



Installation
and Operation
Instruction
Manual

INSMAN-102

Mini Media

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MINI MEDIA FILTER

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GENERAL SAFETY GUIDELINES

Please read the entire manual before beginning any procedure.

1. Only properly trained personnel should operate and service the equipment.
2. Always wear proper safety gear when servicing equipment.
3. Before installing the system, ensure that the system falls within the designed operating parameters.
4. Know the safety operating limits of the system and any equipment directly connected to or affected by it.
5. Be sure that the system is depressurized before any maintenance work, removing components or opening of the vessels.
6. Be sure to re-examine the system before putting it back into service.
7. Be sure to maintain all equipment and to continuously check the system for leaks and or damage. Fixing problems as they occur will prolong the life of the system.

YARDNEY QUICK START INSTRUCTIONS

Sand Media Filter Installation and Start-up Overview

1. Place filters in desired arrangement with couplings in front. Tanks should be on 14 ¾" centers. Install outlet manifold. Ref. Page 4.
2. Install backwash valves, actuator faces up. Ref. page 4.
3. Install inlet and backwash manifolds. Ref. page 4.
4. Wash gravel then install gravel and media to levels indicated on tanks. Ref. page 6.
5. Install the water stack assembly on the inlet manifold. Ref. page 6.
6. Install control box stand and mount controller. Ref. page 6.
7. Install pressure differential switch and tubing. Ref. page 6.
8. Install solenoid valves on automatic valve actuator. #1 port to valve (arrow on the bottom of solenoid valve should point toward backwash valve.) Ref. page 7.
9. Poly tube solenoid valve #2 ports to water stack, poly tube remaining ports to drain. Ref. page 7.
10. Poly tube discharge manifold to low pressure on 3-way valve on water stack. Ref. page 7.
11. Wire solenoids and pressure differential switch. Refer to controller manual. Set pressure differential switch to 13 PSI. Ref. page 7.
12. Gradually introduce water to the system and purge air from the system. Ref. page 7.
13. Adjust the backwash throttling valve to about 25% open. Ref. page 9.
14. Manually backwash the system, open backwash throttle valve until a slight amount media is identified in the backwash stream. Adjust the valve slightly closed until only trace amounts of media are detectable. Ref page 9.
15. Set the delay time on the controller by timing how long it takes the valve to go from the backwash position back to the filter position. Set the delay time to the next time setting shorter than the valve travel time. Ref. page 11.

16. Set the backwash frequency by monitoring the time it takes the system to build a pressure differential of 8 PSI greater than the clean system pressure differential. Set the periodic flush to this time or the next shorter time. The “time” function should be the primary backwash control function. Ref. page 11.
17. Set the backwash duration after the initial clean up. Set the duration for the time it takes clear water to discharge from the backwash line. This should be a minimum of 60 seconds. Ref. page 11.

System set up is now complete. Refer to the following complete manual for more detailed instructions and troubleshooting guide.

GENERAL INFORMATION:

ON-SITE HANDLING: Use caution, the tanks are small but built to last and are heavy!

NEVER LIFT A FILTER TANK BY THE VALVE!

PROVISIONS FOR BACKWASH WATER DISCHARGE: Although the amount of water required to backwash the filter bed is small compared to the amount of water filtered, it is discharged at a high rate for a short period of time. Provisions should be made to drain away, store or otherwise dispose of the dirty backwash water. The backwash line should not be connected to a pressure line and should be discharged to atmosphere. When returning backwash water to a reservoir, the discharge point should be as far away as possible from the pump intake. The backwash water flow should discharge to atmosphere above the water, not underwater! This will allow for proper backwash flow adjustment.

FILTER COUPLINGS: Grooved type couplings are supplied as standard on all piping supplied with the filters. These couplings mechanically lock the filters together, while allowing some line flexibility.

The backwash discharge ports have grooved type couplings with slip PVC adapters to facilitate PVC backwash manifold installation. The backwash discharge line should be the same size pipe as the PVC adapter supplied on the unit. If the backwash discharge line is excessively long or runs on a downhill slope, a vacuum breaker should be installed on the backwash line after the backwash flow restrictor valve.

TOOLS REQUIRED:

- Socket wrench set
- Adjustable wrench, 10"
- Two pipe wrenches, 10"
- Teflon tape
- Soapy water
- Chalk line
- Wire cutters/strippers
- Small screwdrivers, Phillips and flathead

