

Triangularwave Technologies, Inc. (TWT®)
TWT-SYSMD-1400 and 1F472-1400
Modular All-In-One Water Treatment System
Basic Installation Guidelines for Licensed Plumbers and/or Contractor

The TWT® system installation must have enough room on all sides for filter & UV replacement and maintenance at the facility. This will allow most maintenance procedures to be accomplished without removing system components from their mounting brackets.

If there is an existing pressure tank, pressure assist device, or water softener, the system must be installed after that. If operating under high pressure conditions, a pressure reduction system is recommended to be installed.

- Securely mount or place system near water feed line in an area allowing enough room on all sides of system for filter replacement, UV lamp replacement, visual inspection, keeping it out of harm's way (i.e., appropriate service clearances).
- Install connectors and shut-off valves (included) at each end (if shipped separately)
- Shut off water to facility before you start installation
- Plumb system into water feed line

Test system prior to operation:

- Do not plug in control system
- Remove filter cartridges and reinstall housing before testing system
- Close drain ports
- Open shut-off valves, test for leaks
- Replace water filters
- Tighten all connectors and (do not over tighten)
- System should now be ready for operation
- Plug controller into VAC outlet, make sure manual shut of valves and drain ports are in proper position for water flow
- Turn on power switch
- Allow system to operate for a period of time before using water
- Outdoor installation: The Water Treatment System is pre-assembled on a mounting board or skid. Select the suitable location for installation. The system should be installed in weather proof enclosure out of harms way and sheltered from direct sunlight and direct precipitation. Follow same steps as above for testing.



TWT offers several systems designed to treat and meet your individual & industry-specific needs.

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

Your Simple and Safe Solution (wall mounted & skid mounted systems).

- We offer a full range of systems designed to address fluid problems where ever fluid flows
- Enhance water quality, and improve operating efficiency and equipment life cycle.
- Protects Plumbing Equipment & Appliances
- Environmentally Friendly
- Cleaner Water Is Healthier Water

Upgrades (GPM): Higher volume systems available upon request

* SMD are skid-mounted systems

TWT water treatment systems are ruggedly constructed for exceptional performance. These systems are ideally suited for Wells, Homes, Offices, Factories, Farms, Medical/ Dental & Laboratory Environments, Hospitals, Restaurants, Schools and anywhere the need for cleaner water to use and drink are required. The rugged self-contained design of these systems ensure that the system will enjoy a long and reliable life cycle when properly cared for.



TWT-SYSMD-1400 and 1F472-1400

All-in-One Integrated Water Treatment Systems

P.O.E./P.O.U. Applications

Chemical-Free • Multi-Stage Filtration • Electro-Magnetic Fluid Conditioning • UV Disinfection/Purification

Triangular Wave Technologies, Inc. All-In-One fluid management systems, the ultimate in water treatment & conditioning.

TWT® systems are factory engineered and assembled, applying all of the needed elements for maximum fluid protection, management and peace of mind in one simple packaged solution. TWT® Filtration, Microprocessor Deposit Controller, Reaction Chamber and UV Disinfection units are combined to provide a start-to-finish answer to simplified prevention, treatment and management of water line contamination dangers.

The TWT All-In-One Fluid management water disinfection / purification systems are unique, compact, self-contained units for the treatment of water.

Water lines in the residential, commercial & industrial sectors, where clean water is essential, commonly allow a contaminated interior environment conducive to the growth of bacteria, protozoa, and fungi. These initially arrive in small numbers through wells and public waterline plumbing systems. Over time, these microorganisms bind to the sides of your water pipes, tubing and equipment forming biofilm.

As water flows through the pipes and tubes, the biofilm sheds microorganisms and bacterial endotoxins into the water, leading to these harmful conditions.

