

Caution

Read Me First Instruction Sheet (English)

1. Introduction

Thank you for purchasing our Double Diaphragm Pump.
For safe storage, transport, installation, operation and service, please read the following information. Also make sure to refer directly to any local laws related to pumps and liquid handling equipment and make sure that this pump is suitable and can be operated safely for your own specific application.

2. Pump & Accessories

Each pump is supplied with its own Name Plate containing important information such as the serial number and manufacturing date. Please do not remove the Name Plate and also record the information separately. Note that the information contained may be necessary for warranty, service or repair. As well as the pump manuals, sometimes special custom or modified pumps will be shipped together with additional documents such as special operation instructions. Please keep any supplied information for reference purposes and be sure to read and understand it before using the pump.

The following is information on how to access the operation manual placed at the link of QR code on the safety manual: 1. Scan the QR code. 2. Choose purchased series. 3. Select a pump purchased. 4. Click "PUMP OPERATION MANUAL". If you cannot access the QR code, download the manual directly or contact your nearest distributor.

3. Pump Transportation

When moving the pump by hand, by crane, forklift, vehicle or other kinds of devices, refer directly to the operating instructions, for details of lift points, handling instructions and safety requirements. Also be sure to follow all local laws & regulations regarding lifting and transporting of heavy equipment. When transporting a pump use specialized lifting or transport equipment to move the pump from place to place and always wear safety shoes and a helmet.

4. Pump Installation

When deciding where to install the pump make sure to carefully plan the pumps installation taking into account all factors that may affect the pumps performance and safety including spill containment and noise pollution etc. Install and operate the pump in a well-lit and ventilated area free from obstructions and away from people.

5. Connecting Pipes & other Ancillary Devices to the Pump

Before connecting any pipes to the pump, make sure that the air compressor is not running and that all compressed air has been bled out of the system. Please follow standard pipe plumbing practices as required by law in your country. Make sure any pipes, fittings or ancillary equipment attached to the pump are correctly fitted, are certified or rated in accordance with the relevant regulations.

Connecting an Airline:

Connect a correct diameter air inlet hose or pipe to the air inlet of the pump. Make sure to tighten the fittings correctly. Use pipe seal tape to ensure a correct seal. For safety purposes always fit an airline ball valve (as supplied) to control the pump. We recommend to use a suitably sized air regulator, filter or lubricator as required, fitted in front of each pump, for increased pump reliability, control, or maintenance. For emergency purposes fit an emergency compressed air cutoff valve in an easily accessible position close to the pump or pumping system.

Connecting a Liquid Inlet:

Connect a correct diameter liquid inlet line, hose or pipe to the liquid inlet of the pump. Make sure to tighten the fittings correctly and torque as necessary. Use pipe seal tape or a gasket as required to ensure a correct seal. Fit a liquid line inlet ball valve as required to control or stop the liquid flow into the pump for maintenance or for emergency's. It is recommended that you use and fit flexible connections between the pump and piping and the pump should not be used as a weight bearing device.

Connecting a Liquid outlet:

Connect a correct diameter liquid outlet line hose or pipe to the liquid outlet of the pump. Make sure to tighten the fittings correctly and torque as necessary. Use pipe seal tape or a gasket as required to ensure a correct seal. We recommend fitting a liquid outlet line drain valve to safely purge the pump of any remaining liquid. A liquid outlet line ball valve can also be fitted to stop or control the liquid flow from the pump for maintenance or for emergency's. It is best to use flexible connections between the pump and piping and the pump should not be used as a weight bearing device.

Connecting the Air exhaust:

Connect the silencer(s) (as included) to the pump exhaust port(s). Note: some model pumps are provided with internal silencers. If required an extra external silencer can also be used.

6. How to Transfer Exhaust Air Away from the Pump.

Remove the silencer(s) from the pump and connect the required length of hose to the exhaust port(s) of the pump. Attach the silencer(s) onto the end of the hose. Always use a hose whose internal diameter is the same as that of the exhaust port. If the length of the hose is 5m (16.4ft) or more, then contact your dealer for advice. Always take care to electrically earth the exhaust pipe with a ground wire.