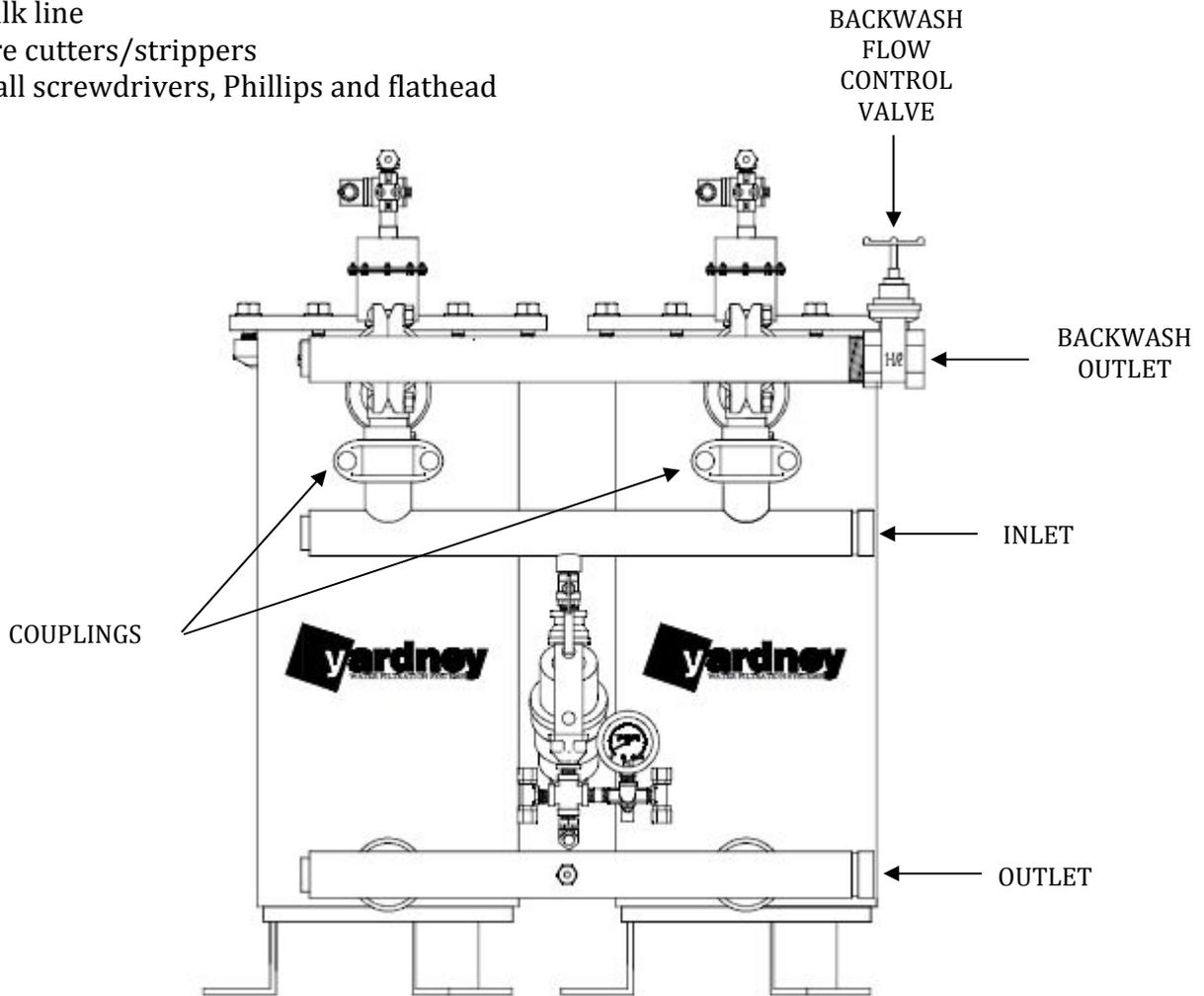


FIGURE 1: BACKWASH MANIFOLD AND FLOW CONTROL VALVE.

1. INSTALLATION

- 1.1 **Position the tanks** on a concrete pad with the couplings facing front.
- 1.2 **Install the backwash valve** on each tank using the corresponding grooved couplings. Remove the gasket from the coupling, apply soapy water and slide the gasket onto the tank inlet connection. Locate the backwash valve on the top connection and slide the gasket into the middle of the 2 grooves. Install the grooved coupling and bolts and tighten partially. The automatic actuator should face up.
- 1.3 **Install the inlet manifold** to the backwash valves using the corresponding grooved couplings. Using soapy water, slide the gaskets onto the inlet manifold spuds and connect the manifold to the backwash valves at the 1 ½" port facing down with the grooved couplings. Tighten the couplings partially, then check alignment of manifolds and valves and re-tighten the bolts on all couplings. In a similar fashion, **install the backwash manifold**.
- 1.4 Connect the incoming water supply to the top inlet manifold.
- 1.5 Connect the bottom outlet manifold to the field side of the irrigation system.
- 1.6 Install the brass gate valve on the end of the backwash line then a 1 ½" PVC male adapter into the other side of the gate valve. Connect the backwash line to the discharge point. Follow the important guidelines in the general information section at the front of this manual.

NOTE: The flush restrictor valve is essential for the correct operation of a sand media filter. Any gate, globe or butterfly valve is satisfactory if, after adjustment, the valve stem can be locked in place to protect against accidental or inadvertent adjustment.

2. FILTER MEDIA INSTALLATION

NOTE: Prior to filling with media, inspect inside of the filters for any foreign material. Filters should be filled with the media to approximately the level given in the chart. Do not allow any of the packaging material to get mixed in with the media

- 2.1 The Mini-Media filters require the use of a gravel pack for optimum performance.
- 2.2 Crushed rock must be thoroughly washed to remove dirt and other foreign material that could plug the underdrain. After washing, ***gently fill the bottom of the filter vessel with rock.*** The crushed rock must cover the wedge wire underdrain by 2 inches. Over the rock, ***install 13" of silica sand.***
- 2.3 Clean the access cover and replace. Tighten bolts alternately at 180° locations. See the diagram on the cover. **DO NOT OVERTIGHTEN!!** Bolts should not be tightened over 25 foot-pounds as over tightening will cut the gasket material.

3. INSTALLATION OF AUTOMATIC BACKWASH CONTROLS

Reference the directions below to the Water Stack drawing at the back of the manual.

NOTE: Use pipe sealant on all threaded connections. Some fittings may be supplied with factory applied sealant, apply sealant to these connections as well.

- 3.1 The water stack is shipped pre-assembled. An assembly diagram for future reference can be found on page 20. ***The water stack is connected to the inlet manifold*** (upper) by screwing the ½" ball valve into the ½" port on the inlet manifold.
- 3.2 **Mount the controller w/stand close to the water stack.** Refer to the separate manual provided with the automatic backwash controller for wiring of the solenoids and pressure differential switch and operation instruction.
- 3.3 Install two ¼" poly elbows onto the pressure differential switch (#2) with the tube connections facing down. ***Mount the pressure differential switch*** to the underside of the controller with the two screws provided (#15.) Tube the high pressure side of the pressure differential switch to the water stack assembly at the ¼" poly elbow (#14.) Tube the low pressure side of the pressure differential switch to the water stack assembly at the ¼" poly tee (#5A.)
- 3.4 On the discharge manifold (lower) following the diagram on page 20, install the ½" x ¼" galvanized bushing and ¼" poly elbow into the ½" port in the outlet manifold.
- 3.5 ***Connect the poly tubing to the poly connector on the outlet manifold.*** Connect the other end of the poly tubing to the poly tee (#5A) on the ¼" three-way valve (#9) on the water stack assembly.
- 3.6 ***Install the solenoid valves to the valve actuators.*** The solenoid port marked **1** is connected to the ¼" port on the valve actuator with a ¼" close nipple. Depending on the number of backwash valves, install either a ¼" poly elbow

or a ¼” poly tee to the solenoid port marked **2**. Refer to the diagram on page 18. The flow arrow on the bottom of the base of the solenoid valve should point toward the valve actuator.

- 3.7 **Connect the poly tubing to the poly tee on the water stack (#5)** and connect the other end to the poly fitting installed **to the solenoid port** marked **2** on filter #1 in step 3.4 above. Filter #2 should be connected in the same manner. In case of larger filter systems (three filters or more), it will be necessary to use either poly elbows or poly tees to connect the poly tubing from one solenoid valve to the next.
- 3.8 **Install poly elbows on the remaining solenoid ports (drain ports)** and connect a length of poly tubing long enough to be inserted inside of a leg of the tank. During the course of normal filter operation, a small amount of water will drain from this tube to the ground.
- 3.9 **Wire solenoids and PD switch to the controller.** Reference the controller manual or the diagram on Pg. 19 of this manual.

