical extension lead.

Compressors fitted with a standard three-pin 10 Amp electrical plug (on which all three pins have the same cross-section) can be connected to a standard 10 Amp socket if there are no other electrical appliances connected to the same branch circuit. They can also be connected to a heavy duty 15 Amp socket.

The direction of motor rotation has been correctly pre-set at the factory during manufacture. If fitting a replacement motor, check that its direction of rotation is anti-clockwise when viewed looking onto the cooling fan (for Models 125-8L and 190-24L) or clockwise (for Model 295-40L).

The compressor’s motor is fitted with a manual reset thermal overload protection device. If it is activated due to an overload condition, allow the motor to cool down for 10 minutes before pressing the black button on the overload switch to reset it.

6.0 Operation

6.1 Precautions

Before operating the air compressor, always check first to ensure that it has been received, inspected and installed in accordance with the instructions herein. Rectify any discrepancies before proceeding further.

Check the compressor pump's oil level by looking at the sight glass. The oil level should be at the top of the red dot as shown in Figure 6-1. Add oil, if required, through the opening in the top of the crankcase by removing the oil fill cap breather and only when the unit is not operating. Do not overfill with oil. Refer to the *Maintenance and Repair* section for recommended oil specifications.

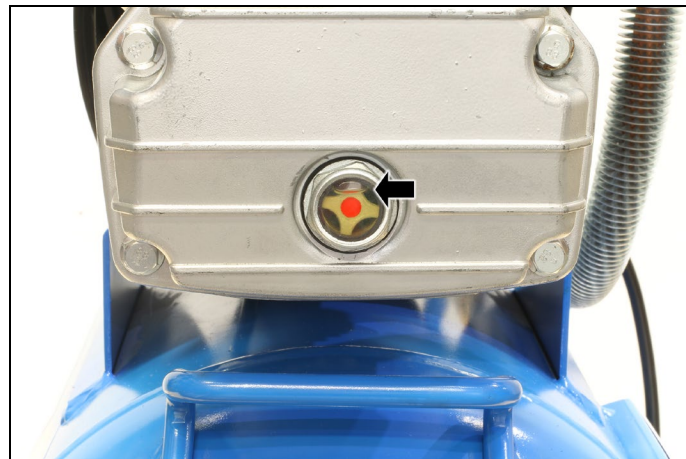


Figure 6-1 Compressor Pump Full Oil Level

Check that any connected air hose(s) or distribution pipe(s) are not open to the atmosphere; this is to prevent any injuries from “hose whip” or high-pressure air discharge and to avoid unattended compressed air discharge to the atmosphere. If an air line is cut or broken, the air supply must be immediately closed off at the compressor either by disconnecting the air hose from the discharge outlet coupling or switching off the compressor. Do not attempt to “catch” the loose end of a discharging air hose.

Check that the tank drain valve is closed by tightening it clockwise.

Take care when discharging air from the tank, i.e. from the safety valve, the drain valve or the air outlet, to ensure that it does not cause dirt, stones, metal swarf or other particles to be blown around.

Any unusual noise or vibration likely indicates a problem with the compressor. Do not continue to operate the unit until the source of the problem has been identified and corrected.

6.2 240 Volt Air Compressors

Check that the electricity supply is turned off.

With reference to Figure 6-2, check that the compressor's pressure switch is turned to the “OFF” position.

