



# SFP Spin-On Filter Panel

Flow rates available up to 11 GPM

# OPERATORS MANUAL

Flow rates available up to 11 GPM



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## 1. GENERAL INFORMATION

The **SFP Spin-On Filter Panel** is designed to filter oil to meet or exceed new oil cleanliness specifications. The system is designed to remove particulate contamination from a wide variety of oils, and it is typically equipped with high-efficiency filter elements made from pleated microglass media rated **Beta x(c)  $\geq$  1000 Per ISO 16889**, meaning that 99.9% of all particles "x" micron and larger are removed in one pass.

The oil is drawn from an existing reservoir to the filtration system by means of a self-priming positive displacement gear pump. The oil passes through the filter housing before being discharged to the outlet, at which point it is pumped back to the existing reservoir.

**Medium weight hydraulic hoses** may be provided with the unit. If supplying your own hoses, please make sure they meet the flow rate and pressure rating for the system.





## 2. STANDARD FEATURES

Features	Advantages	Results
<b>Differential Pressure Indicators</b>	<ul style="list-style-type: none"><li>• Precise Filter Life Indication</li></ul>	<ul style="list-style-type: none"><li>• Less Filter Waste</li><li>• Reduced Filter Costs</li></ul>
<b>Positive Displacement Pump</b>	<ul style="list-style-type: none"><li>• No Need to Prime System</li></ul>	<ul style="list-style-type: none"><li>• Less Operator Labor</li><li>• No Additional Equipment Required</li></ul>
<b>Powder Coated Panel with Drip Pan</b>	<ul style="list-style-type: none"><li>• Strong</li><li>• Minimize Spills</li></ul>	<ul style="list-style-type: none"><li>• Durable, Long Lasting</li><li>• Easy to Attach</li></ul>
<b>In-Line Sample Port Valves</b>	<ul style="list-style-type: none"><li>• Quick and Easy Oil Sampling</li></ul>	<ul style="list-style-type: none"><li>• Durable, Long-Lasting</li></ul>
<b>Inlet Strainer</b>	Protects Pump from Large Particles	<ul style="list-style-type: none"><li>• Longer Pump Life</li></ul>
<b>Small, Compact Design</b>	Perfect use in tight, confined spaces	<ul style="list-style-type: none"><li>• Small Footprint</li></ul>



## 3. MODEL CODE

Model Number: SFP075-5-**-**-S		
Classification	Code	Description
Product Type	SFP	Handheld Mobile Filter Unit
Connection Size	075	1/2" FPT Inlet and Outlet
Flow Rate	11 GPM	Flow rates available up to 11 GPM
1st Stage Filter Element	**	Micron Rating - Beta [c] ≥ 1000 @ 99.9%
2nd Stage Filter Element	**	Micron Rating - Beta [c] ≥ 1000 @ 99.9%
Seal Material	*	Buna-N or Viton®
Sample Port	S	Oil Sampling Ports
Hoses	H	Medium Pressure Hydraulic Hoses
Electrical Requirements	Blank	115 Volts / 1 Phase / 60 Hertz

## 4. SPECIFICATION SHEET

Installation Requirements	
Input Voltage	115 V / 1 PH / 60 Hz
Designed FLA (Full Load Amps)	12.8 AMPS @ 115 Volts
Inlet Connection Size	3/4" FPT
Outlet Connection Size	3/4" FPT
Electrical Operating Specifications	
Oil Pump Motor	(See Motor Nameplate Rating)
Mechanical Operating Specifications	
Flow Rate	5 GPM
Maximum Discharge Pressure	100 PSI (689.5 kPa)
Maximum Oil Viscosity	1500 SSU (323.7 cSt) @ 6µm
Seal Material	Buna-N

Installation Requirements	
Input Voltage	115 V / 1 PH / 60 Hz
Designed FLA (Full Load Amps)	12.4 AMPS @ 115 Volts
Inlet Connection Size	1" FPT
Outlet Connection Size	1" FPT
Electrical Operating Specifications	
Oil Pump Motor	(See Motor Nameplate Rating)
Mechanical Operating Specifications	
Flow Rate	11 GPM
Maximum Discharge Pressure	100 PSI (689.5 kPa)
Maximum Oil Viscosity	1500 SSU (323.7 cSt) @ 6µm
Seal Material	Buna-N

Product Restrictions
<b>IMPORTANT:</b> This system should never be used to remove particulates from volatile fluids such as gasoline since the pump cannot be used for solvents with low lubricity. In addition, the unit should not be used on liquids with a flash point below 200°F (93°C).





## 5. ENGINEERING PRODUCT WARRANTY

For a period of one (1) year from the date of delivery, Precision Filtration Products (Seller) engineered products are warranted to be free from defects in materials and workmanship when properly installed, maintained, or operated within the specific working parameters for which the equipment was designed. If the engineered product does not perform as warranted, it will be repaired or replaced at the Seller's discretion. The Seller will provide parts and labor, free of charge if the defect had occurred within the first year.

