



Alfa Laval AS-H Iso-Disc® Cloth Media Filter

Tertiary filtration and final polishing in municipal and industrial applications for high quality effluent discharge or reuse

Introduction

The Alfa Laval AS-H Iso-Disc is a cloth media polishing filter that enables continuous production of high-purity, reuse-quality filtrate from various applications. The filter removes organic and inorganic pollutants such as residual suspended solids e.g. to <math><10 \text{ mg/l}</math> 95%ile (<math><5 \text{ mg/l}</math> 30 day average). Iso-Disc is a compact, cost efficient alternative to traditional sand filters and other disc filter technologies. It offers a robust yet simple design that can handle peak hydraulic loadings up to

Applications

- Tertiary filtration of municipal and industrial wastewater
- Water reuse
- Surface water treatment e.g. for cooling towers and process water
- Pre-treatment for technologies to produce high purity water
- All industries that require water filtration

Benefits

- Individual filter element monitoring
- Individual filter element maintenance
- Simple, robust and efficient design
- Reuse quality filtrate and California Title 22 Water Reuse Certification
- Fully automatic outside-in depth filtration
- Small footprint-to-flow ratio
- Easily expanded
- Low backwash water rates
- High hydraulic loading capacities
- Uninterrupted operation during backwashing cycle
- High hydraulic and solids loading rates
- Simple internal emergency flow bypass



The filter can be installed into a concrete structure, carbon steel tank with coating, or a stainless steel tank, and can easily be retrofitted into existing tanks

Design

The Alfa Laval AS-H Iso-Disc Cloth Media Filter is engineered as a continuous operating process that utilizes a fixed cloth media and an efficient linear backwashing system that cleans the media equally across the whole surface area. The cloth media is fully submerged into a tank to allow 100% use of filtration area at all times.

An Iso-Disc filter incorporates a number of hollow filter elements, designed to handle the actual flow and load conditions. The elements are mounted in a "cassette frame" within the path of the incoming water. Both square and rectangular cassettes are available to cater for different installation configurations.

All submerged components are corrosion resistant stainless steel or non-metallic materials.

The design of the Iso-Disc allows for individual visual assessment of the effluent flow rate and quality. The filter cloth can be replaced while the filter continues to function without interruption.

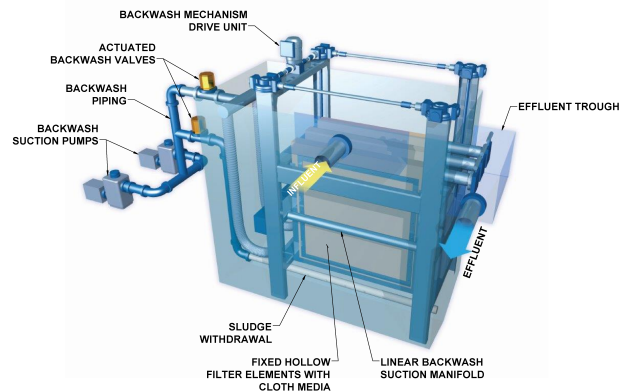
As the filtration area is static, there are no rotating seals which can lead to cross contamination if worn. The simple nature of the Iso-Disc and minimal moving parts ensure that maintenance requirements are kept to a minimum.



Working principles

The Alfa Laval AS-H Iso-Disc Cloth Media Filter operates continuously in an outside-in flow pattern. The cloth media is mounted on the outsides of a hollow filter element which allows the water to pass through the cloth into the centre of the hollow element by gravity. As water passes through the cloth media, the particulate solids are captured on the outer surface of the cloth. The filtered water exits the element at a

high level discharge port which directs the water into a collection trough. .



Vacuum cleaning of the cloth media (Backwashing)

With time, the captured solids progressively build up on the outside of the cloth media and slowly generate resistance to the water flow, causing the water level to rise in the tank. A sensor monitors the water level, and at a preset high level, a backwash is instigated to clean the cloth media and remove the captured solids.

Unlike other fine solids filtration systems, Iso-Disc uses fixed elements with static filtration media and achieves backwashing by moving a horizontal, bi-directional backwash suction manifold up and down each element. A centrifugal pump generates vacuum at the backwash suction manifold/ cloth media surface, which gently relieves the cloth of its solids load via the backwash manifold. As a result, the resistance to water flow is removed, and water level falls in the tank as filtration continues.

When the water level within the tank reaches a predetermined high water level, a simple PLC control system will initiate a back- wash event. Actuated valves between the backwash manifolds and the backwash pump open and close in a programmed sequence to facilitate backwashing of the individual filter elements, one at a time. The manifold is driven up and down the elements using a single electric motor drive and four corner mounted gearboxes. This ensures complete vacuum cleaning of the filter cloth while minimizing the rate at which backwash water is returned to the treatment facility. The efficient cleaning system ensures the minimal number of backwashes per hour.

At the end of each backwashing cycle, the pump, valves and manifolds are parked until the next backwash is required at high water level. After an operator selected number of operation hours or a set number of backwash events, a sludge withdrawal valve will open and remove sediment from the bottom of the tank.

The Iso-Disc operation is self-managing; as flow and load increases or decreases, the backwashing frequency naturally compensates to maintain steady state filtration conditions. At times of high flow and load, the backwash frequency will

increase. Reduced flow and load will result in longer periods between backwashing. In all cases, the cloth media polishing filter remains in operation during backwashing.

Dimensions

Filter Element dimension

Model	Number of elements per filter cassette	Average flow capacity
24" x 24"	2 and 3	24 gallons/minute/element
36" x 36"	3, 5 and 7	54 gallons/minute/element
60" x 60"	3, 4, 5, 6, 7, 8 and 9	150 gallons/minute/element
60" x 96"	7	240 gallons/minute/element
72" x 96"	7	288 gallons/minute/element

Standard filter element sizes and flow capacities

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