

Triangularwave Technologies, Inc. (TWT®)  
**TWT-SMD-1007 Fluid Management Conditioning & Treatment System**  
2-Stage Filtration • TWT Deposit Control Technology  
(50 GPM) Ultra Violet (UV) Disinfection/Purification System

Filtration, TWT® Deposit Control Technology • Ultra Violet (UV) Disinfection & Purification  
Combined for Maximum Effectiveness "The Competitive Edge"



**Factory Assembled Skid Mounted, Fork Lift/Fluid Management  
(50 GPM) Treatment System**

***This fluid management system is a compact, self-contained,  
skid-mounted unit for the treatment of water.***

Applies all the needed elements for maximum fluid protection, management, and peace of mind in one simple packaged solution. Technologically advanced method for water & fluid management, Staged Filtration, TWT® Microprocessor Deposit Controller, Reaction Chamber, and UV Disinfection/Purification units are combined to provide a start-to-finish answer to simplified prevention, treatment and management of water line contamination dangers.

**Specifications:**

- Approx Size: 68" W x 52"H x 30"D
- Approx Weight: TBD (may vary according component assembly)
- Piping: 2" In/Out of system
- 50 GPM
- Filter bags, filter mediums and micronic sizes used in staged filter housings is based upon input water quality, customer and/or industry specific treatment requirements. To be determined (TBD) at time of purchase.
- Skid Mounted Water Treatment System
- Stainless Steel Filter Housings
- 2-Stage Filtration
- TWT® Deposit Control Technology
- Ultra Violet Disinfection & Purification
- Other related components that provide for easy installation and operation
- Stainless Steel Skid

**Please Note:** System engineering design, weight, size and system component assembly can vary based on TWT engineering review, water quality conditions, application, industry and/or customer specific needs.

Pumps, piping, fittings, valves, and other material needed to and from system owners responsibility.

**The rugged self-contained design of this system ensures that the system will enjoy a long and reliable lifecycle when properly cared for.**

**Pressure gauges, monitors and other components are installed in system(s) for for maximum effectiveness.**

**Installation:** Licensed plumber and/or contractor is recommended. Must have enough room on all sides for filter and UV replacement & maintenance. Easy to follow care, maintenance & operational procedures and other basic informational labels will be affixed to the system (system requires minimal maintenance).

**Point-Of-Entry/Point-Of-Use Treatment System**



# Operating Principals of the TWT® SMD Treatment Systems

## Filtration

Filters are designed to trap various kinds of debris, dirt and organic particles that will otherwise enter your equipment and/or plumbing system, restrict your water flow and create a breeding ground for bacteria. Filtration is the first line of defense for residential, commercial, industrial facilities, where the source of water may be ponds, wells or streams that have high exposure to contamination from airborne pollutants, surface run-off, agricultural or industrial waste or similar dangers. The first step in achieving clean water is to install a filtration device that effectively removes particulate matter and similar debris. Filtration is an important step in water treatment, especially for water intended for human consumption. Filtration systems provide a bacteriostatic environment and are designed to remove volatile organic chemicals, hydrogen sulfide and sulfur, herbicides, pesticides, chemical fertilizer residues, trihalomethanes and many other pollutants.

The filtration units utilized in TWT systems are comprised of several filter types and media that remove harmful chemicals, metals, and toxins from the water as it passes through these layers. Filters used in staged filter housings are configured as illustrated on system trade ads. Upon request if needed other filter mediums and filters used in system can be determined by a water quality analysis. If fluid conditions require additional micron particle trapping for enhanced results, filters are available in various micron sizes providing flexibility & adaptability to meet the needs of all fluid conditions & applications.

## TWT® Patented Deposit Control Technology

### Sources of Water

Potable water primarily comes from two sources- the bodies of water on the earth's surface and the subterranean wells which gather groundwater after it is filtered through the top layers of the earth's strata. After the groundwater passes through the uppermost layers of the earth's surface, it contains carbon-dioxide ( $\text{CO}_2$ ), a carbonic acid. In the lower strata of the earth, the carbonic acid-enriched water dissolves lime ( $\text{CaCO}_3$ ) from the subterranean rock and converts it to calcium-hydrogen carbonate. The calcium-hydrogen carbonate is the source of lime deposits and incrustations (scale) which form in water systems.

