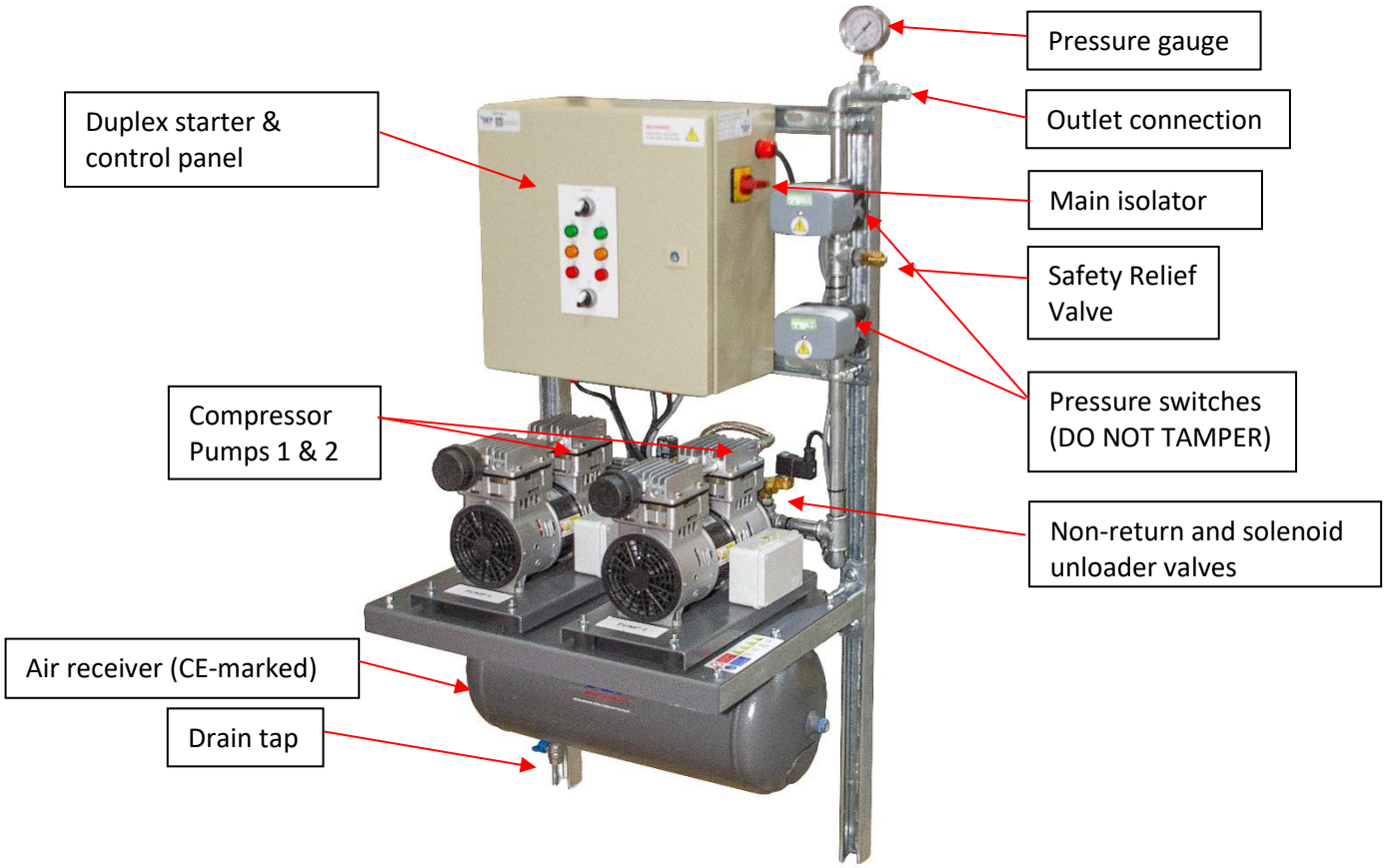
LPC Air Compressors

Duplex Compressor (SEPxxx/DC/LPC)

Operation & Maintenance

QAP02/2B(d) updated: Nov 2023



Description

This station comprises a pair of air cooled reciprocating air compressor pumps which are driven directly by standard electric motors. The station is controlled by a specially designed duplex control unit – under normal operating conditions, when top-ups are required, each pump works alternately. When pressure is very low (e.g. first top-up, following a maintenance drain or power cut) then both pumps work together for a faster fill, unless this function has been disabled (only by request prior to building).

Due to the specialised nature of this unit, the pressure switch settings must not be tampered with – if fine pressure control is required then an air maintenance device can be supplied.

The compressor is fitted with:

- a pair of high-quality pressure switch to enable automatic "stop/start" control, under both normal and low pressure conditions, and one or both pumps to be started automatically.
- a pair of unloading and non-return valve to release pressure once the compressor stops.
- a safety relief valve and thermal overload for both air pressure and electrical protection.
- All models are fitted with an air receiver.
- All compressors are despatched with a flexible stainless braided hose, pipe adaptor, and top-up oil.