This warranty does not apply to consumable components such as filter elements, light bulbs, etc. This warranty shall not apply to product altered by anyone other than Seller or their representative.

At the Purchaser's option, the defect may be handled by one of the following methods:

- Ship (freight pre-paid) the unit in its entirety to Seller for repair or replacement.
- Remove the defective component and ship (freight pre-paid) to Seller for inspection and test. Upon completion of the evaluation typically fourteen (14) business days, Seller will notify Purchaser if the claim is warranty related. If the claim is valid, a replacement component will be immediately shipped. If the claim is found to be due to improper installation, maintenance, or operation, a Purchase order will be required for the replacement component.
- Remove defective component and ship (freight pre-paid) to Seller with an open Purchase Order. Seller will immediately ship a replacement component and begin evaluation concurrently. Upon completion of the evaluation, typically fourteen (14) business days, Seller will notify Purchaser if the claim is warranty related. If the claim is valid, the open Purchase Order will be returned without any charges. If the claim is found to be due to improper installation, maintenance, or operation, the open Purchase Order will be invoiced for the amount of the replacement component.

**SELLER SHALL NOT BE RESPONSIBLE OR LIABLE FOR DOWNTIME, LOSS OF INCOME, LIVING EXPENSES, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES THAT MAY ARISE OUT OF THE USE OF THIS PROPERTY. THIS WARRANTY IS THE SOLE WARRANTY MADE BY PRECISION FILTRATION PRODUCTS IN REGARDS TO THIS EQUIPMENT. PRECISION FILTRATION PRODUCTS MAKES NO OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, OR OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**



## 6. SAFETY INSTRUCTIONS

This system has been examined and tested for safety. If there is any possibility that the oil being purified is contaminated with a solvent or materials which could be considered hazardous, either with toxicant or flammable explosives, the purifier should not be used unless precautions are taken to vent the vapors in a safe manner according to local, state, and federal codes and the flash point is above 200°F (93°C). This caution is necessary to prevent the possibility of fire, explosion, or toxic injury to persons and property.

**NOTE: Normal safety practices and common sense should always be exercised when operating this unit.**

## 7. FLUID COMPATIBILITY

**Depending on the model number, the following seals apply:**

The process fluid must be compatible with Viton seal material. Viton is good in the temperature range of -15°F to +400°F. It is generally recommended for lubricating, fuel, and hydraulic oils. The unit may be ordered with other seals to provide compatibility with specialty fluids.

The process fluid must be compatible with Buna seal material. Buna-N is generally recommended for petroleum, water, diesel, and water glycol. This unit may be ordered with other seals to provide compatibility with specialty fluids. Buna-N is good in the temperature range of -65°F to +250°F.





## 8. INSTALLATION AND START-UP PROCEDURES

### 8.1 Unpacking

This system is delivered with maximum protection during transportation and handling.

**NOTE: All damage attributed to the handling and deliver of the unit must be recorded and brought to the attention of the shipper immediately.**

This unit has been thoroughly tested for a minimum of one (1) hour run time. Fluid used to test the unit is a Shell Turbo® Oil T32, unless otherwise specified by the customer. The unit has been thoroughly inspected for defects prior to the delivery. All connections, however, should be checked prior to operating this unit, vibration and/or rough handling during delivery could adversely affect component alignment and/or connection tightness.

### 8.2 Mechanical Installation

With the system in place, connect the inlet and outlet hoses from the reservoir to the system. The inlet port has been sized to provide enough flow to operate the unit in the standard mode using oil with a maximum viscosity of 1500 SSU (323.7 cSt). A hose diameter equal to inlet/outlet port size (see specification sheet) is required to provide adequate oil supply to this unit.

**NOTE: Use of a smaller diameter line will restrict the flow and will adversely affect the automatic operation of the unit.**

The inlet/outlet connections have been sized for maximum hose lengths of 10 feet. Use of longer hose lengths must be approved prior to installation. Use of a "quick disconnect" on the inlet line is not recommended. This can restrict flow to the unit in specific applications. Oil is drawn into the unit by vacuum created by the system and is capable of pulling oil with up to 8-ft (2.4m) of negative head. For applications that exceed this, please consult the factory.



## 8.3 Operating Instructions

Connect inlet and outlet hoses to the oil supply reservoir and system. Connect power supply cord to the electrical receptacle.

**CAUTION: Main Power Disconnect should be located within a line of sight to the power source.**

Close all drain valves and open the inlet & outlet valves (if supplied) on the filtration system and the oil supply reservoir.

