VESTA

Makes life comfortable
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1-Attention Symbols and Warnings

1.1-Attention Symbol

Warning system is the following ATTENTION letter and symbol next to it. In case subjects referred by this symbol are not complied, serious accidents and injuries may occur. Even there may be loss of life as a result of serious accidents. Absolutely read and apply letters (warned) marked with this symbol. When you take these warnings seriously, this may save your life and minimize injury risk.

1.2 -Warnings

User’s Manual booklet gives useful information from use and to installation, from repair to maintenance of pump. The User’s Manual booklet includes information that aims at introducing you features, way of operation and security information of the pump. This manual also includes designed maintenance information to develop secure use of the pump. It is proposed that VESTAPOMP service makes the entire service and maintenance of the pump. VESTAPOMP service shall also provide other assistances and maintenance that may be needed in addition to its superior service and maintenance. The User’s Manual should be considered as an integral part of the pump and you should keep it around you to apply whenever you want. In case these warning are not considered, there may be material damages in the pump or pump equipment.

! CAUTION The User’s Manual booklet includes user and instructions and you should absolutely read it before using diaphragm pump. Manufacturer Company does not accept any responsibility regarding damage of the pump due to improper use.

1.2.1- Equipment Misuse Hazard

- Fluid to be transferred by the diaphragm pump is notified to authorized dealer or main dealer. The dealer determines pump that is compatible for fluid. Consult to VESTAPOMP or authorized dealer before pumping any other fluid than notified fluid transfer.

- Working pressure of the diaphragm pump is (max.) 7 bars. These pressure values should not be exceeded. Otherwise, diaphragm pump may be damaged or is not included within the scope of warranty.

- Use noise preventive ear plugs, protection goggles and gloves while installing the diaphragm pump for the first time or is put into use and as long as it continues to operate.

- While diaphragm pump is in operation and under pressure, do not lift the pump.

- Comply with necessary fire instructions and electricity and security instructions. (Local, National and Regional)

- Do not make any alteration on parts of the diaphragm pump. Use always (OEM) original spare parts.

- If you used flexible hose while installing the diaphragm pump, pay attention not to bend this hose during transfer.

- Hose in suction part should not be flexible during or after installing the diaphragm pump. Flexible hoses may be bended during suction and stop suction.

- Fluid to be transferred by the pump and pump body and elastomer (parts manufactured from rubber) materials should be compatible. If you do not sufficient information whether they are compatible or not, consult to VESTAPOMP or authorized dealer.

- If the Company producing fluid for fluid to be transferred with the diaphragm pump has any warning, please consider these warnings.

- Control diaphragm pump body, its diaphragms and other equipment each day. If any wear and tear is observed, immediately replace the part. When the diaphragm pump stops to operate and removed from line, if there is risk that fluid in it freezes, clean inside with a fluid compatible with this fluid. Otherwise, material freezing in the diaphragm pump may damage the body and diaphragms.

- Do not transfer trichloroethane, methylene chloride, other halogen hydrocarbon solvents or fluids containing such solvents in aluminum equipment that operate under pressure with these pumps. Use of these fluids may cause chemical reaction and their explosion possibility is high.

- Compliance of fluid to be transferred with pump body and elastomer parts should be determined while selecting diaphragm pump. Under improper situations, pump may be damaged, even there may be injury and death risk. If fluid to be transferred and pump body is improper, the Manufacturer Company is not responsible for all the damages that may occur in case VESTAPOMP did not make this selection.

- Make diaphragm pump connections at original inlet and outlet size. When inlet and outlet sizes are changed or are made smaller, the pump may be damaged and some parts become deformed. In case of this situation, the Manufacturer Company is not responsible for malfunctions and part losses in the pump and pump malfunctions shall not be included within the scope of warranty.
1.2.2- Toxic Fluid Hazard

If toxic fluid or fume contacts with eyes or any part of the body during transfer, there may be permanent damages and may cause death risk. Therefore;

- You should know features of the fluid to be transferred with the diaphragm pump. Take precautions preventing contact of toxic or harmful fluid with environment in parallel with this information.

- Do not move, remove and remove when the diaphragm pump is under pressure in dangerous and toxic fluid transfers.

- Keep dangerous fluid in approved container that fluid will not damage.

- Approach fluid transferred next to diaphragm pump in toxic and dangerous fluid transfers with compatible protective apron, clothes, gloves, goggles and mask.

- Notify absolutely that pumps sent to VESTAPOMP and authorized dealer for repair make toxic or dangerous fluid transfer.