4. SYSTEM START-UP

The following start-up sequence can be used for the starting up of automatic filter systems.

NOTE: First time start-up should be done with caution. All air must be purged out of all lines and filters prior to start-up. Valves and pumps must be opened slowly to prevent damage to filters and the irrigation system due to entrapped air. Please read the Synergy Quick Start Guide before system start-up.

- 4.1 Start the system manually with the controller in the System Disabled state by turning the dial to the System Menu, pressing the dial to select the menu and rotating the dial to Disabled and selecting. Open the backwash restriction valve ¼ and introduce water into the filter system, filling lines and tanks slowly. The ½” ball valve on the water stack should be in the open position.
- 4.2 When approximately 10 PSI pressure is reached, turn the manual override knob on the solenoid on tank #1 to the ON position for 1 to 2 minutes to purge entrapped air from the system. Turn tank #1 OFF and repeat the process on the remaining tanks.
- 4.3 When 50% of the system operating pressure is reached, repeat the flush cycle manually to purge any remaining air.
- 4.4 When 100% of the system pressure is reached or after 15 minutes of operation, repeat the flush cycle allowing 3 minute flushes per tank.
- 4.5 With all of the solenoid manual override knobs in the OFF position, activate the controller by **Enabling** the system following the same procedure in step 4.1. The Synergy controller will be pre-set to flush every two hours with a flush duration of 3 minutes for a two tank system. Please see the Synergy Instruction manual to customize settings to fit your system. Push the manual start button to go through an automatic flush cycle.
- 4.6 **Set the Pressure Differential (P.D.) Switch** 8 PSI over the clean filter pressure differential. (Example: Clean pressure differential of 5 PSI + 8 PSI = 13 PSI switch setting.) Loosen screws on switch and slide switch to adjust set point.

- 4.7 The automatic filter controller should be set so that the frequency of the filter backwashing corresponds with the buildup of pressure drop to the established dirty filter pressure differential set point. Establishing the time frequency of flush may require several days of monitoring to determine the proper setting. (Example: If it takes 6 hours of operation to reach the dirty filter pressure switch setting of 13 PSI, the backwash frequency setting on the controller should be set at 6 hours.
- 4.8 The backwash restrictor valve adjustment – **The most critical factor to proper sand filter operation!!**
- A. **Open the backwash restrictor control valve approximately 25%.**
 - B. Be sure that all air is purged from each tank by partially opening and closing the flush valve on each tank.
 - C. Before proceeding with backwash adjustments, the pump must run long enough to fill the entire irrigation system at the designed pressure and flow.
 - D. ***Manually initiate a backwash*** on one tank (See Figure 6) by turning the manual override screw to the “ON” position.
 - E. If applicable, take a sample using a clear jar or a screen sampling device to monitor the contents of the backwash discharge water.
 - F. Gradually open the backwash restrictor valve until a small amount of media from the backwash water appears in the discharge flow.
 - G. When media begins to show up in the backwash water, close the backwash flow control valve until the water is essentially clear of media. A small trace of media is acceptable since it is desirable that the lighter granules (fines) in the bed be allowed to wash out. After completing the above adjustments, all tanks should be backwashed extensively (3 to 5 minutes each) to remove contaminants and fine material usually found in newly installed media.

RECOMMENDED BACKWASH FLOW RATES

The following table shows the approximate backwash flow rates that are required to provide for proper filter backwash. All factors are per single tank. Actual backwash flow should be determined as described above. The use of a flow meter for when setting the backwash restrictor valve is not recommended.

MEDIA TYPES	MEAN EFF. MEDIA SIZE	UNIFORMITY COEFFICIENT	APPROXIMATE BACKWASH FLOW RATES (GPM) BY FILTER SIZE
			Ø10"
G-78 #11 GRANITE	.78 MM	1.54	8
S-47 #20 SILCA	.47 MM	1.42	8

TABLE 1: RECOMMENDED BACKWASH FLOW RATES.

During backwash the tanks not being backwashed supply clean water for backwashing and also supply the filtered water for the field. If the volume of your water source is not adequate for both the backwash requirement and to supply filtered water to the field, you can increase the backwash flow by installing a valve in the filtered water output line and close off or partially restrict the flow through this line during backwash. If this method is used, the flow must be restricted exactly the same amount each flush or variable backwash performance will occur.

5. THE BACKWASH FUNCTION

Backwashing the filters is the process by which clean water flows upward through the underdrain, lifting and expanding the media bed allowing it to release the collected contaminate. The contaminant is then carried away with the backwash water. Excessive backwash flow rates will expand the media to the point that the media itself is expelled out of the tank. Insufficient backwash flow will not expand the media enough to purge all the entrapped contaminant. This could result in residual pressure loss through the bed even after backwash. To achieve maximum filter performance, the backwash flow must be properly adjusted.

IMPORTANT NOTES:

1. If at a later time you make any significant changes in pressure or flow, the above adjustments should be re-checked.
2. Backwashing at 8 PSI above clean filter pressure differential is recommended.
3. The minimum stated system operating pressure is 20 PSI. When operating at pressures lower than 40 PSI, pay especially close attention to the backwash function to ensure adequate cleaning. An effective backwash requires that back-pressure be maintained on the system during backwash. A pressure maintenance valve may be required. Backwashing should be more frequent on low-pressure (<40 PSI) applications, with an allowable increase in pressure differential, over clean, of 5 psid.

A FINAL IMPORTANT NOTE ABOUT BACKWASH SETTINGS

The backwashing function of your sand media filtration system is the most important aspect of your filter systems operation. Without proper backwashing, the entrapped dirt is not expelled from the system. Filters should be flushed when the pressure loss increases by 8 PSI over the clean filter pressure loss. Each filter should be flushed for a minimum of 90 seconds per tank. If backwash water is not visually clear after 90 seconds extend the flush duration. Filters should be flushed for a minimum of each, at least once every 24 hours even if an 8PSI pressure drop is not attained. The dwell setting is properly set when there is a slight overlap of two filters flushing. Record the time required for a valve to return to the filter position from backwash position. Set the dwell setting to the next shortest setting. The quality of water produced by your sand media filters is directly affected by the quality and frequency of the backwashing operation. In filters utilizing the wedgewire underdrain some contamination build up may occur where heavy silt loading is present. Under these circumstances a periodic longer backwash cycle or mechanical agitation of the sand bed may be required.

