



Instruction Manual



Vertical Air Receivers

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Introduction

Thank-you and congratulations for purchasing a high quality Fusheng vertical air receiver. 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 putting the air receiver into operation. 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 air receiver, please contact your local authorised Fusheng dealer or Glenco Air & Power Pty Ltd before using it.

This manual should be considered a permanent part of the air receiver 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 air receiver may differ slightly from the models pictured, including optional accessories.

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1.0 Safety

The vertical air receiver is a pressure vessel that should only be used 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 vessel and (c) described in the Plant Risk Assessment that's also available from the manufacturer.

You should 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 of the safety rules and working instructions described herein. You should also use your own good judgement and common sense.

All users of the air receiver and any other workers likely to be in the vicinity thereof should undergo training to achieve the requisite minimum level of operator competence before putting the vessel into operation. Do not permit anyone to operate the air receiver without proper instruction.

The air receiver should be installed and operated in an upright position on a firm, level and stationary foundation at ground level such as a concrete floor that is strong enough to support its weight. The vessel should not impede pedestrian or vehicular traffic.

Unobscured access should be provided to the inspection opening(s) in the air receiver. The type, size and location of the inspection opening(s) are described in the pressure vessel manufacturer's data report.

Do not locate the air receiver 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 vessel should be kept away from heat sources.

Do not operate the air receiver in or near a flammable gas or vapour. Do not store flammable liquids or gases in the vicinity of the vessel.

Air receivers should be installed in a well-ventilated area preferably indoors. If it has to be located outdoors, the vessel should be provided with weather protection against precipitation and direct sunlight wherever possible.

Do not climb or stand on the air receiver or use it as a handhold.

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

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

Do not use the air receiver to store any gas except compressed air or other non-harmful gas as defined in Australian Standard AS 4343. If the gas is other than compressed air, its identification should be marked on the vessel in accordance with AS 1345.

If used to store a non-harmful gas other compressed air such as nitrogen or helium, all traces of hydrocarbons should be removed from inside the vessel prior to putting it into operation so as to prevent system contamination downstream.

Do not operate the air receiver at an internal pressure in excess of its design pressure as marked on the vessel's nameplate and stated in the manufacturer's data report.

The air receiver is not designed for vacuum duty and should not be operated at sub-atmospheric internal pressure.

Do not operate the air receiver if the temperature of its contents or the external ambient temperature is outside of the design temperature range as marked on the vessel's nameplate and stated in the manufacturer's data report.

Lift the air receiver for installation only by suitable rigging attached to both of its lifting lugs if so equipped. Do not lift by attachment to only one lifting lug nor by attachment to any other part of the vessel.

Do not roll or slide the air receiver on its side. Do not drop a pressure vessel or allow hard impact or abrasion arising from its contact with any walls, tools or equipment.

The air receiver should be fitted with a pressure-relief safety valve before being put into operation. The safety valve's pressure-relief setting should be less than or equal to the vessel's design pressure. The flow capacity of the safety valve at the pressure-relief setting should be greater than or equal to the total free air delivery of any connected compressor(s) at the same pressure.

The safety valve is not designed to function as a pressure regulator and should not be used to set the pressure at which the compressed air system is to operate. The pressure-relief relief valve should be considered only as a safety device.

Do not bypass, modify or remove the pressure-relief safety valve.

Test the pressure-relief safety valve at least once per month to verify that its release mechanism can move freely.

The air receiver should be fitted with a pressure gauge before being put into operation.

The air receiver should be fitted with a drain valve at the lowest part of the vessel before being put into operation.

If fitted with a manual drain valve, open it carefully at least once per shift or day to drain out any accumulated water condensate. It is safer to depressurise the air receiver prior to draining out the condensate manually, if possible. Or if fitted with an automatic drain valve, check with similar frequency that it is functioning correctly to empty out the condensate.

High voltage electricity can cause death or serious injury. All electrical installation, maintenance or repair work on any air receiver accessories such as an electric-powered timer drain valve should be performed by a licensed electrician.

Electric-powered air receiver accessories should be connected to a properly grounded electrical supply of adequate capacity. The electricity supply circuit should comply with the Australian / New Zealand Standard AS/NZS 3000 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 air receiver accessory in wet conditions unless it is specifically rated for such duty.

Ensure that the drained condensate does not pose a slip hazard, e.g. excessive condensate discharged onto a smooth, non-porous floor.

The potential of freezing ambient conditions should be considered and provision made for heating of the condensate drain where necessary.

Do not put the air receiver into operation with any of its components or accessories damaged, malfunctioning, or partially or wholly removed.

A rusted, cracked or damaged air receiver can explode and cause death or serious injury and should be replaced immediately.

Do not weld, drill or otherwise modify the air receiver tank.

Before putting the air receiver into operation, check the safe condition of any hoses, piping or fittings that are connected to it. The pressure rating of any such connected items should meet or exceed the design pressure as marked on the vessel's nameplate and stated in the manufacturer's data report. Do not use plastic piping unless it is specifically approved for compressed air service and never use PVC piping.

Monitor the air receiver for any leaks or other abnormalities and repair any faults immediately.

Hot surfaces can cause serious injury. Do not touch the metal surface of the air receiver tank during or shortly after operation. Allow to cool before servicing.

High pressure air can cause death or serious injury. 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 air receiver.

Carry out inspections and preventative maintenance on the air receiver in accordance with the recommended schedule and use only genuine spare parts.

If pressure testing of the air receiver is deemed necessary by a qualified inspector, it should be carried out by means of a hydrostatic test and not a pneumatic test.

Before attempting to install, maintain, remove or transport the air receiver, switch-off and tag-out any connected air compressor(s), carefully release any residual air pressure from the vessel and any connected air hoses or piping, and close any isolating valves either upstream or downstream from the vessel. And, if possible, allow the vessel to cool down if it has been in operation.

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 air receiver.

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. Minimise the generation of dust by compressed air blowing.