### Initial Starting Procedure:

1. Read Mechanical Installation (7.2)
2. Plug the cord into the power source and turn the unit on then off quickly to verify proper motor rotation. Proper rotation is verified before each unit is shipped but this should be verified with every power outlet that the machine will use. If the rotation is not correct, the plug should be rewired accordingly. Unplug the machine from the power source. \*If the unit does not start, press the on-off switch down completely to reset the overload then try to restart.
3. It is recommended that the machine is tested with a barrel or tote of fluid without quick disconnects before any application specific fittings or quick disconnects are installed so that the flow can be visually verified.
4. If the machine was ordered with wands, install them and put both wands into the largest bung of a barrel or tote of oil. If the machine was not ordered with wands, install the connection fitting on the inlet hose (suction) and leave the outlet hose without a quick disconnect fitting. The suction hose should be connected to the tote drain port and the outlet (return) hose should be guided into the tote fill port.
5. Ensure that the oil sampling valves are closed.
6. Plug the machine into the power source and start it. Visually inspect that the fluid is flowing and continue to run the HH Unit for several minutes. Flow may also be verified by opening the sampling valve after the second filter outlet.
7. While the machine is running, check for any leaks around fittings and verify that the fluid is flowing.
8. Check the element differential pressure gauge on the filter spin-on head. The gauges might show a reading or not depending on the fluid viscosity.
9. Allow the machine to run for several minutes and check for leaks again.
10. Turn the machine off at the switch and unplug the machine. Slide the wands into the guide rings on the cart frame and place the wand ends into the removable drip pan for drainage.



## Routine Starting Procedure:

1. Ensure that the oil sampling valves are closed.
2. If quick disconnect fitting are being used, ensure that they are properly connected with the mating fitting.
3. Plug the cord into the power source and turn the unit on then off quickly to verify proper motor rotation. Proper rotation is verified before each unit is shipped but this should be verified with every power outlet that the machine will use. If the rotation is not correct, the plug should be rewired accordingly.
4. Check the element differential pressure gauge (photo 1). The piston might be sliding into the red area or not depending on the fluid viscosity and filter element dirt load condition. If the differential pressure gauge piston is in the green the element does not need to be changed. If the piston is in the red, the fluid might be cold or the element needs to be changed. The filter spin-on head is equipped with an integral bypass valve that is open when the piston is in the red. The bypass is for pressure relief so some of the fluid will continue to flow through the element, but this will greatly compromise the efficiency of the filter element and flow will be restricted. Visually inspect that the fluid is flowing and continue to run the HH Unit for several minutes.
5. If the flow cannot be visually verified the sampling port may be opened to confirm the flow of fluid. The actual flow cannot be verified, but the movement of fluid can be detected.
6. As the machine runs, the element differential pressure gauge and vacuum indicator should be checked periodically.
7. If the fluid is not flowing freely it can be attributed to any of the following conditions; cold oil, dirty filter element, dirt Y-strainer on pump inlet.



Photo 1: Element DP Gauge



Photo 2: Both DP Gauges





## Filter Element Service Instructions:

1. Before servicing the filter element ensure that the machine is off and is not plugged into a power outlet.
2. Relieve any pressure by opening a sample port isolation valve. If quick disconnect fittings have been installed on the hoses pressure may not be relieved by disconnecting the HH Unit from a machine.
3. Dump the removable drip pan before removing the spent spin-on elements. Remove the spent element by turning the spin-on counter clockwise by hand or with a strap wrench. The spin-on element will be full of oil so be prepared to dump the oil into the drip pan or have some other receptacle ready for dumping.
4. Remove the gasket from spin-on head and discard it.
5. Remove the new gasket that is provided with the new spin-on element and lubricate it generously. Install the new lubricated gasket onto the spin assembly head.
6. Inspect the new element for severe dents or other damage that could compromise the integrity of the spin-on and result in leakage and injury. If the element is severely damaged discard it as leakage or injury may be a result.
7. Install the new element by turning it clockwise until the spin-on makes good contact with the gasket and is hand tight. Continue tightening another half turn.
8. Once the cart is restarted check the spin-on element for leakage and tighten more if necessary.
9. Failure to properly lubricate the gasket before installation may result in leakage.
10. Refer to routine starting procedure before starting the unit again.

## Y-Strainer Pump Protector Service Instructions

1. Before servicing the pump protector, ensure that the machine is off and is not plugged into a power outlet.
2. Relieve any pressure by opening a sample port valve. If quick disconnect fittings have been installed on the hoses pressure may not be relieved by disconnecting the HH Unit from a machine.
3. Place a bucket or other receptacle under the strainer housing to catch the fluid that will drain from the strainer housing and hose. (If a spin-on strainer is installed, skip to 7)
4. With a wrench or socket, turn the strainer housing (photo 1) plug counter clockwise to remove.
5. Remove strainer screen paying close attention to the orientation of the basket and clean it with shop air or rinse to remove any contaminant.
6. Reinstall the strainer basket in the same orientation before removal and tighten the strainer housing plug.
7. Remove the spent Spin-On Filter Element (photo 2) by turning counter clockwise with hand or strap wrench. The spin-on strainer will be full of oil, be prepared to dump the oil into a drip pan or bucket.
8. Replace the gasket with a new, lubricated gasket.
9. Install the new spin-on element by spinning clockwise by hand until hand tight. Continue tightening another half turn.
10. Refer to routine starting procedure before starting the unit again. When the unit is restarted check the plug for leaks.

