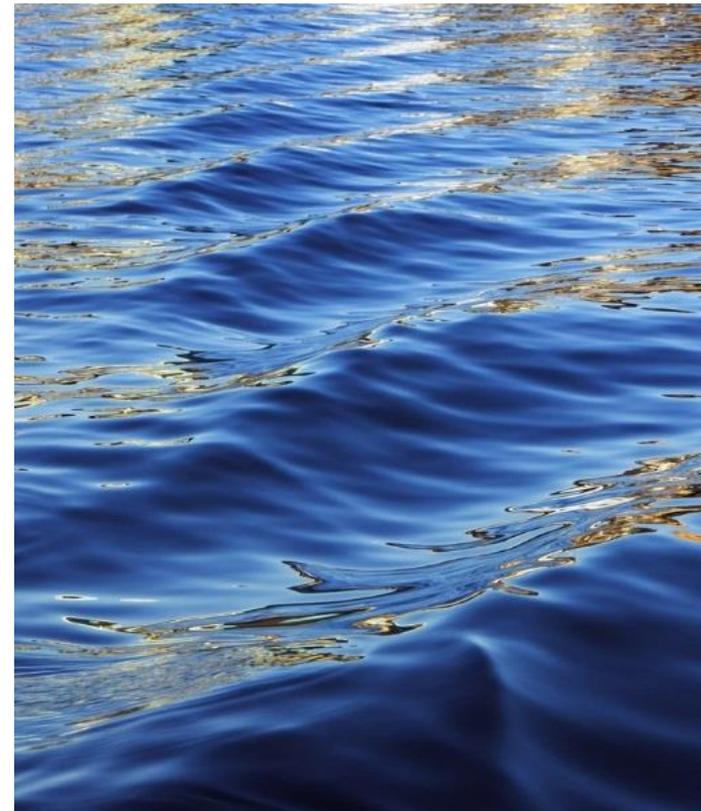




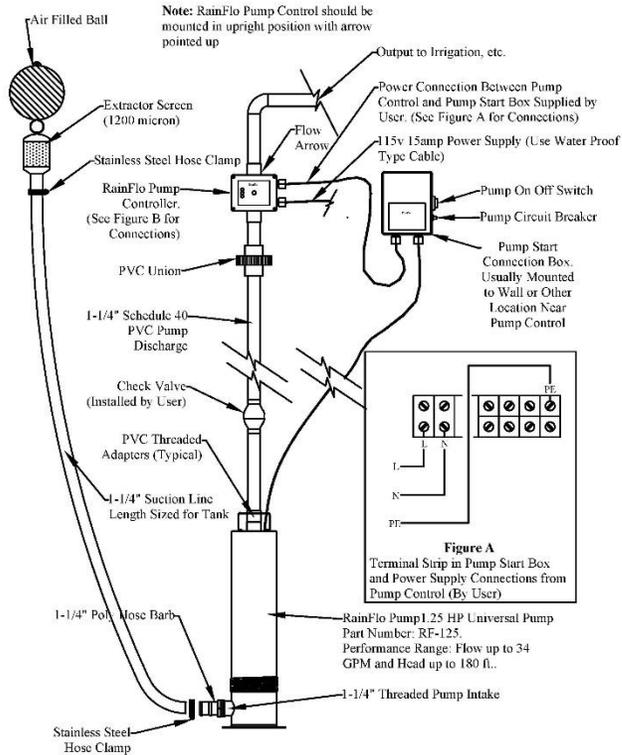
Graf Aqua Controller Programming & Setup to use with 3- way valve for back- up systems



Back-up System Overview

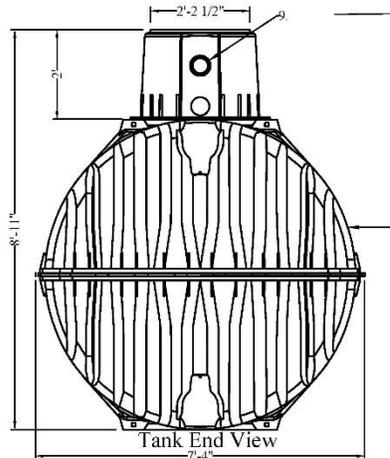
The Graf Aqua Control and Three way valve combined will automate the operation of a backup water supply in a rainwater collection system. When the level in the tank is low the valve will automatically switch to the municipal water supply.

The Graf Aqua control uses an electronic level sensor and sensor control box mounted in the tank. The sensor and sensor control box detect the level of water based on the sensor length. The controller translates that signal and in turn is used to produce a graphical display of the water level from 0 to 100 %. The controller has several programmable functions based on that percentage that can then be used to provide signals to connected devices via 24vac output terminals labeled 1, 2, 3 and 4 in the controller.

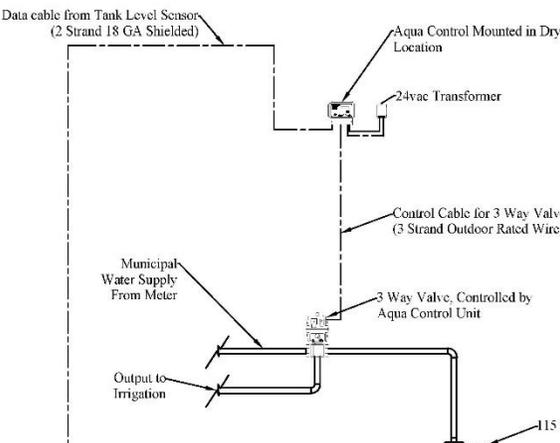


- GRAF Carat S 1700 Gallon Tank Specifications:**
- 1. Variable burial depth: 30" to 42" (39" Max. with optional dome extension and "Maxi" telescopic riser).
 - Unique in the world! – a global innovation: unique manufacturing process produces the highest stability due to latest techniques.
 - Unique fit accuracy of the components thanks to new production process.
 - Consistent quality due to TÜV safety testing and production monitoring.
 - Vehicle-bearing (with telescopic cast iron manway kit). Groundwater stable up to the middle of the tank due to extremely rigid construction.
 - Secure investment with market leading 15-year warranty. Made from high quality Duralene; easy to recycle.
 - Can be expanded as required.

