Operation And Maintenance Manual

Manvac Turbo Side Channel Blower

XT Dongguan HongGuang Hardwares Co., Ltd.

Our Company:Establish in July 2002,Factory space 6000m2.

Our Product:side channel blower,medium pressure blower and low pressure blower (8 series and 70 kinds of wide range air ring blowers)

Our Advantages:light weight,small volume,low nosi,oil-free and fast delivery. Reliable quality,Innovative performance. Stands for best quality,best solution and best service.

http://www.manvac.cn

CONTENTS

SAFETY

Prior to handling the machine, this instruction manual should be read and understood. Read this manual carefully before use and keep for future reference. This instruction manual remains valid as long as the customer does not change anything on the product. The machine is intended for industrial use. It must be handled only by technically trained personnel. Always wear appropriate personal protective equipment in accordance with the local regulations.

The machine has been designed and manufactured according to state-of-the-art methods. Nevertheless, residual risks may remain. This instruction manual highlights potential hazards where appropriate. Safety Notes and Warning Messages are tagged with one of the keywords DANGER, WARNING, CAUTION as follows:

DANGER

... indicates an imminent dangerous situation that will result in death or serious injuries if not prevented.

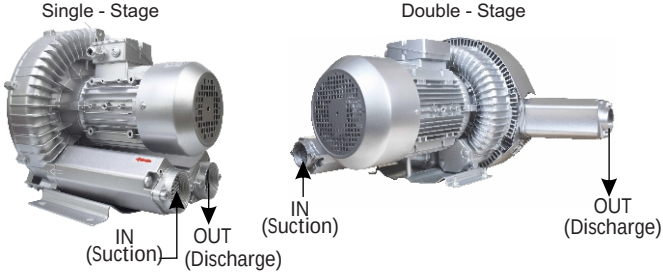
WARNING

... indicates a potentially dangerous situation that could result in death or serious injuries.

CAUTION

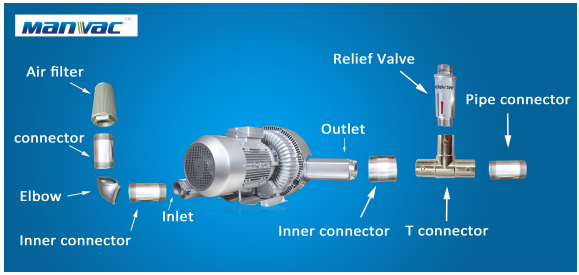
... indicates a potentially dangerous situation that could result in minor injuries.

PRODUCT DESCRIPTION

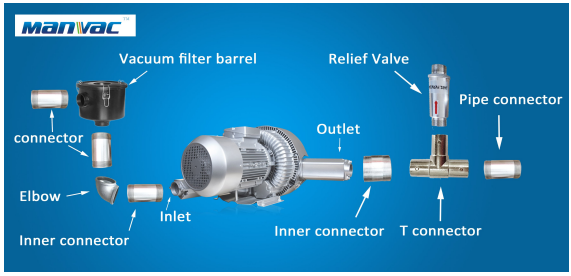


NOTE

Technical Term.
In this instruction manual, we consider that the term 'Machine' refers to 'Manvac Turbo Side Channel Blower'.

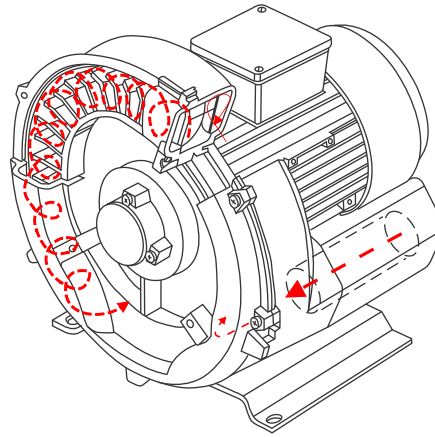


Accessories Layout for Pressure Duty Application



Accessories Layout for Vacuum Duty Application

OPERATING PRINCIPLE



The machine works on the impulse principle, i.e. kinetic energy is transferred from the impeller to the conveyed medium and then is converted into pressure. The change in pressure is made without the use of any lubrication whatsoever.

NOTICE

Lubricating a dry running machine (Process Chamber).
Risk of damage to the machine!
Do not lubricate the process chamber of the machine with oil or grease.

APPLICATION:

The machine is intended for the suction and/or compression of air and other dry, non-aggressive, non-toxic, non-flammable and non-explosive gases.