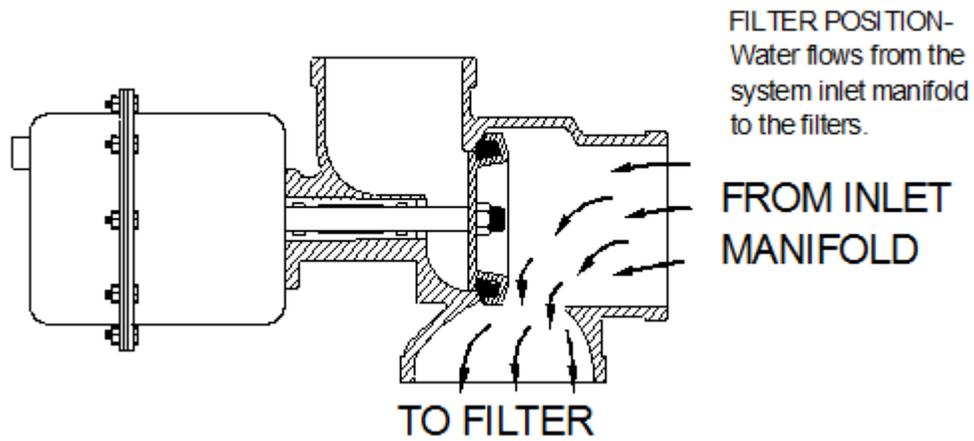


FIGURE 2: AUTOMATIC VALVE - FILTER POSITION.

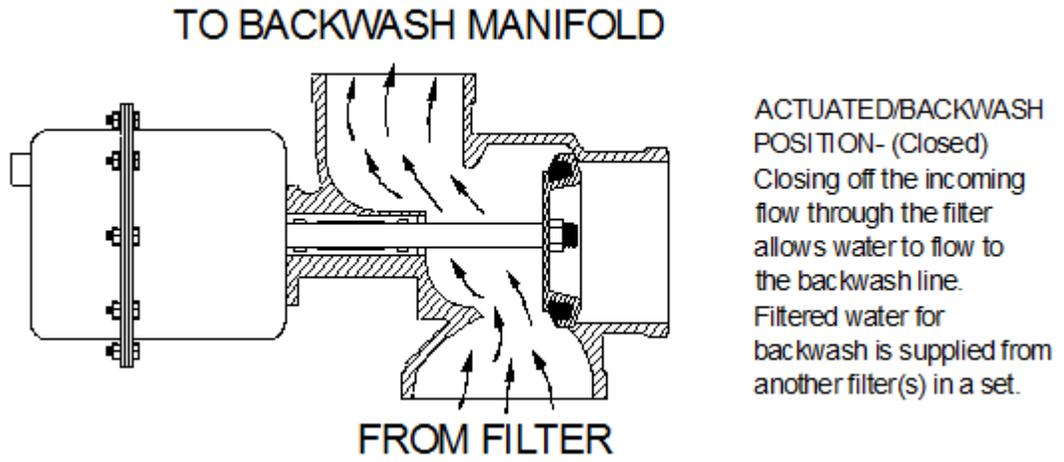


FIGURE 3: AUTOMATIC VALVE - BACKWASH POSITION.

MEDIA FILTER PREVENTATIVE MAINTENANCE SCHEDULE

The following is a simple schedule for start-up and operational preventative maintenance. The chart should be located in an accessible, but protected location on the filter pad.

TASK	SEASONAL START-UP	SEASON SHUTDOWN	DAILY	WEEKLY	BI-MONTHLY	MONTHLY	QUARTERLY
Check media depth		X					X
Clean water pickup assembly filter	X					X	
Inspect hydraulic line connections	X						
Inspect electrical connections and control box seals	X						X
Lubricate backwash valve with general purpose water insoluble grease	X						X
Inspect valve interior components (seals, diaphragm, shaft)	X	X					
Check coupling gaskets for leaks	X			X			
Check system pressure differential	X		X				
Check backwash flow rate	X						X
Check flow meter to assure proper flow rate	X			X			
Monitor duration of flush cycle	X				X		
Evaluate seasonal water quality fluctuations for possible settings adjustments					X		
Service down steam strainer		X					X
Chlorine shock treatment	X						X

TABLE 2: MEDIA FILTER PREVENTATIVE MAINTENANCE SCHEDULE.

REFERENCE | OPERATING TROUBLESHOOTING GUIDE

A. POOR FILTRATION

PROBABLE CAUSE	SOLUTION
Excessive flow through the filters causing coning of media and/or forcing contaminants through the filter to outlet.	Reduce the flow rate or add filter unit(s) See manufacturer for recommended flow range.
Air in filter(s) causing disruption (coning) of media bed.	Install auto or manual air bleed device.
Incorrect media in the filtration system.	Replace with proper media. See manufacturer for recommended media.
Insufficient depth of media, which allows contaminants to pass through system.	Add media to achieve proper depth. (Typically 13 – 14 inches.)

B. CONSTANT HIGH PRESSURE DIFFERENTIAL

PROBABLE CAUSE	SOLUTION
Filter sealed over with contaminants restricting backwash flow.	Open tanks and skim away any excess or caked contaminants from the media sand beds surface. Return tanks to normal service. Backwash each filter tank until backwash flow runs clean.
Insufficient backwash flow rate.	Re-adjust the backwash restrictor valve and/or partially close the field valve to create system back pressure.
Fouled underdrain	Perform shock-treatment on underdrains

C. SAND MEDIA APPEARS DOWNSTREAM

PROBABLE CAUSE	SOLUTION
Incorrect filter sand media (i.e. too fine.)	Replace with the proper sand media. See manufacturer's recommendations.
Broken or damaged underdrain.	Replace or repair.

D. BACKWASH VALVE LEAKAGE CAUSE

PROBABLE CAUSE	SOLUTION
Obstruction in the valve seat area.	Remove obstruction.
Polyurethane sealing disk is worn or damaged.	Replace.
Diaphragm damaged (leaking from port of diaphragm chamber at rear of valve.)	Replace diaphragm.
Pinched or worn O-ring.	Replace O-ring and/or lubricate shaft.

