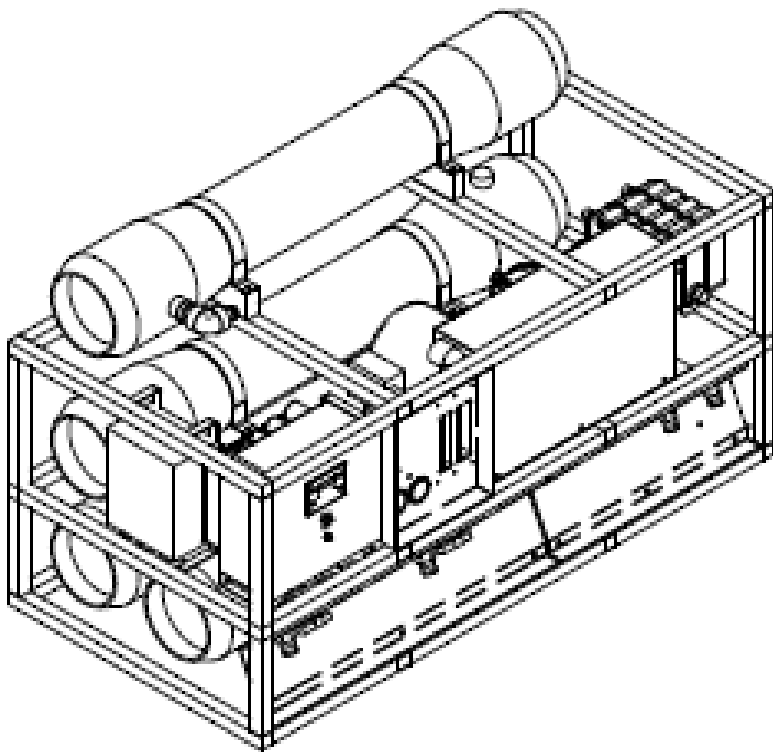




LB 14,000 FM

**With SP-20 Pearson Pump Technology
Installation and Operating Manual**



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Appendix Manuals for UV and feed pump in bag

Getting Started

Thank you for trusting Katadyn Desalination, the makers of Spectra Watermakers for your water purification needs. The Spectra LB-14,000 comes equipped with the revolutionary Spectra Pearson Pump, a unique high pressure pump with integrated energy recovery that allows users to purify water using the least amount of energy possible in a system of this size. If properly installed and cared for, your system will provide you with years of high quality, potable, fresh water.

Please take a moment to review this manual before operating the machine and if you have any questions

Contact: techsupport@spectrawatermakers.com

System Components:

- LB-14000FM watermaker
- 20 and 5 Micron Pre-filter Housing Assemblies
- Service Hose Kit
- Salinity Monitor
- SC-1 Storage chemical
- UV filter

Any shipping damage must be reported to the carrier within 24 hours of receipt, so please inspect the contents of your shipment to ensure that all parts have arrived undamaged. It is the responsibility of the receiver to report any missing or damaged parts to Spectra within one week of taking delivery. Spectra is not responsible for claims made outside this one week window .

The LB-14,000FM system is designed to desalinate water from a brackish water source being drawn from a low turbidity well.

Feed TDS: < 20,000mg/L

Minimum Feed Pressure: 10 psi/ 0.67 Bar

Maximum Inlet Pressure: 20 psi/ 1.4 Bar

Feed Chlorine: 0 mg/L

Feed Water Analysis: Not provided

Feed Water Turbidity: < 1 NTU

Feed Water SDI: < 3

LSI/S&DSI: < 0

Fe, Mn, H₂S, Al, SiO₂, B, Heavy Metals: Not Detectable

System performance cannot be guaranteed without a full feed water analysis. Proper pretreatment is required to ensure adequate system life. Specific feed water contaminants may require additional equipment, contact Spectra with a water analysis for additional details.

Introduction to your System

The main connections and components to the system;

- Feed water is supplied to the system with a jet pump at 20 gpm at 10-15 psi (76 lpm at 0.7-1 bar) pressure after the filters. Feed pressure can vary ± 5 psi (± 0.4 bar) with the proper brine discharge pressure set (see below). Feed pressure is easily adjustable with a knob on the side of the control box labeled Pearson Pump.
- The brine discharge should be plumbed to an open drain (so there is no suction on the discharge line) and be restricted with the brine discharge valve (labeled on the front of the unit) so there is 3 to 5psi back pressure on the brine discharge. This back pressure makes the pump run more efficiently and there is a brine discharge pressure gauge installed to simplify adjustment.
- Chlorine free fresh water for the flush cycle should be supplied to the system at up to 50 psi, the system will draw in flush water as long as the flush water will gravity flow to the machine.

The frame is constructed of powder coated 304 stainless steel and must be positively fixed in place. includes the Spectra Pearson Pump, Motor and Belt drive system coupled to four 8" x 40" seawater membranes. All high pressure connections between the membranes and the pump come pre-assembled and tested. The high pressure hoses use 1" JIC 37 deg. flare fittings.

20" Pre-filter Housings Standard systems are supplied with four 20" filter housings and should be plumbed in two parallel arrays so water flows into both 20 micron filter housings then through the two 5 micron filter housings. The tops of the filter housings have a spring loaded "purge" button to released air from the filters. Do not install the filters above any electrical devices as some water will be spilled when changing the filters or purging air.



Optional 20" Carbon Block filter housing is used to remove chlorine from the flush water as chlorine will cause permanent damage to the membranes.



The Feed Pump (Jet Pump) assembly is to be installed per the manufacturers requirements. The pump supplied with your unit is based on the requirements provided at the time of the order. All these pumps will fail if they are allowed to run dry.



Introduction to your System, continued....

The **Control Panel** for the LB-14,000F (see front view) has a feed water flow meter, gauges for the Boost pressure (feed water pressure) and membrane pressure. Valves are clearly labeled and mounted for easy access for flushing and or cleaning in place.

Front View



All plumbing connections are clearly labeled on the unit.

Control Box The molded FRP box contains the speed control and switches for basic operation;

- Main circuit breaker
- Start/Stop
- Speed for Run and Flush/service

These modules are water resistant not water proof so do not allow them to get wet. Do not operate the machine with the control box open. Should the need arise to open the electrical box after installation, use caution as there is live AC power in the box.



The feed pump pressure is controlled by the knob on the box with speed control for the pump. To prime the system push and hold the button to run the feed pump and the knob is used to adjust the feed pressure. Start with it turned all the way up (clockwise) and adjust as required.



Installation and Setup

Mounting and Service access: Your Spectra LB-14,000 system is designed to be fixed to a level surface and bolted in place. The cleats used on the shipping pallet can be utilized for more permanent mounting or holes can be drilled through the frame to bolt it into place.

Be sure to allow for service access to the unit, we recommend:

- A minimum of 40" (1m) to the right of the unit so membranes can be changed.
- A minimum of 24" (60cm) on the front and above the unit.