Legend	
1.	GRAF Carat S 1700 Gallon Underground Tank.
2.	GRAF Optimax Pro Internal High efficiency, self-cleaning, In Tank filtration system.
3.	4" overflow drain to storm drain or other. Typically 4" PVC Sewer and Drain.
4.	1-1/4" Bulkhead Fitting for plumbing thru tank or riser assembly.
5.	Sensor Control Box and Level Sensor
6.	Overflow siphon.
7.	GRAF 1-1/4" Floating Pump Extractor with 1200 Micron Coarse Screen
8.	RainFlo 1.25 HP 115v Submersible Rainwater Pump High performance submersible rainwater pump with stainless steel base and 1-1/4" threaded inlet for use with a floating filter.
9.	4" Pipe Gasket.
10.	4" PVC from Roof Gutters and Downspouts (By Others).
11.	4" Thin Wall PVC Pipe for Connection to Calming Inlet (By Others).
12.	Calming inlet to prevent the disturbance of the fine sediment layer at bottom of tank.
13.	Adjustable Riser and Childproof Lid.
14.	Graf Spanfix 4" Pipe Coupler.
15.	1-1/4" Pump Output Line to Pump Control and 3-Way Valve (By Others).
16.	Location of Dome and Shaft Seal Gaskets.

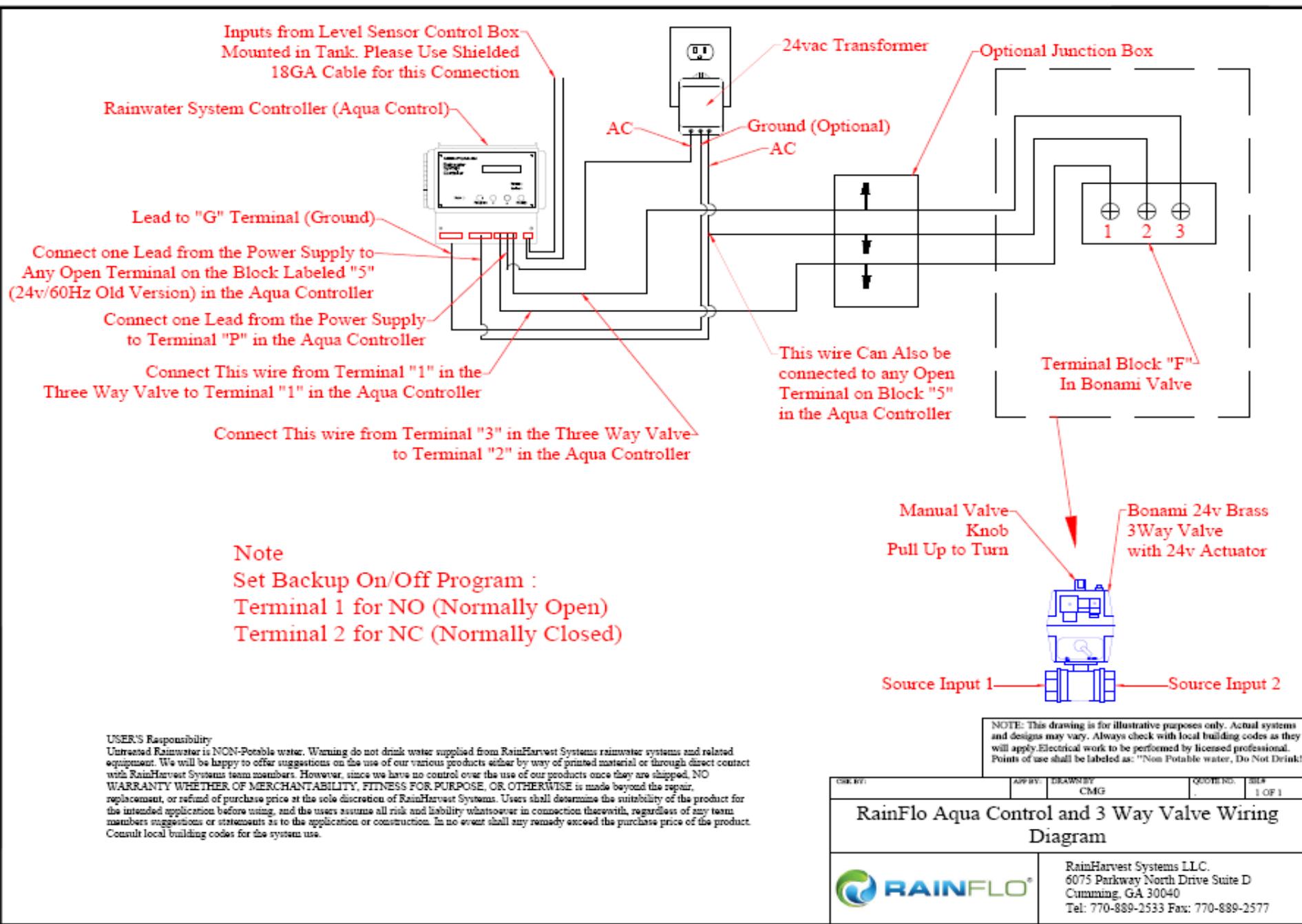


USER'S Responsibility
 Untreated Rainwater is NON-Potable water. Warning do not drink water supplied from RainHarvest Systems rainwater systems and related equipment. We will be happy to offer suggestions on the use of our various products either by way of printed material or through direct contact with RainHarvest Systems team members. However, since we have no control over the use of our products