E. AIR HAMMER

PROBABLE CAUSE	SOLUTION
Air in tanks.	Bleed off trapped air. See start-up instructions. Also check for leaks in the pump suction line. An air bleed at the filter inlet may also help.
Long backwash line causing vacuum induced slamming of valves.	Install a vacuum breaker on the backwash line.

F. FREQUENCY OF BACKFLUSH INCREASING

PROBABLE CAUSE	SOLUTION
Backwash flow or duration is not adequate to flush filter tanks of all contaminants.	Re-adjust backwash flow and/or increase duration of backwash cycle.
Insufficient media depth	Add media sand to achieve proper depth.
Increased concentration of contaminants in water supply. (Note:	Greater filter capacity required.

G. AUTOMATIC BACKWASH FAILS TO CYCLE

PROBABLE CAUSE	SOLUTION
Improper setting on differential pressure switch.	Inspect seals for signs of tampering.
Solenoids(s) malfunctioning.	Check connections. Clean ports. Check filter screen on water pickup assembly for damaged screen and clean or replace if necessary.
Loss of sufficient system pressure to actuate valve(s.)	Check system for pressure leaks. Also inspect filter screen on water pickup assembly for damaged screen. Clean or replace if necessary.

FILTER UNDERDRAIN OBSTRUCTION OR PLUGGAGE

Infrequent flushing, the lack of chemical treatment, improperly set backwash restrictor valve or operating the filters outside of the recommended flow range are the most common causes of media filter underdrain blockage. All four of these situations either singularly or in combination will result in contaminants reaching and possibly fouling the filter underdrain. Evidence of underdrain blockage can be seen by monitoring the pressure gauges. If the pressure differential does not return to 2 – 6 PSI after a flush cycle there is a possibility of underdrain contamination.

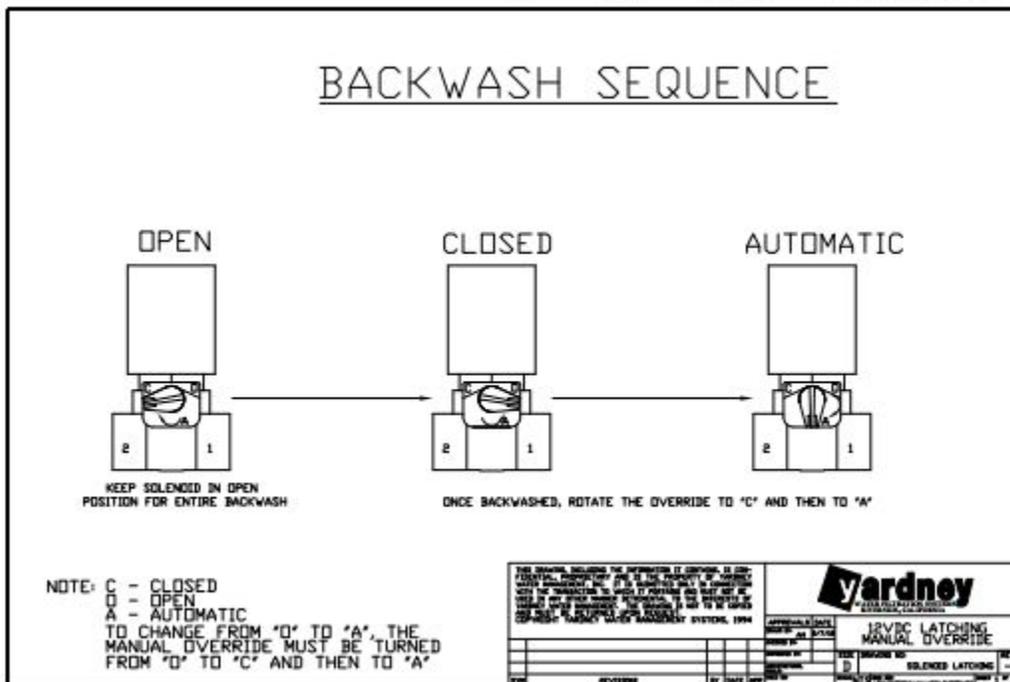
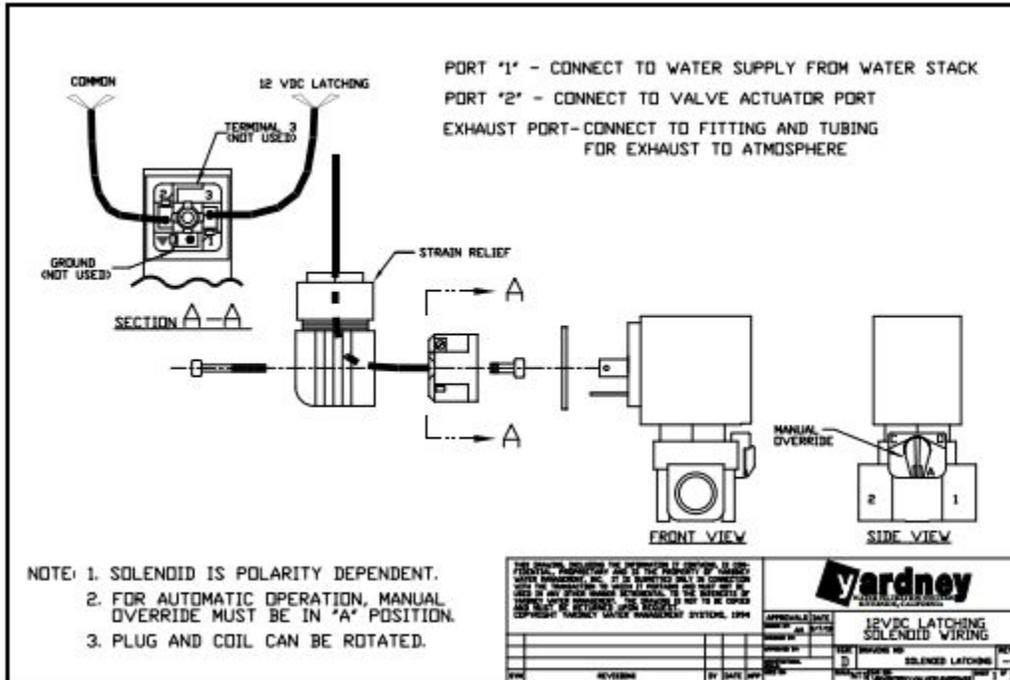
First the cause of the blockage must be determined and rectified (i.e. reset the backwash restrictor valve, increase the frequency of flushing and adjust the flow rate to comply with the manufacturer's recommendation or install chlorine injection equipment.) If the cause of the blockage has been identified and corrected and the pressure differential does not return to 2 – 6 PSI after backflushing, more severe steps will have to be taken to clear the underdrain. If organic contaminants are suspected, a chlorine shock treatment may be necessary.