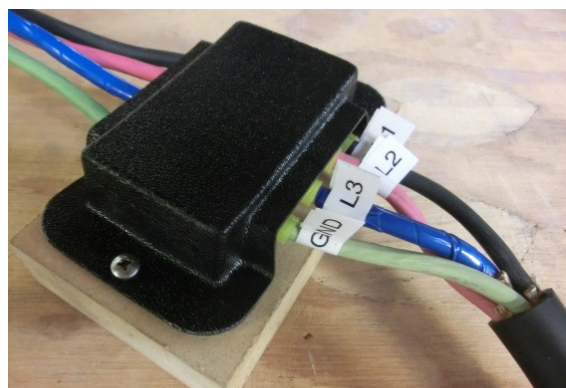
Cables and Hoses: Route all hoses and power cables in the most direct route possible and do not allow hoses to kink or make excessive bends. Hoses should be supported to take any load off the fittings to reduce leaks caused by vibration. Protect all cables and hoses against chafing and size all wiring according to industry standards and local regulations.

Choose a location for the brine discharge that will not be impacted by the salinity of the discharge and is located as far away from the intake as possible.

This unit is 220v 3 Phase 50/60 Hz, 3 wire with ground (L1, L2, L3, G).

A Ground Fault Interruption Circuit breaker (30mA trip rating) is highly recommended for safety.

CAUTION: Undersized or improperly terminated power cabling can result in serious injury or death. Always follow best industry practices when sizing, terminating, and routing cables and hoses.

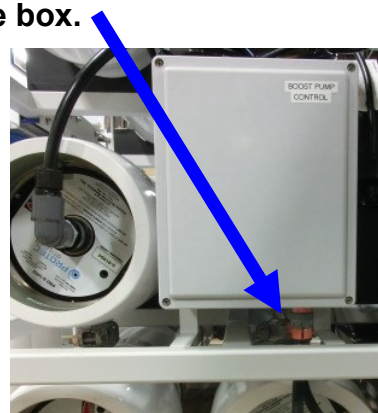


Feed Water Boost Pump control uses an AcTech VFD speed control located in the box on the left side of the unit.

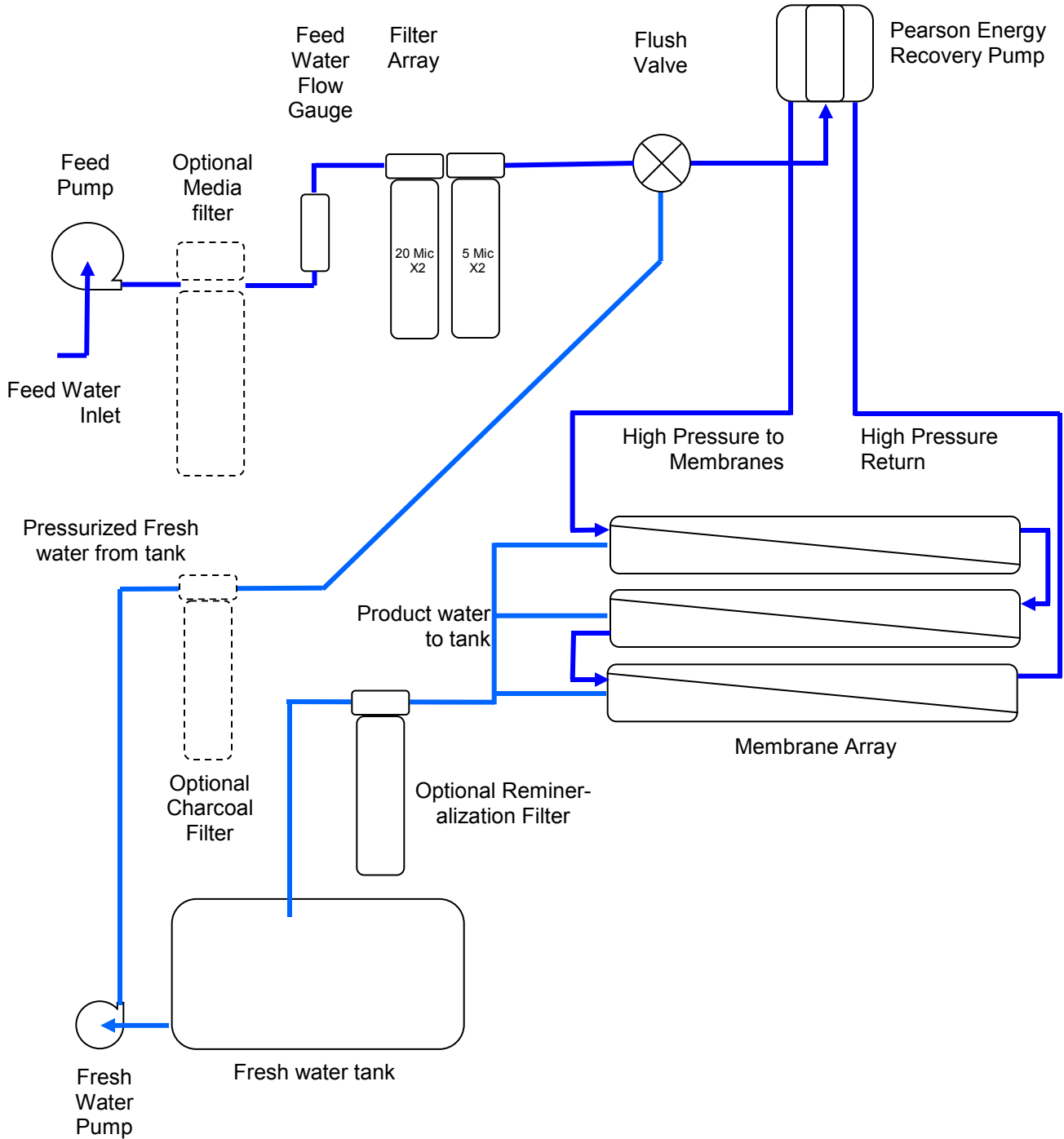
The feed pump connects to a socket in the bottom of the box.

There is an indexing mark on the cable for the pump that should be facing out when you insert the cable. Twist the retaining ring on the connector to lock it into place.

Make sure that the feed pump is installed in accordance with local regulations and the manufacturers specifications and the pressure is regulated (with the knob on the side of the control box) so the boost pressure gauge reads 15 psi (≈ 1 bar).



Simplified Plumbing Layout

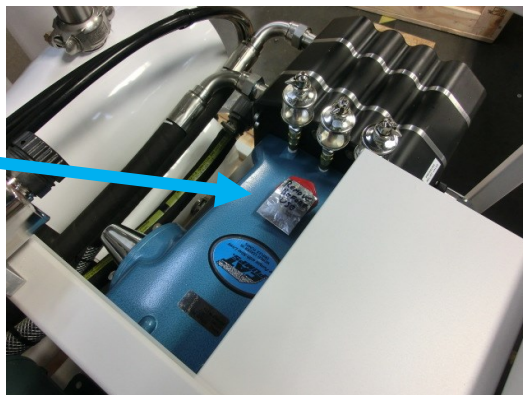


Initial Startup (Purging storage solution)

Note: The unit ships from the factory with oil in the crankcase and tape over the vent hole. Remove tape over vent before operating the watermaker.