TWT All-In-One Wall Mounted Systems



Two (2) Stage Filtration with Pressure Gauges

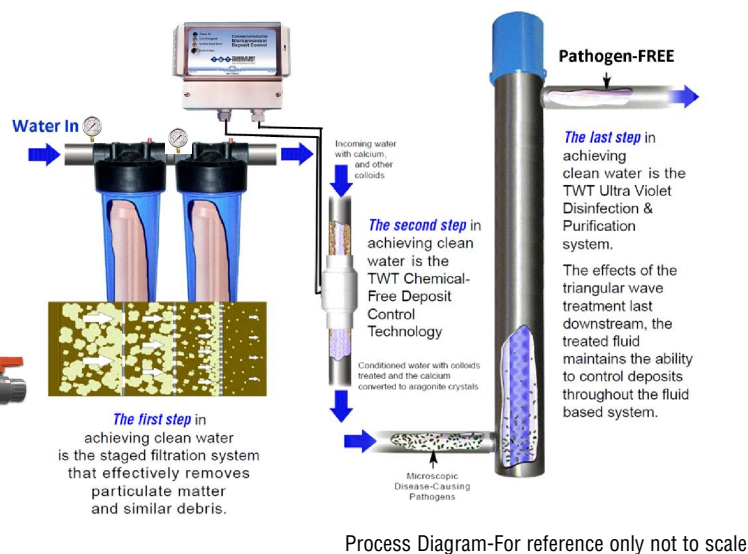
Filters are designed to trap various kinds of debris, dirt and organic particles that will otherwise enter your equipment and/or plumbing system, restrict your water flow and create a breeding ground for bacteria. Water is filtered to remove lingering sediment, chlorine, heavy metals, organic carbon compounds, volatile organic chemicals, pesticides and hundreds of other chemicals sometimes found in source water. (see step 1 on page 6)

TWT® Patented Deposit Control Technology

Hard water problems solved easily. Control scale deposits, bacteria, corrosion, algae and colloids in all fluid based systems. Providing comprehensive end-to-end treatment & conditioning. (**chemical-free**)

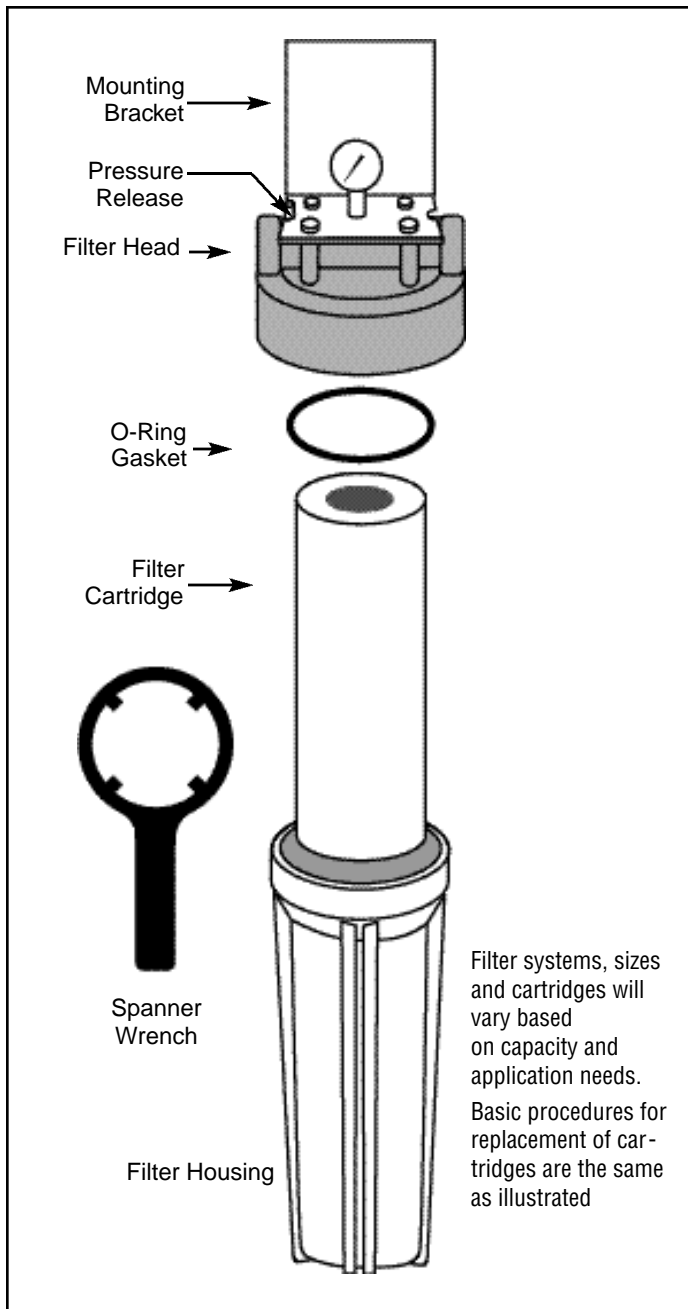
Ultra Violet Disinfection & Purification

