

ZGF EZ Clean EC700S

Product Data Sheet

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



The EC700S is the most advanced, automatic, non-disposable liquid filtration system. **The EC700S's modular "pod" design can meet any flow requirement greater than 200 gpm.** The system flowrate and level of filtration (micron rating) determines the required number of pods. The EC700S is utilized to filter a wide variety of liquids including machining coolant, wash solutions, cooling / process water, waste water, and many other process fluids.

EC700S	Precision Absolute Gap							
Design Flowrate per pod	20 μ	35 μ	50 μ	75 μ	100 μ	150 μ	200 μ	400 μ
	70 gpm	128 gpm	175 gpm	225 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: ~16 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.

The standard EC700S is fabricated from 304 stainless steel. ZGF can provide the pods and manifolds in many materials to meet your requirements. The pods and piping are available in:

- Stainless Steel – 304 or 316
- Super Duplex

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

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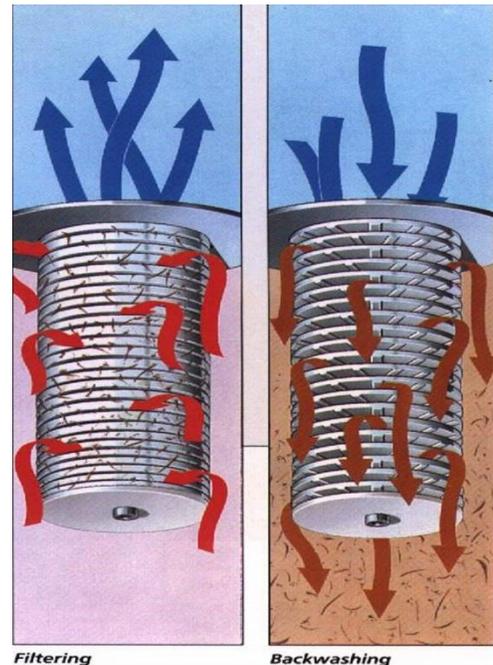
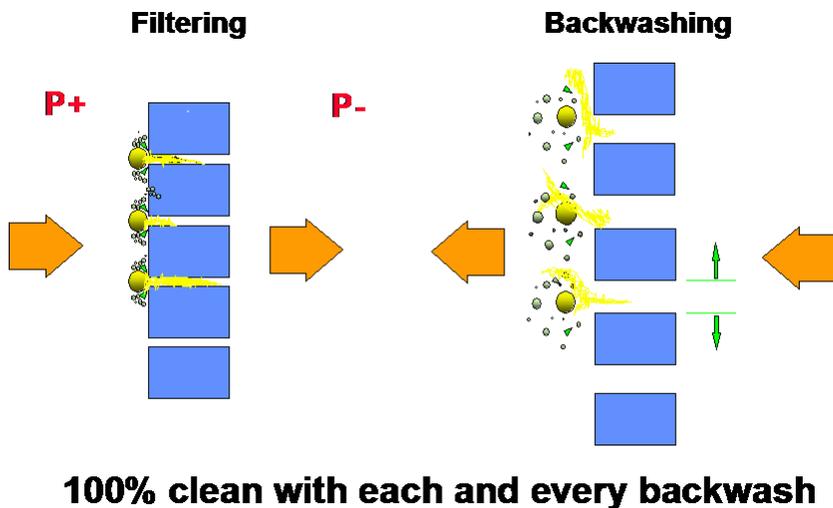
EC700S materials of construction can be matched to ensure compatibility with the wide array of fluid compositions; and the **EC700S is designed for continuous service up to 190°F and pressures from 45 - 120 psi.**

The EC700S features three modes of backwash control - automatic based on differential pressure or time, and manual override.

The EC700S 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.

A normal coil does not open evenly from top to bottom. The full opening of the Spring Filter allows lodged or wedged particles to be easily removed as the gap is increased. While in backwash, the fluid flowing in the reverse direction causes the coil to shimmer which further enhances the cleaning capability of the backwash process. The backwash is:

- ✓ 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 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.

EC700S – Basic Description & Operation

1. Each pod will hold seven (7) filter elements.
2. Each pod will have a 4” inlet and outlet connection as well as a 2” opening for backwash.
3. Each pod will have a pneumatic actuator that operates the 4” inlet butterfly valve and 2” 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 EC700S will initiate an automatic backwash sequence once the differential pressure reaches a predetermined set point established by the user.

EC700S – Standard Materials of Construction

Component	Material of Construction
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)

Filter Mode:

1. Liquid enters the EC700S through the inlet manifold and then flows into each of the pods via their 4” inlets which are fitted with a butterfly valve at the bottom of the pod.
2. Fluid flows from the bottom of the pod to the top and from outside of the Spring Filter element to the inside.
3. All debris is kept to the outside of the filter elements while the clean water is discharged from the top of each pod via their 4” outlets.
4. The common outlet manifold then joins the clean discharge from each pod.
5. The inlet and outlet pressure are continuously monitored by the ZGF control system.
6. The EC700S will continue to operate in Filter Mode until a Backwash is initiated.

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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 the majority 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 EC700S pod uses ~16 gallons of fluid per backwash.

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Controls

The EC700S 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 EC700S an ideal answer for many filtration applications with flows greater than 200 gpm!

ZGF EZ Clean EC700S Features & Benefits

- Full 1-year warranty on filter assembly and 5-year warranty on filter elements → **reduces operating and maintenance costs.**
- Precision engineered absolute gap → **ensures consistent and efficient particle capture and removal from the process (captures and removes >99% of spherical particles equal to or larger than the precision machined filter element gap).**
- Fully automatic, self-cleaning operation → **requires no manual intervention freeing up labor for other value-added plant services.**
- Uninterrupted flow even during backwash → **24 hour / 7-day operation, eliminates downtime and allows for optimized operational productivity.**
- The Spring Filter element is a coil wound with a variable pitch → **allows the filter element to open evenly from top to bottom and shimmer during backwash ensuring that all contaminants are completely removed with each backwash.**
- Compact design → **saves valuable floor space.**
- Low energy requirement → **reduces load on plant utilities and lowers operating costs.**
- Efficient and environmentally responsible design → **uses <0.75 % of total feed volume for backwash.**
- Permanent media filter elements (316 stainless steel, Inconel/Super Duplex) → **do not require replacement thereby reducing labor and disposal costs and increasing productivity.**
- Minimal moving parts through simplicity of design → **increases reliability thereby reducing maintenance and operating costs.**

ALL OF THE ABOVE = BEST AVAILABLE & MOST ENVIRONMENTALLY RESPONSIBLE TECHNOLOGY AND LOWEST 10 YR LIFECYCLE COST IN THE INDUSTRY.

Please contact us today for a free consultation or request a quote via our website www.zgfilters.com. We are always available by phone too. Call us at 248.486.3500.