IMPORTANT: a duty cycle of (maximum) 50% is recommended; continuous running will cause overheating and rapid failure of internal components.

*** SAFETY ***

THESE AIR COMPRESSORS ARE DESIGNED AND BUILT ONLY FOR FIRE SPRINKLER SYSTEMS.

COMPRESSED AIR CAN BE DANGEROUS, AND POTENTIALLY LETHAL.

ELECTRICITY CAN BE DANGEROUS, AND POTENTIALLY LETHAL.

DO NOT INSTALL OR MAINTAIN this compressor unless you are satisfied that you have the knowledge and experience to do so. If you are NOT SURE, ASK. Unless all instructions are followed, the Warranty is void.

Take special care because ALL compressors are heavy – ~30kg for direct-drive model without receiver, ~50kg for direct-drive model with receiver, ~80-150kg for belt-driven models.

DO NOT OPERATE this compressor until you have read and understand the contents of these instructions, particularly with regard to stopping, starting and general safety.

It is required that users employ safe working practices when using this equipment and your attention is drawn to the Health and Safety at Work Act, the latest electrical and pressure equipment regulations and any other current, pending or future safety requirements.

This booklet must be kept with the compressor for reference purposes. An electronic version is also available from the 'Downloads' page of our website.

The following safety signs and symbols may be used:


Read instructions before use


Automatic control – may start without warning


Dangerous voltage may be present


Danger – contents may be under pressure


Surfaces may be hot


General safety information

A. INSTALLATION - MECHANICAL

Before you start, CHECK for any damage in transit and advise the sender immediately if this is the case.

CHECK the power supply required by the compressor, and the power supply available (particularly a 3-phase supply and whether or not it is 3-wire or 4-wire + earth).

CHECK you have the correct compressor.

1. Remove all packing materials from the compressor. Take care to install and operate the compressor in a clean, dry and cool (ambient temperature 5-40^{o}C) to provide enhanced performance, reliability and quality compressed air.
2. For wall-mounted models, use the four mounting holes in the frame or Unistrut, securely bolting the compressor to the wall with M10 bolts. Use ALL four mounting holes, and ensure the bolts are tight. The compressor must be level on both planes once installed.
3. Vibration may be transmitted from the motor, despite the buffers used, if the frame is not entirely secure – you can check this later by running the unit with the contactor box cover removed and observing that the electrics do not evidently vibrate.
4. For floor-mounted models, use the holes in the bottom of the baseplate, or the air receiver struts, to bolt the unit securely to the floor using the appropriate anchors; brace to a solid wall as well if possible.
5. Connect the compressor outlet to the system pipework using the flexible hose and adaptor provided.

B. INSTALLATION - ELECTRICAL

6. This fire sprinkler compressor **must** be wired into an appropriate isolation device and protected by an appropriate circuit-breaking device, as per the requirements of the current version of BS EN 60204-1. A simple 'fused spur' without an isolation switch should not be used.
7. For electrical data, please refer to the product label, or check with SEP.
8. Locate the electrical supply compatible with the compressor, and connect to the supply in accordance with the wiring diagrams. These are provided for information only – the power cable from the top of the contactor box is prepared for direct connection to your power supply. This power cable, or an equivalent of at least the same rating, must be used.

Dangerous, potentially lethal voltages are present within this equipment; therefore, care should be taken to ensure that all electrical connections remain firm and that cables do not wear, nor allowed to be in contact with excessive heat or vibration etc.

C. BEFORE YOU START THE COMPRESSOR

9. Lubricated models: CHECK OIL level with the sight glass or dipstick (remove, wipe clean, re-insert and remove to check). If required, fill or top up with the correct grade of oil (some of which is supplied) to the oil level mark on the dipstick then replace filler plug/dipstick AND RETAINING CLIP if provided.
10. Also, check that the air intake filters/silencers are in place and secure.

D. STARTING AND RUNNING THE COMPRESSOR

To start the compressor

1. Check and ensure that all valves and open ends on the pipework system are closed, and that the main panel door is closed and locked.

2. Ensure both thumb-turn switches are set to 'Off' and then turn on the main isolator.

3. Turn the top switch to 'Manual' then turn the bottom switch to 'Comp 1' in order to check the running of the first pump (if 3-phase, then ensure air is being sucked into the BACK of the pump unit towards the front); after 30-60 seconds, turn the bottom switch to 'Off' and observe the solenoid valve unloading hiss.

4. With the top switch still in 'Manual', turn the bottom switch to 'Comp 2' in order to check the running of the second pump (if 3-phase, then ensure air is being sucked into the BACK of the pump unit towards the front); after 30-60 seconds, turn the bottom switch to 'Off' and observe the solenoid valve unloading hiss.