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".



Alerts you when change out and/or cleaning is required

Triangular Wave Technologies, Inc. offers several systems designed, sized to treat and fit your specific needs. These systems improve water quality, save energy, are none chemical, safe and cost effective.



- Make sure the filters are free flowing, if they become clogged you must replace them.
- Replace filters when needed, generally twice a year, depending on water use, quality, conditions and pressure drop.
- Water condition and GPM determines need (hard water areas of the country may require more frequent replacements).
- Replace resin filter every 150 to 200 gallons of processed fluid (up to 20 grains), above 20 grains hardness to be determined (will vary based on equipment operating conditions, water quality in different areas of country. Manufactures suggest equipment owners replace resin filters more frequently until they have established appropriate usage and time tables).

FILTER REPLACEMENT

When pressure readings reach or pressure drops to undesirable levels it is time to replace your filters.

1. Shut down system before performing any maintenance.
2. Turn off water supply to system.
3. Depress pressure release button to relieve pressure in filter housing(s).
4. Unscrew housing using spanner wrench (shipped with system).
NOTE: When opening filter housing to change cartridge, it is common for O-Ring/Gasket to lift out of housing and stick to cap (remove carefully.)
5. Remove used cartridge and discard. Rinse out housing with about 1/3 full of water. Add about 2 to 3 tablespoons of bleach and scrub thoroughly with brush or sponge. Rinse thoroughly.
6. Remove O-ring/Gasket from housing and wipe groove and O-ring/Gasket clean. Lubricate O-ring/Gasket with a coating of clean food grade silicone grease. Place O-ring/Gasket back in place and press O-ring down into groove with two fingers (or place gasket on rim of sump housing).
NOTE: This step is important to ensure proper seal. Make sure O-ring is seated level in the groove (or gasket is on rim of sump (housing)).
CAUTION: If O-ring/Gasket appears damaged or crimped it should be replaced at this time, contact your distributor for replacement parts.
7. Insert the new cartridges into the sump (filter housing) making sure that it slips down into the housing.
8. Screw the sump (housing) onto the cap and hand tighten (**DO NOT OVER TIGHTEN**).
9. Turn on the water supply slowly to allow system to fill with water (check for leaks).
10. Depress the pressure release button to release trapped air from filter.
11. Restart system



