

TWT® WATER CONDITIONING & PURIFICATION COMBINED for MAXIMUM EFFECTIVENESS

**Triangularwave
Technologies, Inc.**
(TWT®)

**Versatile Fluid
Management
Products & Systems
To Effectively Meet
The Needs Of Any
Industry &
Application**

- Control Scale Deposits
- Bacteria
- Corrosion
- Algae
- Colloids

In All Fluid Based
Systems

**Potable Water,
Process and Waste
Water Treatment &
Conditioning**

PROTECTION FOR NEW EQUIPMENT

TWT provides new equipment with the ability to enhance the product features and benefits

TREATMENT FOR EXISTING EQUIP- MENT

Retrofit existing equipment to improve its operating efficiency and life cycle

ENHANCE PRODUCT LINE

Enter new markets and broaden customer satisfaction

CUSTOM DESIGN

Let TWT, Inc. custom design a fluid management system to meet any industry specific applications

- Commercial
- Industrial

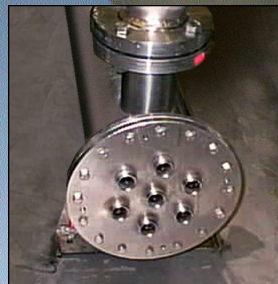
TWT-UV-5007 (220 GPM) Ultra Violet Purifier System

- TRIANGULARWAVE (TWT®) PATENTED DEPOSIT CONTROL TECHNOLOGY
- ULTRA VIOLET DISINFECTION & PURIFICATION

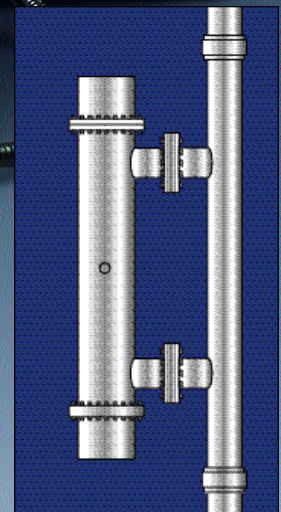


The TWT-UV-5007 sterilizer will ensure a ready supply of safe, pathogen-free water for manufacturing processes or human consumption. Applications may include agriculture, meat & poultry industry, water bottling plants, breweries, waste water treatment or any other type of liquid processing requiring bacterial reduction. With the capacity to remove disease-causing microorganisms effective to a 99.9% or greater kill rate. You can eliminate the need for chemicals and reduce high over-

head costs. TWT water treatment systems are ruggedly constructed for exceptional performance. The rugged self-contained design, component assembly and Stainless Steel body / frame of these systems ensure that the system will enjoy a long and reliable life cycle when properly cared for.



7 UV Lamp System



Optional Vertical or
Horizontal Application

The UV220 GPM unit can be used, configured and applied in multiple ways to effectively treat flow rates from 200 to 800 or greater GPM.



Triangular Wave Technologies, Inc. (TWT®) TWT-UV-5007 (220 GPM) Ultra Violet Purifier System

2 of 7

TWT, Inc. has the technical expertise to assess your water problems and when needed, pre-filtration and TWT® Deposit Control Systems may be added to the TWT-UV-5007 sterilizer for enhanced results. Environmental safety is our priority, therefore no chemicals are added and the pH balance of the water is unaffected by UV sterilization.

TWT-UV-5007 (220 GPM)

- Rated Flow: 833 Liters per minute 220 Gallons per minute
- Rated Flow UV Dose: 95% UVT, 40,400 mw/sec or 40.4 mJ/cm2 at 220 GPM
- Number of lamps: 7
- Lamp wattage: 88 Watts
- Electrical Supply: 120-130V / 50 Hz 3 Amp
220-240V / 60 Hz
- Maximum Operating Temperature: 37°C (98.6°F)
- Maximum Operating Pressure: 125 psi - 8.6 Bar
- Plumbing: 3" flange In-Out (4" optional)
- Unit Dimensions: 56"L x 12.5"W x 20"H
- Controller Dimensions: 30"x24" x 10"
- Unit Weight: 130 lbs (59 kg)
- Controller Weight: 60 lbs (27 kg)
- Body: 316 Stainless Steel

Please Note:

System engineering design, weight, size and system component assembly may vary based on TWT engineering review, water conditions, application, industry and/or customer specific needs. Pumps, piping, fittings, valves, and other material needed to and from system are owners responsibility.

