

Aquaculture Systems Technologies, LLC.

Propeller Wash Bead Filter/Bead Filter By-Pass System Controller

Model PW3

CONTROLLER INSTALLATION

(For Systems Using 4" or 6" Spears Tandem Actuated Butterfly 3-way Diverter Valve and Asahi Electromni, Spears or True Blue 2-way Sludge Valve)

- Wire # 0 -> Connect all neutral (-) wires together with the #0 wire in a wire nut. You should have neutral wires for the following: Power In, Mixing Motor, Sludge Valve, 3 Way Diverter Valve. On the Sludge valve the neutral wire should be connected to the #3 position on the terminal strip. On the 3 Way Diverter Valve the neutral wire should be connected to the #1 position on the valve terminal strip.**
- Connector # 1 -> Connect the 20 amp Power In hot (+) wire to the #1 wire**
- Connector # 2 -> Connect this wire to the #2 position on the terminal strip in the 3 Way Diverter Valve(+)**
- Connector # 3 -> Connect this wire to the black (+) wire on the Sludge Valve.**
- Connector # 4 -> Connect this wire to the Mixing Motor (+)**
- Connector # 5 -> Connect this wire to the #3 position on the terminal strip in the 3 Way Diverter Valve (+)**
- Connectors # 6 -> Connect to the two (2) red wires coming off microswitch of Sludge Valve. It does not matter which #6 connector hooks to which red wire.**

SPECIAL INSTRUCTIONS - PLEASE NOTE!

SYSTEM WIRING **MUST** HAVE 20 AMP INDEPENDENT BREAKER INSTALLED BY A QUALIFIED ELECTRICIAN BEFORE THE CONTROLLER CAN BE INSTALLED WHICH **MUST** MEET NATIONAL - STATE - AND LOCAL REGULATIONS. INSTALLATION AND OPERATION **MUST** BE IN COMPLIANCE WITH STATE, COUNTY AND LOCAL PLUMBING AND ELECTRICAL CODES.

THIS CONTROLLER IS EQUIPPED WITH FOUR 10 AMP RELAYS TO CONTROL THE 3-WAY ACTUATED DIVERT VALVE (2 RELAYS), MIXING MOTOR AND THE 2-WAY ACTUATED BALL VALVE (1 RELAY) ON THE SLUDGE LINE. THE MIXING MOTOR SIZE AND AMP DRAW ARE DEPENDENT ON FILTER MODEL AND PUMP SELECTION, WHILE THE 3-WAY DIVERter VALVE AND SLUDGE VALVE ONLY DRAW 2.2 AMPS. **IF YOUR MIXING MOTOR DRAWS MORE THAN 8 AMPS YOU MUST USE AND EXTERNAL RELAY OR MOTOR STARTER WITH A 110 VOLT COIL.** FAILURE TO USE AN EXTERNAL RELAY OR MOTOR STARTER IN CONJUNCTION WITH A MIXING MOTOR THAT DRAW MORE THAN 8 AMPS WILL VOID ANY AND ALL WARRANTIES.

WARNING! BEFORE BEGINNING ANY WORK MAKE SURE POWER IS TURNED OFF TO ALL POWER WIRES, CONTACTORS OR OTHER SOURCES OF ELECTRICAL CURRENT.

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DETAILED INSTRUCTIONS

1. Remove the four screws securing the cover of the box.
2. Determine and cut the lengths of both 3/4" pipe (gray PVC conduit) needed so that the box can be mounted at eye level on a wall or on a post.
3. Use the 3/4" conduit connectors on the bottom of the box to bring in power and wires out to all connected devices. Make sure to fill each connector with Silicone II following hook up.
4. Connect a wire between the #2 position on the terminal strip of the 3-way diverter valve and the # 2 butt end connector and crimp. This is the power wire (+) for the counter clockwise rotation of the 3-way diverter valve.
5. Connect a wire between the #3 position on the terminal strip of the 3-way diverter valve and the # 5 butt end connector and crimp. This is the power wire (+) for the clockwise rotation of the 3-way diverter valve.
6. Connect a wire between the #1 position on the terminal strip of the 3-way diverter valve and the # 0 wire. This is the neutral wire for the 3-way diverter valve and should be bundle with the other neutral wires and the #0 wire in a wire nut.
7. Connect the black sludge valve power wire (+) to the # 3 butt end connector and crimp.
8. Connect the white sludge valve neutral wire (-) to the #0 wire and bundle in the wire nut with other neutral wires.
9. Connect the two (2) red sludge valve microswitch wires to the two #6 butt end connectors and crimp. It does not matter which #6 connector hooks to which red wire.
10. Connect the mixing motor power wire (+) to the # 4 butt end connector and crimp.
10. Connect the mixing motor neutral wire (-) to the #0 wire and bundle in the wire nut with other neutral wires.
12. Connect the hot "power in" wire (+) to the # 1 butt end connector and crimp.
13. Connect the "power in" neutral wire (-) to the #0 wire and bundle in the wire nut with other neutral wires.
14. Connect the ground from the "power in" line, sludge valve motor, mixing motor and diverter valve wire all into one wire nut.
15. Fill the ends of the 3/4" conduit with Silicone II .*
16. Re-install cover with the four screws, making sure that the black gasket is in place.
15. Hook up black line to the brass compression fitting on the back of the box if using "Auto" pressure trigger to activate backwashing.
16. Turn on 20 amp breaker.
17. Run several manual backwashes to determine if unit is functioning properly.

