Operation Manual

SWT

SPECIALTY WATER TECHNOLOGIES

Municipal Boost w/Pre-Treatment Monitoring System

K-A-MCB-PRE

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Section 1.1 WARNINGS AND CAUTIONS

WARNINGS 

- Read this manual in its entirety before operating the Municipal Boost System.
- The "OFF" button state does not disconnect power from the control box this must be done at the circuit breaker.
- Selecting the "Flow Bypass" turns the boost pump on regardless of a "Run" signal from the RO or the state of the "Flow Switch". Pump or plumbing failure will occur if left in this state for an extended time.
- Misuse, improper operation, and/or improper monitoring of this system could result in serious injury, death, or other serious reactions to the end users of the equipment.
- Routine maintenance of the system is required to protect the system from over-pressurizing and over-temperature which could result in damage to the facility, injury to staff, or the end users of the equipment.

CAUTIONS 

- When used as a medical device, Federal law restricts this device to sale by or on the authority of a physician. Per CFR 801.109 (b)(1).
- All local, state, and federal regulations regarding the installation and operation of this system must be observed.

Section 1.2 THEORY OF OPERATION

The K-A-MCB-PRE Municipal Boost w/Pre-Treatment Monitoring System is designed to be the central nervous system of a fully integrated water purification system. The K-A-MCB-PRE monitors pressures, temperatures, flows, automated valve positions, and pre-treatment timer head cycles. The K-A-MCB-PRE also controls the pre-treatment Municipal Booster System, the RO interlock and the pre-treatment automated valves allowing for both monitor driven safety and active testing sequences. The K-A-MCB-PRE is also the central interactive hub for all alarms pre-treatment, RO and post-treatment. These alarms are relayed from the K-A-MCB-PRE to the Remote Monitor (Smart Nurses Station).

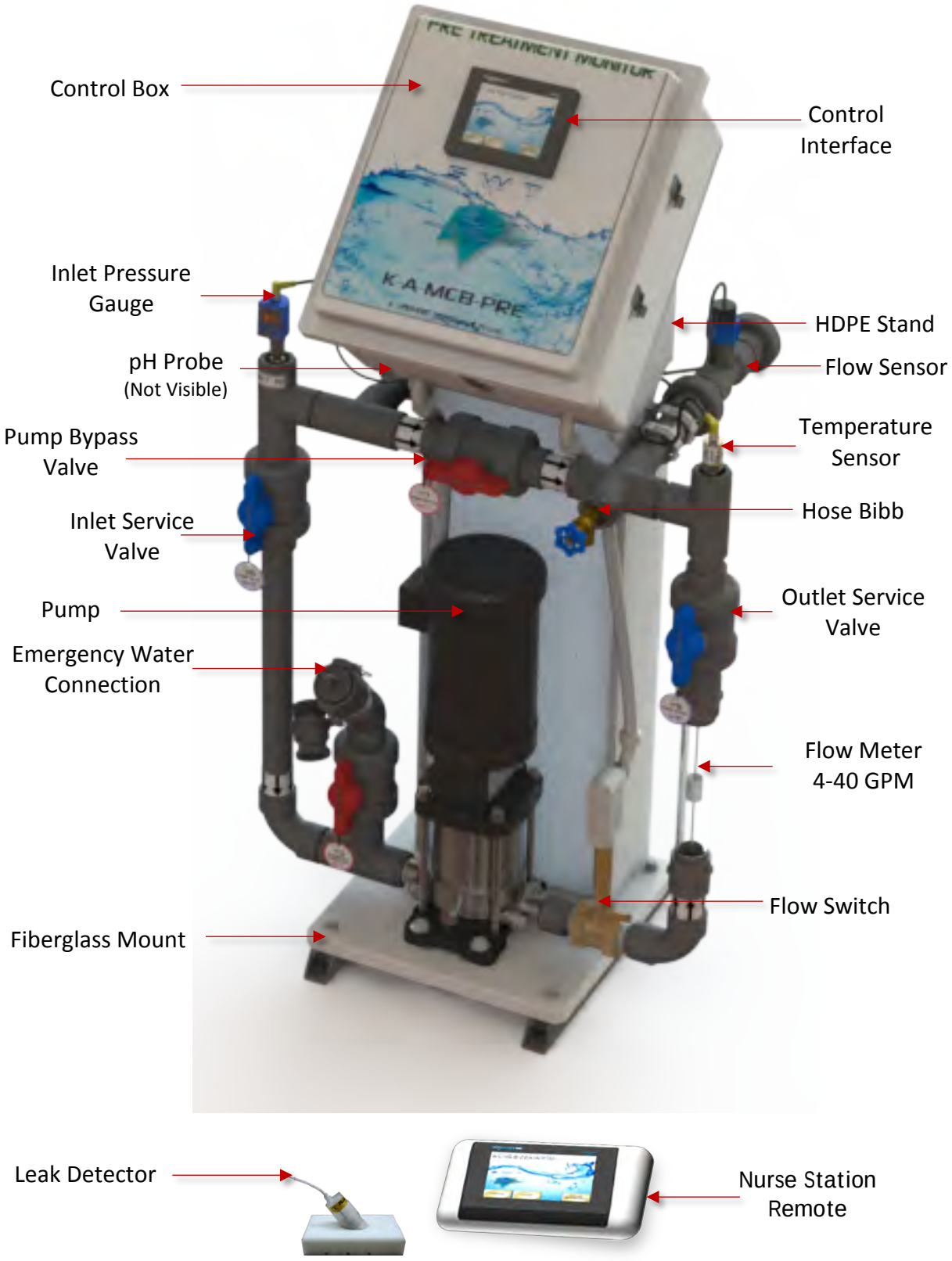
The K-A-MCB-PRE Municipal Boost w/Pre-Treatment Monitoring System incorporates the VFD Municipal Booster System utilizes a Variable Frequency Drive motor controller in lieu of a contactor and thermal overload. The system is also equipped with a pressure sensor which senses the pressure on the outlet/discharge side of the pump which will maintain the pressure programed into the controller.

Once installed and set-up, the system will adjust and maintain the preset pressure required for adequately running the RO system and the regeneration cycles of the media tanks. The pressure sensor continuously transmits an electronic signal to the VFD motor controller, which then accelerates or decelerates the pump in an attempt to maintain the preset pressure. This speed adjustment is accomplished by varying the frequency of the power going to the motor on the pump, which in turn controls the speed (RPM revolutions per minute) at which the motor, and therefore the pump, turns. The motor/pump RPM controls the amount of pressure and flow the pump produces.

This allows the pump to operate when the R.O. turns on, or when a pre-treatment component (such as a media tank) goes into backwash and/or regeneration. This tight control all but eliminates pressure spikes when the R.O. turns off, and also prolongs the life of the Municipal Boost pump and motor.

The Municipal Boost system is designed to convert single phase 220 volts into 3-phase, using one third of the energy required by the existing pump systems. This moves the SWT Municipal Boost System forward into the next generation of pretreatment equipment.

Section 1.3 SYSTEM ILLUSTRATION



Section 1.4 SYSTEM COMPONENTS

See illustration on previous page

OIT (Operator Interface Terminal): This interface terminal contains all operating features. These include viewing all monitored values and logs as well as the ability to set up custom parameters.

Nurse Station Remote: Alarms can be visual and/or audible and may be reset. Staff are able to turn on the Chlorine Timer and view system parameters.

Flow Switch: Monitors if water is flowing through pump or not. An electrical signal is generated if flow is present.

Flow Meter: Monitors the amount of flow in gallons per minute (GPM). When pump is on, a visual flow reading can be done by aligning the top of the stainless-steel cylinder to the gallon engravings on side of the flow meter.

Flow Sensor: Digitally monitors the flow, and a signal is sent to the Control Panel and converted into a digital display of that flow in the user's choice of units of measure (GPM or LPM).

pH Probe: Monitors the pH of the city water pre-booster pump.

Hose Bib: Convenient water faucet for multiple applications.

Pressure Sensor: The Pressure Sensor maintains the pressure setting programed into the drive's control**,** *and should be placed downstream as close to the RO as possible.*

Water Temperature Monitor: Monitors the water temperature post blend valve on the post boost pump side of the device.