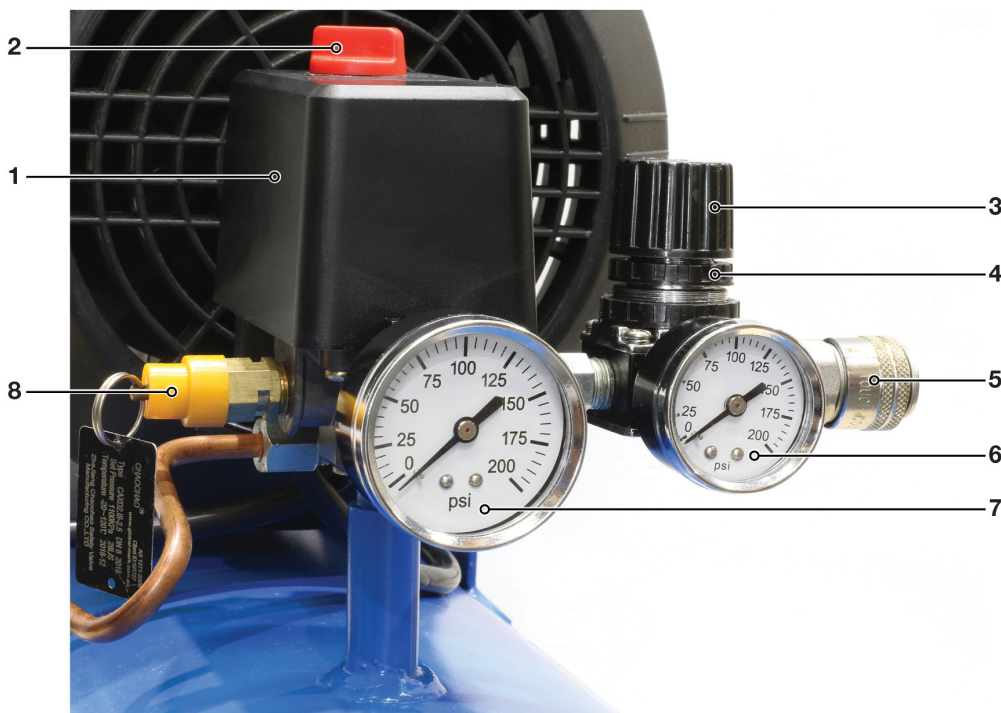
Connect an air hose to the compressor’s discharge outlet coupling by pulling back the locking collar on the socket, inserting a compatible Nitto-style male plug (fitted to one end of an air hose) into the socket, and then releasing the locking collar. Ensure that the connection is secure by checking that the locking collar is fully engaged and also by trying to pull the air hose away from the coupling.

Plug in the compressor’s electrical supply lead.

Switch on the electricity supply.

Turn the compressor’s pressure switch to the ON / AUTO position marked “ON”. The compressor will now start automatically whenever the air receiver pressure drops to or below the pre-set cut-in pressure of approximately 800 kPa (116 psi). It will also stop automatically whenever the air receiver pressure reaches the pre-set cut-out pressure of approximately 1,000 kPa (145 psi).

To adjust the output air pressure, loosen the locking ring on the regulator by turning it clockwise and then turn the black knob until the desired setting is indicated on the outlet pressure gauge. It may be necessary to briefly discharge some air from the outlet to obtain a true reading on the outlet pressure gauge. Or in some cases a longer discharge of air may be required to force a “pump-up” cycle until the compressor reaches its maximum “cut-out” pressure. Re-tighten the locking ring when the regulated output pressure has been set.



Item	Description	Item	Description
1	Pressure Switch	5	Discharge Outlet Coupling
2	Pressure Switch ON / OFF Knob	6	Regulated Outlet Pressure Gauge
3	Pressure Regulator Adjustment Knob	7	Air Receiver Pressure Gauge
4	Pressure Regulator Locking Ring	8	Safety Valve

Figure 6-2 Pressure Switch, Regulator, Gauges, Safety Valve and Outlet Coupling

When compressor operation is no longer required, always turn the pressure switch to the “OFF” position before switching off the electricity supply or unplugging the supply lead. Always use the pressure switch to turn the compressor on and off otherwise the electric motor may be damaged.

6.3 Duty Cycle

To maximise service life, the air compressor should be adequately sized for its given application.

It should ideally operate in a repeating run-stop or pump-unload cycle, with total compressor “pumping” time not exceeding 75% or 45 minutes in every hour on average.

The elapsed time between the start and finish of any given pumping cycle (i.e. the continuous duration that the electric motor operates) should not exceed 10 minutes.

If the unit cannot supply the compressed air demand without exceeding the above duty cycle limits, then either the demand should be reduced or the compressor should be replaced with a unit having a larger free air delivery.