Review the application and installation manuals shipped with system

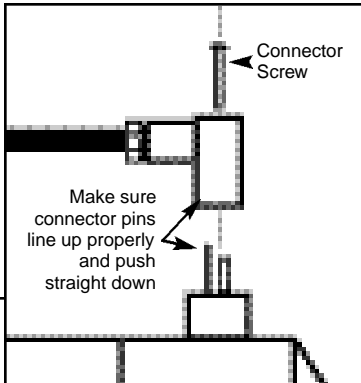




Factory Wrapped Wire Coil Reaction Chambers Application

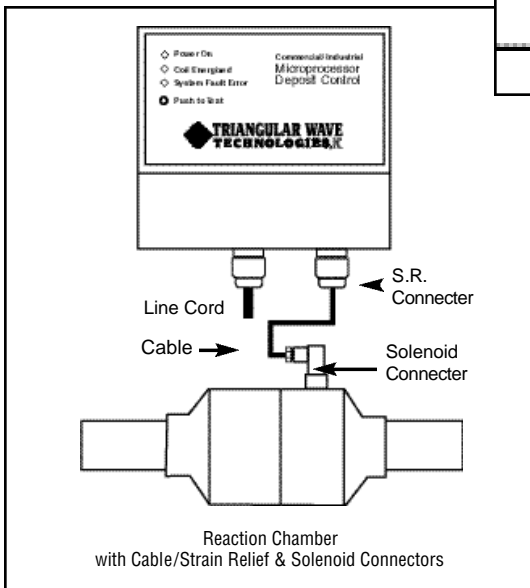
- To address magnetic pipe applications
- When a protected environment (code) is needed
- When on-site solenoid wrap is not applicable

The TWT Reaction Chamber is part of the patented TWT Deposit Control Technology. The Reaction Chamber provides a chamber through which the water flows and is exposed to the triangularwave signal that lies at the heart of the deposit control technology. As the fluid passes through, it is treated and then carries that treatment downstream, to condition the rest of the plumbing system, non-chemically and reliably.



When you have purchased a reaction chamber with cable and connectors with your controller unit, the correct strain relief connector for the controller is furnished with the cable for the reaction chamber. The strain relief connector on the controller (pipe solenoid) should be removed and replaced with the strain relief connector provided with the reaction chamber cable. The two wires should be connected to the coil terminals in the controller housing as illustrated below.

TWT Deposit Control Technology Systems:
on-site testing after application and installation completed according to manufactures guidelines. Owner application & installation manual, sent with systems. All TWT deposit Controllers are engineered and designed to be self-testing. Read all information in manual carefully before operating the system.



Schematic rendering of industrial reaction chamber hookup

IMPORTANT REMINDER

Do not install the wire coil on any magnetic pipe; such as **STEEL, GALVANIZED STEEL, IRON, DUCTILE IRON OR CAST IRON**. When the coil is applied to a magnetic material the pipe then becomes a shield, and prevents the energy from entering the fluid path.

The Triangular Wave Deposit Control System creates an electromagnetic field which is used to address the fluids in the pipe. If the fluid pipe is magnetic, it is necessary to insert a section of non-magnetic pipe to provide the proper pipe material for the unit to work as designed.

Triangularwave Technologies, Inc. has developed factory wrapped wire coils (Reaction Chambers) constructed using PVC or other appropriate pipe material to specifically address this situation.

A Reaction Chamber may be purchased and inserted into the existing pipe in place of an "on-site wrapped" wire coil.

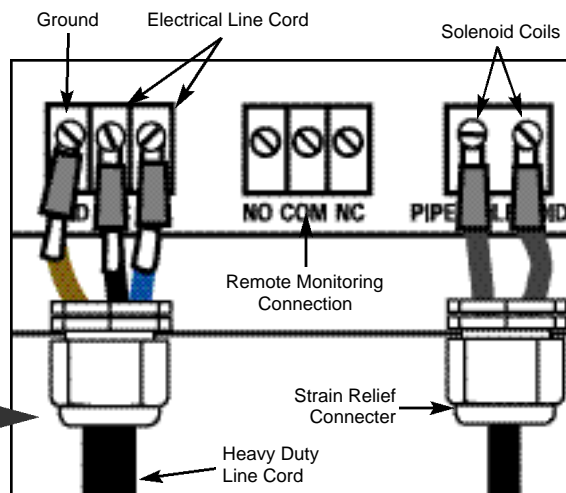
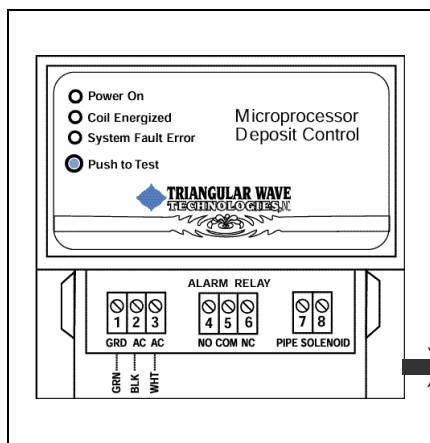
Reaction Chambers: Special Notes

All Reaction Chambers are available as Special Orders (Custom sizing and material upgrades) upon request; and upon the approval of Triangularwave Technologies, Inc.

