



User Handbook

**501 / 502 / 504 Models
(PURS, PUBS, PARS)**

Stationary Air Compressors



ST16254-00A
A.NOTE: 1155840

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IMPORTANT !

BEFORE INITIAL START-UP ENSURE THAT THE COMPRESSOR OIL CHAMBER IS FILLED TO THE CORRECT LEVEL WITH A HYDROVANE APPROVED OIL.

1.1 Support

Your Hydrovane distributor is able to offer a wide range of compressors, dryers, filters and ancillary air-line system products. Their engineers are fully trained and competent in all aspects of compressor and air-system maintenance. If you need any specialist help or service please contact your Hydrovane distributor quoting the MODEL, TYPE and SERIAL NUMBER.

1.2 Customer Warranty Terms

All Hydrovane compressors, which are serviced by an authorised Hydrovane distributor are guaranteed for twelve months from the date of commissioning or eighteen months ex works, whichever is the sooner.

The warranty excludes normal service parts, oil and wear items, dirt ingress, cleaning of filters and fluid drain devices and the tightening of electrical or other connections. Adjustment of pressure switches or any other control device are not covered by the warranty.

Consequential damage of any nature is not covered by the warranty.

1.3 Product Development

Hydrovane adopt a policy of continual product development. The information in this handbook, whilst fully up to date when issued, may be subject to change without notice.

1.4 Quality Standards

Hydrovane Quality Management Systems are approved to BS EN ISO 9001.

These instructions comply with the European Directive 2006/42/EC and the supply of machinery (safety) regulations 2008 and are valid for machines carrying the CE and UKCA mark.

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1.5 Model Range

This handbook relates to all 501-504 50Hz core model compressors, model types PARS, PURS, PUBS and variants.

501PURS10-2415D600, 501PURS10-4035D600

501PUBS10-2415D000, 501PUBS10-4035D000

502PURS10-2415D600, 502PURS10-4035D600

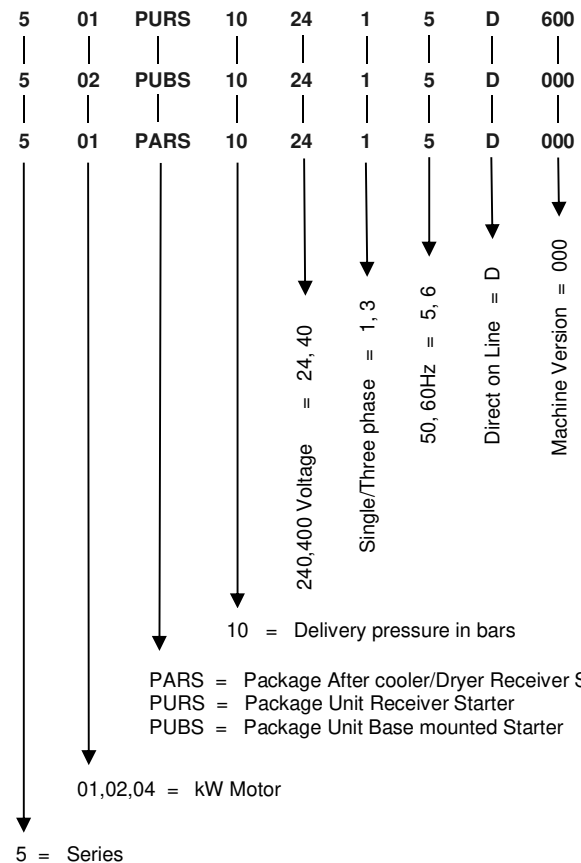
502PUBS10-2415D000, 502PUBS10-4035D000

501PARS10-2415D000, 501PARS10-4035D000

502PARS10-2415D000, 502PARS10-4035D000

504PURS10-4035D300, 504PARS10-4035D000

The last three digits of the product code represent mark number changes, you may receive a unit with numbers higher than those shown above.

1.6 Product Terminology

This publication refers to compressors with serial numbers from:

501-030000-2308

502-042000-2308

504-024000-2308

2.1 General Health & Safety Precautions

Please read carefully and proceed in accordance with the following instructions before installation, operation, maintenance or repair of the compressor unit.

In order to comply with your responsibilities as an owner, or operator of the compressor it is essential the machine to be transported, positioned, installed, operated and maintained by competent persons in accordance with the instructions in this handbook.

Statutory national regulations for Health and Safety will usually apply and may include additional instructions not mentioned here. It is the responsibility of the owner, or operator to ensure compliance.

Read and fully understand the contents contained in the user handbook.

Ensure that the user Handbook is not permanently removed from the compressor.

Check that there are no signs of damage and/or oil leaks from the air-end, cooler and associated pipework.

After completing work, tools and foreign matter should be removed from the compressor and its surrounding area.

In the unlikely event of a compressor fire, dry powder or carbon dioxide fire extinguishers should be used. Never use water.

2.2 Before Working on Compressor

Potentially dangerous voltages are used to power this machine. Do not carry out any work until the isolator is locked in the off position. Fit a safety notice to the isolator advising that work is being carried out and that the isolator must not be switched on. If in doubt then a qualified electrician may remove the fuses and keep them in a secure place until work is complete.

Ensure the compressor has been safely isolated from the main air system and cannot be re-introduced until all work has been completed. Fit a safety notice to the isolation valve advising that work is being carried out.

Do not undertake any work until the compressor and receiver if fitted, have been relieved of all pressure.

Wait until the compressors vent down cycle is complete.

Open the outlet valve to release any pressure contained in the after-cooler or associated pipework.

Check that the air-end pressure gauge reads zero. Do not proceed until it does.

Carefully unscrew the compressor filler plug. If any air or oil escapes before the plug is fully removed - stop! Do not remove the plug until all pressure is lost.

Safety devices fitted to the compressor or air-line system should be checked at regular intervals and replaced if faulty. They should not be tampered with or modified. Non return valves should not be used as isolation devices.

To ensure the compressor operates safely you must carry out the specified maintenance procedures.

Only approved lubricants should be used for flushing purposes.

Extreme caution should be taken if the compressor has been subjected to severe operating temperatures or fire. Certain components may contain fluoroelastomer materials and under these conditions can leave extremely corrosive residues. Severe burns and permanent skin and tissue damage can be a result of skin contact.

The Health and Safety information contained in this handbook is only intended to give general guidelines.

2.3 When Operating the Compressor

When in automatic mode the compressor will re-start without warning.

If an automatic re-start device is fitted (allowing the compressor to start when power is re-applied), or operation is controlled from a remote location, additional warnings will be required.

Do not remove any plugs or release pipework when the compressor is running.

Do not attempt to open the starter enclosure while the compressor is operating.

Beware of hot surfaces both the air-end and electric motor are designed to run at elevated temperatures.

Compressed air is dangerous and can be fatal if misused. Do not allow compressed air jets discharged from any pipe or nozzle to make contact with your body.

Wear safety glasses and suitable clothing when using, or working in an area where compressed air is being used.

Hazardous vapours/fumes can be produced if compressed air is used to remove chemicals, cleaning agents and lubricants from equipment and components. Suitable respiratory and extraction equipment may be required in these circumstances. Never use compressed air for cleaning personal clothing.

Do not use air directly from compressors for breathing purposes. If the air is to be used for human consumption then it must be subjected to further treatment to ensure that the levels of contaminants, odour and moisture meet the requirements of BSEN529 2005.