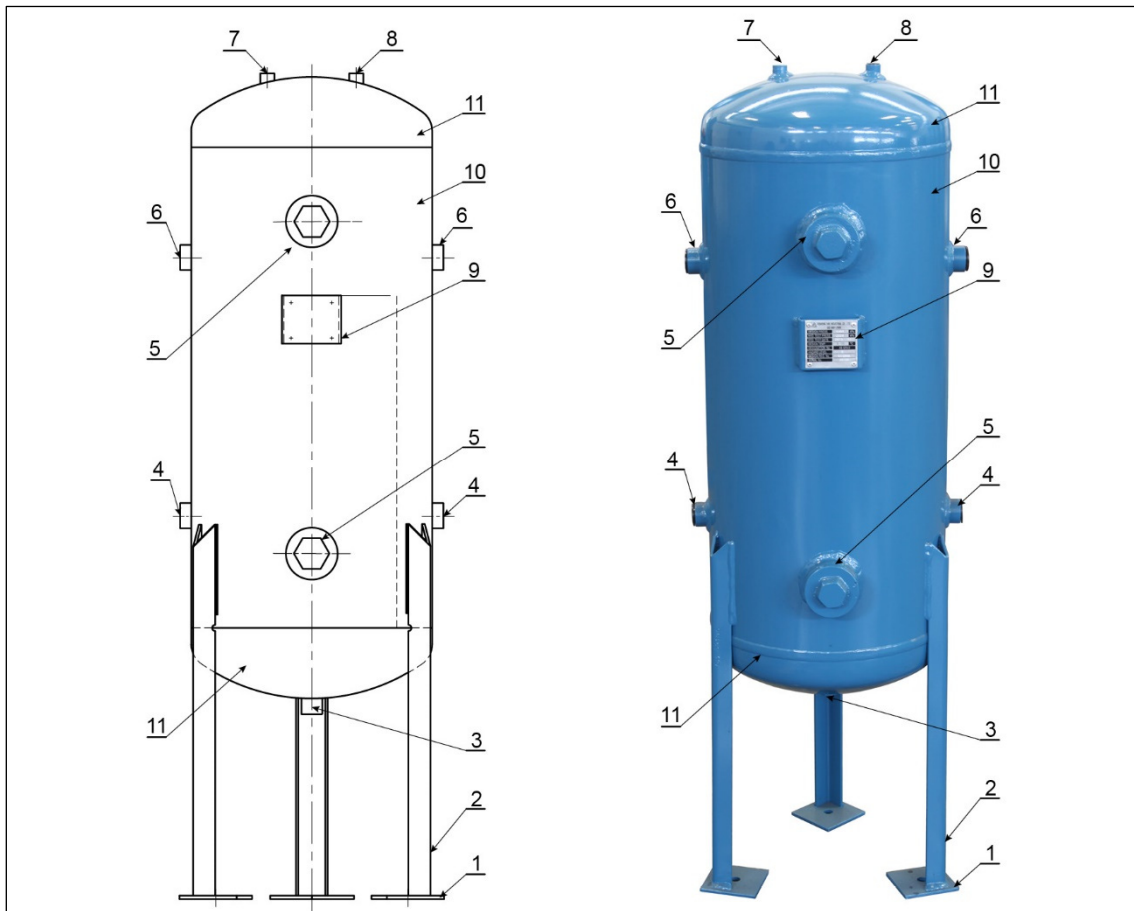
Wear personal protection equipment such as safety glasses, earmuffs and gloves when operating the compressor or using compressed air. Wear a face mask or respirator when spraying, blowing down or otherwise creating airborne mists or dust.

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 direct paint or other sprayed material at the air receiver. Locate air receiver as far away from the spraying area as possible to minimise overspray accumulating on the vessel or its accessories such as the safety valve and pressure gauge.

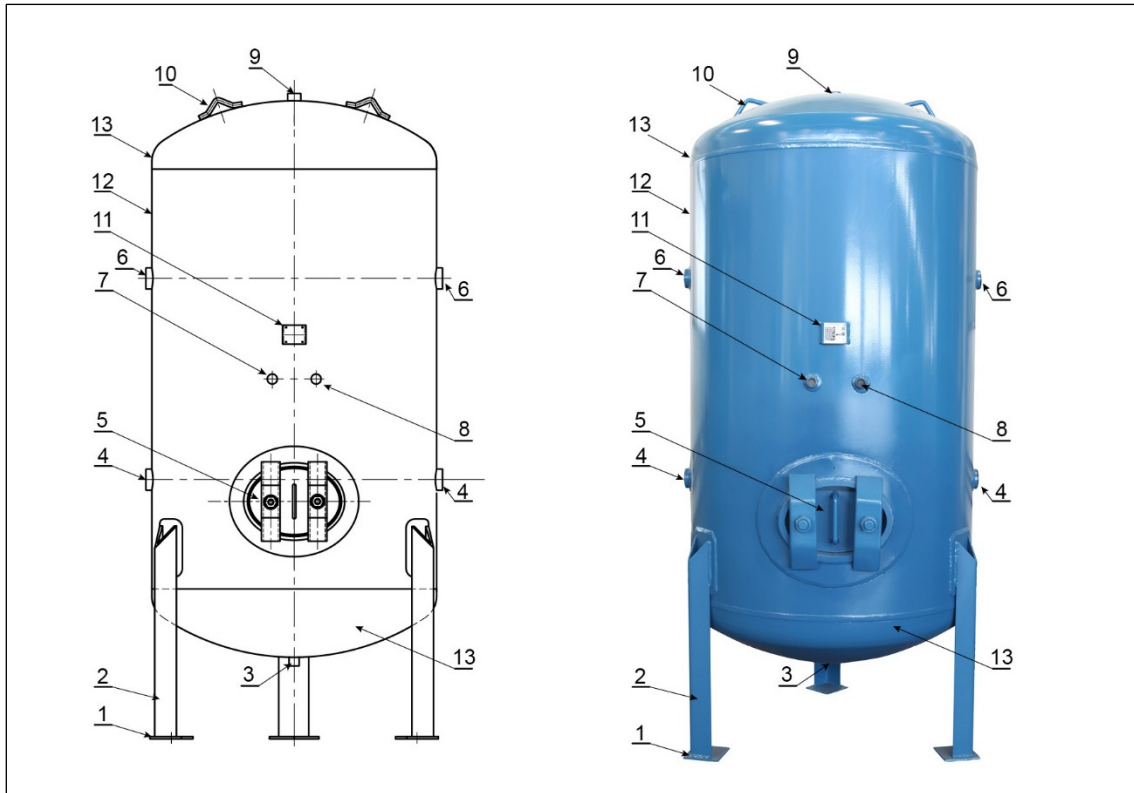
2.0 Product Familiarisation

The major components of the Fusheng vertical air receivers are identified in Figures 2-1 and 2-2. Users should familiarise themselves with their own pressure vessel's features.



Item	Description	Item	Description
1	Mounting Foot Plate	7	Pressure Gauge Socket
2	Leg	8	Safety Valve Socket
3	Drain Socket	9	Nameplate
4	Inlet Socket	10	Shell
5	Inspection Opening with Plug	11	Head
6	Outlet Socket		

Figure 2-1 60 Litre 1,485 kPa Vertical Air Receiver



Item	Description	Item	Description
1	Mounting Foot Plate	8	Safety Valve Socket
2	Leg	9	Auxiliary Socket
3	Drain Socket	10	Lifting Lug
4	Inlet Socket	11	Nameplate
5	Inspection Opening with Cover	12	Shell
6	Outlet Socket	13	Head
7	Pressure Gauge Socket		

Figure 2-2 1,240 Litre 1,100 kPa Vertical Air Receiver

A selection of genuine accessories is available from your local authorised Fusheng dealer or Glenco Air & Power Pty Ltd to complement your vertical air receiver. The mandatory pressure-relief safety valve, pressure gauge and drain valve can be purchased together in model-specific kits. Other items include (a) colour-matched touch up paint to repair any minor chips or scratches and (b) threaded plugs and O-rings or blank flanges and gaskets to close off any unused inlet or outlet ports. Examples of these items are shown in Figures 2-3 to 2-7.