Installation TWT-UV-5007:

Horizontal Application–

- The system must be installed securely on a stable platform

Vertical Application–

- System must be installed securely to piping and/or processing equipment

UV Control Panel–

- Voltage Surge Protection must be installed ahead of the system to protect the electronic circuits
- Control panel should be installed as close to purifier as possible and out of harms way

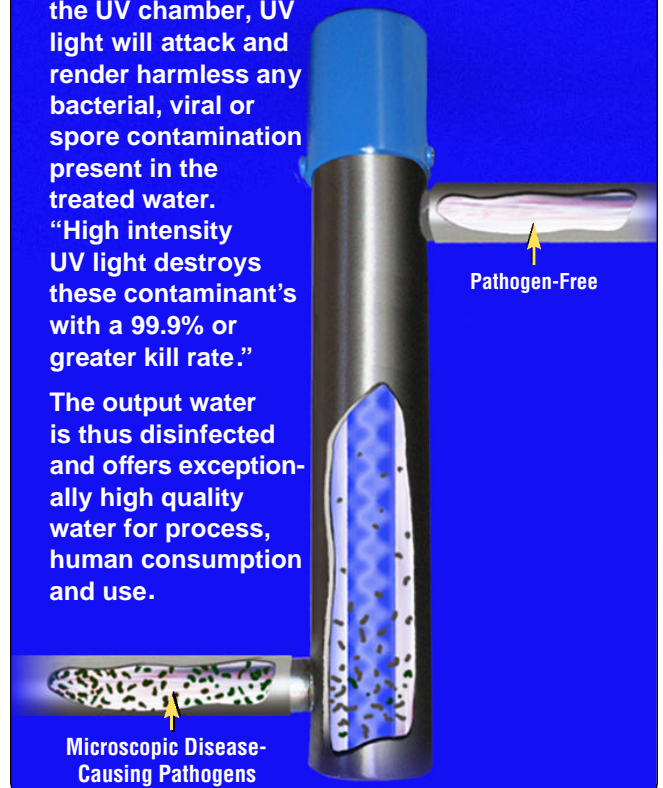
General Information–

- **Optional:** A bypass system may be installed for easy UV lamp replacement and maintenance as required
- After installation – introduce water into the reaction chamber slowly to avoid damage to components from high water pressure
- All systems are shipped with an easy to follow application, installation and maintenance manual
- If necessary, in order to ensure the greatest level of performance and satisfaction in your work with the TWT products & systems, we recommend that you contact our engineering staff, who will be pleased to work closely with you to determine the optimal application and installation for your industry specific needs.

Ultraviolet disinfection systems are mysterious to many people - how can "light" kill bacteria? But the truth is, it can.

The Ultra-Violet (UV) disinfection & purification 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 contaminants with a 99.9% or greater kill rate."

The output water is thus disinfected and offers exceptionally high quality water for process, human consumption and use.



TWT Patented Deposit Control Technologies and Ultraviolet Disinfection & Purification Treatment System. Suggested Product integration for Enhanced Results! End-To-End Solutions!

(As illustrated below)

The basic functions & components of Triangular-wave Technologies, Inc. (TWT) fluid treatment systems can be designed, integrated and assembled to combine various treatment methods that meet your industry specific process needs.

For waste water applications use, double flow rate equals GPM system requirements for maximum UV dose and efficiency. (*build to suit*)

Factory Assembled & Mounted Fluid Management Systems. These fluid management systems are compact, self-contained, skid-mounted unit for the treatment of water.

TWT systems applies all the needed elements for maximum fluid protection, management, and peace of mind in a simple packaged solution. Technologically advanced method for water & fluid management, Separator/Filtration (optional), TWT® Micro-processor 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.

