

## Poseidon Filtration System™ — Ortho-Wash™ Control System

### Automation for Simultaneous or Separate Backwash and Air Scour

#### Key Benefits:

- Optimizes filter performance
- Minimizes operating costs
- Maximizes filter run lengths
- Reduces backwash volume
- Flexible media selection
- PLC-based, SCADA-ready

#### With Simultaneous Backwash and Air Scour:

- Superior media cleaning
- Lowers capital costs



Filter Operating Console

*Poseidon Filtration Systems™ deliver to municipal clientele complete systems that include PLC-based controls, monolithic floor underdrains, backwash troughs, air header piping, and filtration media.*

Ortho-Wash™, a primary component of the complete *Poseidon Filtration System™*, includes all control hardware, programming, and instrumentation to fully automate conventional granular filters for municipal water and wastewater treatment applications.

Ortho-Wash PLC-based control algorithms continuously monitor essential upstream and downstream process parameters, to include influent channel level, filter level, filter headloss, effluent turbidity, effluent flow rate, air flow rate, backwash flow rate, and valve positions.

Using this information, Ortho-Wash optimizes the operation to minimize cost while enhancing effluent quality, meeting regulatory requirements, and ensuring process and personnel safety. Filtration efficiency is maximized with the longest practicable filtration run.

Backwash and air scour sequences are automatically initiated according to real-time conditions, and durations managed to the extent necessary to thoroughly clean the media. Water and air flow rates are applied based on media type(s), configuration, size, and depth to cleanse, yet retain, the filter media. As such, Ortho-Wash is the prudent choice for effective and economical cleaning of conventional filter media, particularly under adverse fouling conditions.

The inherent features of the *Poseidon* nozzle-based monolithic underdrain ensure repeatable backwash and air scour results. Below the suspended underdrain, velocities are relatively low and changes are buffered, which reliably lead to excellent backwash and air scour distribution. This, along with Ortho-Wash controls, create unbeatable media cleaning performance.

Ortho-Wash features non-proprietary, SCADA-ready hardware and communication protocols that allow for easy infrastructure-wide integration.

#### **Simultaneous Backwash and Air Scour**

The Ortho-Wash simultaneous backwash and air scour process combines air and water to vigorously clean filtration media while lowering backwash rates and waste volumes. The combined energy increases media grain collisions, significantly more so than during separate air and water washing. The enhanced scrubbing action increases removal of sticky, adhered particles from the media.

During this simultaneous cleaning process, the top layer of media is often lifted towards the water surface. Ortho-Wash Baffles, installed onto backwash troughs, prevent media loss by deflecting air and providing an adjacent quiescent volume to settle out lightweight GAC or anthracite. Negligible media loss occurs when air scouring and backwashing at prescribed rates. Unlike tube-settler baffles, Ortho-Wash Baffles are engineered to promote surface skimming of nuisance floating solids.

See the following process description and graphic: *Draindown*— The cleaning process begins by closing the filter influent valve and filtering down to approximately six inches above the media

*Ortho-Wash Phase*— Media air scouring begins before gradually increasing to the low backwash flow rate. Solids-laden washwater overflows into the trough while media is retained by Ortho-Wash Baffles

*Air Purge*— Air scour discontinues before gradually increasing to the high backwash flow rate. Air is purged from the underdrain and media bed

*Rinse and Restratify*— A fluidizing rinse clears liberated solids from the filter and restratifies the media layers. The filter is returned to service after a brief filter-to-waste phase

Ortho-Wash™ Simultaneous Backwash and Air Scour Process