Item	Description	Item	Description
1	Pressure Gauge	3	Safety Valve
2	Manual Ball Valve		

Figure 2-3 Accessory Kit with Manual Drain Valve for 60 Litre 1,485 kPa Vertical Air Receiver



Item	Description	Item	Description
1	Pressure Gauge	5	Auxiliary Socket Plug
2	Pressure Gauge Bush	6	Safety Valve
3	Auto-Float Drain Valve	7	Safety Valve Elbow
4	Drain Valve Nipple		

Figure 2-4 Accessory Kit with Auto-Float Drain Valve for 1,240 Litre 1,100 kPa Vertical Air Receiver



Figure 2-5 Touch Up Paint for Vertical Air Receivers



Figure 2-6 Threaded Blanking Plug and O-Ring

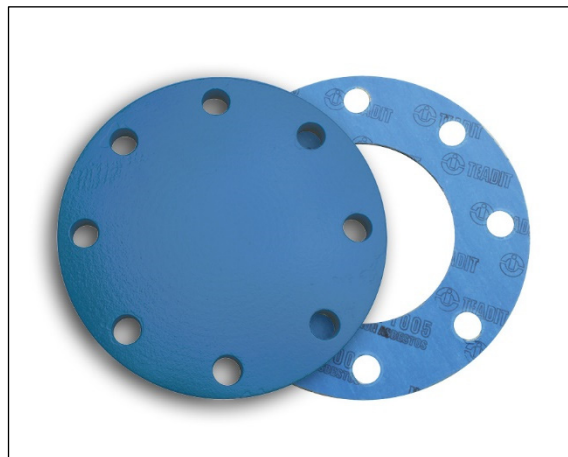


Figure 2-7 Blank Flange and Gasket

3.0 Application and Function

A vertical compressed air receiver or pressure vessel is one of the key components in an industrial compressed air system and is typically found in medium to large installations. Smaller applications are commonly supplied nowadays by a 4-in-1 compressed air station comprising an integrated compressor, horizontal air receiver tank, refrigerant dryer and air treatment filters. Whereas in larger applications, these components are usually separate items. The more compact footprint of a vertical air receiver compared with a horizontal one is preferred because it occupies less floor area in the workplace.

An air receiver provides main or buffer storage volume for the compressed air, balances pulsations from the compressor, cools the air and collects condensation. One or more air receivers are included in a typical installation, the quantity and size of which are a function of the compressor's capacity, flow regulation system and the application's compressed air requirement pattern.

The minimum air receiver size for a given application is determined principally by the desired difference between the compressor loading and off-loading pressure limits and either (a) the permitted frequency of compressor unloading cycles or (b) the required buffer time that the stored volume must maintain the system pressure. Generally, the larger the air receiver the more effectively it performs its functions to the overall benefit of the compressed air system.

The air receiver is usually placed immediately downstream of the air compressor and upstream of any air treatment dryer or filters as shown in Figure 3-1. More complex or larger systems can feature one or more additional air receivers, for example by installing them in strategic decentralised locations to maintain or "buffer" system pressure if some pneumatic device routinely draws too much compressed air for a short period.

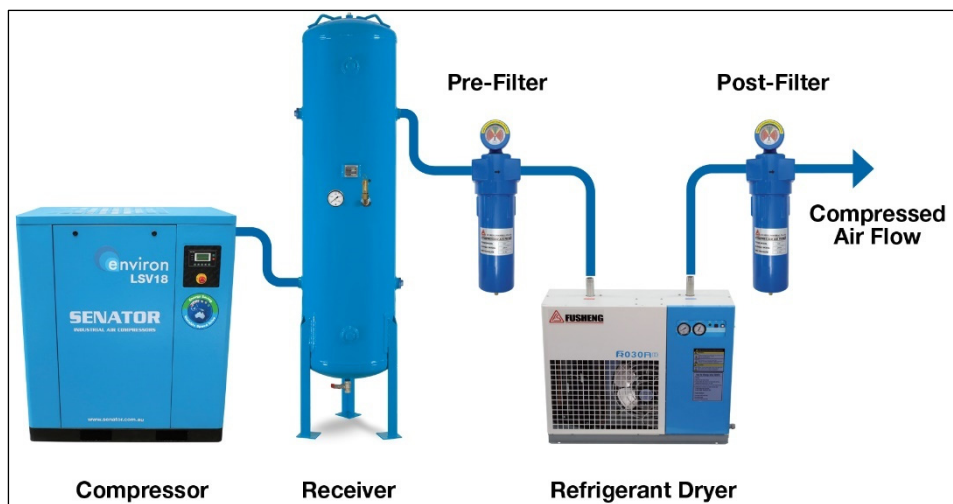


Figure 3-1 Typical Industrial Compressed Air System Configuration

Condensate forms and accumulates within the air receiver and must be regularly removed to prevent harmful carryover into the compressed air system and internal corrosion of the air receiver itself. The simplest solution is to install a manual drain valve in the lowest point of the pressure vessel that a worker opens regularly – typically at the end of each workday or shift – to evacuate the condensate. More sophisticated drain valves are available to automate this function including mechanical float, electric timer, electronic level sensing and pneumatic level sensing types.

A pressure-relief safety valve must be provided to automatically relieve excess pressure from the air receiver to the atmosphere. Its pressure-relief setting should be less than or equal to the vessel's design pressure and its flow capacity should be greater than the aggregate output of any connected compressor(s).

Every air receiver must also be fitted with a pressure gauge for the safety of both operating and maintenance personnel.

The air receiver has one or two dedicated inspection openings to permit visual examination and cleaning of the vessel's internal surfaces. Each inspection opening is fitted with a plug or cover with matching O-ring or gasket, which assembly should normally be left intact, secured and unobstructed.

4.0 Receipt and Inspection

Ensure that adequate lifting equipment is available for unloading and moving the vertical air receiver to the installation site. Lifting equipment, slings, etc. must be properly rated for the packed weight of the unit.

Unload the packed air receiver from the delivery vehicle by using a forklift or crane. The air receiver is packed in a horizontal position inside a timber crate for protection during transport and handling. A plastic bag is fitted over the vessel to keep it clean. The packing crate has been specifically designed for forklift handling and this method is preferred. A typical example is shown in Figure 4-1.



Figure 4-1 Forklift Handling of a Packed Vertical Air Receiver

Do not work or walk under the air receiver while it is suspended in the air.

Inspect the air receiver and any optional accessories 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 Fusheng dealer immediately. Do not put the pressure vessel into operation if it has been damaged during shipping, handling or use.