The duty cycle limit is intended to protect the compressor pump valves and heads against stabilised high operating temperatures that can cause premature pump failure.

In applications where multiple compressors are required to satisfy the total air demand, it is recommended that the compressed air distribution system be split into separate circuits each supplied by a single compressor operating within its recommended duty cycle limits. The parallel operation of individual compressors supplying a common air system can often result in very unbalanced duty cycles amongst the units unless they share a single controller.

7.0 Maintenance and Repair

7.1 Precautions

Before performing any maintenance or repair work on the compressor, isolate and tag-out the power supply, carefully release any residual air pressure from the air receiver tank and any connected air hoses or piping, and disconnect the outlet air hose. And, if possible, allow the unit to cool down if it has been running.

Use only genuine spare parts for maintenance and repair of the compressor to ensure its safe and reliable operation.

The maintenance tasks recommended herein can generally be undertaken by anyone with proficient mechanical ability and access to proper tools. Alternatively, your Puma dealer can carry out this work.

For best results, the following repair procedures should always be observed:

- (a) Use new gaskets, seals and O-rings during reassembly.
- (b) Use PTFE thread tape or Loctite® sealant on threaded joints subject to pressure.

7.2 Maintenance Schedule

The maintenance schedule shown in Table 7-1 has been developed for an average level of compressor use in a clean indoor environment. The service intervals should be shortened in harsher working conditions. Regular preventative maintenance is essential for the safety, reliability and performance of the compressor and will add years to its useful life.

Table 7-1 Recommended Maintenance Schedule for Oil-Lubricated Direct-Drive Compressors				
Activity	Elapsed Time or Operating Hours (whichever occurs first)			
	1 Day	1 Week	1 Month	3 Months or 300 hours
Check Oil Level	●			
Inspect for Oil Leaks	●			
Drain Air Tank	●			
Check or Clean Air Filter(s)		●		
Test Safety Valve		●		
Inspect for Air Leaks		●		
Tighten Joints and Fasteners			●	
Clean Unit			●	
Replace Oil				●
Replace Air Filter Element(s)				●

7.3 Lubricating Oil

Maintain the oil level at the top of the red circle on the oil sight glass fitted to the compressor pump as shown in Figure 6-1.

Remove the oil fill cap breather to add oil only when the compressor is switched off.

Use premium quality engine oil of monograde or multigrade viscosity that is appropriate for the ambient temperature range in which the compressor will be operating. The compressor is supplied from the factory with a bottle(s) of SAE 30 mineral based engine oil that is suitable for ambient temperatures from 5°C (41°F) to 40°C (104°F). Mineral based, semi-synthetic or fully synthetic oils may be used, but different types of oils should not be mixed together.

Regular oil changes in accordance with the recommended maintenance schedule are crucial to the service life of the compressor pump.

To change the oil, remove the oil fill cap breather and then remove the oil drain plug (if fitted). An alternative to draining is to evacuate the oil through the oil fill hole by inserting a suction probe. Oil flows easier if the pump is warm, but do not touch the oil in case it is hot. Reinstall the oil drain plug tightly (if fitted) before adding the new oil and then finally screw the oil fill cap breather back in place.

If the oil changes to a white colour, this indicates water contamination. If it changes to a dark colour, this can indicate compressor overheating or that the oil is contaminated with wear and tear debris. Change the oil immediately in either case of discolouration.

Do not pollute the environment by improper or illegal disposal of waste oil.

New or rebuilt compressor pumps will discharge higher than normal amounts of oil until the piston rings are seated in, which can take up to approximately 100 operating hours. Some oil may also concurrently accumulate at the crankcase breather opening and this too will diminish with run time.

7.4 Air Receiver Tank

To drain condensate from the air receiver tank, slowly open the drain valve and allow the condensate to discharge. Do not pollute the environment by improper or illegal disposal of condensate that may contain lubricating oil or other contaminants.

Note that the drain valve is not located at the bottom-most point of the air receiver tank on some models. In such cases, it is essential to tilt the compressor so that the drain valve is positioned bottom-most when draining the condensate to ensure that all of the liquid is evacuated.