7. Connecting Ground Wires

For safety reasons be advised that an earth wire is always fitted to the pump to electrically ground the pump to an earth point. Any static electricity generated within the pump will then be safely discharged. When installing an earth wire be sure to connect it to the specified position marked on the pump. Note: Some plastic materials are nonconductive and should not be used to pump flammable liquids or used in explosive environments. The use of such materials could lead to a fire or explosion. Please be sure to refer to your local laws regarding static electricity and the use of such equipment for flammable liquids or for use in explosive environments. For safety an earth wire should also be fitted to any piping and other ancillary equipment used together with the pump.

8. Spill Containment

Due to loss of torque, loosening of the pipe connections or diaphragm failure, any liquid contained with the pump or the piping system may be expelled into the local environment from the pump body or directly through the exhaust. When pumping toxic dangerous or corrosive chemicals it is recommend to place the pump into a pit or make sure there is a spill protection system fitted to the exhaust outlet. It is also recommended to keep the liquid source below the height of the liquid inlet of the pump. This will ensure that any liquid or chemicals will run back down the piping into the liquid tank in such cases as the pump losing it prime with a diaphragm failure. It is also possible to fit leak sensors to stop the pump from running or automatically cut off the liquid and or air supply to the pump if a leak occurs.

9. Turning Pump On and Off

Each pump is shipped with a ball valve as a standard accessory. Fit and use the ball valve in front of the air supply to start or stop the pump. By adjusting this valve it is also possible to control the speed of the pump. By fitting an air regulator on the air supply line it is also possible to limit the supplied air pressure going to the pump. A liquid discharge line ball valve can also be used to start and stop the pump. However with this method the pump will always be primed so if a failure occurs with one of the pumps diaphragms or piping of fittings etc. the pump will run and continue to run until the air supply is turned off or the airline ball valve is closed.

10. Using Pump to Safely Transfer liquids.

When pumping dangerous solutions such as acids, alkalis, toxic chemicals etc. make sure that all precautions are carried out as specified by the manufacturer of the solution and all work place safety or any other laws are adhered to correctly before installing and operation the pump. Wear ear, eye, skin and breathing protection as necessary when handling chemicals or when the pump is in operation.

Each pumps wetted parts, (parts that come into contact with fluid) will be different depending on the pump model. Check the pumps materials of construction and cross reference to a chemical resistance chart to make sure your pumps materials are suited to the solution that is to be pumped. Never use a chemical that is not suited to the materials of construction of a particular pump. By doing so may cause permanent damage to the pump, environmental damage, and possible injury or death.

If the pump is to transfer hazardous materials (flammable, acidic, chemically reactive, environmentally dangerous or high temperature etc.) prepare special safeguards such as placing the pump in a pit or protective box and use appropriate sensors to warn against failure or to stop the pump automatically. Also make sure that appropriate warnings are displayed on the pump and surrounding area and all other necessary safeguards are carried out and enforced.

When pumping dangerous chemicals if a leak occurs take extreme care to safely stop the pump and take effective countermeasures to remedy the problem. From time to time check the pump seals for damage and re torque as necessary.

When repairing transporting or storing the pump be aware that the pump may contain toxic flammable or corrosive chemicals. Take full precautions that all chemicals are handled and disposed of correctly.

If the pump has not been operated for a long period of time, chemicals or solution may still remain inside the pump or the connected piping. Over time this solution may expand or contract depending on the ambient environment (such as freezing and heating), resulting in pump or piping damaged or may cause the liquid to leak from the pump.

If a diaphragm of the pump is damaged, the supplied air can get mixed into the solution or the solution can flow into the air motor section of the pump then take extreme care to safely stop the pump and take effective countermeasures to remedy the problem. If liquid enters into the air motor section and if the chemical resistance of any part of the air motor section is not compatible with the chemical then catastrophic failure of the pump or parts may result. Do not continue to use the pump and take effective countermeasures to remedy the problem and repair the pump as necessary.