### Hardness in Water

Regardless of the source of drinking water, water typically contains carbon-dioxide ( $\text{CO}_2$ ) and the earth's alkalines, such as calcium and magnesium. The total hardness of water is determined by the sum calcium-hydrogen carbonate, magnesium-hydrogen carbonate and the non-carbonate starches which include calcium and magnesium component solutions. Consequently, the water "hardness" is dependent upon the amount of lime in the water. There are several methods of preventing lime deposit formation (scale and incrustation) in water systems. The TWT® method for preventing the formation of lime deposits uses an electronic deposit controller, (Triangularwave System) which generates an electronically modulated frequency, an amplified triangulated waveform, which is then oscillated to change the separation characteristics of calcium and carbonates before they enter the water system. That immediately neutralizes the hardness, and functionally "softens" the water. The process is purely physical as it uses no chemical additives. The basic component of the TWT systems is the deposit controller. It is comprised of a microprocessor, solenoid coil wrap and/or a reaction chamber.

The microprocessor is a patented controller that functions like a computer to relay a continuous electrical power supply to the solenoid coil and/or reaction chamber. The reaction chamber is plumbed into the main water in-take line and/or just before each piece of vital processing equipment, and provides a factory wrapped wire coil forming a solenoid. The solenoid conveys the triangular wave signal at the appropriate power level (as allowed by the model chosen) to the water passing through the chamber.

This signal constantly changes the polarity, frequency and amplitude of the current entering the water. This triangularwave treatment produces several benefits. It increases the capability of water to hydrate scale ions and other colloidal particles. In effect, the surface charge of the hydrogen molecules is enhanced and the water is made "wetter". This "hydrated" water can dissolve unwanted particles, suspend them in solution and allow them to be easily filtered out or flushed from the system. Accordingly, the mineral and biological particles that cause scale, deposits and corrosion are dissolved and washed away.

This means that the breeding environments for bacteria, such as bio-film and corrosion, are eliminated. The agitation created in the reaction chamber also disrupts the conditions essential for the normal reproduction of bacteria and they die, thus allowing them to be harmlessly flushed out of the system. If left untreated, scale build-up inside the reaction chamber and on the quartz sleeves containing the UV lamps may rapidly diminish the UV disinfection effectiveness by reducing the amount of UV light which is absorbed into the water stream. The TWT Deposit Control System will further condition the treated water stream so as to prevent this scale build up inside the UV reaction chamber, helping to maintain maximum UV life cycle and penetration into the water stream. TWT deposit control technology (treated fluid) maintains the ability to control deposits throughout the system with down-stream residual value.

## Ultra-Violet Disinfection/Purification

Ultraviolet disinfection systems are mysterious to many people, how can "light" kill bacteria? But the truth is, it can. Ultraviolet (UV) technology has been around for 50 years, and its effectiveness has been well documented, both scientifically and commercially. It is nature's own disinfection/purification method. With consumers becoming more concerned about chlorine and other chemical contamination of drinking water, more dealers are prescribing the ultraviolet solution as suitable for both small flow residential applications as well as large flow commercial projects.

Ultraviolet is a means of killing or rendering harmless microorganisms in a dedicated environment. These microorganisms can range from bacteria and viruses to algae and protozoa. UV disinfection is used in air and water purification, sewage treatment, protection of food and beverages and many other disinfection and sterilization applications. A major advantage of UV treatment is that it is capable of disinfecting water faster than chlorine without cumbersome retention tanks and harmful chemicals. UV treatment systems are also extremely cost efficient!

One of the most common uses of ultraviolet sterilization is the disinfection of domestic water supplies due to contaminated wells. Coupled with appropriate pre-treatment equipment, it provides an economical, efficient and user-friendly means of producing potable water. The following list shows a few more areas where ultraviolet technology is currently in use: surface water, groundwater, cisterns, breweries, hospitals, restaurants, vending, cosmetics, bakeries, schools, boiler feed water, laboratories, wineries, dairies, farms, hydroponics, spas, canneries, food products, distilleries, fish hatcheries, water softeners, bottled water plants, pharmaceuticals, mortgage approvals, electronics, aquaria, boats and RV's, printing, buffer processing, petro-chemical, photography and pre- and post-reverse osmosis.

The UV disinfection technology used in the system provides safe process and potable water, free of disease-causing pathogens. As water passes through the UV chamber, UV light will attack and render harmless any bacterial, viral or spore contamination present in the treated water. "High intensity UV light destroys these contaminant's with a 99.9% or greater kill rate" based on the multi-process technology provided in the system. The output water is thus disinfected and offers exceptionally high quality for human consumption and use.