

WATER AND FLUID MANAGEMENT SOLUTIONS

Versatile Deposit Control Products & Systems To Effectively Meet The Needs Of Any Industry and Application - **Chemical-Free**
 • Residential • Commercial • Industrial

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

HARD WATER PROBLEMS SOLVED EASILY
 Efficient, Cost Effective & Reliable



TWT® Patented Deposit Control systems use advanced technology to restore and maintain a clean, corrosion-free delivery system in an environmentally safe and chemical-free manner... The result is clean pipes and tubing with no biofilm and reduced bacterial contamination.



TWT® Patented “Chemical-Free” Triangularwave Deposit Control Technology:

Electro-magnetic microprocessors sized to meet the needs of all applications. Technologically advanced method for water & fluid management providing comprehensive end-to-end treatment & conditioning.

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).

TWT® Reaction Chambers

To use in conjunction with the TWT Deposit Control Systems when required, Triangular Wave 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 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.

TWT, Inc. offers a full range of products & systems designed to address fluid problems wherever fluid flows. TWT has the versatile, efficient, cost-effective methods to solve your fluid management problems end to end.

- **Controls scale, bio-film & corrosion**
- **Enhance operating efficiency & life cycle of equipment**
- **The only products & systems that pay for themselves**
- **Review application and installation guidelines of all products and systems to ensure proper use and treatment.**



ISO Certified Facility

TS81

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 Websites: www.triangularwave.com • www.twtwatertreatment.com



TWT is the world's leading manufacturer and supplier of chemical-free fluid management products based on its patented TWT Triangularwaveform technology. TWT's chemical-free fluid treatment and management methods have been accepted for use around the world by governments, industry, and individuals, who all enjoy the increased safety, extended equipment life cycle, and decreased operating costs that the TWT systems deliver.

Triangularwave Technologies, Inc. products and systems provide technologically advanced methods for water and fluid management that are both efficient and cost-effective. Components and subsystems chosen from across the range of treatment methods can be combined in different configurations to provide custom solutions specific to any industry, site or application.

TWT systems work to consistently deliver high quality water, reduce scale and bio-fouling in plumbing systems, and to increase efficiency of both once-through and re-circulating

**TWT® Saves:
Chemicals, Water,
Energy, Labor,
Time and Materials.**

**Protection for
New Equipment**

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

**Treatment
for Existing
Equipment**

Retrofit existing equipment to improve its operating efficiency and life cycle.

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.



HVAC, process cooling, agriculture, industrial processing, wastewater and other fluid based systems. Each product line offers a variety of both standalone and comprehensive treatment solutions for end-to-end fluid management, for all types of applications. The patented Triangularwave Deposit Control Systems use advanced integrated circuitry and signal processing to create a complex frequency and amplitude modulated wave form. A complex and changing electrical field is induced in the pipe, which increases the solubility of the minerals and changes the shape and size of the calcium carbonate crystals. By this reaction, the crystals lose their adhesive properties, remain in sub-micron suspension, and pass harmlessly through the pipe. Existing scale deposits are taken into solution and also pass through.

Triangularwave Deposit Control Systems offer all the positive effects of soft water, and clean up existing deposits, without the use of traditional salts and chemicals.

**TWT® Advanced Methods for Water & Fluid Management
Potable Water, Process and Waste Water Treatment
& Conditioning**

- Residential • Commercial • Industrial
- Provides the effects of softened water, neutralizes calcium hardness effects in the water
- Removes and prevents scale buildup
- Uses no salts or other chemicals
- Service and maintenance-free
- Improves efficiency of all water-fed equipment and extends its life cycle
- Quickly pays for itself and continues saving
- Descales the entire plumbing system over time
- Designed for safety—the output is safe to both personnel and equipment
- There is no electrical contact with the pipe

TWT Deposit Control Systems enhance other treatment technologies as well, including chemicals, ozone, ultraviolet, separators and other filtration systems, keeping them clean and enhancing their operation. In this way, their full treatment benefits are realized, with reduced maintenance requirements. Consider using TWT Deposit Control Systems in conjunction with any fluid treatment systems as a complementary technology. Visit our websites for further details on how you can leverage the TWT Deposit Control benefits.

Simply Said... a clean, corrosion-free delivery system is restored and maintained in an environmentally safe and chemical-free manner.