Make sure any fluid pipes or containers as well as the pumps exhausted air does not affect or will not affect any persons, animals, facilities or items etc. Compressed air containing oil dirt or other contaminants such as leaking chemicals could be expelled directly from the pump exhaust. Make sure such contaminants do not affect people animals or other equipment. Use breathing or eye protection if necessary or pipe the exhaust away to a safe environment or fit leak containment measures.

Make sure that all precautions are carried out to restrict the possibility of environmental damage or injury or harm that may result. Refer to this sheet and the pump manuals for more information and appropriate protective measures.

11. Pumping Care & Limitations

All pump curve and pump performance calculations provided are created when pumping water at ambient temperature and at sea level.

Check the pumps materials of construction and cross reference to a chemical resistance chart to make sure your pumps materials are suited to the solution that is to be pumped.

The pumps casing and diaphragms have a limited pressure tolerance. Excess air inlet pressure, liquid inlet pressure, vacuum pressure or pressure caused by water hammer etc. can severely affect the life of the parts and can also cause sudden failure. Always operate the pump within the specified pressure tolerances during operation testing or cleaning, and be aware that different pump models and pump materials are rated differently. Refer to the pump operation manuals for more information.

Each pumps materials of construction are rated for different temperature limits. Always operate the pump within the specified temperature limits as specified within the operation manuals. Temperature can also effect the pressure capabilities of each pump and can also effect the pumps ability to keep a torque. When the pump is used to pump very low temperature liquids or when the pump is operated in atmospheric conditions at or below zero degrees Celsius, then special countermeasures must be carried out. The pumps materials of construction including all liquid and air side parts, seals and gaskets must be rated for low temperature operation. The compressed air supplied should be sufficiently dry to reduce the chances of liquid moisture freezing within the pump or around the pumps exhaust ports.

When pumping high temperature liquids or if operated in high temperature environments, then the pumps materials of construction including all liquid and air side parts, seals and gaskets must be rated for high temperature operation.

Pumping liquids containing hard or abrasive solids (abrasive slurry) can quickly damage the pumps internal wetted components. When pumping liquids containing abrasive particles always choose a pump with wetted materials of construction fully suited to high abrasion resistance.

Each pump is limited to the maximum size of liquid particle (slurry size) it can pump. When pumping particles outside of the allowable limit there can be a resulting loss of pumping performance and the particles can cause pump failure or damage to the pumps internal components.

Pumping liquids containing a high volume percentage of liquid solids (high volume slurry) can severely affect the pumps performance and can also lead to damage of the pumps integral components. Always keep liquid solids volume within the allowable percentages and periodically drain flush and clean the pump in such applications especially when stopping pump for a period of time as solids can settle or before restarting the pump.

Each pump is limited to the maximum viscosity it can pump. Pumping high viscosity liquids can severely affect the pump performance. Also the effects of temperature can affect the way pumps handle viscous liquids and a specialized piping system may be necessary.

Certain types of liquids can be effected by pressure heat or physical stress which can cause a change in the physical consistency of the fluid thus resulting in a change to the pumps pumping performance. In such cases please consult with your local distributor directly.

AODD pumps are self-priming and create vacuum pressure within the pump. All liquids have a specific vapor pressure (boiling point) where liquid turns to gas. Due to the vacuum pressure created within the pump liquids can boil and this will greatly affect the ability of the pump from transferring liquid.

The Specific gravity of liquids can affect the pumping performance of the pump. Take care to include the liquids specific gravity when choosing the pump.

The pump may degrade by the environment.

If you have any questions regarding operating the pump, temperature, pressure, chemical, heat, abrasion or viscosity etc., contact your local distributor directly.

12. Pump Seals & Torque Values

Prior to dispatch the pump has been fully torqued. However over time the torque tolerances on all of the parts comprising the pump may loosen. It is recommended that you re torque the pump prior to use and periodically retighten all of the bolts to their specified tolerances. If operating the pump in an environment with large temperature fluctuations, then it may be necessary to re torque the pump more frequently. Please carryout daily visual checks on the pump for leaks or chemical damage and refer to the specific tolerances within the operation or service books. For more information please refer to the torquing procedure and tolerances as specified within the pump manuals.

