

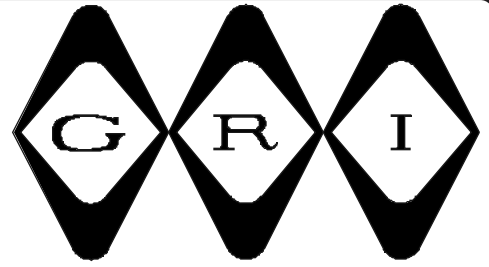
## Water Valve Shutoff



**WVS**  
Water Valve Shutoff

- Monitors flooding from leaking or broken water line
- Automatic control of main water supply line
- Form C Relay output for external monitoring devices
- Visual and audible status indicators
- Automatic self testing
- Covers large area when used with multiple sensors
- Low voltage design with battery backup

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WVS

The G.R.I. Water Valve Shutoff System was designed as a flood prevention device. This system utilizes an electronic controller to provide automatic control of an electronic water valve that is installed in the main water supply line. The controller continually monitors water sensors that are placed in areas where flooding from water line breaks are most likely to occur; washing machine, hot water heater, sinks, dishwasher.

When water is sensed by the water sensor, the sensor will signal the controller of the presence of water. The controller then automatically powers the electronic valve and signals it to close. Once the controller senses that the valve is in the closed position, the controller will then trigger the C form relay that can be used to signal a remote monitoring device, such as an alarm panel or auto dialer. While in this alarm condition, the controller will annunciate an audible alarm and flash an alarm indication LED. The controller will stay in this alarm condition with the valve closed up until the reset button is depressed. When the reset is depressed while in the alarm mode, the controller will either open the valve and return to the normal monitoring mode or if the sensor still senses the presence of water, the controller will annunciate an alarm condition and the valve remains in the closed position.

At any time, the position of the valve can be changed with the use of the controller simply by depressing and holding down the reset button. If the valve is open, a press and hold will cause the valve to close. If the valve is closed, a press and hold will open the valve.

### WARRANTY:

One year warranty against workmanship, material and factory defects.

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KIMBALL, NE 69145



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# WATER VALVE SHUTOFF

## WVS:

The G.R.I. Water Valve Shutoff System was also designed to monitor itself. The controller periodically checks for a signal sent to the controller from both the water sensor and the electronic valve. If either signal is missing or incorrect, the controller will enter a trouble mode. When a trouble occurs a trouble annunciation is sounded and a flashing LED will be displayed. Four green LED flashes indicate a trouble with the water sensors and four red LED flashes indicate a trouble with the valve. Common troubles include loose or broken connecting wires or improper installation.

Another self test feature is a monthly cycling of the electronic valve. Once a month the controller will automatically close and reopen the valve to prevent corrosion buildup inside the valve and to physically check for proper operation of the electronic valve. A trouble condition will be displayed if the test fails.

## SPECIFICATIONS:

Operating Voltage	9 to 12 VDC
Max. Voltage	13.5 VDC
Average Current	55mA with 5 Sensors
Max. Current	300mA
Backup Battery	9V Alkaline

## Valve

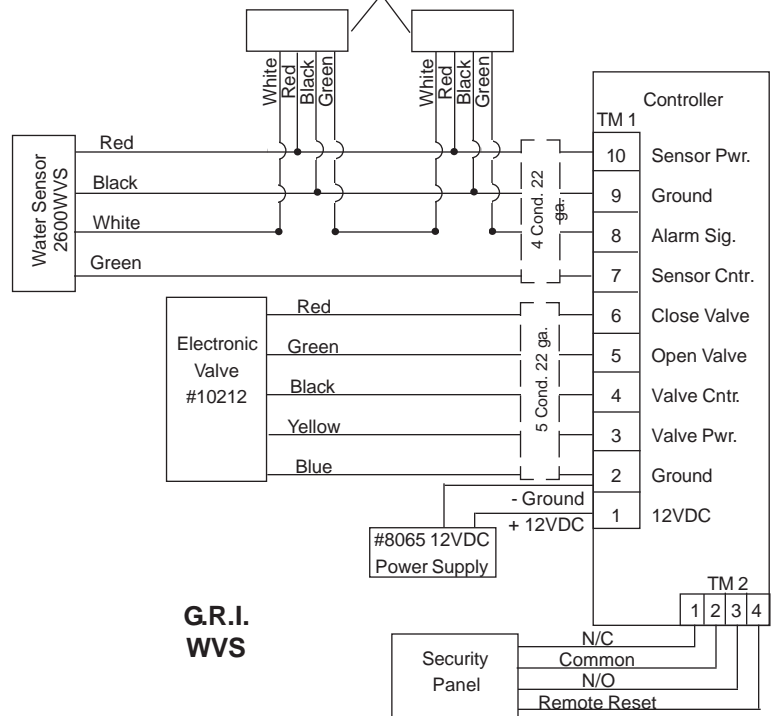
Pipe Size	1" NPT
Height	4 1/2"
Width	3 1/4"
Length	3 1/4"

