

## Digital Scale Control System

*Removes and Prevents Calcium Deposits in Water Systems*

# INSTALLATION AND OPERATION MANUAL



**PLASTIC PROCESS EQUIPMENT, INC.**

8303 Corporate Park Dr., Macedonia, OH 44056

Las Vegas, NV • Odessa, FL

**800-362-0706 • [www.ppe.com](http://www.ppe.com)**

# Installation of Scale Clear System

## COPPER OR PVC PIPE

This unit is only intended for use with copper or PVC pipe. The Scale Clear water coil will not operate correctly on steel pipe. For use in a location that has an all steel pipe system in the building, a plumber must install a section of copper pipe for the coil to be mounted on. It will then work on the entire plumbing much as it does on a complete copper or plastic pipe system. The steel pipes will be cleared of calcium deposits just as copper or plastic pipes are.

## USE WITH A SALT-TYPE WATER SOFTENER

**Do Not Mount the Coil Before the Salt System!** The Scale Clear system dissolves calcium deposits. The ion-exchange salt systems operate by collecting and storing calcium which is then flushed out during a process called regeneration. When regeneration occurs, salt brine is used to flush the stored calcium into plumbing drains. If the Scale Clear is installed before the salt system, it will dissolve the stored calcium and release it into the system. If the Scale Clear is installed on a closed loop system, we recommend that any salt-type softeners be removed from the loop. The best use of a salt system is to provide make-up water for the system. This provides low mineral content water, while the Scale Clear removes existing calcium deposits and prevents their return.

## INJECTION MOLDING MACHINES

Install the coil at the cooling line input to the machine. If possible, locate the coil at least 2 feet from any electric motors greater than ¼ hp. If this is difficult, mounting the coil in an opposite plane to an existing motor will help if there is close proximity. (If the motor is vertical, mount the coil in a horizontal plane etc.) Strong magnetic fields will interfere with the operation of the coil.

## HYDRAULIC OIL COOLERS

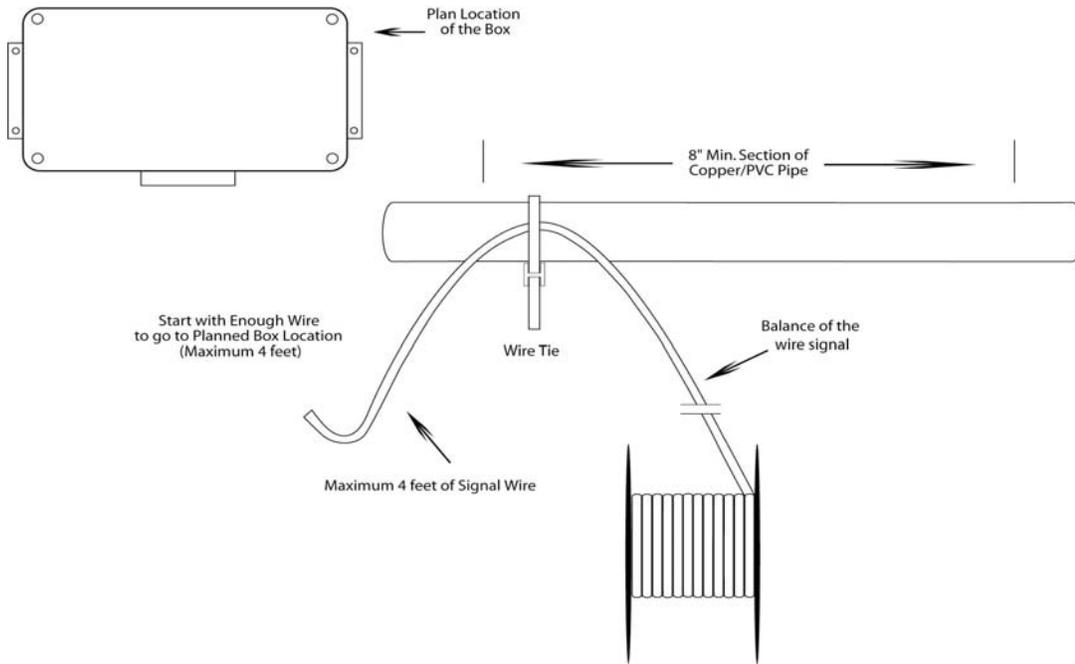
Install the coil at the cooling water input to the heat exchanger. If a temperature control valve is used to control water flow to the heat exchanger, it should be by-passed. It is necessary for the Scale Clear treated water to soak the scale deposits for at least 90 days in order to dissolve them.

