

# Clarke®



## AIR COMPRESSOR

OPERATING & MAINTENANCE  
INSTRUCTIONS



© 0307

Thank you for purchasing this CLARKE Industrial Air Compressor.

Before putting to use, please read this booklet thoroughly to ensure that installation is correctly carried out and the maintenance schedules correctly followed. This, in turn, will ensure the compressor will provide you with long and trouble free service.

Please note that electrically driven machines are designed for indoor use only.

## CONTENTS

Safety Precautions .....	4
Noise Levels .....	4
Installation .....	5
Suggested Fuse Ratings .....	5
Electrical Connections .....	6
Lubrication .....	6
Before Starting Compressor .....	6
To Start Compressor .....	7
To Stop Compressor .....	7
General Arrangement - Stationary .....	7
General Arrangement - Portable .....	9
Air Receiver Pressure Adjustments .....	10
Outlet Pressure Adjustments .....	12
Trouble Shooting .....	13-17
Maintenance Chart .....	17
Declaration of Conformity (Electrically driven machines only) .....	19

## GUARANTEE

This Clarke product is guaranteed against faulty manufacture for a period of 12 months from the date of purchase. Please keep your receipt as proof of purchase.

This guarantee is invalid if the product is found to have been abused or tampered with in any way, or not used for the purpose for which it was intended.

Faulty goods should be returned to their place of purchase, no product can be returned to us without prior permission.

This guarantee does not effect your statutory rights.

## SAFETY PRECAUTIONS

Before using your compressor it is in your own interest to read and pay attention to the following safety rules:

- ◆ **COMPRESSED AIR IS DANGEROUS** - Never direct a jet of air at people or animals.
- ◆ Do not operate your air compressor with any guards removed.
- ◆ Electrical or mechanical repairs should only be carried out by a qualified electrician/engineer. If you have a problem, contact your local dealer, or our Service Department on *020 8988 7400*
- ◆ Before attempting any repair ensure pressure is expelled from the air receiver and disconnect from electrical supply.
- ◆ Do not leave pressure in air receiver overnight or when transporting.
- ◆ Do not adjust or tamper with any safety valves. The maximum working pressure of the compressor is clearly stated on the machine.
- ◆ Exercise caution when transporting the machine to avoid tipping the machine over.
- ◆ Do not operate in a wet/damp environment.
- ◆ Locate your air compressor on a firm flat surface and ensure an adequate supply of clean air is available to the pump unit.
- ◆ Do not exert any strain on electrical cables and ensure that air hoses are not tangled or wrapped around machinery etc.
- ◆ The cylinder head and delivery pipes of your compressor become quite hot during operation. Do not touch. After switching off remember to leave an adequate cool-down period before touching.
- ◆ Ensure that any equipment/tool used in conjunction with your compressor has a safe working pressure exceeding the output pressure of the machine.
- ◆ When disconnecting air hoses or other equipment from your compressor ensure that the air supply is turned off at the machine outlet and expel all pressurised air from within the air hose and other equipment attached to it.
- ◆ If using your compressor for paint spraying:
  - a) Never spray close to any source of flame or heat.
  - b) Always ensure that the spraying area has adequate fresh air ventilation.
  - c) Hazardous paints require special apparatus (see paint manufacturers recommendations).
- ◆ Never let anyone operate the compressor unless they have had the necessary instructions.
- ◆ Permanently installed pipework systems should be designed and installed by a competent engineer.

## NOISE LEVELS

These machines produce noise levels in excess of 70dB(A). Persons working in the vicinity of the machine must be provided with suitable ear protection.

## INSTALLATION

Before installing your machine, check that its air output is sufficient for the equipment to be used. The air output from the compressor must be more than the volume of air required. We recommend the following:

1. Firm and level site, and the use of floor mountings for stationary compressors - anti-vibration pads. (Do not bolt machines directly to the floor).
2. Dust and damp free environment.
3. Adequate ventilation for:-
  - a) Air intake to compressor pump (in order to draw in clean air).
  - b) Cooling to compressor pump, engine or electric motor.
  - c) Engine exhaust gases.
4. Do not operate compressor in the vicinity of combustible materials.
5. To allow sufficient access for servicing, a minimum clearance of 500mm must be allowed around the machine.
6. The power cable from the main supply must be large enough to carry the starting and running load of the electric motor. This is particularly relevant if the compressor is some distance from the source of supply.
7. Electrical installations should be completed by a qualified electrician.
8. Electrical connection to the mains supply must be via a suitably fused (see table below) approved plug or isolator (allowing sufficient capacity for motor starting). If using a circuit breaker in place of fuses, ensure it is Motor Rated and of sufficient size to allow for motor starting.
9. Compressors should be connected to mains electricity supply via an earth leakage protection device (RCD), particularly if used outdoors.