The result is clean pipes and tubing with no biofilm and reduced bacterial contamination.

Conserve Water, Save Energy...Non-Chemical, Safe, Cost-Effective Treatment System:

TWT® The Ultimate in Alternative Energy, Water Treatment & Conditioning

CHEMICAL-FREE

The Green Way

Triangularwave Patented Chemical-Free Deposit Control Technology

- Residential • Commercial • Industrial

WATER & FLUID MANAGEMENT SOLUTIONS

Provide Your Customers With Technologically Advanced Water Treatment Systems

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



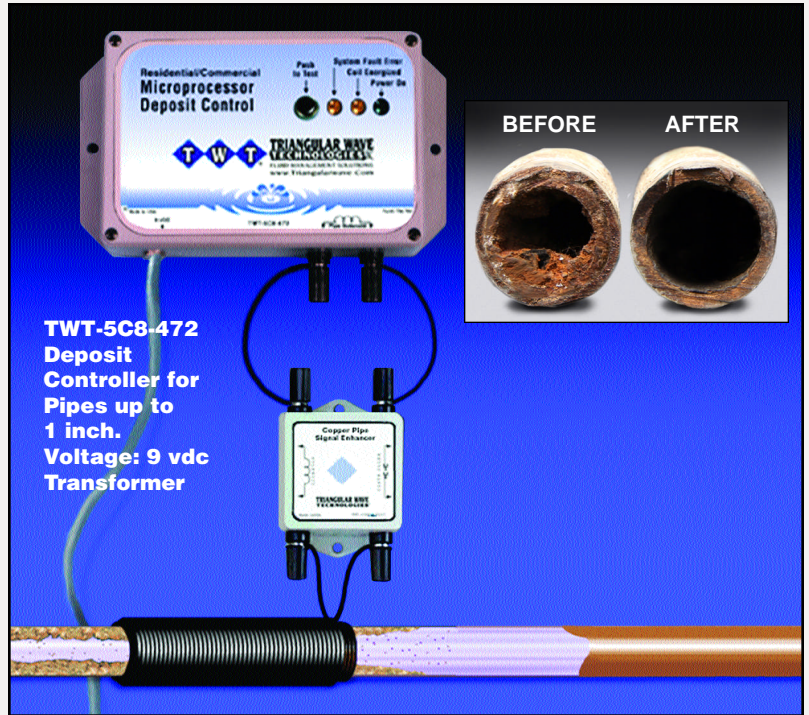
TWT® Deposit Control units sized to meet the applications (pipe size & material) required for point-of-entry and/or point-of-use water treatment and conditioning. Used in residential, commercial & industrial facilities worldwide.

FIELD TESTED AND PROVEN EFFECTIVE

CHEMICAL-FREE HARD WATER CONDITIONING & TREATMENT SYSTEMS



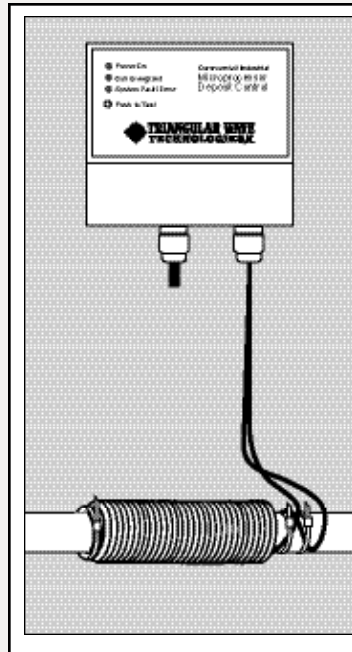
TWT-5C8-402/2" controller with TWT-CSE-0227 copper pipe signal enhancer. Onsite solenoid application, on 2" copper pipe.