Photo 1: Y-Strainer



Photo 2: Spin-On Strainer

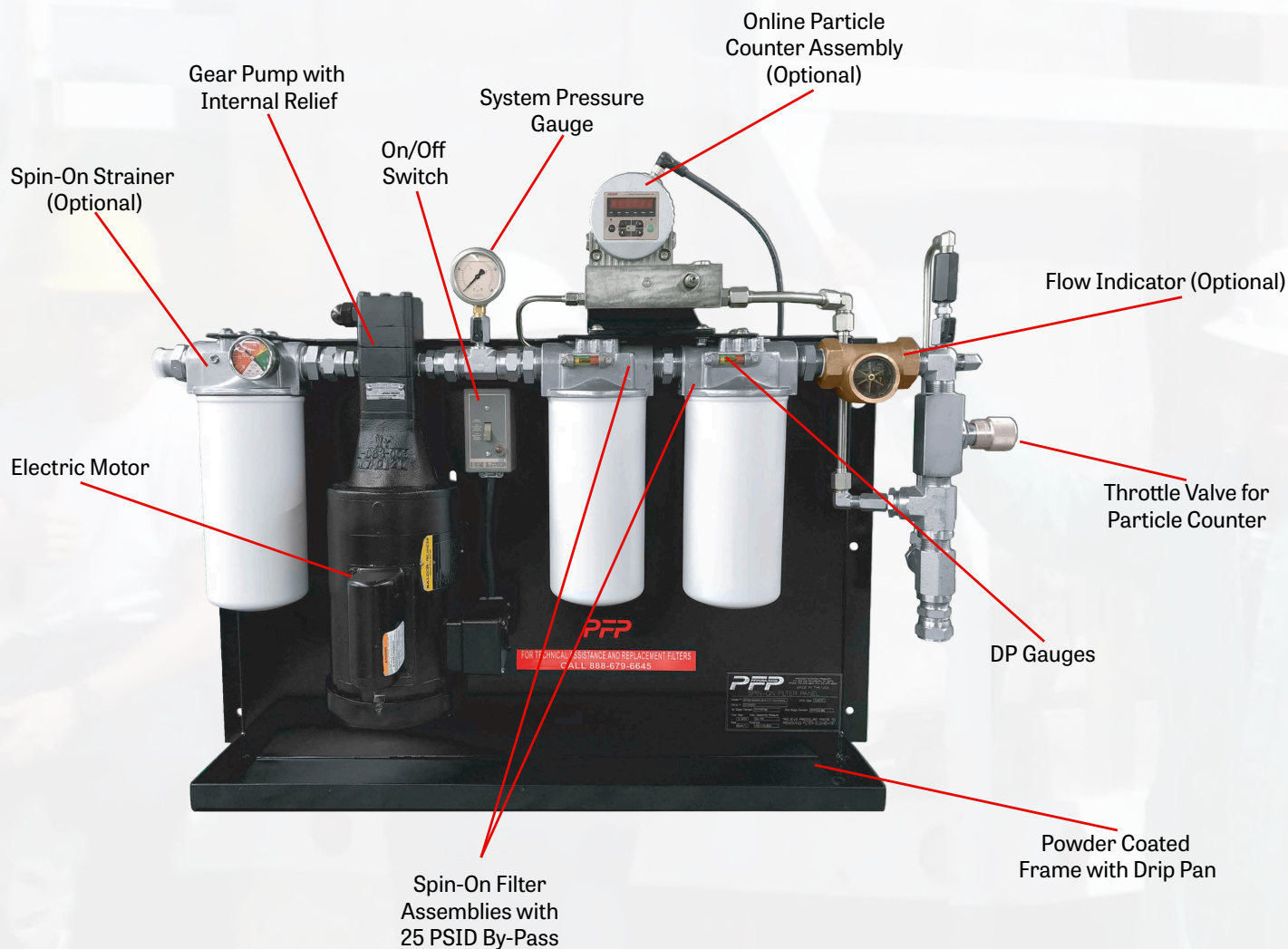


## 9. TROUBLESHOOTING

Problem	Cause	Solution
<b>Unit fails to start switch is activated</b>	<ul style="list-style-type: none"> <li>• Improper external power connection</li> <li>• Breaker at main power source tripped</li> </ul>	<ul style="list-style-type: none"> <li>• Check input power</li> <li>• Make sure it matches machine specifications</li> <li>• Make sure the power cord is the right size</li> </ul>
<b>Unit fails to pump fluid</b>	• Inlet valve is partially or fully closed	<ul style="list-style-type: none"> <li>• Position inlet valve to full open</li> <li>• Valve should be "full port" type valve to reduce restrictions and should be sized as large as the inlet hose</li> </ul>
	• Air leak on inlet supply line	• Check all fittings to ensure no air leaks exist
	• Strainer screen blocked	• Remove encasement housing from strainer assembly. Remove screen and clean with clean lint free rag or blow with air
	• Outlet valve partially or fully closed	• Ensure that outlet valves on both filtration system and reservoir are fully open
<b>Unit pump making excessive noise</b>	• Inlet valves partially or fully closed	• Ensure that all inlet valves on system and reservoir are fully open
	• Strainer obstructed	• Remove and clean screen with air
	• Inlet hose sized incorrectly	Inlet hose should be sized to match system inlet diameter with a maximum length of 20'. In the event that a longer inlet hose is needed a larger diameter should be used to ensure proper supply to the system



