VACLEEN® AGRICULTURAL AUTOMATIC SCREEN FILTERS
**Evoqua's Vacleen®** automatic self-cleaning screen filter for agriculture can remove suspended solids from 250 mesh to 50 mesh (50 to 350 micron). Vacleen filter tanks are made of type 316L stainless steel*, made in the USA and are competitively priced. With flowrates up to 454 m$^3$/hr (2,000 gpm) in a single tank, these filters are compact, reliable, and easy to operate. The patented bi-directional drive ensures that the entire filter screen is cleaned during each flush cycle without interrupting the filtration process. Cleaning the filter screen takes less than 15 seconds and produces very little flush water.

* With the exception of the P-200 which is made of glass-filled nylon
+ Patented in some countries

**MARKETS**
- Agricultural Irrigation
  - Drip Tape
  - Dripline
  - Microspray
  - Sprinkler
  - Center Pivots
- Nursery/Greenhouse
- Packing House

**FEATURES/BENEFITS**
- Single tank filters up to 454 m$^3$/hr (2,000 gpm)
  - **Low cost, small footprint, simple and reliable**
- Short 10-15 second flush cycle and low flush water flow
  - **Quick flush saves water with a very small drop in pressure**
- Type 316L stainless steel tank (on A-Series models only), filter screen and internal parts
  - **Exceptionally long life when compared to filters made of coated carbon steel**
- Low clean-screen pressure loss
  - **Saves energy every single hour of filter operation**
- Easy to move from field to field
  - **Lightweight and portable, saves time and cost in temporary applications**

**PROVEN SUCCESS IN:**
- Canal Water
- Reservoirs
- Rivers/Lakes
- Well Water
- Animal Production
- Wastewater for Crop Production

**Advantages Over Piston-Drive Filters**
Vacleen filters have been proven worldwide to perform reliably and accurately over tens of thousands of cleaning cycles under changing conditions that are often unpredictable. Other filters of this type use a water-driven piston technology that has not changed much since the 1970’s for the motion and position of the internal parts. The bi-directional drive inside the Vacleen filters guides the internal shaft to reliably scan the entire surface of the filter screen every time, regardless of pressure, flow rate, or age and condition of the filter.

**Advantages Over Sand and Disk Filters**
With flow rates up to 454 m$^3$/hr (2,000 gpm) in a single tank, Vacleen filters cost less and are easier to manage in the field compared with other filters that rely on multiple tanks and include complicated controls with multiple three-way valves and solenoids. The Vacleen filter can be inspected and confirmed 100% operational by taking off the single tank lid and removing the internal cartridge as one assembly. This saves hours in the field when compared with troubleshooting and repair of multi-tank filtration systems.

**Operation at Low Pressure 1.3 bar (20 psi)**
Standard minimum pressure is 2 bar (30 psi), but when combined with a small flush pump that pulls water from the flush outlet, the Vacleen filter can automatically self-clean even with the filter pressure as low as 1.3 bar (20 psi). This feature is ideal for situations where saving energy is important or if electrical infrastructure is not available to power high pressure pumps.
### GENERAL SPECIFICATIONS:
- Bi-directional Drive
- Max Pressure
  - P-200: 8 bar (120 psi)
  - A-250/A-500: 5.5 bar (80 psi)
  - A-1000 and larger: 10 bar (150 psi)
- Min Pressure: 2 bar (30 psi)
- With Flush Pump, 1.3 bar (20 psi)
- Max Temp: 80° C (176° F)
- Flush Cycle: 10 to 15 seconds
- Flow Range per Filter: 7 to 454 m³/hr (30 to 2,000 gpm)
- Flange Sizes: 3” to 14”
- Screen Options: 250 to 50 mesh (50 to 350 micron)

### MATERIALS:
- Filter Body
  - P-200: Glass-Filled Nylon
  - A-250 and larger: 316L SS
- Screens: 316L SS Weave-wire
- Seals: Nitrile, Viton®, Silicone, EPDM