### SUGGESTED FUSE RATINGS

MOTOR SIZE		SINGLE PHASE	THREE PHASE MOTORS 415V	
KW	HP	MOTOR D.O.L. 240V	D.O.L.	STAR DELTA
0.75	1.0	13 amp	10 amp	
1.1	1.5	13/15 amp	10 amp	
1.5	2.0	20 amp	10 amp	
1.9	2.5	20 amp		
2.2	3.0	30 amp	16 amp	
3.0	4.0	40 amp	20 amp	
4.0	5.5	50 amp	25 amp	
5.5	7.5		30 amp	
7.5	10.0			25 amp
11.0	15.0			30 amp
15.0	20.0			35 amp

## ELECTRICAL CONNECTIONS

### IMPORTANT - SINGLE PHASE MACHINES ONLY

The wires in the mains lead of this machine are coloured in accordance with the following code:

Green and Yellow	-	Earth
Blue	-	Neutral
Brown	-	Live

As the colours of the wires in the lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows.

- The wire which is coloured green and yellow must be connected to the terminal which is marked with the letter E or by the earth Symbol (⏏) or coloured green or green and yellow.
- The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
- The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

**WARNING: This machine must be earthed.**

## LUBRICATION

**Pump:** Use Clarke compressor oil, as indicated on machine plate.

**Engine:** (Petrol or diesel) refer to maker's handbook.

## BEFORE STARTING COMPRESSOR, CHECK:-

1. Compressor Pump Oil Level by - (a) Dipstick (to level marked)  
or - (b) Sight glass (see fig.1)
2. Engine oil and fuel levels (where applicable) see manufacturers handbook for details.
3. (a) Automatic Control:- Pressure switch ON/OFF switch is in the OFF position  
(b) Genie Control:- Ensure bleed valve is open. (See Fig.5, item 2).

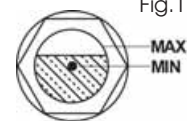


Fig.1

### WARNING

1. Before starting compressor, open all outlet valves.
2. The following start and stop instructions must be followed in the correct sequence to avoid serious damage to the compressor/motor.

## TO START COMPRESSOR – ELECTRIC MACHINES

1. Switch on isolator (mains supply)
2. Switch on pressure switch (lift knob or twist switch). (Fig.2, item 22)
3. Check rotation (Flywheel/Fan blows air over pump)
4. Run compressor for 10 minutes with outlet valves open (first time of operation only).
5. Close valves and check that pressure does not exceed maximum working pressure (stamped on machine plate), adjust if required (see 'Pressure Adjustments' later in this manual).

## TO START COMPRESSOR – ENGINE DRIVEN MACHINES

1. Open bleed valve (fig.5, item 2). N.B. since the CFP9BH does not have a bleed valve (only a small bleed hole) ensure no equipment is connected to the air compressor outlet, and that the pressure adjusting knob (fig.6, item 1) is set to minimum.
2. Start engine in accordance with engine manufacturers instructions.
3. Close bleed valve and allow compressor to run for 10 minutes (first time of operation only).
4. Close valves and check that pressure does not exceed maximum working pressure (stamped on machine plate), adjust if required (see 'Pressure Adjustments' later in this manual).

## TO STOP COMPRESSOR – ELECTRIC MACHINES

1. Switch Off at the pressure switch (Push knob down or turn switch). (Fig.2, item 22)
2. Isolate from the Mains Supply.
2. Drain air receiver (release drain tap).

## TO STOP COMPRESSOR – ENGINE DRIVEN

1. Allow machine to run for 2 minutes off load (with outlet valves open).
2. Switch off engine (see manufacturers handbook).
3. Drain air receiver (release drain tap).