CHLORINE SHOCK TREATMENT FOR SAND MEDIA FILTERS

- Step 1: Remove filter manway lids and fill each tank with water up to the top weld seam. It is not necessary to remove the sand. Make sure that the field valve is closed so water will be held in the filter tanks.
- Step 2: Add 10 to 20 ounces of 12% pool chlorine per square foot of filtration area to each vessel. If unavailable, double the amount of chlorine bleach is an acceptable alternative.
- Step 3: Allow to stand for 12 hours. **BEWARE OF CHLORINE FUMES.**
- Step 4: Secure manway lids, open the field valve and initiate a backflush cycle. Flush each vessel for approximately 3 minutes and repeat the full sequence several times.

<p><u>NOTE:</u> One or two shock treatments will usually be enough to unplug an underdrain that is contaminated with organics. Consult the manufacturer if a high pressure differential persists.</p>
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handling any chemicals. A safety water rinse station should also be available to rinse off any chemicals which may come into contact with filter personnel. Do not mix with other chemicals during this procedure and always induce chemicals into a water filled filter tank.



12VDC/24VAC CONTINUOUS SOLENOID WIRING.

ELECTRIC CONNECTIONS AND BUTTONS

Once the Synergy Controller is mounted and the wires are routed to the enclosure, connect the wires as they are labeled in Figure 6.

Using the pick tool supplied, depress the small buttons on the wire terminals to connect as many stations as your installation requires (up to 16.) The valves controlling each station can be DC or AC valves. See user's Manual for details on continuous vs. latching valves. All must be the same type, including the master valve if used.

If using an AC power supply, be sure the supply select switch is in the correct position before powering up the controller. The two outside contacts of the 4-contact AC connector are used for the AC power. The two center contacts are not used. Any of the aforementioned valve types can be used with AC power.

If using DC supply, be sure that it supplies between 10 and 15VDC and that the polarity is connected as indicated on the panel. Only DC valves can be used with a DC supply.

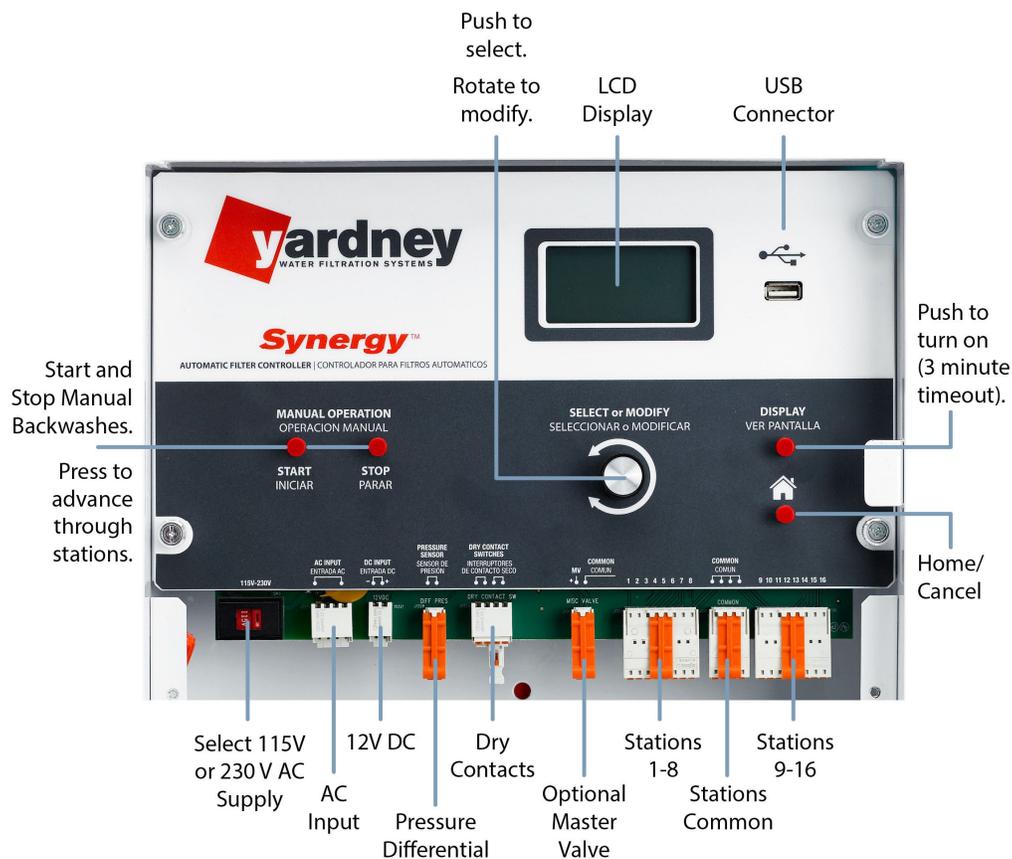
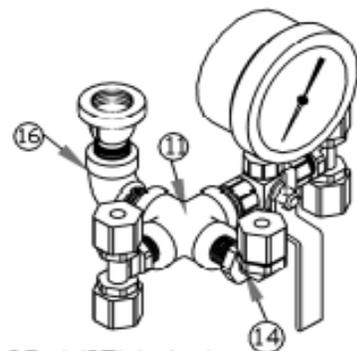
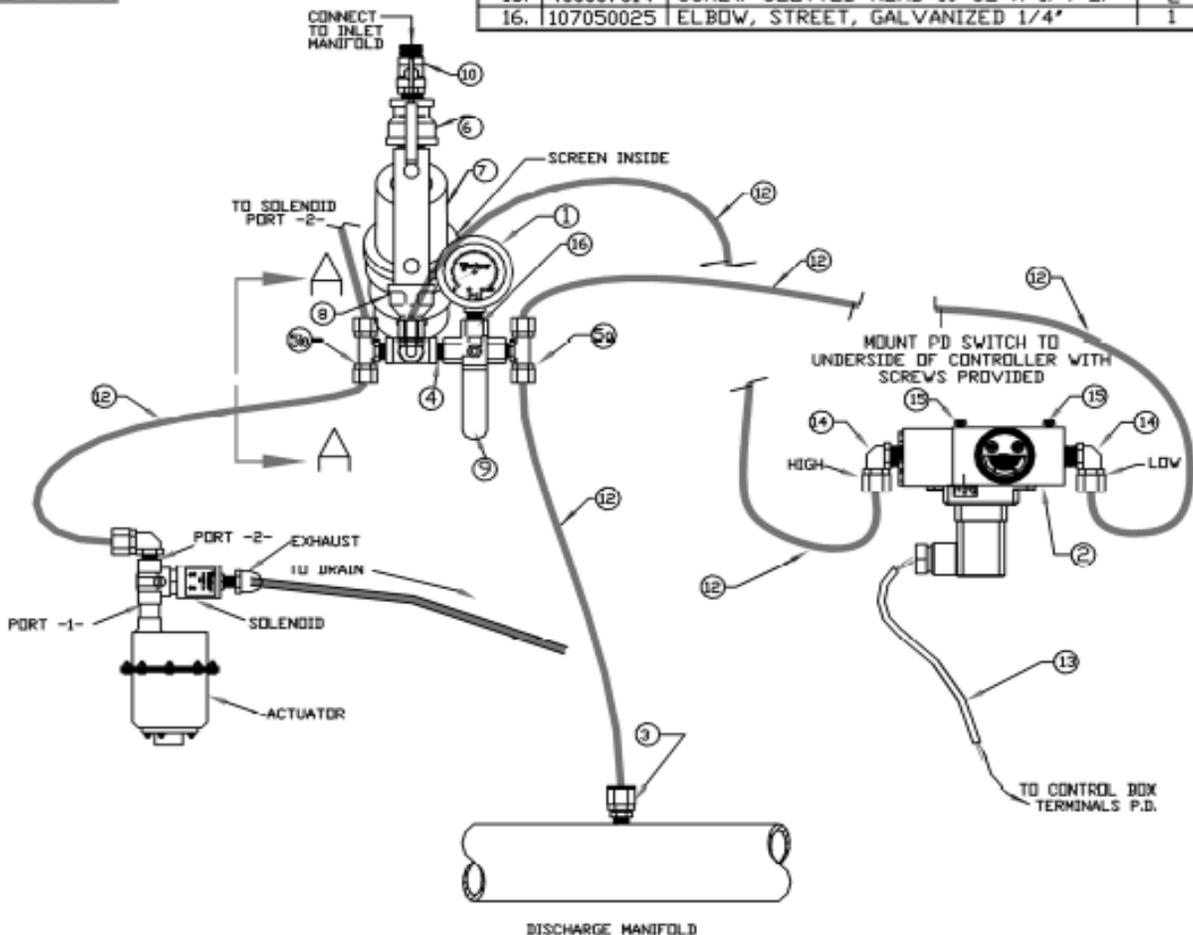