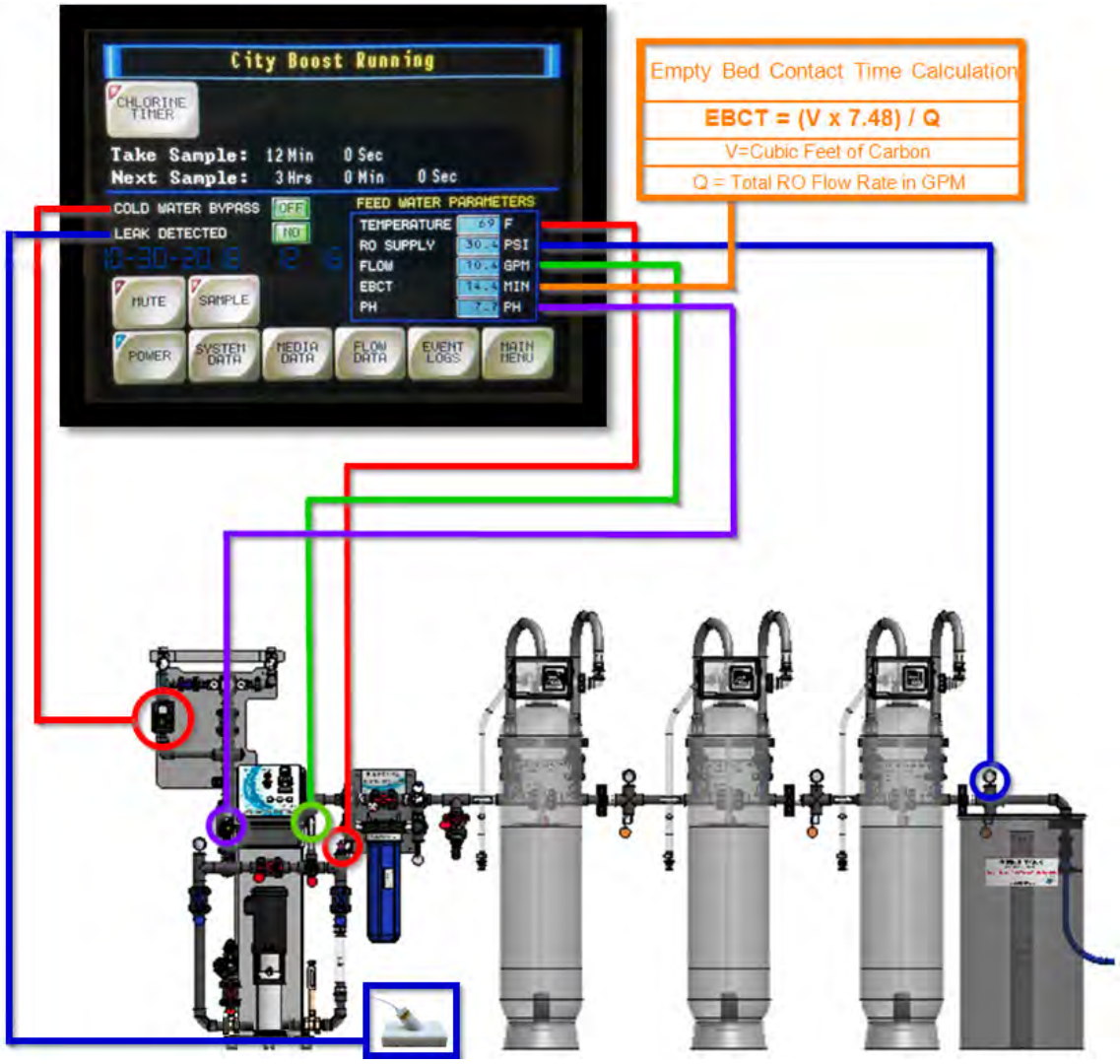
The factory default to alarm is set at 90 degrees Fahrenheit but these parameters can be changed in the maintenance menus.

Leak Detector with Auto Shut Off: The Leak Detector is placed on the floor and used to monitor for leaks in the water treatment room and will automatically turn off the municipal boost system and close the inlet water valve when a leak is detected. It should be placed at the lowest level of the floor where water will naturally travel.

When liquid is detected the water inlet valve closes and the pump will power off. To clear leak detection, clean up water spill. Gently shake the sensor to remove water.

Section 2.1 MONITORING – OPERATION SCREEN

Select **OPERATE** to navigate to the main **OPERATION SCREEN**.



COLD WATER BYPASS: Automated valve position is monitored and displayed.

LEAK DETECTOR*: Monitored by the leak detection probe.

BOOST SYSTEM: Monitored by the flow switch post booster pump.

TEMPERATURE*: Monitored at the temperature sensor post booster pump.

RO SUPPLY: Monitored at the pressure sensor post final media tank.

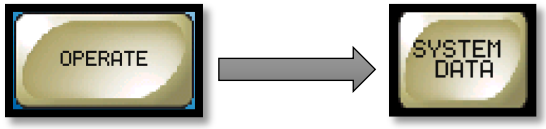
FLOW: Monitored by a turbine flow sensor post booster pump.

EBCT*: Calculated using live flow data and stored carbon volume data.

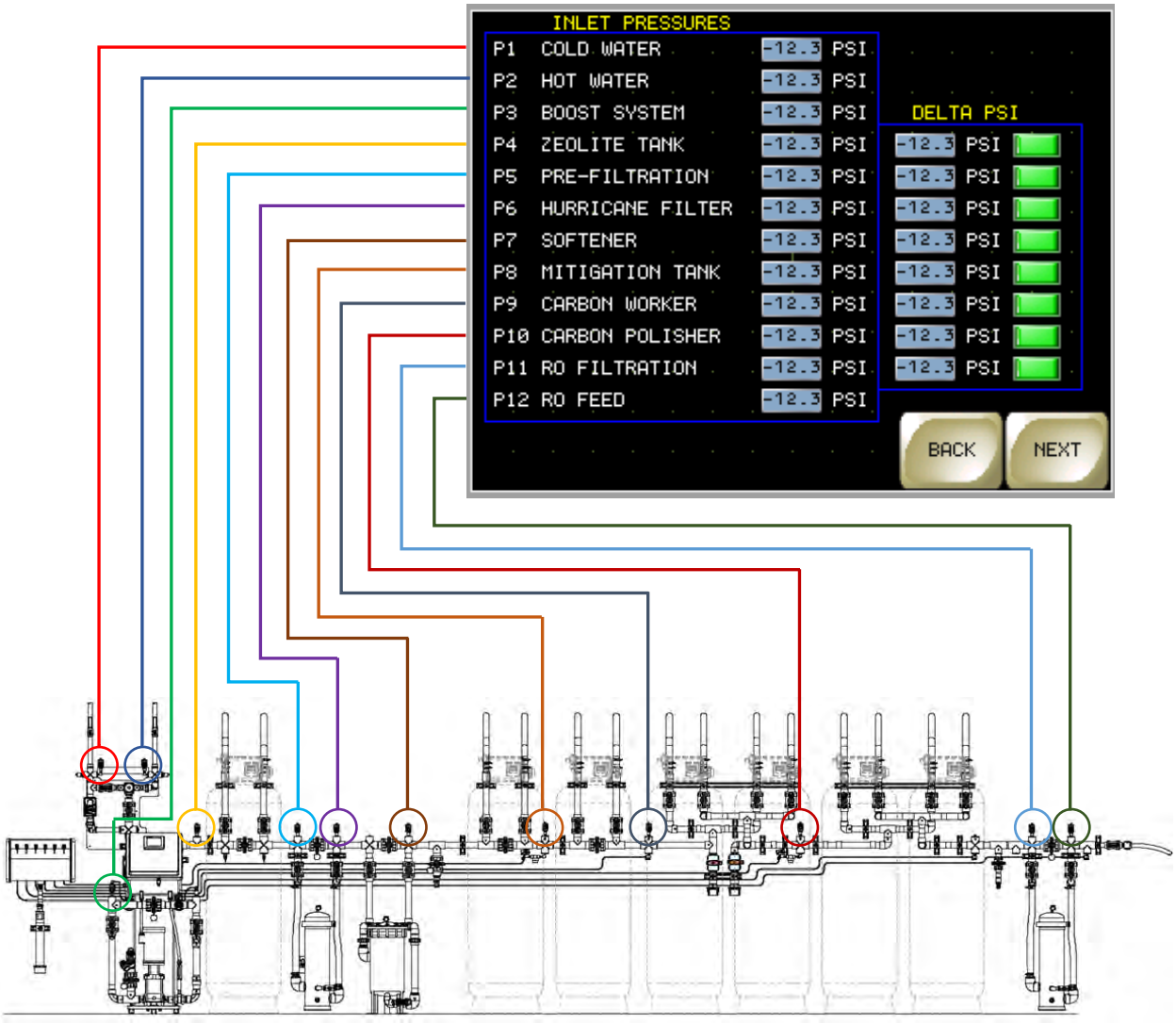
PH*: Monitored at the pH probe pre-booster pump.