TWT Patented Deposit Control System: Stage #1

The basic component in the TWT systems is the deposit controller. It is comprised of a micro-processor, and reaction chamber. The micro-processor is a patented controller that functions like a computer to relay a continuous electrical power supply to the solenoid coil 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 triangular wave treatment produces several benefits. It increases the capability of the 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 sleeve 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 filtered 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 Systems have no moving parts and minimal maintenance requirements. The Triangular Wave Deposit Control remain on all of the time. The control panels have indicator lights and alarm circuits to show any problems caused by external forces; such as damage to the coils or insulation or damage to the electrical connections.

TWT deposit control technology (treated fluid) maintains the ability to control deposits throughout the system with down-stream residual value.

Ultra-Violet Disinfection: Stage#2

The UV disinfection/purification technology used in the system provides safe 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 contaminants with a 99.9% kill rate" The output water is thus disinfected and offers exceptionally high quality conditioned water.

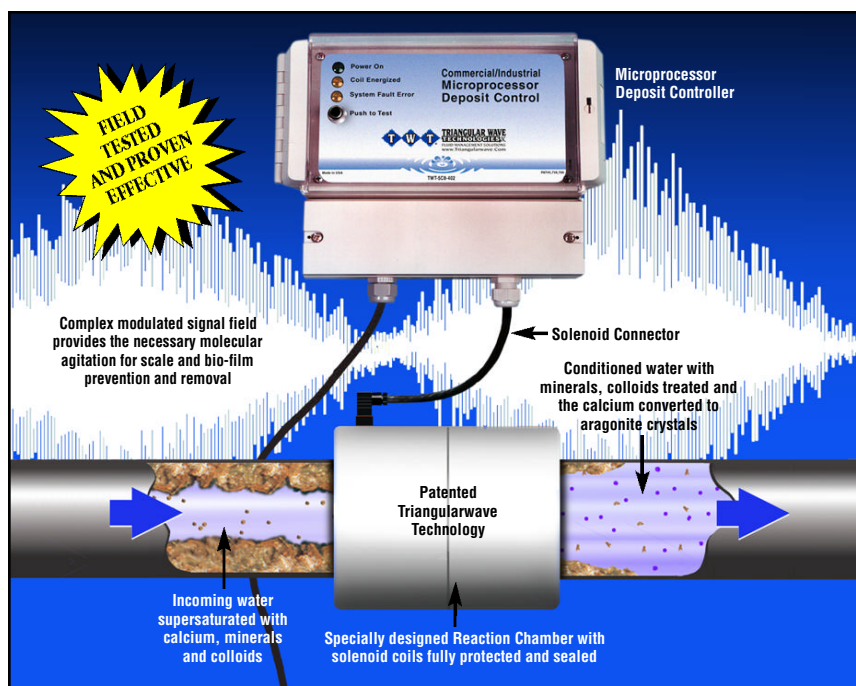
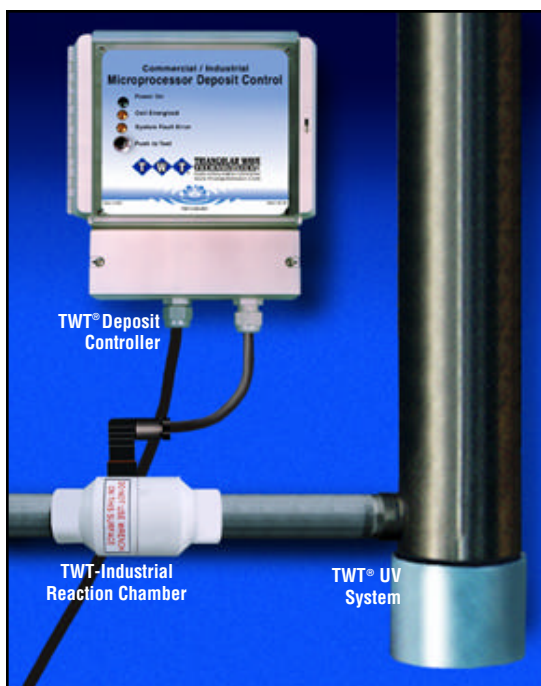
All units are expertly constructed of # 316 stainless steel to high quality control standards. The units operate continuously, automatically and inexpensively. UV lamp replacement is easy. The germicidal lamp is effective for approximately 8,000 hours which means extremely cost effective water sterilization over the long term.