Use extreme caution when opening the drain valve if the air receiver tank is pressurised. The thumbscrew drain cock should be carefully opened by turning it anti-clockwise until it stops at the fully open position; do not force it beyond this limit. After evacuating all of the condensate, turn the thumbscrew drain cock clockwise by hand to close it.

As at the time of writing, individual registration of the air receiver tank as an item of plant is not required by any Australian State or Territory for workplace use due to its relatively small volume and low pressure. The air receiver is considered as low risk when operated in accordance with good engineering practice and process control provided that it is maintained in a fit and safe condition for service, including regular operating surveillance. Please refer to Australian and New Zealand Standard AS/NZS 3788:2006 and the prevailing Workplace Health and Safety Regulations in your jurisdiction.

Do not attempt to repair or modify an air receiver tank. Welding, drilling or any other modification will weaken the tank and may result in damage from rupture or explosion.

Always replace worn, cracked, corroded or damaged air receiver tanks immediately.

7.5 Air Filters

Do not operate the compressor without its air filter(s) installed or if the filter element(s) is clogged or damaged.

The air filter element can be accessed by turning the front cover of the air filter casing anti-clockwise and then pulling it away from the rear part of the casing that is screwed into the compressor pump. Refer to Figure 7-1.

Remove the filter element away from the unit and use compressed air to gently blow it clean from the inside out, but do not wash or oil the element. If it cannot be blown clean or is otherwise torn or damaged, the filter element must be replaced. Wear eye and ear protection when blowing out the filter element.



Figure 7-1 Air Filter Cover and Element Removal

7.6 Safety Valve

Regularly check the safety valve to verify that it's operating freely. While the air receiver tank is pressurised to at least 650 kPa (94 psi), pull the ring on the safety valve and allow it to snap back to its normal position. If air leaks out after the ring has been released, or the valve is stuck and cannot be actuated by pulling the ring, the safety valve is faulty and must be replaced before operating the compressor.

Take care when testing the safety valve as compressed air will discharge from the valve with high velocity and loud noise; wear eye and ear protection.

Do not tamper with the safety valve. It is designed to automatically release air if the tank pressure exceeds a pre-set maximum.

7.7 Air Tightness

While the air receiver tank is pressurised to at least 650 kPa (94 psi) and the compressor is switched off, listen for any audible air leaks. Squirt soapy water around any suspect joint and watch for bubbles indicating a leak.

De-pressurise the air receiver tank and all connected air hoses or air piping fully before commencing any repairs.

Disassemble the leaking joint and clean off all traces of thread tape or sealant using a wire brush. Apply PTFE thread tape or Loctite® 243 liquid sealant to the male threaded connection before reassembling and tightening the joint. Allow at least 30 minutes for the liquid sealant to cure, if used.

Re-pressurise the air receiver tank and check that the air leak has been rectified before putting the unit back into normal operation.

7.8 Cleaning

Switch off the air compressor and use compressed air to blow dust and foreign matter off the compressor pump, motor, piping and air receiver tank. Wear eye and ear protection while undertaking this task.

Oil and grease marks should be cleaned off using mild household surface cleaner and a soft rag. Do not use abrasive cleaners or strong solvents that can damage the compressor's paint finish.

7.9 Oil Fill Quantities

Please note that the oil fill quantities listed in Table 7-2 are approximate only. Always check the compressor pump's oil level using the crankcase sight glass.