We recommend that the air supply to hand held air guns is regulated to a lower pressure (refer to local health and safety regulations).

Do not insert any object or part of body through any opening of the compressor enclosure. Serious personal injury and/or damage may result.

Never run the compressor when any covers or guards are missing, unless advised to do so in this handbook.

2.4 Potential Oil Health Hazards

This section relates to Hydrovane approved oils.

There are no significant hazards associated with Hydrovane approved oil products when properly used and in the application for which it was designed. Frequent and/or prolonged skin contact may give rise to skin irritations and it is recommended that protective gloves are worn. The carcinogenic action of oils should be brought to the attention of all users.

The oil may be hot so take care when carrying out oil changes.

Do not keep oily rags in pockets or wear contaminated clothing. Do not inhale fumes or vapours. Do not swallow. Avoid eye contact.

Always wash hands after use and before eating, drinking or smoking.

2.5 General First Aid Measures

Ingestion - Do not induce vomiting because of the risk of aspiration. Wash mouth out with water. Give ½ pint milk. Seek immediate medical attention.

Skin Contact - *Mildly irritating. Remove by wiping. Wash with soap and water. Apply emollient cream.

Eye Contact - *Mildly irritating. Flush with copious amounts of warm water. Seek medical advice if necessary.

Aspiration - If there is any suspicion of aspiration into the lungs (for example during vomiting) admit to hospital immediately.

Inhalation - Remove from exposure into fresh air. If necessary give artificial respiration or oxygen. Seek medical advice.

Pressure injection - Obtain immediate medical attention, even if injury appears minor.

Spillage - Soak up with absorbent clay.

Waste Disposal - Oil, condensate, filter elements etc. should be disposed of in accordance with local regulations. Do not allow oil to contaminate water supplies.

Refer to MSDS documents for specific hazard information, available on request.

2.6 Warnings, Cautions and Notes

'WARNING' is used in the text of this handbook to identify specific hazards which can cause injury or death. This type of hazard is identified below.



Risk of electric shock



Risk of danger



Risk of hot surfaces



Eye protection must be worn



Dust protection must be worn



Warning pressurised vessel



Warning pressurised component or system



Warning unit is remotely controlled and may start without warning



Read the instruction manual



Do not operate the machine without the guard being fitted



Warning do not start the machine without consulting handbook



Lifting point



Direction of rotation

'CAUTION' is used in the text of this handbook to identify incorrect procedures which can cause damage to the compressor.

'NOTE' is used in the text of this handbook to draw attention to specific points of importance.

Hydrovane declines all liability in the event of material damage or bodily injury resulting from negligence in the application of these precautions, from non-observation or lack of elementary supervision in respect of handling, operation, servicing or repair, even if not expressly stated in this instruction notice.

3.1 Operating Temperatures

Your compressor is designed to give optimum performance and trouble free service life when the bulk oil temperature is between.

77-87°C (171-189°F).

Certain operating conditions sustained over a period of time may cause problems that affect the performance and reliability of this compressor.

Problems may occur when compressors run for short periods on low air demand where they don't reach normal operating temperatures.

Prolonged use under these conditions can cause condensation build up within the compressor and may eventually lead to emulsification of the oil.

Normal operating temperatures are reached in typically 10/15 minutes.

All machines are fitted with thermal bypass system in order to reach optimum working temperature within 5min, to purge condensate from the compressor a longer running period with high air demand, usually 60 minutes, will be required. If due to low duty cycle condensation is still present please install LDS (LDS-05-000).

For PURS models a Low duty solution (LDS) is available to extend and automate the full load running period, other models should adopt the running period as recommended above.

Conditions or applications which prevent the compressor temperature from stabilising between these parameters should be avoided.

Consult your local distributor or Hydrovane if you have any particular concerns about operational characteristics of your compressor.

3.2 High Operating Temperatures

If your compressor frequently operates in high ambient temperatures the oil life will be reduced.

Some of the reasons for high compressor oil temperatures are:

Low oil level.

Blocked oil cooler or cooler flow restrictions.

Wrong type or grade of oil.

High ambient temperature.

Note: Compressors will stop automatically if the temperature rises above 110°C (230°F).

3.3 Noise Level

The compressor should be positioned where noise will not be a problem. We recommend ear protection is used, when near the compressor for extended periods.

3.4 Technical Data 501-504

Model Number		501	502	504
Performance				
Free air delivered @ 10.0 bar (145 psi)	Litre/sec (cfm)	2.03 (4.3)	3.78 (8.0)	9.47 (20.1)
Noise level	dB(A)	62	69	72
Drive motor power	kW (hp)	1.1 (1.5)	2.2 (3.0)	4.0 (5.5)
Starter Type	DOL/VSD	Direct on Line		
Drive Type		Direct		
Operating Controls		Continuous Run, Automatic Stop/Start		
Rotational Speed 50Hz	rev/min	1450	2880	1450
Ambient Temperature Range	°C (°F)	0-40 (32-104)		
Maximum Relative Humidity	%	85 non-condensing		
Maximum air discharge temp above ambient, without aftercooler	°C (°F)	50 (122)		
Maximum air discharge temp above ambient, with aftercooler	°C (°F)	<10 (50)		
Factory Settings				
Minimum Pressure Valve (MPV)	bar (psi)	5.5 (80)		
Nominal Pressure	bar (psi)	10.0 (145)		
Maximum Pressure	bar (psi)	10.8 (157)		
Pressure Control Valve (PCV)	bar (psi)	10.3-10.8 (149-157)		
Pressure Switch Cut-in	bar (psi)	6.0- 6.8 (87 to 99)		
Pressure Switch Cut-out	bar (psi)	10.2-10.4 (148-151)		
Installation				
Air Connection Size	Rp	3/8"		1/2"
Minimum Room Volume	m³	10	12	
Room Air Inlet / Outlet area	m²	0.3		
Cooling Air Flow Rate	m³/hr (cfm)	1500 (883)	1800 (1060)	
Recommended Air Receiver Capacity	Litre (gallon)	100(26)		200 (53)
Compressor Oil				
Approved Compressor Oil		Hydrovane approved oils		
Oil Capacity	Litre (gallon)	1.0 (.26)		1.8 (.48)
Electrical				
Starter Reference 230V 1PH 50Hz (PUBS)	000	CC1237391	CC1237392	
Circuit Reference 230V 1PH 50Hz (PUBS)	000	CZ78037		
Starter Reference 400V 3PH 50Hz (PUBS)	000	CC1237393	CC1237424	
Circuit Diagram 400V 3PH 50Hz (PUBS)	000	CZ78038		
Starter Reference 230V 1PH 50Hz (PURS)	600	CC1237128	CC1237129	
Circuit Diagram 230V 1PH 50Hz (PURS)	600	CZ78035		
Starter Reference 400V 3PH 50Hz (PURS)	600	CC1237130	CC1237131	CC1237132
Circuit Diagram 400V 3PH 50Hz (PURS)	600	CZ78036		

4.1 Introduction

Ensure all lifting equipment and means of transportation are securely located and rated to accept the full load. Inspect all lifting equipment for signs of wear. Do not use if wear is evident.