once they are shipped, NO WARRANTY WHETHER OF MERCHANTABILITY, FITNESS FOR PURPOSE, OR OTHERWISE is made beyond the repair, replacement, or refund of purchase price at the sole discretion of RainHarvest Systems. Users shall determine the suitability of the product for the intended application before using, and the users assume all risk and liability whatsoever in connection therewith, regardless of any team members suggestions or statements as to the application or construction. In no event shall any remedy exceed the purchase price of the product. Consult local building codes for the system use.



NOTE: This drawing is for illustrative purposes only. Actual systems and designs may vary. Always check with local building codes as they will apply. Electrical work to be performed by licensed professional. Points of use shall be labeled as: "Non Potable water, Do Not Drink"

CHK BY:	APP BY:	DRAWN BY:	DATE:	SHEET NO.:	TOTAL:
		CMG		055	1 OF 1
RainFlo Rainwater Collection System with Municipal Back up System					
			RainHarvest Systems LLC. 4475 Alicia Lane Cumming, GA 30028 Tel: 770-889-2533 Fax: 770-889-2577		



This is the Graf Aqua Controller Box

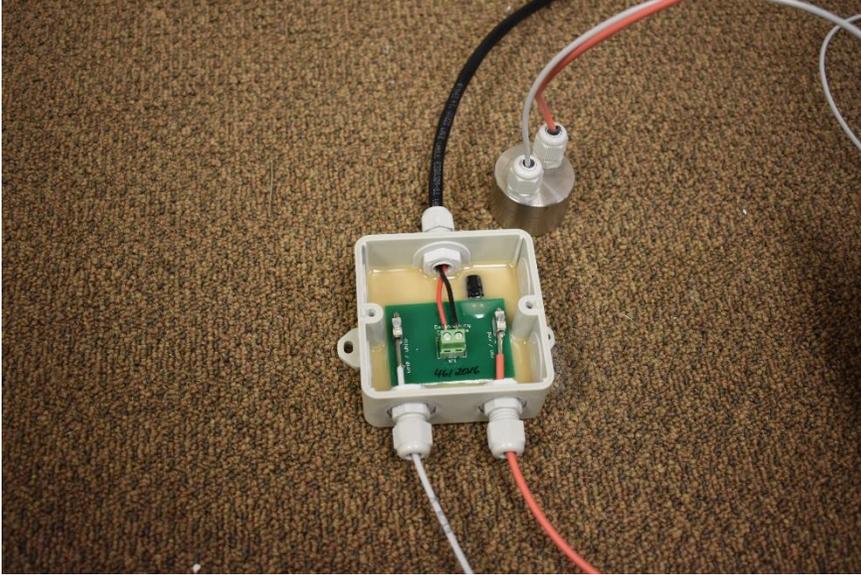




Box contents include: Graf Aqua Controller display unit, Sensor control box, tank level sensor, transformer power supply 24VAC, and fittings/parts bag. 3-Way valve shipped separate.

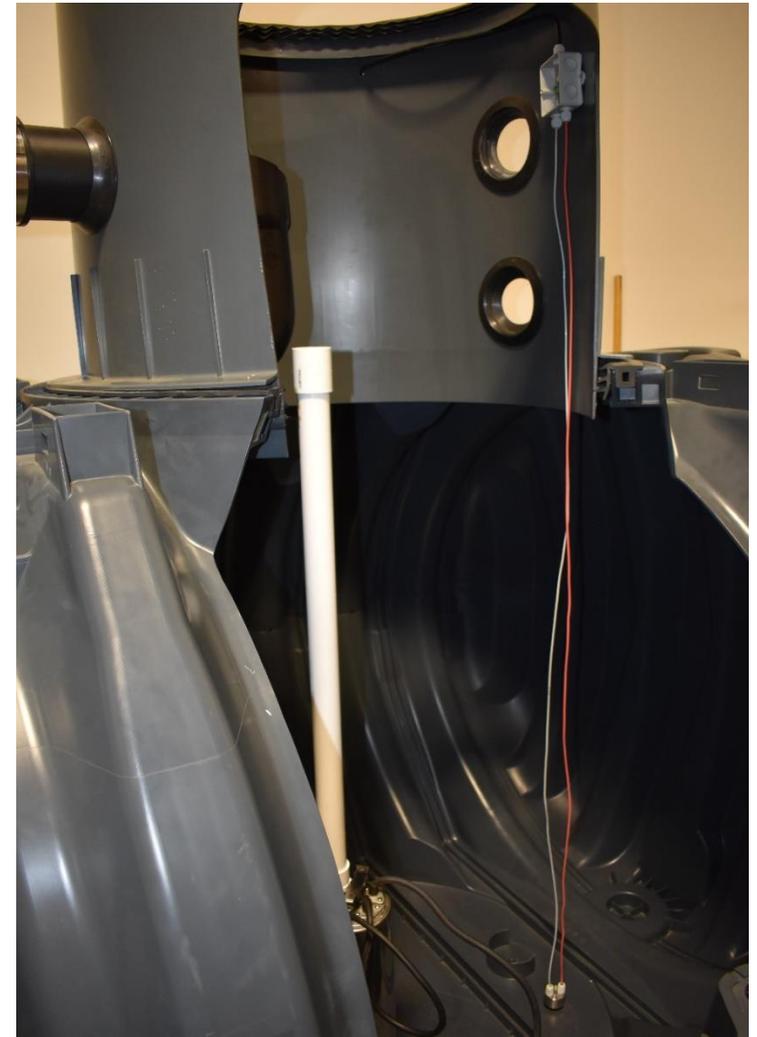
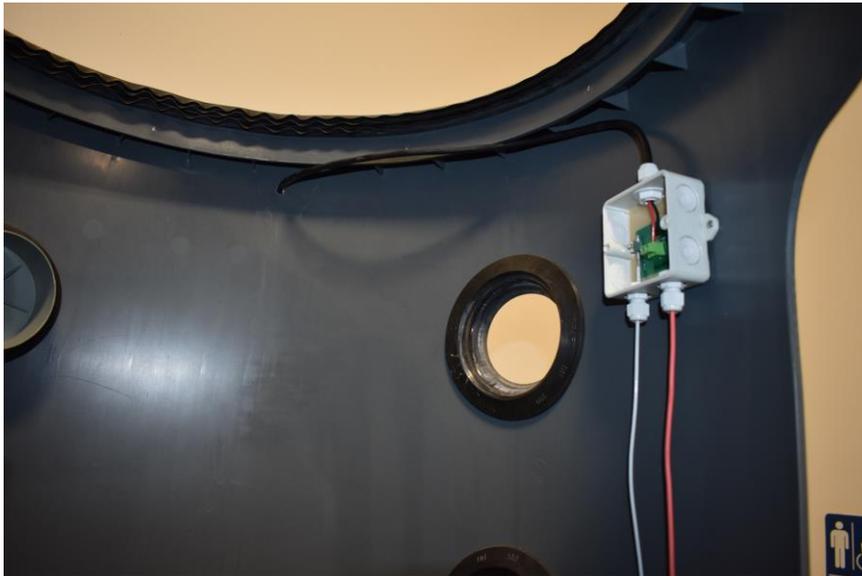