Compressor Model	Oil Capacity (Millilitres / Litres)
125-8L	130 mL / 0.13 L
190-24L	330 mL / 0.33 L
295-40L	370 mL / 0.37 L

7.10 Fastener Torques

Item	Thread Size (mm)	Spanner Size (mm)	Torque (Nm)	Torque (lbf-ft)
Puma 125-8L Cylinder Head Bolt	M6	5 Hex	12	8.9
Puma 190-24L Cylinder Head Bolt	M6	10	12	8.9
Puma 295-40L Cylinder Head Bolt	M6	10	12	8.9
Standard M5 Bolt Class 4.6	M5	8	2.1	1.5
Standard M6 Bolt Class 4.6	M6	10	3.5	2.6
Standard M8 Bolt Class 4.6	M8	13	8.5	6.3
Standard M10 Bolt Class 4.6	M10	16	17	12.5
Standard M12 Bolt Class 4.6	M12	18	30	22.1
Standard M5 Bolt Class 8.8	M5	8	5	3.7
Standard M6 Bolt Class 8.8	M6	10	9	6.6
Standard M8 Bolt Class 8.8	M8	13	22	16.2
Standard M10 Bolt Class 8.8	M10	16	44	32.5
Standard M12 Bolt Class 8.8	M12	18	77	56.8

Note: Apply only 80% of the standard torque when tightening onto an aluminium alloy component.

8.0 Troubleshooting

8.1 Precautions

Before performing any inspection, test or repair work on the compressor, disconnect it from the power supply, carefully release any residual air pressure from the air receiver tank and any connected air hoses or piping, and disconnect the outlet air hose. And, if possible, allow the unit to cool down if it has been running.

8.2 Procedure

Please refer to the troubleshooting guide shown in Table 8-1 for assistance with diagnosing and repairing any problem that might occur with your air compressor. While many of the tasks can be undertaken by a mechanically proficient person with access to proper tools, all electrical work must be undertaken by a licenced electrician.

It is recommended for your convenience that this troubleshooting guide be consulted prior to contacting a Puma dealer or Glenco Air & Power Pty Ltd for advice. Additional technical information is available online for download at www.glencoairpower.com.au.

Symptom	Possible Cause	Corrective Action
Motor will not start, runs slowly or repeatedly trips out overload protection.	<ol style="list-style-type: none"> 1. Pressure switch not turned on. 2. Air receiver tank pressure above cut-in pressure. 3. No voltage at the pressure switch. 4. No voltage at the electric motor (faulty pressure switch). 5. Low supply voltage. 6. Use of extension lead. 7. 240 V: Thermal overload switch on motor tripped. 8. Faulty pressure switch unloader valve (nil or restricted unloading air flow). 9. Faulty cold start valve, if 	<ol style="list-style-type: none"> 1. Turn on pressure switch. 2. Nil (no fault). 3. Check electricity supply including all fuses, circuit breakers, switches and wiring. 4. Repair or replace pressure switch. 5. Check no load and full load supply voltage. Upgrade power supply circuit if required. Disconnect any other electrical devices on the same supply circuit. 6. Do not use extension lead. Use longer air hose with larger diameter. 7. 240 V: Allow motor to cool down and manually reset overload switch. 8. Replace unloader valve or complete pressure switch. 9. Replace cold start valve.

Table 8.1 Troubleshooting Chart		
Symptom	Possible Cause	Corrective Action
	fitted (nil or restricted start-up bleed air flow). 10. Nil or restricted discharge air flow through non-return valve. 11. 240 V: Blown start or run capacitor(s). Damaged motor cowl or fan. Other motor fault(s). 12. Compressor pump partially or totally seized.	10. Repair or replace non-return valve. 11. 240 V: Check capacitor(s) and replace as required. Replace motor cowl or fan. Replace motor. 12. Repair or replace compressor pump.
Compressor pump does not come up to speed.	1. Low supply voltage. 2. Use of extension lead. 3. Damaged or worn compressor pump valves or blown cylinder head gaskets. 4. Compressor pump partially seized.	1. Check no load and full load supply voltage. Upgrade power supply circuit if required. Disconnect any other electrical devices on the same supply circuit. 2. Do not use extension lead. Use longer air hose with larger diameter. 3. Replace compressor pump valves or cylinder head gaskets. 4. Repair or replace compressor pump.
Excessive noise (including knocking and rattling) or vibration.	1. Low oil level. 2. Piston(s) hitting the cylinder head(s). 3. Damaged or worn crankshaft bearings, crankpin bearings, crankshaft, connecting rods, piston pin bearings, piston pins, pistons, cylinders or valves. 4. Faulty non-return valve. 5. Loose fasteners.	1. Add oil. 2. Remove cylinder head(s) and check for carbon deposits or other foreign matter on top of piston(s). 3. Replace components or entire compressor pump. 4. Repair or replace non-return valve. 5. Check and tighten fasteners (including foot mounts).
Slow pressure build-up or unable to reach cut-out pressure.	1. Air demand exceeds compressor pump capacity. 2. Air leaks.	1. Reduce air demand or use larger or additional compressor(s). 2. Tighten, refit or replace leaking connections or