4.2 Lifting and Handling (Fig 4.1, 4.2, 4.3, 4.4, 4.5 & 4.6)

Before transporting, secure the compressor to a suitable pallet, or use compressor features as per instructions below. Use a Fork Lift, or Pallet Truck to transport the compressor. A suitable lifting platform will be required when positioning the compressor. For normal lifting a hoist may be used.

Lift the compressor and place it in the desired location.

PUBS can be lifted with forklift with the apertures in the base bracket.

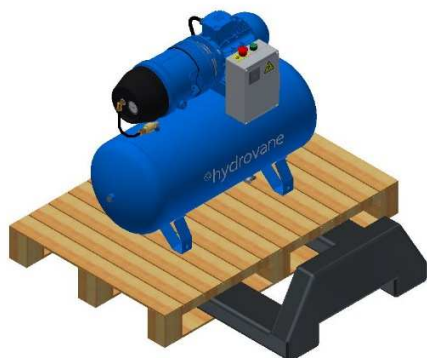


**Fig 4.1 - 501-502-504 PURS (PARS)
Delivered Pallet Mounted**

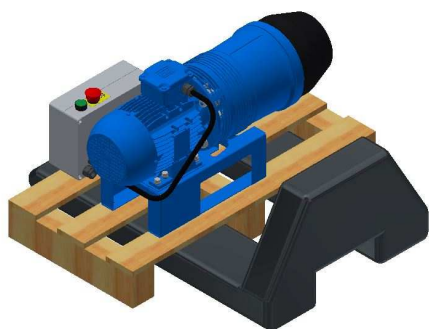


Fig 4.2 - PUBS Delivered Pallet Mounted



**Fig 4.3 - PUBS Aperture for Lifting With
Forklift, or Pallet Truck**

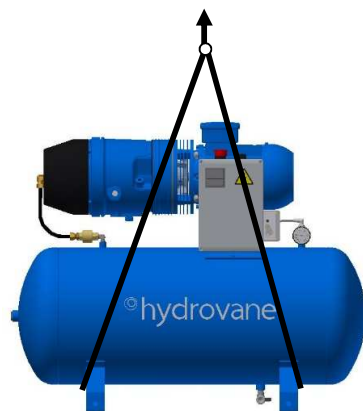


**Fig 4.5 – 501/502/504 PURS Lifting with
Sling**

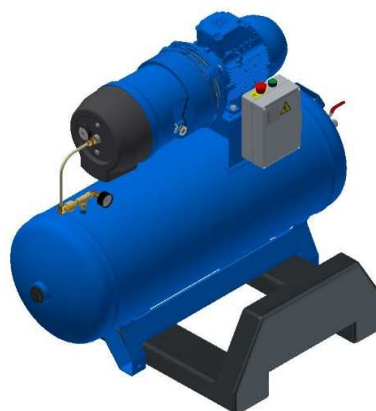


**Fig 4.6 - 504 PURS Lifting with Receiver
Bracket**



**Fig 4.4 - PUBS Aperture For Lifting With
Forklift/Pallet Truck - Alternate Lifting
Option**

4.3 Weights and Dimensions

Table 4.1 shows weights/dimensions for the PUBS/PURS/PARS 501-504 compressors.

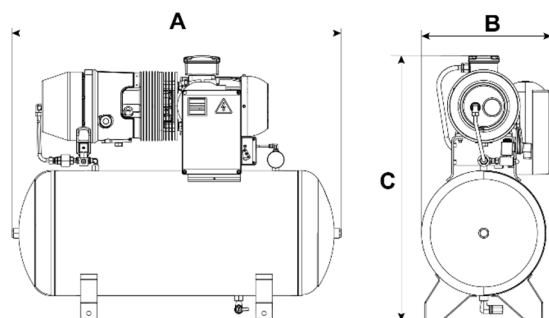


Fig 4.7 - PURS Dimensions

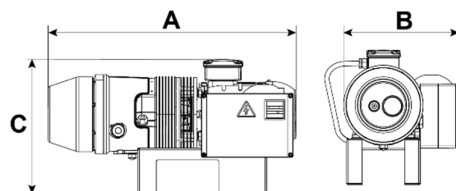


Fig 4.8 - PUBS Dimensions

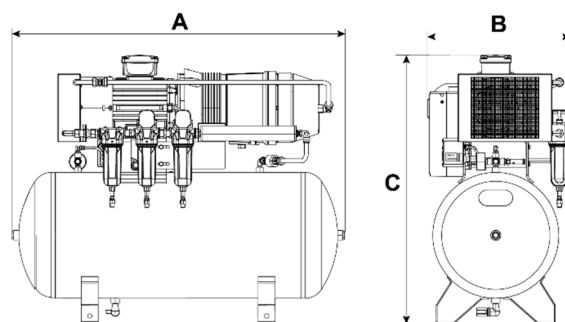


Fig 4.9 - PARS Dimensions

Table 4.1 Weights and Dimensions

Ref.	Unit	501-502	504
BASE MOUNTED (PUBS)			
-	Weight	40 (88)	
A	Length	673 (26.50)	
B	Width	313 (12.32)	
C	Height	366 (14.41)	
Receiver Mounted (PURS)			
-	Weight	75 (165)	145 (320)
A	Length	966 (38.1)	1390 (54.7)
B	Width	386 (15.20)	462 (18.2)
C	Height	784 (30.87)	998 (39.3)
Receiver Mounted with After cooler Dryer (PARS)			
-	Weight	84 (185)	156 (344)
A	Length	966 (38.1)	1390 (54.7)
B	Width	421 (16.57)	516 (20.3)
C	Height	784 (30.87)	998 (39.3)
Weights kg (lbs), Dimensions mm (inch)			
Weights kg (lbs), Dimensions mm (inch)			

5.1 Positioning Your Compressor

We recommend an approved installation from an authorised Hydrovane distributor with a service agreement to maintain your compressor.

Position the compressor in a room of adequate size on a firm surface, level in both planes within five degrees of the horizontal.

Ensure the area has sufficient load-bearing capacity, normally it is not necessary to bolt the unit down.

Sufficient access (1 meter/3.3 ft.) for all routine service procedures should be provided all around and above the unit.

Site the compressor away from sources of dirt, coarse solids, abrasive particles, steam, liquids and gaseous impurities.

This is an industrial compressor and is intended for installation in an indoor environment.

5.2 Ventilation (Fig. 5.1)

Position the compressor in a well ventilated location. Do not restrict the airflow around the compressor or allow the hot air discharge to recirculate into the compressor intake.

Any cooling-air inlet (A) should be positioned low allowing unrestricted airflow to the compressor intake. The warm air outlet (B) should be positioned high, and well away from the inlet, to ensure a positive cooling airflow through the compressor.

For maximum efficiency and reliability, the compressor should be operated in a moderate ambient temperature. If temperatures frequently fall below 0°C (32°F), consult your Hydrovane distributor.

Air ducting, if fitted, must not cover or restrict the cooling air flow of the compressor. Total resistance of the system must not exceed 5mm w.g. (0.2in. water gauge). If resistance is expected to be greater than 5mm w.g. then fan assistance will be required.