Sensor box wiring and installation in tank



Sensor and sensor control box are installed as shown in this photo. Once wired install sensor box cover.

The sensor box should be mounted a minimum of 4 inches from the highest possible water level in tank.



Sensor should be installed so the stainless steel sensor weight is suspended 1 inch from bottom of tank. You will need to measure the length of the wires from the sensor box to the sensor weight for control sensor calibration. (explained on slide 22)



- Once sensor is installed in tank the data wire (2 strand, shielded, 18 gauge, outdoor rated) should be routed to the Aqua Controller. This wire should be run to the Aqua Control unit in its own conduit. Running the data cable in another high voltage conduit can cause interference with the signal.
- Graf Aqua Controller should be mounted indoors or in a similar dry location.
- If outdoor installation is required a weather rated enclosure can be purchased from RainHarvest Systems.

The knockouts used for wiring grommets should be scored all the way around with utility knife and remove for wiring. Then install the included grommets and tighten as shown.



- The 3-way valve should be located in an upright position and in a protected enclosure not more than 150' from the controller. An 18 gauge or heavier, 3 strand SOOW (outdoor) type wire, should be used to run between the controller and the valve. Remember, the longer the distance the larger the wire. Voltage drop must be taken into consideration when sizing wire. The water tight grommets should be utilized on the valve to avoid any moisture from entering the housing. There is more than one terminal strip in the Bonomi valve. The terminal strip needed for valve turning operation is labeled “F” and “1 2 3”. The wiring from the Aqua Control will be connected to these terminals. The other terminal strips are for signal outputs and will not be used.
- Tinning all wires is recommended if you have the ability to do so.



3-way valve plumbing

Manual control knob. Valve can be rotated 360 degrees with this knob.

Either rainwater supply or municipal water supply



Valve position pointer indicates the state of the connection directly below. In this example, the right hand side is open to the output.

