

**INSTALLATION MANUAL
FOR
ROTARY TWIN LOBE (ROOTS) BLOWERS /
COMPRESSORS**



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INDEX

01. Machine Specifications & Operating Instruction.....	3
02. About Rotary Twin Lobe (Roots) Blowers / Compressors.....	4
03. Installation of Machine	5
04. Details to be furnished while ordering for Spare Parts.....	6
05. Trouble Shooting.....	7

Annexure: General Arrangement Drawing of Machine showings different Accessories & Cross-sectional Drawing showing its different parts.

MACHINE SPECIFICATIONS & OPERATING INSTRUCTIONS

Congratulations on purchase of Airvac Rotary Twin Lobe (Roots) Blower / Compressor from Airvac Industries & Projects, Delhi. Please examine the machine for its completeness in all respect and tally the packing list. If you want to install the machine later date, please be sure that all the opening are covered and machine is stored in a clean and dry place. If you keep the machine out doors, please be sure to protect it from weather and Corrosion.

Machine Specifications:

Application : Pressure Vacuum
Medium : Air Gas (Name.....)
Sr. No. :
Manufacturing Year :
Capacity :
Pressure / Vacuum :
Machine RPM :
Machine BHP :
Motor (HP / RPM) :
Water Pressure* :
Water Temperature* :
Required Water Quantity* :

* Applicable to Water cooled Machines only.

Operating Instructions:

1. Please fill C-140 of Indian Oil or equivalent grade gear oil up to the mark in oil sump provided for the lubrication of Gears and AP-3 / Lithium based grease or equivalent grade grease in grease nipples before starting the machine. Also, please change Oil / Grease after 150 Hrs. running of Machine.
2. Please check and clean any foreign material present on suction of machine and ensure the free rotation before starting it.
3. Please check the belt tension and alignment before starting machine to prevent excessive wear and tear.
4. Check Amperage consumption by Motor on no load condition.
5. The load should be applied gradually at least after running the machine for 15 minutes on no load condition.

ABOUT ROTARY TWIN LOBE BLOWERS / COMPRESSORS

Rotary Twin Lobe Blowers / Compressors are used for delivering 100% oil free high volume of Air / gas at pressure up to 1 Kg/cm². Simple and trouble free operation is the main advantage of this machine and it can handle Air, non-aggressive and aggressive gases. The material of construction should be properly selected considering the aggressiveness of media. Rotary Twin Blowers / Compressors are 100% oil free and hence they do not contaminate the media passing through it.

Principle of Operation:

Rotary Twin Lobe Blowers / Compressors follow the well established principle of the roots-type machine. Operation is both simple and effective. Two 8-shaped Rotors / Impellers, mounted on parallel shafts and contained within casing rotate in opposite directions. The Shape of the impellers is such that a small accurately gauged clearance is maintained at all times between the impellers and casing. As they rotate, air is drawn in to the space between the impellers and the casing, where it is trapped as the tip of the impellers passes the edge of the inlet opening.



Continuing its rotation, the opposite tip of the impeller passes the edge of the outlet opening and the trapped air is pushed through the outlet into the air line. This action is repeated twice for each revolution of the impeller, or four times for each revolution of the drive shaft, for each size of compressor a calculated amount of air moves at any given speed and pressure. This makes it simple to select the speed at which the blower / compressor should operate to supply the required volume of air.

INSTALLATION OF MACHINE & PIPE WORK

Place the compressor on a concrete or equally substantial level foundation with the feet supported evenly on steel packing. These should be shimmed level to prevent distortion of the casing when tightening down. The foundation bolts should be grouted in and allowed to set before the compressor is tightened down. If the compressor is mounted on a base frame together with the motor, ensure that the compressor casing is not distorted when the foundation bolts are tightened. If the compressor is directly coupled to the Electric Motor, the flexible coupling must be of a type which permits axial float and must be accurately aligned with coupling. Care must be taken to ensure that Machine is connected to your system having opening of same size as the outlet size of Machine to avoid the excessive back pressure on machine while operating.

Note: If the pulley or coupling is not of the taper bush type, it must be pressed onto the shaft to avoid damage to the bearing. Under no circumstances should a hammer be used to fit a coupling or pulley. The pulley should be fitted as close a as possible to the drive shaft bearing cover

The Assembly of all the accessories should be done as per general Arrangement as shown in Annexure.

DETAILS TO BE FURNISHED WHILE ORDERING FOR SPARE PARTS

Please refer cross-sectional drawing. It will be very helpful to us if the following information is furnished in your order / enquiry:

1. Machine Model & its serial number
2. Motor, HP & RPM
3. Part No. & Description of the components & quantity required. For this, please refer our cross-sectional drawing & part list.

