

Document Ref: LHS2012/10
Revision Date: 03/10/2012

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MAINTENANCE, SERVICE & INSPECTION OF AIR RECEIVERS & COMPRESSORS



LIFTING AND HANDLING SERVICES
TEST HOUSE
SOLUTIONS FOR INDUSTRY



Company Profile

Lifting and Handling Services is an independent Test House, carrying out statutory inspection and certification of materials handling and safety equipment, see enclosed listing. Our company takes inspection to the next level by combining the right people, processes and experience with personal attention to provide our clients with an unrivalled quality of service.

We were the first company of our kind in Ireland to develop a state of the art bespoke online safety management programme which our clients can access 24/7 to view a comprehensive suits of reports surrounding statutory inspection history, plant failures, repairs and statistical analysis.



Services Provided

Lifting and Handling Services provide the following services to our clients nationwide:

✓ Maintenance, Service & Inspection of Air Receivers & Compressors	✓ Statutory Inspection and Certification of Materials Handling & Safety Equipment
✓ Load Testing – Safety Equipment and Structural	✓ Calibration & Certification of Torque Measure Devices
✓ Product Investigation & Reporting	✓ P.A.T. (Portable Appliance Testing) Solutions
✓ Non Destructive Testing Services	✓ Static Testing
✓ Safety Management Consultation & Training	✓ Fuel Dispense / Pump Testing
✓ Accident & Incident Investigation	✓ Air Receivers & Pressure Vehicles
✓ Expert Witness	✓ Fire Extinguishers Inspection
✓ Safety Audits & Risk Assessments	✓ Access Equipment including ladders
✓ Ergonomics – Work Risk Analysis & Solutions	✓ CAD Design & Simulations for steel structures
✓ Fire Safety Risk Assessment / Audits	✓ Pallet Racking and Storage Systems



Air Receivers

The following defines that an "Air Receiver" is:

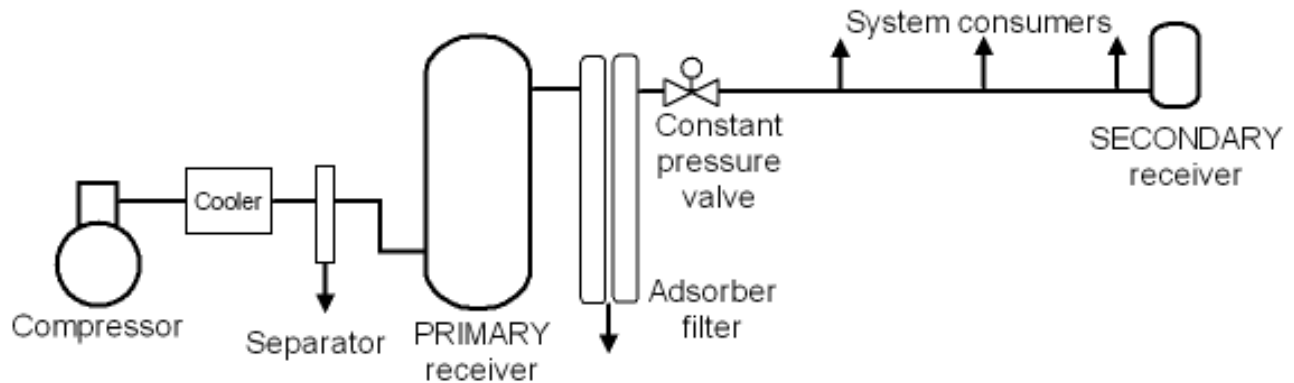
- any vessel (other than a pipe or coil, or an accessory, fitting or part of a compressor) for containing compressed air and connected with the air compressing plant,
- any fixed vessel for containing compressed air or compressed exhaust gases and used for the purpose of starting an internal combustion engine,
- any fixed or portable vessel (not being part of a spraying pistol) used for the purpose of spraying by means of compressed air any paint, varnish, lacquer or similar material, or
- any vessel in which oil is stored and from which it is forced by compressed air



Air Compressor

An air receiver is essential to every compressed air system to act as a buffer and a storage medium between the compressor and the consumption system. There are in principal two different air receivers in a compressed air system:

- PRIMARY receiver - located near the compressor, after the after-cooler but before filtration and drying equipment
- SECONDARY receivers - located close to points of larger intermittent air consumptions



Statutory Requirements

Both manufacturers and users should be familiar with the statutory requirements applying to compressed air systems and air receivers. These are principally contained in the pressure systems and transportable gas containers regulations 1989. Additional recommendations are given in the approved code of practice safety of pressure systems. Requirements for inspection and testing Air Receivers are prescribed in S.I No 445 of 2012 Safety, Health And Welfare At Work (General Application) (Amendment) Regulations 2012. There would be an air receiver as part of most compressors.

In premises where the air receivers must be cleaned and examined at regular intervals and for air receivers with a value of pressure times volume greater than 250 bar litres, the nature and frequency of the examination must be contained in a written scheme of examination. The written scheme of examination drawn up or certified by a competent person will normally specify a period between examinations of 2000 hours, or annually, whichever is reached first.

When connected to an air compressing plant a receiver should either be constructed to withstand the compressor's maximum pressure safely, or be fitted with a safety valve and a pressure-reducing valve to prevent the receiver's safe working pressure from being exceeded. When providing a safety valve and pressure gauge for a set of air receivers that are interconnected and collectively supplied through a single pipe, they may be treated as one receiver, provided that:

- (a) Any reducing valve or other suitable appliance is provided in the single supply pipe; and
- (b) There is no means of isolating any interconnecting pipework.

The receiver should be fitted with a suitable safety valve complying with BS 6759, Part 2 or similar equivalent standard and adjusted so that air is allowed to escape as soon as the safe working pressure has been exceeded. It is essential that the valve is capable of discharging more air than the system can supply to the receiver.

The receiver should be fitted with a correct pressure gauge complying with BS 1780 or similar equivalent standard and which indicates pressure in bar, lbf/sqin, or other suitable units.

There should be a suitable appliance, either manual or automatic, for draining the receiver. It is recommended that manual drain valves should be full bore and straight through, to minimise any build-up of debris which could prevent tight shut off. Automatic drain valves should have adequate capacity for liquid discharge, be designed to minimise debris build-up and have a manual override to check performance. A strainer positioned immediately upstream of the valve will help prevent debris build-up. Protection against freezing of valves will be required in low temperature conditions.

A receiver should have a suitable manhole, handhole or other means (as determined by the relevant standards, for example BS EN 286-1 *specification for simple unfired pressure vessels designed to contain air or nitrogen* and BS 5169 *specification for fusion welded steel air receivers*) to enable the interior to be thoroughly cleaned and inspected.

A receiver should be clearly marked, in a conspicuous position, with its safe working pressure and other relevant information required by the pressure systems and transportable gas containers regulations 1989. The details should be clearly visible on the vessel or a plate attached to it.

A receiver should be readily distinguishable. This can be achieved by painting on identification markings or by affixing a manufacturer's plate, giving the name of the manufacturer, serial number etc.

Hazards

The main hazard is that the vessel may explode because its safe working pressure has been exceeded or because its ability to withstand pressure has been reduced through corrosion fatigue or internal coke fires for example.



General Information & Advice

All new air receivers should conform to BS EN 286-1 or BS 5169, where applicable, or to a standard providing equal integrity.

Precautions

To determine the required capacity, the compressor output and demand pattern need to be taken into account. As a guide, this will be between six and ten times the free air output of the compressor at normal pressure (litres/second). Many users try to save on initial cost and make the mistake of buying a receiver that is too small.

The drain valve, safety valve, examination holes and manholes need to be accessible.

The scale of any gauges needs to be clearly visible.

On large compressor systems the air receiver should be fitted with a fusible plug conforming to BS 1123, part 1. If a fire breaks out nearby, the plug will help to prevent an explosion by guarding against:

- (a) The air temperature rising to the compressor lubricating oil flashpoint; or

(b) An explosion occurring below the designed working pressure because of lost integrity owing to heat.