FIGURE 5: INTERFACE AND ELECTRICAL CONNECTIONS.



3D VIEW A-A
NTS

ITEM	PART #	LEGEND	QTY.
1.	144025100	0-100 PSI PRFSSSURF GAUGF	1
2.	166070020	PRESSURE DIFFERENTIAL SWITCH	1
3.	143010404	1/4" POLY PROP CONNCTR (P4MC4)	1
4.	106522015	1/4" X1-1/2" GALVANIZED NIPPLE	1
5.	143004000	POLY PROP "T" (P4MT4)	2
6.	106850150	REDUCER BELL GALVANIZED 1" X 1/2"	1
7.	147510020	SCREEN FILTER 1" - PLASTIC "Y"	1
8.	106850125	REDUCER BELL GALVANIZED 1" X 1/4"	1
9.	135000025	VALVE KITZ 3-WAY	1
10.	137000050	1/2" BALL VALVE MALF	1
11.	107022025	1/4" GALV. CROSS	1
12.	143000025	1/4" POLY ETHYLENE TUBING	120"
13.	167001807	WIRE 18GA GREY 2 CONDUCTOR	12"
14.	143003400	POLYPROPYLENE (P4ME4) ELBOW	3
15.	400007014	SCREW SLOTTED HEAD 10-32 X 1/4 ZP	2
16.	107050025	ELBOW, STREET, GALVANIZED 1/4"	1



WATER STACK ASSEMBLY - MINI MEDIA
WITH 1" Y-STRAINER
PART# 250070040

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DO NOT SCALE DRAWING

REV	DESCRIPTION	BY	DATE	APP	APPROVALS	DATE
B	UPDATED YARDNEY LOGO	DTG	1-13	APP	DTG	1-13-04
C	TO USE UP STOCK (EACH 1" FILTERS)	DTG	10-09	APP	DTG	10-09-04
B	REVISED DETAIL ON ACTUATOR	DTG	10-05	APP	DTG	10-05-04
A	ADDED 1/4" GALV. STREET ELBOW	DTG	9-05	APP	DTG	9-05-04
SYN	REVISIONS	BY	DATE	APP	DTG	9-05-04

WATER-STACK MINI MEDIA	SIZE D	DRAWING NO 250070040	REV D
NONE		DTG	10-09-04

FIGURE 6: WATER STACK ASSEMBLY WITH Y-STRAINER.