TROUBLE SHOOTING

Causes

Checks to be performed

No Air Flow:

- | | |
|--------------------------|---|
| 1) Speed too low | Check by Tachometer & Compare with Speed Shown on Name Plate. |
| 2) Wrong Rotation | Compare Actual Rotation with Arrow on Blower (If Wrong). |
| 3) Obstruction in Piping | Check Piping, Valves, Silencer to assure an Open Flow path.
Damaged Bearings |
-

Low Capacity:

- | | |
|--------------------------|--|
| 4) Speed too low | See item No. 1 above, if belt driven, check slippage and readjust tension. |
| 5) Excessive Pressure | Check inlet vacuum and discharge pressure compare with specified operating conditions. |
| 6) Obstruction in Piping | See item No. 3 above. |
| 7) Excessive Slip | Check inside of casing for work or eroded surface causing excessive clearances. |
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Excessive Power:

- | | |
|-----------------------|---|
| 8) Speed too high | Check Speed & Compare with data on name plate. |
| 9) Pressure too high | See item 5. |
| 10) Impellers Rubbing | Check outside of cylinder & Side plates for high temperature areas, then check for impeller contact at these points, correct blower mounting drive alignment. |
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Over Heating of Bearings & Gears:

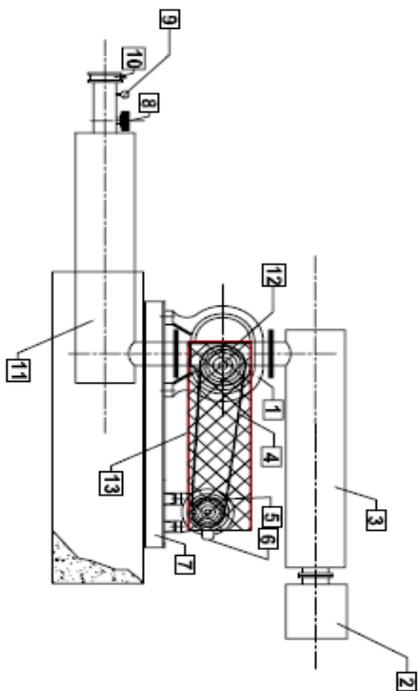
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|-----------------------------|--|
| 11) Inadequate Lubrication | Restore correct oil level in gear sump & grease at drive end bearings. |
| 12) Excessive Lubrication | Check gear oil level, if not correct up to the mark, drain & refill with clean oil of recommended grade. |
| 13) Excessive Pressure rise | See item 5. |
| 14) V-belt / Coupling | Check carefully, re-align, if required. |
| 15) Excessive belt tension | Re-adjust for correct tension. |
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Vibration:

- | | |
|------------------------------------|--|
| 16) Mis-alignment | See item No. 14. |
| 17) Impeller Rubbing | See item No. 10. |
| 18) Worn Bearings or Gears | Check Gear backlash & condition of bearing if lateral rotor play exceeds 10 mils, replace gear and bearings. |
| 19) Unbalanced Rubbing
Impeller | Remove build up to restore clearance and impeller. |
| 20) Driver on Blower loose | Tighten mounting bolts securely. |
| 21) Piping Resonances | Determine whether standing wave pressure pulsation are in piping refer our office. |

ANNEXURE - 1

13. V-BELT GUARD
12. BLOWER PULLEY
11. DISCHARGE SILENCER CUM INTER-CONNECTING PIPING
10. NON-RETURN VALVE
9. PRESSURE GAUGE (INDICATOR)
8. SAFETY VALVE (DEAD WT. TYPE)
7. COMMON BASE FRAME
6. ELECTRIC MOTOR
5. MOTOR PULLEY
4. V-BELTS
3. SUCTION SILENCER
2. SUCTION FILTER
1. TWIN LOBE BLOWER