- Relieve exhaust air (pressure outlet) of the pumps making toxic fluid transfer to areas that will not damage anything. When diaphragms are exploded, toxic fluid or gas in the pump shall be taken out from pressure outlet.

- Make pipe connections of the pump to which dangerous fluid shall be transferred in a controlled manner.

- Clean these fluids with the fluids that can clean them before transferring toxic, acid and explosive fluids beforehand and empty fluid in the pump.

- These marks were attached on them while dispatching the pump.

1.2.3- Fire and Explosion Hazard

Installation in non-ventilated environments and proper grounding of the pumps that are used in transfer of fluids having fire and explosion danger may cause dangerous situations. In this case, there may be serious injuries or even deaths.

- The pumps transferring inflammable and flammable fluids should be grounded against static electricity. (See Figure 4)

- Do not transfer non-conductor inflammable fluids with non-conductor pump body materials (Polypropylene, PVDF).

- If you encounter any electric shock or sparks while using the pump and equipment, stop the pump. Do not operate the pump without being sure that problem was resolved.

- If fluid transfer is made to the diaphragm pump and it is in a closed environment, ventilate the environment.

- Carry air outlet to a secure environment with pipe. In case of diaphragm explosion, since flammable material will move out with pressurized air, some accidents will be prevented. (See Figure 3)

- Do not smoke in an area where pump is installed and do not use lighter, do not weld.

- The pipe, connected to suction line during inflammable and explosive fluid transfer in diaphragm pump, should not be flexible. Otherwise, vacuum created by the diaphragm pump during suction may cause that pipe bends and it may also stop fluid suction. Besides, there may be tears in the pipe whose surfaces stick together due to vacuum. These tears may cause that inflammable and explosive fluid leaks outside.

- Use protective clothes, protective goggles and face mask in installation or repair of the pump making inflammable and explosive fluid transfer.

- Take necessary safety precautions when inflammable and explosive fluid transfer will be made with the diaphragm pump or transfer fluid temperature is 80°C and above.

CAUTION The pump is delivered to user without equipment. The user is obliged to supply protective equipment and transfer equipment.

CAUTION Internal parts of the pumps sent to the Manufacturer Company or authorized dealer for service should be emptied in a way not to damage environment and package. The Manufacturer or authorized dealer should be notified about fluid when pumps via which dangerous, explosive, and inflammable fluid hazardous on human health is transferred. The Company using pump is responsible for injuries and even deaths that may occur.
2-Installation
2.1- General Information
Installation of the diaphragm pump is easy. However, if installation characteristics recommended by the Manufacturer Company are considered, working life of the pump shall be long and have high efficiency. (See Figure 1).

It should be paid attention that there is no leak and flow from thread connections when air or fluid connection components (hoses, pipes, fittings material and etc.) are interconnected while installing the diaphragm pump. All connection components should be pressurized well. If necessary, fluid seal should be used.

- All bolt and nut connections should be controlled before installing the diaphragm pump and it necessary it should be re-tightened. There may be loosening in these connections due to vibrations that the pump suffered during carrying.

- If there is pressure difference more than 25% between air pressure entering in the diaphragm pump and outgoing fluid pressure, the pump operates inefficiently. Transferred fluid is very dense. This situation may be prevented by increasing weights of balls used as check valve or by using stainless steel marbles.

- Rubber wedge should be placed under pump stands in a place where installation is made while installing the diaphragm pump. This is recommended by the Manufacturer Company. Rubber wedge decreases tensions to pump, prevents dissolution of bolts from vibration and also prevents material fatigue.

- Diaphragm pump installation should be made to fluid to be transferred at a close distance as far as possible.

- Suction line length and fittings number should be kept at a minimum during installation.

- Diameter of suction line of the installed pump should not be decreased to smaller diameters.

- If pipe line is not flexible in a place where diaphragm pump was installed, flexible hose should be positioned between pipe line and pump.

- Our exproof pumps with ATEX Certification are suitable for use in explosive atmospheres.

The following (Figure 1) installation type is to give User Company enlightening information about how installation should be made and to guide. Consult to VESTAPOMP or authorized dealer for more information and document.