## Relay Contacts:

Contact Resistance	100 mOhms
Max. Switching Power	DC 30W - AC 60 VA
Max. Switching Volts	60 VDC - 120 VAC
Max. Switching Current	2A DC/AC

Max. Water Sensors	5
Max. Wire Length to Sensors	200 ft.
Max. Wire Length to Valve	50 ft.

Optional Not Included: 2600/2600T (max. 4)



## Items Included:

- 1 - Electronic Controller
- 1 - Electronic Water Valve
- 1 - Water Sensor 2600WVS
- 1 - 12 VDC Regulated Power Supply 8065
- 9 - Connectors

## Optional Items:

- 2600 Water Switches 2600/2600T

## CONTACT YOUR G.R.I. DISTRIBUTOR OR CALL:

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# WVS INSTALLATION AND SETUP INSTRUCTIONS

The GRI Water Valve Shutoff System is a critical first step toward a proactive approach to water conservation and in preventing water damage due to burst or leaking pipes or plumbing system components.

## IMPORTANT CONSIDERATIONS BEFORE YOU BEGIN:

- **DO NOT INSTALL THE GRI WVS SYSTEM ON SUPPLY LINES FOR FIRE SUPPRESSION SYSTEMS.**
- Installation of the GRI Water Valve Shutoff System requires a basic knowledge of plumbing as well as specialized tools for cutting pipe and joining fittings.
- Depending on local building codes, a building permit may be required.
- If the Water Supply has an irrigation system or water softener installed on the main water line, consider installing the WVS valve downstream of these systems.
- If the Controller and Sensors are to be remotely located from the valve, you may need to fish the connecting cables through walls and / or floor cavities.
- If you are not comfortable with any of these procedures, GRI suggests you obtain an experienced plumber and / or electrician to complete this work.

## CONTENTS CHECKLIST

### *Items Included with Kit*

- \_\_\_ WVS Controller
- \_\_\_ 12 VDC Power Supply
- \_\_\_ Valve Assembly
- \_\_\_ Sensor, 2600WVS 1 ea
- \_\_\_ Cable Connectors, 9 ea
- \_\_\_ Installation and Operating Instructions, Mounting Screws and Drywall Anchors

### *Items Not Included with Kit*

- \_\_\_ Additional Sensors, (2600/2600T) with Mounting Screws and Connectors)
- \_\_\_ Cable, 5 conductors (Controller to Valve)
- \_\_\_ Cable, 4 conductors (Controller to Sensors)
- \_\_\_ Cable, 2 conductors (Controller to Power Supply)
- \_\_\_ 9 Volt Alkaline Battery
- \_\_\_ Pipe Fittings, Transition from water pipe to the Valves 1" female (NPT)

## STEP 1 – DETERMINE VALVE LOCATION

The Valve assembly should be located on the main water line after main shutoff valve.

If the structure is built on a concrete slab or you prefer to install the Valve assembly outside the footprint of the structure, it is possible to place the Valve in a below-grade, watertight valve box. Whether you choose to place the valve inside or outside the footprint of your building, no more than 50 feet of cable is recommended for the distance between the valve and the controller.

