

High Efficiency Sand Filter Model CWST

Single Tank



Table of Contents

1	CO	NTACT DETAILS4				
2	INT	RODUCTION				
	2.1	Warranty Claims and Liability				
3	OPERATIONAL OVERVIEW					
3.1 Modes of Operation						
3.1.1 Service Mode						
	3.1.	2 Backwash Mode	.7			
	3.2	Start-Up	.7			
	3.3	Initiating the Backwash Cycle	.7			
	3.3.	1 Automatic	.7			
	3.3.	2 On-Demand	.7			
	3.3.	3 Manual	.8			
	3.4	Backwash Sequence of Operations	.8			
	3.4.	1 Aborting the Backwash	.8			
	3.5	Automatic Backwash Timer	.9			
	3.5.	1 Setting the Automatic Timer	.9			
	3.6	System Backwash Pump Enable	.9			
	3.7	Optional Backwash Storage Tank	.9			
4	INS	TALLATION1	0			
	4.1	Unpacking Filter System1	0			
	4.2	Rigging1	0			
	4.3	Locating Filter System1	0			
	4.4	Filter System Assembly1	1			
4.5 Assembling Manifolds		Assembling Manifolds1	1			
4.6 Installing Safety Relief Valve		Installing Safety Relief Valve1	1			
4.7 Electrical		Electrical1	2			
4.8 Control / Motor Starter Package		Control / Motor Starter Package1	2			
	4.9	Control Package1	3			
	4.10	Pipe Connections1	3			
	4.11	Supply and Return Lines1	3			
4.12 Backwash Supply		Backwash Supply1	4			
	4.13	Waste Line1	4			

	4.14	Media Installation15					
	4.15	Installation Check List					
	4.16	Request for Startup					
	4.17	Startup Data Sheet					
	4.18	Filter Daily Log Sheet	19				
5	OPI	ERATION	20				
	5.1	Initial Startup	20				
	5.2	Seasonal Shutdown	20				
	5.3	Seasonal Startup	21				
	5.3	.1 Media	21				
	5.3	.2 Pump	21				
	5.3	.3 Manifolds	22				
	5.3	.4 System Automation	22				
	5.4	Freeze Protection	22				
6	OPI	ERATOR INTERFACE	23				
	6.1	Start Up Screen	23				
	6.2	Home Menu Screen	24				
	6.3	Control Menu Screen	25				
	6.4	Control View Screen	26				
	6.5	Manual Backwash Initiate Confirmation Screen	27				
	6.6	Manual Backwash Abort Confirmation Screen					
	6.7	Pump Control Screen	29				
	6.8	Activity Log Screen					
	6.9	Alarm Log Screen	31				
	6.10	Alarm Screen					
	6.11	1 E-Stop Screen					
	6.12	Setting Menu Screen	34				
	6.13	Backwash Setting Screen					
	6.14	Backwash Water Select Screen					
	6.15	Date & Time Screen3					
	6.16	Remote Control Screen					
	6.17	Setup IP Address Screen3					
	6.18	Change Password Screen					

6.19 Bac	kwash Setting Confirmation Screen41
6.20 Bac	kwash Water Select Confirmation Screen42
6.21 Bac	kwash Interlock Screen43
7 ALARM LIS	ST44
8 LOG LIST	
9 MAINTENA	ANCE
9.1 Mainte	enance Schedule49
9.1.1 R	Replacing Pump Mechanical Seal49
9.1.2 N	٨edia (Level & Condition)
9.1.3 R	Recommended Media Removal Procedure51
9.2 Contro	ol Functions51
10 CONSUN	MABLES AND SPARES
10.1 Con	nsumables
10.2 Spa	are Parts
11 DRAWIN	IGS
11.1 Flow	w Schematic58
11.2 Inst	tallation
11.3 Wiri	ing of Components60
11.4 Elec	ctrical Schematic65
12 OPTION	AL BACKWASH STORAGE TANK72

1 CONTACT DETAILS

We trust the unit meets all your expectations but in the event of any problems please do not hesitate to contact us as follows:

For all spares and consumables contact:

Customer Service Tel No: 1-800-535-5585

For all service or technical support contact:

Technical Support Tel No: 1-800-535-5585

Web address: <u>www.ameriwater.com</u>

(Or your local authorized **AmeriWater** dealer)

Useful Telephone Nos.

Tel No.....Contact Name:....

Tel No.....Contact Name:....

2 INTRODUCTION

This Installation, Operation, and Maintenance manual contains instructions for the AmeriWater filter series CWST. Check the model number on your filter system (located on the front of the control enclosure).

Read and understand each section of this manual before proceeding with installation and operation of your AmeriWater Filter System.

CAUTION: All WARNINGS AND CAUTIONS MUST BE FOLLOWED TO AVOID PERSONAL INJURY!

This filter system has been factory assembled and tested before shipping. The filter system may be broken down for shipping, with major components remaining assembled.

Report damage or missing parts immediately to AmeriWater. This filter system must be started by a Factory Authorized Representative.

START UP BY ANYONE OTHER THAN AN AUTHORIZED AGENT WILL VOID WARRANTY!

Contact AmeriWater at least two (2) weeks in advance to arrange start up.

Specifications subject to change without notice. Local codes supersede instructions in this manual. Contact AmeriWater with questions or to report significant deviations between local code and instructions.

System Description

AmeriWater High Efficiency Filter System series CWST are composed of the following major components: Filter vessel Filter Pump Pre-assembled pipe manifolds (may be packed loose) Valves Control / Motor Starter Panel Skid

2.1 Warranty Claims and Liability

AmeriWater warrants the Product to be free from defects in materials and workmanship. The warranty period shall not exceed (a) twelve (12) months from the date of startup (b) eighteen (18) months from the date of shipment, whichever occurs first. AmeriWater's obligation under this warranty is limited to repair or replacement of any part or parts found to be defective. AmeriWater shall not be required to incur expenses for labor outside of the place(s) of business of AmeriWater, nor travel expenses to fulfill its obligations hereunder. AmeriWater neither assumes nor authorizes any person to assume for it, any other liability in connection with the sale of Products.

This warranty shall not apply to any Product that has been subjected to abuse, misuse, alteration, neglect, or accident, nor to any Product that has been damaged as a result of any unusual force of nature such as flood, hurricane, tornado, or earthquake. All implied warranties, including any implied warranty of merchantability or of fitness for a particular purpose are disclaimed to the extent they extend beyond the above periods.

Manufacturer:

AmeriWater 3345 Stop 8 Road Dayton, OH 45414 United States of America

Telephone:	1-800-535-5585
Fax:	1-937-461-1988

3 OPERATIONAL OVERVIEW

This section describes the operation of standard High Efficiency Filter Systems as they are shipped from the factory. It is intended to be an aid to understanding the general operation of the unit for the equipment operator and should not be considered a technical reference.

3.1 Modes of Operation

There are two modes of operation for the CWST Series.

3.1.1 Service Mode

Incoming water is pumped into the top inlet of the filter tank, through the filtering media, out the bottom inlet of the tank and returned to the cooling system.

3.1.2 Backwash Mode

This is the CWST Series self-cleaning mode. Water is directed to enter the bottom of the tank at a controlled flow rate. The media bed is lifted and separated loosening the trapped particles. The water exits the top of the tank carrying away the previously filtered particulates to the drain.

3.2 Start-Up

When power is applied to the CWST Series filter, the filter cycle valves will advance to the service mode. In service mode, all service valves (V1&V2) will be open and all backwash valves (V3&V4) will close. The filter pump will be disabled for a period of 60 seconds to allow the cycle valves to move into proper position.

Applying power to the control box also starts a timing mechanism that initiates automatic backwash cycles at predetermined intervals.

3.3 Initiating the Backwash Cycle

There are three ways to initiate the backwash cycle.

3.3.1 Automatic

The Backwash Setting screen allows for a daily or weekly auto scheduled backwash.

3.3.2 On-Demand

Two pressure transducers monitor the input and output water pressures and send a signal to the PLC to start a backwash when the difference between inlet and outlet water pressure reaches the preset threshold of 18 PSI. This feature is also automatic.

3.3.3 Manual

The backwash cycle can be initiated manually at any time by pressing the **Manual Backwash** button on the *Control Menu* screen of the HMI. Once initiated, the backwash cycle will commence without operator assistance.