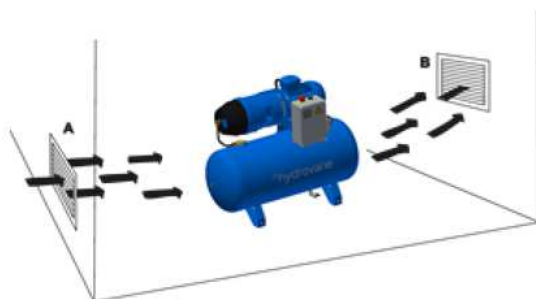


Fig 5.1 - Ventilation

5.3 Electrical Connections

WARNING!



CONNECTION TO, OR INSTALLATION OF, AN ELECTRICAL POWER SUPPLY MUST ONLY BE CARRIED OUT BY AUTHORISED AND QUALIFIED ELECTRICIANS. THEY MUST FULLY UNDERSTAND AND ADOPT CORRECT AND SAFE WORKING PRACTICES. ALL ASPECTS OF THE INSTALLATION MUST MEET THE WIRING REGULATIONS PRESENTLY IN PLACE.

Before connecting to the mains electrical supply ensure that the system can sustain the additional electrical load. To ensure reliable low resistance joints, make sure that your incoming supply cables are firmly secured to the starter terminals and that they are of the correct cross sectional area.

Refer to starter and circuit diagrams before starting work. Note carefully the instructions relating to earthing, fuses and size of cable.

Fuses to BS HD 60269-2 or IEC 60269-2 (type G), or circuit breakers (Type K) to IEC 60947-2, must be used to protect the starter, refer to sizes specified on the circuit diagrams.

5.4 Electrical Installation (Fig 5.2, 5.3, 5.4)

WARNING!



Remove 4 Screws and Starter Cover (Fig 5.2).

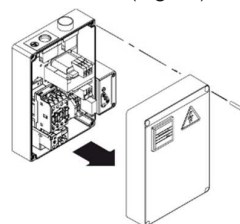


Fig 5.2 Starter Cover

Single phase Compressors must be connected to the mains electrical supply via a lockable, switched and fused isolator positioned near to the compressor with clear unrestricted access.

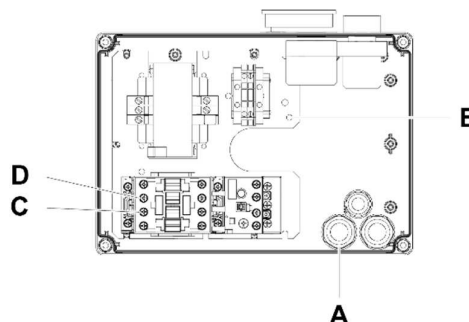


Fig 5.3 501/502 230V 1PH PUBS

The mains cable of all models are colour coded as follows:

BROWN	LIVE, terminal 3/L2
BUE	NEUTRAL, terminal 5/L3
GREEN/YELLOW	EARTH, terminal E

Pass the mains cable through entry hole (A). Connect the two mains supply cables to the contactor terminals (C) marked 3/L2 (Brown) and (D) 5/L3 (Blue). Connect the earth cable to the earth pin marked E.

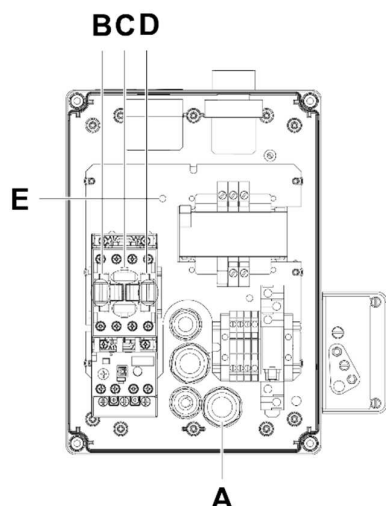


Fig 5.4 501/502/504 400V 3PH PURS

Three phase Machines must be connected to the mains electrical supply via a lockable, switched and fused isolator positioned near to the compressor with clear unrestricted access.

Pass the mains cable through entry hole (A). Connect the three mains supply cables to the contactor terminals (B) marked 1/L1 (Brown), (C) marked 3/L2 (Black) and (D) marked 5/L3 (Grey). Connect the earth cable to the earth pin marked E.

Note: Cable sizes specified are the minimum size to suit typical installation. If the compressor is located a long way away from the isolator or the ambient temperature normally exceeds 35°C (95°F), then cable size may need to be increased. Refer to IEE Regulations for Electrical Equipment in Buildings to determine the size required.

Check transformer fuse is positioned to suit the supply voltage.

Ensure that ALL electrical connections are tight, high voltage connections to contactors and incoming terminals are critical.

5.5 Check Motor Rotation

WARNING !

READ HEALTH AND SAFETY PRECAUTIONS BEFORE STATING THE COMPRESSOR.

Ensure that the compressor air-end is filled correctly with Hydrovane Approved oil and that all plugs are fitted securely.

Close air-outlet valve to air-line system and switch mains electrical supply on.

Start compressor. Motor will now start and should rotate clock wise when viewed from the drive-end.

If correct, the pressure displayed on the air-end pressure gauge will immediately rise to 5.5 bar (80 psi).

If not correct, pressure will not rise and the pressure gauge will read zero.

CAUTION !

STOP THE COMPRESSOR IMMEDIATELY: SERIOUS DAMAGE TO THE AIR-END WILL RESULT IF THE MOTOR IS ALLOWED TO RUN IN REVERSE!

WARNING!

IF INCORRECT STOP THE COMPRESSOR AND LOCK THE ISOLATOR IN THE OFF POSITION. FIT A SAFETY NOTICE TO THE ISOLATOR ADVISING THAT WORK IS BEING CARRIED OUT ON THE COMPRESSOR.

Single phase models.

Change over any two of the incoming cables connected to the starter terminals 3/L2 and 5/L3.

Three phase models

Change over any two of the incoming cables connected to the starter terminals 1/L1, 3/L2 and 5/L3.

Note: Qualified person only.

Ensure that all covers and panels have been securely reinstated.

6.1 Compressor Assembly (Fig. 6.1, 6.2)

The compressor assembly comprises of an air-end (A), complete with oil cooler (B), driven by an electric motor (C). This assembly is mounted to either an air receiver (D) or base (E) together with a starter box (R). Starter box is fitted with hours counter (HC) Receiver mounted variants are fitted with pressure switch (F).

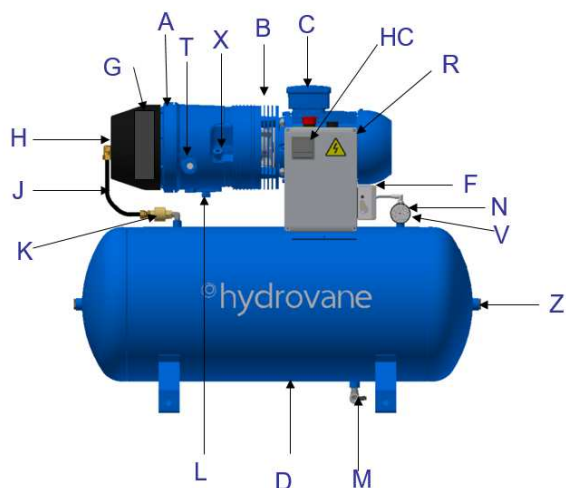
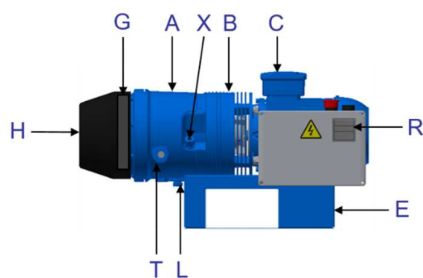
The air enters the compressor through an air filter (G). The air is compressed by the air-end and pressure is displayed by pressure gauge (H). It is then discharged through the air outlet pipe (J) and non-return valve (K) into the air receiver (D), where applicable.