**(Indicates out of range value will generate an alarm status)*

Section 2.2 MONITORING – SYSTEM DATA SCREEN

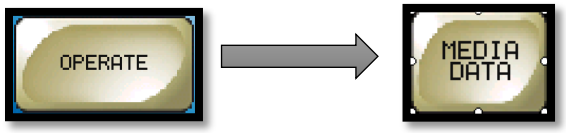


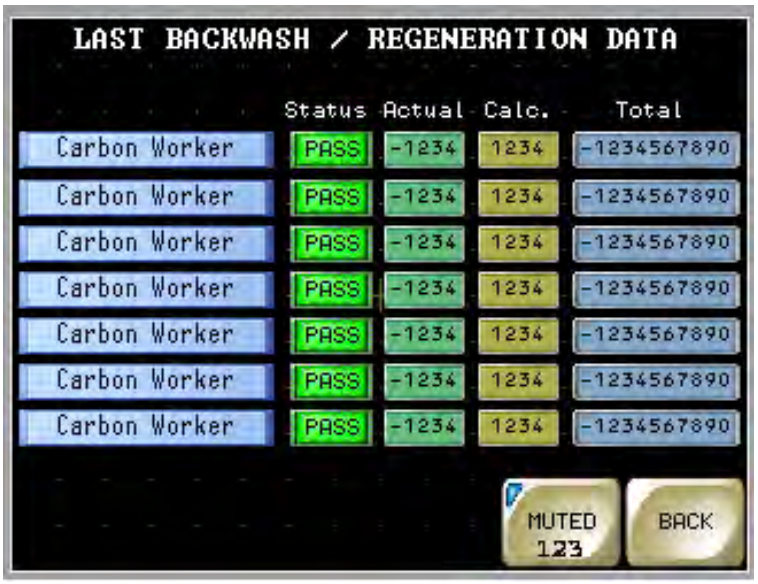
From the Operation screen select **SYSTEM DATA** to navigate to the system data screen.



The **SYSTEM DATA** screen allows the user to monitor all pre-treatment pressures in real time. Temperatures of pre and post blending valve are monitored and displayed. Delta pressure drops across filters and media tanks are calculated and displayed in real time. Out of range Delta Pressures produce a banner alert across the OIT.

Section 2.3 MONITORING – SYSTEM PERAMETERS SCREEN

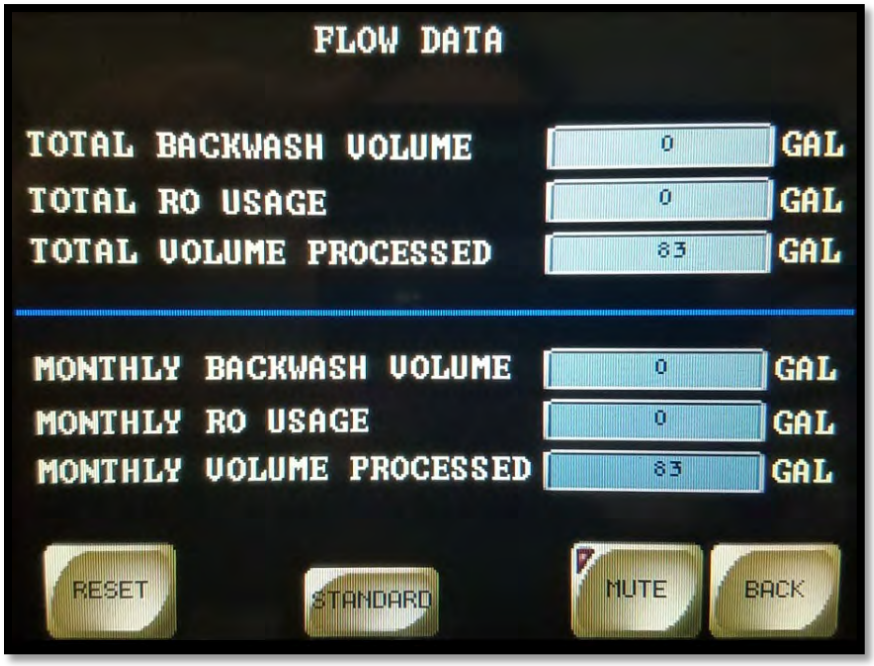




The **MEDIA DATA SCREEN** can monitor the backwash/regeneration data of up to seven media tanks.

The **STATUS** column will alert the user (including an alarm at the Nurse Station Remote) if a particular media tank failed to complete its cycles or if the **ACTUAL** volume of water used (measured by the flow meter) is outside the tolerance of the pre-calculated value. The **CALCULATED** volume value is populated at initial set up using the programed cycle times of the control head and the value of the flow control valve attached to the drain of the control head. The **TOTAL** column represents lifetime volume.

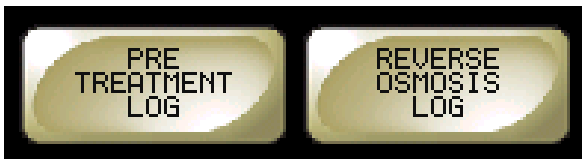
Section 2.5 MONITORING – FLOW DATA SCREEN



System water usage is monitored at the **FLOW DATA SCREEN**. The values of **VOLUME PROCESSED** are obtained by adding together the water consumed by the cycles (**BACKWASH**, forward flush and regeneration) of the media tanks and the **RO USAGE**.

The top half of the screen maintains lifetime totals of usage. The bottom half of the screen values designed to be reset monthly. This temporary data can be **RESET** to zero by the user. **STANDARD/METRIC** button is used to select gallons or liters.

Section 2.6 MONITORING – EVENT LOG SCREENS



SWT RO SYTEMS ONLY

Upon entering the **EVENT LOG SCREEN** the three options are **PRE TREATMENT LOG, REVERSE OSMOSIS LOG,** and **POST TREATMENT LOG.**

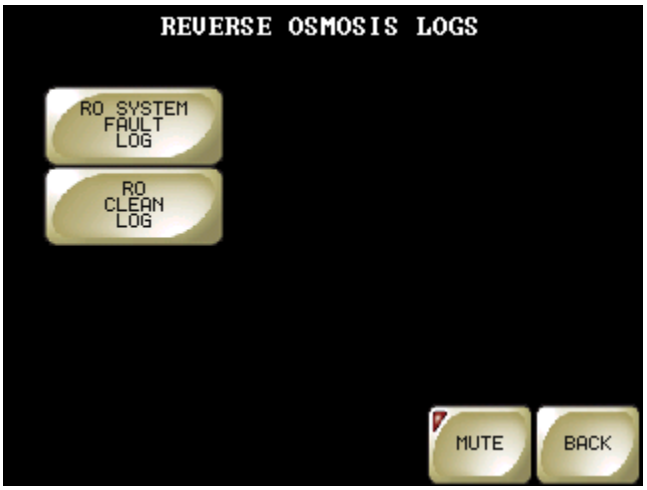
CHLORINE TEST LOG: Records the dates and times of completed chlorine test cycles.

MEDIA TANK BACKWASH LOG: Records the dates and times of media tank backwash cycles.

PRESSURE HOLDING TEST LOG: Records the dates and times of both automated and initiated pressure holding tests.

SYSTEM FAULT LOG: Records the dates and times of system errors and faults.

SWT RO System Only



RO SYSTEM FAULT LOG: Records the dates and times of the alarm states transmitted by the reverse osmosis machine.

RO CLEAN LOG: Records the dates and times when an RO clean cycle was initiated.

Section 3.1 TESTING – CHLORINE TESTING

1. From the Operation Screen select "CHLORINE TIMER" to start the timer. The red indicator and the cancel button will appear. At any time during the chlorine timer process the cancel button may be used to stop the process.

2. Once the chlorine timer has counted down (settable from 1-30 minutes), an audible alarm will sound prompting the user to collect the sample at the sample station. The screen will also display "TEST COMPLETE" and "END OF DAY" buttons.

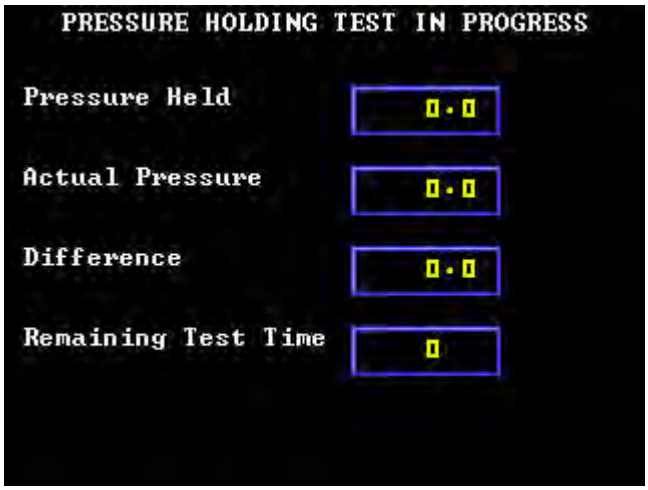
NOTE: The Test Complete button will reset the Chlorine Timer and start the shift interval timer for the next scheduled chlorine test (settable from 1-4 hours).

NOTE: The End of Day button will reset the alarm and turn the chlorine timer off. This is typically done after the last chlorine sample is taken for the day.

3. The SHIFT INTERVAL and TEST CYCLE timers may be changed by entering the SYSTEM MAINTENANCE menu and selecting the CHLORINE TIMER SETUP menu.