13. Sound Protection

When operating the pump under normal conditions the noise level may vary depending on the system and operating requirements. Use hearing protection or sound proof the pump as required. Do not remove silencer(s). Turn off pump and de pressurize before transport or service. Pressurized air can cause severe harm to hearing. Refer to local laws regarding ear protection, sound or noise pollution.

14. Compressed Air

Supplied air is under pressure. The use of compressed air can be dangerous and should be controlled and regulated based on local laws or local regulations. When service or repair is required to the pump piping or ancillary equipment then the compressed air should be disconnected and any pressurized air should be either isolated or purged completely from the pump and airlines.

15. Air Supply Requirements

Based on the pump model and size and the required flow rate and head conditions then the air volume and air pressure supplied should be adequate to run the pump. Air pressure losses will occur through pipes and fittings and piping must be sized correctly. Any ancillary equipment if fitted must also be sized to allow to an adequate amount of air volume. The air compressor must be sized correctly taking into account all effects of the pump and piping system. Running more than one piece of equipment from a compressor at the same time or running the pump at the end of a line of air power equipment can severely effect the pumps ability to operate correctly.

Excessive amounts of dirt water or oil can affect the pumps ability to operate correctly and can shorten the life expectancy of the pumps wearing parts. Fit correctly sized filter regulator and or dryer as necessary to ensure an adequate amount of clean and dry air to the pump. Excessive dry air can adversely affect the life of rubber seals used within the air motor. In such applications it is recommended to lubricate the air supply as specified below.

16. Pump Lubrication Requirements

Pumps are shipped without oil or grease lubrication and are generally designed to operate free from lubrication. However under certain circumstances the use of oil lubrication can extend the life of the pumps wearing components.

If the pump is used intermittently it will not require any form of lubrication. However lubrication is recommended if running the pump continuously for long periods of time or if using very dry air, or running the pump at high temperature as doing so can extend the life of the pumps air motor seals.

- High temperature operation : When transferring liquid whose temperature exceeds 158°F (70°C)
- Continuous operation : When the pump operates continuously for longer than 1 hour and is thereafter stopped for less than 15 minutes.
- Lubrication : Use only turbine oil Class I grade oil (equivalent to ISO VG32), under the following Conditions : Oil concentration at 50mg / m3, Absolute pressure at 0.1MPa. Maximum temperature of 68°F (20°C) and Humidity at 65%.

The use of too much oil can affect the operation of the pump. Using the wrong type of lubrication can affect the consistency of the pumps air seals and can cause pump stoppages or failure.

17. Safety when working with and around the pump

Before transporting installing or using the pump make sure you thoroughly understand all of the instructions warning cautions and notes as contained within this document and within the operation and service manuals.

If you have any questions regarding safely transporting installing or operating the pump contact your local distributor directly.