3.4 Backwash Sequence of Operations

Once a backwash has been initiated by any of the above methods, the sequence of events that follows will always be the same. The sequence is as follows:

- a) If a filter is using city water for backwash, the pump goes off. If the filter uses system water for backwash, the pump will be deactivated until the cycle valves turn, and the pump is reactivated. Note: If the system pressure exceeds 40 PSI, City Water mode should be used and the bypass valve should be opened.
- b) On single tank filters, all service valves (V1&V2) close at the same time. Event time is 60 seconds.
- c) Tank backwash begins.
- d) Tank backwash valves (V3&V4) open. Backwash duration is 5 minutes.
- e) When Tank backwash is complete, the backwash valves (V3&V4) close.
- f) After tank has been backwashed, all service valves open.
- g) The pump returns to run mode and the CWST Series Filter returns to service mode.

3.4.1 Aborting the Backwash

In certain situations, it may be desirable to abort a backwash. A backwash in progress can be aborted by pressing the **Backwash Abort** button on the *Control Menu* or *Control View* screen.

NOTE: If the backwash is being initiated by demand from the differential pressure, the backwash will be delayed only briefly. Demand for a backwash will continue until the differential pressure is brought below the preset threshold.

3.5 Automatic Backwash Timer

The backwash timer will automatically initiate a backwash at pre-determined intervals. The interval can be set to daily or weekly on the *Backwash Setting* screen.

3.5.1 Setting the Automatic Timer

The 24 hour or 7 day automatic backwash timer can be reset to zero by initiating a manual backwash. Thereafter, the CWST Series will backwash 24 hours or 7 days from the time you reset the timer, unless a manual or on demand backwash is initiated. The 7 day backwash interval is not recommended on cooling tower filters, only on closed loop water filters.

Note: In the event that electrical power is removed from the control box, the timer will keep the time with an internal battery. If the power failure happens right before a scheduled backwash and power is returned after the cycle should have started then the backwash will not occur until the next scheduled time (either the next day or the next week). A manual backwash can be initiated to maintain the schedule.

3.6 System Backwash Pump Enable

The CWST Series is a pressurized filter system designed to operate at a specific water flow rate. To achieve the specified flow rate, a pump is integrated into the CWST Series. Normally, this pump runs continuously whenever the system is in service mode. During backwash the pump is turned off if set to City Water and turned on if set to System Water on the *Backwash Water Select* screen. The system should not be set to System Water if the system pressure exceeds 40 PSI, as that will cause issues with the media bed.

3.7 Optional Backwash Storage Tank

The Backwash Storage Tank is used during a filter's backwash process to make sure the drain is not overwhelmed. The optional Backwash Storage Tank is designed to be paired with one filter, since it has one float switch to tell the CWST when the storage tank is full.

4 INSTALLATION

4.1 Unpacking Filter System

NOTE: Filter components may be placed next to the filter loose or packed in boxes on shipping skid. Be sure to remove all components before disposing of skid.

DO NOT LIFT OR PULL FILTER VESSELS BY SIDE PORTS; INTERNAL COMPONENTS MAY BE DAMAGED!

- a) Remove the crate and foam packing from the filter system.
- b) Inspect filter system and media for damage. Before signing bill of lading, report any damage to AmeriWater 800.535.5585.
- c) Unpack filter system as close as possible to installation location.

4.2 Rigging

a) Pallets should be lifted by a forklift or crane. Filter systems should be rigged from lift points. **Do not** allow rigging straps to contact system components.

4.3 Locating Filter System

- a) Filter should be located on a level floor or housekeeping pad.
- b) Vibration pads (not included) may be used under components and pipe stands for vibration isolation.

NOTE: Vibration pads, if used, should be placed under all components to ensure proper alignment.

- c) Floor load rating must be sufficient to accept filter weight.
- d) Place system in close proximity to water to be filtered. Factory representative should be consulted if filter will be over 20 feet from water source.
- e) Protect system from water temperatures below 32 °F and above 140 °F unless filter is designed for those temperature applications.
- f) The pipe run to the drain must be able to be 20 feet or less. Vertical drain pipe installations not to exceed 8 feet in height.

4.4 Filter System Assembly

a) Place system skid in desired location and level skid.

NOTE: If system was shipped assembled, the pipe assembly may be loose at flanges to avoid flex damage. Some piping may be shipped broken down to avoid damage from flexing.

b) Arrange vessel with valves front.

CAUTION: PERSONAL INJURY MAY RESULT! READ FOLLOWING CAREFULLY BEFORE PROCEEDING!

With vessel properly aligned and leveled and with manifolds attached, add base (stone) media. (See media addition in Section 4.14). This will counter balance the system and reduce tipping hazard.

NOTE: Be sure that vessel IS properly placed and aligned before adding base media. Vessel will be difficult to move with media added.

4.5 Assembling Manifolds

- a) Install any manifold piping that was shipped loose (if applicable). Make sure all threaded connections are securely tightened
- b) Assemble all interconnecting manifold flanges and secure unions. Tighten all connecting bolts at this time.

WARNING: DAMAGE TO MANIFOLD MAY RESULT IF THE MANIFOLD IS PLACED UNDER STRESS OR IF FLANGE BOLTS ARE OVER TIGHTENED!

4.6 Installing Safety Relief Valve

- a) Inspect components to ensure that male and female threads are clean and free of nicks, burrs, scratches or any foreign materials.
- b) Ensure the male thread is not cross-threaded in the female thread before tightening fitting. Dry fit the fittings together before applying tape. Record the number of turns where the fittings begin to tighten.
- c) Teflon tape is wrapped in a clockwise direction as viewed from the end of the fitting. Ensure tape is pulled tightly against the threads of the fitting while wrapping.
- d) Begin to wrap Teflon tape from the base of the fitting toward the outer threads.

- e) Proceed down the threads to the end leaving a thread at the end of the fitting for a clean engagement.
- f) Proceed back up the fitting to the base and tear off.
- g) Depending on the length of the threading, this should take from <u>2-4 wraps*</u>. Always keep the number of wraps to a minimum to prevent additional stress on the female fitting.
- h) Apply a layer of thread sealant smoothly over the threads.
- i) Screw the fittings together until they are in the FINGER TIGHT position (according to step b).
- j) Secure the female fitting and use a wrench to tighten the female fitting 1.5 to 2 turns. Failure to follow the recommended number of turns past finger tight may result in failure of the fitting. Never back off pipe threaded connections to achieve alignment.
- k) If leaking occurs after the above steps, check threads for damage. The total number of engagements should be between 3 ½ and 6 threads. Any number of threads outside this range may indicate either under or over tightened fittings.
- I) It is recommended to plumb the outlet of the safety relief valve to a nearby drain.

4.7 Electrical

NOTE: Filter control panel and pump must have a solid earth ground. Conduit and water pipe are NOT acceptable ground.

- a) All wiring must be properly sized, rated, and connected in accordance with local, state, and national electrical codes.
- b) Filter system should be on a dedicated circuit originating at a service disconnect panel.

NOTE: If filter pump motor starter is not factory supplied it must be wired with a dedicated disconnect.

c) Penetrations to filter control panel should be made with watertight connectors to preserve NEMA 4X rating.

4.8 Control / Motor Starter Package

a) Factory installed motor starter package includes a service disconnect, motor starter, and transformers pre-wired to the PLC. These systems require a single point electrical connection to the service disconnect. Line service must be rated to pump motor requirements. Standard systems are factory set for 208V or 460V, 3ph service based on filter model. b) Wire the pump motor from the motor starter with seal tight (provided).

NOTE: Do not operate pump dry. Damage to pump seal and shaft may occur.

4.9 Control Package

- a) The control package is pre-wired at factory.
- b) Two sets of terminals, located in the control panel, are provided for pump control.
- c) Power for motorized valves is supplied from control panel terminal strip. Valves and pressure transducers will need to be wired according to Section 11.3.

NOTE: Changes to panel without instructions from AmeriWater may void the filter warranty.

4.10 Pipe Connections

Recommended pipe size for all pipe connections are noted in schedule.

Connecting pipe should be of materials compatible in construction to filter manifold. Dielectric fittings are highly recommended if dissimilar metals are used.

Pipe runs shall not exceed 20 feet from filter system.

The companion full-face flange to the suction side of the filter pump is to be provided by enduser or contractor.

Basket or Y strainer (with gauges before and after strainer) is recommended ahead of filter pump at the size of the recommended pipe size.

