

Field Visit Tips for VACLEEN® Automatic Screen Filters

VACLEEN® is an automatic self-cleaning screen filter that catches particles that are larger than the screen mesh. The filter will automatically go through a flush cycle to clean the screen whenever it gets dirty. You will know that the screen is dirty when there is a pressure difference of 5 PSI or more between the inlet and the outlet of the filter.

Automatic self cleaning happens when the flush valve opens and dirty flush water flows out of the filter. The filter needs to have pressure when flushing and the recommended pressure is at least 35 PSI at the filter outlet when the flush valve is open. When there is less than a 35 PSI, some cleaning of the screen will happen, but the cleaning cycle will not be as effective and some dirt may remain on the screen.

Here is how you check a VACLEEN® filter in the field when the water is flowing.

The first thing to do is check the pressure at the filter inlet and the filter outlet to find out the pressure difference across the filter. This is done by pointing the arrow on the selector located next to the gauge first to INLET and then to OUTLET so that the pressure difference can be read with the same gauge so there is no worry about calibration between two gauges.



Selector pointed to "INLET"



Selector pointed to "OUTLET"

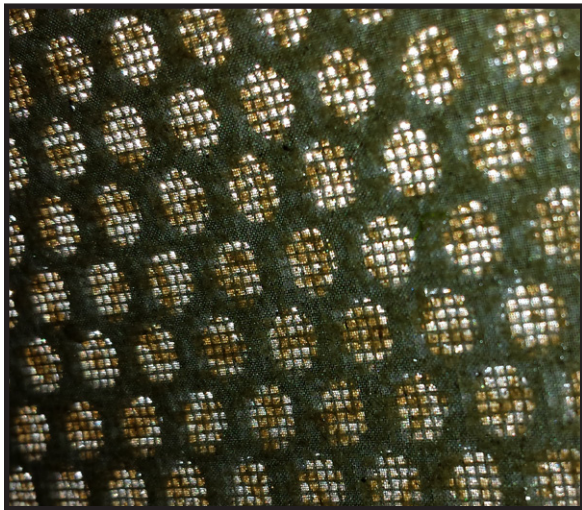
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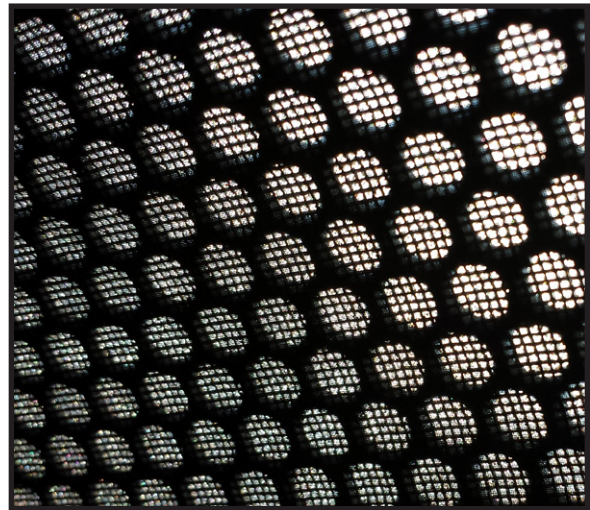
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The selector at the gauge is only for reading pressure. Pointing the selector at FLUSH will not flush the filter. Instead, pointing at FLUSH will read the pressure in the flush chamber. Pointing at INLET will read the pressure of dirty water coming into the filter. Pointing at OUTLET will read the pressure of clean water leaving the filter. It does not matter where you leave the selector after you have finished checking out the pressures.

If there is less than 1 or 2 PSI pressure difference between INLET and OUTLET, this means the screen is clean. If the difference is about 5 PSI, the filter should be starting a flush cycle pretty soon. Watch the pressure difference build up to the point that starts the flush cycle and watch the filter as it flushes. The flush cycle is only 10 seconds for smaller Model 250 and 500 filters, and 20 seconds for the larger Model 1000, 1500 and 2000 filters. During the flush cycle, the flush valve will open and flush water will pour out to atmospheric pressure. During the flush, point the selector to FLUSH and read the pressure gauge and be sure it is reading a very low pressure of 5 to 10 PSI or less. Also, during the flush, quickly point the selector to OUTLET and be sure it is at least 35 PSI.



Example of a dirty screen



Example of a clean screen

After 10 to 20 seconds, the flush valve will close. When it does, read the INLET and OUTLET pressure again to be sure there is nearly zero pressure difference across the filter. This confirms that the filter screen is now clean and waiting for the dirt in the water to build up on the screen and signal the next flush.

If the filter screen is clean and it does not look like the automatic flush will happen anytime soon, it is possible to flush the VACLEEN® filter manually. To manually flush a filter that has hydraulic control, open the flush valve with the two-way selector. If the filter has electric or battery control, push the symbol for manual flush

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twice on the electric or battery control panel. While the flush is happening, turn the selector arrow and read the pressures to be sure that the FLUSH chamber drops to a very low pressure. Next, quickly point the selector to OUTLET and be sure you have at least 35 PSI while the filter is flushing. After the manual flush has stopped, read the pressure gauge again to check that there is very little difference between the INLET and the OUTLET and this confirms that the filter screen is clean.



Flush valve in CLOSED position



Flush valve in OPEN position

If the difference between the INLET and the OUTLET is more than 10 PSI, this means that the screen is dirty and there may be a problem with the filter or the controls. When this happens, the filter may be constantly flushing because the screen is dirty.