Read the accompanying paperwork and check the air receiver's nameplate to verify it is the correct one as ordered.

If the air receiver is to be stored prior to installation, leave it packed inside the protective timber crate and kept indoors with protection against moisture and direct sunlight.

5.0 Installation

Installation of the vertical air receiver and any related pressure equipment should be carried out in accordance with AS 3892.

5.1 Location

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

Select a clean, dry and well-lit area preferably indoors with plenty of space for ventilation, cooling air flow and personnel access. Always provide sunshade and shelter from moisture if the air receiver has to be located outdoors.

Do not position the air receiver where chemicals, dust, dirt, fibres, oil, salt, water, or flammable or explosive liquids, gases or dusts may be present.

Do not operate the air receiver in or near a flammable gas or vapour. Do not store flammable liquids or gases in the vicinity of the air receiver. Position it away from heat sources.

Locate the air receiver at least 600 mm (2 ft) or preferably no less than 900 mm (3 ft) away from any adjacent walls for ease and safety of operation, inspection and maintenance.

Where the air receiver is situated in a Wind Region D area per AS/NZS 1170.2, it should be located indoors to eliminate wind loading on the pressure vessel.

5.2 Handling and Unpacking

When ready for installation:

- (a) Move the packed air receiver onto a firm and level surface as close as possible to the mounting position.
- (b) Remove the top and sides of the crate.
- (c) Cut and remove the plastic strapping and then remove the plastic bag cover.

5.3 Supports

The air receiver should be securely affixed onto its foundation by means of suitable hold-down fasteners installed through the three mounting foot plates. A generously sized hole is provided in each plate for this purpose.

Various fastening options including cast-in threaded rods, mechanical anchors (e.g. DynaBolt™, TruBolt™, etc.) and chemical anchors (e.g. ChemSet™) are available to the installer.

It is recommended to set out the positions of the hold-down fasteners on the floor by using a template traced from the actual air receiver's mounting feet.

The preferred method of hold-down fastening should be determined and pre-installed as far as possible before proceeding to lift the air receiver from its crate and stand it vertically.

5.4 Erection

The air receiver should be erected bare without any accessories fitted or other pressure equipment attached. It should be depressurised and empty.

The 60-litre model can be erected by hand, preferably as a two-person manual handling task. Raise the top end of the air receiver up slowly and guide the bottom end to pivot on two support legs until the vessel is standing vertically. It can then be carefully manoeuvred by hand into its final mounting position.

The larger models should only be erected using a mechanical aid such as a crane or a forklift with jib attachment. Connect a suitable two-leg sling to both of the air receiver's lifting lugs as shown in Figure 5-1. Take care not to damage the vessel's external painted finish. The sling legs should be of equal length and sufficient to maintain an angle between them of not greater than 30 degrees.

Do not lift the air receiver by attachment to only one lifting lug nor by attachment to any other part of the vessel.

It is also recommended to attach one or two tag lines to the support leg(s) for manual control of the air receiver's rotation during lifting and handling.

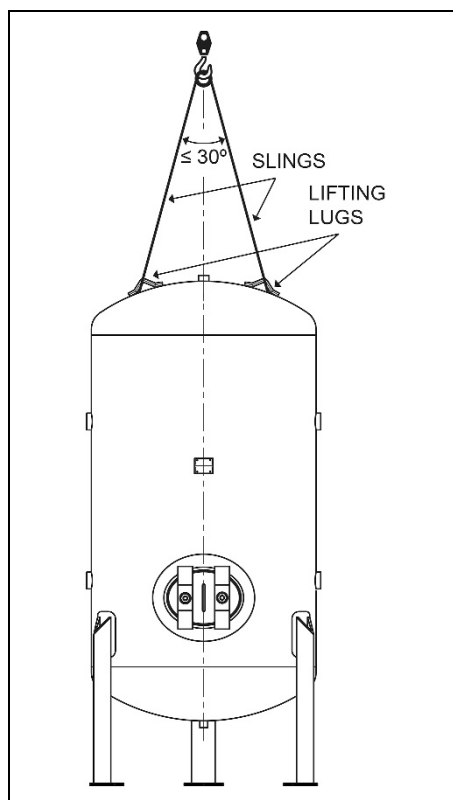


Figure 5-1 Lifting Slings Arrangement for a ≥ 150 Litre Vertical Air Receiver

Lift the air receiver gently in a controlled manner to prevent any shock loads being applied to the lifting lugs. Overloading of the lifting lugs due to rough handling can cause irreparable damage to the pressure vessel that is not covered by warranty. Continue lifting and manoeuvring the air receiver until it is

standing vertically in the desired mounting location.

Check that the air receiver is mounted with an accurate vertical posture. Use shims under the mounting foot plates to adjust its plumbness as required. Then complete the installation and tightening of the hold-down fasteners to finish.

Discard the air receiver's shipping crate and other packing materials in an environmentally responsible manner. Do not use the shipping crate for mounting the air receiver.

5.5 Mandatory Accessories

The air receiver must be fitted with a drain valve, pressure-relief safety valve and pressure gauge before being put into operation. These accessories can be conveniently purchased from your local authorised Fusheng dealer or Glenco Air & Power Pty Ltd in a kit to suit your specific pressure vessel. Or they can be purchased separately through other channels.

The drain valve should be fitted to the drain socket on the underside of the air receiver. The size of the valve should be at least 20 mm and must not be less than 10 mm as prescribed in AS 1210. If an automatic drain valve is to be used, it is recommended that it be supplemented by a manual drain valve unless the automatic type has a manual override or "test" function.

If installing a condensate discharge line from the drain valve, the piping should be kept as short as possible and routed to a suitable drain point or waste container. Condensate may contain traces of compressor lubricating oil and other substances that should not be discharged into drains or sewers without pre-treatment; proprietary oil-water separators are available and recommended for this purpose.

A safety valve complying with AS 1271 should be fitted to the safety valve socket on the air receiver, which is located on top of the 60-litre model and on the front of the shell on larger models. Do not fit the safety valve to the auxiliary socket on top of the larger models because its height above the floor would make it difficult to inspect and test the valve. The safety valve should be installed in a vertical position; use an elbow pipe fitting to achieve such vertical mounting on the larger air receivers.

For air receivers up to 150 litres, the safety valve orifice size should be at least 6 mm if the set pressure does not exceed 1,400 kPa. For larger air receivers, the orifice size should be at least 10 mm irrespective of the set pressure.

A pressure gauge complying with AS 1349 should be fitted to the pressure gauge socket on the air receiver, which – like the safety valve socket – is located on top of the 60-litre model and on the front of the shell on larger models. Do not fit the pressure gauge to the auxiliary socket on top of the larger models because its height above the floor would make it difficult to view and inspect the gauge. The pressure gauge should be installed with its dial face in a vertical position.