Reference Section 11.2 for typical installation. **Properly secure all pipe runs with M & F clamps (or similar). Pipe movement may cause filter and / or pipe damage.**

4.11 Supply and Return Lines

NOTE: Isolation valves are recommended convenient to filter.

a) Connect influent (supply) line from pre-selected point in cooling system to suction side of filter pump.

NOTE: A foot valve / check valve should be installed on suction side of self-priming pump to prevent loss of pump prime.

b) Connect effluent (return) line from the outlet connection to the pre-selected point in the cooling system (downstream of inlet connection).

NOTE: Filter return must be connected to a point in the cooling system where cooling system pressure is equal to or less than pressure to filter pump suction.

NOTE: Filter supply and return lines should be connected to the cooling system where they are in an area of 'common' flow.

Reference Section 11.2 for connections.

4.12 Backwash Supply

NOTE: If filter is designed to use cooling system water for backwash, no backwash supply pipe is required in this section. (Skip to waste line section)

NOTE: Clean water supply is always recommended for closed loop filters.

Backwash supply requires min / max 30/60 psig at the filter. Make sure to consider the 10 PSI loss at the backflow preventer if installed. An isolation valve is recommended, convenient to filter. Backflow preventer is recommended and commonly required by local codes when potable water is used for backwash. A pressure gauge is recommended at the discharge of the backflow preventer.

NOTE: An efficient backflow preventer will create approximately 12 psig loss in line pressure. A minimum of 30 psig must be available at outlet side of backflow preventer.

Connect properly sized backwash supply line to inlet side of backwash flow control device.

4.13 Waste Line

NOTE: Ensure drain is adequately sized and free flowing to handle backwash flow. Optional Backwash storage tank is available to help handle the backwash flow.

A swing check valve is recommended for waste lines with a vertical lift. Check valve should be installed immediately after the filter waste line connection. Ball Type or Spring Type Checks Are <u>Not</u> Acceptable.

Drainpipe runs shall not exceed 20 feet or an 8-foot lift from filter system.

Connect properly sized drain line to filter backwash drain.

4.14 Media Installation

WARNING: PROPER PROTECTIVE EQUIPMENT MUST BE WORN WHEN INSTALLING MEDIA. PERSONNEL HANDLING MEDIA MUST WEAR A DUST MASK OR RESPIRATOR FOR LUNG PROTECTION AND GOGGLES FOR EYE PROTECTION. REFER TO SAFETY DATA SHEET (SDS) FOR COMPLETE INFORMATION.

- a) Media containers are labeled. Separate containers according to vessel and order of addition. Before installing media, inspect media containers for loss during shipping. Notify AmeriWater if media loss is suspected. All loses must be verified by authorized factory representative.
- b) Remove top filter vessel closure.

NOTE: Fill vessel 1/3 full with water to cover under drain before adding media. This will help to level the media, expel air, and reduce dust exposure.

- c) Add media in the order as indicated on media container label.
- d) Install top distributor basket into elbow at top inlet inside tank. Note: the basket is shipped connected to the back of the filter vessel.
- e) Fill vessel to top with water.
- f) Replace and secure vessel gasket and closure.
- g) Allow the media to soak in the water for 24 hours.

NOTICE: Contact AmeriWater at 800.855.5535 to arrange for factory authorized technician to do startup and training. AT LEAST A TWO-WEEK ADVANCE NOTICE IS REQUIRED. START UP BY UNAUTHORIZED PERSON MAY VOID WARRANTY!

4.15 Installation Check List

All flange bolts and unions tightened
Media installed (Section 4.14)
Vessel caps installed and secured
All recommended components installed per Typical Installation Sketch
Filter effluent (return) line connected to cooling system at point where pressure is equal to or lower than filter influent (supply) line
All pipes properly secured to avoid movement
Safety relief valve installed (Section 4.6)
Power to control panel disconnect from dedicated supply w/ correct voltage (Section 4.7)
Pump wired from motor starter (Section 4.8)
Pump rotation correct
Backwash supply connected (Section 4.12)
Drain connected (Section 4.13)
24-hour soak and 45 minute install backwash (Sections 4.14 and 5.1)

4.16 Request for Startup

Request for Startup

Please complete this form and return via fax to schedule startup date. At least a two-week
advance notice is required for startup.

AmeriWater Fax: 937.461.1988

Please have a factory authorized technician contact me to arrange startup for the AmeriWater Sand Filter System.

System location:

Note: All items listed below must be complete before startup personnel arrive. Should installation not be complete, additional charges may be incurred, including but not limited to, additional labor hours, travel expenses, and materials provided for startup.

All flange bolts and unions tightened
Media installed
Vessel caps installed and secured
Isolation valves, check valves, and pump strainer installed
Filter effluent (return) line connected to cooling system at point where pressure is equal to or lower than filter influent (supply) line
All pipes properly secured to avoid movement
Safety relief valve installed
Power connected to panel
Pump wired from motor starter
Pump rotation correct
Control panel wired with dedicated power supply of correct supply
Backwash supply connected
Drain connected
Authorized Signature: Date:

Printed Name:_____ Phone #:_____

<u>Star</u> AmeriWat	<u>rt Up Data</u> er Filter Sy	C Ame The Water 3345 Stoj 800-855-5	AmeriWater The Water Purification Specialists 3345 Stop 8 Rd., Dayton, OH 45414 800-855-5535 Fax 937-461-1988		
То	Be Completed by Fa	ctory Autho	rized Representativ	e at Start up	
Customer:			Start up date:		
Address:					
Contact:					
Tel/Fax/Email:					
Filter Data:					
Model #:					
Serial #:					
Pump Model:					
Pump Serial #:					
Motor HP:					
Valves:					
Connection Data: Electrical:	<u>Control Power:</u> <u>Pump Power:</u>				
PLC Brand:					
<u>System Water:</u>	<u>PSI to Pump:</u> <u>Suction PSI to</u> Cooling System:		<u>PSI across filter</u> after backwash:	<u>ln</u>	<u>Out</u>
Backwash Supply:	<u>Potable:</u> <u>System:</u> <u>Other:</u> Backwash Count:		<u>Pressure:</u>		
Notes:					
Tech			Customer:		

4.18 Filter Daily Log Sheet

Company: Filter Model: Serial Number: Start up Date:



AmeriWater Filter Daily Log Sheet

Date	Pressure In	Pressure Out	Backwash Count	Number of Backwashes	Notes
	<u> </u>				

5 OPERATION

5.1 Initial Startup

Note: Initial Startup must be performed by an Authorized Factory Technician.

- a) After the media has been installed and allowed to soak for 24 hours, a 45-minute install backwash needs to be performed.
- b) Check all bolts and fittings for tightness. Then Unlock the system by entering the password and navigate to the *Backwash Setting* screen [Enter Password > Setting Menu > Backwash Setting]. Change the *Each Tank Backwash Time* to 45 minutes and the *Auto Schedule* to Daily.
- c) Select the **Home** button and navigate to the *Control Menu* screen to select the **Manual Backwash** button. A confirmation screen will come up, select yes to begin the backwash.
- d) When the backwash is complete, the system will go into Service.
- e) Check that actuator valves rotate correctly and service occurs as expected.
- f) Navigate to the *Control View* screen [Enter Password > Control Menu > Control View] and turn the throttling valve on the system until the *Pressure Difference* reads 10 psi.
- g) The *Each Tank Backwash Time* can be set to 5 or 15 minutes at this time.
- h) The throttling valve will need to be fully opened after a few days. To accomplish this, preform a backwash each day and then adjust the throttling valve until the *Pressure Difference* reads 10 psi again.

5.2 Seasonal Shutdown

If the filter system will be shut down for a prolonged period of time (over 1 week), the following procedures should be performed:

- a) Backwash the system to remove debris from media.
- b) Isolate and secure the filter system.
- c) Drain system from system drain and leave drain open.
- d) Open filter vessel and inspect media. Clean or replace as necessary.
- e) Replace filter access cover gasket and cap. Leave bolts loose.

5.3 Seasonal Startup

5.3.1 Media

a) Check all bolts and fittings for tightness. Initiate filter backwash.

Note: Stop backwash cycle before it is completed (about 4 minutes in) by de-energizing system at service disconnect on control panel.

Perform the following steps with the filter system isolation valves closed.

- b) Energize the disconnect and start to drain filter system through lower drain manual valve. Check filter readings to ensure pressure is reading zero before turning the system off and proceeding to next step.
- c) Remove filter vessel cover. Inspect cover and cover gasket, replace if necessary.
- d) **Note: Drain water to top of sand then close drain.** Inspect filter media. Sand should appear clean and loose. Manually remove any debris from top of sand.
- e) Level of sand in the filter vessel should be approximately 7.5" 8.5" from bottom of filter inlet. If media level is below normal or appears other than loose sand, contact AmeriWater 800.855.5535.