The System is rated to operate continuously with water pressure up to 145 PSI. If your water pressure exceeds 145 PSI, you will need to install a pressure reducing valve prior to the GRI WVS System.

The Valve can be installed on a horizontal or vertical pipe run, although when selecting the point on the water main, consideration must be given for the dimensional specifications of the valve assembly, and for visual access to the fully open/closed indicator.

## STEP 2 – INSTALL VALVE INTO WATER LINE

Before beginning the installation of the Valve, the water to the building should be shut-off. Open a cold water faucet at the lowest elevation point in the structure and open a cold water valve at highest point to break the plumbing system vacuum and improve drainage.

Depending on your plumbing system, you will need one or more pipe fittings to transition from your water pipe to the 1" female (NPT) threaded connection on the WVS Valve. It is recommended that unions be placed on both sides of WVS valve for easy removal.

Assemble and / or tighten the various fittings required to transition from the main water line to the Valve. Use Teflon tape to wrap the 1" male threads of the two assembled transition fittings (one for each end) and securely tighten.

Carefully measure the overall length of the assembled Valve and fittings. Take this measurement and mark it on the water pipe where you intend to locate the Valve. Next determine how far the pipe will insert into each of the transition fittings when assembled after cutting, this is usually equal to the diameter of the pipe (e.g. a 3/4" pipe will insert 3/4" and a 1/2" pipe will insert 1/2"). Reduce the width of the overall measurement by these insertion lengths. In the 3/4" pipe example cited above, the overall measurement would be reduced by 1 1/2" ( $2 \times 3/4" = 1 1/2"$ ). Now mark the reduced overall length on the pipe and prepare to cut the pipe.

**NOTE: Prior to cutting into the pipe, it is recommended that you position a large bucket under the pipe to catch any water that remains in the line even after draining the house lines.**

Using the appropriate tools, cut the pipe in the places marked. Dry fit the transition fittings onto the water line you cut. Confirm that the Valve will easily slide into the gap and make any adjustments necessary. Secure the fittings to the pipe according to the manufacturer's instructions for this process and positioning the Valve in an orientation that allows for easy access before securing. You may now slowly turn the water back on at the meter or by restarting your well pump. After restoring the water service, open taps that you had opened and run for a sufficient time to purge any air that was trapped in the plumbing system.

### STEP 3 – INSTALL CONTROL PANEL

The GRI Water Valve Shutoff Controller should be mounted on a wall at least 4 ft. off the ground and no further then 100 ft. away from the valve assembly, and no further then 50 ft. from the power supply. The controller can be surface mounted to the wall using the surface mount box that is supplied with the controller or it can be installed in a single gang electrical junction box.

A 2 conductor cable with a minimum 22 ga. wire size should be used to connect the power source to the controller. The positive side of the 12 volts DC connects to terminal #1 (12VDC) of the controller and negative side of the 12 volts DC connects to terminal #2 (Ground).

If a security panel is being used in conjunction with the Water Valve Shutoff System, auxiliary power from the panel may be used to power the controller as long the aux power can handle a 250mA surge current from the controller.

A 5 conductor cable with 22 ga wire size should be used to connect the valve assembly to the controller. If more then 100 ft. of cable is needed to reach the valve, then the size of the valve cable should be increase from a 22ga to an 18ga wire,

When connecting the water valve to the valve cable and the valve cable to the controller, critical attention to wire colors must be observed. The 5 wire colors that are used with the Valve Assembly are Yellow (+ Positive), Blue (- Negative), Black (Common), Green (Open) and Red (Closed). These valve cable wires should be spliced to the valve wires using the supplied connectors, while noting wire color match up. The valve cable should then run directly to the controller with no additional splices or taps and at no more the 100 ft. of cable. At the Controller, the Valve Cable can then be connected to the controller by observing valve color matches and connect valve cable wires as followed. (See WVS electrical diagram.)