## 10. SYSTEM COMPONENTS



### Operating Temperature

Nitrile (Buna) -40°F to 150°F (-40°C to 66°C)

Fluorocarbon (Viton)\* -15°F to 200°F (-26°C to 93°C)

\*High temperature / phosphate ester design

### Recommended Viscosity Range

5 GPM\*: 28 SSU ~ 2000 SSU, 6 cSt ~ 400 cSt

11 GPM\*: 28 SSU ~ 1000 SSU, 6 cSt ~ 200 cSt

\*At maximum viscosity clean element pressure drop with 3µm media code < 12 psid/0.85 bar. Please check maximum viscosity of oil in coldest condition. For high viscosity oils, consider our LCFC series filter cart.

Spin-On Filter Panel shown with Optional Particle Counter and Inlet and Outlet Manifolds







11. Pump & Motor Information

TECHNICAL SERVICE  
MANUAL

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INSTALLATION, START UP, TROUBLESHOOTING,  
PREVENTIVE MAINTENANCE, DO'S & DON'TS  
SERIES SG-04, SG-05 & SG-07 SPUR GEAR PUMPS

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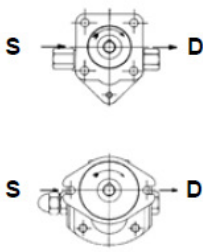


FIGURE 1

INSTALLATION

General

The following items must be considered prior to pump installation:

1. Location - locate the pump as close as possible to the liquid supply. If possible locate the pump below the liquid supply. Viking pumps are self-priming; but the better the suction conditions, the better the pump will perform.
2. Accessibility – the pump must be accessible for inspection, maintenance and repair.
3. Suction/Discharge - SG Series pumps are designed for clockwise rotation as standard (viewed from end of shaft). Refer to Figure 1.
4. Pressure Relief Valve - the SG Series is a positive displacement pump and requires some form of over pressure protection. Without pressure protection, if the discharge line is blocked or becomes closed, pressure will build up until the motor stalls, drive equipment fails, a pump part breaks, or the piping and/or other equipment in the system bursts. To prevent the possibility of any one or more of the above from occurring, the use of a pressure relief valve is recommended.
5. Storage - drain the pump and apply a light coat of non-detergent SAE 30 weight oil to all internal pump parts. Apply grease to the pump shaft extension. Viking suggests rotating the pump shaft by hand one complete revolution every 30 days to circulate the oil.

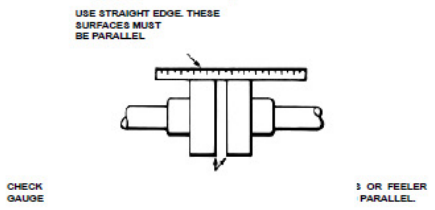
MOUNTING

1. Surfaces to which the pump mounts must be clean and flat.
2. Use SAE Grade 5 or better capscrews to mount pump.
3. The 4 mounting capscrews for the SG-04 and SG-05 pumps must have a minimum of 1/4 inch thread engagement, and must be torqued evenly to 12-15 ft-lbs.
4. The 2 mounting capscrews for the SG-07 pumps must have a minimum of 1/2 inch thread engagement, and be evenly torqued to 50-55 ft-lbs.
5. Standard SG Series pumps are designed to be used with jaw type couplings that do not induce axial thrust on the pump shaft. If an improper type of coupling is used, internal damage may result.
6. Do not strike or press the pump drive coupling to install. Internal pump damage will result. If the coupling does not slide onto the shaft, inspect the coupling, shaft and key for nicks or burrs and remove.
7. If the pump is to be belt or gear driven, the overhung load option must be specified.
8. Once the pump has been mounted and the coupling installed, it is recommended to put lube oil into the suction port and turn the pump by hand to make sure it turns freely.

Alignment

Check alignment after mounting.

1. If the unit has a flexible coupling, remove any coupling guards or covers and check alignment of coupling halves. A straight edge (piece of key stock will work) across the coupling must rest evenly on both rims at the top, bottom and sides. See Figure 3.
2. Make a final check on alignment after the piping is hooked up.



Piping/Hose

The cause of many pumping problems can be traced to the suction piping. It should always be as large in diameter and as short in length as possible.

Before starting the layout and installation of your piping system, consider the following points:

1. Never use piping smaller than the pump port connections. Piping larger in diameter than the port connection is sometimes required to reduce friction losses.