Conveying of other media leads to an increased thermal and/or mechanical load on the machine and is permissible only after consultation with EVEREST TURBO. The machine is intended for the placement in a non-potentially explosive environment. The machine is not capable of maintaining ultimate pressure/vacuum. The maximum allowed ultimate pressure/vacuum is to be read from the nameplate of the machine. By means of process control and/or pressure/vacuum relief valve it must be made sure that the maximum allowed ultimate pressure will not be over run. Refer to Technical Data for permitted environmental conditions.

OPTIONAL ACCESSORIES

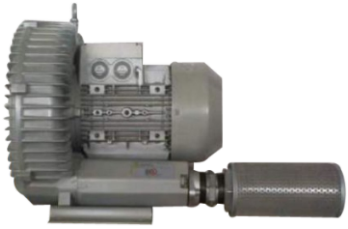
OPTIONAL ACCESSORIES:

(a) Pressure/Vacuum Relief Valve

- The vacuum relief valve controls inlet pressure when the machine is used in vacuum duty.
- The pressure relief valve controls pressure when the machine is used in pressure duty.

(b) Inlet Filter

- The inlet filter protects the machine against dust and other solids in process gas. The inlet filter is available with a cartridge.

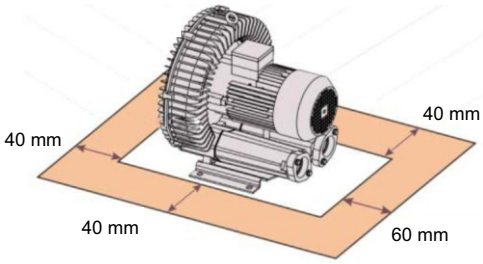


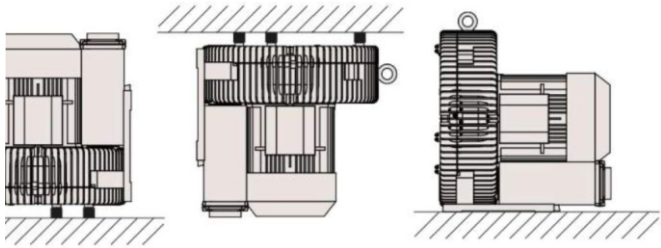
(c) Silencer

A silencer at the discharge connection (OUT) can be provided to reduce the exhaust gas noise.

INSTALLATION

INSTALLATION CONDITIONS





- Make sure that the environment of the machine is not potentially explosive.
- Make sure that the ambient conditions comply with the technical data.
- Make sure that the environment conditions comply with the protection class of the motor.
- Make sure that the installation space or location is well ventilated such that sufficient cooling of the machine is provided.
- Make sure that cooling air inlets and outlets are not covered or obstructed and that the cooling air flow is not affected adversely in any way.
- Make sure that the machine is placed or mounted horizontally/vertically, with a maximum deviation of 25 mm in any direction.
- Make sure that the machine is placed or mounted horizontally on a flat surface.
- Make sure that all provided covers, guards, hoods, etc. are mounted.
- If the machine is installed at an altitude greater than 1000 meters above sea level, contact your sales representative. The motor should be derated or the ambient temperature limited.
- If the machine is installed outdoor, provide a protective cover against the weathering effects.

INSTALLATION

CONNECTING LINES / PIPES

- Remove all protective caps before installation.
- Make sure that the connection lines cause no stress on the machine's suction/discharge openings. If necessary use flexible joints.
- Make sure that the line size of the connection lines over the entire length is at least as large as the suction/discharge openings of the machine.
- In case of very long connection lines it is advisable to use larger line sizes in order to avoid a loss of efficiency. Seek advice from your sales representative.

(a) Suction Connection

NOTICE

Ingress of foreign objects or liquids.
Risk of damage to the machine!

- If the inlet gas contains dust or other foreign solid particles: Install a suitable filter (5 micron or less) upstream from the machine.

(b) Discharge Connection

NOTICE

Depending on the specific order, other connection dimensions may apply. Make sure that the discharge gas flows without obstruction. Do not shut off or throttle the discharge line.

INSTALLATION

ELECTRICAL CONNECTION

DANGER

Live wires.
Risk of electrical shock !