PVC Pipe mentioned in all descriptions is Schedule 40 PVC material.

The Industrial PVC & Stainless Steel Reaction Chambers are factory wrapped and assembled with two bulkhead connectors, and adequate conduit wire for each installation.

TWT Deposit Controller terminal Hookup



TWT Deposit Control Unit

The controller is supplied with a wiring kit and a strain relief connector for the solenoid coil wires. This strain relief will provide a water resistant seal for the two coil wires. You should rotate the compression ring counter clockwise to release pressure on the seal. Feed the two wires through the provided holes and tighten the compression ring. Connect the two wires to the coil terminals in the controller housing as illustrated (refer to winding instructions in owners installation manual).

A standard installation will not require access to the main control circuit board, because all connections are available in the wiring terminal. The control circuit is accessed by removing the front panel of the TWT unit.

TWT-SYSMD-1400 and 1F472-1400 UV Lamp Replacement Guidelines

For Uv Purifiers UV-1 • UV-250 • UV-700 • UV-1200 • UV-1400 • UV-1500 • UV-3000 • UV-1500 • UV-5000

ULTRA-VIOLET LAMP REPLACEMENT

NOTE: It is required that the lamp be changed every 10 to 12 months after installation regardless of apparent condition of the lamp.

The ultra-violet lamp located in the sterilization chamber will operate effectively, round the clock, for approximately one year under normal conditions. The lamp will light up longer than that, but the maximum U.V. light penetration may fall below the prescribed safety level.

TO DISASSEMBLE THE UV LAMP

- **Shut down system** • **Close shut off valves**
- **Drain system** (optional)

1. Shut off power switch and/or unplug the system from the electrical outlet and turn off all water supplies to the system.
2. With Allen wrench provided, loosen the two set screws that secure the top cap containing the electrical cord. Remove cap and set aside carefully.
3. Remove the lamp connector located at the cord end of the lamp by gently wiggling and pulling away from the lamp.
4. Carefully slide UV lamp out of the quartz tube and discard.
5. Insert the replacement lamp into the quartz tube.
IMPORTANT: DO NOT TOUCH THE LAMP WITH BARE HANDS. FINGER PRINTS WILL PREVENT THE SYSTEM FROM WORKING EFFECTIVELY.
6. Gently push the lamp connector against the pins at the end of the lamp.
7. Make sure that all electric components are dry before replacing the top cap. Secure cap with the set screws (**DO NOT OVER TIGHTEN**).
8. Plug in the power cord. The lamp should be operating at this time. To confirm that your new lamp is working correctly, check with your model's pilot light indicator:

The LED indicator will light up on the side of the unit UV-700 and above: A bluish light should be visible through the viewport

9. Close drain port, open shut off valves, test for leaks, and restart system to allow the flow of water through the unit.

IMPORTANT: Where water turbidity is a problem, it is advisable to clean the quartz tube when replacing the lamp.

TO CLEAN AND CHANGE THE QUARTZ TUBE

1. Turn water off and unplug unit.
2. With the Allen key provided, loosen the two set screws that secure the top cap containing the electrical cord. Remove the cap and carefully set aside (it is attached to the chamber with the ground wire).
3. Remove the white lamp pin connector from lamp end. Remove the UV lamp carefully from the UV unit.
4. Loosen and remove the sealing compression nut. Caution: Quartz dome/sleeve may be stuck to the O-ring inside the retaining nut.
5. **CAREFULLY** remove the quartz sleeve from the UV chamber.