PURS / PARS receiver is fitted with a safety valve (V), drain valve (M), pressure switch (F) starter (R) and pressure gauge (N) which displays the pressure in the receiver and air-discharge tap (Z).

The oil sight glass (T) allows you to check the oil level, when the compressor has stopped. The oil filler plug (X) incorporates a thermometer pocket which allows you to monitor the oil temperature. When you fill or top-up the compressor the correct oil level is fill to overflow.

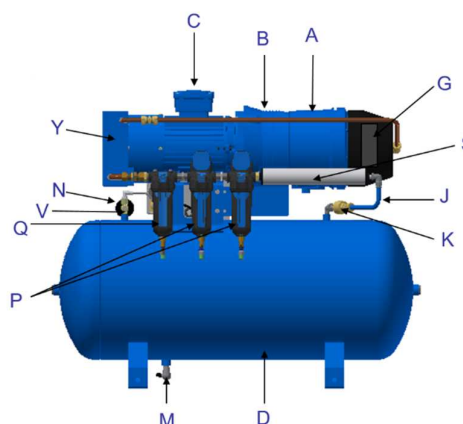
Drain plug (L) is used to drain the compressor of oil, discharge all pressure before remove.

Drain valve (M) is used for draining the condensate from the receiver.

**Fig 6.1 Receiver Mounted****Fig 6.2 Base Mounted****6.2 Dryer Kit (Fig 6.3)**

The compressor can be supplied with a dryer kit. This comprises of an Membrane dryer, complete with after-cooler and air treatment filters. This assembly can be ordered as a retro fit kit to existing PURS machine - ATK (air treatment kit), or as a complete machine PARS.

The air leaving the after-cooler (Y) is fed into a water drain (Q) and two coalescing filters (P), where solids and oil are removed. The air then enters the membrane dryer (S), where it is passed down hollow micro-fibre membranes. As air travels along the individual fibres, water vapour contained within the air diffuses through the walls of the fibres and collects on the outside. The air entering the receiver is now dry.

**Fig 6.3 Receiver
Dryer Kit**

6.3 Low duty Solution LDS-05-000 (Fig 6.4)

The Hydrovane LDS (low duty solution) is designed to prevent condensation build up in compressors that are used in applications where they only run for a short time.

If the compressor only runs for a short time, over cooling can occur resulting in condensation build up in the compressor. The auto timer starts up the compressor at an off duty period and lets it run "on load" for a period at optimum working temperature, to "boil off" any excess moisture.

For further information see document ST16253.



Fig 6.4 Low duty solution with PURS

7.1 Introduction

WARNING ! 

THE COMPRESSOR SHOULD ONLY BE OPERATED BY AUTHORISED PERSONS FULLY TRAINED IN THE STARTING AND STOPPING PROCEDURES.

BEFORE STARTING THE COMPRESSOR, READ THE 'HEALTH AND SAFETY PRECAUTIONS'.

7.2 Checking Procedure Before Starting

Check oil level.

Check filler and drain plugs are fitted securely.

Check for any signs of oil or water leaks.

Refit all covers and secure.

Check compressor pressure gauge reads zero.

Check air-outlet valve is open.

Turn mains electricity supply on.

7.3 Starting 501-504 PURS / PARS (Fig 7.1)

Complete checking procedure.

Push the green start button (A).

The compressor will start immediately and will automatically stop and restart according to air demand. On initial start-up the air-end pressure will immediately rise and the air-end pressure gauge will read 4-6 bar (58-87 psi). The air-line pressure will rise slowly and fluctuate with air demand.

If there is no demand for air the air-line pressure will rise until the high setting of the pressure switch is activated. The compressor will stop immediately and will remain stopped until there is an air demand. When the pressure falls to the differential setting of the pressure switch the compressor will immediately restart.



Fig 7.1 501-504 PURS/PARS

Starting 501-502 PUBS (Fig 7.2)

Complete checking procedure.

Push the green start button (A).

The compressor will start immediately and run continuously irrespective of either the pressure in the air-line system or the air demand.

On initial start-up the air-end pressure will immediately rise and the air-end pressure gauge will read 4-6 bar (58-87 psi). The air-line pressure will rise slowly and fluctuate with air demand.

If there is no demand for air the air-line pressure will rise until the pressure control valve lifts and the pressure stabilises.

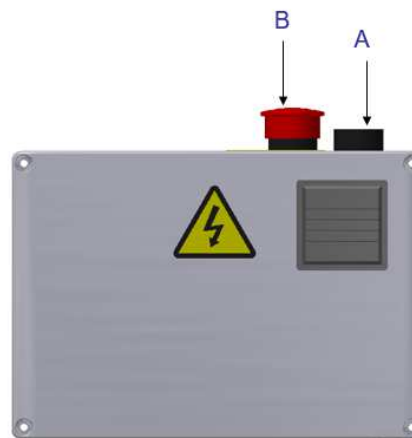


Fig 7.2 501-502 PUBS

7.4 Stop/Emergency Stop (Fig 7.1, 7.2)

Close air-outlet valve. Press the stop/emergency stop button (B).

If an emergency occurs, hit the stop/emergency stop button (B). The button will lock in the depressed position and stop the compressor immediately.

Clear any faults which may have occurred, do not re-start until safe to do so.

Reset the stop/emergency stop button by twisting it clockwise before restart.

7.5 Compressor Vent Down Time

After stopping the air-end must be allowed to vent down naturally. Speeding up the de-pressurisation may cause separator flood.

8.1 Introduction

WARNING !



READ HEALTH AND SAFETY PRECAUTIONS BEFORE MAKING ANY ADJUSTMENTS.

Adjustment procedures shown must only be carried out by authorised persons fully trained and competent in the maintenance of Hydrovane compressors.

If you are not able to carry out the work safely, contact your Hydrovane distributor.

Check and record cut-out pressure shown on pressure gauge (B).

Carefully open air-outlet valve (A), allow pressure to fall slowly until compressor cuts-in (re-starts).

Check and record cut-in pressure shown on pressure gauge (B).

Stop compressor.

8.2 Pressure Control Valve (PUBS)

Pressure control valve is pre-set and cannot be adjusted, if faulty must be replaced.

Factory settings: 10 bar models 10.3-10.8 (149-157 psi)

8.3 Pressure Switch (Fig. 8.1)

The pressure switch (C) is located on the Starter and is pre-set at the factory. The recommended cut-out pressure (high pressure switch setting) is a maximum and must not be exceeded. The cut-in pressure (re-start pressure switch setting) may be adjusted to suit your application.

Factory setting 10 bar (145 psi) machines:-

Cut-out = 10.2-10.4 bar (148-151 psi) (max)

Cut-in = 6.0 - 6.8 bar (87-99 psi)

Note: Do not adjust when pressure switch is under pressure. Compressor has to be safely isolated from the mains electrical supply.

Pressure sensing

Since the pressure switch is located into the air receiver we recommend that you do not fit a non-return valve in your air-line system (A).