The industrial size TWT-UV-5007 sterilizer can assure a ready supply of safe, pathogen-free water for manufacturing processes or human consumption. Applications include all types of liquid processing. With the capacity to remove disease-causing microorganisms effective to a 99.9% kill rate at 200 G.P.M. (820 L.P.M.), you can eliminate the need for chemicals and reduce high overhead costs. TWT has the technical expertise to assess your water problems and when needed, pre-filtration systems may be added to the TWT-UV-5007 sterilizer. Environmental safety is our priority, therefore no chemicals are added and the PH balance of the water is unaffected by UV sterilization.

Benefits of TWT® Fluid Treatment Systems:

- Short payback period (pays for itself)
- Prevents scale buildup • Eliminates toxic chemicals
- Reduces corrosion • Controls algae and bacteria
- Less downtime for equipment repairs and maintenance
- Unpolluted discharge-compliance

TWT treatment equipment is a reusable investment and retains its value – if you move your facility or re-engineer your plumbing system, TWT equipment moves with you.



Hard Water Problems Solved Easily—Chemical-Free

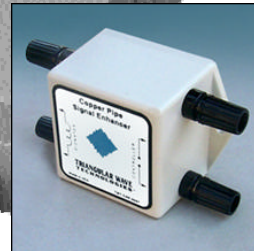
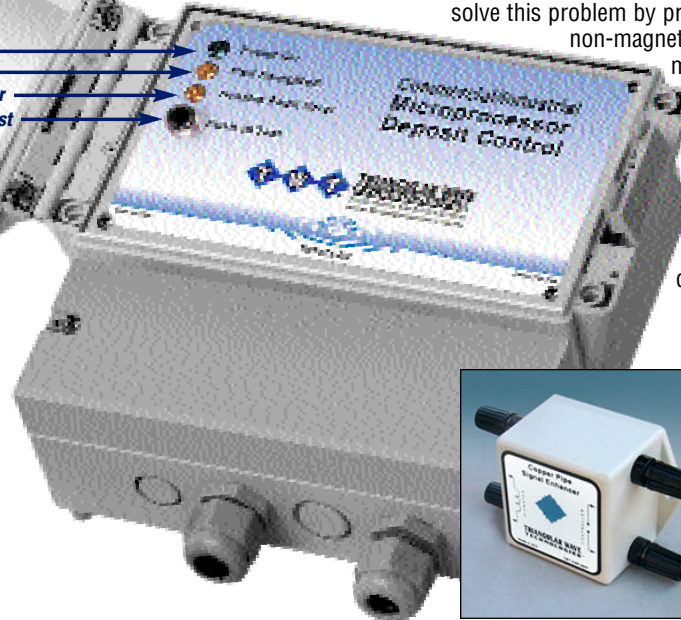
Control Scale Deposits/ Bacteria /Corrosion/ Algae/ Colloids In All Fluid Based Systems



TWT® Reaction Chambers

To use in conjunction with the TWT Deposit Control Systems when required, Triangularwave Technologies, Inc. has developed a line of factory-wrapped wire Reaction Chambers to address magnetic pipe environments. Typically, wire coil cannot be installed on any magnetic pipe, such as steel, galvanized steel, ductile iron, or cast iron. The TWT Reaction Chambers solve this problem by providing an easily installed section of non-magnetic pipe to provide the proper pipe material for the Deposit Control System to work as designed. The TWT Reaction Chambers are fully sealed, protecting their two layers of factory-wrapped coil. The PVC, Stainless Steel and the Industrial Reaction Chamber systems are designed and manufactured to meet the highest quality specifications.