The pressure gauge dial face should not be less than 50 mm diameter for use with the 60-litre model, and not less than 75 mm diameter for use with the larger air receivers. The operating pressure of the air receiver should fall within the middle third of the gauge's range; a red line should mark the operating pressure, which can be applied onto the gauge's window with a permanent marker pen.

The safety valve and pressure gauge sockets are intentionally the same size and located adjacent to one another. Their use can be interchanged if required.

5.6 Pressure Piping and Fittings

Inlet piping from the upstream air compressor(s) is normally connected to one or both of the inlet sockets or flanges – collectively also known as “nozzles” – positioned towards the bottom of the air receiver’s shell. If only one of the inlet nozzles is used for this purpose, the other one needs to be securely blanked-off or used for the connection of some other pressure fitting(s).

In a similar manner, outlet piping is normally connected to one or both of the outlet nozzles in the upper part of the air receiver’s shell. This is used to convey the compressed air downstream for further treatment and then supply to the pneumatically powered device(s) or process(es).

Interchanging the roles of the inlet and outlet nozzles is feasible from the compressed air flow and storage perspectives, but it is not recommended because the air receiver’s condensing functionality would be adversely affected.

For a typical industrial compressed air system equipped with one or more compressors and only one air receiver, an isolation valve should be fitted to each of the air receiver’s active inlet nozzles provided that the air compressor(s) can be rendered inoperative whilst the vessel is being inspected or maintained. An isolation valve should also be fitted to each of the air receiver’s active outlet nozzles.

In more complex scenarios where the source of pressure is from another connected vessel that may be in operation during inspection or maintenance of the primary air receiver, the provision for isolation should be one of the following:

- (a) One stop valve and a blanking plate.
- (b) Two stop valves with an atmospheric vent between.
- (c) Removal of a section of interconnecting pipework.

An auxiliary socket is provided at the top of the 150-litre and larger air receivers. Some users find it to be a convenient position to install other related equipment, for example such as an electronic pressure transducer. This socket should be blanked-off with a plug if not otherwise used.

The connected piping or fittings should not apply any loads onto the air receiver’s nozzles. Suitable provision should be made for pipe supports and piping thermal expansion effects.

All pressure piping and fittings connected to the air receiver must be certified safe for the maximum possible pressure and temperature conditions. In practical terms, the pressure in the air receiver ought not exceed the pressure-relief safety valve’s setting and the temperature ought not exceed the maximum design temperature stated on the pressure vessel’s nameplate. Do not use PVC plastic piping or fittings for compressed air service.

Use pipe thread sealant or thread tape on all pressure joints and assemble them tightly to prevent air leaks and energy wastage.

5.7 Ambient Temperature

The air receiver’s condensing effectiveness is inversely proportional to the operating temperature. So where possible in hot areas, the air receiver should be installed 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 drain valve. Locate the air receiver indoors if possible. Drain the condensate daily from the air receiver and leave the drain valve open when the compressed air system is not in use if safely practicable to do so.

The likelihood of freezing ambient conditions should be considered when planning for installation of the air receiver. The application-specific circumstances may dictate the need for insulation or externally powered heating.

5.8 Noise Emissions

The air receiver itself operates silently when under steady state conditions. A faint whistling sound can sometimes be heard when the vessel is initially pressurised from empty due to high velocity air flow through the pressure piping and fittings.

Any discharge of compressed air to the atmosphere will be much louder, for example from a drain valve, safety valve or leak.

Objectionable drain valve noise can be reduced or eliminated by the installation of condensate drain piping or an automatic drain valve.

A pressure-relief safety valve need only be checked in-situ infrequently and if the resultant noise emission is troublesome then the safety valve can instead be removed from the vessel for a bench test. The over-pressure condition whereupon a safety valve vents to atmosphere ought not occur during normal operation and so this should not be a source of noise concern.

Any air leaks should be investigated and repaired without delay. They should not be tolerated as being normal.

6.0 Operation

Operation of the vertical air receiver and any related pressure equipment should be carried out in accordance with AS 3873.

Before putting the air receiver into operation, always check first to ensure that it has been received, inspected and installed in accordance with the instructions herein. Any discrepancies should be rectified before proceeding further.

Check that each of the air receiver's nozzles is either fitted with an accessory (e.g. safety valve, pressure gauge, etc.), connected to inlet or outlet piping, or blanked-off with a suitable plug or blind flange. All pressure connections must be secure and airtight.

Check also that any fitted accessories such as manually operated valves are not open to the atmosphere.

The air receiver is a passive item of plant that does not have an on / off switch or other controls. It becomes operational upon the compressed air system being pressurised.

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

Any loud hissing noise likely indicates a leak from the air receiver. Shut down the compressed air system until the source of the leak has been identified and fixed.

Monitor the pressure gauge to verify that the compressed air system is operating within the desired pressure range.

The pressure-relief safety valve should remain closed and airtight unless it is venting an over-pressure condition from inside the air receiver to the atmosphere.

After a period of compressor operation and active air flow through the vessel, verify that condensate is being evacuated through the drain valve connected to the underside of the air receiver either by its manual or automatic activation depending upon the type installed.

7.0 Inspection and Maintenance

Inspection and maintenance of the vertical air receiver and any related pressure equipment should be carried out in accordance with AS/NZS 3788 and AS 3873, respectively.

7.1 Precautions

Before performing any inspection or maintenance of the air receiver, isolate and tag-out the power supply to the air compressor(s), carefully release any residual air pressure from the vessel and any connected air hoses or piping, and close the air outlet valve(s) or disconnect the outlet air hose(s).

Refer to the separate instruction manual(s) for inspection and maintenance of any automatic drain valve or condensate oil-water separator, if fitted.

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

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

The recommended inspections should only be performed by a competent person with the appropriate knowledge and skills.

Avoid energy wastage from air leaks and the inconvenience of repairing them by using PTFE thread tape or Loctite® sealant on all threaded joints subject to pressure. Use only new gaskets and O-rings, where fitted, during reassembly. And ensure that all joints are tightly assembled.

7.2 Inspection and Maintenance Schedule

The inspection and maintenance schedule shown in Table 7-1 has been developed for typical industrial applications in clean indoor environments. The task intervals should be shortened in harsher working conditions. Regular inspection and preventative maintenance are essential for the safety and reliability of the air receiver and will add years to its useful life.

Activity	Interval						
	Initial	Daily	Monthly	1 Year	2 Years	4 Years	5 Years
Press. Gauge Commission Insp'n	●						
Press. Vessel Commissioning Insp'n	●						
Safety Valve Commissioning Insp'n	●						
Drain Condensate		●					
Check for Air Leaks			●				
Safety Valve In Situ Test			●				
Check and Clean External Surfaces				●			
Safety Valve External Inspection				●			
Pressure Vessel External Inspection					●		
Pressure Vessel Internal Inspection						●	
Replace Safety Valve							●

Note: In accordance with AS/NZS 3788, the 60-litre air receiver model only is exempt from the commissioning and in-service (external and internal) inspections listed in Table 7.1.