2. Be sure the inside of the pipe is clean before installing.
3. When approaching an obstacle to the suction line, go around instead of over it. Going over an obstacle can create an air pocket. Where practical, slope the piping so no air or liquid pockets will be formed. Air pockets in the suction line make it hard for the pump to prime.
4. A strainer on the suction side of the pump should always be considered in any pumping system. The strainer will keep foreign matter from entering the pump. The strainer mesh or perforation size should be large enough so that it does not cause excessive pressure drop, but fine enough to protect the pump. Use of a strainer is particularly important at start up to help clean the system of weld beads, pipe scale and other foreign objects.
5. A pressure relief valve is required in the discharge line. See Pressure Relief Valves, General page 1 item 4.
6. The pump must not be used to support the piping. Hangers, supports, stands, etc. must carry the weight of the pipes.
7. When fastening piping to the pump do not impose any strain on the pump casing. "Springing" or "drawing" the piping up to the pump will cause distortion, possible misalignment and probable rapid wear of the pump. Do not use the pump to correct errors in piping layout or assembly.
8. All joints of piping system must be tight; liquid thread sealant will help assure leak free threaded joints. Loose joints result in liquid leaks or suction side leaks. Air leaks make the pump noisy and reduce flow. **CAUTION:** Be careful not to over tighten fittings as this can cause cracked joints. Do not use Teflon tape. Reduced friction makes over tightening very easy and will result in cracked ports. Leaks in the suction line can permit air to be drawn in, and will cause a noisy pump and reduction in capacity.
9. Drive alignment must be checked after piping is hooked up.
10. Provide a pressure relief device in any part of a pump and piping system that can be valved off and, thus, completely isolated. A rise in temperature will cause a liquid to expand. If there is no provision for pressure relief in the closed off section, there is a chance that the pump or piping will rupture.

## Danger !

**Before starting pump, be sure all drive equipment guards are in place.  
Failure to properly mount guards may result in serious injury or death.**

## START UP

Before pushing "start" button, check the following:

1. Are vacuum and pressure gauges (liquid filled) mounted on or near the pump? Gauges are the quickest and most accurate way of finding out what is happening in the pump.
2. Is the pump correctly aligned with the drive equipment?
3. Make sure there is no pipe strain on the pump ports.
4. Rotate the pump shaft by hand to be sure it turns freely.



TYPICAL SG-04/SG-05  
EXPLODED VIEW



TYPICAL SG-07  
EXPLODED VIEW

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1.	Bracket, lipseal & bearing section	5.	Relief valve kit
2.	Match ground casing & (2) gears, driver & driven shafts	6.	Lipseal
3.	Separation plate & bearing assy.	7.	O-ring
4.	Head and alignment sleeve assy.	8.	Assembly capscrews



5. Before connecting to the motor, jog it to be sure it is running in the correct direction. Refer to "General" on page 1.
6. Is the pressure relief valve installed properly?
7. Make sure suction piping is properly connected and sealed, and valves are open.
8. Make sure the discharge piping is properly connected and sealed, valves are open, and there is a place for the liquid to go.
9. Make sure all guards are in place.
10. The above checklist is a general guideline to be used prior to starting the pump. Since Viking Pump cannot foresee every application for our product and possible system design, the final responsibility is with the user. The pump must be utilized within the catalog specifications and the pump system must be designed to provide safe working conditions.

The "start" button may now be pushed.

The pump should begin to deliver liquid within 15 seconds! If not, push the stop button. Do not run the pump without liquid flow longer than 30 seconds or the pump may be ruined.

Review **Startup** steps 1 through 10. Consider what the suction and discharge gauges may indicate. If everything appears in order, re-prime pump. Refer to **Mounting**, page 2, item 8.

Push the "start" button. If nothing is flowing within 30 seconds, stop the pump. The pump is not a compressor, it will not build up much air pressure. It may be necessary to vent discharge line until liquid begins to flow.

If pump still does not deliver, consider one or more of the following:

1. The suction line has air leaks.
2. The end of the suction pipe is not submerged deeply enough in the liquid.
3. The suction lift is too great or the suction piping is too small.
4. Liquid is vaporizing in the suction line before it gets to the pump.

If after consideration of these points, the pump still does not deliver liquid, review all points given under **START UP** and read through the **TROUBLESHOOTING** guide and try again. If pump still will not deliver liquid, contact your Viking Pump supplier.

## TROUBLESHOOTING

A Viking pump that is properly installed and maintained will give long satisfactory performance.

If trouble does develop, one of the first steps toward finding the difficulty is to install a vacuum gauge in the suction line and a pressure gauge in the discharge line. Readings on these gauges often give a clue on where to start looking for trouble.

### **DANGER !**

**Before opening any Viking pump liquid chamber (pumping chamber, reservoir, relief valve adjusting cap fitting etc.) be sure:**

1. That any pressure in chamber has been completely vented through the suction or discharge lines or other appropriate openings or connections.
2. That the driving means (motor, turbine, engine, etc.) has been "locked out" or made non-operational so that it cannot be started while work is being done on the pump.
3. That you know what liquid the pump has been handling and the precautions necessary to safely handle the liquid. Obtain a material safety data sheet (MSDS) for the liquid to be sure these precautions are understood.