Power On
Coil Energized
System Fault Error
Push to Test



TWT® Copper Pipe Signal Enhancer

The copper pipe signal enhancer is a passive signal/ impedance matching circuit. This device provides a power boost to the conditioning signal in copper pipes (for copper pipe applications only).



Efficient Cost Effective & Reliable



ISO Certified Facility

HARD DOLLARS SAVINGS- Chemicals, Salts Water & Energy

- Usage reductions of around 90% or more are typical.
- Energy - systems have been found to deliver between 5 and 15 % energy savings when compared to a well functioning chemical system because the controller adapts to changes in water conditions without operator intervention. Energy savings can be much higher (up to 40 %) vs. a poorly performing chemical system or no chemical system at all.

SOFT DOLLARS - Materials, Labor, Time, Safety

- Chemical, salt handling and storage costs - reduced material and labor costs, freed-up storage space and cost allowance for increased safety (risk reduction). Reduction comparable to chemical cost reduction (up to 90 %).
- Maintenance, repair, replacement and downtime costs (chemical & salt delivery systems) - due to reduced usage rate. Reduction comparable to chemical and salt cost reduction (up to 90 %).
- Maintenance, repair, replacement and downtime costs (plumbing system), due in part to the adaptability described above under "Energy" Cleaning of the system and/or during shut down is also generally easier with TWT technology, as any film on any surface can be easily removed with a soft cloth. Additionally, the lower level of chemicals in the system will make it safer for workers doing the cleaning (75 - 90 %).

LIFECYCLE SAVINGS

- Savings continue typically for 10 years or more from date of installation. Savings accelerate after the payback period and continue for the life of the system. Lifecycle savings are thus typically many times the cost of the TWT System.

HARD DOLLARS

- Can be estimated from purchase records or water volume and prices from the previous year.

SOFT DOLLARS

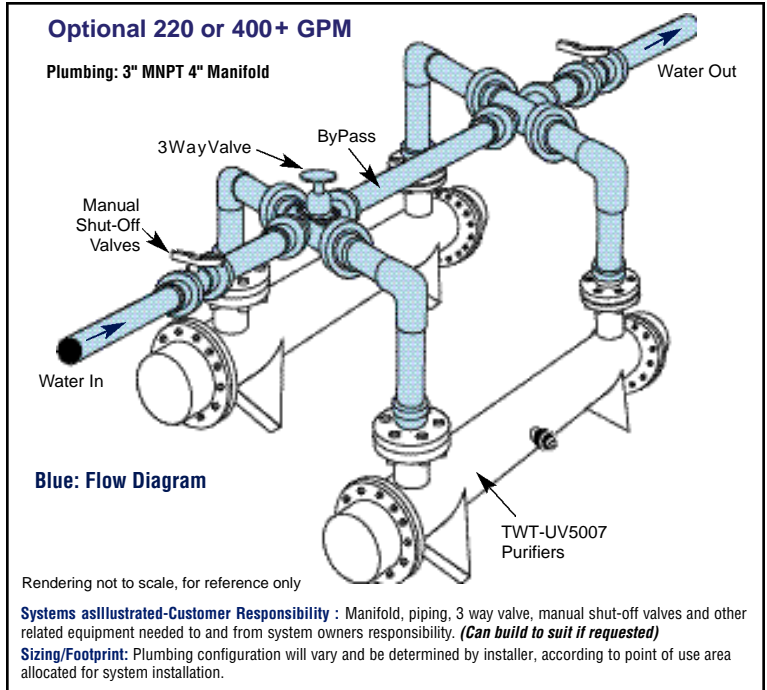
- Costs should be estimated based on the average of 10 years of data, or the age of the system if less than 10 years old, to smooth out the effect of infrequent repairs and replacements.

LIFECYCLE SAVINGS

- Are calculated as the net present value of the sum of the annual savings over 10 years using a reasonable interest rate (e.g. prime plus 2 %)

TYPICAL PAYBACK is less than 2 years when considering **HARD DOLLARS ONLY**.