Either rainwater supply or municipal water supply

Output to irrigation system or other

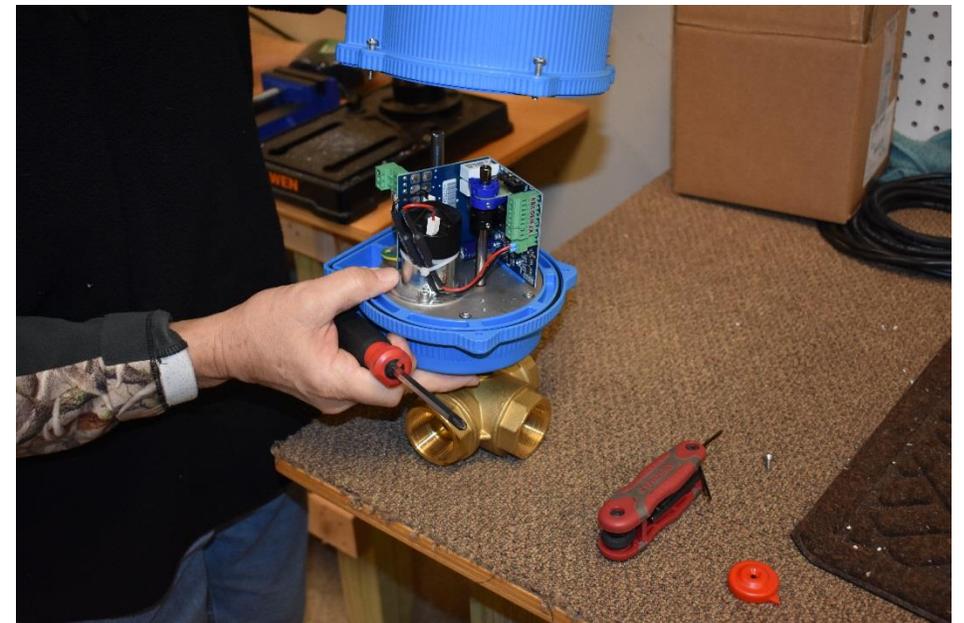
Making Connections Inside 3-Way-Valve

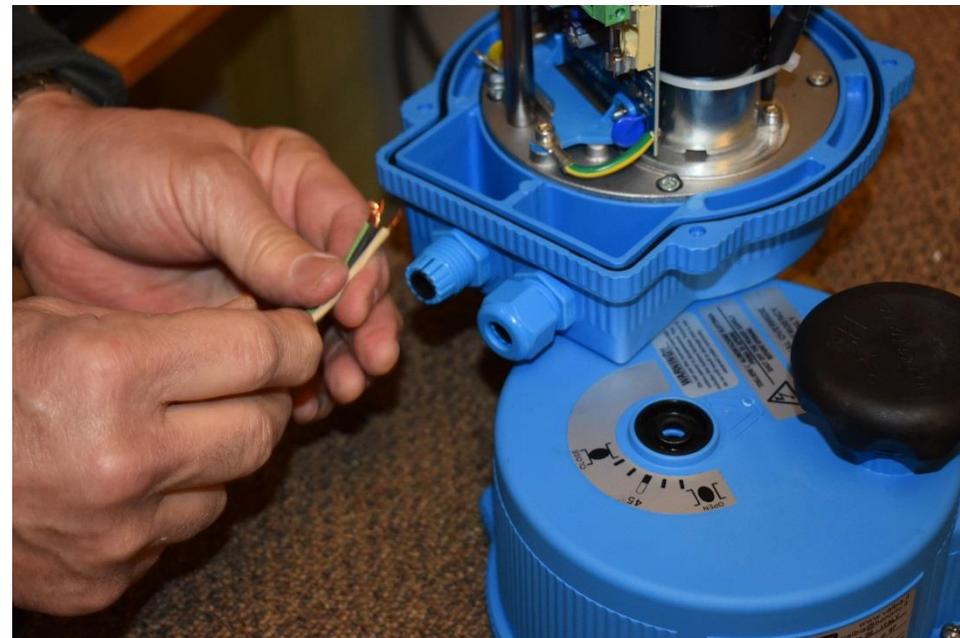
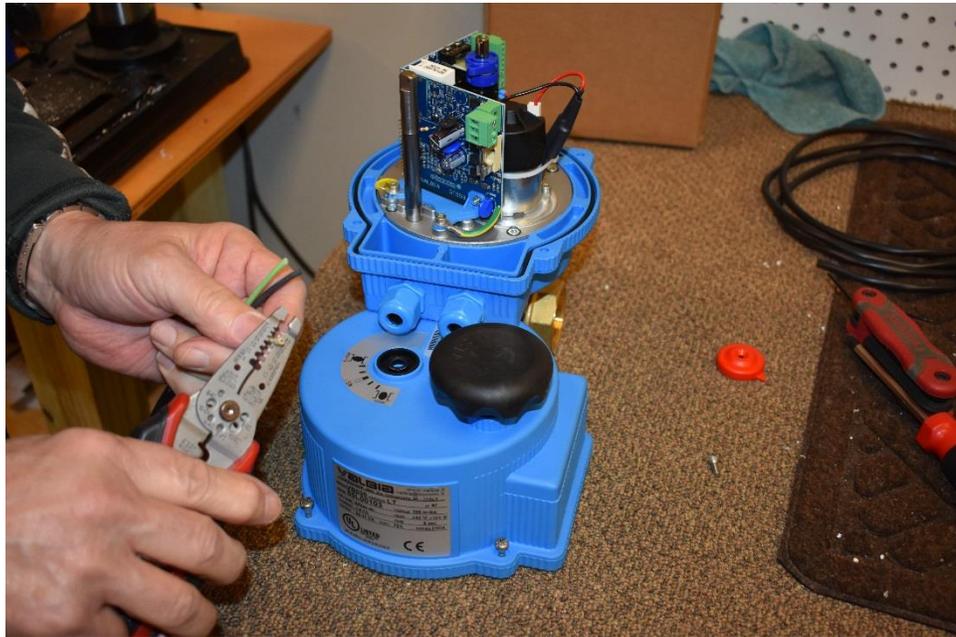


Remove red dial with 2.5mm hex wrench



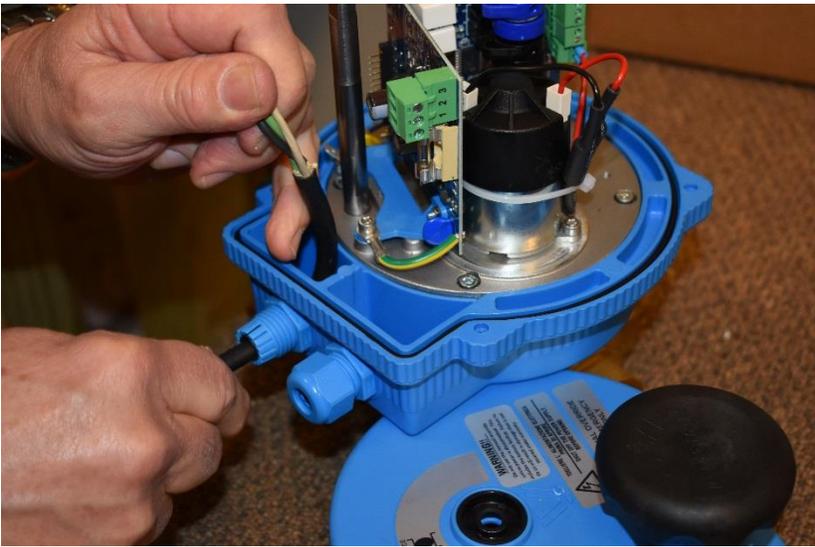
Loosen (4) screws to remove 3-way valve cover