Note: Media may appear colored. This condition is common and usually due to the presence of iron oxide or organics in the system water.

- f) If sand is at normal operating level and clean, refill vessel with water.
- g) Replace filter access cover gasket and cover, and secure cover bolts.

5.3.2 Pump

- a) Remove basket strainer or 'Y' strainer cover (if applicable).
- b) Inspect cover gasket. Replace or lubricate as needed and reinstall.
- c) Remove and clean strainer basket.
- d) Replace basket and secure cover(s).
- e) Lubricate pump motor and pump shaft (if required).
- f) Turn pump by hand, if possible, to ensure ease of movement.
- g) Verify pump rotation.

5.3.3 Manifolds

a) Open isolation valves and check for leaks in fittings and pipe before energizing filter system.

5.3.4 System Automation

- a) Energize control system.
- b) Engage manual backwash by pressing **Manual Backwash** button on *Control Menu* screen.
- c) Allow system to backwash for full cycle. After last vessel backwashes allow system to return to filter mode.
- d) Pressure differential should now be close to that indicated on startup data sheet (typically 8 12 PSI).
- e) Check voltage and amperage on pump motor leads. Current/amp draw should not exceed rating on motor nameplate.
- f) Check system for unusual noise or vibration. **Contact AmeriWater 800.535.5585 if any unusual conditions are noted.**

5.4 Freeze Protection

If filter is to be installed in an area where freezing is likely, all wetted surfaces should be heat traced and insulated to protect equipment from freezing. Follow shutdown procedures to reduce the likelihood of damage during winter shutdown periods.

6 OPERATOR INTERFACE

6.1 Start Up Screen



- (1) Real Time Clock
 - a. FORMAT: DD/MM/YY HH:MM:SS DAY
- (2) Alarm Indicator
 - a. Only visible when alarm is present
 - b. Blinking every 0.5 seconds
 - c. All the valves will move to closed position and pump will be off while this alarm indicator is present (only for Alarms in Red in Section 7)
- (3) Login as a Master User
 - a. Password screen pops up when pressing the Master Login text
 - b. Correct password allows access to the Home Menu screen
- (4) Backwash/Service Status Indicator
 - a. Only visible when the system is in backwash or service
 - b. "Backwash in Progress" or "Service in Progress" will show up when visible
- (5) Login as a Customer
 - a. Password screen pops up when pressing the Press Here to Unlock text
 - b. The password can be changed from Change Password screen
 - c. Correct password allows access to the Home Menu screen
 - d. Default password is 0000
- (6) Backwash Remaining Timer
 - a. Only visible while the system starts to backwash the first tank until end of the timer
 - b. Completing this timer initiates service mode
 - c. This timer is adjustable to 5, 15, or 45 minutes on the Backwash Setting screen
- (7) Backwash Total Number

- a. Count total number of backwash initiated
- b. This number is not resettable
- (8) Pressure Monitor
 - a. Displays current backwash inlet pressure from 0-300 psi
 - b. Displays current filter inlet pressure from 0-300 psi
 - c. Displays current filter outlet pressure from 0-300 psi
 - d. Displays pressure difference between filter inlet and filter outlet

6.2 Home Menu Screen



- (9) Master Login Indicator
 - a. When login as a master user, "Login as a Master" text is always visible on the top of the screen.
- (10) Control Menu
 - a. Pressing the button will display the Control Menu screen
- (11) Activity Log
 - a. Pressing the button will display the Activity Log screen
- (12) Alarm log
 - a. Pressing the button will display the Alarm Log screen
- (13) Setting Menu
 - a. Pressing the button will display the Setting Menu screen
- (14) Lock Screen
 - a. Pressing the button will display the Start Up screen

6.3 Control Menu Screen



- (15) Control View
 - a. Pressing the button will automatically display the *Control View* screen with correct number of tank system, based on selected number of tank system in setting
 - b. If no tank system is selected, pressing button will automatically display the *Tank* # *Select* screen
- (16) Manual Backwash
 - a. Pressing the button will display the Manual Backwash Initiate Confirmation screen
 - b. If no tank system is selected, pressing button will automatically display the *Tank* # *Select* screen
- (17) Backwash Abort
 - a. Pressing the button will display the Manual Backwash Abort Confirmation screen
 - b. If no tank system is selected, pressing button will automatically display the *Tank* # *Select* screen
- (18) Pump Control
 - a. Pressing the button will display the Pump Control screen
- (19) Home Button
 - a. Pressing the button will display the *Home Menu* screen

6.4 Control View Screen



- (20) Text Information
 - a. Abbreviation for each valves that are used on the system
- (21) Backwash Abort
 - a. Same function as (17) but only visible when system is in service mode
 - b. Pressing the button will display the Manual Backwash Abort Confirmation screen
- (22) Service Inlet Status
 - a. Show the status as "OPEN", "CLOSE", or "FAIL"
- (23) System Drain Status
 - a. Show the status as "OPEN", "CLOSE", or "FAIL"
- (24) Backwash Inlet Status
 - a. Show the status as "OPEN", "CLOSE", or "FAIL"
- (25) Service Outlet Status
 - a. Show the status as "OPEN", "CLOSE", or "FAIL"
- (26) Pump Status
 - a. Show the status as "ON", "OFF", or "FAIL"
- (27) Backwash Total Number
 - a. Count total number of backwash initiated
 - b. This number is not resettable

- (28) Backwash/Service Status Indicator
 - a. Same function as (4) but has color around the text
 - b. Green color for backwash and sky blue color for service
 - c. Only visible when the system is in backwash or service
 - d. "Backwash in Progress" or "Service in Progress" will show up when visible
- (29) Back button
 - a. Pressing the button will display the *Control Menu* screen

6.5 Manual Backwash Initiate Confirmation Screen



- (30) Backwash Initiate Confirmation Button
 - a. Pressing the button will initiate backwash process
 - b. Pressing the button will automatically display the *Control View* screen with correct number of tank system, based on selected number of tank system in setting



6.6 Manual Backwash Abort Confirmation Screen

- (31) Backwash Abort Confirmation Button
 - a. Pressing the button will abort backwash process and initiate service process
 - b. Pressing the button will automatically display the *Control View* screen with correct number of tank system, based on selected number of tank system in setting
- (32) Back button
 - a. Pressing the button will display the previous page

6.7 Pump Control Screen



* System turns on pump only when each valves are properly set.

- * Pump will be automatically off while actuator valves are moving.
 - (33) Pump Off Button
 - a. Pressing the button will force the pump off at any time
 - (34) Pump Auto Button
 - a. Pressing button sets the pump to on/off automatically based on the process
 - (35) Pump Status Indicator
 - a. Shows the status of the pump
 - b. "OFF" or "AUTO" will be displayed
 - (36) Warning Information
 - a. "Pump was remotely controlled last time." text is visible when customer controlled the pump remotely via hardwire or Ethernet
 - b. This text dissapears as soon as cutomer controls the pump from the HMI screen

6.8 Activity Log Screen



* The log list automatically update to top list when new log item is triggered.

- (37) 0-99 number indicator
 - a. This number is for easy visual distinguishment between each item in the log
 - b. The number indicator restarts at 0 after 99
- (38) Date Stamp
 - a. Stamp date for each stored item
 - b. FORMAT: DD/MM/YY
- (39) Time Stamp
 - a. Stamp time for each stored item
 - b. FORMAT: HH:MM:SS
- (40) Log Information
 - a. Stamp description for each stored item (refer to Section 8 for more information)
- (41) Log Page Up Button
 - a. Pressing the button will shift down the log lists
 - b. Log lists do not shift down when first log on screen reaches to most recent log hisotry
- (42) Log Page Down Button
 - a. Pressing the button will shift up the log lists
 - b. Log lists do not shift up when 5th log on screen reaches to oldest log hisotry
- (43) Clear History Button
 - a. Only visible when login as a master user
 - b. Empty all the log history

6.9 Alarm Log Screen



* The alarm list automatically updates to the top list when a new alarm is triggered.