Valve Assembly / color		WVS Controller / Terminal #	
-Negative	Blue	Pwr/Valve Gnd	2
+ Power	Yellow	Valve Pwr +	3
Common	Black	Valve Common	4
Open	Green	Valve Open	5
Close	Red	Valve Close	6

### STEP 4 – INSTALLING WATER SENSORS

The water sensor that is supplied with this system is the 2600WVS. The GRI Water Valve Shutoff System will not function without the 2600WVS Water Sensor installed. This sensor is electrically configured to work in conjunction with the controller to help provide for fail safe operation of this system. This sensor should be placed at the very end of the sensor cable and at

the furthest water sensor location from the controller. All other sensors should tap into this one sensor cable (see sensor diagram #1 for wiring options). GRI recommends that a sensor be placed in each location where flooding from broken or leaking water lines may occur. Only closed loop water sensors can be used with this system such as the GRI 2600 and 2600T water switches. All water sensors should be installed according to manufacture instructions and wired into WVS System in compliance with one of the electrical diagrams provided with this system.

The WVS Controller and Sensor cable will only provide enough current to power a maximum of five GRI 2600 water switches along with one 2600WVS Sensor (6 sensors total). If other relays will be powered off the Controller then a maximum of 100mA should be limited for sensor power in addition to the one 2600WVS. If more power is needed for additional sensors then an external power source should be used for the additional sensors. (See sensor diagram #2.)

The Water Sensor Cable will require a minimum of 4 conductors and a maximum cable length of 200 ft. if using 22ga signal wire or 4 conductors of a 24 ga. cat 5 cable. If more footage of cable is needed to reach all water sensors, then the size of the sensor cable should increase from a 22 ga to an 18 ga wire, or 2 conductors of cat 5 per connection may also be used, with a maximum length of 500 ft.

When connecting the water sensors to the water sensor cable and the water sensor cable to the controller, critical attention to wire colors must be observed. The 4 wire colors that are used with the GRI 2600WVS, 2600 and 2600T are Red, Black, Green and White.

The Red wires will always go to the sensors power + 12VDC (terminal # 10) and the Black wires will always go to ground - GND (terminal # 9). When connecting these wires to the sensor cable, observe the conductor color for that type cable and maintain that color match for all taps made for additional sensors.

The Green wire for the GRI 2600WVS is the Sensor Control Wire, this wire tells the controller all voltages are correct from the controller to the end of line sensor. This wire will need to go directly from the 2600WVS sensor to the controller Sensor Cntr (terminal #7) with no taps and with as few splices as possible.

The white wire for the GRI 2600WVS is the Alarm Signal wire, this wire when open tells the controller to alarm and close the valve. Splice this wire to the sensor cable (observing color match) and then splice all additional normally closed contacts for each additional water sensor to this sensor cable wire (observing color match). Then connect this sensor cable wire to the controllers Alarm Sig (terminal #8). (See WVS diagram).

The Green and White wires for the GRI 2600 and 2600T are the normally closed contact for this water sensor, these wires are used for splicing into the sensor cable Alarm Signal Wire (See WVS diagram).

The GRI 2600WVS should be the first sensor installed and then tested with the controller before connecting any additional sensors to the sensor cable.

<b>2600WVS/ Wire Color</b>		<b>WVS Controller / Terminal #</b>	
Sensor Control	Green	Sensor Cnt	7
Sensor Alarm	White	Sensor Alm	8
Ground	Black	Sensor Gnd	9
+ 12VDC	Red	Sensor Pwr	10

## **STEP 5 – REMOTE CONNECTIONS**

The GRI Water Valve Shutoff system can be used to signal remote device of alarm conditions. Relay contacts are available on the controller at terminals #11, 12 and 13. Connecting either the normally open or normally closed contacts to a security panel or a phone dialer will allow for remote notification of either an alarm from a tripped water sensor or both an alarm condition and a trouble condition if found during self testing. (See remote diagram.)

JP 2 is used for controlling of these options. With a jump block on JP 2 the relay will trip only if an alarm occurs, and without the jumper, the relay is configured to trip with either an alarm or a trouble condition.