## MOUNTING THE CONTROL UNIT

Mount the control unit first. The control unit should be mounted no farther than 4 feet from where you intend to wind the coil over the pipe. The control box produces heat. It should be hung from the pipe with the LED facing up. This provides maximum cooling around the control unit and allows visual assurance that the unit is working. (Green light flashing)

*For copper pipe:* Using a marking pen, mark a 5-inch section of the pipe where the coil is to be wrapped. Follow the diagrams in the instructions below to install two layers of coil, one on top of another both wound in the same direction.

*For PVC, CPVC, PEX, OR OTHER PLASTIC OR RUBBER pipes and hoses:* mark a 5 inch section with a marking pen. Using a marking pen, mark a 5-inch section of the pipe where the coil is to be wrapped. Follow the diagrams in the instructions below to install two layers of coil, one on top of another both wound in the same direction. The bottom coil should be wound to 5 inches and the top coil should only be ½ the length of the bottom coil or 2 ½ inches.

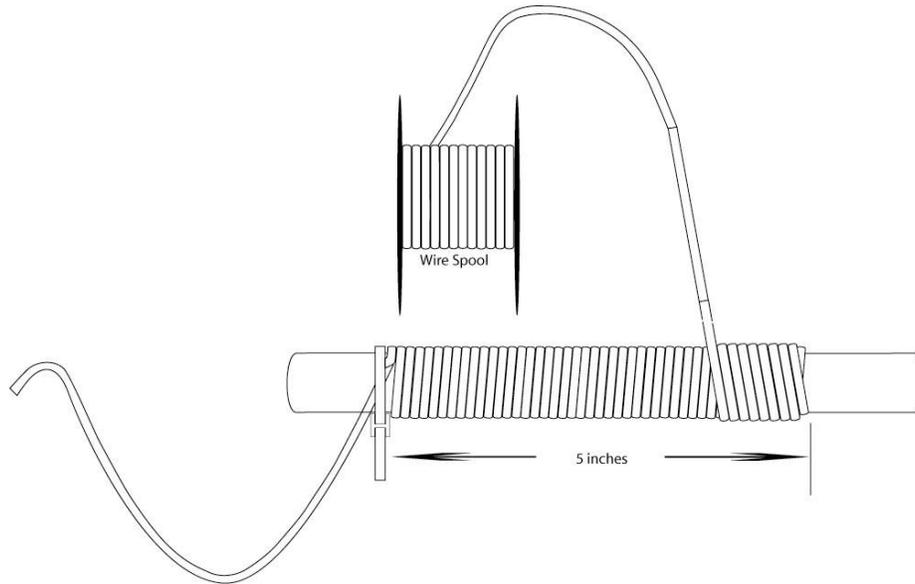


**Diagram A**

The wire for the coil has been provided on a spool. Do not “unwind” all of the wire from the spool. It is much easier to wind the coil directly from the spool and on to the pipe when making the coil.

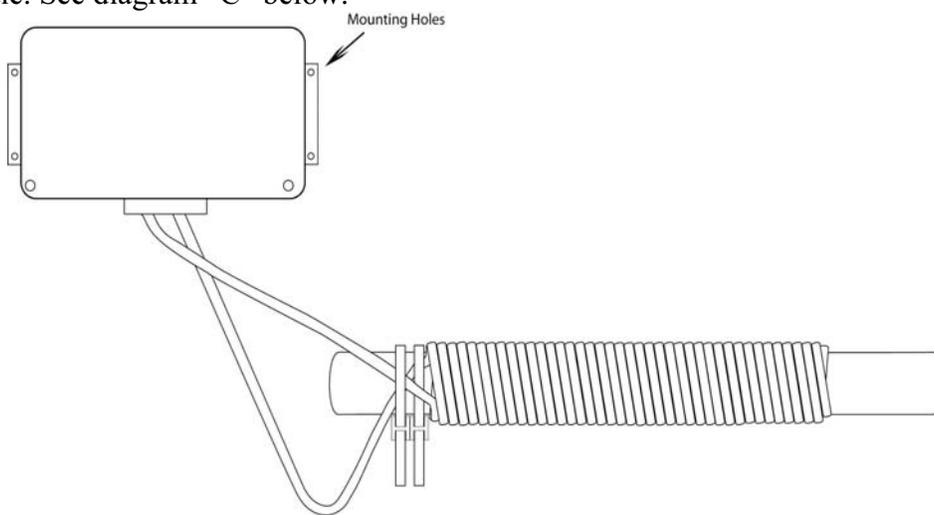
The 1 inch model has been supplied with 45 feet of wire on a spool. This is enough to wrap a 1-inch pipe and attach to the control unit. Larger 2 inch units are supplied with enough wire to wrap up to a 2-inch pipe. Included in the package are several wire wraps to aid in wrapping the coil and to hang the unit from the pipe.