Check the dip-stick to confirm the oil level is correct in the crankcase.

Spectra recommends 76 Super Synthetic Blend SAE 5W-30 (ILSAC GF-5).



Caution; Never operate the system with the belt guard removed or the control boxes open as serious injury or death could occur.

All hose connections must be in place for proper operation;

- 1" feed water hose from pre-filters to front of machine and the 1" feed hose from the boost pump to the filter array.
- 1" brine discharge hose to air gap drain (no suction from drain line). The output from the brine discharge is 9 gpm so find a suitable discharge site.
- 3/4" minimum product water hose to tank.
Note that any restriction in the product line can lead to permanent membrane damage also the product line should not be over 10ft (3m) above the water maker.
- Confirm the feed pump is connected properly and the **basket strainer** is full of water. This pump cannot apply any suction to the feed hose if the basket is not full of water, do not run the pump dry as the seals will be damaged.
- The 3/4" hose for the fresh water flush connects to the valve on the front of the watermaker. As long as there is positive pressure (meaning water will flow out of the hose when disconnected from the watermaker) the fresh water flush will work. Typically product water is used for the flush and it must be unchlorinated.



Chlorinated water will damage the membranes.

Initial Startup (Purging Storage Solution)

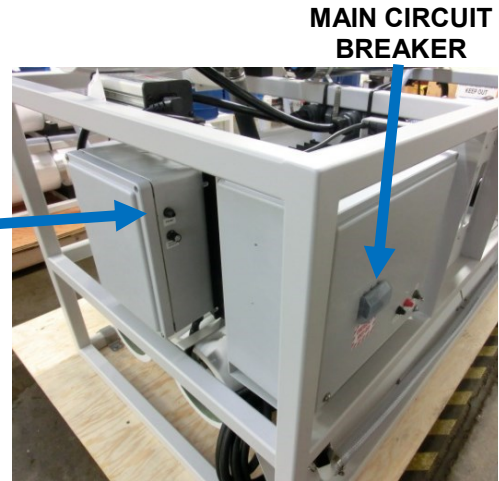
1. Open the pressure relief valve on the Spectra Pearson Pump 1 full turn. There is a label on the pump head for the pressure relief valve.

Operation note:

It is always a good idea to open the pressure relief valve for start up and shut down.

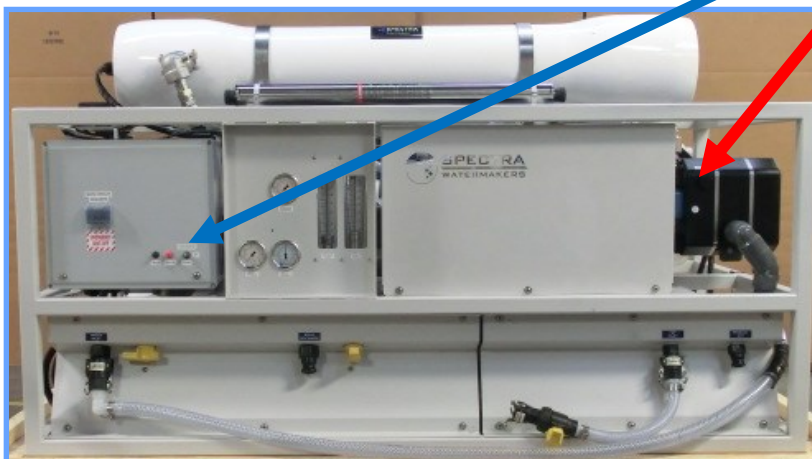
When in doubt - open the pressure relief valve before tuning the system on or off

2. Confirm the Toggle switch on the front of the control box is in the "OFF" position and turn on the "MAIN CIRCUIT BREAKER" on the front of the control box.



3. Push the prime button for the feed pump to start feed water flow and purge air from the filters with the buttons on the filters until all air is expelled. Use the knob below the purge button to adjust the feed pressure to 15 psi. You will likely need to adjust the pressure again when the system starts up and comes up to the full flow rate of 20gpm.

Flush/Service and Purge Toggle Switch



Pressure Relief Valve



Filter Purge Button

4. When the air is purged from the filter housings start the system by flipping the toggle switch to the "PURGE" position, this will start the Pearson Pump and the feed pump so water will begin to flow into the system and out the brine discharge (this will take a few minutes the first time). Allow the system to flush with feed water for at least one hour (two is better) to insure all chemicals are eliminated from system.
5. After this purge cycle is complete flip the toggle switch from PURGE to off. The watermaker is now ready to start normal operation.

Normal Operation - Overview

It is always a good idea to open the pressure relief valve one full turn for start up and shut down. **When in doubt - open the pressure relief valve.**

If the system contains preservative, antifreeze or any cleaning chemicals and the pressure relief valve is closed the membranes will be permanently damaged.

Nominal operating parameters are:

Feed: 20gpm (76lpm)

Product: 11gpm (41 lpm)

Membrane Pressure: 850psi (59 Bar) max

Boost Pressure: 15psi (1 Bar)

Product Quality <300ppm TDS (Total Dissolved or Salinity)

Checking the product quality is a good indicator of the system performance. The membranes will remove 99.4% of the minerals in the feed water. The product quality will typically improve as the system is run, so allow the unit to run for at least 2-3 hours and see how the water quality compares to when the system was first started.

An important tool for future maintenance and service is keeping an accurate log. There is a suggested log in the back of this manual and keeping it current is a good habit.

Monitor the Feed Pressure gauge on the front of the unit during start-up and operation. Pressure drop across the filter can be determined by comparing the gauge reading when the filters are new, with the current boost pressure reading. When the pressure differential begins to climb the filter is getting dirty. When the feed pressure has decreased by 5 psi (0.4 bar) the pre-filters should be changed, or if the Boost Pressure Gauge drops below 8 PSI (0.7 Bar).

If the boost pressure drops below 6 PSI (0.4 Bar) at any time, the system will automatically shut down. Change the filters if required and/or adjust the boost pressure up (using the prime button) and restart.

If the membrane pressure exceeds 950 PSI (65.5 Bar) at any time the system will automatically shut down. Determine why the membrane pressure is high and (if indicated) clean the membranes to decrease membrane pressure.

Monitor the sound of the Spectra Pearson Pump. If the pump is knocking there is a problem with the balance of the boost pressure to the back pressure on the brine discharge. If you cannot accurately control the boost pressure increasing the restriction on the brine discharge will allow the pump to run smoothly. Any vacuum on the brine discharge will also cause knocking. The brine discharge should go to an air gap drain and there should be 3-5psi of restriction on the discharge line (close the brine discharge valve slightly to adjust).