Welded-on brackets are often used to mount compressor-motor combinations onto air receivers. Where this is the case, welding should be to the specification and approval of the air receiver manufacturer. It should not be carried out indiscriminately because the welder may unwittingly weaken the receiver. Mounting brackets should be designed and fitted in accordance with the applicable air receiver standard. It is good practice to weld mounting brackets onto intermediate reinforcing plates rather than directly to the air receiver.

COOLERS

Hazards

Many aftercoolers are pressure vessels and the associated hazards are similar to those of air receivers.

General information and advice

Cooling plays an important part in the supply of good quality compressed air. Intercoolers and aftercoolers lower the temperature of the compressed air. These coolers are usually water or atmospheric air cooled. With very small air compressors the function of the aftercooler (ie the lowering of the dewpoint of the compressed air) is performed by the air receiver. For other cases a separate aftercooler will normally be necessary.



Air Receiver Information

- (1) Every air receiver shall –
 - a. Have marked upon it so as to be plainly visible the safe working pressure,
 - b. In the case of a receiver connected with the air compressing plant either be so constructed as to withstand with safety the maximum pressure which can be obtained in the compressor, or be fitted with a suitable reducing valve or other suitable appliance to prevent the safe working pressure of the receiver being exceeded,
 - c. Be fitted with a suitable safety valve so adjusted as to permit the air to escape as soon as the safe working pressure is exceeded,
 - d. Be fitted with a correct pressure gauge indicating the pressure in the receiver,
 - e. Be fitted with a suitable appliance for draining the receiver,
 - f. Be provided with a suitable manhole, handhole, or other means which will allow the interior to be thoroughly cleaned, and
 - g. In a case where more than one receiver is in use in the factory, bear a distinguishing mark which shall be easily visible.
- (2) The requirement of paragraph (e) of subsection (1) of this section shall not apply to any such vessel as is mentioned in paragraph (c) or paragraph (d) of subsection (8) of this section.
- (3) For the purpose of the provisions of subsection (1) of this section relating to safety valves and pressure gauges, any set of air receivers supplied with air through a single pipe may be treated as one receiver.
- (4) In a case where suitable reducing valve or other suitable appliance to prevent the safe working pressure being exceeded is required to be fitted to a set of air receivers supplied with air through a

single pipe, subsection (3) of this section shall not apply unless the valve or appliance is fitted on the single pipe.

(5) Every air receiver and its fittings shall be of sound construction and properly maintained.

(6) Every air receiver shall be thoroughly cleaned and examined at least once in every period of twenty-six months, but in the case of a receiver of solid drawn construction:-

- a. The person making any such examination may specify in writing a period exceeding twenty-six months but not exceeding four years within which the next examination is to be made, and
- b. If it is so constructed that the internal surface cannot be thoroughly examined, a suitable hydraulic test of the receiver shall be carried out in lieu of internal examination.

(7) Every examination and test under subsection (6) of this section shall be carried out by a competent person and a report of the result of every such examination and test, containing the prescribed particulars (including particulars of the safe working pressure), shall be entered in or attached to the general register.

- a. An air receiver which has previously been used shall not be taken into use in any factory for the first time in that factory until it has been thoroughly examined and tested by a competent person so far as the construction of the receiver permits.
- b. A new air receiver shall not be taken into use in any factory unless-
 - o There has been obtained from the manufacturer, or from a competent person, a certificate specifying the maximum permissible working pressure thereof and stating the nature of the tests to which the air receiver and fittings have been submitted,
 - o The certificate is kept available for inspection, and
 - o The air receiver is so marked as to enable it to be identified as the air receiver to which the certificate relates.
 - o The person making the report of any examination under this section, or in the case of an air receiver inspecting company or association, the chief engineer thereof, shall within twenty-eight days of the completion of the examination send to the minister a copy of the report in every case where the maximum permissible working pressure is reduced, or the examination shows that the air receiver cannot continue to be used with safety unless certain repairs are carried out immediately or within a specified time.



Certification by LHS

All air receivers will have a signed self-adhesive label affixed showing the date of inspection and the work carried out. An inspection report and certificate of conformance will be given to you showing details of the service history of each receiver. Please refer to our Method Statement for full details.

Contact us for advice or a quotation at 045-868342 or sales@liftingandhandling.ie