- (44) 0-99 number indicator
 - a. This number is for easy visual distinguishment between each alarm
 - b. The number indicatior restarts at 0 after 99
- (45) Date Stamp
 - a. Stamp date for each stored alarm
 - b. FORMAT: DD/MM/YY
- (46) Time Stamp
 - a. Stamp time for each stored alarm
 - b. FORMAT: HH:MM:SS
- (47) Alarm Information
 - a. Stamp description for each stored alarm (refer to Section 7 for more information)
- (48) Alarm Page Up Button
 - a. Pressing the button will shift down the alarm lists
 - b. Alarm lists do not shift down when first alarm on screen reaches to most recent alarm history
- (49) Alarm Page Down Button
 - a. Pressing the button will shift up the alarm lists
 - b. Alarm lists do not shift up when 5th Alarm on screen reaches to oldest alarm history
- (50) Clear History Button
 - a. Only visible when login as a master user
 - b. Empty all the alarm log
- (51) Alarm Reset
 - a. Pressing the button will remove blinking alarm notification on the top of the screen

- b. After pressing the button, system will try to go to service mode
- c. Alarm will trigger again if the fault condition is not recovered
- (52) Alarm Calibration
 - a. Only visible, not modifyable
 - b. Apply to ALARM #034 through ALARM #039, which sets low and high limits of each alarm (refer to Section 7 for more information)
 - c. City Water Pressure is set for a minimum of 20 PSI and a maximum of 90 PSI
 - d. System Water Pressure is set for a minimum of 0 PSI and a maximum of 125 PSI for PVC systems, 150 PSI for Low Pressure Copper systems, and 300 PSI for High Pressure Copper systems

6.10 Alarm Screen

99/99/99 99:99:99 SL	JNDAY (1) ALARM ACTIVATED (2)
	(53) ALARM #039: System Water Pressure Too High From Backwash Inlet Pressure Transducer
(54)	AmeriWater

* This screen will automatically pop up when any alarm triggers, as well as stamping it in the alarm log.

* If the system is on the *Manual Operation* or *E-Stop* screen, this screen will not pop up and not override the current status, but will still stamp to the alarm log.

- (53) Alarm Information
 - a. Display alarm information (refer to Section 7 for more information)
- (54) Back button
 - a. Pressing the button will display the Start Up screen

6.11 E-Stop Screen



* This screen will automatically pop up when the user presses the emergency stop button and will activate a gerneral alarm notification on the top of the screen.

- (55) Back button
 - a. Same function as (54) but only emergency button is no longer activated
 - b. Pressing the button will display the Start Up screen

6.12 Setting Menu Screen



- (56) Backwash Setting
 - a. Pressing button will display the Backwash Setting screen
 - b. Pressing button while the system is in backwash process will display the *Backwash Setting Confirmation* screen
- (57) Backwash Water Select
 - a. Pressing button will display the Backwash Water Select screen
 - b. Pressing button while the system is in backwash process will display the *Backwash Water Select Confirmation* screen
- (58) Date & Time
 - a. Pressing button will display the Date & Time screen
- (59) Tank # Select
 - a. Only visible when login as a master user
 - b. Pressing button will display the Tank # Select screen
- (60) Remote Control
 - a. Pressing button will display the Remote Control screen
- (61) Change Password
 - a. Pressing button will display the Change Password screen
 - b. Enter same login password as logged in currently, if user entered customer login, customer password is required to access *Change Password* screen
- (62) Manual Operation
 - a. Only visible when login as a master user
 - b. Pressing button will display the Manual Operation Confirmation screen
- (63) Software Version
 - a. Display the current PLC program version
6.13 Backwash Setting Screen



- (64) Auto Schedule
 - a. Select daily or weekly auto backwash schedule from the last time backwash has been initiated
 - b. Select daily option inactivates ALARM #033 (refer to Section 7 for more information)
 - c. Select weekly option inactivates ALARM #032 (refer to Section 7 for more information)
 - d. Auto Schedule timer resets when backwash process is initiated
- (65) Each Tank Backwash Time
 - a. Setup backwash duration of each tank
 - b. 5 mins, 15 mins, or 45 mins
- (66) Warning Information
 - a. "Backwash operation is deactivated during this setup screen" is always visible
 - b. Preventing the risk of changing settings while the system is in backwash process
- (67) Back Button
 - a. Pressing the button will display the Setting Menu screen

6.14 Backwash Water Select Screen



PAGE 17: BACKWASH WATER SELECT SCREEN

- (68) Backwash Water Select
 - a. Select city water or system water during backwash process
 - b. This does not affect pump operation during service process
 - c. Select city water turns off pump during backwash process
 - d. Select system water turn on pumps only while backwash valves are properly set
 - e. Pump will be automatically off while actuator valves are moving

6.15 Date & Time Screen



- (69) Change Date
 - a. Display current Date
 - b. FORMAT: DD/MM/YY
 - c. Key pad entry will pop up when pressing the box to change the current date
- (70) Change Time
 - a. Display Current Time
 - b. FORMAT: HH:MM:SS
 - c. Key pad entry will pop up when pressing the box to change the current time

6.16 Remote Control Screen



- (71) Text Information
 - a. Show memory bits for Ethernet connection
- (72) Text Information
 - a. Show inputs and outputs of PLC system for remote connection
- (73) IP Address Set Up Button
 - a. Pressing this button will display the Setup IP Address screen
- (74) Back Button
 - a. Pressing the button will go back to previous page

6.17 Setup IP Address Screen



- (75) IP (Internet Protocol)
 - a. Pressing each box configure IP address
- (76) Subnet
 - a. Pressing each box configure subnet address
- (77) Default Gateway
 - a. Pressing each box configure default gateway address
- (78) Confirm Button
 - a. Pressing the button will confirm the new settings

6.18 Change Password Screen



- * If user login as a customer, customer password is required to access this screen
- * If user login as a master user, master password is required to access this screen
 - (79) Change Password
 - a. Key pad entry will pop up when pressing the box to change current user password
 - b. This only changes customer's password
 - c. Default password is 0000



6.19 Backwash Setting Confirmation Screen

- (80) Backwash Setting Confirmation Button
 - a. Pressing the button will display the *Backwash Setting* screen
 - b. Auto/Scheduled backwash will be prevented once user presses the button and function will return when the setting menu is exited



6.20 Backwash Water Select Confirmation Screen

- (81) Backwash Water Select Confirmation Button
 - c. Pressing the button will display the Backwash Water Select screen
 - d. Auto/Scheduled backwash will be prevented once user press the button and function will return when the setting menu is exited

6.21 Backwash Interlock Screen



* This screen automatically pops up when customer presses manual backwash button on *Control Menu* screen while interlocked unit is in backwash.

* Any Backwash process is prevented while interlocked unit is in backwash.

7 ALARM LIST

All the actuator valves will move to closed position when any of the alarms are triggered.

RED - Manual backwash is not available while these alarms are present. Valve will stay closed until alarm is reset. High risk.

BLACK – Manual Backwash is available while these alarms are present. Low risk.

See Diagnostic Guide for Checks and Proposed Actions for each alarm.

0	1	
Alarm #	Alarm Info	Description
ALARM	Excessive Backwash	Caused by more than 15 backwash attempts within 24
#001		hour timer
"001	(More Than 15 Backwashes	
	were Initialized within 24	This timer results over 24 hours or when Alarm Boset
	were initialized within 24	huttag is triggered
	Hours)	button is triggered
ALARM	Pump Overload	Caused by motor overload tripping, due to short circuit
#002		or thermal overload
		Motor contactor sends overload signal to PLC input I1
ALARM	Backwash Inlet Pressure	Caused by backwash inlet pressure out of range from
#003	Transducer Failure	0–300 psi for more than 2 seconds
	(Out of Pressure Range)	
ALARM	Filter Inlet Pressure	Caused by filter inlet pressure out of range from 0–300
#004	Transducer Failure	psi for more than 2 seconds
	(Out of Pressure Range)	
ALARM	Filter Outlet Pressure	Caused by filter outlet pressure out of range from 0–
#005	Transducer Failure	300 psi for more than 2 seconds
	(Out of Pressure Range)	
ALARM	Service Inlet Valve Failure	Caused by service inlet open limit switch and service
#006		inlet close limit switch pressed simultaneously for more
	(Open and Close Limit Switch	than 1 second
	Are Triggered Simultaneously)	
ALARM	Service Inlet Valve Failure	Caused by service inlet open limit switch is not pressed
#007		for more than 2.5 minutes while service inlet actuator
11007	(Open Limit Switch Is Not	is energized to open the value
	Triggorod)	
	Sorvice Inlet Value Failure	Caused by convice inlat close limit switch is not pressed
		for more than 2.5 minutes while convice inlat activities
#008	(Class Limit Curitals Is Nat	is operated to close the value
		is energized to close the valve
	Iriggered)	
ALARM	Service Outlet Valve Failure	Caused by service outlet open limit switch and service
#009		outlet close limit switch pressed simultaneously for
	(Open and Close Limit Switch	more than 1 second
	Are Triggered Simultaneously)	

