evoqua
WATER TECHNOLOGIES

# DAVCO™ Continuous Backwash Filter

## TECHNICAL SPECIFICATIONS

Evoqua's DAVCO Continuous Backwash Filter is an ideal technology for tertiary nutrient removal

## DESCRIPTION

Evoqua's DAVCO™ Continuous Backwash Sand Filter is a deep bed upflow filter developed for the physical, chemical, and biological filtration of process water, wastewater, cooling water, and groundwater applications.

The compact modular design of the Continuous Backwash Sand Filter allows for easy installation and low maintenance with all critical operating components located in the filter body creating a small footprint.

## PRINCIPALS OF OPERATION

The DAVCO Continuous Backwash Filter from Evoqua operates under a constant backwash mode, continuously cleaning the filter bed. This self-cleaning, continuous process allows for consistently high filtrate quality. Unlike conventional filtration with the starting and stopping of backwash cycles which are susceptible to increases in flow and loading rates, the continuous wash water flow of the Continuous Backwash Filter is independent of the suspended solids and hydraulic loads.

The hydraulic design capacity varies between three to six gallons per minute per square foot, depending on the application. The centering of the airlift assembly is very critical to the uniformity of the sand circulation rate with special assembly procedures developed to ensure the correct position of the airlift pipe.

## MARKETS

- Municipal Water & Wastewater
- Food & Beverage
- General Manufacturing
- Oil & Gas
- Power Generation
- Healthcare

## APPLICATIONS

| Application | Elements Removed |
|---|---|
| Surface Water | TSS, turbidity, color, $PO_4$-P |
| Ground Water | Mn, $NH_4$+ |
| Cooling Water | biofouling, TSS, turbidity |
| Washwater | Fe, TSS, turbidity |
| Wastewater | P, TSS, NOx, heavy metals |
| Biofiltration | $NH_4$+, NOx, heavy metals, aromatic carbons |

## FEATURES & BENEFITS

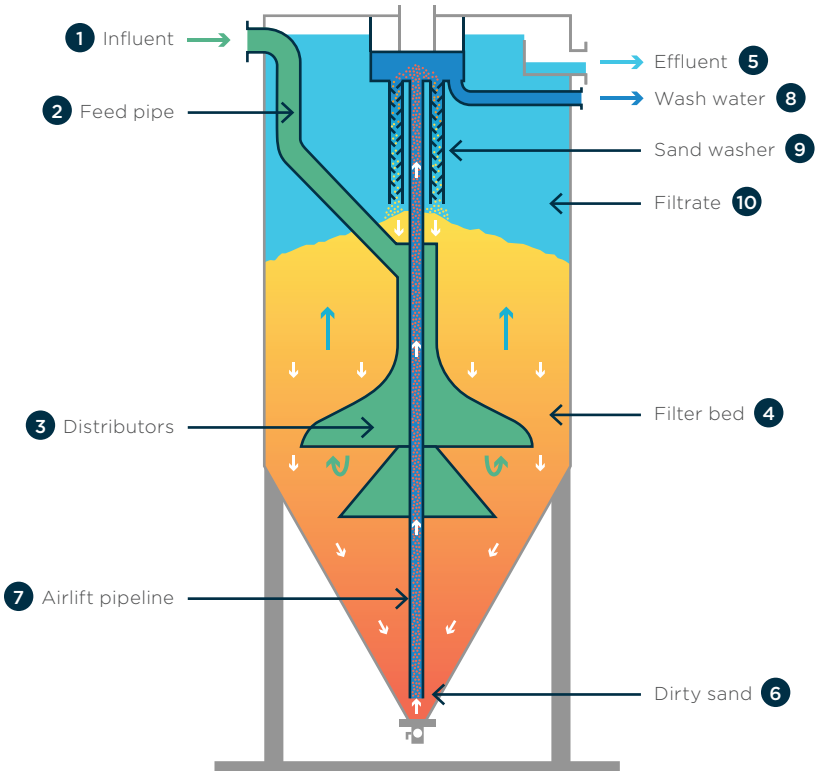
- Standard modular design within a small footprint
- Robust airlift, wash box, and distribution system
- Deep bed filtration up to 120"
- No moving mechanical parts
- Phosphorus removal to low levels
- High solids load handling
- No backwash tank or pump required
- No redundancy required since media is continuously cleaned while in operation
- Title 22 approved