1- Add Pump
2- Fluid Relieve Valve
3- Fluid Shutoff Valve
4- Grounded, Flexible Fluid Outlet Line
5- Manometer
6- Rubber Wedge
7- Ball Valve (to control air flow)
8- Manometer (air pressure measurement)
9- Air Filter / Regulator Assembly
10- Air Supply Line
11- Fluid Section Grounding Via Grounding Strip or Grounding Screw (Required for Metal and Acetal Pumps)
12- Grounding Wire
13- Fluid Drain Valve (Required)
2.1.1- Secure Operation Temperature for body

<table>
<thead>
<tr>
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<th>Temperature</th>
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<td>Aluminium</td>
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<td>Stainless Steel</td>
<td>85°C</td>
</tr>
<tr>
<td>PVDF</td>
<td>85°C</td>
</tr>
<tr>
<td>Cast Iron</td>
<td>85°C</td>
</tr>
<tr>
<td>Glass Fiber Reinforced Polypropylene</td>
<td>85°C</td>
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<tr>
<td>Sheet Stainless Steel</td>
<td>85°C</td>
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</table>

2.1.2- Secure Operation Temperature for Elastomer Parts

<table>
<thead>
<tr>
<th>Material</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neoprene</td>
<td>80°C - 23°C</td>
</tr>
<tr>
<td>Buna-n</td>
<td>80°C - 23°C</td>
</tr>
<tr>
<td>EPDM</td>
<td>85°C - 23°C</td>
</tr>
<tr>
<td>PTFE</td>
<td>85°C - 37°C</td>
</tr>
<tr>
<td>Viton</td>
<td>85°C - 0°C</td>
</tr>
<tr>
<td>Santoprene</td>
<td>85°C - 23°C</td>
</tr>
</tbody>
</table>

**CAUTION**

Temperature values of materials whose operation temperatures are given above are stated by considering use conditions of the diaphragm pump

2.2- Air Line

Pressure from the air line connected to the pump should not exceed 7 bar. Install the air line with a pipe that will not have less size than the connection size so that the pump operates at demanded efficiency. Air line connection size is 1/4 in VP 02 type pump. Install air line of the pump as shown in Figure 1. Pay attention that air line between the master air line and pump is flexible. Place a cut-off valve (ball valve) before the air line coming to the pump. Close air inlet from this valve when necessary or if pump air is cut off.

- Make air line connection as shown in Figure 1. Connect accessories to the wall or to a fixed place. Make sure that air line conducts electricity.

- Place conditioner (air regulator) before air line of the diaphragm pump. Water in pressurized air line may cause frosting or outlet air freezing. This may cause that pump operates in an unbalanced way or it stops completely. Moisture and water in the pressurized air from the compressor may be decreased by being used with water retainer that may be used in addition to air drying unit of user. This will prevent that polluted air enters in this pump. Besides, it will decrease or prevent freezing in outlet line by keeping a sum of water within line.

- Open air valve approximately between 1/2 and 3/4 to operate the pump. After the pump operates, air flow may be given to air valve at demanded degree. If valve opening increases change frequency but does not increase flow speed, it means that fluid formed a cavitation within suction line. In this case, air coming to valve is decreased and the pump is activated slowly. Thus, cavitation is prevented.

- Fluid flow in the diaphragm pump is controlled in two ways either by controlling pressurized air line entering in the pump with a pressure regulator, ball valve or solenoid valve or by controlling fluid outlet line of the pump with a pressure regulator, ball valve or solenoid valve.
2.3- Suction Line
Connection of the pump to master suction line after suction nozzle should be made with flexible hoses. This situation prevents that some parts of the pump are broken during knocking and that bolts are loosened.

- Place cut-off valve before the suction line during installation of the pump. The valve shall provide that pump is removed easily at repair and maintenance times.

- You can observe whether there is regular fluid flow in section line of the pump or not via manometer placed on the line.

- Flexible and master line pipes to be connected to suction line should be conductive. Ground the pipes if you did not use conductive pipes.

- Diaphragm life becomes shorter in fluid inlet pressure higher than 1 bar. The most distinct characteristic of this is that diaphragm life of the diaphragm pumps connected under high tonnage tanks is short due to tank pressure.

- The suction is from the bottom by construction in top check valve diaphragm pumps.

2.4- Compression Line
Compression line should be connected to master line with a flexible hose just like suction line so that pipes in the pump are not exposed to knocking, bolts are not dissolved and pump parts are not damaged.

- Place ball cut-off valve before the compression line in a way to be close to the pump. (See Figure 1)

- Place manometer before the compression line to be able to read the pressure. (See Figure 1)

- Flexible and master line pipes to be connected to suction line should be conductive. Ground the pipes if you did not use conductive pipes. (See Figure 1)

- Place fluid Relieve valve or valve to be able to Relieve pressure on the compression line. This valve prevents that harmful fluids are splashed to eyes or skin during Relieve of fluid. It prevents serious injuries. These injuries may cause death.