**Failure to follow the above listed precautionary measures may result in serious injury or death.**

### Vacuum Gauge - Suction Port

**High vacuum reading would indicate:**

1. The suction line is blocked, valve closed, a strainer is plugged or a pinched suction line.
2. The suction line is too small.
3. The liquid is too viscous to flow through the piping.
4. The lift required is too high.

**Low reading would indicate:**

1. There may be an air leak in the suction line.
2. The end of the pipe is not in the liquid.
3. The pump is worn.
4. The pump is dry and should be primed.





## Flutter, jumping or erratic reading would indicate:

1. The liquid is vaporizing.
2. Liquid is coming in to the pump in slugs, possibly an air leak or insufficient liquid above the end of the suction pipe.
3. Vibration from cavitation, misalignment, or damaged parts.

## Pressure Gauge - Discharge Port

### High reading would indicate:

1. High viscosity and small diameter and/or lengthy discharge line.
2. The strainer or filter is plugged.
3. The pressure relief valve is set too high.
4. Valve in the discharge line partially closed.
5. Line partially plugged from build up on inside of pump, solidified product or foreign object.
6. Liquid in the pipe not up to temperature.

### Low reading would indicate:

1. Pressure relief valve set too low.
2. Pressure relief valve poppet not seating properly.
3. Pump mounting capscrews into torqued to specifications (GP-04 and GP-05 Series 12-15 ft.-lbs.).
4. Pump assembly bolts not torqued into specifications (GP-07 Series 50-55 ft.-lbs.).
5. The bypass around pump partially open.
6. Pump is damaged or worn.
7. The pump has too much internal clearance.

## Flutter, jumping or erratic reading would indicate:

1. Cavitation.
2. Liquid is coming to the pump in slugs.
3. Air leak in the suction line.
4. Vibrating from misalignment or mechanical problems.

## Miscellaneous

### Pump does not pump:

1. The pump has lost its prime from air leak or low level in tank.
2. The suction lift is too high.
3. Rotating in the wrong direction.
4. The motor does not come up to speed.
5. The strainer is clogged.
6. The bypass valve is open, pressure relief valve set too low or pressure relief valve poppet stuck open.
7. The pump is worn out.
8. Any changes in liquid, system or operation that would help explain the trouble, e.g. new liquid, additional lines or process changes.

### Pump starts, then loses its prime:

1. The supply tank is empty.
2. The liquid is vaporizing in the suction line.
3. There is an air leak or air pockets in the suction line.
4. The pump is worn out.

### Pump is noisy:

1. The pump is cavitating (liquid vaporizing in suction line) or being starved (heavy liquid cannot get to pump fast enough). Increase the suction pipe size and/or reduce the length, or decrease the pump speed. If the pump is above the liquid, raise the liquid level closer to the center line of the inlet port. If the liquid is above the pump, increase the head of the liquid.
2. Check alignment.
3. Anchor the base or piping to eliminate vibration.

### Pump not delivering up to capacity:

1. The pump is starving or cavitating – see Pump is noisy, item 1.
2. The strainer partially clogged.
3. Air leak somewhere in the suction line.
4. Running too slow. Is the motor the correct speed and wired up correctly?
5. Pressure relief valve is set too low, stuck open or has damaged poppet seat.
6. The bypass line around the pump partially opened.
7. The pump is worn out.





## Pump takes too much power (stalls motor):

1. The pump sequence valve set too high.
2. Liquid is more viscous than the unit is sized to handle.
3. The system pressure relief valve set too high.
4. The pump is misaligned.

3. DO obtain, read and keep all maintenance instructions furnished with pump.

## DO'S AND DON'TS

Do's and Don'ts for installation, operation and maintenance of Viking pumps to assure safe, long, trouble free operation.

### Installation:

1. DO install the pump as close to supply tank as possible.
2. DO leave working space around the pumping unit.
3. DO use large, short and straight suction port.
4. DO install a strainer in the suction line.
5. DO a double check of alignment after unit is mounted and piping is hooked up.
6. DO provide pressure relief valve for discharge side of pump.
7. DO check for proper rotation.
8. DO use a return line filter.
9. DO use an industrial grade hydraulic oil.
10. DO use piping, hose and fittings rated for maximum system pressure.

### Operation

1. DON'T run the pump at speeds faster than 3600 RPM.
2. DON'T allow the pump to develop pressure higher than those shown in catalog at that size.
3. DON'T operate pumps at temperatures above or below limits shown in catalog for model.
4. DON'T operate unit without all guards in place.
5. DON'T operate pump without pressure relief valve in discharge piping; be sure valve is mounted and set correctly.
6. DON'T stick fingers in ports of pump!!! Fingers may be pinched between gears.
7. DON'T work on the pump unless driver has been "locked out" so it cannot be started while work is being done on the pump.

### Maintenance:

1. DO record pump model number and serial number and file for further use.
2. DO have spare parts, pump or stand by units available, particularly if pump is essential part of key operation process.

