

# Model 4614

## UV + Automatic Prefilter Process Water System



Sigma Design Company continues to expand its array of powerful advanced filtration solutions with the new Model 4614 UV + Automatic Prefilter Process Water System. This system couples Spiral Water's patented automatic water filtration technology with UV disinfection, a chemical-free water treatment process that uses ultraviolet (UV) light to kill or inactivate harmful microorganisms, including bacteria, viruses, and protozoa.

Sigma Design's automatic filtration + UV disinfection system provides a highly effective, environmentally friendly, and easy to use solution for treating and disinfecting water in a wide range of applications and industries. Examples of applications include wastewater treatment and industrial water reuse and makeup water, while industries range from aquaculture to pharmaceutical production, electronics manufacturing, food & beverage, and other industrial markets.

## How Sigma Design Company's Automatic Filtration + UV Disinfection System Works

UV lamps emit light in the UV-C range (typically at a wavelength of 254 nanometers), which has **germicidal properties**. Water passes through a UV reactor where microorganisms are exposed to the UV light, which penetrates the cells of microorganisms, damaging their DNA or RNA and preventing them from replicating or causing infections.

### UV disinfection offers **many other advantages**.

It does not require chemical additives, unlike chlorine or other chemical disinfectants, and it eliminates the risk of harmful disinfection byproducts (e.g., trihalomethanes or chloramines). UV is effective against chlorine resistant microorganisms such as Cryptosporidium and Giardia, which are common concerns in water treatment.



## More Reasons to Use Sigma Design Company's Custom Filtration + UV System

- UV for **TOC Reduction**. 185 nm UV at a minimum dose of 90 mJ/cm<sup>2</sup>\* creates powerful hydroxyl radicals that oxidize total organic carbon (TOC) molecules. UV can be used together with Deionization (DI) and Reverse Osmosis (RO) to reduce TOC to levels below 1.0 ppb.
- UV for **Ozone Reduction**. Residual ozone (O<sub>3</sub>) is efficiently removed by UV at a wavelength of 254 nm. Ozone absorbs the UV energy and quickly breaks down to dissolved oxygen (O<sub>2</sub>). Typically 1.0 ppm of ozone can be reduced to less than 0.1 ppm with a UV dosage of 90 mJ/cm<sup>2</sup>.
- UV for **Chlorine Reduction**. Free chlorine residuals up to 2.0 ppm can be successfully reduced by the application of UV light, which also reduces carcinogenic by-products.

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Widely used, UV disinfection is a rapid, proven, reliable, safe, environmentally friendly, and effective method for ensuring **water quality and clarity**, while enabling industrial users to meet strict regulatory requirements across multiple sectors.

But suspended particles in water can shield microorganisms from receiving adequate UV light, so **water clarity** is an important aspect of effective UV treatment. This is another way that Spiral Water's patented technology, which features a **high solids removal, automatic mechanically self-cleaning pre-treatment filter system**, plays a critical role. **Spiral Water's Model 850SS (stainless steel) 15 $\mu$  Automatic Filter** – the heart of the system – removes insoluble solids from the fluid stream, collecting and purging them from the filter to help keep the UV system operating effectively and efficiently.

The system also features Sigma Design's robust yet easy-to-use **control interface** and **real-time sensors** that monitor the UV dose and system performance for optimized operation. Providing constant monitoring of the automatic filter's conditions, the controller automatically detects changes in differential pressure pressure and motor current against an operator-defined setpoint. If sudden upset(s) in the process flow are detected, the system expels the debris through an automated purge line. The controller can also be set to purge regularly on a timer basis, or to be run in an intermittent mode. This allows the Spiral Water filter to maintain continuous filtration of the influent stream without the need for operator intervention or cleaning, thus reducing downtime.



## About Sigma Design Company

Sigma Design is a leading one-stop design, engineering, and manufacturing resource for the development of specialty equipment and engineered systems. Our mission is to provide clients with creative, affordable and easily manufactured designs and manufacturing assembly solutions that achieve their product, business and revenue goals. Our clients have included hundreds of leading global brands and manufacturing firms across a wide array of industries. Based in New Jersey for more than 20 years, we have transformed more than 1,000 design and design/build projects into successful products and specialty equipment in use across the world.

### SERVICES INCLUDE:

- Design and engineering
- Testing
- Manufacturing

Your trusted one-stop resource for end-to-end product development and commercialization solutions, on time and on budget.

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