2.5- Relieve Valve for Fluid Pressure
Expansion of the fluid in compression line by getting heated causes increase of pressure within the line. This situation can be observed in long compression lines with sun effect or environmental factors. Besides, this may occur when valves do not perform their duties in high pressure pumps supported with the diaphragm pump. In these cases, it is recommended to set up pressure relief mechanism as it is seen in Figure 2 (by-pass line).

- Do not tighten connection parts with excessive specified torque during installation. This situation may damage the pump.

![FIGURE 2](image)
2.7- Grounding

**CAUTION** Diaphragm Pump should be grounded against the static electricity.

Ground the diaphragm pump as shown below (Figure 4). Surfaces that contact with fluid in the diaphragm pump should be grounded with metal stainless wire or power cable. Suction and compression lines should be selected from the conductive materials while transferring inflammable and explosive fluids. Grounding should be made just like in the pump in two lines. Do not use nonconductive polypropylene and PVDF bodies in inflammable and explosive fluid transfer.

All equipment should be grounded to prevent sparks and fires that may occur due to static electricity and to decrease risks (pump, air and fluid hoses, air compressor, inflammable matter buckets, fluid supply container and etc.).

- Clips should be also grounded in clip type pumps.
- Fluid pressures should be less than $2 \times 10^{12}$ ohm centimeters in the diaphragm pumps.

**CAUTION** Grounding cable section should be minimum 6,5 mm in Exproof pumps. Besides, HFFR (Halogen free flame retardant) cable should be used instead of standard cable. Place to which cable to be used in the pump will be connected was stated with a special mark on the pump. The customer supplies this cable.

![Figure 3](image1)

**FIGURE 3**

A - Muffler
B - Electrically Conductive Air Exhaust Hose
C - Container For Remote Air Exhaust

![Figure 4](image2)

**FIGURE 4**

A - AODD Pump
B - Fluid Relief Valve
C - Fluid Drain Line
D - Grounding Strip (Grounding Screw)
E - Container Grounding Cable
2.8- Washing and Cleaning the Pump
The diaphragm pump to be installed was exposed to pressure and leakage test with water by the Manufacturer Company. If any food product will be transferred with this pump or any fluid transfer to react will be made in case of contact with water, wash the pump with a compatible solvent or compatible fluid before commissioning the pump.

2.9- Commissioning of the Pump
Connection of the diaphragm pump is very easy. The fluid is absorbed inside the pump from the bottom inlet pipe having suction nozzle and transfer fluid is pressed to outside from the pump from top outlet pipe having pressure nozzle. Diaphragm pumps have a knocking flow. One of the ways to prevent knocking flow is to install flexible hose before inlet and outlet line of the pump in installation place. Another flow regulation is to place damping volume (balance tank, tranquilizer) before the compression line. Manometer and valves are placed to inlet and outlet line to determine pressure values that may occur in inlet and outlet of the pump and to be able to make flow adjustments. When one valve or both valves are closed, the pump does not operate. When both valves are opened, the diaphragm pump continues to operate. The diaphragm pump is not damaged in the meantime.

Pressurized air is needed so that diaphragm pump operates. Air inlet hose should have the same diameter with air inlet line so that the pump operated with full capacity. It is recommended by the Manufacturer Company to place conditioner before the air inlet line. The conditioner controls pressure adjustments and lubricates air diverter valve. Fluid flow rate is adjusted by controlling air flow with valve to be placed before the air inlet line.

Subjects to be considered while installing the diaphragm pump:
- The diaphragm pump should be close to fluid to be transferred as much as possible.
- Suction line length and elbow number in the suction line should be kept minimum as much as possible.
- Inlet-outlet dimension of the diaphragm pump should not be different from connection size in a place where installation was made.

- Pipe connections should be made flexible in a place where the diaphragm pump was installed.
- If the pump does not pull when it is operated, it means cavitation occurred.

Cavitation causes that diaphragm life becomes shorter. Control suction height. Do not operate the pump fast, control suction line diameter. They may cause cavitation.

Control all threaded connections and air connections against leakage and leaks during first commissioning of the pump. If there is any leak, its entering in inflammable, explosive or acidic fluid environment may constitute risk. Damping tanks should be used to prevent knocking in the pipe line in long push distances.

2.10- Pressure Equipment Relief
The pump and equipment are under pressure until pressure in the pump is relieved. While the pump is at this stage, the user may be damaged from material to be sprayed, poured or splashed accidentally from the pump or equipment. Apply pressure relief procedure to decrease damage and risks that may be occurred.

How should it be made?
- Close the air line entering in the pump from the valve. Open air pressure relief valve for relieving pressure air remaining between air line valve and pump.
- Close the valve in the push line. Open the valve by opening a compatible container under fluid pressure relief valve. Empty remaining fluid in the container. Remove outlet hose from the pump.