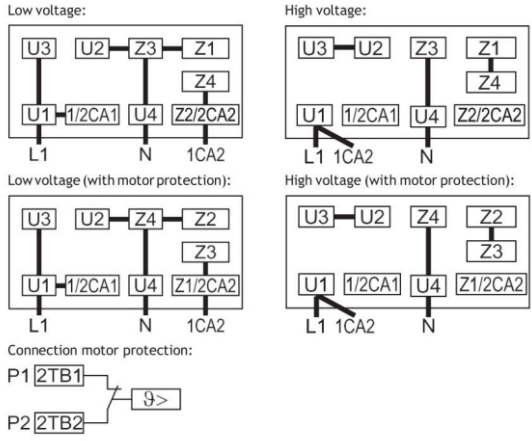
- Electrical installation work must only be executed by qualified personnel.
- Make sure that the power supply for the motor is compatible with the data on the nameplate of the motor.
- Provide overload protection according to EN60204-1 for the motor.
- Make sure that the motor of the machine will not be affected by electric or electromagnetic disturbance from the mains; if necessary seek advice from your sales representative.
- Connect the protective earth conductor.
- Electrically connect the motor.

NOTICE

Incorrect connection.
Risk of damage to the motor !

- The wiring diagrams given below are typical. Check the inside of the terminal box for motor connection instructions/diagrams.

(a) Wiring Diagram Single - Phase Motor



INSTALLATION

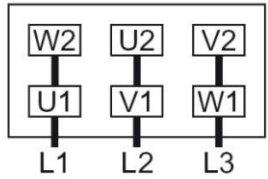
(b) Wiring Diagram Three-Phase Motor

NOTICE

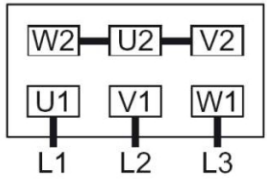
Incorrect direction of rotation.
Risk of damage to the machine!

- Operation in the wrong direction of rotation shall destroy the machine in a short time.
- Prior to start-up, ensure that the machine is operated in the right direction.
- If the rotation of the motor is in wrong direction:
  Switch any two of the motor phase wires.

Delta connection (low voltage):



Star connection (high voltage):



COMMISSIONING

NOTICE

Lubricating a dry running machine (Process Chamber)
Risk of damage to the machine!

- Do not lubricate the process chamber of the machine with oil or grease.

CAUTION

During operation the surface of the machine may reach temperatures of more than 70°C.
Risk of burns!

- Avoid contact with the machine during and directly after operation.

COMMISSIONING

CAUTION

Noise of running machine
Risk of damage to hearing!

- If persons are present in the vicinity of a non noise insulated machine over extended periods:
  Make sure that ear protection is being used.
  Make sure that the installation conditions are complied with.
- Switch on the machine:
  Make sure that the maximum permissible number of starts does not exceed 6 starts per hour.
  Make sure the working/pause periods are equal with multiple starts per hour.
- As soon as the machine is operated under normal operating conditions:
  Measure the motor current and record it as reference for future maintenance and trouble shooting work.

MAINTENANCE

WARNING

Machines contaminated with hazardous material.
Risk of poisoning!
Risk of infection!

- If the machine is contaminated with hazardous material:
  Wear appropriate personal protective equipment.

CAUTION

Hot surface
Risk of burns!

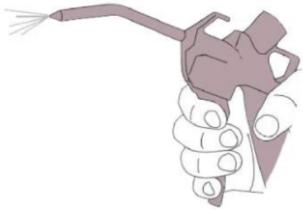
- Prior to any action requiring touching the machine, let the machine cool down first.
- Shut down the machine and lock against inadvertent start up.
- Vent the connected lines to atmospheric pressure.
- If necessary:
  Disconnect all connections.

(a) **Maintenance Schedule:**

The maintenance intervals depends on the individual operating conditions. The intervals given below are desired to be considered as starting values which should be shortened or extended as appropriate. Particularly heavy duty operation, such as high dust loads in the environment or in the process gas, other contamination or ingress of process material, can make it necessary to shorten the maintenance intervals significantly.

Interval	Maintenance work
Monthly	• Clean the machine from dust and dirt. In case of an inlet filter being installed: • Check the inlet filter cartridge, replace if necessary.
Every 6 months	• Clean the machine from dust and dirt. • Make sure that the electronic components and the cooling fan are free from dust.
Yearly	• Carry out a visual inspection and clean the machine from dust and dirt. • Check the electrical connections and the monitoring devices. • Clean the inlet and outlet silencer.
Every 5 Years	• Have a major overhaul on the machine (contact your sales representative).

(b) **Cleaning from Dust and Dirt**



Clean the ventilation grills and cooling fins

OVERHAUL

NOTICE

Improper assembly.
Risk of premature failure!
Loss of efficiency!

- It is highly recommended that any dismantling of the machine that goes beyond anything that is described in this manual should be done through EVEREST.

WARNING

Machines contaminated with hazardous material.
Risk of Poisoning!
Risk of infection!