The WVS can also be remotely signaled to close the valve, this is done by connecting a remote device to terminals #2 and #14. Closing the circuit between these terminals, places the controller into a lockout feature. When placed in this configuration the controller places the valve assembly into the fully closed position and will continually annunciate and indicate the closed condition. This also locks out the reset button on the face plate of the controller preventing any local control of the WVS system. Local control can be regained by either remotely removing the closed circuit, or by disconnecting the circuit at terminals 2 and 14.

Disabling the annunciating sounder can be done by removing the jumper block at JP 1. Disabling the annunciator will not prevent LED indication. (See remote diagram.)

## **STEP 6 – TESTING**

### **Controller Testing**

Start with all terminal wires and a 2600WVS connected to the controller as directed in the installation instructions, no power (12 volts or the 9 volt battery) applied to the controller.

Begin by applying 12VDC power to terminal #1. Immediately after power is applied to the controller initialization begins by first checking for the correct sensor control voltage at terminal #7, if correct, the controller then applies power to the WVS Valve and checks for proper valve voltage at terminal # 4, only if this is correct will it then start moving the valve to either the open or closed position. The controller will continue to move the valve through fully closed and fully open positions for verification of proper operation of the valve motor control circuit. Visually confirm this by viewing the window dial at the valve assembly. When a proper initialization is complete, a Normal Operating Condition is verified by the valve set to the fully open position, an announcement is sounded once and a continuous slow flashing of the green LED is displayed, approximately once every 60 seconds.

A sensor and valve voltage verification will be performed every time the reset button on the controller's faceplate is depressed, if all voltages are correct and all sensors are in their normally closed position, the controller will then return to the normal operating condition. If either voltage at terminals #4 or #7 is incorrect the controller will annunciate and display a trouble condition. A Sensor Trouble is indicated by an intermittent annunciation and a continuously flashing sequence of four rapid flashes of the green LED. A Valve Trouble is indicated by an intermittent annunciation and a continuously flashing sequence of four rapid flashes of the red LED. The system will remain in this condition until the correct voltage can be detected at these terminal positions.

### **Sensor Testing**

Each Water Sensor should be tested as they are being installed and connected into the main sensor cable of a working Water Valve Shutoff System. Test each water sensor by applying a damp towel or sponge across the water sensor probes and verify the following.

The controller should detect a voltage change at terminal #8, it should then apply power to the valve circuit and move the valve to the fully closed position, it will then trigger the alarm relay from its normally open to a closed position and then start annunciating and flashing the red alarm LED. The unit should stay in this alarm state up until the reset button is depressed. At that time the alarm relay should return to the normally open position and the sounder will stop annunciating. The water sensor status at this time, will determine whether the controller reopens the valve and returns to normal operating condition or waits in the alarm mode for the correct voltage at terminal #8. If the unit does not go into alarm status and then returns to normal when the sensor probes are wet and then dried, consider the sensor defective. All sensors and contacts tied to the sensor alarm wire should be tested in this or a similar manor. GRI also highly recommends that all sensors be cleaned and tested annually.

### **Valve Testing**

Proper operation of the WVS Water Valve Assembly is confirmed visually by watching the movement of the window dial and confirm the dial reaches the fully open and fully closed positions. The valve can be manually opened or closed simply by pressing and holding down the reset button for a few seconds. If the dial is at F.O. (Fully Open) position the motor should start and move the dial toward F.C. and stop at the F.C. (Fully Closed) position. Pressing and holding the reset button again should send the dial back to the F.O. (Fully Open) position.