Stopping: Stop the machine at any time by pressing the red 'Stop' button. When possible open the pressure relief valve first.

Fresh water flushing is one of the most basic maintenance items, keeping the system full of fresh water when it is not in use is good for the membranes and will keep the system working properly. Bacteria growth will happen, we call this Bio-Fouling, when the water in the system goes Anaerobic (usually in 3 to 7 days depending on the climate). When the water goes Androbian you will notice a "rotten egg" smell in the water which can be eliminated by either running the watermaker for an extended period or cleaning with the SC-2 cleaner.

Normal Operation - Daily Start-up Sequence

It is always a good idea to open the pressure relief valve one full turn for any start-up or shut-down. **When in doubt - open the pressure relief valve.**

1. Confirm the feed water valve is open and the brine discharge point is ready to accept discharge flow.
2. Confirm the Main Circuit Breaker is on.
3. Push and hold the START button until the Pearson Pump ramps up to full speed (this takes a few seconds) and adjust the boost pressure to 15psi if required. Release the START button.
4. Close the pressure relief valve and the system will start making water (it may take a minute or two to fill all the product lines).
6. Check for leaks and make sure the product tank is vented and everything is flowing properly.
7. Open each of the 3 seal oilers (see page 17) and allow 4-5 drops per oiler to fall. This helps improve the lifespan of the seals.

Stopping: Stop the machine at any time by pressing the red 'Stop' button. When possible open the pressure relief valve first.

Fresh water flush the system according to the instructions on the next page.

Fresh Water Flushing

If the machine is to be turned off for more than 4 hours it should be flushed with un-chlorinated product water. This process should be repeated after every production cycle and then once every 3 to 7 days, depending on climate, when the machine is not in use. Warmer climates should flush more frequently. If you notice a rotten egg smell in the product water after setting for a few days you will need to adjust the number of days between flushes.

Flushing the membranes with fresh water helps to remove minerals from the membrane surface and control bio-fouling.

1. Close the feed valve (the yellow handle should be pointing out) to block feed water entering the system.
2. Open the fresh water flush valve. **If the flush water is chlorinated there must be a charcoal filter installed to remove any chlorine from the flush water.**
3. Flip the toggle switch on the control box to the “FLUSH/SERVICE” position, the Pearson Pump will run slowly and water should begin to flow from the brine hose.
4. Allow the system to flush until the brine discharge is below 1000ppm. This time will vary depending on the salinity of the feed water source. The flush will use at least 40 gallons and will require more as the salinity of the feed water increases.

Failure to use un-chlorinated water will result in permanent damage to the membranes.

SYSTEM MAINTENANCE

General

Periodically inspect the entire system for leaks and chafe on the tubing and hoses. **Repair any leaks as soon as possible.** Check for corrosion around the fittings. If any rust appears, remove, clean, and reassemble the fitting. Rust is a sign of crevice corrosion inside the fitting and must be dealt with promptly.

Some salt crystal formation around the Spectra Pearson Pump mating surfaces is normal. Wash down any salt encrusted areas with a damp cloth. Keep the watermaker clean, dry, and salt free.

The Spectra Pearson Pump should have the plunger seals replaced annually, every 2,500 hours of operation, or when leaks are present, whichever comes first. Leaks in the Pearson Pump will appear between the pump head and the crankcase, when you see leaks it's time to change the seals.

Pre-Filter maintenance

Monitor the filter condition by logging the feed pressure. When the feed pressure decreases by 5 psi it is time to replace the filters. Avoid letting the filters get so dirty the unit shuts down automatically and check the feed pressure frequently during operation. Partially clogged filters can be rinsed and reused if allowed to dry completely before reusing. When installing used filters inspect them for any tears or punctures. The purpose of the filters is to protect the pump and the membranes from fouling.

After a filter change it may be necessary to expel the air from the feed line using the purge buttons, located on top of the filter housings.

Use silicone grease on the o-ring to ensure a proper seal between the filter bowl and lid. **Do not use a petroleum based product, such as petroleum jelly or mineral oil, as it will permanently damage the filter housing bowl.**

The Crankcase

Change the crankcase oil every 5000 hours of operation or if it begins to darken in color or become milky. Milky oil indicates seal failure so replace seals if this happens. Use high quality synthetic motor oil. SAE 5W-30 or equivalent is recommended in most climates.

Belt Tension

The belt alignment and tension have been pre-set at the factory prior to shipping. Check both tension and alignment weekly for signs of wear or slipping. You should just be able to twist the belt 45 degrees from horizontal when it is properly tensioned. The belt should run in the center of the drive pulley when properly installed.

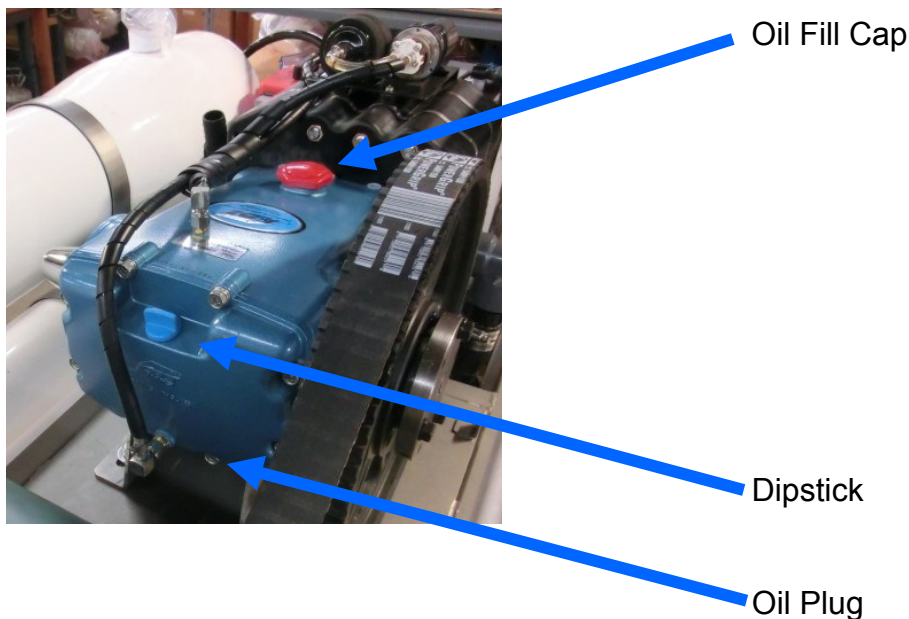
Replace the belt immediately if it looks worn or damaged, or if it cannot be properly tensioned.

MAINTENANCE - OIL CHANGES

GEARCASE LUBE OIL

Use only 5W-30 synthetic oil in Pearson Pump crankcase. Do not overfill the crankcase with oil, follow the marks on the dipstick. Check oil condition and level frequently. The Oil should be replaced every 5000 hours, when milky, or annually, whichever comes first. Milky oil indicates seal failure so replace seals if this happens.