Table 8.1 Troubleshooting Chart		
Symptom	Possible Cause	Corrective Action
	<ol style="list-style-type: none"> 3. Blocked or dirty inlet air filter(s). 4. Damaged or worn compressor pump valves or blown cylinder head gaskets. 5. Damaged or worn piston rings, pistons or cylinders. 6. Faulty non-return valve. 	<p>components.</p> <ol style="list-style-type: none"> 3. Clean or replace air filter element(s). 4. Replace compressor pump valves or cylinder head gaskets. 5. Replace components or entire compressor pump. 6. Repair or replace non-return valve.
Compressor pump runs excessively hot (and possibly melts air filter enclosures).	<ol style="list-style-type: none"> 1. Incorrect direction of rotation. 2. Ambient temperature too high or insufficient ventilation. 3. Low oil level. 4. Excessive duty cycle. 5. Damaged or worn compressor pump valves or blown cylinder head gaskets. 	<ol style="list-style-type: none"> 1. Check compressor pump turns anti-clockwise (looking onto cooling fan) on Models 125-8L and 190-24L or clockwise on Model 295-40L. Change electric motor connections if incorrect. 2. Reduce ambient temperature or improve ventilation (e.g. move further away from walls or other equipment). 3. Add oil. 4. Reduce air demand or use larger or additional compressor(s). 5. Replace compressor pump valves or cylinder head gaskets.
Excessive duty cycle (> 75% loading ratio or continuous loading times > 10 minutes).	<ol style="list-style-type: none"> 1. Air demand is too high. 2. Air leaks. 	<ol style="list-style-type: none"> 1. Reduce air demand or use larger or additional compressor(s). 2. Tighten, refit or replace leaking connections or components.
Excessive cycling between pumping mode and off mode.	<ol style="list-style-type: none"> 1. Maximum cycling occurs when air demand is at 50% of rated compressor output. 2. Air leaks. 3. Excessive condensate in air receiver tank. 	<ol style="list-style-type: none"> 1. Nil (no fault). Cycling will reduce with either decreased or increased compressed air demand. 2. Tighten, refit or replace leaking connections or components. 3. Drain air receiver tank.
Excessive oil in discharge air.	<ol style="list-style-type: none"> 1. Blocked or dirty inlet air 	<ol style="list-style-type: none"> 1. Clean or replace air filter

Table 8.1 Troubleshooting Chart		
Symptom	Possible Cause	Corrective Action
	filter(s). 2. Overfilled with oil. 3. Oil viscosity too low. 4. Excessive duty cycle. 5. Blocked or damaged crankcase breather. 6. Damaged or worn intake valves, piston rings, pistons or cylinders.	element(s). 2. Drain oil down to high level mark. 3. Replace with correct oil. 4. Reduce air demand or use larger or additional compressor(s). 5. Clean or replace crankcase breather. 6. Replace components or entire compressor pump.
Water in discharge air.	1. No fault. This is normal operation. Condensate quantity will increase with duty cycle and humidity.	1. Install dryer or filter in discharge line. Install automatic tank drain valve or manually drain air tank more often. Revise distribution piping system to ensure proper condensate drainage.
Compressor does not switch off and safety valve discharges.	1. Faulty or incorrectly set pressure switch. 2. Faulty safety valve. 3. Note: Use tank pressure gauge to help diagnose fault.	1. Adjust or replace pressure switch. 2. Replace safety valve.
Low suction or air blowing out at air filter inlet(s) during pumping mode.	1. Damaged or worn compressor pump inlet valves or blown cylinder head gaskets.	1. Replace compressor pump inlet valves or cylinder head gaskets.
No short discharge of air from the pressure switch after reaching cut-out pressure or being manually switched off.	1. Faulty pressure switch unloader valve. 2. Blocked or damaged unloading line. 3. Blocked or faulty non-return valve.	1. Replace unloader valve or complete pressure switch. 2. Clean or replace unloading line. 3. Clean, repair or replace non-return valve.
Short initial discharge of air from the 240 Volt pressure switch during pumping mode after starting with nil or low pressure in the air receiver tank.	1. Correct function of the "soft start" pressure switch unloading valve to reduce motor starting current.	1. Nil (no fault).
Continuous discharge of air from the pressure switch after reaching cut-out pressure or being manually switched off.	1. Faulty non-return valve.	1. Repair or replace non-return valve.
Continuous discharge of air from pressure switch during	1. Faulty pressure switch unloader valve.	1. Replace unloader valve or complete pressure switch.