Section 3.2 TESTING – PRESSURE HOLDING TEST

1. Press "Pressure Hold Test" button.
2. The following screen will appear. There is no user input involved.
3. Test will complete within 1 minute and test result will be logged in "Pressure Holding Test" log.



Pressure Held: Is the pressure the system is at when "Pressure Holding Test" was initiated.

Actual Pressure: The actual pressure in the pre-treatment system during test interval.

Difference: The amount of pressure loss the system has sensed.

Remaining Test Time: Is the amount of time remaining before the test is completed & logged.

NOTE: The controller performs this test by closing the pre-booster pump automated leak detector valve and the RO inlet valve. To pinpoint a leak in the system you can manually close the outlet valves of the media tanks (starting at the last tank and moving toward the booster pump) and run the test after each closed valve to identify the leaking component.

Section 4.1 INTERFACE SETUP – RANGES AND ALARMS

RANGE OF PARAMETERS SETUP

Empty Bed Contact Time	10-15 Minutes
RO Flow Volume	5-35 Gallons Per Minute
Shift Interval	1-4 Hours
Test Cycle	1-30 Minutes
Temperature Set Point	Cold: Range 60-95°F Hot: Range 100-180°F Blend: 60-100°F
PH Set Point	Low: Range 2-6.5 PH High: Range 7.5-12 PH
Pump Pressure	Range 30-100 PSI
Pressure Test Set Point	Range 0.5-2.0 PSI
Alarm Cycle	3-60 Seconds
Alarm Repeat	1-10 Minutes
Auto Off	5-90 Minutes
Shift Interval	1-4 Hours
Test Cycle	12-30 Minutes
DLFC - Drain Line Flow Control	4-85 GPM
Backwash Cycle	2-60 Minutes
Rapid Rinse Cycle	2-60 Minutes
BLFC - Brine Line Flow Control	2-12 GPM
Brine Draw	2-60 Minutes
Brine Fill	2-60 Minutes
Carbon Volume	4-21 Cubic Feet
Filter Delta (Δ)	1-35 psi

Temperature Set Point

Cold: When feed water temperature reaches this value a low-level reminder banner is generated alerting user to possible blend valve failure or adjustment. This feature may be used as a reminder to put blend valve back inline when bypassed during summer months.
Hot: When feed water temperature reaches this value, alarm is generated and "Cold Water Bypass" valve is opened in attempt to cool system.

PH

"PH Fault Bypass" & "Flow Switch Bypass" buttons should be left in the "OFF" position on SWT RO water systems. These parameters should only be bypassed in the event of an emergency. All other systems "Flow Switch Bypass" should be in the "ON" position.

Pump Pressure

If the pressure sensor post booster pump fails (sensors fail to the high side – 100psi), the controller will adjust the pump hertz to a preset medial level for safety.

Pressure Set Test Point

This range represents the allowable leak of pressure during the Pressure Holding Test. An alarm would be generated upon exceeding this set point.

Section 4.2 INTERFACE SETUP - ACCESS

User is required to enter username & password to access "System Maintenance" screens. Username determines the access level to critical parameters.

TECH: Gains access to general setup parameters. User Setup menu options.

1. Press the "Login" Button from the Main Menu.
2. Touch "black area" to right of "User ID". A popup screen will appear.
3. Use keypad to enter "User ID" (SWT) and press ENT.

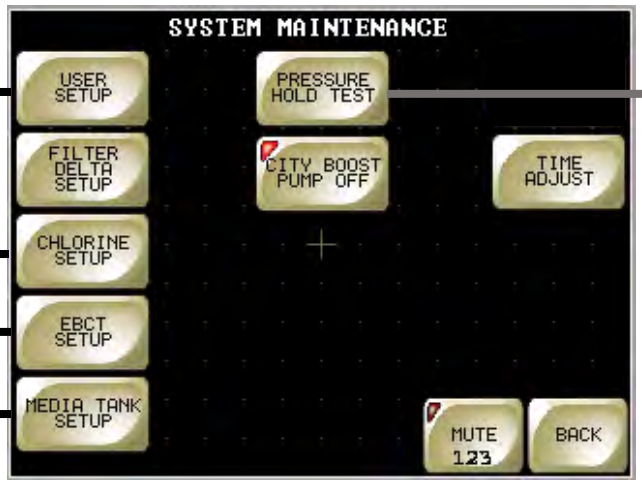
4. Touch "black area" to right of user "Password". A popup screen will appear.
5. Use keypad to enter "Password" (H2O), press ENT and then press "OK"

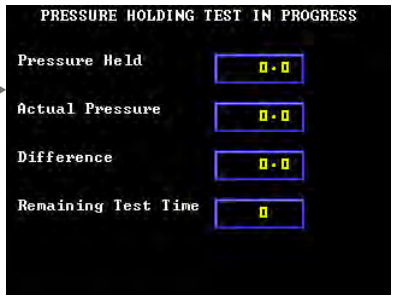
NOTE: The "System Maintenance" button is now available on the lower right portion of the "Main Menu" screen.

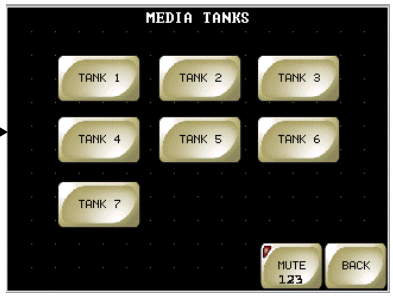
6. Press "System Maintenance" to enter Setup.

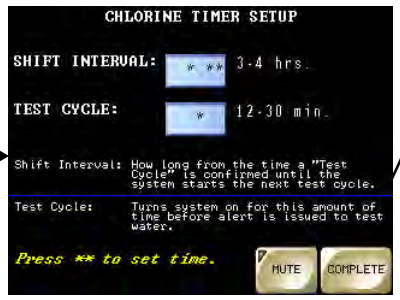
Note: System will log user out of system in 5 minutes of in-activity.

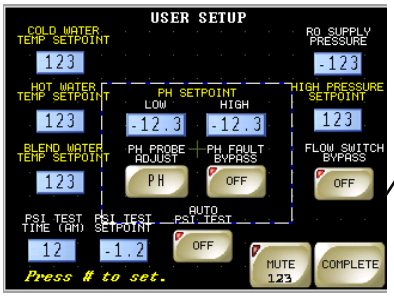
Section 4.3 INTERFACE SETUP – SYSTEM MAINTENANCE SCREEN











RANGE OF PARAMETERS

Contact Time
10-15 Minutes

Flow Volume
5-35 Gallons Per Minute

Shift Interval
1-4 Hours

Test Cycle
1-30 Minutes

Temperature Set Point
Cold: Range 60-95°F
Hot: Range 100-180°F
Blend: Range 60-100°F

PH Set Point
Low: Range 2-6.5 PH
High: Range 7.5-12 PH

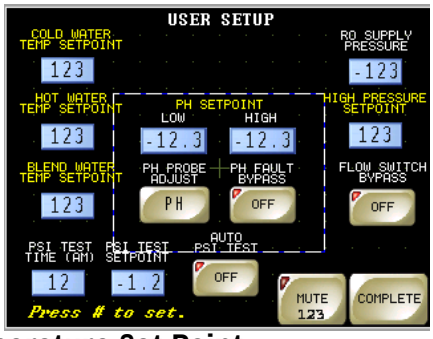
Pump Pressure
Range 30-100 PSI

Pressure Test Set Point
Range 0.5-2.0 PSI

High Pressure Set Point
Range 75-110 PSI

Section 4.4 INTERFACE SETUP – USER SETUP

1. Press "User Setup" button.
2. The following menu options will appear. Press inside the blue box to set each parameter. A popup screen will appear.
3. Enter a value within the parameter ranges and Press "ENT" to save value.
4. Once all the parameters have been set, Press "COMPLETE" to return to "System Maintenance" menu.



Temperature Set Point

Cold: When feed water temperature reaches this value a low-level reminder banner is generated alerting user to possible blend valve failure or adjustment may be required. May be used as a reminder to put blend valve back online when bypassed during summer months.

Hot: When feed water temperature reaches this value, an alarm is generated and "Cold Water Bypass" valve is opened in an attempt to cool system.

PH Set Point

Low: When feed water PH reaches this value a low-level reminder banner is generated alerting user to feed water changes that could have detrimental effects on the operation of reverse osmosis equipment.

High: When feed water PH reaches this value a low-level reminder banner is generated alerting user to feed water changes that could have detrimental effects on the operation of reverse osmosis equipment.

Pump Pressure

Sets the pressure in PSI to the value pump should maintain when active. Pressure will be controlled via an electronic pressure sensor. Expected pump pressure will be maintained at location nearest to the psi sensor.

PSI Test Set Point

Sets the amount of pressure loss that can be sensed before a pressure test failure is generated.

PH Fault Bypass

Bypasses all PH alarms, monitoring is still active. PH probe should be online at all times.