The Pearson Pump comes mounted on an oil lubricated CAT crankcase. This system is designed for easy maintenance with long intervals between required oil changes. **Inspect the oil level and condition (darkening or milky) often.**



Changing the Oil

1. Turn the watermaker off if running with the stop button. Turn off main breaker and put a safety lock on the breaker.
2. Remove the oil plug and allow the crankcase to drain. The Spectra-Pearson Pump crankcase holds 3 quarts.
3. Using a small funnel fill the crankcase with oil until the level reaches the marked line on the dipstick (about 3 quarts).

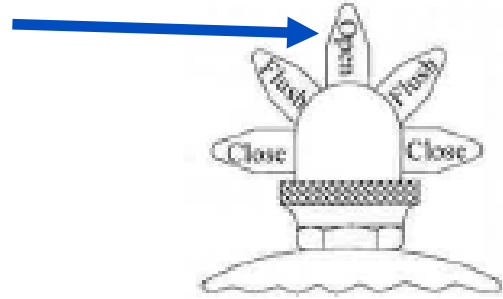
MAINTENANCE - SEAL OILERS

Seal / Ceramic Oilers

The Pearson Pump comes with drip oilers which are used to extend the service life of the seals. Allow the system to run for at least one hour before allowing the seal oilers to drip. Use the same 5W-30 synthetic oil as used in the Pearson Pump crankcase. Do not overfill the reservoirs with oil.

Following this procedure will dramatically increase the seal life. We have some customers with 20,000 hours on their systems and they have never replaced the seals.

Each time you start the watermaker open the oiler lever (pointing up) and allow 4-5 drips to fall.



The oilers will drip when opened, which can be seen in the window below the reservoir.

Drip Windows

Oil can to fill seal oilers



Long Term Storage

If the machine will not be used for more than seven days it should be placed in Auto store mode or treated with preservative. Spectra Watermakers SC-1 powdered preservative may be used if there is no danger of freezing. **Do not use other brands of preservative, they will damage the equipment!** If there is danger of freezing Propylene Glycol potable water antifreeze should be used instead of Spectra Watermakers SC-1. **The Pressure Relief Knob on the Spectra Pearson Pump must be open while preservatives or cleaning compounds are present!**

If SC-1 chemical is to be used: You will need one 4lbs. of SC-1 and 5 gal. (38L) of chlorine free water, and the system must have already been thoroughly flushed with fresh water. The feed water supply must be shut off.

Run the system through a fresh water flush cycle until the brine discharge is below 1000ppm. If possible connect the service hose to the brine discharge port on the system and monitor the discharge during the flush cycle, when it drops below 1000 ppm you can fill a 5 gallon bucket with water so you have the water required to recirculate the storage chemicals through the system.

Attach both the feed and brine discharge service hoses, so the feed and the brine discharge hoses go into the bucket.

Use the service switch on the control panel to run the pump (at low speed) and the water in the bucket will begin to circulate.

Add one container at a time (8 oz.) of SC-1 storage chemical into the bucket and stir until well dissolved (note that the dry chemical may not completely dissolve). Arrange the feed (suction hose) so it is close to the top of the bucket so unmixed chemical is not sucked into the system. When all the chemical has been added circulate the solution for at least 20 minutes.

Turn the service switch to off, remove the brine hose from the bucket and put it to a drain.

Turn the flush switch to on again and pump the remaining solution out of the bucket to the drain. Turn off the Flush switch before the bucket is drained, again avoiding the unmixed chemical. Remove and store the service hoses.

Leave the pressure relief valve open. The watermaker can now be stored for up to six months. If the machine has not been used for six months the above storage procedure should be repeated.

When the system is stored it is a good idea to put a sign on the control box indicating that "The watermaker was filled with storage solution on this date and will need to go through the normal purge before use".

MEMBRANE CLEANING

Keeping an accurate log of system performance is important to understanding maintenance patterns for your system. Being able to track filter pressure and membrane pressure over time will help in understanding how the system is functioning and what is required for system maintenance.

Keeping up with pre-filter changes is the single most important step in system maintenance. If a filter fails due to being overloaded (clogged) it can damage the pump and potentially foul the membranes.

Membrane Cleaning

Membranes need to be cleaned only when feed pressures have risen 10% or production has dropped 10% *due to fouling*, or the product quality degrades. Causes of fouling are: Biological growth that occurs when the system is left unused without flushing or pickling, and mineral scaling if the feed water contains carbonates, sulfates, silicates or other sparingly soluble salts. Colloidal particles can also clog the membrane. Monitor the product salinity and feed pressure for higher than normal readings for the conditions. Look for all other causes before cleaning the membrane, i.e. feed water temperature and salinity, pump speed, hose restrictions, membrane life can be shortened by unnecessary cleaning.

There are two types of cleaners: acid and alkaline. The acid cleaner (SC-3) will remove mineral scaling. The alkaline cleaner (SC-2) is used to remove biological by-products, oil, and dirt particles that get past the pre-filters. The acid cleaner should be used first. If the membrane fails to respond to both cleanings, this is an indication of another problem with the system, or that it is time to replace the membrane. Contact Spectra Watermakers before removing a membrane.

Note: Procedures are the same for the SC-2 and SC-3 cleaners

For normal cleaning, the SC-3 Acid Cleaning Compound is used first, then the SC-2 Alkaline Cleaning Compound, if necessary. If known bio-fouling is present, the SC-2 may be used first. Using warm water if possible, up to 120°F (50°C) is recommended as it greatly enhances the ability of the cleaners to do their jobs.

Warning! The pressure relief valve on the Spectra Pearson Pump must be open for this procedure or membrane damage may result.

.Spectra Cleaning Compounds (SC-2 or SC-3) must be mixed with unchlorinated fresh water at a ratio of two containers of compound to 10 gallons (45L) of water to have the proper solution. An LB 14,000 system contains 40 gallons of water so 8 containers of compound are required per cleaning.

SC-2 and SC-3 are never mixed together. Do not use them for storage pickling solution.

MEMBRANE CLEANING, continued....

Cleaning Procedure:

Note; The pressure relief valve is always open when cleaning chemicals are in the system or being purged from the system.

For either of the cleaning chemicals: You will need 8 containers (4 lbs) and 5 gal. (38L) of chlorine free water, and the system must have already been thoroughly flushed with fresh water. The feed water supply must be shut off.

Run the system through a fresh water flush cycle until the brine discharge is below 1000ppm. Connect the service hose to the brine discharge port on the system and monitor the discharge during the flush cycle, when it drops below 1000 ppm you can fill a 5 gallon bucket with water so you have the water required to recirculate the cleaning chemicals through the system.

Attach both the feed and brine discharge service hoses, so the feed and the brine discharge hoses go into the bucket.

Use the service switch on the control panel to run the pump (at low speed) and the water in the bucket will begin to circulate.

Add one container at a time (8 oz.) of the cleaning chemical into the bucket and stir until well dissolved (note that the dry chemical may not completely dissolve). Arrange the feed (suction hose) so it is close to the top of the bucket so unmixed chemical is not sucked into the system. When all the chemical has been added circulate the solution for at least 20 minutes.