Table 8.1 Troubleshooting Chart		
Symptom	Possible Cause	Corrective Action
pumping mode.		
Air receiver tank does not hold pressure when compressor is off and discharge outlet is closed.	<ol style="list-style-type: none"> 1. Faulty non-return valve. 2. Air leaks. 	<ol style="list-style-type: none"> 1. Repair or replace non-return valve. 2. Tighten, refit or replace leaking connections or components.
External oil discharge from compressor pump.	<ol style="list-style-type: none"> 1. Oil leaks. 	<ol style="list-style-type: none"> 1. Tighten, refit or replace leaking connections or components.
Oil appears "milky" in sight glass.	<ol style="list-style-type: none"> 1. Water contamination in oil. 	<ol style="list-style-type: none"> 1. Replace oil and move compressor to less damp or humid location.
Oil appears black in sight glass.	<ol style="list-style-type: none"> 1. Graphite carry-over from cast iron material (initial oil fill only). 2. Oil dirty or overheated (second or subsequent oil fills). 	<ol style="list-style-type: none"> 1. Replace oil. 2. Replace oil and check for compressor pump overheating.

9.0 Transport

Always switch off the air compressor and de-pressurise the air receiver tank before transporting the unit. Keep the compressor upright to prevent oil spillage.

Ensure that adequate manpower or lifting equipment is available for moving and loading the compressor. Lifting equipment, slings, etc. must be properly rated for the weight of the compressor.

Take care when attaching load restraining devices to ensure that the compressor does not tip over during transport, especially because of its high centre of gravity.

Check with the carrier whether lubricating oil must be drained out prior to transport. If so, ensure that the party receiving the compressor is notified accordingly.

Keep the compressor covered during transport to prevent the ingress of dust, debris and precipitation.

10.0 Storage

Always switch off the air compressor and then de-pressurise and drain the air receiver tank before storing the unit.

Keep the compressor upright to prevent oil spillage.

Store the compressor in a cool, dry and shaded place and keep it covered to prevent the ingress of dust and debris.

If storing the compressor for a long period, change the compressor pump lubricating oil and clean the entire unit in accordance with the maintenance instructions.

11.0 Dismantling and Disposal

There is no requirement for the air compressor to be dismantled during normal operation other than for major repair / overhaul or prior to final disposal at the end of its service life.

Dismantling should only be carried out by a mechanically proficient person with access to proper tools or alternatively by your Puma dealer.

Before dismantling the compressor, switch off the unit, disconnect the power supply, carefully depressurise and drain the air receiver tank, and drain the lubricating oil from the compressor pump.

Do not pollute the environment by improper or illegal disposal of the waste oil and condensate.

Air receiver tanks should be rendered unusable for pressure service prior to disposal, for example by cutting or massive deformation. This is to prevent their unauthorised and unsafe use by others.

Do not pollute the environment by improper or illegal disposal of the compressor either as a whole or dismantled. Take the unwanted unit or components to your local recycling centre instead. The compressor is made almost entirely of metal that can usually be sold to scrap metal recyclers.