ALARM Ser	vice Outlet Valve Failure	Caused by service outlet open limit switch is not
#010		pressed for more than 2.5 minutes while service outlet
(Op	en Limit Switch Is Not	actuator is energized to open the valve
Trig	gered)	
ALARM Ser	vice Outlet Valve Failure	Caused by service outlet close limit switch is not
#011		pressed for more than 2.5 minutes while service outlet
(Clo	ose Limit Switch Is Not	actuator is energized to close the valve
Trig	ggered)	
ALARM Bac	kwash Inlet Valve	Caused by backwash inlet open limit switch and
#012 Fai	lure	backwash inlet close limit switch pressed
		simultaneously for more than 1 second
(Op	en and Close Limit Switch	
Are	Triggered Simultaneously)	
ALARM Bac	kwash Inlet Valve	Caused by backwash inlet open limit switch is not
#013 Fai	lure	pressed for more than 2.5 minutes while backwash
		inlet actuator is energized to open the valve
(Op	en Limit Switch Is Not	
Trig	ggered)	
ALARM Bac	kwash Inlet Valve	Caused by backwash inlet close limit switch is not
#014 Fai	lure	pressed for more than 2.5 minutes while backwash
		inlet actuator is energized to close the valve
(Clo	ose Limit Switch Is Not	
Trig	ggered)	
ALARM Sys	tem Drain Valve Failure	Caused by system drain open limit switch and
#015		backwash outlet close limit switch pressed
(Op	en and Close Limit Switch	simultaneously for more than 1 second
Are	Triggered Simultaneously)	Conservations and the second state of the theory to be the second
ALARM Sys	tem Drain Valve Failure	Caused by system drain open limit switch is not
#016		pressed for more than 2.5 minutes while backwash
(Op	en Limit Switch Is Not	outlet actuator is energized to open the valve
Trig	ggered)	
ALARM Sys	tem Drain Valve Failure	Caused by system drain close limit switch is not
#017		pressed for more than 2.5 minutes while backwash
	se Limit Switch is Not	outlet actuator is energized to close the valve
	(gered)	
ALARIM E-S	TOP	Caused by pressing the emergency button
#030		Emergency by the sends overload signal to DLC input
		Emergency button sends overload signal to PLC input
		IV
	BATTERY LOW	Caused by low internal battery from PLC
#051		When you replace the batteny you lose PAM values
		ייחבה צטע דבאומנב נהב שמננברץ, צטע וטצב האועו values
	ly Rackwach Eailura	ONITY ADDITIES WHEN BACKWARD CETTING IS SELECTED
#032	ly Backwash Failure	ONLY APPLIES WHEN BACKWASH SETTING IS SELECTED

	(Backwash Not Fully	Caused by incompletion of full backwash process
	Completed at Least Once	within 24 hour timer
	within 24 Hours)	
		This timer resets every 24 hours or when Alarm Reset
		button is triggered
ALARM	Weekly Backwash Failure	ONLY APPLIES WHEN BACKWASH SETTING IS SELECTED
#033	,	AS WEEKLY
	(Backwash Not Fully	
	Completed at Least Once in 7	Caused by incompletion of full backwash process
	Davs)	within 7 days timer. This timer resets every 7 days or
		when Alarm Reset button is triggered
	City Water Pressure Too	
	Low	
#034		BACKWASH FROCESS ONET (FOMF OTT)
	(From Backwash Inlet	Caused by backwash inlet pressure transducer reading
	Prossure Transducer)	too low, but doos not fall bolow 0 psi. (this lower limit is
		configured by AmeriW(ster)
	City water Pressure 100	
#035	ніви	BACKWASH PROCESS (POIMP OFF)
	(From Dockwork Inlat	Coursed by backwork inlat process to transducer reading
	(From Backwash Inlet	Caused by backwash inlet pressure transducer reading
	Pressure Transducer)	too nigh, but does not exceed 300 psi. (this upper limit
		is configured by AmeriWater)
ALARM	System Water Pressure Too	APPLIES TO SYSTEM WATER (PUMP ON)
#036	Low	
		Caused by filter inlet pressure transducer reading too
	(From Filter Inlet Pressure	low, but does not fall below 0 psi. (this lower limit is
	Transducer)	configured by AmeriWater)
ALARM	System Water Pressure Too	APPLIES TO SYSTEM WATER (PUMP ON)
#037	High	
		Caused by filter inlet pressure transducer reading too
	(From Filter Inlet Pressure	high, but does not exceed 300 psi. (this upper limit is
	Transducer)	configured by AmeriWater)
ALARM	System Water Pressure Too	APPLIES TO SYSTEM WATER DURING BACKWASH
#038	Low	OPERATION (PUMP ON)
	(From Backwash Inlet	Caused by backwash inlet pressure transducer reading
	Pressure Transducer)	too low, but does not fall below 0 psi. (this lower limit is
		configured by AmeriWater)
ALARM	System Water Pressure Too	APPLIES TO SYSTEM WATER DURING BACKWASH
#039	High	OPERATION (PUMP ON)
	_	
	(From Backwash Inlet	Caused by backwash inlet pressure transducer reading
	Pressure Transducer)	too high, but does not exceed 300 psi. (this upper limit
		is configured by AmeriWater) too high, but does not
		exceed 300 psi. (this upper limit is same as ALARM
		#037)

8 LOG LIST

Logged Item	Description	Additional Note
Manual Backwash Initiated	Triggers when user initiates	This action is prevented while
	manual backwash from the	system is interlocking with
	HMI touch screen.	other unit and the other unit is
		in backwash.
		(Input Terminal 1D and 1L)
		(Output Terminal 50 and 51)
		This action is prevented during
		Backwash and Water Selection
		Setting screen.
Backwash Aborted	Triggers when backwash is	Remote Abort:
	aborted. This includes manual	Ethernet = Trigger MB303
	abort, remote abort, etc.	
		Hardwire = Trigger INPUT4
		longer than 10 seconds while
		system is in backwash mode
		(Terminal 1D and 1K)
		The system will go to service
De aleura als Canada ta al		mode.
Backwash Completed	hadwash is completed	ne system will go to service
	Dackwash is completed.	mode.
Domoto Backwach Initiated	Triggors when user initiates	Domoto Starts
Remote Backwash Initiated	Triggers when user initiates	Remote Start:
Remote Backwash Initiated	Triggers when user initiates remote backwash from	Remote Start: Ethernet = Trigger MB302
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K)
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K)
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K) This action is prevented while
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K) This action is prevented while system is interlocking with
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K) This action is prevented while system is interlocking with other unit and the other unit is
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K) This action is prevented while system is interlocking with other unit and the other unit is in backwash.
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K) This action is prevented while system is interlocking with other unit and the other unit is in backwash. (Input Terminal 1D and 1L)
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K) This action is prevented while system is interlocking with other unit and the other unit is in backwash. (Input Terminal 1D and 1L) (Output Terminal 50 and 51)
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K) This action is prevented while system is interlocking with other unit and the other unit is in backwash. (Input Terminal 1D and 1L) (Output Terminal 50 and 51)
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K) This action is prevented while system is interlocking with other unit and the other unit is in backwash. (Input Terminal 1D and 1L) (Output Terminal 50 and 51) This action is prevented during
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K) This action is prevented while system is interlocking with other unit and the other unit is in backwash. (Input Terminal 1D and 1L) (Output Terminal 50 and 51) This action is prevented during Backwash and Water Selection
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K) This action is prevented while system is interlocking with other unit and the other unit is in backwash. (Input Terminal 1D and 1L) (Output Terminal 50 and 51) This action is prevented during Backwash and Water Selection Setting screen.
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K) This action is prevented while system is interlocking with other unit and the other unit is in backwash. (Input Terminal 1D and 1L) (Output Terminal 50 and 51) This action is prevented during Backwash and Water Selection Setting screen. This action is prevented while
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire. Triggers when daily or weekly scheduled backwash is	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K) This action is prevented while system is interlocking with other unit and the other unit is in backwash. (Input Terminal 1D and 1L) (Output Terminal 50 and 51) This action is prevented during Backwash and Water Selection Setting screen. This action is prevented while system is interlocking with
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K) This action is prevented while system is interlocking with other unit and the other unit is in backwash. (Input Terminal 1D and 1L) (Output Terminal 50 and 51) This action is prevented during <i>Backwash</i> and <i>Water Selection</i> <i>Setting</i> screen. This action is prevented while system is interlocking with other unit and the other unit is
Remote Backwash Initiated	Triggers when user initiates remote backwash from Ethernet or electric hardwire.	Remote Start: Ethernet = Trigger MB302 Hardwire = Trigger INPUT4 longer than 5 seconds while system is in service mode (Terminal 1D and 1K) This action is prevented while system is interlocking with other unit and the other unit is in backwash. (Input Terminal 1D and 1L) (Output Terminal 50 and 51) This action is prevented during Backwash and Water Selection Setting screen. This action is prevented while system is interlocking with other unit and the other unit is in backwash.