Do not cut the wire until after you have completed the coil and brought the end of the wire to the control unit. Begin by unrolling 4 feet of wire from the spool. Take one of the wire wraps and attach the wire to the pipe at the point where you intend to begin the coil. See diagram “B” below. Pass the coil of wire around and around the pipe as shown in the illustration, so that each wire touches the side of the wire next to it.



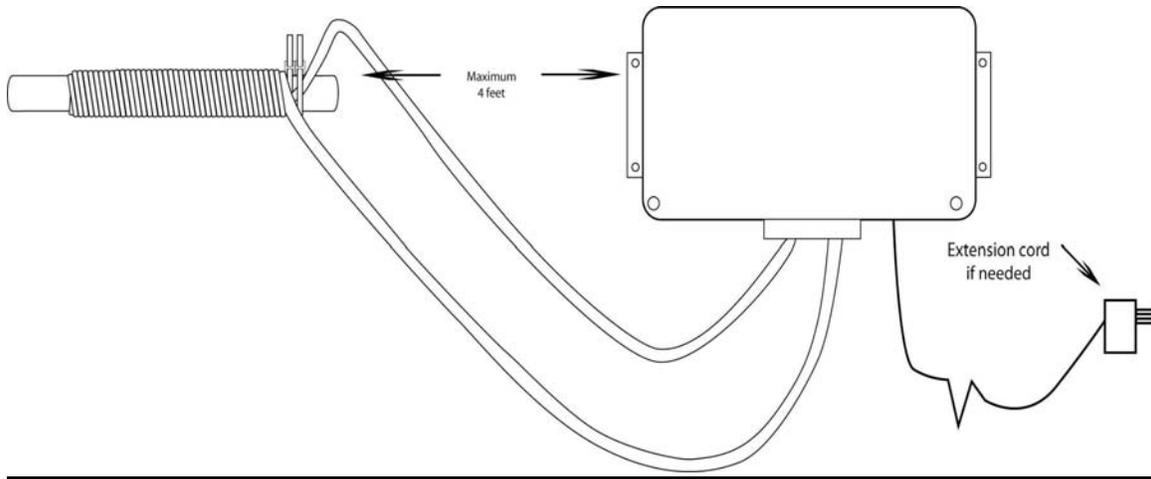
**Diagram B**

When you have completed about 5 inches of coil, stop, and then continue winding the coil (in the same direction) to the place where you started. (Stop  $\frac{1}{2}$  ways for plastic or rubber as stated above) Install another plastic tie. See diagram "C" below.



**Diagram C**

The coil is now complete. See diagram "D".



**Diagram D**

Take BOTH wires, the one you used to start the coil and the one at the end of the coil (the remainder of the spool) and bring them over to where the control unit is mounted.

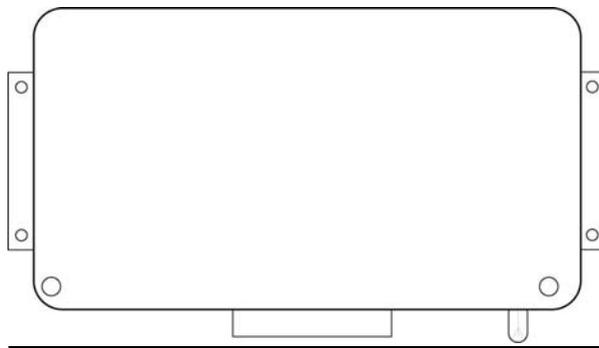
Bring the wires from the control box, cut both wires to length, leaving them long enough to attach to the control unit. Then strip the insulation for about ½ inch at the end and insert them into the connectors by holding down on the spring clip and inserting the bare end of the wire into the hole on the clip. Release the connector and the spring clip should now hold the bare section of the wire firmly.