7.3 Commissioning Inspection

The air receiver and its accessories should be inspected by a competent person after installation, but before being put into service. This task should include:

- (a) An initial inspection to detect any damage that may have occurred during transport, handling or installation.
- (b) Checking that each item of pressure equipment is clearly identified by marking in accordance with the relevant Standard.
- (c) Checking that all necessary safety devices are properly fitted and operating correctly.
- (d) Establishing that all required inspections during design, manufacture and installation have been completed and that evidence of the design registration is readily available and marked on the vessel.
- (e) Verifying that all operational and performance tests specified by the manufacturer and plant owner have been successfully completed

7.4 Draining the Condensate

To drain condensate from the air receiver, slowly open the manual drain valve – if fitted – 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.

Use extreme caution when opening a manual drain valve if the air receiver tank is pressurised; lever operated drain valves can be fully opened with only one quarter of a turn.

If an automatic drain valve is fitted, verify that it is functioning properly to keep the vessel well emptied of condensate. Such devices are prone to clogging and should be cleaned out as required in accordance with the instructions supplied therewith. Always depressurise the air receiver before disassembling or removing the automatic drain valve.

7.5 Airtightness

While the air receiver is pressurised at about 75% of its design pressure, if possible, switch off the air compressor(s) and listen for any audible air leaks from the vessel's threaded or flanged connections. This most basic test can be easily supplemented by brushing or spraying a soapy water mix onto any suspect joint and then watching for bubbles indicating a leak. More sophisticated methods can be deployed including the use of ultrasonic or sonic imaging leak detection test equipment, if desired.

Depressurise the air receiver and all connected air hoses or piping before commencing to repair a leak.

The first remedy should be to check whether the treaded or flanged connection is tightly assembled. If any joint or fastener is found to be loose, retighten it as required and then repressurise the air receiver and repeat the leak detection test.

If the first remedy does not fix the leak, then proceed as follows:

- (a) Depressurise the air receiver and all connected air hoses or piping.
- (b) Disassemble the joint entirely and clean off all traces of thread tape, gasket or O-ring material and thread sealant using a wire brush.
- (c) Check that there are no cracks or pinholes in any of the components and that there is no damage to mating threads or flanges.
- (d) Apply PTFE thread tape or Loctite® 243 liquid sealant to the male threaded component, if fitted, before reassembling and tightening the joint. Allow at least 30 minutes for the liquid sealant to set, if used; a full cure is achieved after 24 hours.
- (e) Use a new gasket or O-ring, if fitted, and then reassemble and tighten the joint.
- (f) Repressurise the air receiver and repeat the leak detection test.

Ensure that the air leak has been rectified before putting the air receiver back into service.

7.6 Safety Valve

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

The safety valve should be checked regularly to verify that it is operating freely. While the air receiver is pressurised, ideally at about 75% of the safety valve's pressure rating, pull the ring on the safety valve vertically upwards and allow it to snap back to its normal position. If air continues to leak out after the ring has been released or the valve is stuck closed and cannot be actuated by pulling the ring, the safety valve is faulty and must be replaced before putting the air receiver back into service.

Depressurise the air receiver and all connected air hoses or piping before replacing the safety valve.

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

The safety valve supplied in the optional accessory kit is a sealed non-adjustable type and there are no user serviceable parts inside. It is not suitable for "overhaul and bench test" every five years as prescribed in AS/NZS 3788 and nor is this a cost-effective method of working nowadays; the safety valve should instead be replaced with a new one and the old one should be disposed of to a metal recycler.

7.7 Cleaning

Switch off the air compressor(s) and use compressed air to blow dust and debris off the air receiver. Wear eye and ear protection while undertaking this task.

Oil, grease or other contaminants 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 vessel's external paint finish.

7.8 In-Service Inspection

A regime of internal and external inspections of the air receiver is prescribed in AS/NZS 3788, a summary of which is provided in Table 7-1 above. These should be carried out by a competent person accredited by AICIP, NATA or the like.

The Workplace Health and Safety Regulations in your jurisdiction may dictate other requirements for pressure vessel inspections both at commissioning and in-service, and these should take precedence.

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

Always replace a worn, cracked, corroded or damaged air receiver immediately. Do not continue to use it.

7.9 Paint Repair

It is best practice to repair any corrosion or paint damage on the exterior of the air receiver as soon as it becomes evident.

- (a) Mask off the area to be repaired and then use a wire brush or wheel to remove any areas of loose rust or flaking paint.
- (b) Abrade down to bare metal using 400 grit sandpaper and then clean off with wax and grease remover.
- (c) Apply a coat of primer such as Dulux® Metalshield All Surface Primer or Killrust® Heavy Duty Primer and allow to dry in accordance with the product instructions.
- (d) Apply two finish coats of gloss enamel in the nominally matching colour of Dulux® Process Blue. A suitable paint product as shown in Figure 2-5 is available from your local authorised Fusheng dealer or Glenco Air & Power Pty Ltd. Or use a commercial off-the-shelf paint product such as Dulux® Metalshield. Follow the instructions provided on the paint tin or spray can.

8.0 Transport

The air receiver is intended for stationary duty only and after initial installation it normally remains in the same position for its entire service life. It is possible, nonetheless, to remove the air receiver and relocate it for duty at another location if necessary.

The procedure to remove the air receiver is essentially the reverse of that described herein for its installation. The first step should always be to isolate and tag-out the power supply of the air compressor(s), carefully release any residual air pressure from the vessel and any connected air hoses or piping, close any air outlet valve(s) and disconnect any outlet air hose(s).

Ensure that adequate lifting equipment is available for moving and loading the air receiver. Lifting equipment, slings, etc. must be properly rated for the weight of the vessel.

The air receiver can be transported slowly over a short distance while slung vertically from its lifting lugs, for example by using a tractor crane to relocate it within the confines of a workplace.

For movement over a longer distance that would typically include public roads, the vessel should only be transported in a horizontal position while packed on its original shipping skid or something similar. When packed horizontally, the vessel should have continuous support along the longitudinal line of contact on its underside to prevent it from being damaged at localised contact / stress points. And timber wedges or similar should be used to prevent the vessel from rolling on its side.

Any open nozzles in the air receiver should be temporarily plugged or blanked-off to prevent the ingress of dust or debris during handling and transport.

9.0 Storage

If the air receiver is to be taken out of service temporarily, the first step should always be to isolate and tag-out the power supply of the air compressor(s), carefully release any residual air pressure from the vessel and any connected air hoses or piping, close any air outlet valve(s) and disconnect any outlet air hose(s).

Any condensate in the air receiver should be drained out completely and the drain valve closed afterwards. The external surfaces of the vessel and any installed accessories should be cleaned in the normal manner.