		(Output Terminal 50 and 51)
		This action is prevented during Backwash and Water Selection Setting screen.
DP Backwash Initiated	Triggers when differential pressure between filter inlet and filter outlet is greater than 18 psi for more than 10 seconds.	This action is prevented while system is interlocking with other unit and the other unit is in backwash. (Input Terminal 1D and 1L) (Output Terminal 50 and 51)
		This action is prevented during Backwash and Water Selection Setting screen.
Enter Manual Operation (Only Accessed by Master Login)	Triggers when master user accesses the <i>Manual Operation</i> screen.	It closes all the valves and turns off the pump initially. Remote/auto backwash scheduled operation is prevented during this screen.
Leave Manual Operation (Only Accessed by Master Login)	Triggers when master user leaves <i>Manual Operation</i> screen.	The system goes to service mode. The system will go to service mode.
Storage Tank Full	Triggers when INPUT2 float switch is triggered while system is in backwash mode. (Terminal 1D and 1I)	Backwash process is aborted from this action. The system will go to service mode.
Alarm Activated	Triggers when any of the alarms trigger.	Backwash process is aborted from this action. The system will go to service mode.
Power Loss	Triggers when power loss occurs.	The system will go into service mode when power returns.

9 MAINTENANCE

9.1 Maintenance Schedule

AmeriWater High Efficiency Filter Systems are designed for low maintenance. The following maintenance procedures are **minimum** frequency and will help to ensure continued trouble free operation.

Note: Keep daily record of pressures, backwash count, performed maintenance and unusual occurrences on log sheet provided (Section 4.18). The system log provides valuable information should factory service assistance be required. Contact AmeriWater 800.855.5535 if log sheets are needed.

Weekly:

Check automatic pump oilers (if applicable) Check pump strainer and clean as necessary

Monthly: Grease pump motors (if applicable)

Quarterly: Check all control functions

Annual:

Check pressure differential transducers for proper operation Inspect pump and pump motor for bearing wear Inspect pump for seal wear Inspect media. Clean, add, or replace as necessary.

Note: Expected wear life for pump seal is approximately 2 years. This may vary due to site specific operating conditions.

It is recommended that the entire media bed is removed and replaced with new media every 5 years. See section 10.1 for media repack kit part numbers. See section 9.1.3 for media removal instructions. Use the IFU that comes with the repack kit for media installation instructions.

9.1.1 Replacing Pump Mechanical Seal

- a) Turn power to the pump off.
- b) Disconnect the pump from the plumbing system by removing the bolts on the flanges on the inlet and outlet of the pump. Place the pump on a table or spacious work area.
- c) Unscrew the bolts on the pump housing. Detach the pump's motor shaft from the housing.
- d) Dismantling the pump's impeller is the next step, as the seal is located on the shaft behind

the impeller. While holding the shaft in place, rotate the pump's impeller counterclockwise with a wrench until it disconnects from the shaft. Part of the old mechanical seal will be attached to the impeller, while the other part will still be attached to the motor shaft. Remove both of these pieces.

- e) Slide the new mechanical seal along the shaft of the motor. Do not touch the front face of the seal, as it is highly sensitive to oils. Once the new seal is on the shaft, screw the impeller back on and reattach the pump housing and motor by tightly screwing in the bolts.
- f) Place the pump back onto skid and reconnect the flange bolts. Return power to system.

9.1.2 Media (Level & Condition)

- a) Backwash filter (de-energize control panel before vessel is finished backwashing).
- b) Isolate filter system from all water sources.
- c) Open bottom filter drain (ensure that pressure drops to zero).
- d) Remove vessel cap and gasket.
- e) Drain water to top of media then close drain.
- f) Inspect sand. Sand should be loose and clean. Some discoloration is normal in systems with iron oxide or organic particles. Remove any loose debris or small amount of accumulated cake.
- g) Push a broomstick or other rod into sand. Rod should penetrate media with relative ease until gravel is contacted.
- h) Top of sand should be approximately 7.5" 8.5" below bottom of inlet manifold.
- i) Add or replace sand as necessary.
- j) Refill vessel with water.
- k) Replace vessel cap gasket and secure cap.
- l) Open all water supply valves and energize power supply.
- m) Return system to service with manual backwash.

9.1.3 Recommended Media Removal Procedure

- a) Backwash filter (de-energize control panel before vessel is finished backwashing).
- b) Isolate filter system from all water sources.
- c) Open bottom filter drain (ensure that pressure drops to zero).
- d) Remove vessel cap and gasket.
- e) Drain water to top of media then close drain.
- f) Use a Wet/Dry Shop Vacuum to suck out the media, emptying as needed. Note: make sure to clean out shop vacuum when complete so the sand doesn't cement into place.

9.2 Control Functions

- a) Actuate manual backwash by pressing the **Manual Backwash** button.
- b) Watch system through backwash cycle for smooth valve actuation and water flow.
- c) Differential pressure should be 8-12 psig when system returns to filter mode.

10 CONSUMABLES AND SPARES

10.1 Consumables

Consumable P/N	Description
0133-0016	Media Repack Kit, 16" Tank, ½ Micron
0133-0017	Media Repack Kit, 20" Tank, ½ Micron
0133-0018	Media Repack Kit, 30" Tank, ½ Micron
0133-0019	Media Repack Kit, 36" Tank, ½ Micron
33-0015	Top layer of sand, 50 lb bag, ½ Micron
0133-0020	Media Repack Kit, 16" Tank, ¼ Micron
0133-0021	Media Repack Kit, 20" Tank, ¼ Micron
0133-0022	Media Repack Kit, 30" Tank, ¼ Micron
0133-0023	Media Repack Kit, 36" Tank, ¼ Micron
33-0010	Top layer of sand, 50 lb bag, ¼ Micron

10.2 Spare Parts

Valve P/N	Actuator Only P/N	Description
051-0038	51-0057	ACTUATOR,2WAY,1-2.5",NON-SPRING RETURN,BRAY, W
051-0044		AUX SWITCHES
051-0045		
051-0046		
051-0039	51-0058	ACTUATOR,2WAY,1-2",SPRING RETURN,BRAY, W AUX
051-0040		SWITCHES
051-0043		
051-0042	51-0059	ACTUATOR,2WAY,3",NON-SPRING RETURN,BRAY, W AUX
		SWITCHES
051-0041	51-0060	ACTUATOR,2WAY,4",NON-SPRING RETURN,BRAY, W AUX
		SWITCHES



VOLTAGE

DESCRIPTION

FUSES

<u> 16"Tanks</u>



MODEL	116CHPH	116CLPHB	116CLPQ	116PLPHB	116PLPQ
FLOW CONTROL	42-0029	42-0022	42-0021	42-0022	42-0021
PUMP	80-0217	80-0087	80-0087	80-0084	80-0084
RELIEF VALVE	44-0006	44-0062	44-0062	44-0063	44-0063
TANK GASKET	041730471	041730175	041730175	041730175	041730175
INLET/OUTLET GASKET	041730125	041730118	041730118	041730118	041730118
TOWER BY-PASS		042-0046		041730160	
MANUAL VALVE	-	043-0040	-	041/20109	-
PUMP MECHANICAL SEAL	80-0294	80-0293	80-0293	80-0292	80-0292