5. Now turn the top switch to 'Auto'; if the system is empty or very low pressure, then one pump will start, followed after a few seconds by the second; both will run until minimum system pressure is reached – one pump will stop, and the other will continue to run until full system pressure is reached. Please note that on some models the simultaneous function is disabled by customer request.

5. Once the system is filled to pressure and in 'maintenance mode', the pumps will then alternate each time there is a new start. Running both pumps at once, or turning off the power to the unit, will re-start the alternating feature with the first pump.

Running Notes

- In Auto, once at pressure, the higher-set switch (usually pressure switch 2) controls the relay which determines which pump will be called for.
- In Auto, the lower-set switch (usually pressure switch 1) will only be activated if pressure falls below its cut-in pressure.
- Therefore, in all normal circumstance, switch 2 is the main operative switch.
- In Manual, pressure switch 1 controls pump 1, and pressure switch 2 controls pump 2.
- If there is any failure of the first pressure switch, pump or contactor starter, then as the pressure drops further, the second switch and/or pump will activate.
- *It is strongly recommended that, for critical applications such as deluge systems, a low-pressure alarm is installed, set maybe 0.5 bar below the lowest cut-in pressure.*

Pressure Safety (Relief) Valve

A pre-set safety valve is fitted to the pipework. The safety valve will release air should the pre-set air pressure (as marked on the product label) be reached. If adjusting the pressure switches – see below – then the maximum cut-out pressure should not exceed 90% of the PSV rating.

Pressure Switch Adjustment

The pressure switches should NEVER be adjusted from factory settings unless written authority and instruction has been received from Sale Engineering Products Ltd. The switches carefully control the duplex operation and incorrect settings will cause the unit to work incorrectly and invalidate your warranty.

E. STOPPING THE COMPRESSOR

- Turn the top thumb-switch to 'Off', or
- Turn the isolator to 'Off', or
- Turn both pressure switches to '0'.

F. TESTING & MAINTENANCE

If you wish to TEST the operation of the compressor, then:

1. Isolate the compressor air from the system air, assuming a valve between the duplex unit outlet and the sprinkler system is in place.
2. Create a 'slow leak' from the compressor – you may have a separate drain valve, or use the valve at the bottom of the air receiver.
3. Once normal cut-in pressure is achieved, one pump will start and refill the air pressure – observe the unloading hiss once it stops.
4. Continue with a 'slow leak' and observe the other pump then cut in, run to pressure and then unload the line as it stops.
5. If you wish to check each pump and pressure switch, then turn the selectors to Manual and Comp 1 or Comp 2. Refer to D3 and D4 above.
6. If you wish to check both pumps operate together from low pressure, then turn the unit OFF, release all air pressure, then turn to AUTO. Refer to D5 above.

WARNING: Before carrying out any maintenance, the following points MUST be observed:

1. Isolate the compressor from the mains supply.

2. Some components of the compressor may be hot and therefore could cause harm, so please ensure that the compressor is fully cooled before handling or attempting any maintenance.

3. Check that all air pressure has been released from the compressor and delivery line.

4. Isolate from pipework system, flexible hoses etc.

5. Attach "DO NOT OPERATE" signs to the compressor and power supply.

Regular Maintenance

To ensure continued reliability and efficiency, it is important that regular maintenance is carried out. The condition of lubricants, the general cleanliness of the machine and the prevention of the ingress of dirt into the working components of the compressor are important factors.

Weekly:	Drain receiver condensate using the tap underneath the vessel.
	Check compressor oil levels and top up if required.
Monthly:	Check, and clean if necessary, the air intake filter.

Every 6-12 months, depending on usage and ambient conditions:

1. Drain old oil into a suitable container and dispose of according to local requirements environmental restrictions. Replace drain plug and refill the compressor with fresh oil. Replace filler plug/ dip stick once the level has been checked.

2. Clean external surfaces of the compressor removing any dirt from the compressor cylinder, cylinder head, motor fins and motor cowl: this will maintain efficient cooling.

3. Check the operation of the duplex control by reducing system pressure (or isolating the system from the compressor and opening slightly the receiver tap) and allowing the controller to start each pump in turn over several starts.

Annually: As well as the above, check the operation of the safety, non-return and solenoid valves; replace if worn or damaged.

Replace air intake filters.

Lubrication

Lubrication for the compressor is achieved by a simple splash system, periodic checking of the dipstick (or sight glass) level is required as per the maintenance schedule.

The recommended lubricant in temperate conditions: VGE/ISO100-150 dedicated compressor oil. The crankcase capacity is approximately 0.2 litres for direct-drive models, and up to double this for belt-driven models.

Spare Parts

Only use genuine spare parts purchased from Sale Engineering Products or your compressor maintainer, since the use of non-genuine spare parts will invalidate the warranty and may affect the reliability and service life of the compressor. Genuine spare parts, service kits, oils and accessories are readily available.

N.B. In the event of any difficulty understanding these instructions, or operating the compressor, contact your installer or maintainer immediately.

Alternatively please contact Sale Engineering Products as below.

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