NOTE: *If PH alarms persists, remove and clean PH probe per instructions to see if it clears condition.*

Flow Switch Bypass

Bypasses the "Flow Switch" and allows pump to run in pressure control mode. No run dry protection is available if bypassed.

Section 4.5 INTERFACE SETUP – CHLORINE TIMER SETUP

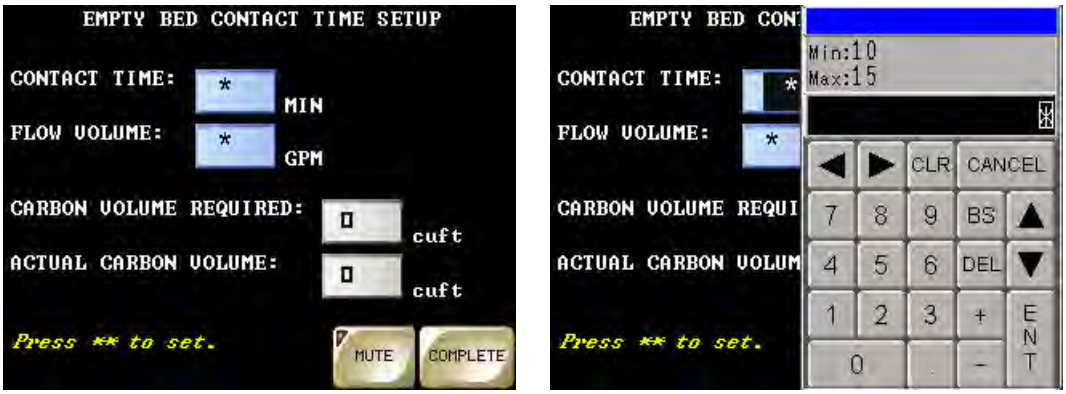
1. Press "Chlorine Setup" button.
2. The following menu options will appear. Press inside the blue box to set each parameter. A popup screen will appear.
3. Enter a value within the parameter ranges and Press "ENT" to save value.
4. Once all the parameters have been set, Press "COMPLETE" to return to "System Maintenance" menu.

Shift Interval: Is the amount of time between the last completed "Chlorine Test" and when the next "Test Cycle" is initiated.

Test Cycle: Is the amount of time when the RO remains "ON" until an audible prompt is generated. RO remains "ON" until user acknowledges test has been completed.

Section 4.6 INTERFACE SETUP – EMPTY BED CONTACT TIME SETUP

1. Press "EBCT Setup" button.
2. The following menu options will appear. Press inside the blue box to set each parameter. A popup screen will appear.
3. Enter a value within the parameter ranges and Press "ENT" to save value.
4. Once all the parameters have been set, Press "COMPLETE" to return to "System Maintenance" menu.



Contact Time: Enter your facilities standard for Empty Bed Contact Time. A.A.M.I. Standard is 10 Minutes.

Flow Volume: Is the total flow volume of reverse osmosis system. Flow Volume (gpm) = RO Drain + RO Product.

Carbon Volume Required: Is the minimum calculated amount of carbon required to meet "EBCT".

Actual Carbon Volume: Is the total amount of carbon that is present in existing system. If "Actual Carbon Volume" is less than "Carbon Volume Required" and "EBCT Alarm" will occur.

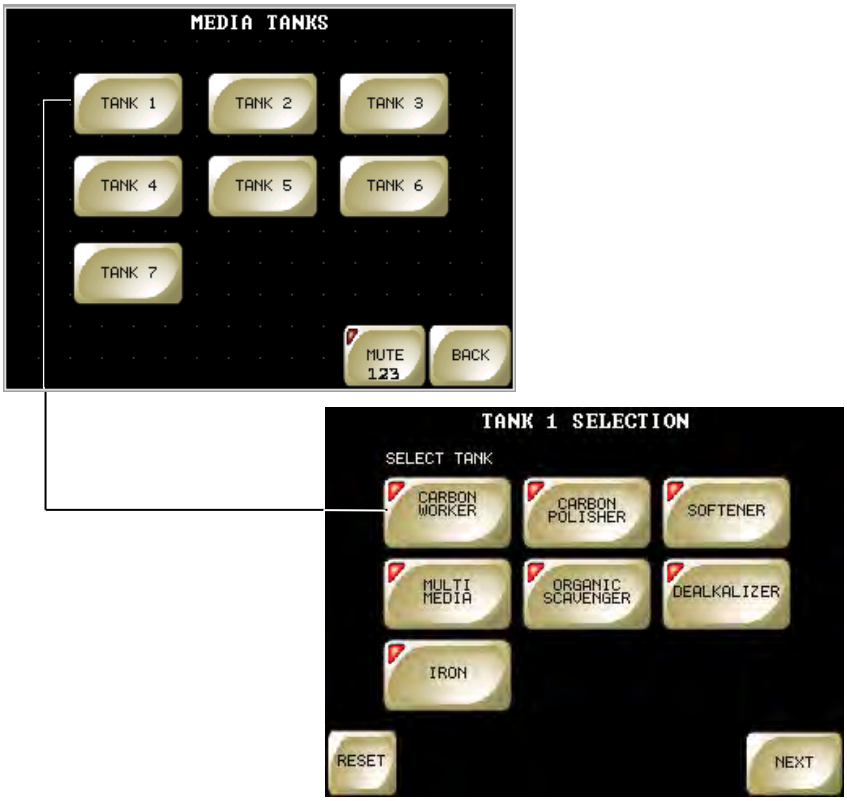
Section 4.7 INTERFACE SETUP – MEDIA TANK SETUP

1. Press "Media Tank Setup" button.
2. The following menu options will appear. Press Tank # that is to be programmed.
3. Press "Carbon Worker" and press "Next".

NOTE: Tank 1 is always the first media tank in sequence regardless of its media contents.

Example: Use FIG **1** for reference.

Tank 1 = Carbon Worker Tank 2 = Carbon Polisher Tank 3 = Softener



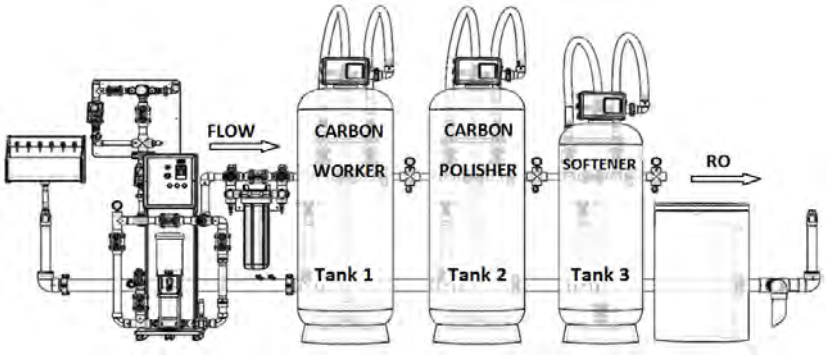


Figure 1
(Typical Layout, May Vary)

4. Press inside the blue box to set each parameter. A popup screen will appear.
5. Enter a value within the parameter ranges and Press "ENT" to save value.
6. Once all the parameters have been set, Press "COMPLETE" to return to "Media Tanks" menu.
7. Repeat steps 1-6 until all media tanks are programmed. Un-programmed tank numbers will be ignored in all monitoring and reporting activities.

NOTE: Only required parameters based on media selection will appear visible in setup screens. For instance, regeneration type tanks such as a softener would have additional data fields to program as seen in **Fig 2.**

DLFC- Drain Line Flow Control: Is a flow restrictor placed on the drain line of a media tank controller to control the backwash volume **Fig 3**. The DLFC should have a GPM value stamped, stenciled, engraved or inked on side of device. See **Fig 4.**

Backwash: The amount of time the media tank controller is programmed for in Backwash mode.

Rapid Rinse: The amount of time the media tank controller is programmed for in rapid rinse mode.

BLFC- Brine Line Flow Control: Is a flow restrictor placed in the injector assembly of a media tank controller to control the brine cycle volume **Fig 5**. The DLFC should have a GPM value stamped, stenciled, engraved or inked on side of device. See **Fig 6.**

Brine Draw: The amount of time the media tank controller is programmed to draw brine into media tank.

Brine Fill: The amount of time the media tank controller is programmed to fill the brine tank.

Carbon Volume: Is the total amount of carbon that is in tank being programmed.