If a non-return valve is essential for your application then the air-supply to the switch must be relocated after the non-return valve.



Fig 8.1 - Pressure Switch Location

8.4 Check Setting Procedures

Close air-outlet valve (A).

Start compressor, allow pressure to rise until compressor cuts-out(stops).

8.5 Pressure Switch Adjustment

Close air-outlet valve (A).

Start compressor, allow pressure to rise until compressor cuts-out (stop).

WARNING ! 

ISOLATE THE COMPRESSOR FROM MAINS ELECTRICAL SUPPLY. LOCK THE ISOLATOR IN THE OFF POSITION. FIT A SAFETY NOTICE TO THE ISOLATOR ADVISING THAT WORK IS BEING CARRIED OUT ON THE COMPRESSOR.

Pressure Switch (Fig 8.2)

The maximum and differential pressures are factory pre-set, the maximum pressure will not normally need adjustment. The differential pressure can be re-set to give the correct cut-in pressure required by the air system. Before adjustment is attempted ensure that there are no leaks in the pipework system.

Remove the pressure switch control unit cover to expose the pressure switch (A).

Remove keyplate retaining screw (C), remove keyplate (D).

Maximum Pressure Adjustment

Adjust screw (E) until the MAX scale indicates 10.2 bar (148 psi) on 10 bar compressors, these pressures should not be exceeded.

Differential Pressure Adjustment

Adjust screw (F) until the DIFF scale gives the required differential.

MAX pressure minus DIFF pressure equals MINIMUM (cut in) pressure.

The differential pressure is factory pre-set to between 1 (14.5 psi) or 2 bar (29 psi) depending on the compressor.

High cut-in pressures will increase the frequency of start-up.

Re-fit keyplate (D) and retaining screw (C).

Switch mains electrical supply on. Start compressor and carry-out check settings procedure.

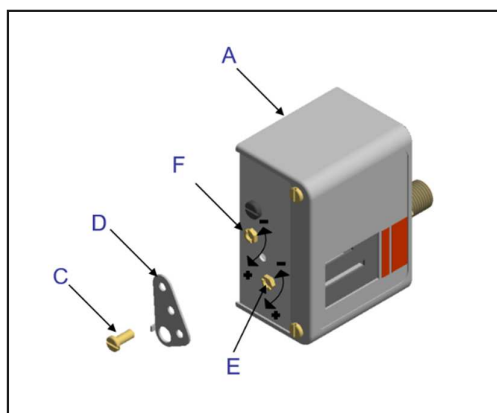


Fig 8.2 - Pressure Switch

procedure).

9.1 Introduction

WARNING !



SERVICING OF THE COMPRESSOR MUST ONLY BE CARRIED OUT BY AUTHORISED PERSONS FULLY TRAINED AND COMPETENT IN THE MAINTENANCE, MAINS ELECTRICAL SUPPLY AND STARTER CONTROL EQUIPMENT OF HYDROVANE COMPRESSORS. THEY MUST FULLY UNDERSTAND AND ADOPT CORRECT AND SAFE WORKING PRACTICES.

If you are unable to carry-out the work safely in the required manner then your Hydrovane distributor will be pleased to help.

Use genuine parts and Hydrovane Approved oils during routine servicing, the following service kits are available.

Maintenance kit, 2000 hour/12 months, use KM51 (501-502) or KM52 (504).

Top-up kit, 24000 hour/10 year, use KT52 (501-502) or KT53 (504)

Full overhaul: Use KM + KT

9.2 Routine Service Schedule

The work listed below must be carried-out at the indicated running hours which are visible on the Hours counter (HC) device fitted on the Starter (R). Service intervals must be regarded as a maximum. In dusty, hot or humid conditions more frequent servicing may be necessary. Service schedule should be performed depending on running hours, or period of time based schedule (whichever is sooner).

This section shows the minimum service requirements for your compressor. To ensure that the full compressor maintenance programme is carried out, Hydrovane recommend, your compressor to be regularly serviced by an authorised Hydrovane distributor.

9.3 Check Compressor Operation

Wait until air-end vent down cycle is complete.

Check that the air-end pressure gauge reads zero.

Pour a small amount of oil into the thermometer pocket of the oil filler plug. Screw a temperature gauge or thermometer into the thermometer pocket.

Assuming the compressor is serviced correctly the machine is capable of operating in ambient temperatures up to a maximum of 40°C (104°F). At this ambient the bulk oil temperature measured at the filler plug should be 70-90°C (158-194°F).

Check oil temperature. When the compressor is working the temperature should be:

Initial start-up and warm-up period.	< 70°C (158°F)
Optimum working temperature.	77-87°C (171-189°F)
High temperature.	90-100°C (194-212°F)
Stop ! See fault finding section.	>100°C (212°F)

Check Air Line Pressure

Check the air-line system pressure by using the receiver mounted pressure gauge.

Check Air-End Pressure

To check the air-end pressure, use the pressure gauge located in the air-end.

Check Oil Level

Check that the air-end pressure gauge reads zero.
Check the oil is present in compressor using sight glass.
Remove filler plug and check inside oil chamber.
Oil should be filled to overflow if not top up (see oil top-up

Draining Air Receiver (Fig 9.1)

Wait for air-end vent down cycle to finish.

Position suitable container beneath condensate drain valve (B).

WARNING !



THE AIR RECEIVER IS PRESSURISED, TAKE GREAT CARE WHEN CARRYING OUT THE NEXT OPERATION.

Carefully open drain valve and allow pressure to fall slowly to zero. Collect all condensate drained from receiver.

Note: Condensate may contain traces of oil and must be disposed of in an approved manner.

Close drain valve (B) and open air outlet valve (A).

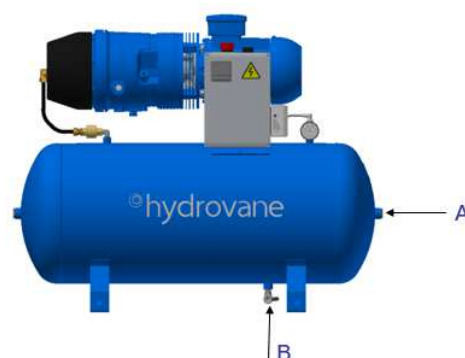


Fig 9.1 - Outlet Drain Valve Location

9.4 Basic Service Procedures

WARNING !

STOP THE COMPRESSOR AND ISOLATE FROM MAINS ELECTRICAL SUPPLY. LOCK THE ISOLATOR IN THE OFF POSITION. FIT A SAFETY NOTICE TO THE ISOLATOR ADVISING THAT WORK IS BEING CARRIED OUT ON THE COMPRESSOR.

CLOSE THE AIR OUTLET VALVE TO ISOLATE THE COMPRESSOR FROM THE AIR-LINE SYSTEM. FIT A SAFETY NOTICE TO THE VALVE ADVISING THAT IT IS NOT TO BE OPENED.

DO NOT PROCEED UNTIL GAUGE READS ZERO!

Oil Top-Up Procedure (Fig 9.2)

Wait until the air-end vent down cycle is complete, check that the air-end pressure gauge reads zero.

Note: If pressure gauge does not fall to zero then non-return valve (D) may be faulty.

Drain air receiver following procedure above. Do not reopen air-outlet valve (A).