### **WARNING:**

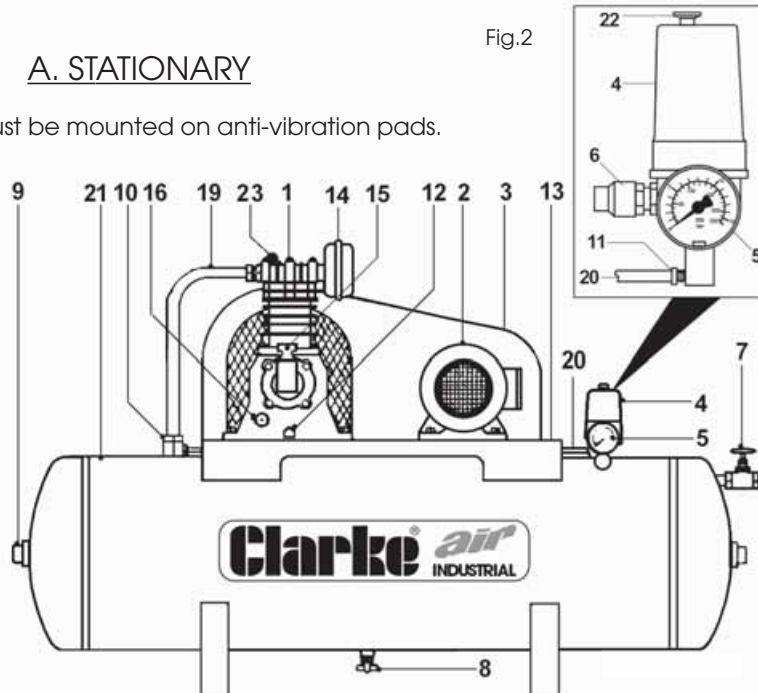
***Compressor pumps, delivery pipes etc., and engines will remain hot for some time after use.***

***NOTE: When starting compressors up to and including the 3HP models, an auto bleed valve will operate and air will be heard vent. This is quite normal and should not cause concern. The valve should close after several seconds. Should it fail to close, consult your Clarke dealer.***

## GENERAL ARRANGEMENT

### A. STATIONARY

NB: Must be mounted on anti-vibration pads.



1. Air Compressor Pump	8. Drain Tap	16. Oil Level Sight Glass
2. Electric Motor (or petrol/diesel engine)	9. Inspection Plug	17. -
3. Belt & Pulley Guard	10. Non-Return Valve	18. -
4. Pressure Switch	11. Air Bleed Valve	19. Air Delivery Pipe
5. Pressure Gauge	12. Oil Drain Plug	20. Air Bleed Pipe
6. Safety Valve	13. Saddle	21. Air Receiver
7. Ball Valve	14. Air Intake Filter	22. On/Off switch
	15. Oil Filler/Breather	23. Auto Air Bleed

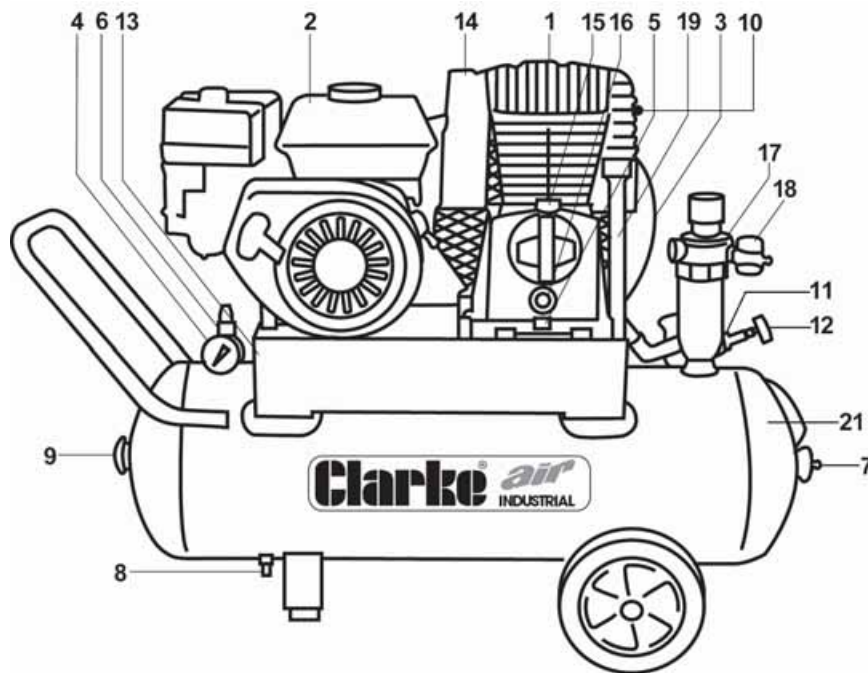
#### NOTES:

- On some electric driven and all petrol/diesel models, item 10 is replaced by a pressure unloading genie for constant run operation. In this case items (4), (11) and (20) are deleted.
- On automatic machines 10 H.P. & above a solenoid valve is fitted to the delivery pipe.
- On automatic machines 10 H.P. & above, an Auto Star Delta (ASD) starter is fitted, ready to be mounted to a wall or panel etc. It is **IMPORTANT** to note that **NO ADJUSTMENTS** should be made to this component.  
The ASD should be connected to a 3-phase supply by a qualified technician.

## GENERAL ARRANGEMENT

### B. PORTABLE

Fig.3



1. Air Compressor Pump	8. Drain Tap	16. Oil Level Sight Glass
2. Petrol/Diesel Engine (or electric motor)	9. Inspection Plug	17. Air Filter/Regulator (see Fig.7)
3. Belt & Pulley Guard	10. Auto Air Bleed	18. Outlet Air Pressure Gauge
4. Pressure Gauge	11. Air Bleed Valve	19. Air Delivery Pipe
5. Oil Drain Plug	12. Air Governor (see Fig.5)	20. -
6. Safety Valve	13. Saddle	21. Air Receiver
7. Air Outlet Valve	14. Air Intake Filter	
	15. Oil Filler Breather	

N.B. On Electric Portable Machines items 11 and 12 are replaced with a Non-Return Valve and a Pressure Switch, as shown on page 7.

## AIR RECEIVER PRESSURE ADJUSTMENTS

**WARNING:**  
**THE SAFETY VALVE (ITEM 6, FIG. 2 & 3) FITTED TO THIS COMPRESSOR IS FACTORY SET AND MUST NOT BE ADJUSTED.**

If it is necessary to alter the pressure settings on the compressor please remember that increasing the pressure will NOT increase the volume of air supplied.

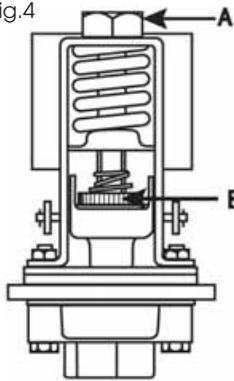
Any adjustments must be made with the compressor at working pressure.

### ELECTRIC MACHINES

**WARNING:**  
**DISCONNECT FROM ELECTRICITY SUPPLY BEFORE REMOVING ANY COVER.**

#### **a. NEMA Pressure Switch** (shown with cover removed).

Fig.4



##### **PRESSURE ADJUSTMENT:**

To increase the cutout pressure, turn the hexagon (A) on top of the pressure switch clockwise.

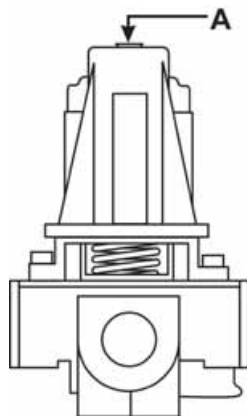
To reduce the cut out pressure, turn it anticlockwise.

##### **RANGE ADJUSTMENT:**

To increase the pressure differential between cut in and cutout, turn the toothed wheel (B) situated under the large spring anticlockwise, using a screwdriver. In it's present position, the pressure SWITCH is set to the minimum range.

NOTE: These operations must always be performed with the PRESSURE SWITCH under pressure.

#### **b. CONDOR Pressure Switch - Type MDR1** (shown with cover removed).



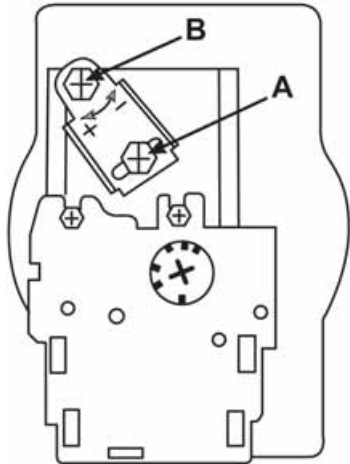
To remove the cover, complete with rotary switch, simply unscrew and remove the single securing screw, adjacent to the rotary switch, and pull off the cover.