How is the fluid remaining in the pump emptied?
- Wear clothes compatible for fluid transferred by the pump.
- Close valve, if any, in suction part of the pump.
- Use a compatible container to keep the fluid that will flow or drop from the suction hose.
- Remove the suction hose from suction nozzle. Remove it if it is connected to ground (Figure 5)
3-OPERATION
3.1 Technical Information
3.1.1- Performance Curve and Pump Figure

- There may be loss of 25% in pumps whose diaphragm is teflon. The reason is that no supportive diaphragm is used behind teflon diaphragm in the pump. Increase of total hardness in used diaphragm and decrease of pump efficiency.
3.1.2- Pump Type Coding

<table>
<thead>
<tr>
<th>Pump Size</th>
<th>Body Material</th>
<th>Elastomers</th>
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</thead>
<tbody>
<tr>
<td>02</td>
<td>Aluminium</td>
<td>PVDF</td>
</tr>
<tr>
<td>05</td>
<td>Cast Iron</td>
<td>PVDF</td>
</tr>
<tr>
<td>10</td>
<td>Precision Casting</td>
<td>PVDF</td>
</tr>
<tr>
<td>15</td>
<td>Stainless Steel</td>
<td>PVDF</td>
</tr>
<tr>
<td>20</td>
<td>Polypropylene</td>
<td>PVDF</td>
</tr>
<tr>
<td>30</td>
<td>PVDF</td>
<td>PVDF</td>
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</table>

3.1.3- Spare Part Type Coding

<table>
<thead>
<tr>
<th>Elastomers</th>
<th>Pump Size</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neoprene</td>
<td>02</td>
<td>¼&quot;</td>
</tr>
<tr>
<td>Santoprene</td>
<td>05</td>
<td>¾&quot;</td>
</tr>
<tr>
<td>Buna - N</td>
<td>10</td>
<td>1&quot;</td>
</tr>
<tr>
<td>EPDM</td>
<td>15</td>
<td>1½&quot;</td>
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<td>PTFE</td>
<td>20</td>
<td>2&quot;</td>
</tr>
<tr>
<td>FKM</td>
<td>30</td>
<td>3&quot;</td>
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</table>

3.1.4- Technical Specifications of the Pump

- Max. Capacity: 16 lt/min.
- Fluid Inlet-Outlet: ¼"
- Max Fluid Outlet Pressure: 7 bar
- Pump Head (max): 70 m
- Body Material: Polypropylene, PVDF
- Diaphragm Options: Santoprene, Neoprene, Buna - N, EPDM, PTFE, FKM
- Top Options: Santoprene, Neoprene, Buna - N, EPDM, PTFE, FKM, Stainless Steel, Steel
- Ball Socket Options: Santoprene, PTFE
- Air inlet Size: ¼"
- Solid particle Permeability Size: 1 mm
- Dry Suction Depth: 1 m - 1.5 m
- Air Pressure (Min,Max.): 1-7 bar
- Working Temperature: -18 °C and 100 °C
- Noise Level: 70 dB
- Flow in a stroke: 0.07 lt/min.

* Our expproof pumps with ATEX Certification are suitable for use in explosive atmospheres.
### 3.1.5- Pump Scaling with Plastic Body

Plastic Body

### 3.1.6- Packaging Sizes and Weights

As it is seen in the following figure, the diaphragm pump is connected to pump fixing board from its stands via bolt and nut. Lean of the pump is prevented during transport.

Scaling with Plastic Body

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
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<tbody>
<tr>
<td>212</td>
<td>70</td>
<td>87</td>
<td>186</td>
<td>190</td>
<td>140</td>
<td>157</td>
<td>180</td>
<td>80</td>
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</tbody>
</table>

- **Pump Weight**: 1.650 gr
- **Package Weight**: 250 gr
- **Gross Weight**: 1.900 gr

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>190</td>
<td>150</td>
<td>230</td>
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### VP02 PLASTIC BODY PUMP PART LIST