Carefully unscrew oil filler plug (B), remove filler plug (B), retain bonded seal (C).

Fill compressor to overflow with Hydrovane Approved OIL, do not overfill.

Note: Oils must not be mixed.

Examine bonded seal, if not damaged refit to filler plug.

Refit seal and filler plug, tighten to 25 Nm.

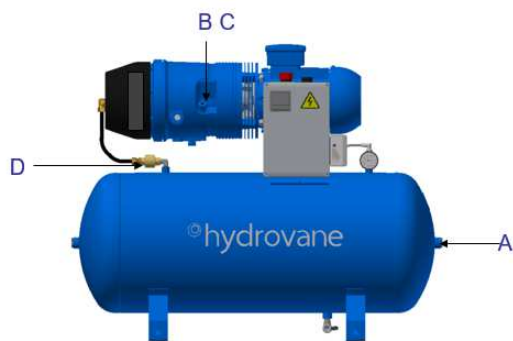


Fig 9.2 - Outlet and Filler Plug Location

Check Air Intake Filter (Fig 9.3, 9.4)**WARNING !**

The air filter (D) is located beneath the filter cover (A). Filter cover will slide over adapter and pipe (B).

Wait until air-end vent down cycle is complete, open outlet valve to vent pressure from the receiver and associated pipework.

Check that air-end pressure gauge reads zero.

Disconnect pipe (B).

Firmly pull filter cover (A) to remove from separator casing.

Remove air filter (D), and filter support (E). Clean separator casing and inside of filter cover.

Vacuum clean or blow dust out of filter using low pressure, clean, dry air. Renew the filter if it cannot be cleaned satisfactorily.

Refit filter support (E), air filter (D), refit filtercover (A), reconnect pipe (B).

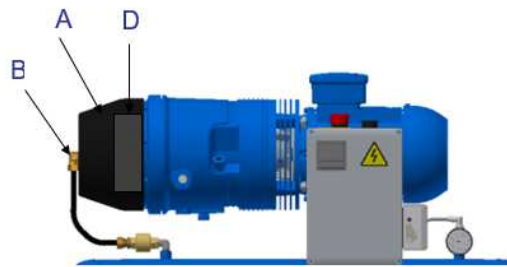


Fig 9.3 - 501-502 Intake Filter

Air Intake Filter Replacement (Fig 9.3, 9.4)

The air filter (D) is located beneath the filter cover (A). Disconnect pipe (B).

Firmly pull filter cover (A) to remove from separator casing.

Remove air filter (D), and filter support (E) clean separator casing and inside of filter cover.

Note: Air filter may contain traces of oil and must be disposed of in an approved manner.

Refit filter support (E), a new air filter (D), refit filter cover (A) and reconnect pipe (B).

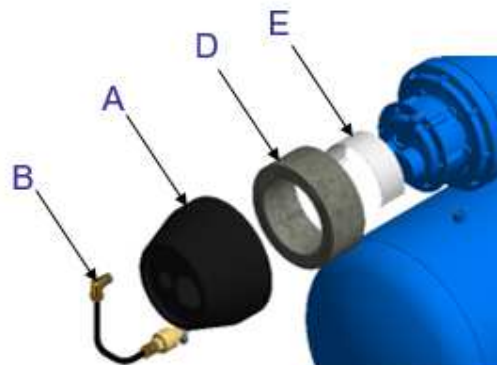
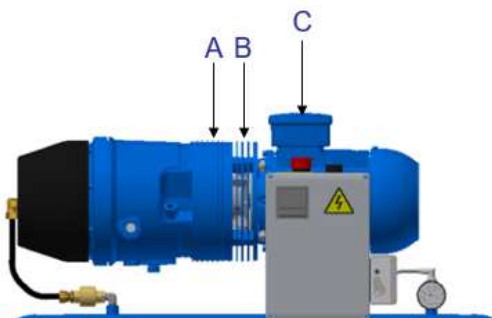


Fig 9.4 - 504 Intake Filter

Clean Cooler and Motor (Fig 9.5)**WARNING!**

Carefully vacuum clean the oil cooler matrix (A), aftercooler if fitted and guard rings (B).

Vacuum clean or blow dust from motor (C) and motor grill, using low pressure, clean dry air.

**Fig 9.5 - Cooler and Motor Location****Replace Oil Separator Element (Fig 9.6)**

Remove cap head screws (A), gently tap the end cover (B) until it is clear of the separator casing.

Unscrew the oil separator element (C) and discard.

Note: Oil separator element contains oil and must be disposed of in an approved manner.

Fit a new separator element. Ensure that the 'O' ring (E) is in place. Do not over tighten.

Refit end cover (B). Ensure cover is positioned correctly and bolt holes are in line. Be careful not to damage 'O' ring (D) when refitting.

Refit cap head screws (A). Tighten to 6 Nm.

**Fig 9.6 - Separator Element Location****Oil Change Procedure (Fig 9.7)**

Remove filler plug (A), discard bonded seal (B), place container beneath oil drain plug (D).

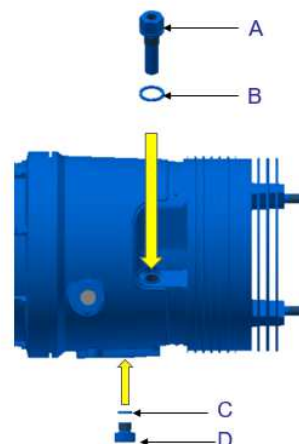
Carefully remove drain plug (D) and discard bonded seal (C). Collect all the oil that drains from the compressor.

Note: Any waste oil collected must be disposed of in an approved manner.

Refit drain plug (D) using a new bonded seal. Tighten to 20 Nm.

Fill to overflow with an Hydrovane Approved oil, do not overfill.

Refit filler plug (A) using a new bonded seal. Tighten to 25 Nm.

**Fig 9.7 - Oil Change Procedure****Electrical Checks****WARNING !**

Remove the starter panel and pressure switch covers.

Check for any signs of overheating and ensure that all electrical connections are tightened to correct torque settings.

Note: Pay special attention to power connections and cables connected to contactors and incoming terminals.

Check Electric Motors

Remove any dust or dirt from motor bodies and motor air intake grills.

Lubricate motor bearings as per manufacturer's instructions, or see service manual below.

Reinstate all covers, remove safety notices, turn mains electrical supply on and open air-outlet valve. Test run compressor, check pressure and inspect for oil leak.

9.5 Servicing Requirements

The compressor warranty will be invalidated if non genuine spare parts or lubricants are used. Using such items may cause the efficiency and service life of the compressor to be reduced and could create a hazardous condition over which Hydrovane has no control.

Failure to maintain the compressor correctly, or modifying it without prior approval from Hydrovane may also create a hazardous condition. This will also invalidate the warranty.

The following preventative maintenance charts cover all Hydrovane compressors using Hydrovane approved oil.

NOTE! If other approved oils are used, service intervals have to be changed accordingly.

The work to be carried out must be done on, or before the hours shown for this action, or every 12 months, whichever is soonest.

Table 9.1 for 4000 hour oil change periods are shown. Shaded items are Hydrovane distributor maintenance tasks only.

NOTE ! Certain items may not be applicable to all units.

READ HEALTH AND SAFETY PRECAUTIONS BEFORE STARTING ANY WORK.