Pressure adjustment is effected by turning the screw 'A' clockwise to increase, anticlockwise to reduce.

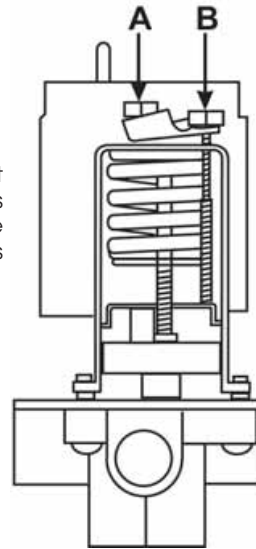
No provision is made for pressure differential.

An information sheet for this component is provided with the machine's documentation

### c. CONDOR Pressure Switch Type MDR3



An information sheet for this component is provided with the machine's documentation



The cover is removed by unscrewing the two securing screws - one at each side, and pulling off the cover complete with rotary switch.

#### A. PRESSURE ADJUSTMENT:

To increase the cutout pressure, turn the hexagon (A) on top of the pressure switch clockwise using a screwdriver.

To reduce the cut out pressure, turn it anticlockwise.

#### B. RANGE ADJUSTMENT:

Pressure differential between cut in and cutout, is preset and should not be tampered with.

### ENGINE DRIVEN MACHINES

(Except CFP9BH - see page 12)

#### Air Governor - Pressure unloading genie

1. Air Delivery Pipe from Compressor Pump.
2. Bleed Valve
3. Exhaust Filter
4. Pressure Adjustment Knob
5. Lock Nut.

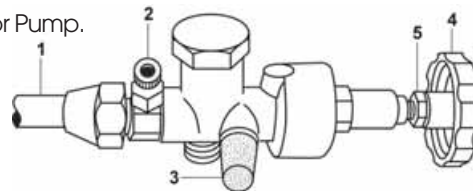


Fig.5

To adjust pressure slacken lock nut (5). Turn pressure adjusting knob (4) clockwise to increase pressure, anti-clockwise to decrease. Tighten lock nut (5) when correct pressure is obtained.

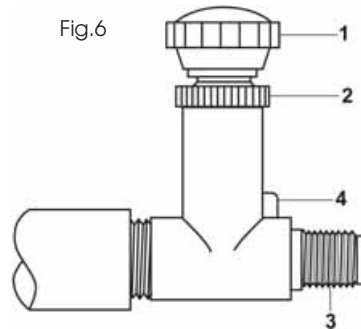
#### WARNING:

**Do not exceed the maximum working pressure of the machine, as marked on the CLARKE AIR specification plate.**

## OUTLET PRESSURE ADJUSTMENTS

### CFP9BH

1. Pressure Adjusting Knob
2. Lock Nut
3. Air Outlet
4. Bleed Hole



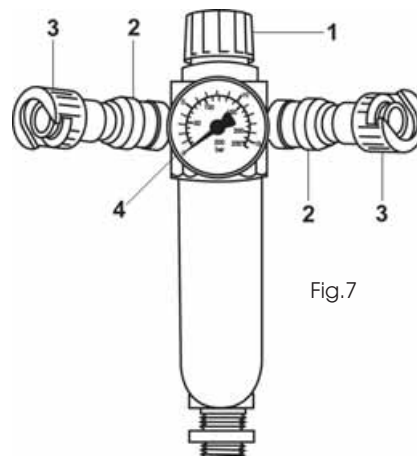
**To adjust outlet pressure** - slacken lock nut (2). Turn Pressure Adjusting Knob (1) clockwise to increase outlet pressure, anticlockwise to decrease. Tighten lock nut (2) when correct pressure is obtained.

**NOTE:**

1. When Compressor reaches cut-out pressure air will bleed from bleed hole (4).
2. Item (3) quick fit nut can be removed if required and hose can be fitted using 1/4 BSP nut.

### PORTABLE COMPRESSORS

1. Pressure Adjusting Knob
2. Outlet Taps
3. Quick Fit Nuts
4. Pressure Gauge



**To adjust outlet pressure:**

To increase pressure - turn knob (1) clockwise.  
To decrease pressure - turn knob (1) anticlockwise.

**Outlet taps** - slide knurled section (2) away from body to open, push towards body to close.

**NOTE:** Pressure Gauge (4). Pressure shown will differ by approximately 1 bar depending on whether the outlets are open/closed.