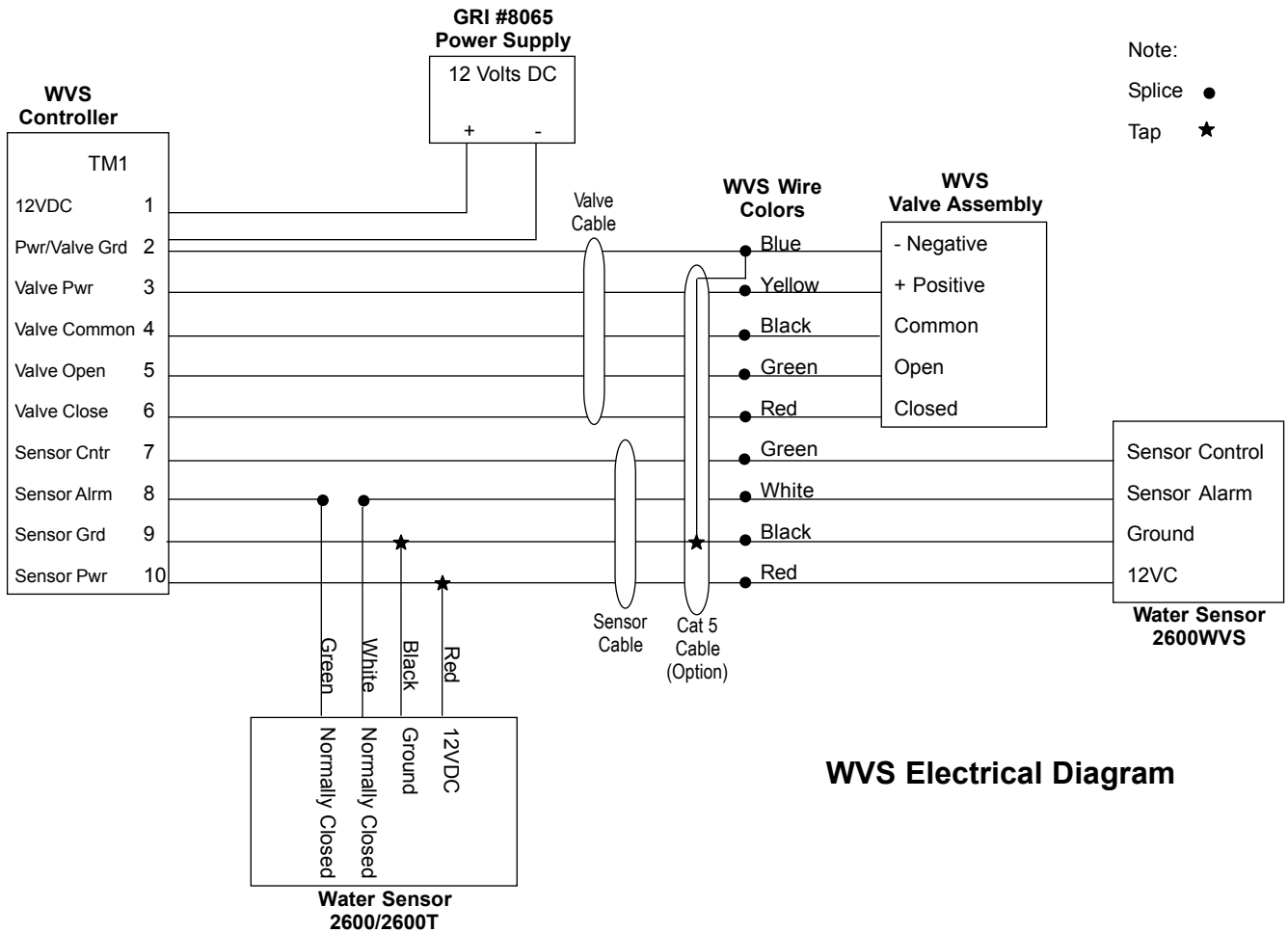
In the advent of a controller or valve cable failure, the valve assembly can be operated locally by disconnecting the Valve Cable and applying 12 volts and ground directly to the valve wires, +12VDC to yellow and ground to blue. By connecting the black wire to the green wire, the valve should open. By connecting the black wire to the red wire the valve should close. No movement would indicate a valve assembly failure.

### **Battery Backup**

The Water Valve Shutoff system is equipped with a 9 volt battery connector for use of short term battery operation. Battery backup is recommended for continuous operation during power failure. A 9 volt alkaline battery will run the WVS system for only short durations of loss power so the battery should be checked or replaced annually.

