HS LF-2: FLOW TEST/ SINGLE SHURFLO PUMP (VENTURA)

The flow test is the most useful diagnostic test for system performance, and should be done before replacing or cleaning your membrane. Changes in production or water quality are normally caused by something **other than** the membrane, unless the system has been left unused for a long time.

Before the flow test, change all filters and clean the sea strainer. Carefully check for water or air leaks, as air in the system will cause low production and erratic salinity. Look for air bubbles in the product flow meter, feed water hoses, and brine overboard hose.

Run the system and watch the pressures very closely. If the feed pressure to the Clark Pump is asymmetrical from one stroke to another, this could be part of the problem. A difference of a few PSI is acceptable, but anything over that is an issue. If the pump is asymmetrical, Clark Pump repairs should be done before continuing with these tests. See "CP-5 Clark Pump Checkout."

If no asymmetry is noted, continue with this test.

Make sure the ShurFlo overpressure cutout switch (PL-PMP-SFPH) is set to 125 PSI. With the pump running, close the brine service valve. The feed pressure should rise to 125 PSI, then the pump should shut off. If the pump shuts off at a lower pressure see "SF-2 Adjust ShurFlo Pressure Switch."

You will need a graduated bucket and a stopwatch. Measurements must be very accurate, as errors of just a few percent will skew the results. Log the voltage at the feed pump at the same time. Confirm at least 12.5 volts at the pump. You may have to run the engine or battery charger during the test.

1. First divert the product flow into the bucket and record how long it takes to accumulate a given amount. Product flow is usually expressed in Gallons Per Hour or Liters Per Hour, so it's easiest and most accurate to collect the flow for exactly ten minutes, then multiply the quantity by six to get GPH or LPH. Alternatively, you can collect exactly one gallon or four liters then calculate GPH or LPH as follows:
   3600/time in seconds x quantity of water=GPH/LPH
   There are 3600 seconds in an hour.
   Example: It took 9 minutes, 45 seconds to collect 1 gallon of product water, so 3600/585 x 1=6.15 GPM (9 times 60 seconds is 540 plus 45 equals 585 seconds).

2. Connect the service hose to the brine discharge fitting and divert the brine discharge into the bucket. Brine flow and total flow are usually expressed in Gallons Per Minute or Liters Per Minute. For the simplest and most accurate measurement, divert exactly 5 gallons or 20 liters, record the time, and calculate GPM or LPM as follows:
   60/time in seconds x quantity of water = GPM or LPM

Example: It took 3 minutes (180 seconds) to collect 5 gallons of brine discharge, so 60/180 x 5 = 1.67 GPM

3. For a final test, which can be cross-referenced with the data from the first two, divert both the product and brine discharge into the bucket, and repeat the methodology from step 2.

System	Feed Pressure		Static * Pressure	Feed Flow				Product Flow			
				Flow		MIN	MIN	Flow	Flow	MIN	MIN
	psi	bar	psi	gpm	lpm	gpm	lpm	gph	lph	gph	lph
Ventura	60-70	4.2-5	10-15	1.7	6.4	1.65	6.2	6.5	24.6	5.7	21.5
VT 200	80-90	5.6-6.3	20-25	1.7	6.4	1.6	6.0	8.3	31.4	7.7	29.1

***pressure relief valve open ½ turn**

In order to make good water, you need the proper amount of feed water flow, as in the table above. Compare the product flow to the total feed flow. Product flow should be 7% of total flow for a 150, and 9.5% of total flow for a 200 model. If product percentage is low, you may have an internal leak in the Clark Pump.

For every $^{1}/_{10}{}^{th}$ of a GPM feed water flow loss, we will lose about $^{1}/_{2}$ gallon per hour of product flow and the salinity will go up 100 PPM.

Low feed flow combined with low system pressures (see Misc-4: Nominal Pressures) is most frequently due to worn ShurFlo pump heads (PL-PMP-SFPH).

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