TWT-5C8-472 Deposit Controller for Pipes up to 1 inch. Voltage: 9 vdc Transformer

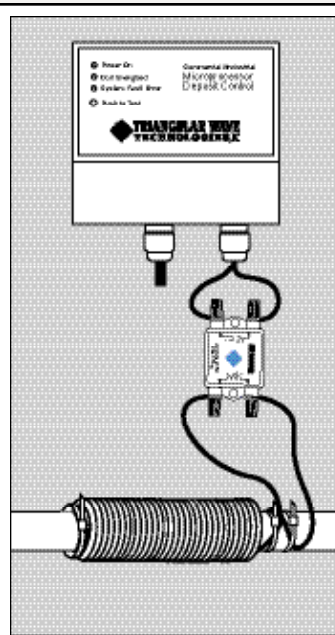
Residential Deposit Control Unit

For Maximum Effectiveness Follow These Simple Guidelines



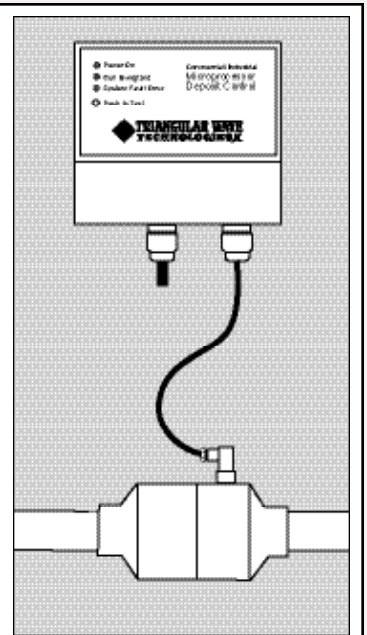
TWT-Deposit Control Solenoid Coil Wrap on PVC Pipe Application:

PVC/Plastic pipes require **NO** copper pipe signal enhancer or reaction chamber



TWT-Deposit Control Solenoid Coil Wrap with a CSE Copper Pipe Signal Enhancer Application:

Copper pipe signal enhancer is required for copper pipe applications only



TWT-Deposit Control with Stainless Steel or PVC Reaction Chamber Application:

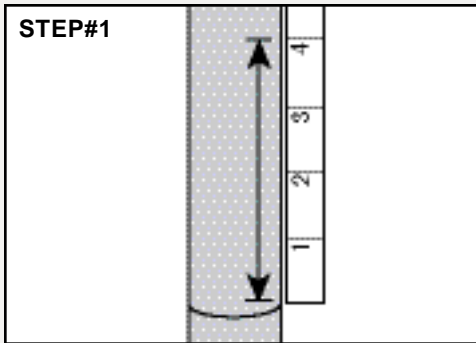
Magnetic pipes (steel/iron) require a reaction chamber

Owner application, installation, and maintenance manuals sent with units:
Read all instructions carefully before installing the systems.

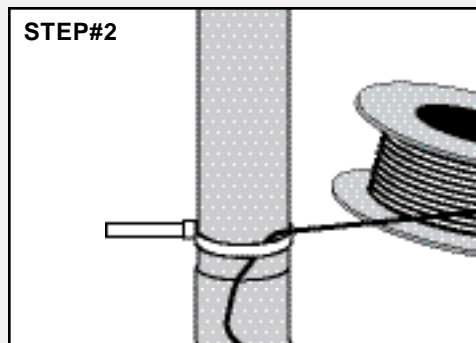
On site solenoid wrap measurements vary according to pipe material & size. For further instructions regarding the comple-

tion of the installation of the unit purchased, please refer to your Deposit Control System Owner/ Installation Manual.

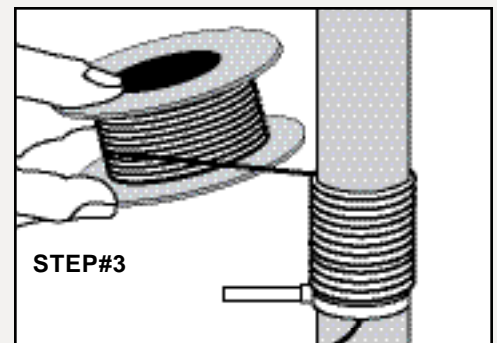
Example: On site solenoid installation for Model#TWT-5C8-402/ Step by Step Instructions of Coil Wrap



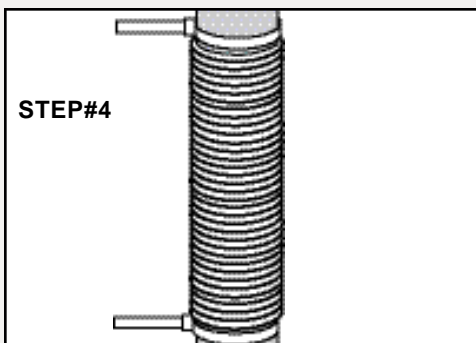
Measure and mark a 7" section in the middle of a straight pipe segment.