Turn the service switch to off, remove the brine hose from the bucket and put it to a drain.

Turn the flush switch to on again and pump the remaining solution out of the bucket to the drain. Turn off the Flush switch before the bucket is drained, again avoiding the unmixed chemical. Remove and store the service hoses.

Purge the system with feed water as per new system start up and purge procedure (see page 11).

TROUBLESHOOTING

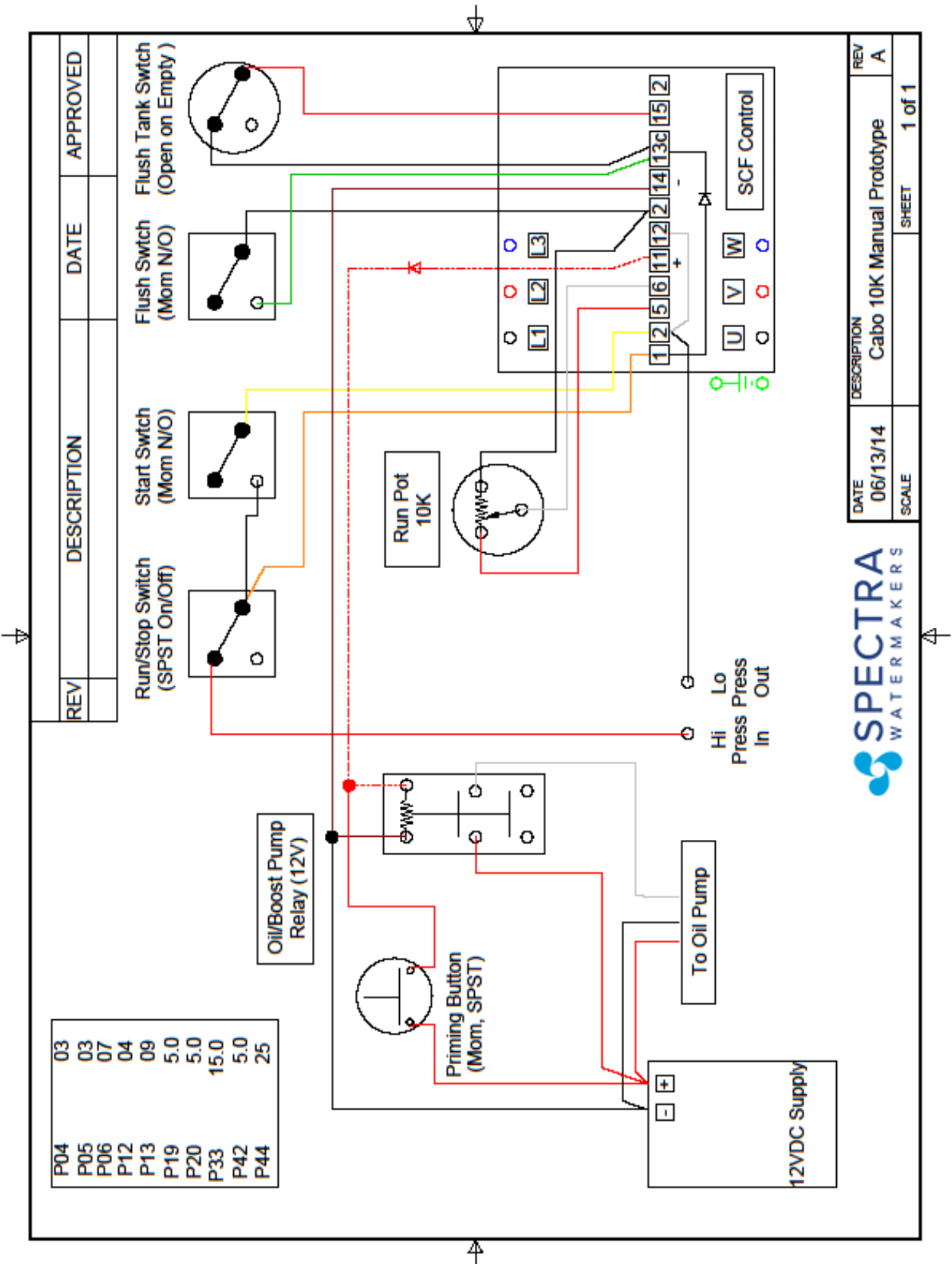
Symptom	Cause	Resolution
Pump Knocks Loudly	Incorrect Boost Pressure	Increase or Decrease boost pressure as appropriate Check Pre-filtration for blockages
	Inadequate Feed Water Supply	Check Supply Pump for proper operation and adequate flow through pre-filtration system
	Suction on brine discharge	A vacuum break (air gap) or a small restriction on the brine discharge (2-5 psi) can reduce knocking
Belt Skipping Teeth on Gear-End	Belt Too Loose	Tighten Belt
	Motor Turning Wrong Direction	Run motor in reverse direction by swapping T1 and T2 on VFD Output terminals (AC Systems Only)
Permeate Flow Decreasing	Worn High Pressure Seals	Replace seals
	Worn Damper Piston Seal	Replace Damper Piston and Seal
	Worn Piston Seals	Replace Pistons and Seals
	High Membrane Pressure	Check membrane pressure against nominal system parameters.
Recovery Ratio Increasing	Worn Pistons	Replace Pistons and seals
	Permeate Flow Meter Not Calibrated	Calibrate permeate flow meter

TROUBLESHOOTING

Symptom	Cause	Resolution
High Power Consumption (Decreased Energy Efficiency)	High Membrane Pressure	Check membrane pressure against nominal system parameters
	Low Boost Pressure	Check Supply Pump for proper operation and adequate flow through pre-filtration system
	Motor Problems	Test motor, replace if necessary
	Water in crankcase	Change oil
Pump Won't Run	Motor Problem	Check AcTech VFD for error codes, display should change if manual run or service switch is used
	VFD Problem	Check all wiring Check VFD for error codes
Pump Leaking	Seal failure	Replace seals
Poor Product Quality	Biofouling (rotten egg smell)	Run watermaker for 6 to 8 hours, if the water still smells clean with SC-2 (alkaline)
	Scaled Membranes (elevated membrane pressure)	Clean with SC-2 (acid)