There are two ways to clean a dirty filter screen. The first is a POWER FLUSH and you do not need to open the filter. To do a POWER FLUSH, be sure the filter is flushing manually and will remain flushing for the entire POWER FLUSH which takes about one minute. Manually flush the filter by opening the flush valve to create a very low pressure in the FLUSH chamber for as long as you need it. Next, close down a valve at the filter outlet to raise the pressure in the filter. If the pump has a variable-speed drive, it may be necessary to increase the motor speed. Be sure not to increase the pressure higher than a pressure blow-off setting or the maximum rated pressure of the filter, the piping, the pump, or the well. Most of the smaller Model 250 and 500 VACLEEN® filters are rated for 80 PSI and the larger filters are rated for 150 PSI.

Continue the POWER FLUSH and read the OUTLET and FLUSH pressures to be sure the OUTLET pressure is at least 40 PSI or higher and the FLUSH pressure is very low

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such as 10 PSI or lower. Continue to close down the valve at the filter outlet to create as high a pressure as possible and still be safely under the maximum pressure of the filter, the pump and the well. Higher pressure will create a much stronger flush than normal, and may be what is needed to clean the screen. After a minute of POWER FLUSH, reduce the pressure in the filter by opening the valve at the filter outlet. Close the flush valve and read the pressure gauge again. If you see very little difference between the INLET and the OUTLET, this confirms that the filter screen is clean.

If there is still a difference of more than 2 PSI between the INLET and the OUTLET after a POWER FLUSH, the filter screen needs to be taken out and cleaned with a pressure washer. Before taking this step, however, it is important to check out the irrigation system while the water is flowing in order to find out what may have caused the filter to become dirty in the first place and unable to clean itself.

Check the irrigation system pressure with the water flowing. Read the pressure at the INLET and the OUTLET. The pump must be strong enough to be able to create at least 35 PSI at the filter outlet. If there is not enough pressure available, the filter may never be able to keep itself clean. Next, open the flush valve and read the pressure with the selector pointing to FLUSH. The FLUSH pressure should be very low when the flush valve is open because the flush valve discharge should be close to atmospheric pressure. If the pressure at the FLUSH is more than 5 to 10 PSI when the flush valve is open, look at the pipes that take flush water away from the filter. If these pipes are smaller than 3 inches and if they include several elbows or fittings



Photo of zero pressure in the FLUSH when the flush valve is open

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that create restrictions, or if the flush pipe goes uphill to a higher elevation than the filter outlet, this could be the reason for the higher than normal FLUSH pressure. Remember, the FLUSH pressure must be very low while the filter is flushing. If you do not have 35 PSI in the filter when flushing AND you have more than 5 to 10 PSI in the flush chamber, the filter will not come completely clean each time, and the material in the water may slowly build and accumulate on the screen. Always be sure there is pressure in the filter and nearly zero pressure in the FLUSH when the flush valve is open.

Another possible reason for a dirty screen is lack of pressure in the filter when the system is first started up or when zones are opened in the field. When there are empty pipes in the field, there will be no pressure in the filter unless there is a valve between the filter and the field. If there is no valve, pressure will not appear in the filter until the field pipes are completely full and this may take several minutes. Meanwhile, the material in the water will be building up on the filter screen and may plug the filter before the automatic flush can get a chance to operate. This problem is solved automatically by installing a pressure sustaining valve downstream of the filter, between the filter outlet and the field piping. The pressure sustaining valve automatically restricts water flow and maintains pressure in the filter for as long as it takes to fill the pipes in the field. After the field pipes are full of water, the pressure rises to normal operating pressure and the pressure sustaining valve will go fully open.



Remember that when a new zone opens up in the field, pressure can fall again until the new zone completely fills with water. The pressure sustaining valve will automatically maintain pressure in the filter while a new zone is filling so that the filter can flush properly at any time the screen gets dirty.

If there is no pressure sustaining valve, or if it is not set correctly to maintain the right pressure, there is a very good chance that at some time, not enough pressure was in the filter to flush the filter screen and the screen may have become plugged.

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Summary

Operating your VACLEEN® filter under the guidelines outlined in this document will ensure that the filter gets a good, strong flush whenever it needs to and that the screen comes clean again after a flush cycle. This will keep the filter clean and ready to catch the material in the water. As a final note, whenever you turn off the water, do a manual flush of the filter to be sure that the screen is clean and ready for the next start-up.

1. The VACLEEN® filter needs 35 PSI pressure when flushing.
2. When the flush valve is open, the pressure in the FLUSH chamber should be near zero.
3. A flush cycle takes no more than 10 to 20 seconds and after it is done, the difference in pressure between INLET and OUTLET should be 1 or 2 PSI at the most.
4. You can manually open the flush valve and raise the pressure in the filter to do a POWER FLUSH for one minute for extra cleaning power.
5. When flushing, be sure that you always have at least 35 PSI pressure in the filter and that there are no restrictions in the flush line so that the pressure at the FLUSH is nearly zero when the flush valve is open.
6. Use the three way selector and the gauge on your filter to easily tell if the filter is clean or dirty and how well it is flushing.

About CalWest Rain

As an authorized dealer for Evoqua VACLEEN® Filters (formerly Olson Filers) in Central California. We provide complete sales, parts and service support for VACLEEN® automatic screen filters. CalWest Rain began serving the Ag Irrigation and Pump needs of growers in 1989. Our commitment to providing the highest quality standards in irrigation design, integration, equipment, automation and customer service remains the benchmark by which we measure our success.

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