### STATIONARY COMPRESSORS

These machines are not supplied with the facility to adjust outlet pressure. A comprehensive range of airline accessories is available from your local CLARKE stockist.

## TROUBLE SHOOTING CHART

### IMPORTANT!

1. Any remedial work that may be required must be carried out by a qualified electrician/engineer.
2. Switch off current before removing any parts from the compressor.
3. Empty Air Receiver of Air before dismantling any part of the compressor unit's pressure system.
4. If your compressor develops a fault do not use until the fault has been rectified.

SYMPTOM	PROBABLE CAUSES	REMEDY
Compressor will not start automatically.	Fault in electrical installation. a) current supply failure. b) voltage drop. c) motor starter faulty. d) motor incorrectly connected or faulty. e) starter overload has tripped out. f) Pressure switch defective. g) Fuse blown.	Let an electrician check electrical installation.  Reset by depressing button. Have pressure switch changed by an electrician. Check fuse rating - replace.
Fuses keep blowing.	Inadequate size fuse installed. Fault in motor.	Replace with reference to chart on page 2. Consult an electrician.
Compressor unit starts, but stops again after only a few revolutions.	Non-return valve leaking (compressor unit is on load during start). Non-return valve blocked, possibly frozen up.  Solenoid valve leaking or defective (only applies to 10 hp machines and above).	Switch off current and empty air receiver. Clean or replace non-return valve. Thaw non-return valve out (Unit must be installed in frost-free place). Let an electrician inspect electrical installation in accordance with diagram supplied with starter (10 hp and above).

SYMPTOM	PROBABLE CAUSES	REMEDY
Compressor unit will not stop automatically.	<p>Pressure switch defective.</p> <p>Pressure switch set at a pressure higher than the safety valve's opening pressure.</p>	<p>Have pressure switch changed by an electrician</p> <p>Adjust pressure switch or safety valve</p> <p><b>WARNING:DO NOT ADJUST SAFETY VALVE ABOVE MAXIMUM WORKING PRESSURE DETAILED.</b></p>
Bleed valve under pressure switch blows whilst compressor is not running.	Non-return valve leaking.	Clean non-return valve or replace.
Bleed valve under pressure switch blows whilst machine is running.	Relief valve leaking.	Clean relief valve or change pressure switch.
Compressor runs continuously and can't attain the working pressure required.	<p>Suction filter blocked.</p> <p>V-belt too slack (not applicable to direct drive machines).</p> <p>Leak between compressor block and air receiver/ leaks in or near air receiver.</p> <p>RPM too low because of incorrectly connected electric motor.</p> <p>Valves blocked by dirt, paint, dust or coked up.</p> <p>Inspection cover or plug leaking.</p> <p>Suction rendered difficult or impossible at suction intake or the air being taken in is too warm.</p> <p>Pressure gauge defective. Unit too small in relation to air consumption.</p> <p>Compressor worn.</p>	<p>Change filter.</p> <p>Tighten V-Belt.</p> <p>Tighten connection and repair leak.</p> <p>Call an electrician.</p> <p>Clean or change valves.</p> <p>Empty air receiver and change seal.</p> <p>Larger fresh-air inlet.</p> <p>Change pressure gauge. Connect a supplementary compressor or install a larger model.</p> <p>Have compressor overhauled or replace it.</p>

SYMPTOM	PROBABLE CAUSES	REMEDY
Unusual noise from compressor.	Bolts loose. V-Belt flywheel or cooling coil touching belt guard Flywheel loose. Unit installed on an unsuitable base. Bearings, piston rings or cylinder worn. Valve broken. Bearings of electric motor worn.	Tighten Bolts. Find place of contact and remedy fault. Tighten flywheel. Move unit to a more solid base. Replace worn parts or change compressor pump Change valve parts. Have motor bearing replaced.
Compressor becomes too hot.	Insufficient ventilation  Oil level too low (check 2 or 3 times after stopping). Wrong direction of rotation.  Fault in valves (machine not stopping). Blown head gasket (machine not stopping). Dirt on cooling fins or suction filter. Unit working at too high a pressure Not fully unloading (Governor control machines only). Non-return valve partly blocked. Compressor being overworked and running continuously.	See that sufficient air is supplied to flywheel or fan of compressor and that hot air is properly vented. Fill with oil - see Page 3.  Cooling air from flywheel fan must blow against compressor. Check, clean/replace  Check and replace gasket  Clean cooling fins and suction filter. Reset to correct working pressure detailed on unit. Check pressure unloading genie, adjust if necessary, check valve(s) Clean or thaw out non-return valve. Connect to a supplementary compressor or install a larger model.