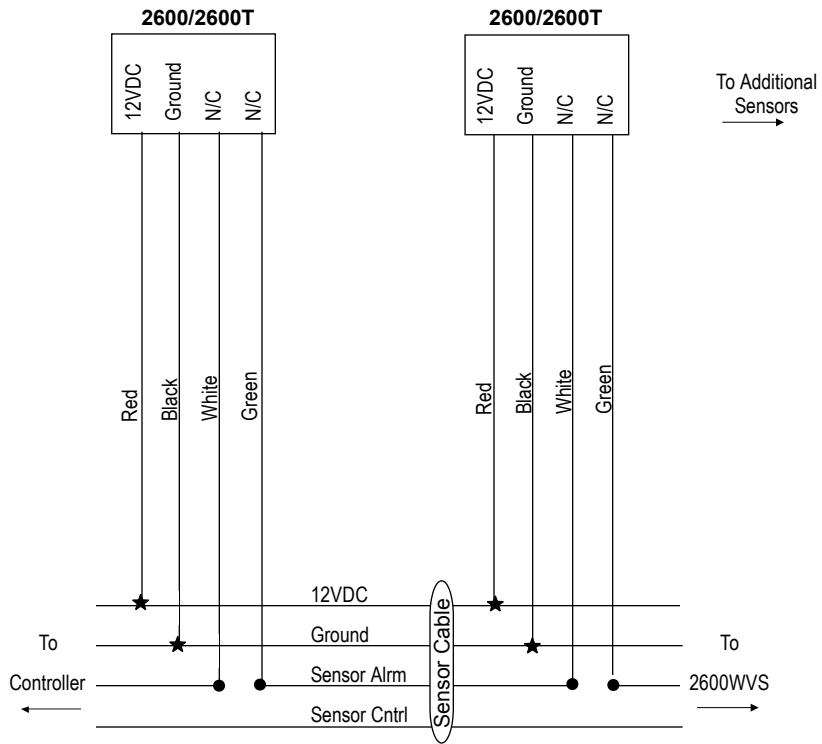
If low power is detected at the controller, a low power indicator will be displayed by continually flashing 2 orange LED flashes until full power is restored and the button is pushed to reset.