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<th>DESCRIPTION</th>
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<td>SUCTION LINE</td>
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<td>CHAMBER OUTHER</td>
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<td>S30234</td>
<td>CHAMBER OUTHER</td>
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<td>SM6-P CAPSCREW HEX HEAD M6x15 LONG</td>
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<td>BALL CHECK</td>
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<td>S040246</td>
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<td>SM6 CAPSCREW HEX HEAD M6x15</td>
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<tr>
<td>6</td>
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<td>4</td>
<td>S050235</td>
<td>BALL SEAT</td>
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<tr>
<td>6A</td>
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<td>GASKET BALL SEAT</td>
<td>8</td>
<td>S050246</td>
<td>BALL CHECK</td>
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<td>7</td>
<td>S060245</td>
<td>DIAPHRAGM</td>
<td>2</td>
<td>S060246</td>
<td>DIAPHRAGM</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>H060233B</td>
<td>CAP, AIR INLET EXHAUST</td>
<td>1</td>
<td>S100233</td>
<td>BUMPER</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>H030233B</td>
<td>AIR VALVE BODY</td>
<td>1</td>
<td>S120290</td>
<td>RING RETAINING, FOR PILOT VALVE</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>S130233</td>
<td>BUMPER</td>
<td>2</td>
<td>H070233B</td>
<td>CAP, AIR INLET</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
4- MAINTENANCE

If fluid to be transferred before starting pump maintenance has freezing and drying characteristic, it should be cleaned with proper cleaning fluid. Otherwise, pump maintenance will be more expensive and difficult. Control bolt connections in each use. Tighten loose connections with key. Replace necessary connections.

4.1 – Diaphragm Maintenance

4.1.1- Removal of the Diaphragm

Remove external diaphragm faster by turning it counter-clockwise via use of 12 socket wrench to remove diaphragm group from diaphragm shaft. One of the diaphragm shall be removed with internal and external diaphragm fastener and the other shall be removed in a way to be connected to shaft. Firstly, connect the internal diaphragm fastener to clamp to remove the diaphragm between internal and external diaphragm fastener and tighten it, and remove it by turning it counter-clockwise via use of 12 socket wrench.

Fasten the shaft connected to other diaphragm to the clamp loosely and remove it via use of wrench. Repeat the same operation to remove other diaphragm. Control the diaphragm for cut, puncture, wear and chemical exposure.

4.1.2- Installation of the Diaphragm

Fasten external diaphragm to fastener and push from central hole of the diaphragm to inside. Tighten the internal diaphragm to the shaft clockwise by installing bolt. Re-install loose group to the clamp. Tighten diaphragm group with 12 socket wrench.

4.1.3- Installation of the Diaphragms to the Pump

Make sure that ram was installed on the diaphragm shaft. Tighten a diaphragm group shaft until it comes to same line with shaft end of internal diaphragm plate to threaded hole on diaphragm end clockwise. Install the shaft to the pump. Align bolt holes in the diaphragm with bolt holes of internal chamber. Connect external chamber to the pump by using bolt and nut.

Pull diaphragm shaft from other side of pump as well as that it comes. Make sure that ram is installed on diaphragm shaft. Tighten open shaft of the diaphragm group to the diaphragm shaft clockwise as much as possible and leave a blank in a way to make adjustment so that bolt holes in the diaphragm coincides with internal chamber bolt holes.

Install suction and push lines to the pump by using bolt, nut and washer. Connect the suction and push lines to the pump by using bolt, nut and washer. The pump is ready to be re-fastened and used.

---

<table>
<thead>
<tr>
<th>Line</th>
<th>Part No</th>
<th>Part Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>H010233B</td>
<td>Main Body</td>
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<tr>
<td>21</td>
<td>H160247</td>
<td>Oil Seal</td>
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<td>10</td>
<td>S130233</td>
<td>Bumper</td>
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<td>H150232</td>
<td>Srod, Diaphragm</td>
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<td>17</td>
<td>H130230</td>
<td>Plate, Inner, Diaphragm</td>
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<td>7</td>
<td>S0602XX</td>
<td>Diaphragm</td>
</tr>
<tr>
<td>18</td>
<td>S070233</td>
<td>Plate, Outer Diaphragm</td>
</tr>
</tbody>
</table>
4.2– Air Valve Kit Types and Maintenance
Air valves are lubricated with special greases in the factory so that there is no additional lubrication requirement. If additional lubrication is demanded, air valve connected to the pump is removed in 1 or 2 weeks. Machine oil is added to inside 4-5 times with an oil feeder.

