

# EZ Clean EC900

## Product Data Sheet

The Most Advanced, Automatic,  
Non-Disposable Liquid Filtration System



The EC900 is the most advanced, automatic, non-disposable liquid filtration system. The EC900's modular "pod" design can meet any flow requirement greater than 250 gpm. The system flowrate and level of filtration (micron rating) determines the required number of pods. The EC900 is utilized to filter a wide variety of liquids including machining coolant, wash solutions, cooling / process water, waste water, and many other process fluids.

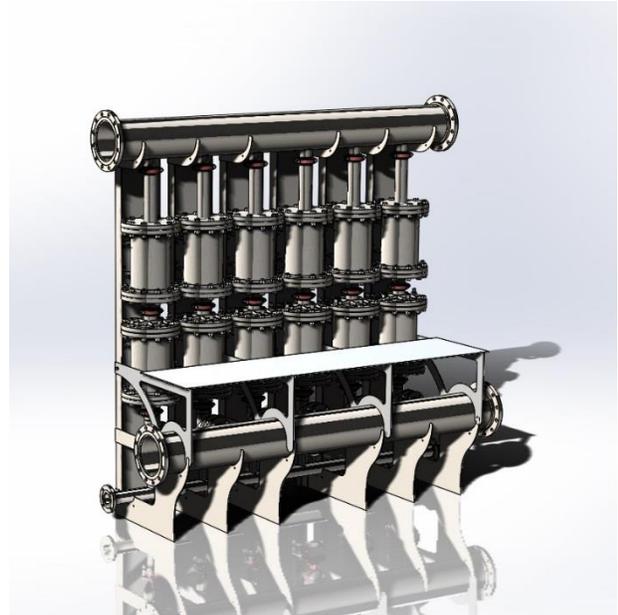
The EC900 pods and piping are available in the following materials.

- Standard: 304 stainless steel
- Additional corrosion resistance: 316 stainless steel

Filter elements are available in the following materials.

- Standard: 316 stainless steel coil / 316 stainless steel element cage
- Additional corrosion resistance: Inconel coil / super duplex element cage
- Most corrosion resistance: Inconel coil / Inconel element cage

EC900 materials of construction can be matched to ensure compatibility with a wide array of fluid compositions; and the EC900 is designed for continuous service up to 190°F and 230 psi



EC900	Precision Absolute Gap							
	20 μ	35 μ	50 μ	75 μ	100 μ	150 μ	200 μ	400 μ
Design Flowrate per pod	90 gpm	165 gpm	225 gpm	290 gpm	300 gpm	300 gpm	300 gpm	300 gpm

**NOTES:**

1. **The design flowrate is a GUIDELINE based upon a clean differential pressure of 2.5 psi or less.** The solids loading in the feed stream can also impact the design flowrate. **MAXIMUM flowrates are documented in the Product Specification Sheets.**
2. Backwash Volume per Pod: ~20 gallons
3. Based on "663" Spring Filter elements
4. The solids loading, physical characteristics, material and density of the particles impact system sizing / design flowrate. 500 ppm is typical maximum loading for ZGF EZ Clean filtration systems utilizing the patented ZGF Spring Filter.