Section 4.7 INTERFACE SETUP – MEDIA TANK SETUP

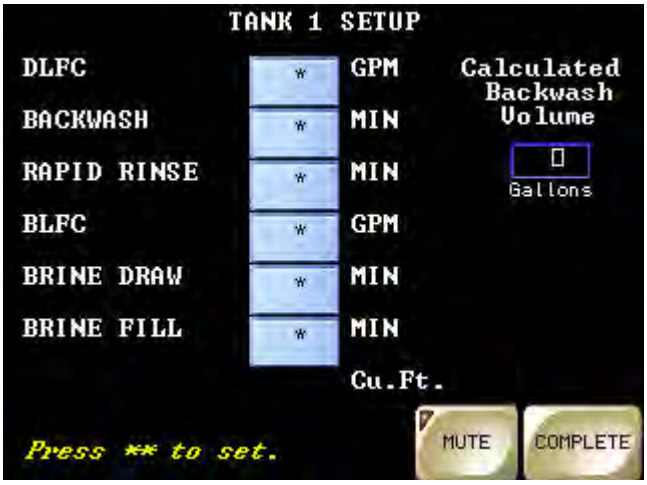
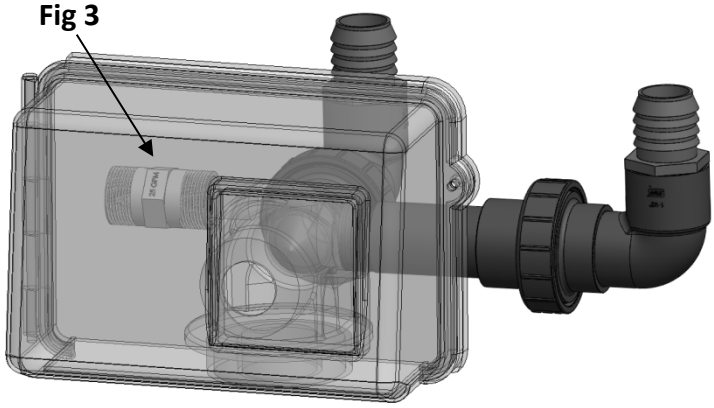


Fig 2

Fig 3



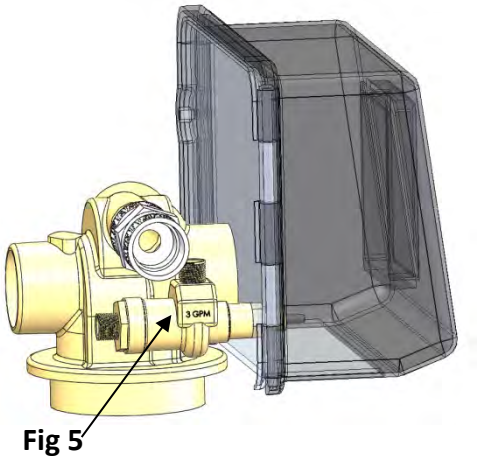
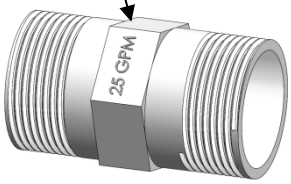


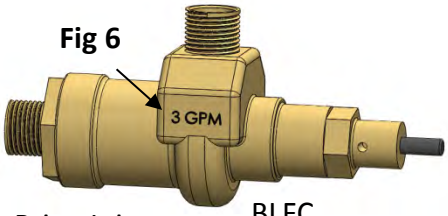
Fig 5

Fig 4



DLFC

Fig 6



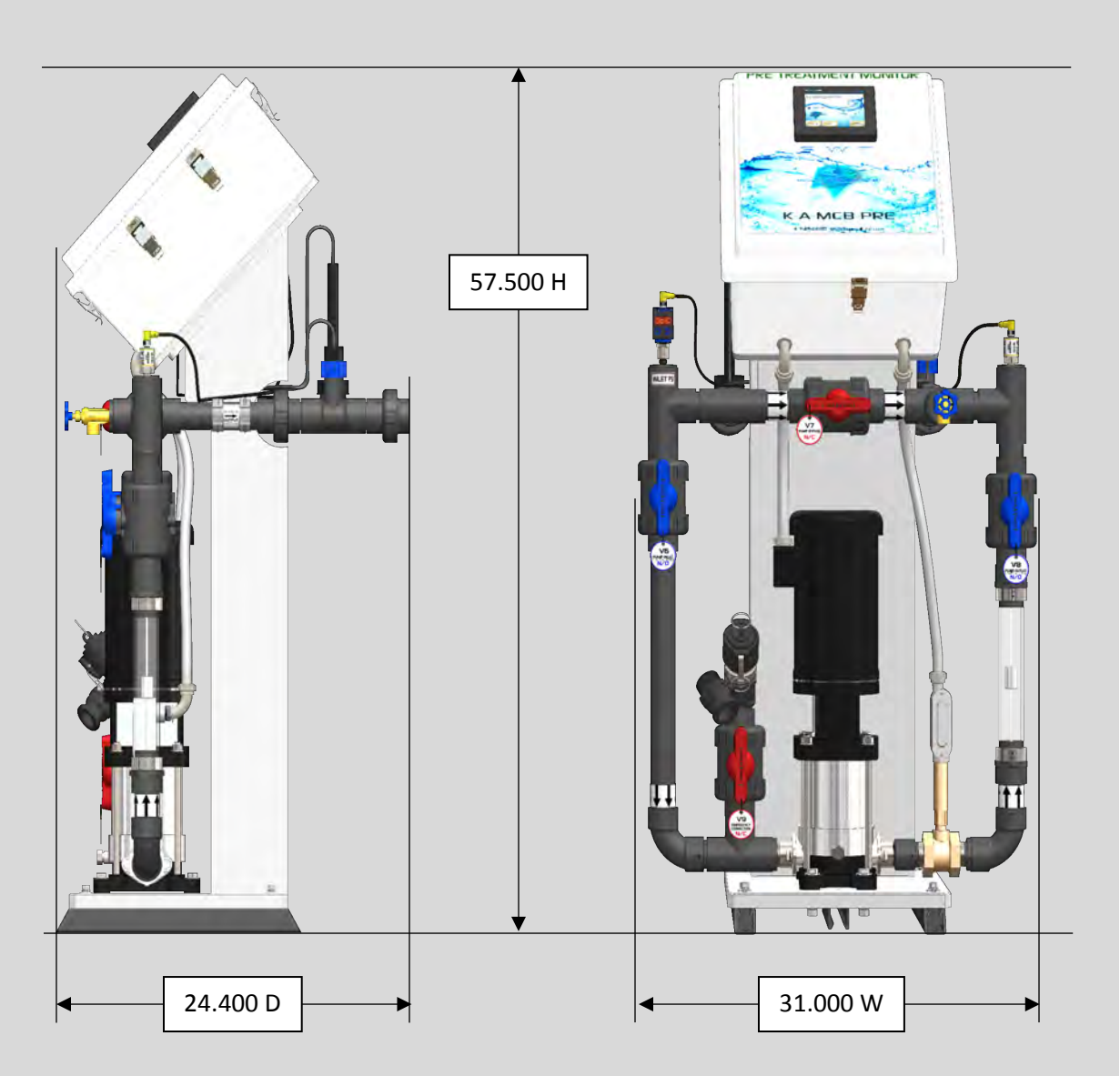
Brine Injector BLFC

(Pentair / Fleck 2850 Series Shown)

Section 5.1 SPECIFICATIONS - DIMENSIONS & WEIGHT

Size: 57.5” H X 31” W X 24.4” D

Weight: 190 LB. Dry



Section 5.2 SPECIFICATIONS – ELECTRICAL AND WATER REQUIREMENTS

Inlet Water Connection: Inlet water piping capable of delivering 20 GPM (Gallons per Minute), and 30-40 PSI (Pounds per Square Inch) pressure.

Feed Water Connection: The connection from the water feed side of the Municipal Boost to the trunk line is normally 1 ½" sch. 80 PVC. (Occasionally 1" piping is used)

Electrical Requirements: 2HP Pump Version:

208-230 volt, single phase 20 AMP dedicated circuit w/30A twist N lock receptacle.

3HP Pump Version:

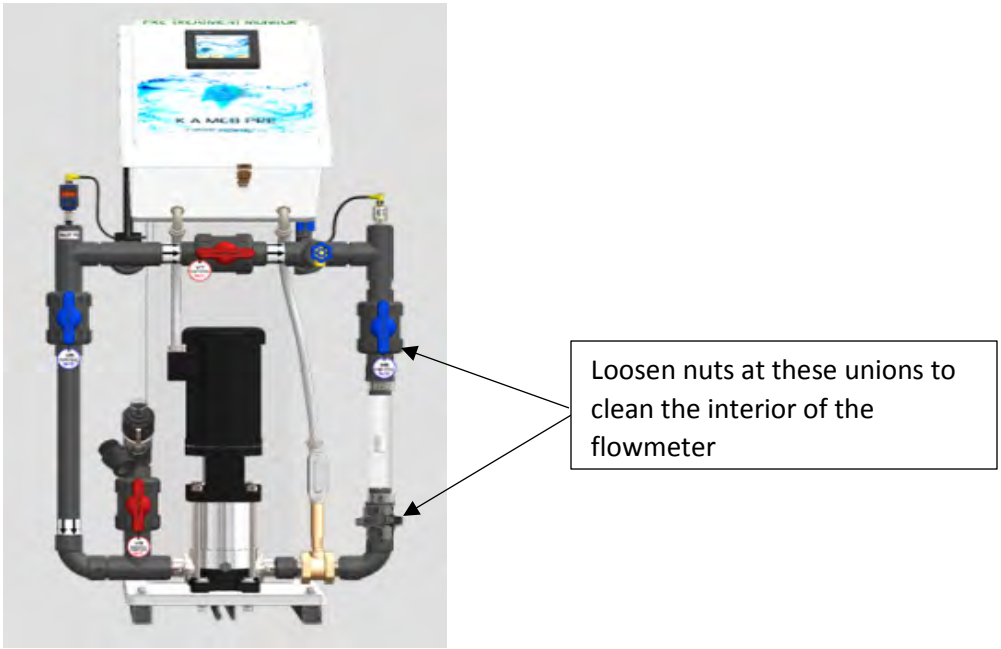
208-230 volt, single phase 30 AMP dedicated circuit w/30A twist N lock receptacle.