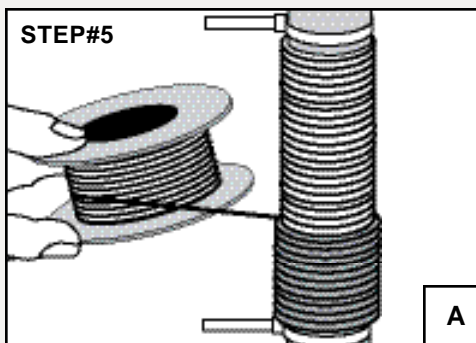
Fasten the signal wire to the pipe with a cable tie (provided) at one end of the 7" section.



Wrap the signal wire around the pipe in a tight coil, in a clockwise manner, so that the adjacent wires are touching each other.

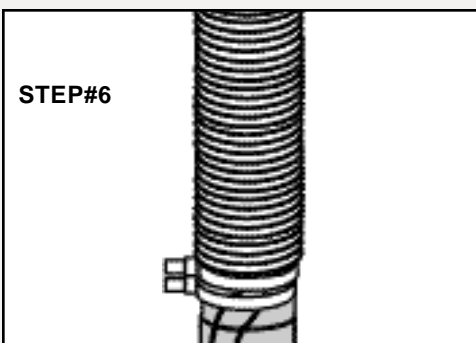
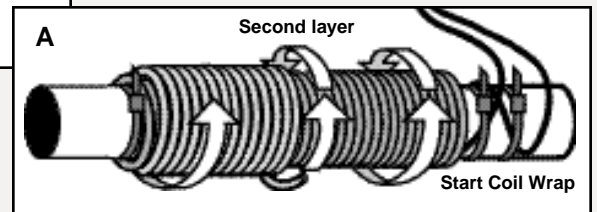


Continue to wrap until the 7" section of pipe is completely covered. Fasten down the end of the coil with the second cable tie (provided). You can hold the first layer in place with cloth tape or electrician's tape.

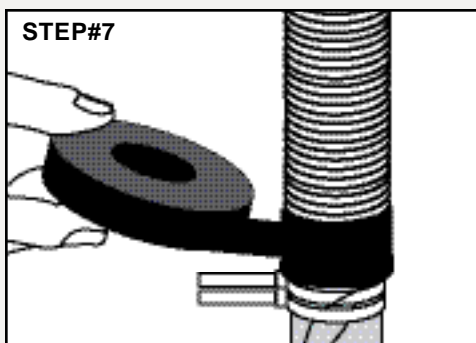


Add a second layer to the coil by continuing to wind in a clockwise manner starting where you completed the first layer and wind **back in the direction of the starting**

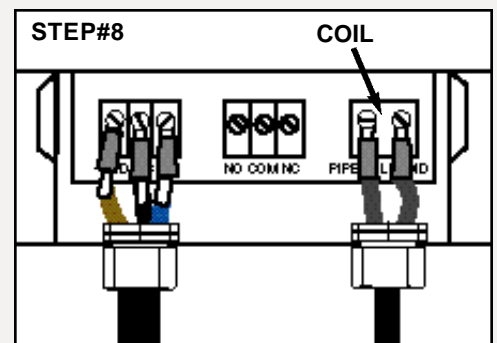
Add a second layer to the coil by continuing to wind in a clock wise manner starting where you completed the first layer and wind **back in the direction of the starting point. (see Diagram A) Do Not Twist or Cut Wire or the System WILLNOT Function.** Place the second layer directly on top of the first layer. Be careful to wind the second layer tightly **in the same clockwise manner** as the first layer **back in the direction of the starting point.**