**Warranty:** One year warranty against workmanship, material and factory defects.



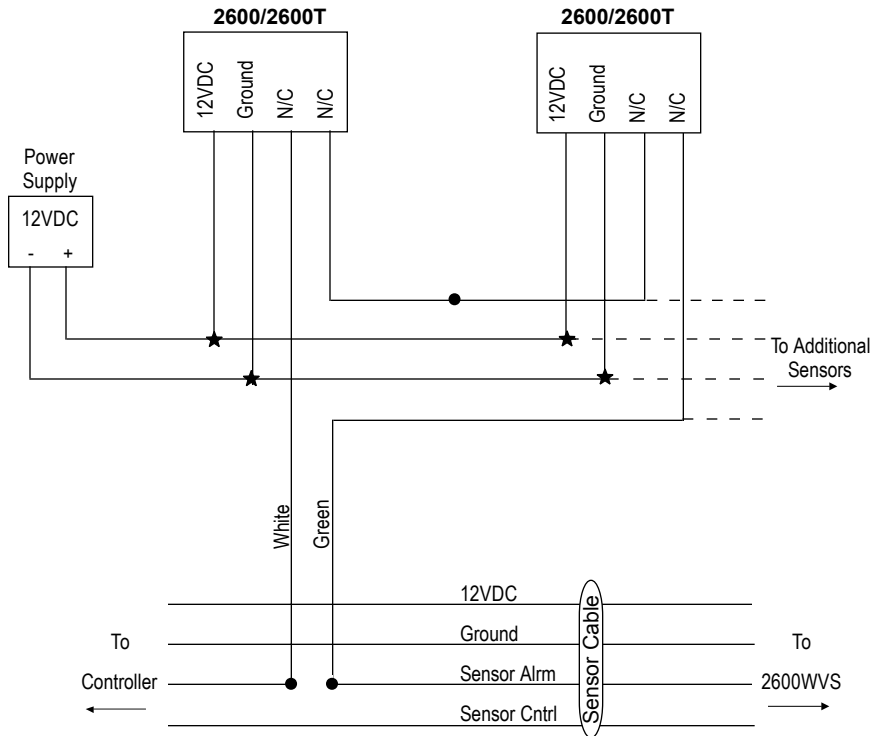
**WWS Electrical Diagram**



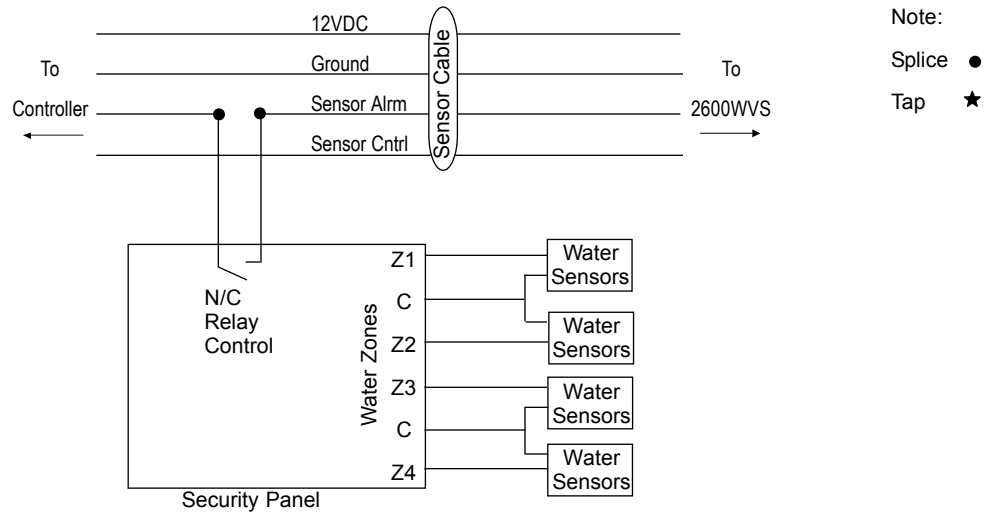


Note:  
 Splice ●  
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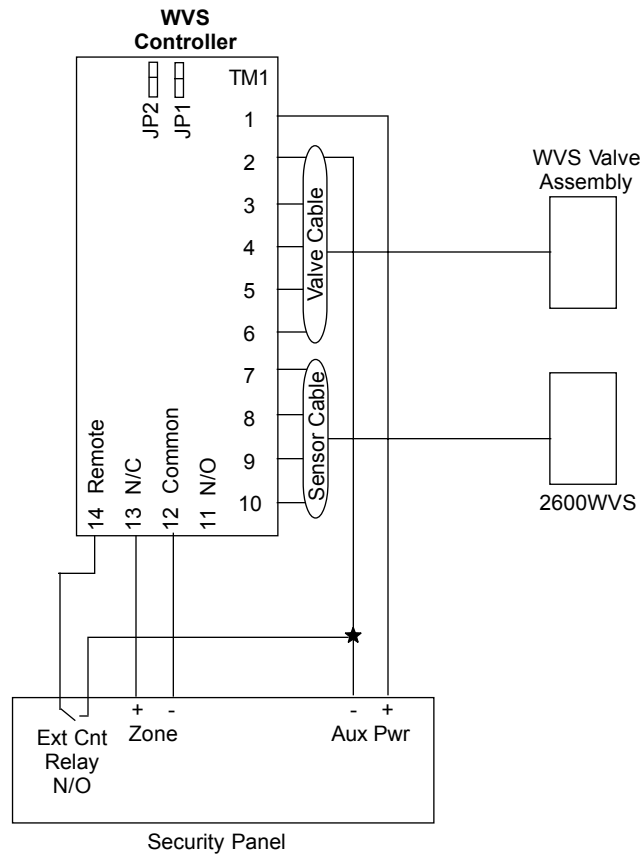
**Sensor Diagram 1**



**Sensor Diagram 2**



**Sensor Diagram 3**



**Remote Diagram**

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