9.6 Service Schedule: Hydrovane HPO oil

For normal ambient conditions bulk oil temperatures must not exceed 100°C/212°F when using HPO oil @ 4000 hour oil change periods.

In extreme ambient conditions, HPO oil should be used @ 2000 hour oil change periods. If the oil is working above these temperatures the oil life will be significantly reduced.

If changing to FLUID FORCE CLEAR flush the compressor with FLUID FORCE PRIME in order to comply with USDA H1 standard.

The service life of the air filter and cabinet filter are an indication only, actual life durability will depend on the operating conditions.

Maintenance Actions	Install	Every Day	Every Week	Every 4000 Hours (*)	Every 24000 Hours (**)
Site-sufficient access for service	X				
Site-protected from weather	X				
Site-adequate ventilation	X	X	X	X	X
Site-ambient temperature within limit	X	X	X	X	X
Site-dust free ambient	X	X	X	X	X
Check/torque electrical connections	X			X	X
Check oil level at filler plug/sight glass	X	X	X	X	X
Check correct drive rotation	X				X
Check for air leaks	X		X	X	X
Check for oil leaks	X		X	X	X
Check air intake filter/clean if necessary	X		X		
Check power on-load	X			X	X
Check power off-load	X			X	X
Check oil temperature	X		X	X	X
Check RSU temperature	X		X	X	X
Check servo pressure off-load	X			X	X
Check motor gland/cables secure	X			X	X
Check motor for damage	X			X	X
Check motor/starter for loose connections	X			X	X
Check motor cables and earth	X			X	X
Check motor for vibration	X			X	X
Check flexible oil pipes				X	
Check oil seal for leakage				X	
Check drive media/key				X	
Check starter contactors				X	
Check motor insulation resistance					X
Check combi cooler matrix			X	X	X
Clean any external dirt from compressor	X		X	X	X
Clean any external dirt from motor	X		X	X	X
Clean cabinet filter			X		
Clean solenoids				X	X
Change separator element				X	X
Change 4000 hour oil				X	X
Change oil filter				X	X
Change air intake filter				X	X
Change cabinet filter				X	X
Change unloader valve seals				X	X
Change MPV seals				X	X
Change vacuum valve seals				X	X
Change flexible pipes				X	X
Change thermal motor				X	X
Grease motor bearings (if applicable)				X	
Full air end inspection (internal)					X
Clean servo filter					X
Change drive media/key					X
Change oil seal					X
Change pressure gauge					X
Change motor bearings					X
Full operational test/check	X			X	X
Filter element fitted to Hypac units only				X	

Table 9.1 Maintenance Actions

* Or annually whichever is soonest ** Or 12 years whichever is soonest

10.0 Introduction

WARNING !**READ HEALTH AND SAFETY PRECAUTIONS BEFORE YOU START ANY SERVICE WORK.**

Servicing of the compressor must only be carried-out by authorised persons fully trained and competent in the maintenance of Hydrovane compressors. They must fully understand and adopt correct and safe working practices.

If you are unable to carry-out the work safely in the required manner then your Hydrovane distributor will be pleased to help.

The range of minor faults which may occur with your Hydrovane compressor can be grouped under the following categories.

10.1 High Pressure

Symptom	Cause	Action
Air-end pressure gauge reads: >10.8 bar/157 psi (10-PUBS) >10.4 bar/151 psi (PURS), Air-end safety valve blowing (PURS). High temperature, high power, low air-output.	- Safety valve setting too high. Pressure control valve stuck. MPV not operating correctly. - Blocked pressure control valve or filter. Pressure switch faulty.	- Check that air-end pressure gauge returns to ZERO when compressor is switched off, if not, renew. - Replace pressure-control valve. (PUBS only). - Check that air-receiver pressure gauge returns to ZERO when receiver is fully de-pressurised. if not replace. (PURS only). - Check pressure switch is set correctly. (PURS and PARS, where fitted).

10.2 High Temperature

Symptom	Cause	Action
- Very hot to touch. - High power, low air-output, high oil discharge. Compressor cuts-out. - Oil life reduction. - Compressor seizes.	- Incorrect oil level. - Unapproved oil, incorrect grade of oil being used. Dirty or blocked cooler. - Re-circulation of hot air or lack of ventilation. Thermostatic valve stuck in closed position. Incorrect stator/rotor end clearance. - Oil relief valves leaking. Internal oil passage blocked. Oil return plug blocked. - Internal high pressure to low pressure leak.	Check temperature in thermometer pocket. If >95°C/203°F then: a) Compressor location, check: - Ambient temperature too high (>40°C/104°F) Air-intake temperature too high. - Air-intake located near heat source. Excessively dusty conditions. b) Air-end, check:- - Oil level too low. - Wrong type or grade of oil. - Oil cooler blocked. - Prolonged running off-load.

10.3 Low Air Output

Symptom	Cause	Action
- Malfunction of air-tools/equipment. Pressure gauges reading low. - Rapid pressure loss from air-end on stopping. - Rapid pressure loss from air-line when compressor switched off.	- Restriction in airline, valve closed. Minimum pressure valve stuck closed. - Air intake filter blocked. - Pressure control valve stuck in open position. Separator element blocked.	- Carry-out air delivery test. a) If less than specification, check air-end for: - Blocked air-intake filter. - Blocked separator element. - M.P.V. stuck closed. - Air leaks from air-end. b) If correct, check air-line system for: - Excessive air demand. Air leak in air-line system. Restriction in air-line system. Pipework/equipment too small.

10.4 Compressor Stops

Symptom	Cause	Action
Compressor stops unexpectedly.	- Pressure switch set low. - Over-temperature fault. - Motor overload tripped. - Supply voltage low. - Compressor seizing.	- Re-adjust pressure switch. Rectify over temperature fault. - Machine is fitted with AUTO reset overload, and it will reset itself after few seconds. Check motor for potential overload. - Check supply voltage status. Check compressor functionality.

10.5 Excessive Oil Consumption

Symptom	Cause	Action
- Oil visible in tools and equipment. Excessive oil usage. - Possible high oil temperature. Possible high power absorption.	- Wrong type or grade of oil. - Compressor over filled or not sited level. - Excessive air demand. - Separator element fractured and/or O-ring damaged. - Blocked oil return filters/orifice. - Excessive condensate in oil chamber.	Quantify oil discharge rate. a) If >5ppm, check for: - Wrong type or grade of oil. - Ambient temperature >40°C/104°F. - Air-intake temperature too high. - Compressor not positioned on a level site. - Blocked oil-return plug. - Faulty separator element. b) If within specification, check for: - Excessive air demand. - Air leaks in air-line system. - Too many stop/start cycles per hour (PURS only).

10.6 Low Operating Temperature.

Symptom	Cause	Action
- High oil discharge but oil level does not fall. - High power, low air-output. - Compressor seizes.	- Wrong/poor location for compressor. - Low duty cycle, insufficient demand. - Compressor operating temperature too low.	- Remove oil drain plug, if water drains out before oil then you have a problem. - Time the duty cycle, if compressor switches off within 15 minutes and is not called upon to restart within 2 hrs. then duty cycle is too short. If duty cycle is too short then either: a) Install Low duty solution (LDS). b) Run compressor fully on-load for at least one hour every week.

Rotary Vane Solutions for
Various Applications



Global Expertise



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