6. Wipe the quartz sleeve with an alcohol wipe being careful not to touch the sleeve with your fingers.

TO RE-ASSEMBLE

1. Reassemble using a clean cloth to hold the quartz sleeve, guide the quartz sleeve gently into the hole and screw the retaining nut down until snug.
2. Insert the replacement lamp into the quartz sleeve. Gently push the lamp connector against the pins at the end of the lamp.
3. Complete the reassembly of the UV purifier. Make sure that all electrical parts are dry before replacing the top cap and securing it with the setscrews.
4. Turn the water supply on slowly and check the unit carefully for leaks. If water is leaking from around the rubber seals, tighten the retaining washernuts until the leak stops. A 1/8 turn past this point should be tight enough.

COMPLETE RE-ASSEMBLY OF THE UV PURIFIER BY FOLLOWING LAMP REPLACEMENT INSTRUCTIONS FROM 7 THROUGH 9.

Note:

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

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).

Sediment / Carbon and other Cartridge Replacement:

Generally twice a year, depending on water use, quality, conditions and pressure drop.

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

Other voltage sources available upon request (must specify)

Installation:

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

Upon request if needed other filter mediums of filters used in system can be determined by a water quality analysis (purchaser responsibility).

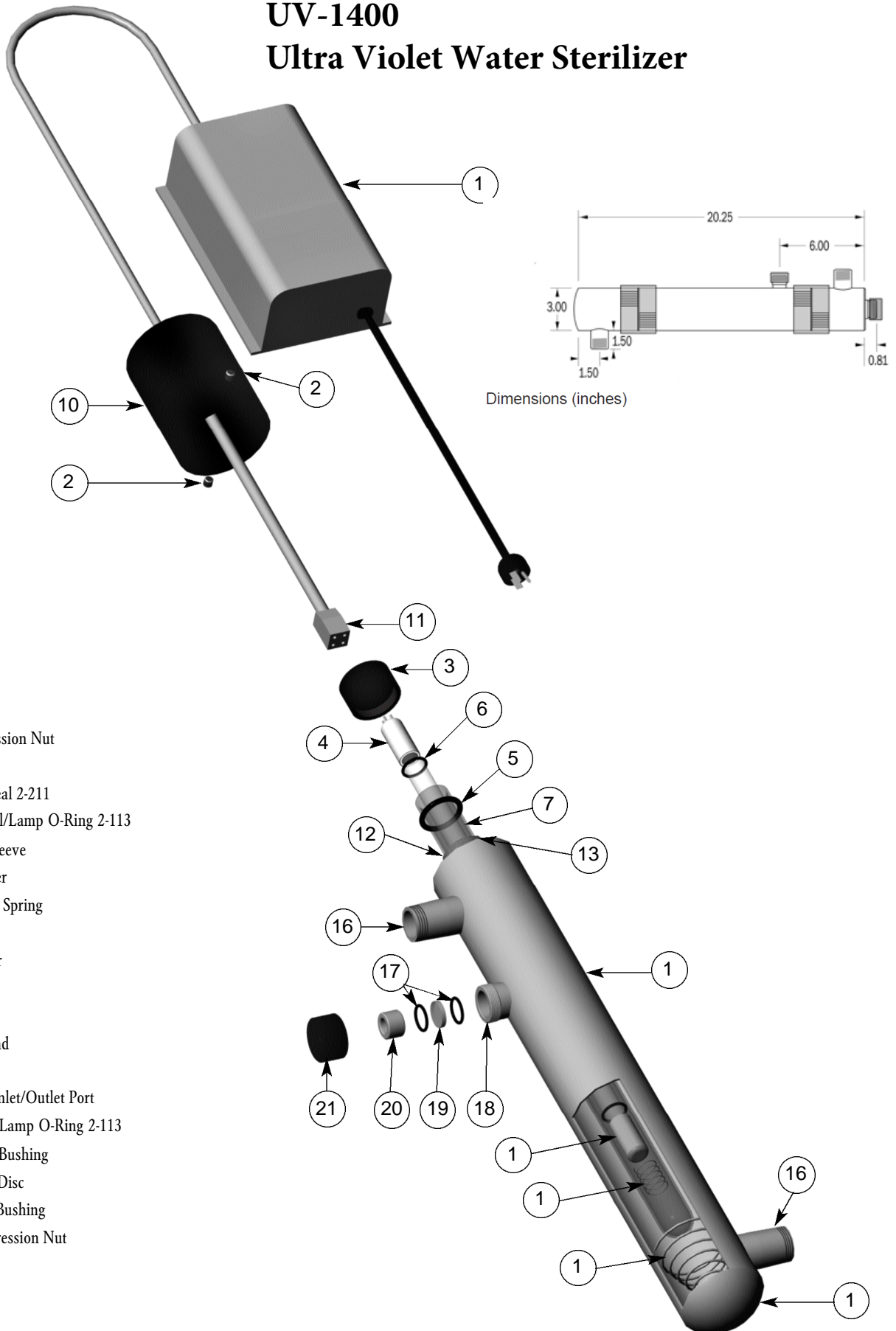
Micronic sizes of filters are generally 5, 20 microns, unless otherwise specified.