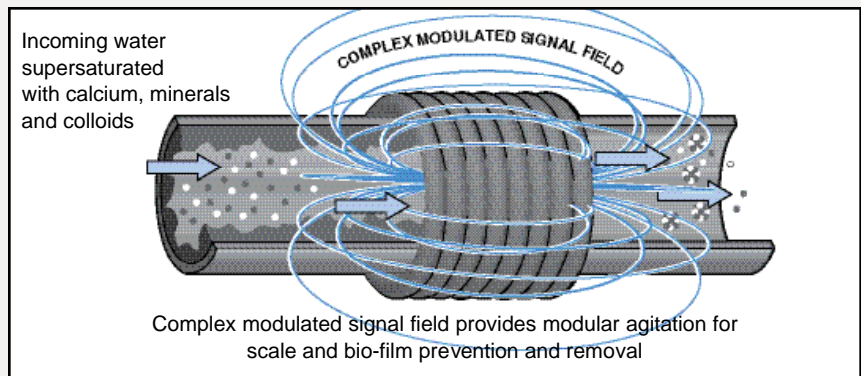
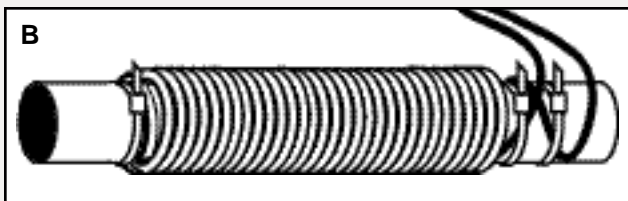
Complete the second layer by clamping the wire with third cable tie (provided). (See Diagram B Below)



Wrap the coil with vinyl industrial tape to help maintain a tight coil and protect the coil from loosening.

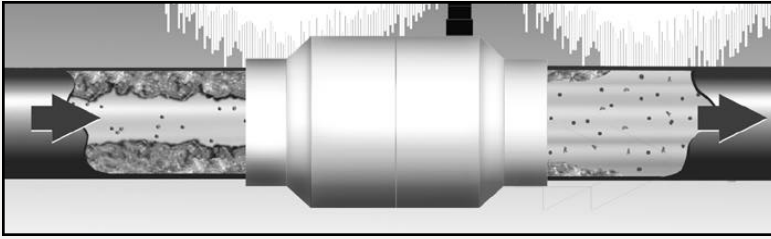


Guide both wires to the Triangularwave Unit and leave about 2" of extra wire.



For high temperature applications of 176°F and above, request and use teflon wire. Teflon wire solenoid measurements sizes vary according to pipe material and pipe size, refer to the technical guidelines on the TWT website for additional information.

For Magnetic Pipe Environments



TWT, a leader in comprehensive fluid management solutions for the industrial, commercial, and residential sectors, is proud to offer our unique Reaction Chamber series of products. Designed to be used with our Deposit Controllers, TWT Reaction Chambers are manufactured to the highest specifications and quality. These products provide the simple-to-use answer to deposit control in environments where magnetic pipe is found and where safe, non-chemical treatment could not otherwise be used. Overcoming the barriers to chemical-free treatment regardless of pipe material is just another way that TWT leads the field in offering complete solutions to meet your needs.

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 Triangularwave 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.

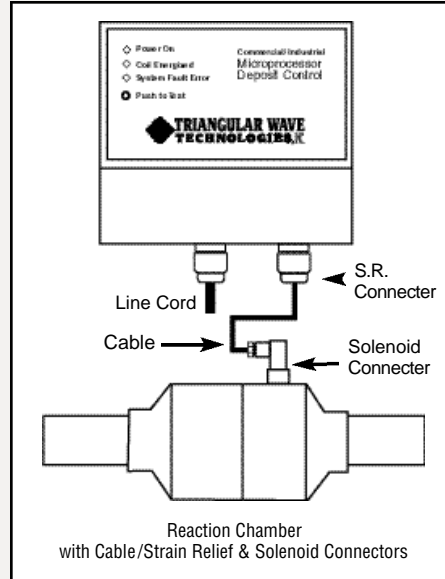
A Reaction Chamber may be purchased and inserted into the existing pipe in place of an "on-site wrapped" wire coil.

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.

Factory Wrapped Wire Coil Reaction Chambers Application



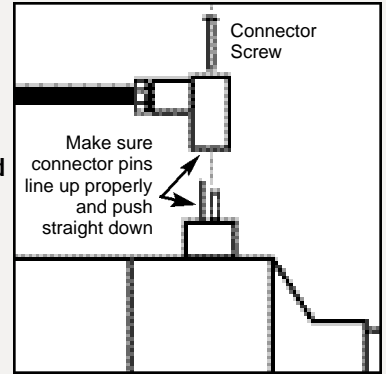
Schematic rendering of industrial reaction chamber hookup

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.