If the air receiver is to be left installed in-situ, the compressed air system should be closed or sealed to minimise corrosion of the air receiver's internal surfaces. Or if disconnected or removed entirely from the compressed air system, the vessel's nozzles should be temporarily plugged or blanked-off in an airtight manner.

There are many supplementary methods of corrosion protection of varying complexity and cost that can be employed to preserve the air receiver's internal surfaces. These can include the use of proprietary volatile corrosion inhibitor products inside the vessel or purging with an inert gas such as nitrogen. The cost benefit of such preservation options should ideally be assessed by the plant owner in the context of the specific application and circumstances.

Wherever possible, the air receiver should be stored indoors and protected against moisture and direct sunlight.

10.0 Dismantling and Disposal

There is no requirement for the air receiver to be dismantled during normal operation other than for:

- (a) Removal of plugs or covers to permit scheduled visual inspections of the vessel's interior.
- (b) Removal of the pressure-relief safety valve for bench testing or replacement.
- (c) Removal of the pressure gauge for replacement.
- (d) Removal of the condensate drain valve for cleaning or replacement.
- (e) Re-arrangement of connected pressure piping or other fittings.

At the end of its service life, all of the pressure piping, fittings and accessories should be disconnected or removed from the air receiver.

Any such dismantling work should only be carried out by a mechanically proficient person with access to proper tools or alternatively by your Fusheng dealer.

Before dismantling the air receiver, isolate and tag-out the power supply of the air compressor(s), carefully release any residual air pressure from the vessel and any connected air hoses or piping, close any air outlet valve(s) and disconnect any outlet air hose(s). Drain the vessel and take care not to pollute the environment by improper or illegal disposal of the condensate.

The air receiver should be rendered unusable for pressure service prior to disposal, for example by destructive cutting or deformation. This is to prevent its unauthorised and unsafe use by others.

Do not pollute the environment by improper or illegal disposal of the air receiver. Take the unwanted vessel to your local recycling centre instead; the air receiver is made entirely of steel that can usually be sold to scrap metal recyclers.

11.0 Statutory Registrations

Each air receiver model conforms with a Plant Design Registration that is valid throughout Australia. The design registration number and other important details about the pressure vessel are provided in the Manufacturer's Data Report (MDR) that is supplied with each vessel.

A copy of the MDR and any other reasonably necessary information about the air receiver can be obtained from your local authorised Fusheng dealer or Glenco Air & Power Pty Ltd upon request.

Each individual air receiver must also have a Plant Item Registration issued by the Work Health and Safety Authority in the jurisdiction where the vessel is located. It is the responsibility of the plant owner to apply for and maintain this registration. Note: This requirement does not apply in Victoria nor does it apply to the 60-litre model in any jurisdiction.

In New Zealand, the plant design must be verified by a locally accredited inspection body in accordance with the Health and Safety in Employment (Pressure Equipment, Cranes, and Passenger Ropeways) Regulations 1999. Such plant design verification has been undertaken for the V300-1215, V530-1215 and V820-1220 air receiver models; a copy of the applicable Design Verification Certificate can be obtained from your local authorised Fusheng dealer or Glenco Air & Power Pty Ltd upon request.

12.0 Specifications

12.1 Pressure Vessel Design Parameters

Design Standard: AS 1210-2010 *Pressure Vessels*. Vessel Class 3.

Design Pressure and Hazard Level: Refer to the specific air receiver data in Section 12.2.

Design Temperature: 0°C to 100°C.

Contents: Compressed air. Non-harmful gas as per AS 4343. Note: Other non-flammable and non-toxic compressed gases at 0°C to 90°C such as nitrogen are permissible.

Design Life: Nominally indefinite, subject to proper operation, maintenance and in-service inspection.

Application: Fixed stationary duty.

Environmental Design Conditions and Assumptions for Australia and New Zealand:

- AS/NZS 1170.0 Importance Level 2, Design life 25 years.
- AS/NZS 1170.2 Region C, Terrain category 1.
- AS 1170.4 Site hazard factor 0.22, Soil type Ee, at ground level.
- NZS 1170.5 Site hazard factor 0.42, Soil type E, at ground level.
- AS/NZS 1170.2 Shielding and Topographical Factors = 1. If the pressure vessel is to be located in Wind Region D, it should be located indoors to eliminate wind loading.
- If the pressure vessel is to be located inside a building above ground floor level, an additional seismic loading review should be carried out by the person conducting the business.
- Environmental Design Standards: AS/NZS 1170.2, AS 1170.4, NZS 1170.5, AS 4100 and sound engineering practice.

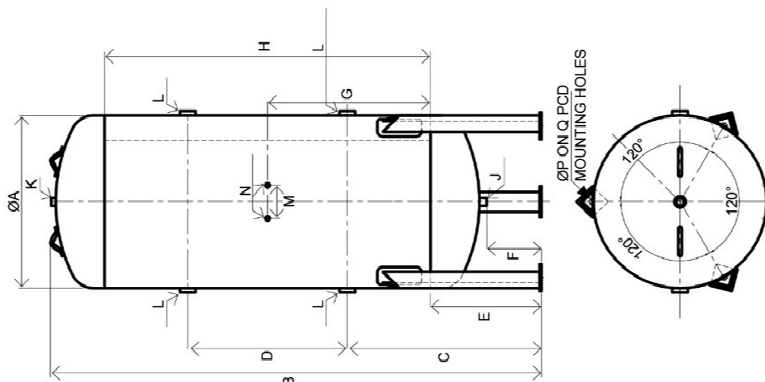
Design Verification Conditions for New Zealand (for pressure vessel models V300-1215, V530-1215 and V820-1220 only):

- NZS 1170.5:2004 Seismic Coefficient 0.79 g HORZ. (V300-1215), 1.70 g HORZ. (V530-1215) and 1.19 g HORZ. (V820-1210).
- AS/NZS 1170.2:2011 Wind Loading 1,121 Pa.
- NZS 1170.5:2004 Site hazard factor 0.42 or less.
- If the pressure vessel is to be located inside a building above ground floor level, an additional seismic loading review should be carried out by the person conducting the business.
- Design life 25 years (IL3).