Verify that the current source of the system meets electrical code prior to installation.

In order to ensure the greatest level of performance and satisfaction in your work with the TWT products & systems, we recommend, if required, 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.



UV-1400 Ultra Violet Water Sterilizer



Parts List

Item Description

- | | |
|----|------------------------------------|
| 1 | Ballast |
| 2 | Set Screws |
| 3 | Quartz Compression Nut |
| 4 | UV Lamp |
| 5 | Quartz Dome Seal 2-211 |
| 6 | Quartz Disc Seal/Lamp O-Ring 2-113 |
| 7 | Quartz Dome Sleeve |
| 8 | UV-250 Chamber |
| 9 | Lamp Extension Spring |
| 10 | Plastic Cap |
| 11 | Lamp Connector |
| 12 | End Washer |
| 13 | End Busing |
| 14 | Concave Cap End |
| 15 | Conical Spring |
| 16 | 1" NPT 304SS Inlet/Outlet Port |
| 17 | Glass Disc Seal/Lamp O-Ring 2-113 |
| 18 | Viewport Outer Bushing |
| 19 | Glass Viewport Disc |
| 20 | Viewport Inner Bushing |
| 21 | Viewport Compression Nut |

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 EQUIPMENT

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 application

- Residential
- Commercial
- Industrial

Industry specific custom designed multi-process modular, technologically advanced method for water / fluid management & control.

All-In-One water filtration, disinfection & purification systems available upon request.

ALL TWT® PRODUCTS AND SYSTEMS COME WITH EASY TO FOLLOW CARE, MAINTENANCE AND OPERATIONAL MANUALS. READ ALL INFORMATION CAREFULLY BEFORE INSTALLING THE SYSTEM

ALL PRODUCTS & SYSTEMS ARE RUGGEDLY CONSTRUCTED FOR EXCEPTIONAL PERFORMANCE.

THE RUGGED DESIGN OF THE PRODUCTS & SYSTEMS ENSURE THAT THEY WILL ENJOY A LONG AND RELIABLE LIFE CYCLE WHEN PROPERLY CARED FOR.

HAVE AN INDUSTRY SPECIFIC FLUID PROBLEM?

HAVE AN INDUSTRY SPECIFIC TUBE AND/OR PIPE CONFIGURATION PROBLEM?

TROUBLE SHOOTING (PROBLEMS)?

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.

**LOTS OF COMPANIES PROVIDE PRODUCTS AND SYSTEMS...
TWT, INC. SENSES ENVIRONMENTAL NEEDS
WITH INTELLIGENT SOLUTIONS!**

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.

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



TWT® has the versatile, efficient, cost-effective methods to solve your water/fluid management problems end to end.

TWT® The Ultimate in Water Treatment & Conditioning

TWT® "The Competitive Edge"

Go Green-Save Green



ISO Certified Facility

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