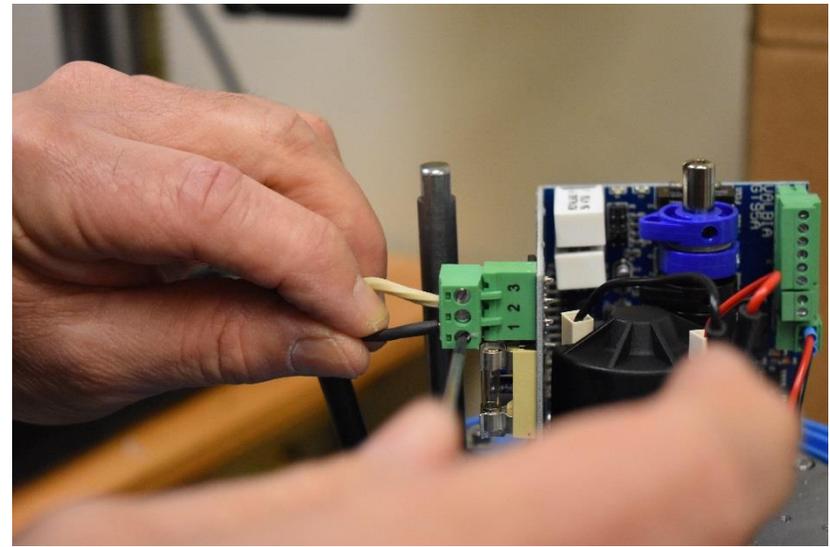


Remove one of the grommet nuts and slide over the wires before inserting wires into valve

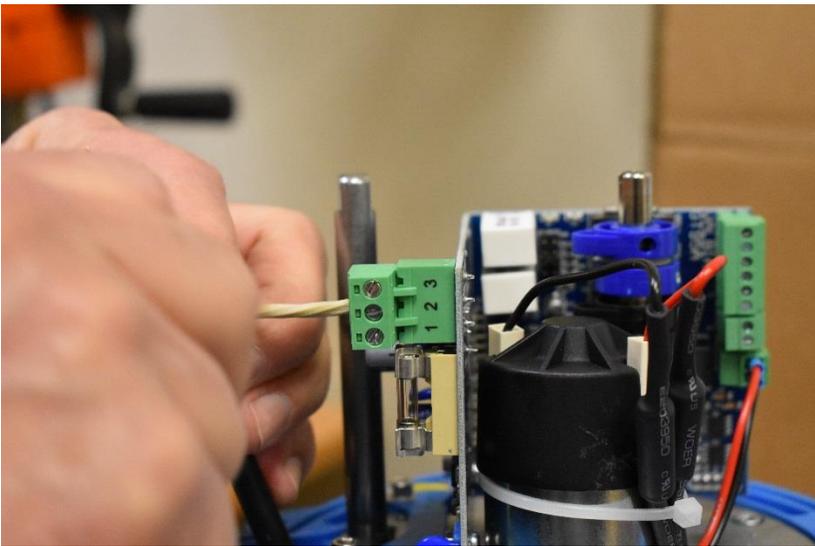
Strip wires back roughly half an inch. Wire size should be 16 or 18 gauge SOOW type wire to ensure water tight seal.