Section 6.1 ROUTINE MAINTENANCE

Routine inspection of the system is recommended. Follow all facility procedures regarding regular inspection of electrical equipment.

Quarterly system should be inspected as follows:

- Unplug from wall outlet and inspect plug for signs of electrical burn. Inspect plug for frayed wires. Repair and replace as needed.
- Inspect and clean fan vents on each side of the control box. Ensure adequate ventilation.
- Wipe exterior and inspect pump for dust and debris accumulation on top of fan shroud. Keep fan shroud clean.
- Inspect and clean glass on flowmeter for visual clarity by loosening nuts on ball valve above the flowmeter and union below the meter. See diagram below.
- Over the course of time, the variation of temperatures, pressure and vibration may cause some threaded fittings to loosen. Tighten only enough to stop the leak. Overtightening may cause damage to the fitting.
- Check hand-tightened fittings (valve couplings) for leaks. Hand tighten only enough to stop leak. Overtightening may cause damage to the valve union.
- Inspect the flange mounts on each side of the pump for leaks. Tighten clamp bolts to 22 ft/lbs or just enough to stop the leak.



Section 6.2 PH PROBE CLEANING / MAINTENANCE

Cleaning PH Probe:

1. Turn off incoming water supply. (Close V-4 and ensure Cold Water Bypass is in closed position).
2. Place bucket under probe assembly to catch water.
3. Loosen nut on PH probe assembly by turning counter clockwise.
4. Pull up on pH probe assembly to release it from piping.
5. Remove PH sensor from bottom by unscrewing it counter clockwise until it separates from housing.
6. Clean probe using one of the following steps:

   Soft Coatings can be removed by vigorous stirring, by use of a squirt bottle or very carefully, by gently wiping with a soft, clean non-abrasive paper or cloth. A probe cleaning detergent is recommended. Do not use any brush or abrasive cleaner on pH glass.

   Hard Coatings should be chemically removed. The chemical used to remove the coating should be the least harsh chemical that dissolves the coating in one or two minutes and does not attack the electrode's materials of construction. Acetic acid is recommended.

   Oily or Organic Coatings are best removed with detergents or an appropriate solvent that does not attack the electrode's materials of construction. For example, isopropyl alcohol might be used but acetone should be avoided if the electrode's body is made of CPVC.

   NOTE: When using chemicals or solvents, care should be taken and appropriate eye, face, hand, body and/or respiratory protection should be used.
7. Reinstall probe into housing.
8. Open incoming water slowly and watch for leaks.
9. Verify PH with external meter.

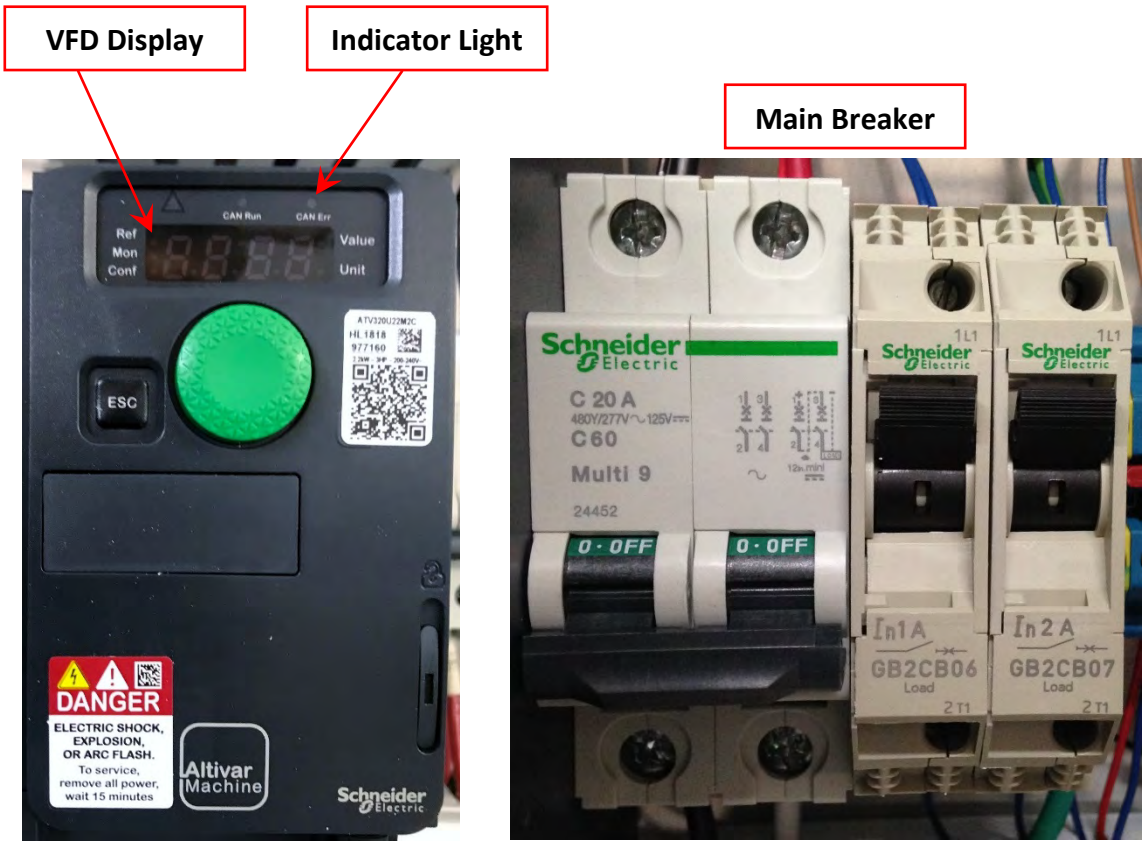
Section 6.3 REBOOT PROCEDURE

Reboot Procedure – This may be used to reboot the boost system if one of the following fault detection codes is present on the VFD drive display.

CrF	IF3	bLF	OCF	
IF1	IF4	EEF	SCF	SOF
IF2				tnF

1. Open the control box.
2. Flip the Main breaker to the "OFF" position.
3. Wait 45 seconds. (Indicator light on VFD Drive must be completely out)
4. Flip the Main breaker to the "ON" position.

Error code should now be reset and system should resume normal operation



Section 6.4 CARBON POLISHER PERFORMANCE TEST PROCEDURE

Objective: To bypass the carbon worker under a controlled environment and validate carbon polisher tanks ability to remove chlorine/chloramines at systems maximum flow rate. Procedure begins with the assumption water treatment system is in "Service Mode".

Required: Worker Bypass Shunt, located on a wall hanger around the media tanks & low-level chlorine test strips.

WARNING! **DO NOT LEAVE CARBON TANKS BYPASSED!**

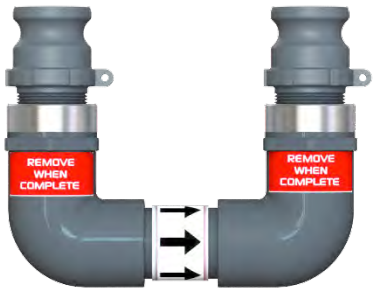
DO NOT DIALYZE PATIENTS WHILE CONNECTED!

IMPORTANT! **DO NOT EXPOSE RO LOOP TO RO PERMEATE UNTIL POLISHER PERFORMANCE TEST IS COMPLETE AND SYSTEM HAS BEEN VERIFIED SAFE FOR USE.**

DO NOT SEND PERMEATE TO RO LOOP UNTIL TEST SEQUENCE IS COMPLETE.

FOLLOW CLINICAL PROTOCOLS REGARDING RO AND DISTRIBUTION TANK DISINFECTION!

System Components May Require Disinfection After Polisher Performance Test Procedure!



Worker Bypass Shunt

Section 6.4 CARBON POLISHER PERFORMANCE TEST PROCEDURE

1. Switch power on the RO system to the "OFF" position.
2. Locate permeate connection, determine if RO is a "Direct Feed" or a "Tank Feed" system and proceed as instructed.

   Tank Feed System: Leave permeate hose connected to storage tank during the duration of test sequence.