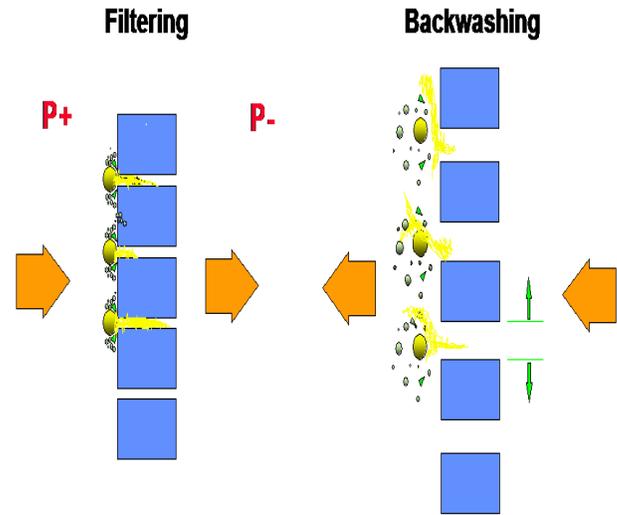
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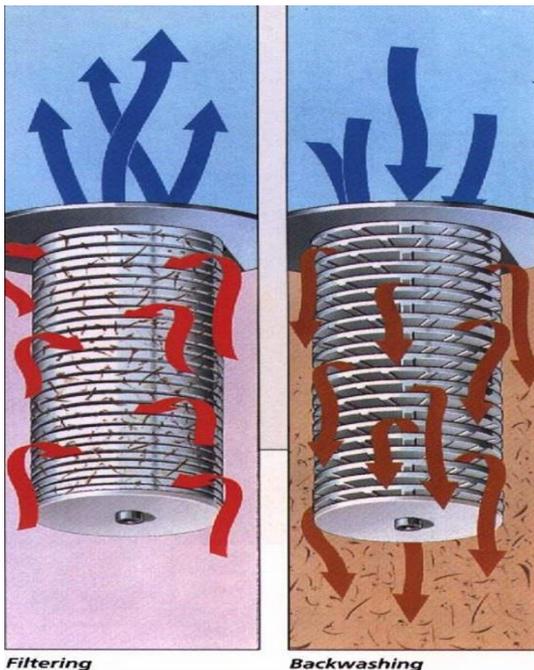


The EC900 features three modes of backwash control - automatic based on differential pressure or time, and manual override.

The EC900 utilizes the patented ZGF Spring Filter element. Each "pod" houses seven (7) Spring Filter elements. The ZGF Spring Filter is a 316 stainless steel coil wound with a variable pitch that allows the filter element to open evenly from top to bottom ensuring that all contaminants are completely removed from the filter element with each backwash. The Spring Filter is manufactured with precision raised "nidges". These nidges create an absolute gap that allow the Spring Filter to capture > 99% of spherical particles larger than the micron rating of the filter element.



**100% clean with each and every backwash**



The ability of the Spring Filter element to open uniformly along its entire length during backwash provides three distinct benefits not achievable by auto-backflushing filters with fixed geometric screens (i.e. wedge wire, etc.).

The benefits are as follows:

1. Particles wedged or lodged are quickly released and washed away as the gap is increased.
2. Fluid flowing in the reverse direction causes the coils of the filter element to "shimmer" which further enhances the cleaning process.
3. The moment the filter element begins to open during backwash, the fluid velocity is instantaneously increased and subsequently followed by a surge in flow that scours the coil effectively and efficiently removing the contaminants.

- **Quick** - 2 to 4 seconds per Pod
- **Efficient** - <1 gallon per filter element
- **Effective** - 100% clean along the entire length of the filter element with each & every backwash

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### **EC900 – Basic Description & Operation**

1. Each pod will hold nine (9) filter elements.
2. Each pod will have a 3” inlet and outlet connection as well as a 3” opening for backwash.
3. Each pod will have a pneumatically actuated 3” inlet butterfly valve and 3” backwash butterfly valve.
4. The pods will be connected to common inlet and outlet manifolds and a frame. Manifold size will be determined based upon flowrate and established/accepted design velocities, and/or customer specifications.
5. Each pods’ backwash will be connected to a common backwash manifold.
6. A pressure transducer is fitted on the common inlet and outlet manifolds. The inlet and outlet pressure are continuously monitored. The EC900 will initiate an automatic backwash sequence once the differential pressure reaches a predetermined set point established by the user.