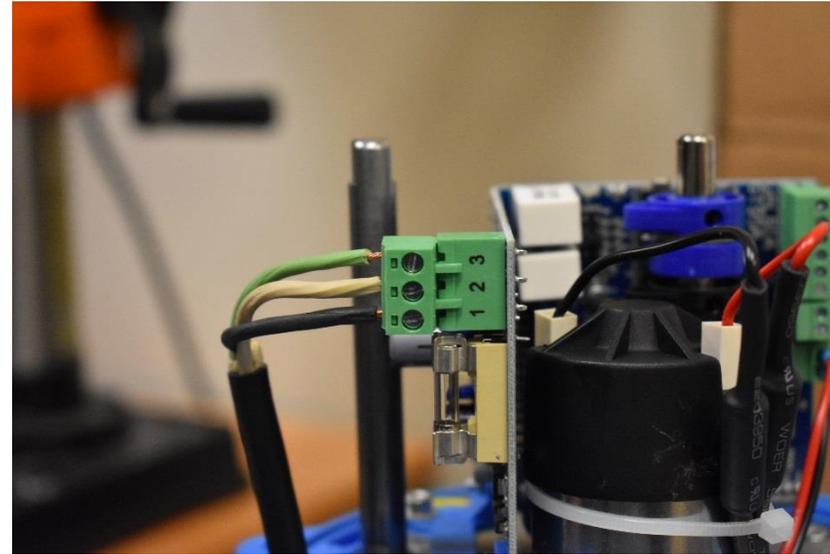
Pull wires through roughly 4 inches



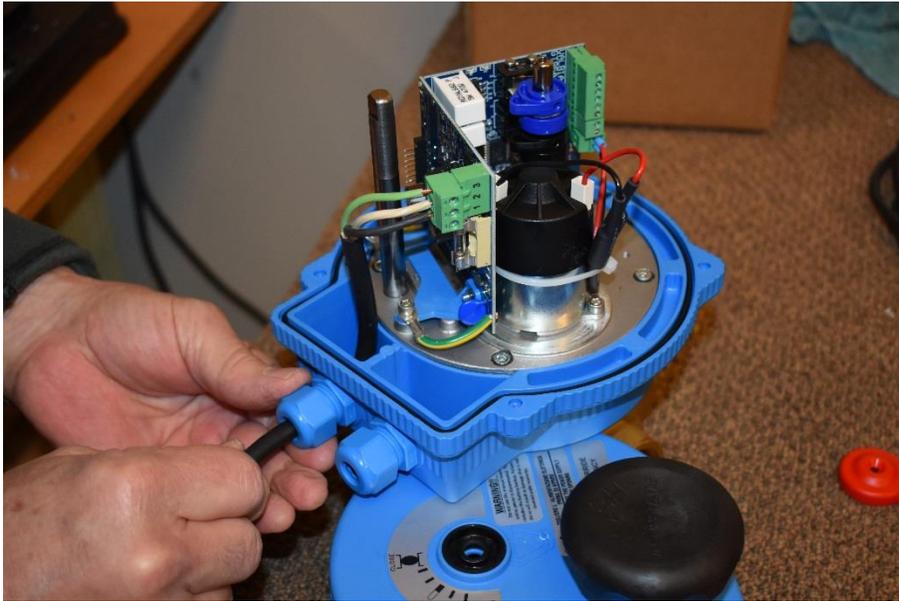
Connect black wire to terminal 1



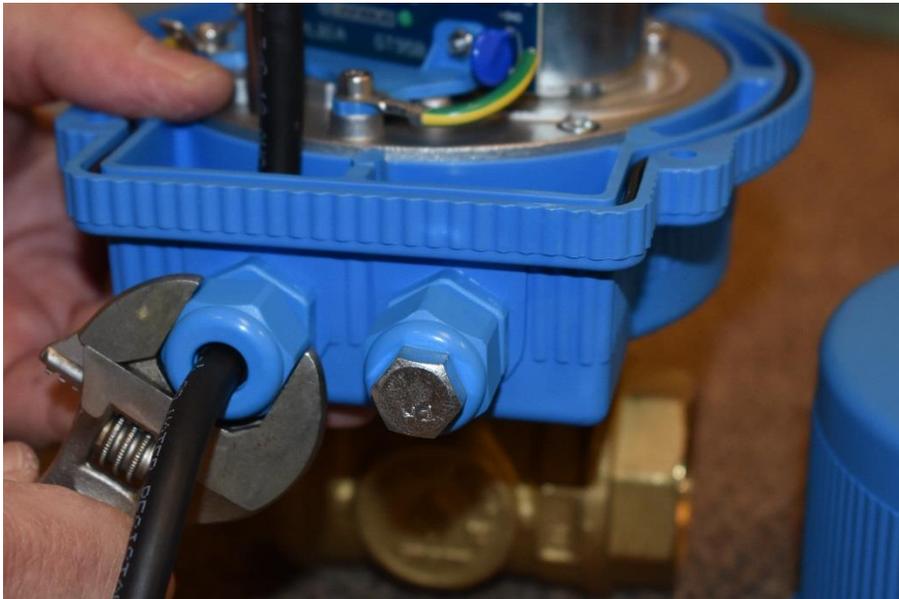
Connect white wire to terminal 2



Connect green wire to terminal 3



Tighten grommet onto black wire



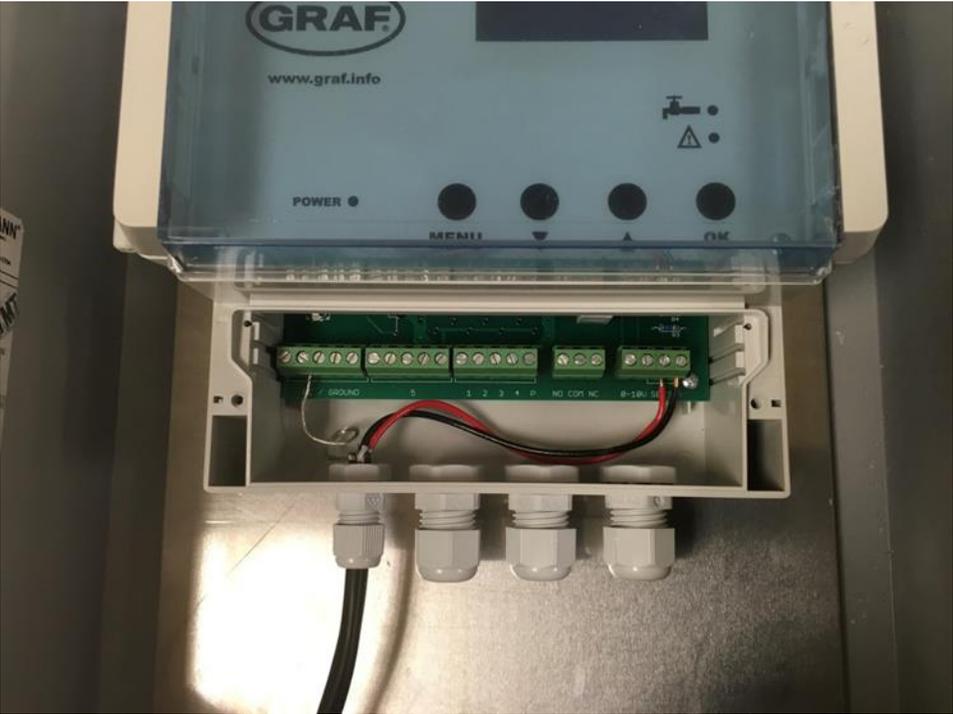
Use a bolt or other fitting to seal the unused side opening to prevent any moisture from getting inside