TWT-UV-50007 (220 GPM)

- Rated Flow: 833 Liters per minute 220 Gallons per minute. 50,000 litres/hour (50 m3/h), 1,200 m3/day (13,200 gallons/hour, 316,800 gallons/day)
- Rated Flow UV Dose: 95% UVT,40,400 mw/sec or 40.4 mJ/cm2 at 220 GPM
- Number of lamps: 7 • Lamp wattage: 88 Watts
- Ballast: Electronic Ballast (7) (Part # 4-13B-PN) w/ Lamp Out Alarm (1), Power LED (7)
- Electrical Supply: 120-130V / 50 Hz 3 Amp 220-240V / 60 Hz

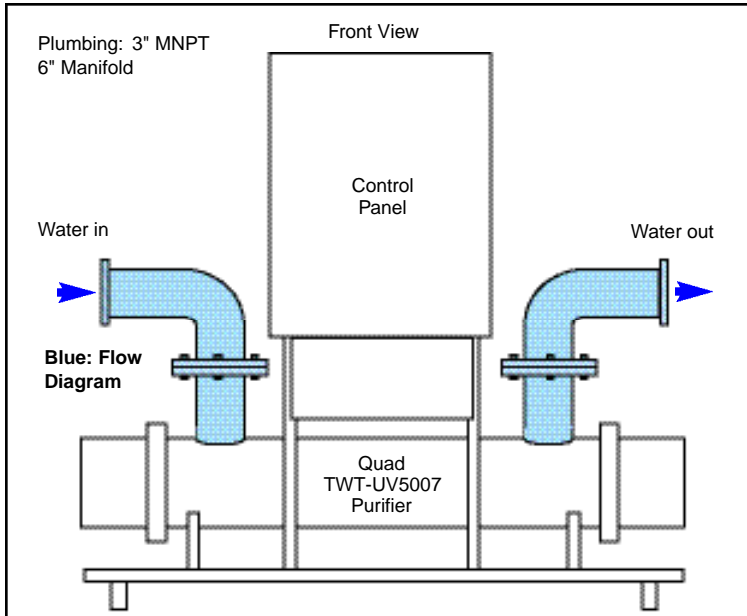
- Maximum Operating Temperature: 37°C (98.6°F) • Maximum Operating Pressure: 125 psi - 8.6 Bar
- Plumbing: 3" flange In-Out (4" optional) • Unit Dimensions: 56" L x 12.5" W x 20" H
- Control Panel: NEMA 4 complete., 24"x 20"x 10" inches, 67 lbs, Enamel Coated. Includes Lamp LEDs, Power Switch, UV Monitor Meter Face • Controller Dimensions: 30" x 24" x 10"
- Unit Weight: 130 lbs (59 kg) • Controller Weight: 60 lbs (27 kg) • Body: 316 Stainless Steel
- UV lamp replacement: To ensure adequate disinfection/purification of water line contamination, replace UV lamps every 12 months (or sooner depending on water use, quality and conditions).

Suggested (optional) plumbing configuration for triple unit system operation

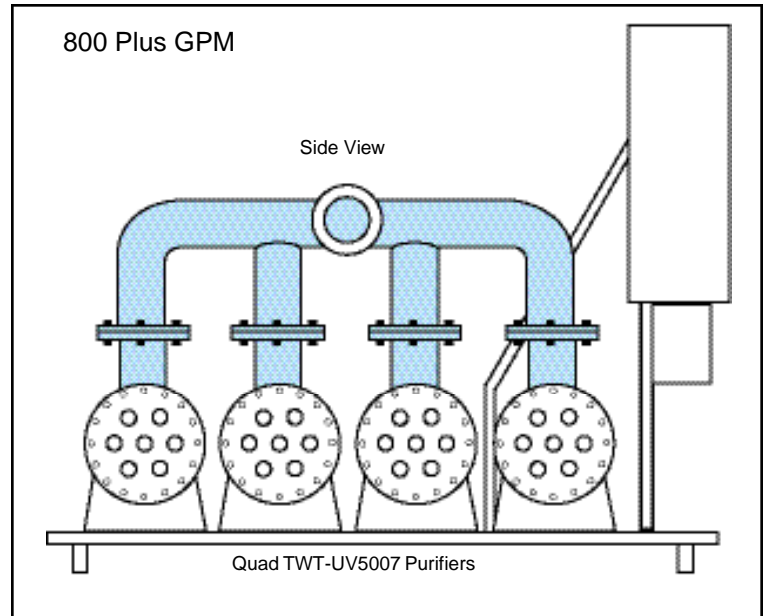


Custom Engineered Systems Built to Suit
TWT "The Competitive Edge"