## OPTIONAL ADDITIONS

- Maintenance/access platform
- Steel tank or internals only for concrete tank
- Common Controller up to 4 units
- Washbox 304SS or 316SS

# System Capacity, Weight and Dimensions

## OPERATION DETAILS




### FEED WATER

The polluted water is transported into the filter by means of the feed pipeline (1). Water enters the filter bed (4) through the supply pipe (2) and the distributors. This water is filtered as it flows through the filter in an upward direction. The filtrate is discharged from the upper part of filter (5).

### SAND

The filter bed moves downward as the water flows up. Dirty sand (6) is continuously extracted from the sand bed and washed by a sand washer (9), after which it is released back on the top of the filter bed (4).

### AIR

The sand circulation is based on the airlift principle, forcing a mixture of dirty sand and water upward through a central pipeline (7). Intensive sourcing movements separate the impurities from the sand particles. At the top of the pipeline the air is released, and the dirty water is discharged (8). The sand then settles in the washer.

### SAND WASHER

The sand washer (9) at the top of the filtration tank washes the sand with a small amount of clean filtrate. This removes the final traces of pollutants from the sand. Flow is achieved through a difference in level between the filtrate (10) and the wash water (8).

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### DESIGN BASIS

- Operating temp: 50–100°F
- Continuously cleaning media while in operation
- Indoor/outdoor installation
- Feed flow through gravity
- Influent TSS up to 60 mg/L

### CONSTRUCTION MATERIALS

- Painted carbon steel or 304 stainless steel
- Internal distribution header and piping—304SS
- Galvanized or stainless steel with aluminum checker plate
- Airlift and Washbox—high density polyethylene (HDPE or stainless steel)