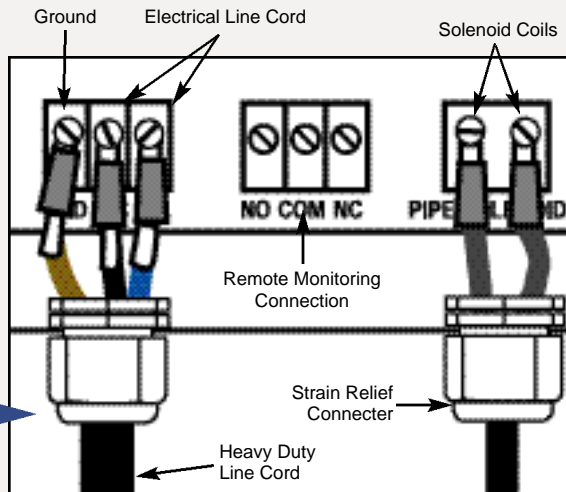
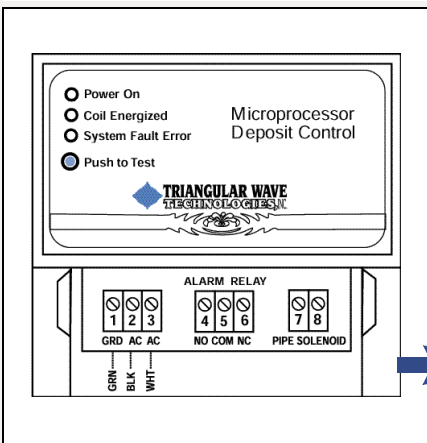
When you have purchased a reaction chamber with cable and connectors with your controller unit, the correct strain relief connector for the controller is furnished with the cable for the reaction chamber. The strain relief connector on the controller (pipe solenoid) should be removed and replaced with 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.

- 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.



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.

Choosing the right system depends on several things...

Triangularwave Technologies, Inc. products and systems provide technologically advanced methods for water and fluid management that are both efficient and cost-effective. Components and subsystems chosen from across the range of treatment methods can be combined in different configurations to provide custom solutions specific to any site or application. Each product line offers a variety of both standalone and comprehensive treatment solutions for end-to-end fluid management, for all types of applications.

At TWT, Inc. we feel the simplest way to choose a system depends on your personal situation. Home/office owners with well water have different water treatment requirements than users who rent an apartment in a city. People with municipal water may choose to rely on a scaled down system that meets their current needs, while people drinking untreated ground or surface water need to fully account for all aspects of water treatment in order to guarantee the purity of their water.

To ensure the greatest level of satisfaction in your work with the TWT Water Treatment Products & Systems:

Know the performance capabilities and technical limitations of all products and systems to guarantee the proper installation application and treatment solutions.

Manage Expectations: Verify the purchase order product/system application, installation and performance needs.

Take these steps before placing your purchase order:

TWT, Inc. Deposit Control Systems:

1. Verify the pipes/tubes to be treated in your systems, i.e., diameter of pipe or Tube (1", 2", 3", etc.) pipe material – copper, PVC, steel, ductile iron, glass, rubber, etc.
2. Verify that you have chosen the correct location and application method, i.e., determine reaction zones, (reaction zone is a place in the water system where the water goes through a physical or chemical change, and the deposit ion of scale or biofilm occurs), onsite solenoid wrap, Copper Pipe Signal Enhancer, Reaction Chamber, etc.
3. Verify that you have determined the appropriate Deposit Controller based on water quality review, system to be treated (process review); check your installation & technical guidelines on TWT website for additional information.
4. If any upgrades/changes are requested, it must be noted on your purchase order, e.g., voltage source changes (110/240 etc.), Deposit Controller upgrades and reason for upgrade additional wire & type of wire (Teflon, etc.), Reaction Chamber construction material e.g., Schedule 40/80 PVC, etc.
5. When using TWT Deposit Control Systems in conjunction with or integrated within other TWT or non TWT treatment technologies and systems, be certain to verify the performance capabilities and technical limitations of all system components

Additional Process Uses of Triangularwave Patented Deposit Control Technology

Triangularwave Technologies, Inc. patented Deposit Control Technology has other potential applications in a wide range of industrial processes including transport, mixing and blending, size separation, dewatering, flotation, leaching, solvent extraction, ion exchange, electrolytic processes, chemical synthesis (compounds/ structures), water reclamation and extraction of oil or sulfur from geological formations.