### Options:
- Filter Body: 2205 Duplex for Seawater
- High Pressure: up to 24 bar (350 psi)
- High Temperature: 99° C (210° F)
- Screen: 1250 to 13 mesh (10 to 1500 micron)

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Note: Please contact us to discuss filter selection for a specific project.
**HOW IT WORKS**

Dirty water enters the filter through the inlet (1) and then passes through the coarse screen (2) from the outside in. It flows from the inside of the coarse screen to the inside of the fine screen and then passes through the fine screen (3) from the inside out. Dirt is collected on the inside surface of the fine screen. The clean filtered water then exits through the filter outlet (4).

As the dirt or cake builds up on the inside surface of the fine screen, the pressure drop across the screen increases. When the pressure drop (the DP or differential pressure) reaches 0.3 to 0.5 bar (5-7 psi), the filter controller starts a flush cycle by opening a flush valve on the flush outlet (5). This flush valve exhausts the flush chamber to atmosphere at “0” psi.

The pathway to flush the dirt from the filter starts at the inlet of the cleaning nozzles (8) through the dirt collector shaft (7) and into the separate flush chamber (6) through the water motor (9). When the flush valve opens, each cleaning nozzle is exposed to atmospheric pressure, creating a strong flow of water through this path. There is a very small clearance between the tip of each cleaning nozzle and the screen, and when flushing, there is counterflow of clean water backward through the screen and into the tip of each cleaning nozzle. The high velocity counterflow of clean water is concentrated over each cleaning nozzle and ensures that dirt on the screen is pushed off the screen surface into the cleaning nozzles to be ejected out of the filter.

The water motor has opposite facing jets near its ends. Water jetting out of these openings (coming from the cleaning nozzles) creates a reaction force (like a pin wheel) which rotates the motor and the dirt collector. As the dirt collector rotates, each cleaning nozzle cleans a spiral band on the fine screen.
As the dirt collector rotates, the reverser (10) (works like the level winder on a fishing reel) causes the water motor / dirt collector / cleaning nozzle assembly to move back and forth on a controlled path. This ensures proper overlap for 100% cleaning of the screen’s inner surface. The rotation governor (11) helps control the rotation speed of the dirt collector assembly. The balance tube (12) removes pressure forces on the reverser. A magnet located on the end of the balance tube repels the reverser indicator (13) which provides visual indication of the dirt collector assembly movement. This indicates that the entire cleaning system is operating properly during the flush cycle.

After 12-15 seconds, the flush valve closes and the flushing cycle is complete. Very little water is used for each flush; the filter continues to supply water to the system during the flush cycle.

Go to www.vacleen.com to see the Vacleen® filter’s simplicity in action.

PRESSURE SUSTAINING AND PRE-FILTRATION

For best results when using a Vacleen filter, a pressure sustaining valve between the filter outlet and the field is recommended, particularly in cases where pumps and valves operate automatically. This is because during flushing, the high velocity counterflow of clean water comes from the difference in pressure between field pressure (outlet of the filter) and atmospheric pressure at the flush discharge. Whenever there is low pressure in the field, such as during system start-up, or when pipes need to fill when changing irrigation blocks, the filter will not flush properly unless at least 2 bar (30 psi) pressure is created at the filter outlet. Pressure can be maintained automatically at the filter outlet with a pilot-operated pressure sustaining valve installed between the filter outlet and the field.

Some Vacleen filter models include an internal coarse pre-filter screen to be sure that very large particles, such as rocks, twigs, leaves, and floating moss, cannot get into the fine screen and possibly interfere with the motion of the cleaning nozzles. If the internal coarse screen will often become plugged with large debris, it may be necessary to install pre-filtering at the pump suction or between the pump and the filter. The external pre-filters should be generously oversized so that they do not need attention very often and should be easy to service.
APPLICATIONS
Canal Water, Center Pivot

River Water, Apple Orchard

Canal Water, Melons
(Trailer Mounted Filter)

To respect grower privacy, the locations here are not exact and include only a sample of actual installations in the field.
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