- If the machine is contaminated with hazardous material: Wear appropriate personal protective equipment.
- In case of the machine having conveyed gas that was contaminated with foreign materials which are dangerous to health: Decontaminate the machines as well as possible and state the contamination status in a 'Declaration of Contamination'.

DECOMMISSIONING

- Shut down the machine and lock against inadvertent start up.
- Vent the connected lines to atmospheric pressure.
- Disconnect all connections.

Dismantling and Disposal

- Separate special waste from the machine.
- Dispose of special waste in compliance with applicable regulations.
- Dispose of the machine as scrap metal.

SPARE PARTS

NOTICE

Use of non Everest genuine spare parts.
Risk of premature failure!
Loss of efficiency!

- The exclusive use of EVEREST TURBO genuine spare parts and consumables is recommended for the proper function of the machine and for granting of warranty.
- Commercially available standard parts may be purchased from open market.
- If other parts are required:
  Contact your sales representative for the detailed spare parts and accessory list.

TROUBLESHOOTING

DANGER

Live wires.
Risk of electrical shock!

- Electrical installation work must only be executed by qualified personnel.

CAUTION

Hot surface.
Risk of burns!

- Prior to any action requiring touching the machine, let the machine cool down first

FAULT CHART

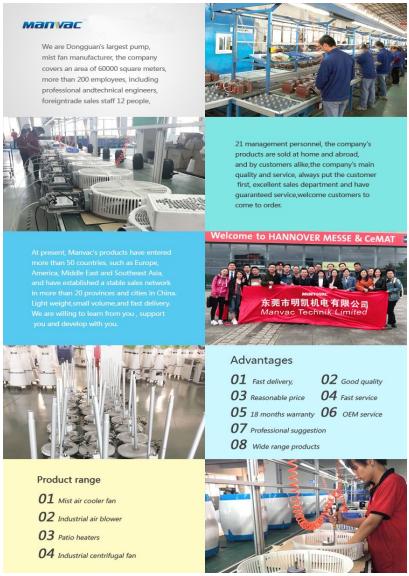
PROBLEM	PROBABLE CAUSE	REMEDY
The machine does not start.	• At least two power supply leads are interrupted • The motor is not supplied with the correct voltage. • The motor is defective.	• Check the fuses, terminals and power supply cables. • Check the power supply. • Repair the machine (contact us).
The machine does not start; humming noise.	• One power supply lead is interrupted • Impeller defective • Impeller is jammed • Bearing on motor side machine side is defective	• Check the fuses, terminals and power supply cables. • Replace impeller. • Open the cover, remove foreign body and clean. • Check the impeller gap. • Replace defective bearing.
Motor protective switch trips when starting the machine. Power consumption is too high.	• Winding short-circuit • Motor overloaded. Throttling does not match specification on rating plate • Compressor is jammed	• Check the winding. • Reduce throttling. • Clean Filters, mufflers and connecting pipes. • See the machine does not start; humming noises.
The machine runs very noisily.	• The machine runs in the wrong direction • Bearing lacking grease • Defective bearings	• Check the direction of rotation. • Relubricate or replace if necessary. • Repair the machine (contact us).

TROUBLESHOOTING

FAULT CHART

PROBLEM	PROBABLE CAUSE	REMEDY
The machine runs with abnormal flow noises.	• The flow speed is too high. • The silencers are soiled.	• Use larger size pipes. • Check silencer inserts, clean or replace if necessary.
The machine does not reach the usual pressure on the suction connection.	• Suction or discharge lines too long or section diameter too small. • The machine runs in the wrong direction. • Different density of conveyed medium • Change in blade profile due to soiling • In case an inlet screen is installed: The inlet screen is partially clogged. • In case a vacuum relief valve is installed: The vacuum relief valve is misadjusted or defective. • In case an inlet filter is installed: The inlet filter cartridge is partially clogged. • Leak in the system. • Internal parts are worn or damaged.	• Use larger diameter or shorter lines. • Seek advice from your local sales representive. • Check the direction of rotation, see wiring diagram Three-Phase Motor. • Take conversion of pressure value into account. Contact us if necessary. • Check the impeller, clean or replace if necessary. • Clean the inlet screen. • Replace the vacuum relief valve. • Replace the inlet filter cartridge. • Repair leak. • Repair the machine (contact us).
The machine runs too hot	• Insufficient cooling. • Ambient temperature too high.	• Remove dust and dirt from the machine. • Observe the permitted ambient temperature.
Compressor leaky.	• Seals on silencer defective • Seals in motor area defecive	• Check silencer seals and replace if necessary. • Check motor seals and replace if necessary.

For the solution of problems not mentioned in the troubleshooting chart contact your sales representative.



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