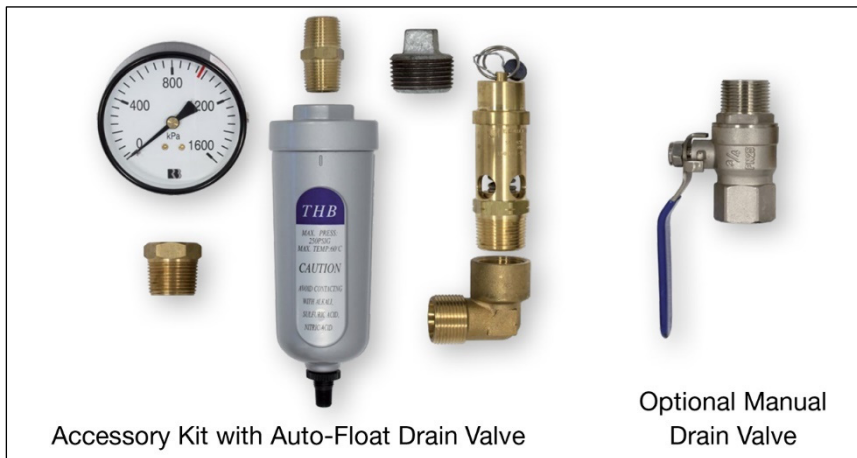
12.2 Pressure Vessel Capacities, Dimensions and Weights

Product Code	Volume Litres	Design Pressure kPa	Hazard Level	Dimensions & Weight															
				A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	J inch	K inch	L inch	M mm	N inch	P mm	Q mm	Wt. kg
FS V60-1485	60	1,485	D	325	1,115	515	350	365	249	750	650	1/2	N/A	3/4	120	1/4	14	300	33
FS V150-1235	150	1,235	C	390	1,700	750	450	375	254	620	1,200	1/2	3/4	1-1/2	150	1/2	14	388	68
FS V150-1620	150	1,620	C	390	1,700	750	450	375	254	620	1,200	1/2	3/4	1-1/2	150	1/2	14	388	81
FS V300-1215	300	1,215	C	490	2,040	755	780	405	254	800	1,480	1/2	3/4	1-1/2	150	1/2	14	505	126
FS V300-1505	300	1,505	C	490	2,040	755	780	405	254	800	1,480	1/2	3/4	1-1/2	150	1/2	14	505	149
FS V530-1215	530	1,215	C	640	2,140	820	750	445	254	750	1,500	1/2	3/4	2	150	1/2	18	645	205
FS V820-1220	820	1,220	B	780	2,215	875	720	500	250	735	1,470	3/4	3/4	2	150	1/2	18	785	334
FS V820-1560	820	1,560	B	780	2,215	875	720	500	250	735	1,470	3/4	3/4	2	150	1/2	18	785	415
FS V1240-1100	1,240	1,100	B	975	2,213	889	690	514	245	720	1,440	3/4	1	2	150	3/4	18	967	468
FS V1240-1395	1,240	1,395	B	975	2,213	889	690	514	245	720	1,440	3/4	1	2	150	3/4	18	967	548
FS V2400-1080	2,400	1,080	B	1,160	2,870	1,015	1,100	615	245	900	1,900	1	1	3E	200	1	20	1,145	858
FS V5000-1145	5,000	1,145	B	1,455	3,705	1,095	1,780	695	245	900	2,580	1	1	4E	250	1	20	1,430	1,657

- Inspection openings and nameplate not shown for clarity.
- All sockets are BSPP (British Standard Pipe Parallel).
- All flanges are Table E per AS 2129-2000 (R2016).
- Hazard levels per AS 4343-2014.



12.3 Optional Accessory Kit Specifications



Product Code		Safety Valve			Pressure Gauge		Auto Drain Valve		Manual Drain Valve	
Auto-Float Drain Valve Kit	Manual Drain Valve Kit	Pressure	Flowrate	Size	Scale	Dial Dia.	Inlet	Outlet	Inlet	Outlet
		kPa	m ³ /min	inch	kPa	mm	inch	inch	inch	inch
N/A	GM V60-1485-K	1,400	4.98	1/4	2,500	63	N/A	N/A	1/2	1/2
GM V150-1235-ADK	GM V150-1235-K	1,100	8.30	1/2	1,600	80	1/2	1/8	1/2	1/2
GM V300-1215-ADK	GM V300-1215-K	1,100	8.30	1/2	1,600	80	1/2	1/8	1/2	1/2
GM V530-1215-ADK	GM V530-1215-K	1,100	8.30	1/2	1,600	80	1/2	1/8	1/2	1/2
GM V820-1220-ADK	GM V820-1220-K	1,100	8.30	1/2	1,600	80	1/2	1/8	3/4	3/4
N/A	GM V150-1620-K	1,400	10.42	1/2	2,500	80	N/A	N/A	1/2	1/2
N/A	GM V300-1505-K	1,400	10.42	1/2	2,500	80	N/A	N/A	1/2	1/2
N/A	GM V820-1560-K	1,400	10.42	1/2	2,500	80	N/A	N/A	3/4	3/4
GM V1240-1100-ADK	GM V1240-1100-K	1,100	17.98	3/4	1,600	80	1/2	1/8	3/4	3/4
N/A	GM V1240-1395-K	1,390	22.34	3/4	2,500	80	N/A	N/A	3/4	3/4
GM V2400-1080-ADK	GM V2400-1080-K	1,080	37.61	1	1,600	80	1/2	1/8	1	1
GM V5000-1145-ADK	GM V5000-1145-K	1,080	37.61	1	1,600	80	1/2	1/8	1	1

13.0 Reference Standards

13.1 General

- AS/NZS 1200 Pressure equipment
AS 4343 Pressure equipment – Hazard levels

13.2 Design, Manufacture and Installation

- AS 1210 Pressure vessels
AS/NZS 1170.0 Structural design actions – General principles
AS/NZS 1170.2 Structural design actions, Part 2 – Wind actions
AS 1170.4 Structural design actions, Part 4 – Earthquake actions in Australia
NZS 1170.5 Structural design actions, Part 5 – Earthquake actions - New Zealand
AS 1345 Identification of the contents of pipes, conduits and ducts
AS 4100 Steel structures
AS 4458 Pressure equipment – Manufacture
AS 3892 Pressure equipment – Installation
AS 1271 Safety valves and fittings for pressure equipment
AS 1349 Bourdon tube pressure and vacuum gauges
AS 4041 Pressure piping
AS/NZS 3000 Electrical installations (known as the Australian / New Zealand Wiring Rules)

13.3 Conformity Assessment

- AS 3920 Pressure equipment - Conformity assessment
New Zealand Health and Safety in Employment (Pressure Equipment, Cranes, and Passenger Ropeways) Regulations 1999 [PECPR Regulations]

13.4 Use

- AS 3873 Pressure equipment – Operation and maintenance
AS/NZS 3788 Pressure equipment – In-service inspection

14.0 Warranty Against Defects

14.1 Record of Ownership

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

Date of Purchase:

Purchased From:

Tax Invoice Number:

Air Receiver Model Number:

Air Receiver Serial Number:

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

14.2 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

14.3 Warranty Conditions

Glenco Air & Power Pty Ltd (the “Company”) warrants that its Fusheng products (the “Goods”) shall be free from defects in material and workmanship for the following period from the date of original sale (hereinafter the “Warranty Period”):

- Reciprocating air compressor pumps: Twelve (12) months if sold as a bare pump or twenty-four (24) months if sold as part of an Airmac air compressor set.
- Electric rotary screw air compressors: Twenty-four (24) months.
- Compressed air receivers, refrigerant dryers and treatment filters: Twenty-four (24) months.

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 filter elements, 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.



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