### TYPICAL FILTRATE QUALITY

- Filtrate TSS 1–10 mg/L
- Filtrate turbidity < 2 NTU

### UTILITY REQUIREMENT

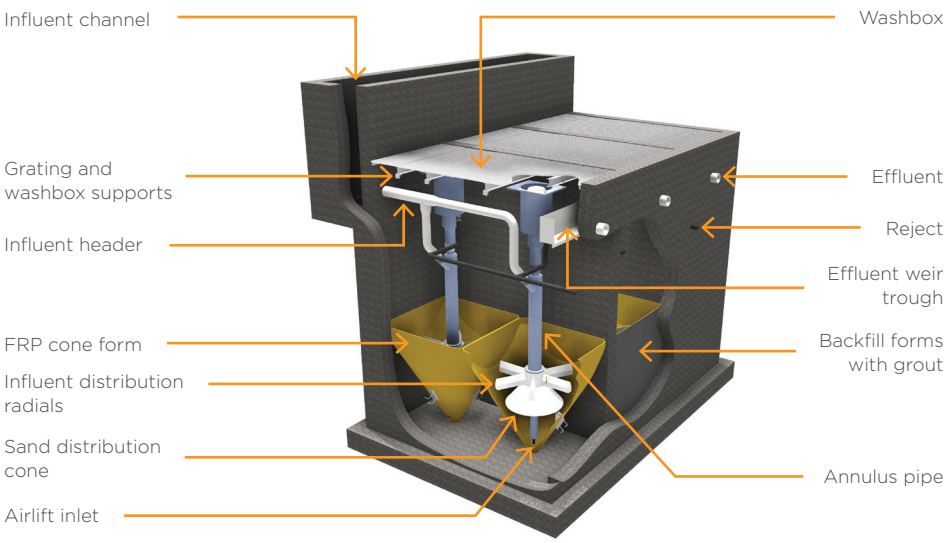
- 460 VAC, three-phase, 60 Hz

## STEEL TANK SPECIFICATIONS

| | CB-70-20 | CB-150-20 | CB-200-20 | CB-300-20 | CB-500-20 | CB-800-20 |
|---|---|---|---|---|---|---|
| Tank Diameter (ft) | 3′ 1¾″ | 4′ 7⅜″ | 5′ 3¼″ | 6′ 3⅜″ | 8′ 4⅜″ | 10′ 6″ |
| Tank Height (ft) | 13′ 2⅛″ | 16′ 10⅞″ | 16′ 7¼″ | 18′ 5¼″ | 21′ 10⅝″ | 25′ 5⅝″ |
| Sand Filtration Area ($ft^2$) | 7.46 | 16.49 | 21.47 | 30.67 | 54.54 | 86.07 |
| Capacity (gpm)* | 22–44 | 44–96 | 66–132 | 96–198 | 176–330 | 264–528 |
| Air Flow (SCFM) (Norm–Max) | 0.41–0.82 | 0.88–1.77 | 1.18–2.35 | 1.77–3.53 | 2.94–5.86 | 4.12–8.24 |
| Average Reject Flow (gpm ±) | 3 | 7 | 7 | 10 | 20 | 32 |
| Influent Flange (in) | 3 | 4 | 4 | 6 | 8 | 10 |
| Effluent Flange (in) | 3 | 4 | 4 | 6 | 8 | 10 |
| Reject Flange (in) | 1¼ | 2½ | 2½ | 2½ | 2½ | 2½ |
| Walkway Size (L×W)* | 37.6×30.8 | 54.8×43.8 | 63.2×43.8 | 77.3×43.8 | 96.1×43.8 | 126×43.8 |
| Media Depth (ft)* | 6′ 7¼″ | 6′ 7¼″ | 6′ 7¼″ | 6′ 7¼″ | 6′ 7¼″ | 6′ 7¼″ |
| Empty Weight/Ea Unit (lbs)* | 640 | 2,400 | 2,600 | 3,000 | 5,500 | 10,000 |
| Sand Volume ($ft^3$)* | 60 | 145 | 190 | 265 | 530 | 1,030 |
| Sand Volume (lbs) | 6,000 | 14,500 | 19,000 | 26,500 | 53,000 | 103,000 |
| Operating Weight (lbs)* | 9,200 | 27,000 | 32,000 | 48,000 | 92,000 | 168,000 |

*Estimated
**Hydraulic flux per tertiary wastewater treatment filtration.

Evoqua through its DAVCO™ product line is an industry leader in the manufacture and installation of water and wastewater treatment equipment and systems. Our single-source approach integrates industry leading expertise and equipment with design, build, installation, and commissioning services, with the capability of delivering a high-quality project in months instead of years.




## CONCRETE TANK SPECIFICATIONS

| | CB-232-20 | CB-465-20 | CB-930-20 |
|---|---|---|---|
| Concrete Basin Width (ft) | 5′ 1″×5′ 1″ | 7′ 1″×7′ 1″ | 10′ 1″×10′ 1″ |
| Concrete Basin Hight (ft) | 17′ 2″ | 19′ 6″ | 25′ 5⅝″ |
| Sand Filtration Area (ft²) | 25 | 50 | 100 |
| Capacity (gpm)* | 44–96 | 150–300 | 264–528 |
| Air Flow (SCFM) (Norm–Max) | 0.88–1.77 | 1.18–3.53 | 4.12–8.24 |
| Average Reject Flow (gpm ±) | 7 | 7 | 32 |
| Effective Media Depth (ft-in)* | 6′ 8″ | 6′ 8″ | 6′ 8″ |
| Sand Volume (ft³)* | 145 | 340 | 1,030 |
| Sand Volume (lbs) | 14,500 | 34,000 | 103,000 |

*Estimated
**Hydraulic flux per tertiary wastewater treatment filtration.

EVOQUA WATER TECHNOLOGIES

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