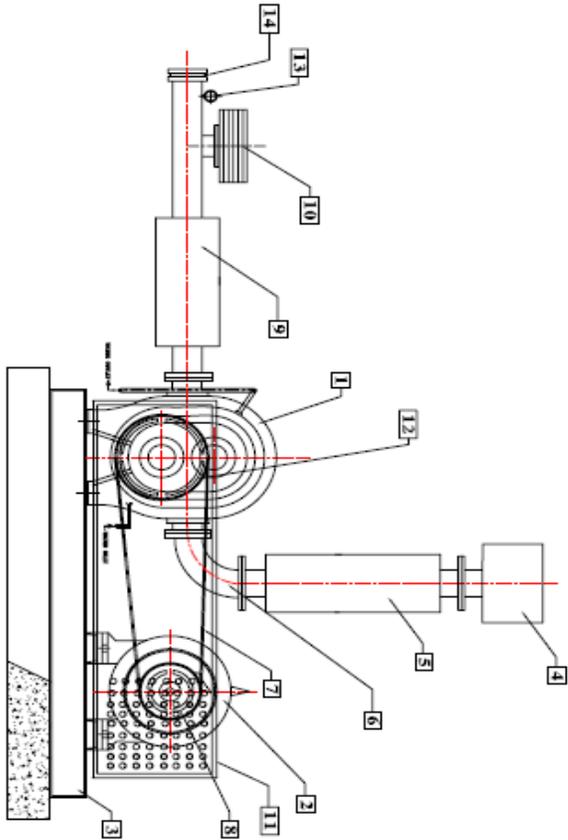


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PART NAME:
GENERAL ARRANGEMENT OF AIR COOLED BLOWER

ANNEXURE – 2

1. TWIN LOBE BLOWER
2. ELECTRIC MOTOR
3. COMMON BASE FRAME (M.S.)
4. SUCTION FILTER
5. SUCTION SILENCER
6. SUCTION BEND
7. V-BELTS
8. MOTOR PULLEY
9. DISCHARGE SIELNGER CUM INTERCONNECTING PIPING
10. SAFETY VALVE (DEAD WT. TYPE)
11. V-BELT GUARD
12. COMPRESSOR PULLEY
13. PRESSURE GAUGE
14. NON RETURN VALVE

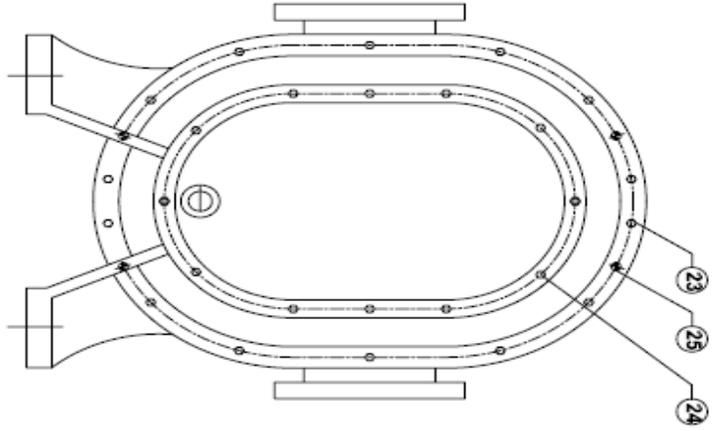


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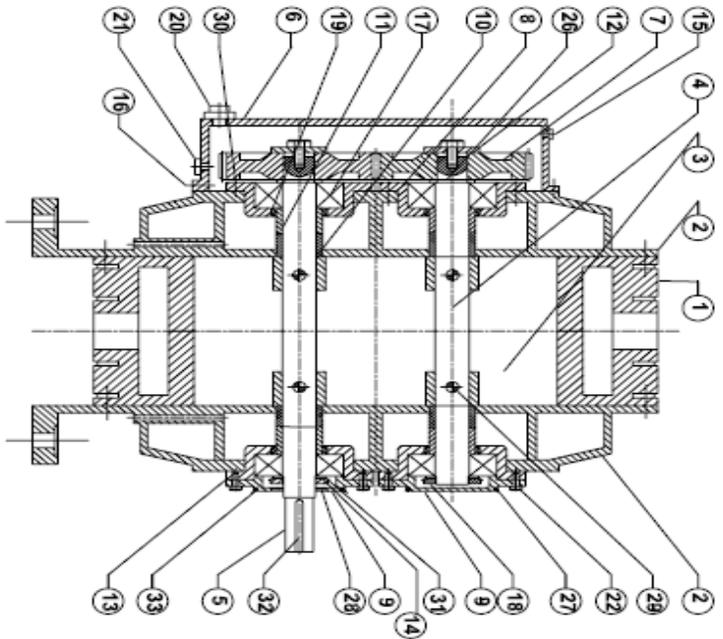
PART NAME:
GENERAL ARRANGEMENT OF WATER COOLED BLOWER

ANNEXURE – 3

- 20 OIL LEVEL INDICATOR
- 19 OIL SEAL
- 18 CHUCK NUT
- 17 BEARING
- 16 GASKET GEAR COVER
- 15 BREATHER PLUG
- 14 SPACER
- 13 GASKET BEARING COVER
- 12 THRUST PLATE & BOLT
- 11 OIL SEAL BUSH
- 10 LABRINTH SEAL
- 9 BEARING COVER
- 8 BEARING HOUSING
- 7 HELICAL TIMMING GEAR
- 6 GEAR COVER
- 5 DRIVE SHAFT
- 4 DRIVE SHAFT
- 3 IMPELLER
- 2 GEAR & PULLEY SIDE PLATE
- 1 CASING



- 33 GREASE DRAIN PLUG
- 32 KEY FOR PULLY
- 31 LOCKING WASHER
- 30 HEX-SOCKET HEAD SCREW
- 29 LOBE PIN
- 28 OIL SEAL BRG.COVER
- 27 GREASE NIPPLE
- 26 CIRCLIP
- 25 TAPPER PIN
- 24 HEX-HEAD SCREW
- 23 HEX-HEAD SCREW
- 22 HEX-HEAD SCREW
- 21 OIL DRAIN PLUG



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PART NAME:
CROSS SECTIONAL ASSEMBLY OF BLOWER