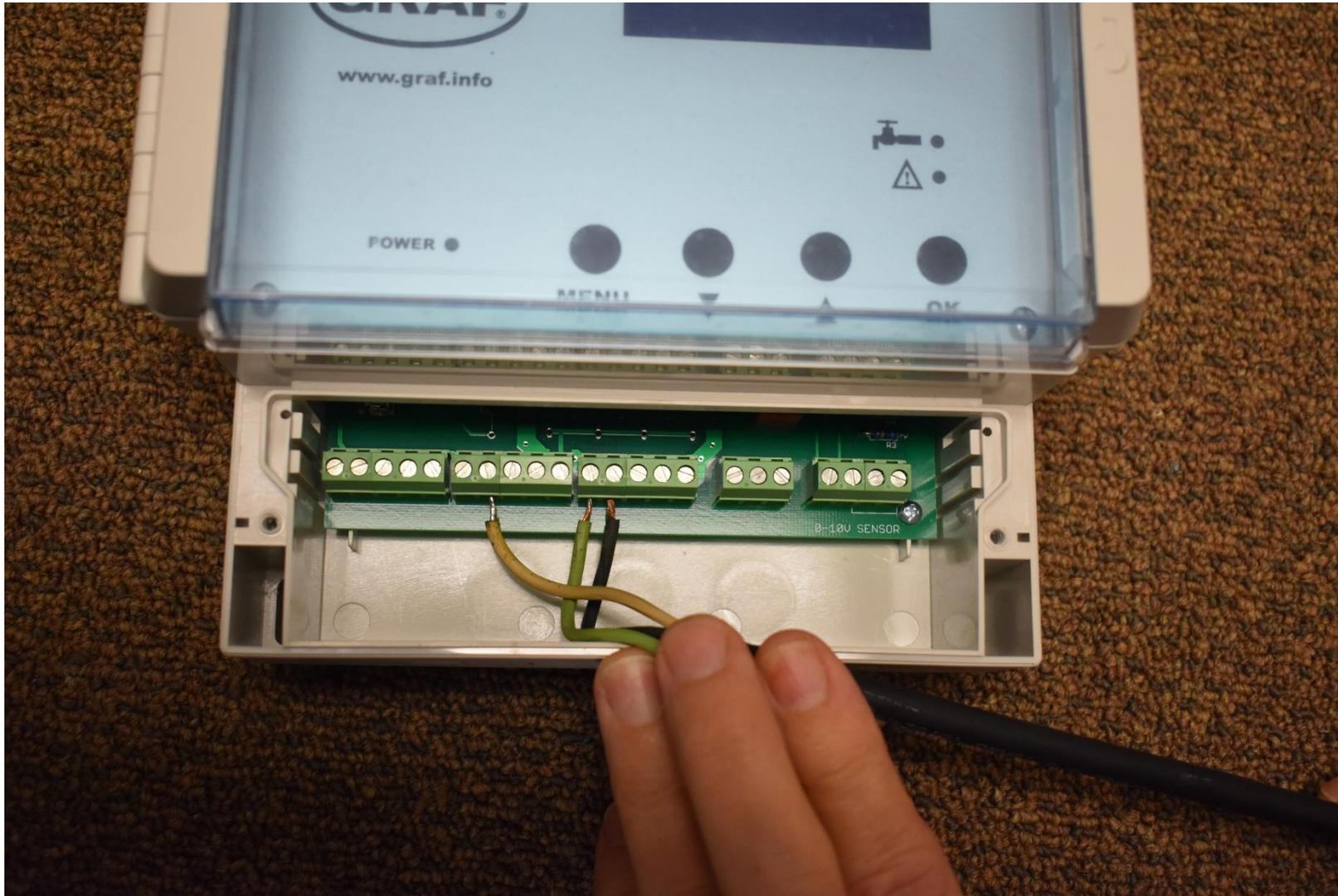
Wiring Of Aqua Control

Wiring power supply transformer and sensor box to Aqua Control display unit

Sensor Box wiring to display unit.
Easier to wire before the others



3-way-valve wiring to Aqua Control display unit



3 wire connection from 3-way valve at display unit. Note: Green and black wires may need to be reversed depending on orientation of municipal and rainwater connections on 3-way valve.

Programming Controller for use with 3-way Valve

Start-up screen



Press and hold menu button for 5 seconds



Use arrows to scroll to DEVICE ADJUSTMENT



Press OK



First setting is language, English is default, scroll to next setting, which is UNITS and default is inches.



MEASURING LENGTH: Press OK and the number will flash indicating selection, enter tank sensor length taken from measuring the sensor wires in tank. Then press OK once length is correct.



After setting the length and pressing OK scroll to OPERATION TERM.1 and press OK.

The default setting of PUMP NO will be flashing. Using arrow keys change to BACKUP NC and press OK.



Scroll to OPERATION TERM.2 where the default setting is BACKUP NC, change this to BACKUP NO, press OK.



This completes the DEVICE ADJUSTMENT settings.

The controller uses the BACKUP function to control the 3 way valve operation. This function has two states, BACKUP ON (which when activated, is indicated on the front of the unit by an LED located beside the spigot icon) and BACKUP OFF. The default settings for this function are on at 10% and off at 12%, but you can make these settings any logical amounts you need in the SWITCHING POINTS menu. When the level in the tank reaches 10%, the backup function is activated and will energize terminal 1 and that will cause the 3 way valve to rotate. Conversely, when the water level moves up to 12%, the backup function will turn off, terminal 2 will be energized and the valve will rotate in the opposite direction.

Important note: If the BACKUP ON and BACKUP OFF percentages need to be raised it will be necessary to change the REFILL OFF setting to a number higher than what the desired BACKUP ON setting is.