**VIKING  
PUMP**

**IDEX**  
IDEX CORPORATION

### WARRANTY

Viking warrants all products manufactured by it to be free from defects in workmanship or material for a period of one (1) year from date of startup, provided that in no event shall this warranty extend more than eighteen (18) months from the date of shipment from Viking. If, during said warranty period, any products sold by Viking prove to be defective in workmanship or material under normal use and service, and if such products are returned to Viking's factory at Cedar Falls, Iowa, transportation charges prepaid, and if the products are found by Viking to be defective in workmanship or material, they will be replaced or repaired free of charge, FOB Cedar Falls, Iowa.

Viking assumes no liability for consequential damages of any kind and the purchaser by acceptance of delivery assumes all liability for the consequences of the use or misuse of Viking products by the purchaser, his employees or others. Viking will assume no field expense for service or parts unless authorized by it in advance.

Equipment and accessories purchased by Viking from outside sources which are incorporated into any Viking product are warranted only to the extent of and by the original manufacturer's warranty or guarantee, if any.

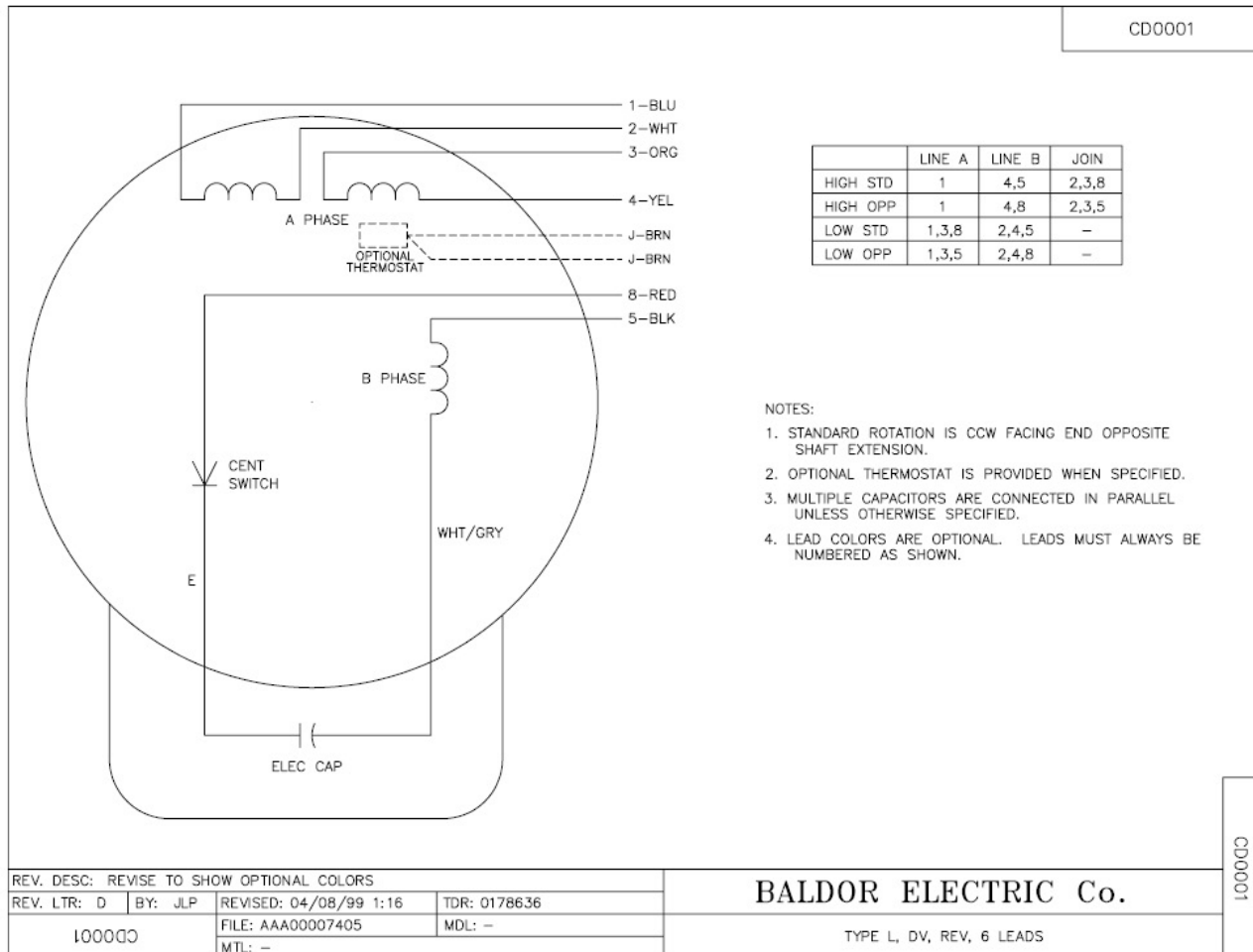
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# SFP Spin-On Filter Panel

Flow rates available up to 11 GPM

**BALDOR • RELIANCE** Product Information Packet: CL3510 - 1HP,1725RPM,1PH,60HZ,56C,3524L,TEFC,F1,N



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