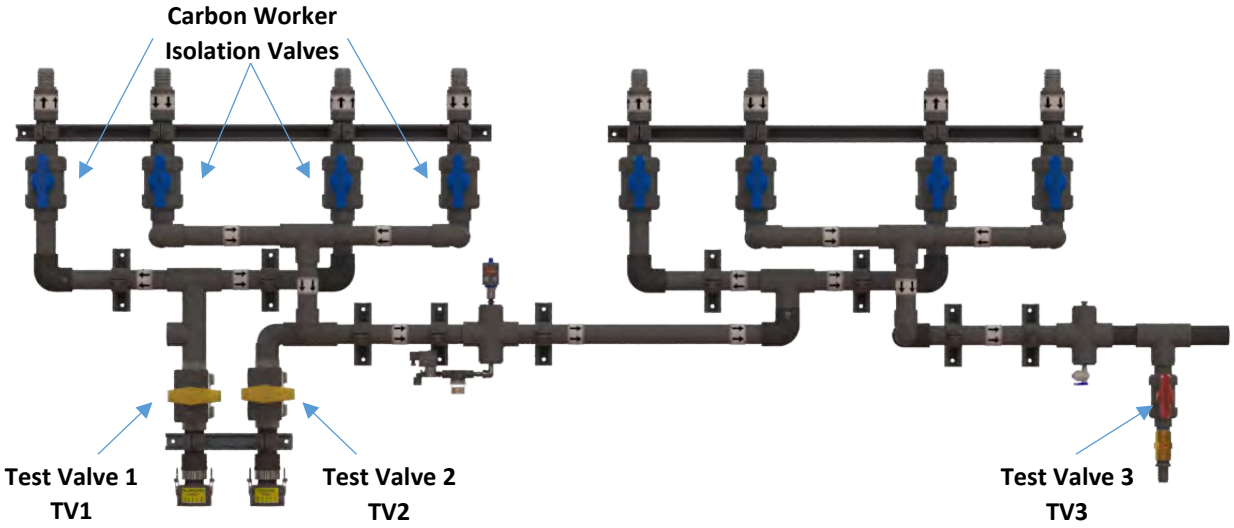
   a) Switch power on the RO Loop distribution pump to the "OFF" position.

   b) Locate "Inlet Water" valve to the RO loop distribution pump, rotate to the "CLOSED" position.

   c) Locate "Tank Drain" valve, rotate to the "OPEN" position. Leave tank drain valve open for duration of procedure.

   Direct Feed System: Leave RO in the Off position for duration of test.

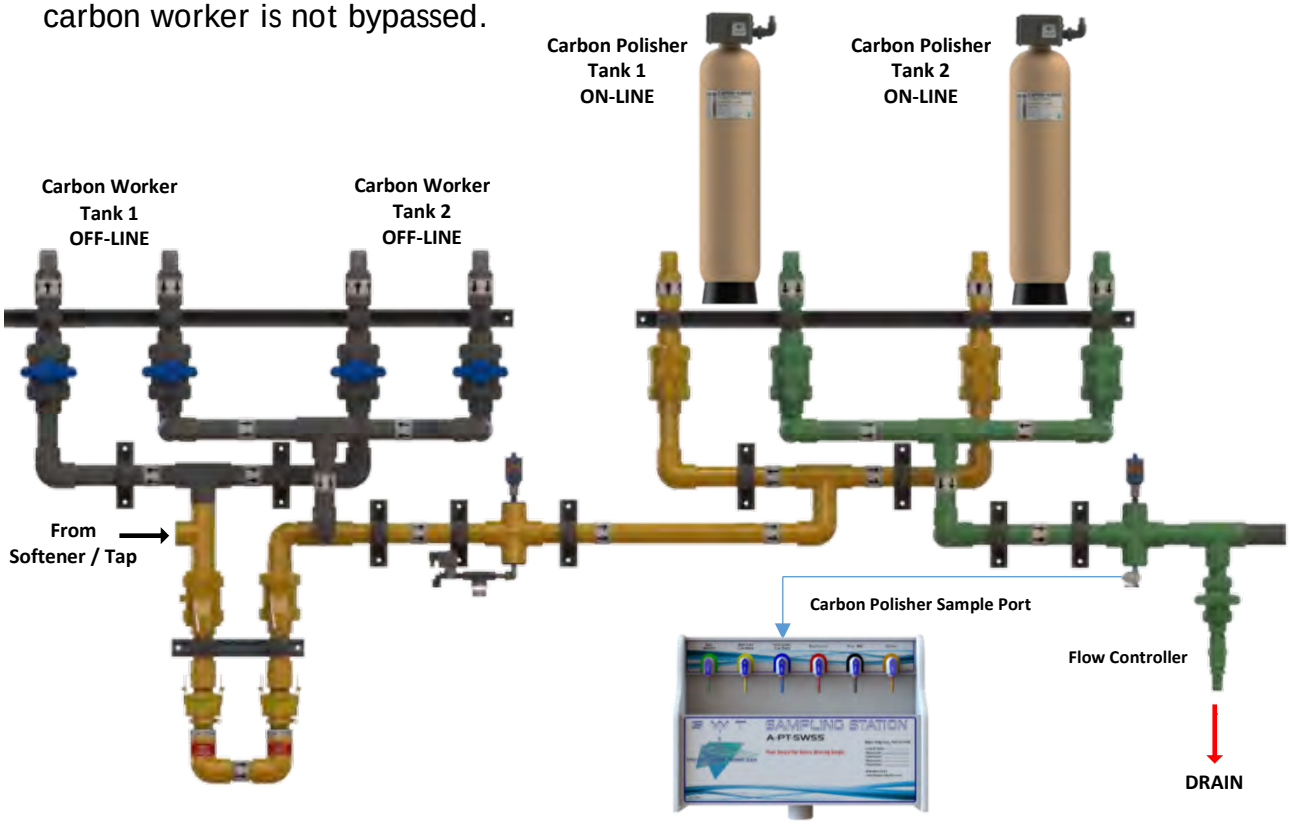
3. Familiarize yourself with the valves associated with test procedure.



4. Locate the following valves: "Carbon Worker Isolation Valves" – rotate valve handles to the "CLOSED" position.

Section 6.4 CARBON POLISHER PERFORMANCE TEST PROCEDURE

5. Locate the "Carbon Polisher Sample Port"- open fully. Leave open until instructed to close. Allow polisher carbon(s) to completely depressurize until flow stops at sample port before proceeding. If system does not depressurize it is an indication carbon worker is not bypassed.



6. Install "Worker Bypass Shunt" as shown. Make sure cam levers are in the locked position.

7. Slowly open TV1 and allow shunt to pressurize.
8. Fully open valves TV1 & TV2.
9. RO system will be locked out. PTM banner will display "Carbon Worker Tank Bypassed".
10. Open TV3 fully. Flow to drain to should match or exceed the maximum flow of the RO system. May be monitored at analog flow meter of PTM.

Section 6.4 CARBON POLISHER PERFORMANCE TEST PROCEDURE

PROCEED CAUTIOUSLY!

IF A CHLORINE LEVEL >.1 mg/L DISCONTINUE PROCEDURE IMMEDIATELY AND CONTACT TECHNICAL SUPERVISOR!

NOTE: It is important to monitor the total chlorine levels at the carbon polisher sample port every 5 minutes to minimize potential chlorine contamination.

11. Start a timer and record the chlorine levels at the carbon polisher sample port at the following intervals:

    5 Minutes ___<.1 mg/L

    10 Minutes __<.1 mg/L

    15 Minutes __<.1 mg/L

12. Once system has met the above criteria. Close TV1 & Sample Port and allow polisher carbon tank(s) to depressurize. When flow stops at TV3 valve close TV3.
13. Make sure TV1 is closed and system is depressurized before proceeding.
14. Close TV2. Remove "Worker Bypass Shunt" and return to wall hanger for storage.
15. Locate the following valves: "Carbon Worker Bypass Valves" – rotate valve handles to the "OPEN" position.
16. Polisher carbon tank(s) will begin to pressurize, flow will occur at polisher carbon sample port. Close polisher carbon tank sample port. If flow does not occur this indicates a valve is not in the correct position.
17. Switch power on the RO system to the "ON" position and allow to run for 15 minutes and verify the chlorine levels are <.1mg/L at carbon worker and carbon polisher sample ports.

    If total chlorine levels are elevated Turn RO OFF immediately and contact Technical Supervisor.

    Carbon Worker: _____mg/L
    Carbon Polisher: _____mg/L

18. Switch power on the RO system to the "OFF" position.
19. Log all results.
20. Complete.

FOLLOW CLINICAL PROTOCOLS REGARDING RO AND DISTRIBUTION TANK DISINFECTION!
System Components May Require Disinfection After Polisher Performance Test Procedure!

NOTES:

MCB w/Pre-Treatment Monitor System Rev. 3_2019

Manual P/N: OM-K-A-MCB-PRE

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