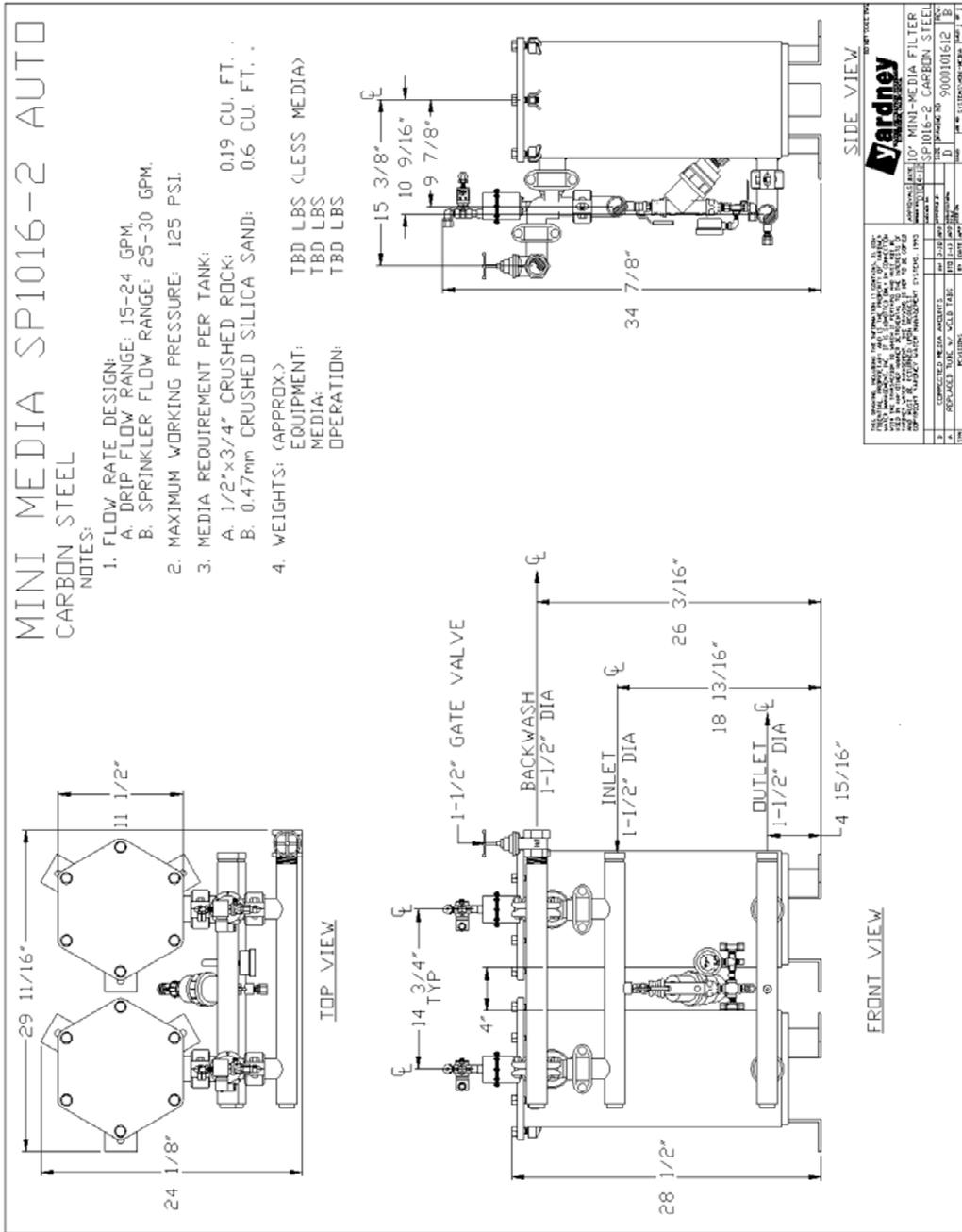


FIGURE 7: MINI MEDIA TWO TANK ASSEMBLY.

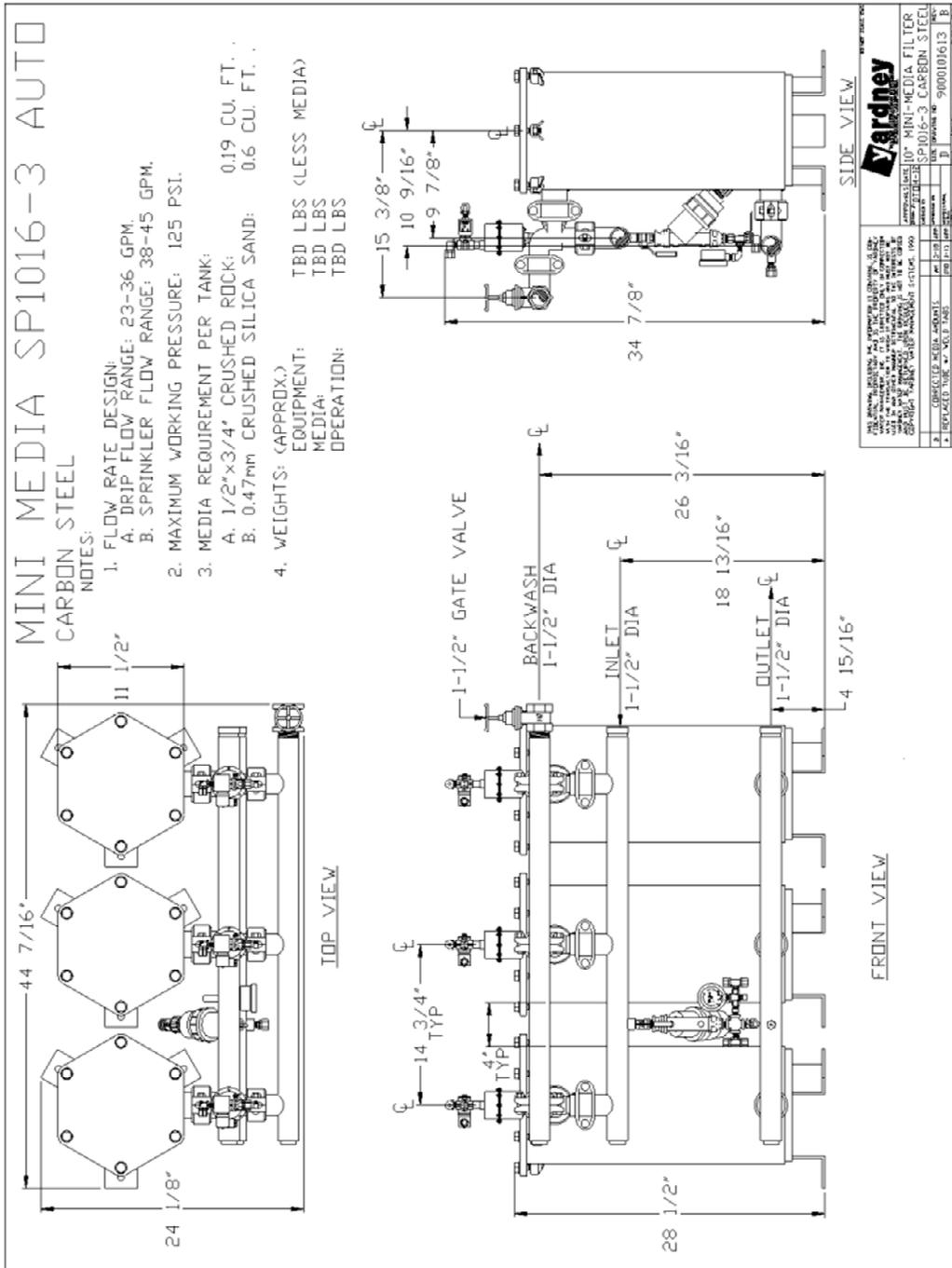


FIGURE 8: MINI MEDIA THREE TANK ASSEMBLY.