H030233B Air Valve Repair Kit

**AIR VALVE (PLASTIC BODY) REPAIR KIT PART LIST**

<table>
<thead>
<tr>
<th>Line</th>
<th>Part No</th>
<th>Part Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>H550233</td>
<td>Air Valve Body</td>
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<tr>
<td>9A</td>
<td>H720270</td>
<td>Air Valve Body</td>
</tr>
<tr>
<td>9B</td>
<td>H710270</td>
<td>Sleeve, Air Valve</td>
</tr>
<tr>
<td>9C</td>
<td>H579047</td>
<td>Orings, Air Valve</td>
</tr>
<tr>
<td>9D</td>
<td>H580233</td>
<td>Cap, End</td>
</tr>
<tr>
<td>9E</td>
<td>H509090</td>
<td>Ring, Retaining</td>
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</tbody>
</table>

H590232 Sleeve - Spool Set

**CASE PISTON REPAIT KIT PART LIST**

<table>
<thead>
<tr>
<th>Line</th>
<th>Part No</th>
<th>Part Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>9A</td>
<td>H720270</td>
<td>Spool, Air Valve</td>
</tr>
<tr>
<td>9B</td>
<td>H710270</td>
<td>Sleeve, Air Valve</td>
</tr>
</tbody>
</table>

**CAUTION** Do not lubricate the pump excessively while making extra lubrication. This situation may cause pollution around and even malfunction.

4.3– Pilot Valve Repair Kit Types and Maintenance
Close suction and push line of the pump before starting valve maintenance. Cut pressure air inlet and relieve pressure in the pump. Relieve fluid in the pump.

H040233B Pilot Valve Repair Kit

**PILOT VALVE REPAIR KIT PART LIST**

<table>
<thead>
<tr>
<th>Line</th>
<th>Part No</th>
<th>Part Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>H010233B</td>
<td>Main Body</td>
</tr>
<tr>
<td>11</td>
<td>S120290</td>
<td>Ring Retaining, for Pilot Valve</td>
</tr>
<tr>
<td>16</td>
<td>H470247</td>
<td>Orings, for Pilot Valve Case</td>
</tr>
<tr>
<td>19</td>
<td>H460230</td>
<td>Sleeve, for Pilot Valve</td>
</tr>
<tr>
<td>23</td>
<td>H480232</td>
<td>Spool, Pilot Valve</td>
</tr>
</tbody>
</table>

See pump installation figures.
Remove four bolts by using wrench or socket. Remove air inlet cover and air inlet gasket. Pilot valve group can be removed for control and maintenance. You can remove pilot valve kit before removing the pump completely.

Remove pilot valve piston. Clean and control piston and o-rings for dirt, cut and wear. When necessary, replace o-rings and piston with new ones. Remove the segment from case end and case from the valve body and clean. Control case and o-rings for dirt, cut and wear. When necessary, replace o-rings and case with new ones.

Lubricate external surface and o-rings of the case abundantly. Then place the case in valve body carefully. PAY ATTENTION that o-rings are not cut while placing the case. Install the segments in case. Lubricate external surface and o-rings of the case abundantly. Then place the case in valve body carefully. PAY ATTENTION that o-rings are not cut while placing the case.
Pay attention that pilot valve ends are adjusted between piston pins while reinstalling pilot valve group to intermediate space gap. Reinstall gasket, air inlet cover and bolts. Connect air inlet to the pump. The pump is ready to be used.

4.4– Plastic Body Pump Check Valve Maintenance
Close suction and push line of the pumps before starting check valve maintenance. Cut pressure air inlet and relieve pressure in the pump. Relieve fluid in the pump. Remove the bolts in fluid inlet and fluid Outlet lines in section shown in the figure and achieve ball valve. Control tear, wear and cuts that may occur in global surface of the balls. Ball slots should be controlled in terms of potential materials adherent on internal and external surfaces for cut and wear. Ball surfaces should be placed completely on surfaces of the ball slots. This situation affects pump efficiency. When necessary, replace wearing or damaged parts. Regroup check valve parts.

---

### PILOT VALVE REPAIR KIT PART LIST

<table>
<thead>
<tr>
<th>Line</th>
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<tr>
<td>1A</td>
<td>S260233</td>
<td>Elbow, Suction</td>
</tr>
<tr>
<td>6A</td>
<td>S260233</td>
<td>Elbow, Suction</td>
</tr>
<tr>
<td>6A</td>
<td>S080246</td>
<td>Gasket, Ball, Seat</td>
</tr>
<tr>
<td>5</td>
<td>S0502xx</td>
<td>Ball Seat</td>
</tr>
<tr>
<td>5</td>
<td>S0402xx</td>
<td>Ball, Check</td>
</tr>
<tr>
<td>4</td>
<td>S030233</td>
<td>Chamber Outher</td>
</tr>
<tr>
<td>2A</td>
<td>S600233</td>
<td>Chamber Outher</td>
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<tr>
<td>2A</td>
<td>S600235</td>
<td>Elbow, Discharge</td>
</tr>
<tr>
<td>6</td>
<td>S600235</td>
<td>Elbow, Discharge</td>
</tr>
</tbody>
</table>