General Cautions & Warnings

- Refer directly to this Read me first instruction sheet and the pump operation and service manuals before installing or operating the pump.
- Always refer to the relevant environmental / workplace and company safety laws before transporting, installing or operating the pump.
- Use specialized lifting / transport equipment to move the pump from place to place.
- Check that pump model, size and materials of construction are fully suited to the process application.
- Install and operate the pump in a well-lit and ventilated area free from obstructions and away from people.
- Always fit a ball valve to the air inlet of the pump and fit an air cutoff valve or air regulator in an easily accessible position.
- Make sure to fit the correct exhaust mufflers and do not remove the muffler as hearing damage or particulate dispersion may result.
- Make sure any fittings or ancillary equipment attached to the pump are correctly fitted, are certified or rated in accordance with the relevant regulations.
- An earth wire should always fitted to the pump to electrically ground the pump to an earth point.
- Fit or use chemical a spill / leak system or countermeasures on or around the pump.
- When pumping dangerous chemicals, position the pump above the liquid source to allow for safe draining in case of a diaphragm failure.
- Always fit a ball valve to the air inlet of the pump and fit an air cutoff valve or air regulator in an easily accessible position.
- The use of an airline filter regulator will greatly improve the pumps internal parts life expectancy.
- Always wear the correct safety equipment including hearing protection, eye protection, breathing protection, safety gloves or safety shoes.
- Follow the relevant handling, storage and safety warnings regarding the chemical to be pumped.
- If a liquid comes into contact with your skin or eyes or are ingested or aspirated it may cause serious of fatal injuries to yourself or to others. Make sure to read and follow the use and safety instructions provided on the liquid containers or data sheets.
- Verify that the chemical to be pumped will be fully compatible with all of the pumps wetted components.
- If liquid or vapor enters into the air motor section any part that is not compatible with the chemical could encounter chemical attack and this could result in catastrophic failure of those parts.
- Fit or use chemical a spill / leak system or countermeasures on or around the pump.
- Take care that the pumps exhausted air is clean and free of oil mist grease dirt or chemical vapors as these may cause damage or harm to people animal's materials or equipment.
- Before commencing pump maintenance or transport, disconnect the compressed air line and purge any remaining air. Remover the liquid inlet and outlet lines. Take care to completely flush any remaining chemicals from the pump and neutralize and dispose of the chemicals as required.
- Prevent the occurrence of a static electricity discharge by specifying pumps constructed out of fully conductive materials and correctly ground the pumps to earth.
- While the pump is operating do not place your hand or any other object near the material inlet or outlet.
- If the pump has not been operated for a long period of time, or you have misgivings about running the pump, please consult with your local distributor directly.
- Verify that the chemical to be pumped will be fully compatible with all of the pumps wetted components.
- Always operate the pump within the specified temperature limits.
- Temperature limits will vary based on pump materials of construction.
- In combination with certain chemicals, temperature limits may be reduced.
- Temperate will affect the pumps ability to withstand pressure. Refer to the pressure temperature correlation curve.
- Do not exceed the maximum allowable air inlet pressure for a specific pump or material of construction.
- Excessive air pressure can lead to premature diaphragm failure.
- Do not operate the pump with excess liquid inlet pressure as this can lead to premature diaphragm failure. Excessive Liquid suction pressure can lead to premature diaphragm failure. Diaphragm materials of constructions will have varied pressure limits.
- Water hammer may damage the pumps components, take measures to prevent this with the use of a pulsation dampener or other such liquid line devices.
- Pumping abrasive solids can lead to premature wear of the pumps internal components. Make sure to use abrasive resistant materials when choosing pump model and oversize the pump & run the pump slowly when possible.
- Solid size, solid volume, viscous liquids, specific gravity, and boiling point can all effect pumping performance.
- Pumps used for mining applications, pumping flammable liquids or used in explosive environments or used for food pharmaceutical or cosmetic applications must be certified to do so.
- AODD pumps create pulsation in the liquid line. A pulsation dampener may be required.
- Re torque bolts prior to operation and re torque periodically.
- Follow torque values as specified for the pump and do not over or under torque and this may lead to leaks or damage to the pump.
- Always torque bolts gradually and evenly. Always following a diagonal tightening pattern.
- Make sure to remove excess weight loading from the pump and use flexible joints when possible.
- Pump operational noise or pressurized air can cause severe harm to hearing. Refer to local laws regarding ear protection, sound or noise pollution.
- Compressed air should be clean and dry and an adequate air supply should be provided to run the pump.
- Running more than one device from the compressor, restricted airline apertures, or multiple joints and elbows etc. can affect the speed and reliability of the pumps operation.
- Our pumps are non-lubricated however in high frequency applications or where the air is very dry, lubrication may lengthen the life of the pumps internal elastomer components.
- Lubrication if applied must be as specified within the pump operation manuals.

Please also refer to the pumps operation & service manuals or contact your local distributor directly if you have any questions regarding the operation or servicing of this pump.