20" Tanks



MODEL	120CHPH	120CLPHB	120CLPQ	120PLPHB	120PLPQ
FLOW CONTROL	42-0030	50730090	42-0022	50730090	42-0022
PUMP	80-0283	80-0087	80-0087	80-0085	80-0085
RELIEF VALVE	44-0006	44-0062	44-0062	44-0063	44-0063
TANK GASKET	041730471	041730175	041730175	041730175	041730175
INLET/OUTLET GASKET	041730125	041730118	041730118	041730118	041730118
TOWER BY-PASS		045-0046		041720160	
MANUAL VALVE	-	045-0046	-	041/20109	-
PUMP MECHANICAL SEAL	80-0295	80-0293	80-0293	80-0292	80-0292

<u>30" Tanks</u>



<u>36" Tanks</u>



PUMP MECHANICAL SEAL 80-0294

80-0293 80-0293

80-0292 80-0292

11 DRAWINGS

11.1 Flow Schematic



DESCRIPTION	SERVICE INLET NON-SPRING ACTUATED BALL VALVE	SERVICE OUTLET NON-SPRING ACTUATED BALL VALVE	BACKWASH INLET NON-SPRING ACTUATED BALL VALVE	SYSTEM DRAIN SPRING ACTUATED BALL VALVE	PUMP	FLOW CONTROL VALVE	CLOBE VALVE	FILTER INLET PRESSURE TRANSDUCER	FILTER OUTLET PRESSURE TRANSDUCER	BACKWASH INLET PRESSURE TRANSDUCER	TOWER BY-PASS MANUAL VALVE	SAMPLE MANUAL VALVE	DRAIN MANUAL VALVE	NLY ON BYPASS SYSTEMS
ITEM	5	2	73	44	۵.	2	S	PT1	PT2	PT3	В	SV	S	Ŷ

11.2 Installation



CITY WATER OR ALTERNATE CLEAN WATER SOURCE.

INSTALLATION NOTES:

- DURING BACKWASH WATER PRESSURE MUST BE BETWEEN 30 AND 60 PSIG ENTERING BACKWASH FLOW REGULATOR. <u>-</u>
 - WITH THE IDEAL PRESSURE SETTING BEING 40 PSIG. a. CITY WATER INSTALL PRESSURE REDUCING VALVE IF REQUIRED. b. TOWER WATER ADJUST TOWER WATER BACKWASH VALVE TO KEE
- b. TOWER WATER ADJUST TOWER WATER BACKWASH VALVE TO KEEP PRESSURE WITHIN RANGE. MAXIMUM BACKWASH WATER TEMPERATURE IS 140°F (CONSULT AMERIWATER).
 - CONSULT AMERWATER FOR PIPE RUNS GREATER THAN 20' FROM FILTER. CONSULT AMERIWATER FOR VERTICAL DRAIN PIPE INSTALLATIONS GREATER THAN 8' IN HEIGHT. ALL PIPING MUST MEET STATE AND LOCAL PLUMBING CODES. SINGLE POINT ELECTRICAL CONNECTION TO CONTROL PANEL. 0 2 4 3 3

	Backwash to Drain	1.5"	1.5"	2"	2"
Plumbing Sizing	City Backwash Inlet	1.5"	1.5"	2"	2"
	Filter In/Out	2"	2"	3"	4"
	Model	16"	20"	30"	36"

11.3 Wiring of Components



98-2030 Rev A





sturn Wire	Black -> White	N/A	Red -> Yellow	Black/Red -> Black White/Red -> Black	Black/Blue -> Pink	White/Gray -> Orange
Spring Re	Power Common	Power CW (Close)	Power CCW (Open)	Limit Switch Common	Limit Switch Close	Limit Switch Open





11.4 Electrical Schematic



TABLE 1								
	ELECTRICAL LEGEND							
	- Denotes wire number	C - WIRING NUMBER ON TERM. BLOCK						
	- WIRE CONNECTION	- FUSE						
	- PANEL GROUND	- EARTH GROUND						
†	- Field revote tien	☆ - ITEM WOUNTED ON DOOR						
K	- MOTOR CONTROL RELAY/STARTER	CR1 - CONTROL RELAY						
	- DIP SWITCH	• - MOTOR OPERATED VALVE						
↓ 0/L	- NORMALLY CLOSED PUMP MOTOR OVERLOAD	0/L - NORMALLY OPEN PUMP MOTOR OVERLOAD						
CR1	- NORWALLY OPEN RELAY	- NORWALLY OPEN ACTUATOR LIMIT SWITCH						
	- SINGLE-PHASE THERMAL TRIP	- 3 Phase motor						
010	- Emergency stop button	TRANSFORMER						

TABLE 2

WIRE SIZE AND COLOR (AT A MINIMUM)								
WIRE TYPE	SIZE	COLOR						
POWER	10 AWG	BLACK						
VAC CONTROL	18 AWG	RED						
VAC NEUTRAL	18 AWG	WHITE						
VDC CONTROL	18 AWG	BLUE						
VDC NEUTRAL	18 AWG	WHITE/BLUE STRIPE						
REMOTE	18 AWG	ORANGE						
SHIELDED 2 or 3 COND	18 AWG	BLACK - RED + BLUE WIPER						
MTR/DRV GND	10 AWG	GREEN/YELLOW STRIPE						
OTHER GND	16 AWG	GREEN/YELLOW STRIPE						

NOTE:

TABLE 3

OVERLOAD RELAY PART NUMBER BASED ON VOLTAGE AND HORSE POWER.

L	PANEL CURRENT RATING & MOTOR FULL LOAD AMPS							
		PANEL WITHOUT PUMP	1.5 HP MOTOR	2 HP MOTOR	3 HP MOTOR	5 HP MOTOR		
ſ	208 VAC	0.72 A	6.9 A	7.8 A	11.0 A	17.5 A		
l			OVERLOAD	OVERLOAD	OVERLOAD	OVERLOAD		
I			RELAY 4-20A:	RELAY 4-20A:	RELAY 4-20A:	RELAY 4-20A:		
			XTOE020CCS	XTOE020CCS	XTOE020CCS	XTOE020CCS		
ſ	460 VAC	0.33 A	3.0 A	3.4 A	4.8 A	7.6 A		
l			OVERLOAD	OVERLOAD	OVERLOAD	OVERLOAD		
			RELAY 1-5A:	RELAY 1-5A:	RELAY 1-5A:	RELAY 4-20A:		
L			XTOE005CCS	XTOE005CCS	XTOE005CCS	XTOE020CCS		












12 OPTIONAL BACKWASH STORAGE TANK



TABLE						
MODEL	CAPACITY IN GALLONS	INLET	OUTLET	OVERFLOW	D	H
CWBWST130	130	1"	1" FPT	1" FPT	23"	76"
CWBWST200	200	1"	1" FPT	1" FPT	30"	72"
CWBWST300	300	2"	2" FPT	2" FPT	35"	81"
CWBWST550	550	2"	2" FPT	2" FPT	45"	97"
CWBWST750	750	2"	2" FPT	2" FPT	46"	119"
CWBWST1000	1000	2"	2" FPT	2" FPT	64"	81"

The float switch needs to be wired to the filter system's control panel. Route the cable to the control panel and through a strain relief on the underside. There are two float wires, wire one to 1D and one to 1I. See the diagram on the next page for wiring locations.

Tanks that hold 550 Gallons or more are drop shipped. The float switch assembly is sent with the filter system and will need to be assembled on site.



This product can expose you to chemicals such as vinyl chloride (used in the production of PVC) or Nickel (used in the production of stainless steel), that are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Dear Valued Customer,

California Proposition 65 (Prop 65) is the Safe Water and Toxic Enforcement Act of 1986. The State of California began enforcing amendments to California Prop 65 at the end of August 2018. Prop 65 requires manufacturers to provide a clear and reasonable warning to residents of California about chemicals used in products that they purchase that are included on the Prop 65 Chemical List. The chemicals included on the list are chemicals that are known to the State of California to cause cancer, birth defects, or other reproductive harm. One such chemical is Vinyl Chloride, a compound used to produce Polyvinyl Chloride (PVC). The AmeriWater system you have purchased may contain PVC or stainless steel parts.

While warnings are only required in the State of California, AmeriWater has initiated the use of Prop 65 labeling for all products to ensure compliance with California regulations. Please note that the above warning does not necessarily mean that the product that you have purchased is unsafe. Products that have been cleared for market by FDA have been determined to be safe and effective by the United States Food and Drug Administration. The warning is simply a requirement by the State of California. If you wish to obtain additional information, please visit: p65warnings.ca.gov. You may also contact your AmeriWater representative if you have any questions.

Thank you for your understanding and we look forward to continuing to serve you.