### **EC900 – Standard Materials of Construction**

<b>Component</b>	<b>Material of Construction</b>
Spring Filter Element	316 Stainless Steel
Spring Filter Pod / Cage	304 Stainless Steel
Manifolds (pipe & fittings)	304 Stainless Steel
Valves (wetted – disc & stem)	Stainless Steel
Valve Seats / O-Rings	Buna or Viton
Frame	Stainless Steel
Control Enclosure	NEMA 4 (painted steel, ZGF Blue/RAL 5013)

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### Backwash Mode:

1. The backwash cycle can be initiated 3 ways:
  - ✓ differential pressure (user-defined set-point)
  - ✓ time interval (user-defined)
  - ✓ manual initiation)
2. Once initiated, the filter will complete a self-cleaning operation called a backwash. This backwash operation is designed to clean all the pods in sequence while still maintaining flow of clean liquid to the downstream process / operation.

### Backwash Sequence:

1. Once initiated, the actuator at the bottom of Pod 1 cycles / rotates. The 4" inlet valve closes while simultaneously opening the 2" backwash valve. The backwash port is now open to atmosphere (i.e. no backpressure).
2. With most of the clean, filtered fluid flowing to the process / operation, a small portion of the clean, filtered solution is directed through Pod 1 in a reverse flow direction. The reverse flow of liquid opens the Spring Filter element along its entire length and causes the coil to shimmer.
3. The opening of the gap combined with the shimmering of the coil (i.e. shaking effect) allows for complete removal of all the debris that was trapped by the filter.
4. The backwash valve is fitted immediately below the pod to enable the debris to be removed as efficiently and effectively as possible.
5. This backwash process takes approximately 3-4 seconds to clean each Spring Filter element. Once the first pod is cleaned, the 4" inlet valve opens simultaneously with the closing of the 2" backwash valve.
6. All other pods are cleaned sequentially following the same procedure.
7. During the backwash process, there is uninterrupted flow of filtered water / fluid to the process / operation.

During backwash, all debris is removed from the outside of the filter element, even debris that may be lodged on the surface of the filter element. The result is a very effective (*clean element*) and efficient (*minimal backwash volume*) backwash. Once the backwash has been completed, the filter will return to its clean differential pressure each time.

***Each EC900 pod uses ~14 gallons of fluid per backwash.***

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### **Controls**

The EC900 is monitored and controlled by means of a Siemens LOGO! logic module / TDE control system.

Control system features include the following.

1. NEMA 4 steel control enclosure painted ZGF blue / RAL 5013
2. A Siemens LOGO! logic module
3. A Siemens TDE text display and operator interface. The TDE is mounted in the enclosure door allowing for operator interface without opening the enclosure. The Siemens TDE has the following features and capabilities.
  - ✓ Displays system conditions and faults
  - ✓ Allows for adjustment of designated program variables (i.e. backwash differential pressure set-point, backwash duration, etc.)
  - ✓ Allows for manual initiation of the backwash cycle
4. A 3-color stack light that displays system condition (power on, alarm condition, backwash)
  - ✓ green lamp - indicates that the 110 VAC electrical supply is connected
  - ✓ amber lamp - indicates that a backwash cycle is in progress
  - ✓ red lamp - indicates a fault condition.

### **The standard control package includes the following:**

- a) Manual backwash button - used to manually initiate a backwash.
- b) Backwash duration timer - length of time in seconds for backwashing each pod.
- c) Backwash interval timer - maximum length of time before the filter will initiate a backwash.
- d) Backwash set point adjustment - the differential pressure at which the filter will backwash.
- e) High set point adjustment – the differential pressure at which the filter will provide alarm indication that there is an excessive differential pressure across the filter.
- f) Backwash counter - non-reset counter that is incremented at completion of each backwash.
- g) The control panel is housed in a painted steel enclosure rated to NEMA 4.
- h) Air solenoid valves situated in the control panel or mounted to the frame for operation of the pneumatically actuated butterfly valves.
- i) Two stainless steel wetted pressure transducers. Two settings will be calculated by the Siemens LOGO! logic module. The backwash set-point will be the differential at which the filter will initiate a backwash. The high set point will signal an alarm condition.
- j) Two pressure gauges are fitted to monitor the filter's performance.

**Simplicity, consistency, reliability, and lowest cost of ownership make the EC900 an ideal answer for many filtration applications with flows greater than 200 gpm!**