Suggested (optional) plumbing configuration for Quattra unit system operation



Systems as illustrated-Customer Responsibility: Manifold, piping, 3 way valve, manual shut-off valves and other related equipment needed to and from system owners responsibility. *(Can build to suit if requested)*



Sizing/Footprint: Plumbing configuration will vary and be determined by installer, according to point of use area allocated for system installation.



Features

- 7 UV Lamp Array • Single UV Monitor • Individual Lamp Indicators
- 316L Stainless Steel • Compact Footprint
- Rugged Construction • NEMA Control Panel

Additional Features (Optional)

- TWT® Deposit Ci Protector

Benefits

- High Volume Disinfection, Low Cost per Litre
- Extreme UV Dose Available for Many Applications
- Larger Flow Rates Possible with Manifolding
- May be Configured for Redundant Operations
- Systems May be Skid Mounted for Ease of Transport and Installation
- Extremely Simple to Use and Maintain

Sizing/Footprint:

Plumbing configuration will vary and be determined by installer, according to point of use area allocated for system installation.

Installation:

Licensed plumber and/or contractor is recommended. Must have enough room on all sides for UV replacement & maintenance

UV lamp replacement:

To ensure adequate disinfection/purification of water line contamination, replace UV lamps every 12 months (or sooner depending on water use, quality and conditions).

The system is fully self-contained and mounted on transportable skid. The total dimensions are within allowable limits, making it possible to ship by air-freight to any international airport. Easy to follow care, maintenance & operational procedures and other basic informational labels will be permanently affixed to the TWT system. This information will ensure owners of a long and reliable lifecycle if system is properly cared for (system requires minimal maintenance).

Note:

TWT Inc. recommends that an initial supply of replacement products e.g., UV lamps etc. be stored at owners facility at all times, that will insure uninterrupted service and treatment.

TWT offers a full range of products & systems designed to address fluid problems wherever fluid flows. From TWT® patented deposit control technology to pre and post filtration needs, ionization, disinfection, and ultraviolet purification treatment and conditioning. Components and subsystems chosen from across the range of treatment methods can be combined in different configurations to provide custom solutions specific to your facility site or application.

TWT also has extensive design, engineering, manufacturing, consulting and training ability to work with customers worldwide, and to use its products and/or systems in whole or component form, as a component assembly, or as an accessory to their primary product. Take advantage of our outstanding manufacturing and marketing expertise.

Let TWT custom design a product and/or system to meet your specific application (footprint), flow rate, system integration, and/or retro-fit program needs.

At TWT, Inc. our unique capabilities and custom design expertise have and continue to successfully solve a wide variety of problems for a wide variety of customers world wide commercial, industrial, and residential.