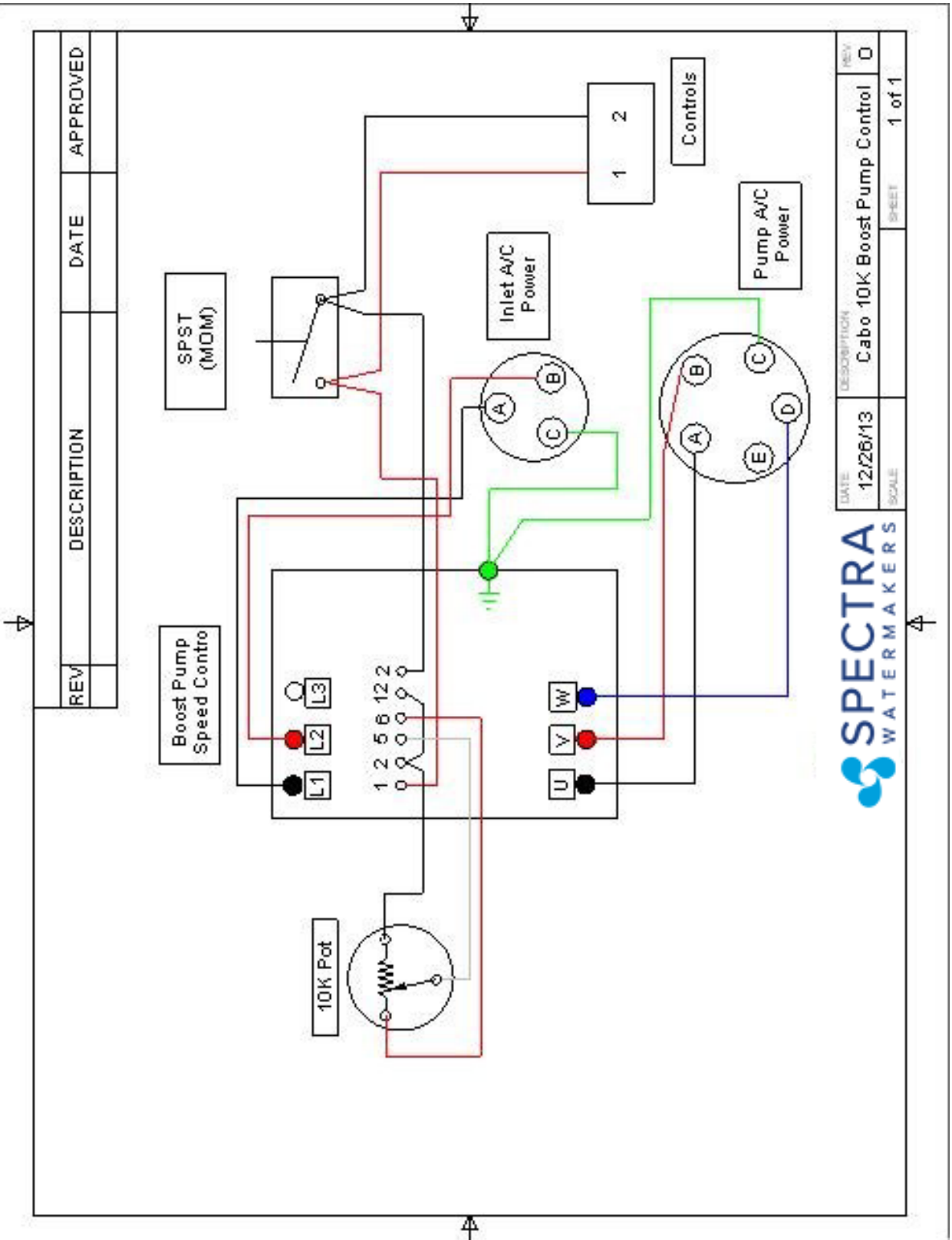
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Wiring Diagram and speed control settings



DATE	06/13/14	DESCRIPTION	Cabo 10K Manual Prototype	REV	A
SCALE		SHEET	1 of 1		

Feed Pump Speed control



Specifications

Electrical Input

208-240 volts three phase 50/60 Hz, 7.5 hp motor (5.5kW max**)

Power consumption will vary depending on feed water conditions and motor RPM. Do Not Exceed Factory Recommended Max/Min values.**

Feed Water Supply

Minimum Pressure after filters: 10 psi, .7 bar

Maximum Pressure after filters*: 20 psi, 1.4 bar

Feed Flow Rate: 20gpm, 76 L/min.

Total Dissolved solids: 0-20,000 mg/L

pH range: 4-11

Continuous free chlorine: 0 ppm

Temperature: 0° to 45° C

Turbidity: 1 NTU max

Silt Density Index: 1 max (after pre-filtration)

Product

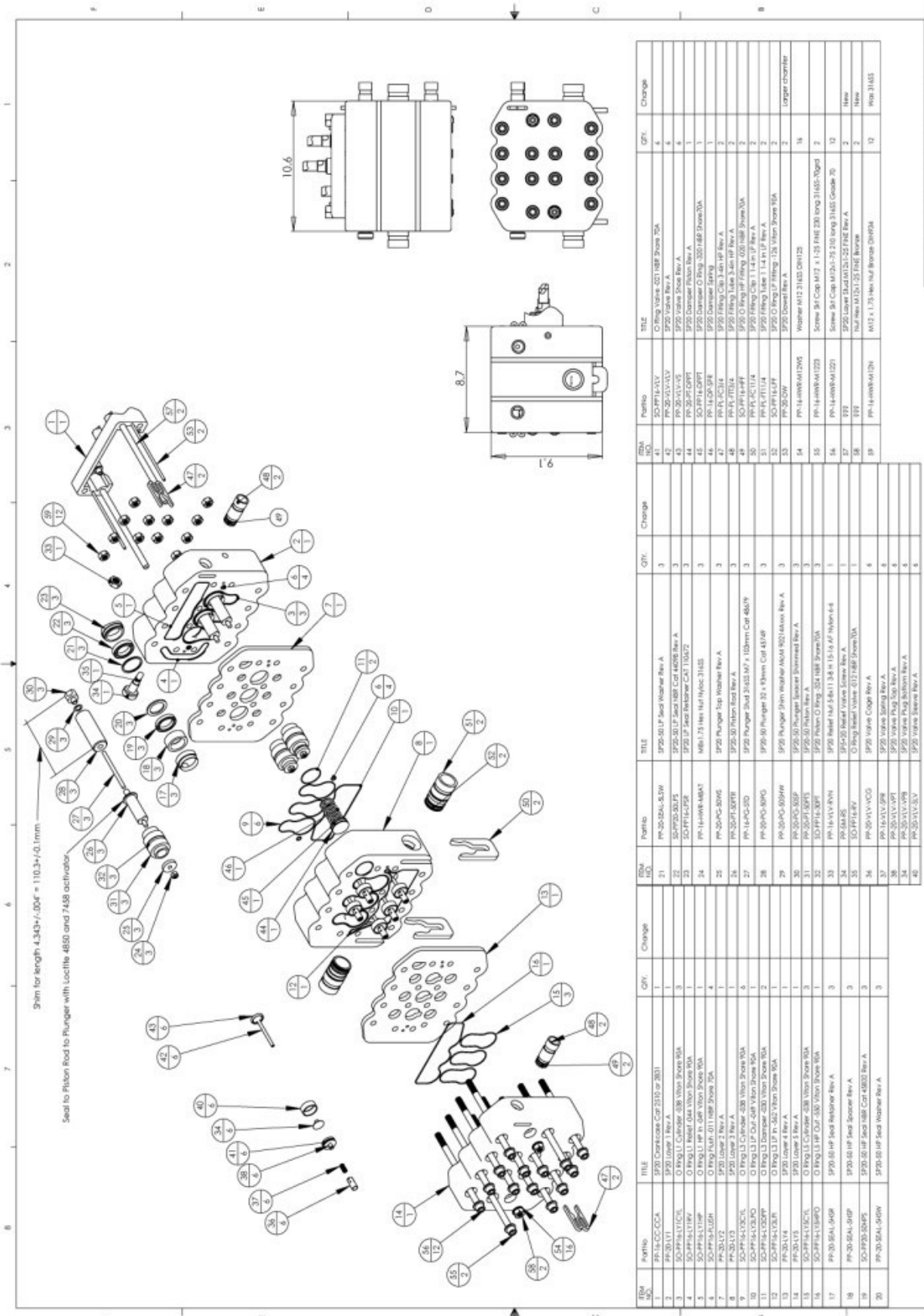
Rejection: 99.4%

Flow: ≈11gpm, ≈41 lpm

Lubricant:

O-rings and seals: Dow Corning Silicon Lubricant

CAT Crankcase: 5W-30 or equivalent synthetic motor oil



Shim for length 4.343 +/- .004\"/>

Seal to Piston Rod to Plunger with Loctite 4850 and 7458 activator

REV	PartNo	QTY	Change	REV	PartNo	TITLE	REV	PartNo	TITLE	QTY	Change	REV	PartNo	TITLE	QTY	Change
1	PR-14-CC-CCA	1		31	PR-20-50-AL-3LW	SP20-50 LP Seal Washer Rev A	1	SO-20-PI-14-VLV	O Ring Valve, 021 1487 Shore 75A	6		41	SO-20-PI-14-VLV	O Ring Valve, 021 1487 Shore 75A	6	
2	PR-20-PL-1	1		32	SO-20-50-BLPS	SP20-50 LP Seal Washer Rev A	3	PR-20-50-VLV-VLV	SP20 Valve Rev A	6		42	PR-20-50-VLV-VLV	SP20 Valve Rev A	6	
3	SO-20-PI-14-VLV	3		33	SO-20-PI-14-VLV	SP20-50 LP Seal Washer Rev A	3	PR-20-50-VLV-VLV	SP20 Valve Rev A	6		43	PR-20-50-VLV-VLV	SP20 Valve Rev A	6	
4	SO-20-PI-14-VLV	3		34	SO-20-PI-14-VLV	SP20-50 LP Seal Washer Rev A	3	PR-20-50-VLV-VLV	SP20 Valve Rev A	6		44	PR-20-50-VLV-VLV	SP20 Valve Rev A	6	
5	SO-20-PI-14-VLV	3		35	SO-20-PI-14-VLV	SP20-50 LP Seal Washer Rev A	3	PR-20-50-VLV-VLV	SP20 Valve Rev A	6		45	PR-20-50-VLV-VLV	SP20 Valve Rev A	6	
6	SO-20-PI-14-VLV	3		36	SO-20-PI-14-VLV	SP20-50 LP Seal Washer Rev A	3	PR-20-50-VLV-VLV	SP20 Valve Rev A	6		46	PR-20-50-VLV-VLV	SP20 Valve Rev A	6	
7	PR-20-50-VLV-VLV	6		37	PR-20-50-VLV-VLV	SP20-50 LP Seal Washer Rev A	6	PR-20-50-VLV-VLV	SP20 Valve Rev A	6		47	PR-20-50-VLV-VLV	SP20 Valve Rev A	6	
8	PR-20-50-VLV-VLV	6		38	PR-20-50-VLV-VLV	SP20-50 LP Seal Washer Rev A	6	PR-20-50-VLV-VLV	SP20 Valve Rev A	6		48	PR-20-50-VLV-VLV	SP20 Valve Rev A	6	
9	SO-20-PI-14-VLV	3		39	PR-20-50-VLV-VLV	SP20-50 LP Seal Washer Rev A	6	PR-20-50-VLV-VLV	SP20 Valve Rev A	6						
10	SO-20-PI-14-VLV	3		40	PR-20-50-VLV-VLV	SP20-50 LP Seal Washer Rev A	6	PR-20-50-VLV-VLV	SP20 Valve Rev A	6						
11	SO-20-PI-14-VLV	3		41	PR-20-50-VLV-VLV	SP20-50 LP Seal Washer Rev A	6	PR-20-50-VLV-VLV	SP20 Valve Rev A	6						
12	SO-20-PI-14-VLV	3		42	PR-20-50-VLV-VLV	SP20-50 LP Seal Washer Rev A	6	PR-20-50-VLV-VLV	SP20 Valve Rev A	6						
13	PR-20-50-VLV-VLV	6		43	PR-20-50-VLV-VLV	SP20-50 LP Seal Washer Rev A	6	PR-20-50-VLV-VLV	SP20 Valve Rev A	6						
14	SO-20-PI-14-VLV	3		44	PR-20-50-VLV-VLV	SP20-50 LP Seal Washer Rev A	6	PR-20-50-VLV-VLV	SP20 Valve Rev A	6						
15	SO-20-PI-14-VLV	3		45	PR-20-50-VLV-VLV	SP20-50 LP Seal Washer Rev A	6	PR-20-50-VLV-VLV	SP20 Valve Rev A	6						
16	PR-20-50-VLV-VLV	6		46	PR-20-50-VLV-VLV	SP20-50 LP Seal Washer Rev A	6	PR-20-50-VLV-VLV	SP20 Valve Rev A	6						
17	PR-20-50-VLV-VLV	6		47	PR-20-50-VLV-VLV	SP20-50 LP Seal Washer Rev A	6	PR-20-50-VLV-VLV	SP20 Valve Rev A	6						
18	PR-20-50-VLV-VLV	6		48	PR-20-50-VLV-VLV	SP20-50 LP Seal Washer Rev A	6	PR-20-50-VLV-VLV	SP20 Valve Rev A	6						
19	SO-20-PI-14-VLV	3														
20	PR-20-50-VLV-VLV	6														

Remove all burrs and sharp edges, max radius 0.010"

Material: Cast Aluminum

Surface Finish: As Machined

Dimensions: Inches

Tolerances: Do not scale

Third Angle Proj.

Rev: A Date: 140314

SP16 50% Assembly Exploded Rev A, plus changes as BOM

Purpose & Changes

Scale: 1:1

SP20-50 Assembly Exploded Rev A

Contact: Colin Pearson

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email: colin.pearson@spektrix.com

Dwg No.: 2

Size: C1 Sht 1 of 1

Notes for parts:

Desalinator OPERATOR'S LOG

LOCATION:

DESALINATOR #

OPERATOR:

FEED WATER
SOURCE:

FEED SALINITY:

DATE	TIME	PROD- UCT GPH/LPH	SALINI- TY PPM	FEED TEMP	MEM- BRANE PSI/BAR	PREFIL- TER PSI/BAR	HOURS
NOTES:							