*** Failure to glue and Silicone II conduit connectors will void any warranty!**

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DESCRIPTION/SEQUENCE OF OPERATION

Power Up Self Check - turn the independent 20 amp breaker on, you will hear a beep and the BACKWASH yellow light will come on. The 3-way diverted valve will move to the by-pass position (the controller allows 30 seconds for this to occur). Next the SLUDGE VALVE OPERATION yellow light will come on as the controller cycles this valve and confirms that the valve is in the closed position (the controller allows 30 seconds per cycle for this to occur). Once the controller has confirmed that the sludge valve is in the closed position, the green OK light will come on and the 3-way diverter valve will move to the filter position (the controller allows 30 seconds for this to occur).

NORMAL OPERATION

1. **SLUDGE VALVE CLOSED/PUMP ON/DIVERTER VALVE SENDING WATER TO BEAD FILTER:** System knows that the diverter valve is in the open position and will operate the system for the duration selected on the BACKWASH FREQUENCY selector.

BACKWASH

2. **SLUDGE VALVE CLOSED/PUMP ON/DIVERTER VALVE SENDING WATER TO FLUIDIZED BED FILTER OR OTHER BIOFILTER (AUTO OR TIME) :** Thirty seconds before the backwash interval selected on the BACKWASH FREQUENCY selector has been reached you will hear a series of double beeps indicating a backwash event is about to begin. The controller will move the diverter valve to the bead filter bypass position and go into BACKWASH mode. The pump will not turn off, but will continue to run, the water will by-pass the bead filter.
4. **MIXING DURATION:** Mixing motor will run for the time selected on the switch.
5. **MIXING MOTOR OFF:** and system settles for 10 minutes. The settling time is fixed.
6. **OPEN DUMP VALVE:** For time selected for DRAIN TIME
7. **CLOSE DUMP VALVE - NOTE - THE DIVERTER VALVE WILL NOT CHANGE BACK TO FLOW WATER THROUGH THE BEAD FILTER UNLESS THE SLUDGE VALVE HAS FULLY CLOSED.**
8. **CONFIRM VALVE CLOSED**
9. **OPEN DIVERTER VALVE AND RESTART SYSTEM.**

TO MANUALLY BACKWASH THE FILTER

With the controller BACKWASH FREQUENCY selector in any position, press and hold the RED BUTTON on the side of the controller for 35 seconds. This will initiate an immediate backwash event. You will hear a series of double beeps 30 seconds before backwash is initiated.

TO CHANGE BACKWASH FREQUENCY

1. Power down the system at the independent breaker.
2. Confirm that none of the lights on the panel are on.
3. Change the BACKWASH FREQUENCY selector to the desired position.
4. Power up the system at the independent breaker. This procedure is necessary to prevent unauthorized or inadvertent changes in backwash frequency. The microprocessor in the controller only reads the BACKWASH FREQUENCY selector position when the unit is first powered up.

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Declaration of Warnings

WARNING! FAILURE TO COMPLY TO THE INSTRUCTIONS FOR THE INSTALLATION OF THE SYSTEM CONTROLLER WILL VOID ANY AND ALL WARRANTIES PROVIDED BY AQUACULTURE SYSTEMS TECHNOLOGIES, LLC. OR INNOVATIVE ENVIRONMENTAL SOLUTIONS, LLC., AND WILL PLACE THE BURDEN OF WARRANTY COVERAGE ON THE INSTALLER. FAILURE TO FOLLOW INSTALLATION INSTRUCTIONS PROPERLY MAY CAUSE SERIOUS INJURY, ILLNESS, OR DEATH TO PERSONS OR PROPERTY AND MAY CAUSE SERIOUS DAMAGE TO THE SYSTEM, CONTROLLER, OR OTHER PROPERTY.

DANGER! ONLY A QUALIFIED PROFESSIONAL SHOULD ATTEMPT TO REPAIR OR FIX THE CONTROLLER. FAILURE TO CONTACT AQUACULTURE SYSTEMS TECHNOLOGIES, LLC. PRIOR TO ANY ATTEMPTED REPAIR WILL RESULT IN THE VOID OF ANY AND ALL REMAINING WARRANTIES. AQUACULTURE SYSTEMS TECHNOLOGIES, LLC. WILL HAVE REPAIR PARTS AVAILABLE FOR PURCHASE ONCE THE WARRANTY PERIOD HAS LAPSED. WORK BY ANYONE OTHER THAN A QUALIFIED PROFESSIONAL MAY CAUSE SERIOUS BODILY INJURY OR DEATH TO THE OPERATOR OR OTHER PERSONS AND MAY CAUSE SERIOUS DAMAGE TO THE EQUIPMENT AND OTHER PROPERTY.

WARNING! IN CASE OF POTENTIAL FLOOD, IMMEDIATELY TURN OFF THE ELECTRICAL POWER TO THE CONTROLLER SYSTEM AT THE INDEPENDENT BREAKER LOCATED WITHIN SITE OF THE CONTROLLER. FAILURE TO TURN OFF THE ELECTRICAL POWER MAY CAUSE SERIOUS INJURY OR DEATH TO THE OPERATOR AND OTHER PERSONS AND MAY CAUSE SERIOUS DAMAGE TO THE AQUACULTURE SYSTEM AND OTHER PROPERTY.