---

**CAUTION** Feeder in external cover and Outlet manifolds should be controlled in abrasive fluid transfers during ball valve change. This may wear fluid feeders and cause that balls are ruptured.
## 4.6- PROBLEMS THAT MAY OCCUR IN THE PUMP AND THEIR SOLUTIONS

<table>
<thead>
<tr>
<th>Problem Description</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>If pressure air comes to the pump and pump does not operate, air directly gets out from the exhaust.</td>
<td>The case piston may be stuck. Air coming to the pump should be clean. Remove and clean air valve</td>
</tr>
<tr>
<td>If the pump operates but does not suction</td>
<td>Parts may be pressurized between ball and ball slot. Clean ball valves especially in suction section.</td>
</tr>
<tr>
<td>If the pump operates but fluid capacity is low</td>
<td>Air coming from the compressor may be less. Ball and ball slots may be abraded. Control and if necessary replace with the new ones.</td>
</tr>
<tr>
<td>If pump transfer is unbalanced</td>
<td>Pilot valve may be malfunctioned Replace with the new one</td>
</tr>
<tr>
<td>If there are bubbles in fluid coming from the pump</td>
<td>Suction line may be loose Compress Diaphragm may be perforated Replace Diaphragm retainers may be loose Compress</td>
</tr>
<tr>
<td>If liquid comes from the exhaust air</td>
<td>Diaphragm may be perforated Replace Diaphragm retainers may be loose Compress Compressor air is excessively moist Clean compressor tank</td>
</tr>
</tbody>
</table>
5- WARRANTY CONDITIONS

VESTAPOMP gives warranty to remove material and workmanship defects arising from production as of the date when pumps with VESTAPOMP brand that it produces are sold to final user. This warranty applies only when the equipment is installed, operated and maintained in accordance with VESTAPOMP's written recommendations.

This warranty does not include general wear and tear and VESTAPOMP general wear and tear or faulty installation, faulty application, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, unconscious maintenance or equipment not included within warranty of VESTAPOMP: (hoses, connection components, pneumatic regulator,) diaphragms having consumables, check valve balls, ball slots and all the bolts (o-ring, z-ring) are not within the scope of warranty.

It does not give any warranty for accessories and equipment which are sold by VESTAPOMP but not produced by it and rejects warranties fitting for all old merchantability and a definite purpose.

In no event, VESTAPOMP accepts any compensation, loss, damage and injury responsibility under no circumstances, does not accept any responsibility, liability, cost or expenditure that are directly or indirectly related to or occur due to use or non-functionality of any product or VESTAPOMP does not accept any responsibility or liability regarding direct, special, criminal or successive results including but not limited to sales loss, profit loss, pumped material loss, work slowdown, production loss, contract loss, reputation or good will injury whether VESTAPOMP is aware of or notified about potential damages.

This warranty is conditioned upon sending the pump inner as completely emptied and cleaned in a way not to damage the environment and package by paying transportation fee to VESTAPOMP or authorized distributor to verify equipment stated to be defective and notified malfunction.

Equipment shall be returned to final user as prepaid transportation fee. If there is no material or labor fault as a result of equipment examination, repair operation shall be made against a reasonable price that may include part, labor and transport costs.

VESTAPOMP web site, introduction marketing and technical literature and declarations and data on materials are not intentional for defining performance under real use conditions of any product or at a time when it was used in special applications, they do not define warranty, and these declarations and data should not relied in determination of compliance of the products for performance or special applications under real use conditions.

All decisions on inefficiency reason depend only on VESTAPOMP’s determination. Prior approval should be received from VESTAPOMP to give back any product so as to make evaluation on scope of the warranty.

In any case, VESTAPOMP responsibility regarding any single product shall be limited to original price paid for the product.

No VESTAPOMP authorized distributor or any other person is authorized to make any amendment on product warranty and expose VESTAPOMP apart from those submitted here expressly to any responsibility or liability.

Extended Product Warranty
Pumps, produced with VESTAPOMP brand, are warranted against labor and fabrication faults for 2 years as of invoice date.

Repair period of the pumps is 20 business days, our Company is not responsible for the products not delivered within 60 days. Period elapsed in repair is within the warranty period. In case of conflict, consumer has liability to prove.

5 years: VESTAPOMP gives warranty on spare part and labor supply.
5-10 years: VESTAPOMP gives only warranty on supplying spare part.

All written and visual data in this document reflect last product information current while they were printed. VESTAPOMP reserves the right to make amendment without making prior notification at any time.

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