When installed in a process pipeline the Triangularwave Deposit Controller will:

- Reduce viscosity
- Control fine particles (slime)
- Enhance mixing/blending
- Keep reactants or products in solution or suspension; reduce agglomeration and clogging of pipes, valves, fittings etc.
- Enhance transport limited liquid-solid reactions
- Provide a new chemical synthesis regime
- Enhance water reclamation processes
- Enhance performance of filtration equipment
- Enhance performance of size separation equipment
- Enhance dewatering process

Partial List of Applications:

RESIDENTIAL & LIGHT COMMERCIAL OFFICES

Medical/Dental Offices
Lawn & Sprinkler Systems
Mobile Homes
Humidifiers
Boilers
Aquariums
Car Wash
Steamers Systems
Marine Industry-Houseboats
Laundry & Cleaning Industry

WATER SUPPLY

Water Treatment
Waste Water Treatment
Emergency Water Systems

COMMERCIAL

Cooling Towers
Filtration Equipment
Heat Exchangers
Condensers & Chillers
Evaporators
Boilers/Water Heaters
Power Generation
Condensers Irrigation
Public Swimming Pools
Public Display Fountains
Steam Cleaning Systems
Food Processing Equipment
Maritime Cargo
Medical/Dental

INDUSTRIAL PROCESS

Petro Chemical
Aluminum
Chemical Plastics
Glass Molding

Dye Manufacturing
Fabric Manufacturing
Food Processing
Metal / Mills Finishing
Paint Manufacturing
Pulp & Paper Industry
Pharmaceuticals
Rubber
Slurry Process Lines
Steel
Sugar Mills
Textile Manufacturing
Mining & Ore processing
Breweries
Pasteurization
Plastic Injection Molding
Polymer Production

HEAVY INDUSTRY & ELECTRIC GENERATION

Steel Making
Surface Condenser Cooling Tower
Refining
Petro-Chemical
Surface Condensers
Steam Electricity Generation

AGRICULTURAL APPLICATIONS

Dairy Products
Irrigation Systems
Poultry
Farming

To find out more about prospective markets and technical information.

Check TWT's websites:

www.triangularwave.com click on Industrial Applications.

www.twtwatertreatment.com click on Industry Specific.

The Return On Investment of a TWT System is Undeniably Significant From Operational, Economical, and Safety Points-Of-View.

Hard water is the most commonly reported water quality problem by consumers in the U.S., found in over 85 percent of the country. Over 60% of the earth's water is groundwater, which picks up minerals, rocks and soil, including calcium and magnesium contaminants that make water hard.

Some telltale signs that water may be hard:

- Clogged pipes and/or appliances may be due to hard water.
- Mineral deposits can form in pipes and plumbing equipment.
- Heating bills are increased, because the hard water forms an insulated shell between the heating element and the water to be heated. Heated hard water causes scale.

The Triangularwave System represents a significant breakthrough in electromagnetic technology. The triangularwave has made possible the use of electromagnetic technology in applications of all sizes, from residential to large commercial and industrial applications.