SYMPTOM	PROBABLE CAUSES	REMEDY
Compressor unit starts and stops more frequently than usual.	Large amount of condensation in air receiver. Leaks in control unit or inspection cover. Too little pressure differential.	Drain off condensation AT LEAST once a week. Locate leaks (by means of soapy water) and repair. Adj. pressure switch (see fig.4).
Compressor unit starts when no air is being used.	Leaks in pipework system	Locate and repair leaks.
Compressor's oil consumption rising.	Too much oil in compressor.  Leaks around crank case.  Working temperature of compressor too high because of insufficient cooling. Unit too small in proportion to air consumption. Semi-automatic unit Load too small. Cylinder worn.  Intake air filter blocked.	Check oil level 2 or 3 minutes after stopping. Change seal and inspect packing surfaces. Repair or replace defective parts. Increase ventilation to air compressor.  Connect supplementary.  Convert to fully automatic operation. Replace worn parts or send compressor pump for an overhaul Change air filter.
Oil in the air delivered.	Sump over full. Cylinder worn.  Governor controlled unit running off load for too long a period. Intake air filter blocked.	Reduce oil to correct level. Replace worn parts or send compressor pump for an overhaul. Convert to automatic control. Change air filter.
Oil level rises although -no oil has been put in.	Condensation in oil pump.	Compressor over dimensioned.
Condensation in crank case (especially in 2-stage compressors).	Compressor overdimensioned (operational periods too short in relation to resting periods).	a) Frequent oil changes. b) Reduce cooling of crank case (eg. by shielding it from air stream). c) Reduce RPM of pump.

SYMPTOM	PROBABLE CAUSES	REMEDY
Condensation at outlet points.	Piping installation incorrect. Compressor taking in air which is too warm. Delivery temperature of air from air receiver too high.	Consult your local dealer. Obtain better fresh-air supply for compressor. a) Use a larger air receiver. b) Insert an aftercooler.
Electric Motor too hot: maximum temperature 90 C (194 F).	Operational voltage too low. Faults in electrical installation or electric motor. Cooling fins of electric motor blocked by dirt.	Call an electrician. Call an electrician. Clean cooling fins.
Machine running but not pumping air into receiver (10 HP and above).	Air exhausting from solenoid after starter has changed from star to delta.	Check solenoid valve. Call an electrician to check starter.

## MAINTENANCE CHART

CHECK LIST	DAILY	WEEKLY	6 MONTHLY	
Oil Level	Check		Change	
Air receiver	Drain			
Intake filter		Check/Clean		Replace if necessary
Oil breather		Check/Clean		
Fan and Cooling Fins		Clean		
Inlet and Outlet valves			Check	Replace if worn
Non-return valve		Clean	Replace if worn	
Belt tension			Check/Adjust	Does not apply to direct drive
Big end bearings		Check	Replace if worn	
Main bearings			Check	Replace if worn
Piston rings		Check		Replace if worn

**OTHER PRODUCTS WITHIN OUR RANGE** In addition to Air Compressors from 3–80 cfm, we offer a vast range of airtools and airline equipment. Please ask your local dealer for details of our range or a copy of our Power Products Catalogue

**Clarke<sup>®</sup>**  
**INTERNATIONAL**

**This is an important document, and should be retained.**



## **DECLARATION OF CONFORMITY**

We declare that this product complies to the following standards/directives:

- **98/37/EC**
- **87/404/EEC**

**Product Description:** AIR COMPRESSOR

**Model No:** SE & VE Ranges  
(Electric models only)

**Place and date  
of Declaration:** Stockport, U.K.

**Serial (Batch) No:** See product Data Plate

Signed 

Engineering Manager  
Date: 16/3/2007

**Clarke<sup>®</sup>** INTERNATIONAL  
Hennall Street, Epping, Essex CM16 4LG

Clarke International is a trading style of Clarke International Limited

A Declaration of Conformity is provided for Engine Driven compressors, separately

*air*

**Clarke<sup>®</sup>**