Take the wall transformer and insert the round connector into the control unit. Install the wall transformer into a wall outlet or extension cord. After a few moments, the light on the control unit should start flashing GREEN indicating that it is working correctly. The installation is now finished.

If the unit should flash RED or not light at all, see the instructions below.

## **TROUBLESHOOTING**

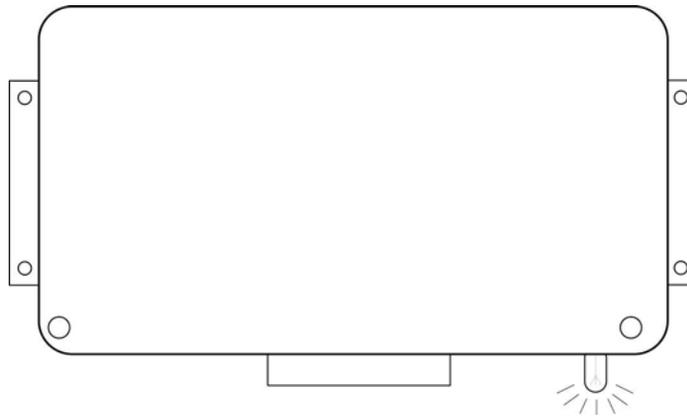
### **NO LIGHT AT ALL**



**Diagram E**

Check to see if the outlet that the unit is plugged into has power. Be certain that the outlet it is not controlled by a switch. Plugging a lamp or other device into the outlet can test this. The Scale Clear unit must be left on at all times.

## FLASHING RED LIGHT



**Diagram F**

Be sure that the wires have been inserted into the hole above the spring clip that is used to hold the wire. Do not install the wires under the spring clip lever itself.

Check that the coil wire has not been cut. It should be one continuous piece of wire from the beginning of the coil to the end.

Check that the insulation has been removed from the ends of the wire where they enter the connector on the control unit. The wire should have bare copper at the end where it goes into the hole on the connector of the control unit.

Check to see that the two bare ends of the wires are not touching each other as they enter the control unit.

# **THEORY OF OPERATION**

The Scale Clear system works by injecting multiple frequencies and polarities to fracture the mineral content in the water into microscopic particles. Typically these particles range from 2-4 microns in size. This reduced particle size allows the minerals to dissolve into the water at a rate six times greater than conventional mineral content. The water's surface tension is then reduced, making it a better solvent. In addition the rapidly changing polarities of the computer-generated signal will prevent the minerals from sticking to surfaces and forming scale. Within 90 days, mineral deposits are dissolved.

## **COOLING GALLERIES**

In order for deposits to be eliminated in the cooling galleries of injection dies, the treated water created by the Scale Clear system must be in the die for 90 days. If dies are changed on a regular basis, this will not occur. A chemical de-scaling solution can be used clean the galleries of existing and the Scale Clear system will prevent their return. Contact PPE for further information about these solvents.

## **DE-SCALE PROCESS**

A single 1" Scale Clear system will provide de-scaling for an individual injection molding machine with a cooling water input of 1 inch or less. Each 1" Scale Clear can process up to 30 GPM. The larger 2 inch units can be located on a branch feeder and provide treated water for several machines. Each 2" Scale Clear can process up to 150 GPM.

In a larger cooling system, if a sufficient number of branch feeders and individual machines are provided with treated water, the system itself will begin to de-scale. This includes all components the system such as pumps, solenoid valves, heat exchangers, immersion heaters and cooling towers.

As this begins to occur, water should be blown off on a regular basis from the lowest point of the system to remove the accumulated mineral deposits which will appear as milky water or in more severe cases milky-white sludge. The required frequency of this procedure will diminish as the system is cleared. The amount make up water and its mineral content will add new materials to the system so that the system will require blow off from time to time.

If the Scale Clear is installed on a closed loop system, we recommend that any salt-type softeners be removed from the loop. The best use of a salt system is to provide make-up water for the system. This provides low mineral content water, while the Scale Clear removes existing calcium deposits and prevents their return.

## **OTHER APPLICATIONS**

**Homes, Individual Apartments, Individual Condominiums**

**Apartment Buildings, Office Buildings, Shopping Centers**

**Landscape Management, Golf Courses, Nurseries,**

**Commercial/Institutional Kitchens**

**Hotels, Motels, Restaurants, Bars**

**Fountains, Waterfalls**