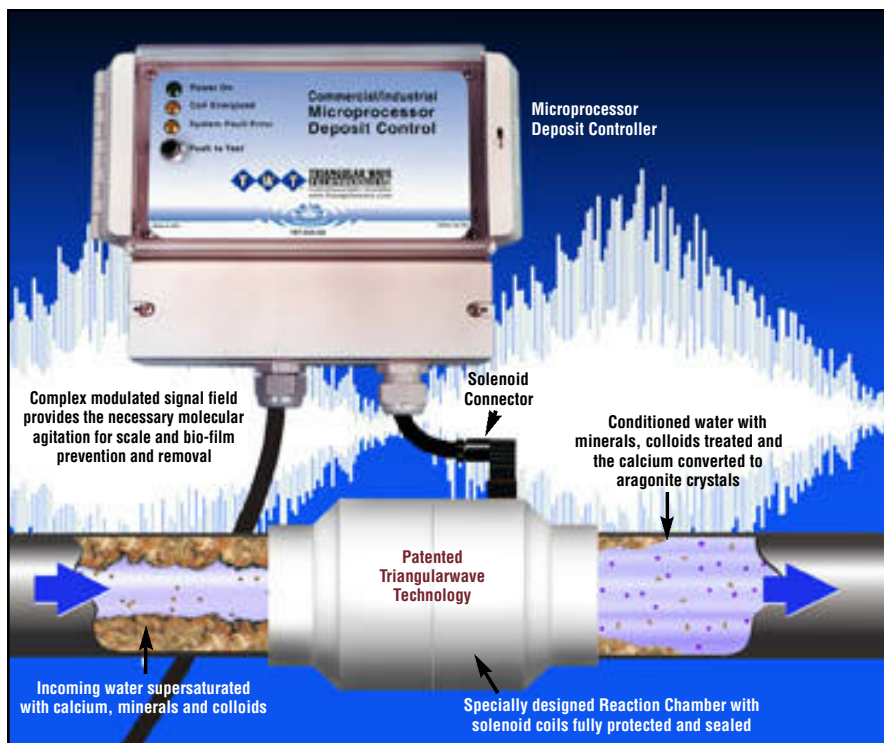
An advanced system for controlling scale and bio-fouling, it is applicable with once-through and recirculating HVAC, heating and process cooling systems, as well as agricultural, industrial processing, wastewater, and other fluid-based systems.

TWT Patented Microprocessor Deposit Control Systems. Technologically Advanced Method for Water & Fluid Management Providing Comprehensive End-To-End Solutions. Water The way Nature Intended It! Chemical Free.

- **Eliminates Deposits in Pipes, Fixtures and Equipment (Softens and removes hard scale build-up around plumbing fixtures)**
- **Controls Algae and Bacteria (Prevents the formation biofilm, the breeding ground for algae and bacteria)**
- **Removes Existing Scale on Heat Exchangers Over Time Which Improves Heat Transfer for Greater Efficiency**
- **Salt and Chemical -FREE Water Conditioning**
- **Controls Algae and Bacteria**
- **Controls Scale and Bio-fouling in Water Fed Appliances**
- **Performance and Durability Guaranteed**
- **No Moving Parts**

Highly Cost Effective:

- Savings in maintenance such as cleaning, monitoring and adding chemicals are greatly reduced.
- Savings in electrical expenses, due to cleaner system components and better heat transfer, can also be significant.
- Protects expensive capital equipment; cleaner systems, with less chemicals added, will operate more efficiently, and will have a longer working life.
- Operating costs of Triangularwave Systems are very small and the systems require no maintenance.
- Non-hazardous blowdown means no treatment and no discharge permits required.
- Ownership of the TWT System will afford you and your customers significant savings over a short period of time and even greater savings over the life cycle of the equipment.



How TWT Deposit Control Technology Works:

Using modern integrated circuitry and signal processing techniques, the patented TWT Deposit Control Technology works by producing a complex frequency-modulated waveform. This creates a deionizing effect, induced by physical means, which increases the solubility of the minerals, and colloids in the liquid and changes the shape, size and texture of the calcium carbonate crystals. By this reaction, the minerals, colloids and crystals lose their adhesive properties and remain in suspension in the liquid. Pre-existing scale is taken back into solution and removed in the same way. The effects are immediate and long lasting down stream.



TWT® System Packaging Contents

- TWT Microprocessor Deposit Control Unit
- Wire for onsite wiring & solenoid coil hookup
- Hardware kit: Screws, wire ties
- Controller mounting kit: Mounting brackets & wire ties
- System registration card
- Owners Manual

Not included, sold separately:

Contact your dealer and/or TWT, Inc. before installation of system if application requires a—
TWT Copper Pipe Signal Enhancer
TWT factory wrapped Reaction Chamber
Teflon coated wire

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.

Triangularwave Technologies, Inc.(TWT)
Sensing Environmental Needs with Intelligent Solutions
Be Smart, Buy Once! Go Green Save Green

Additional information: e-mail: info@triangularwave.com • triwaveinc@aol.com.
Websites: www.triangularwave.com • www.twtwatertreatment.com