12.0 Specifications

12.1 240 Volt Electric Air Compressors

Puma Model	Capacity (L/min)	FAD (L/min)	Maximum Pressure (kPa)	Maximum Pressure (psi)	Electric Motor (kW)	Electric Motor (hp)	Tank Volume (L)	Weight (kg)
125-8L	125	65	1,000	145	1.1	1.5	8	17
190-24L	190	105	1,000	145	1.5	2.0	24	27
295-40L	295	180	1,000	145	2.2	3.0	40	39

13.0 Warranty Against Defects

13.1 Record of Ownership

Please complete the following details about your air compressor for future reference concerning warranty, spare parts and service.

Date of Purchase:

Purchased From:

Tax Invoice Number:

Air Compressor Model Number:

Air Receiver Tank Serial Number:

It is recommended that you keep a copy of the original tax invoice together with this manual.

13.2 Warrantor

Name: Glenco Air & Power Pty Ltd (ABN 21101370085)
 Address: 21 Resource Street, Parkinson, 4115, Australia
 Phone: (07) 3386 9999
 Fax: (07) 3386 9988
 Email: sales@glencomfg.com.au
 Web: www.glencoairpower.com.au

13.3 Warranty Conditions

Glenco Air & Power Pty Ltd (the “Company”) warrants that its Puma air compressors (the “Goods”) shall be free from defects in material and workmanship for a period of twelve (12) months from the date of original sale (hereinafter the “Warranty Period”).

Accessories or components furnished by the Company, but manufactured by others – including, but not limited to electric motors, petrol engines and diesel engines – shall carry whatever warranty the manufacturer conveyed to the Company and which can be passed onto the Consumer.

The Warranty Period is continuous from the date of original sale and does not restart upon the repair or replacement of the Goods or any part thereof.

Upon return – transportation charges prepaid by the Consumer – to the Company’s or its nominated dealer’s premises within the Warranty Period, the Company shall repair or replace, at its option, any Goods which it determines to contain defective material or workmanship, and shall return said Goods to the Consumer free-on-board (FOB) at the Company’s or agent’s premises. The repair or replacement work will be scheduled and performed according to the Company’s normal workflow and availability of replacement parts.

The Company shall not be obligated, however, to repair or replace Goods which have been: repaired by others; abused; improperly installed, operated, maintained, repaired, transported or stored; not serviced to schedule using genuine spare parts; altered or otherwise misused or damaged in any way.

The Company shall not be responsible for any diagnosis, communication, dismantling, packing, handling, freight, and reassembly or reinstallation charges.

Freight damage, pre-delivery service, normal operating adjustments, preventative maintenance service, consumable items, cosmetic damage, corrosion, erosion, normal wear and tear, performance, merchantability, and fitness for a particular purpose are not covered under this Warranty. Consumable items include batteries, filters, lubricants and V-belts.

The Company shall not be liable for any repairs, replacements, or adjustments to the Goods or any costs of labour performed by the Consumer or others without the Company's prior written approval.

To the extent permissible by law and notwithstanding any other clause in these Warranty Conditions, the Company excludes all liability whatsoever to the Consumer arising out of or in any way connected with a contract for any consequential or indirect losses of any kind howsoever arising and whether caused by breach of statute, breach of contract, negligence or other tort.

The Company's liability will be limited to, in the case of products, the replacement of the products, the supply of equivalent products or the payment of the cost of replacing the products or of acquiring equivalent products or, in the case of services, the supply of the services again or the payment of the cost of having the services supplied again. The choice of remedy will be at the discretion of the Company and the Consumer acknowledges that this limitation of liability is fair and reasonable.

This Warranty is available only to the original Consumer bearing the original tax invoice from the Company or one of its authorised dealers as proof of purchase. Goods purchased from any other party such as a private seller, auction house, eBay seller, etc. are not covered by this Warranty.

Our Goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the Goods repaired or replaced if the Goods fail to be of acceptable quality and the failure does not amount to a major failure.



Dependable Performance