- FROM IDEAS TO FINAL PRODUCTION
- EFFICIENT ENGINEERING DESIGN TEAM

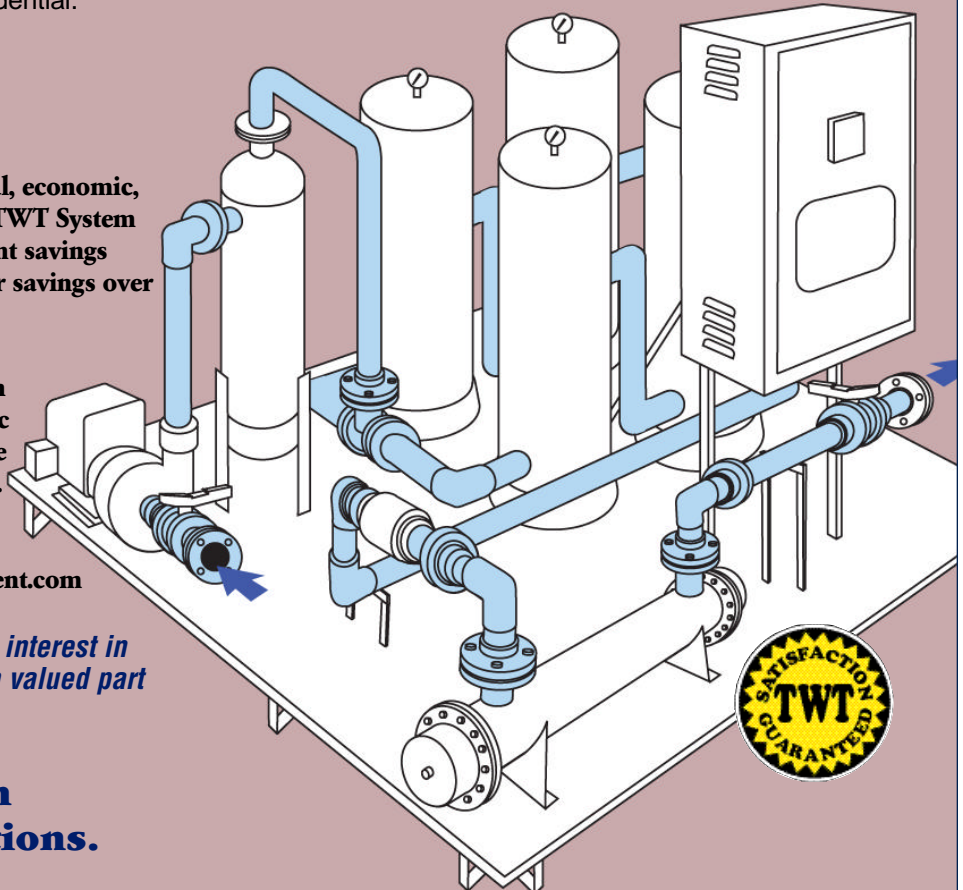
TWT products make sense from operational, economic, and safety point of view. Ownership of the TWT System will afford you and our customers significant savings over a short period of time and even greater savings over the life of the equipment.

Contact your Distributor or TWT today (info@Triangularwave.com) for information on what TWT system will meet your specific application needs and/or visit [Triangularwave Technologies, Inc. Comprehensive Websites](http://TriangularwaveTechnologies, Inc. Comprehensive Websites). The Valuable Technical Resource For All Involved In Water And Fluid Management. www.Triangularwave.com • twtwatertreatment.com

We sincerely thank you for your time and interest in our products, and look forward to being a valued part of your operation.

Bringing You The Best in Fluid Management Solutions.

- STATE-OF-THE-ART PRODUCTION EQUIPMENT AND FACILITY TO MEET THE EVER CHALLENGING PRODUCTION REQUIREMENTS
- TECHNICAL AND TEST DEPARTMENT WITH OUTSTANDING QUALITY CONTROL GUARANTEED
- ECONOMICAL & COST EFFECTIVE
- ENERGY & WATER SAVINGS
- IN ORDER TO ENSURE THE GREATEST LEVEL OF PERFORMANCE AND SATISFACTION WORKING WITH TWT PRODUCTS AND SYSTEMS, WE RECOMMEND THAT YOU CONTACT OUR ENGINEERING STAFF, WHO WILL BE PLEASED TO WORK CLOSELY WITH YOU TO DETERMINE THE OPTIMAL TREATMENT REQUIREMENTS (UV Dosage, GPM and/or System Integration) INSTALLATION AND APPLICATION FOR YOUR INDUSTRY SPECIFIC PROJECT.
- ENGINEERED MULTI-PROCESS MODULAR WATER TREATMENT SYSTEMS, DESIGNED TO CUSTOMER'S SPECIFICATIONS.



TWT® The Ultimate in Water Treatment & Conditioning

The Green Way

