



# Ultra-Pure Water Systems

PCZ 380

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## Set-Up

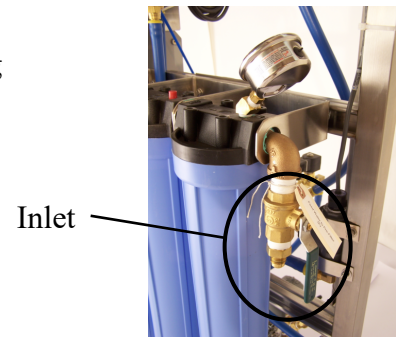
Set the three components of the PCZ-380 system in the desired location. Keep them easily accessible for future maintenance as shown in steps A, B, C, & D.



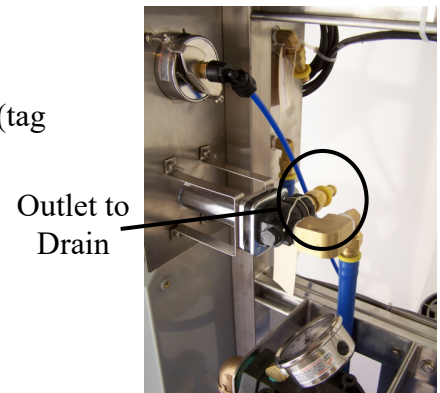
- A. A distance of 48" should be maintained overhead.
  - a. This allows the membranes to be removed from the housing for future maintenance.
- B. Choose a location that allows easy replacement of the sediment and carbon filters.
- C. Leave access to the shut off valve when positioning the storage tank.
- D. Position the Silex stand so the pressure gauge can be seen.

## Pre Start-up

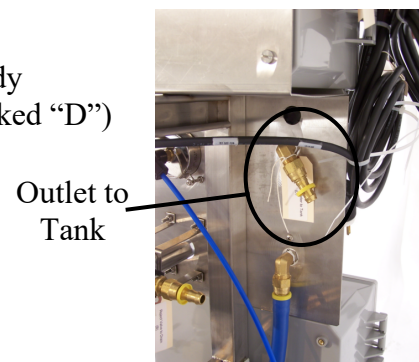
- A. Run a section of ½” blue hose from the prefilter assembly (tag marked "E") to site feed water.



- B. Run a section of ½” blue hose from the reject valve outlet (tag marked "B") to site supplied drain.

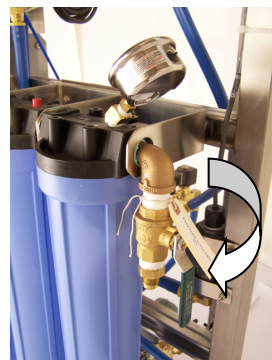


- C. Run the remaining section of ½” blue hose from the already attached service fitting on the service flow meter (tag marked "D") to the site supplied drain.



- D. Plug the float wires plugs together from the tank to the bottom control box of the RO system (tag marked "5").

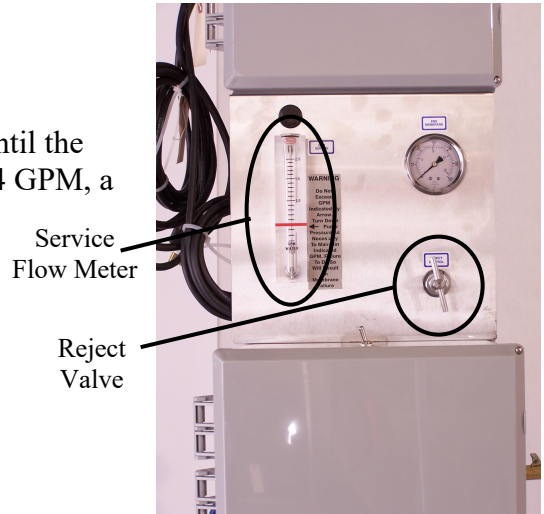
- E. Open the ball valve for the incoming water.



- F. Plug in the 110 volt power plug (tag marked “1”) for the control box from the bottom control box into a 110 volt outlet.
- G. Plug in the 110 volt power plug (tag marked “4”) for the production pump from the bottom control box in to a 110 volt outlet.

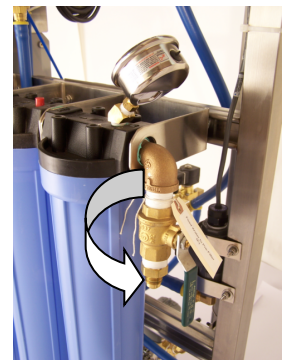
The production pump will start running and water will be flowing through the GPM Service flow meter.

- H. Allow 5 minutes for the flow rate to equalize.
  - I. Adjust the reject valve on the front of the RO system until the widest part of the float in the Service flow meter is at .4 GPM, a red line on the flow meter indicates this point.
- DO NOT exceed 200 PSI on the Pre Membrane pressure.



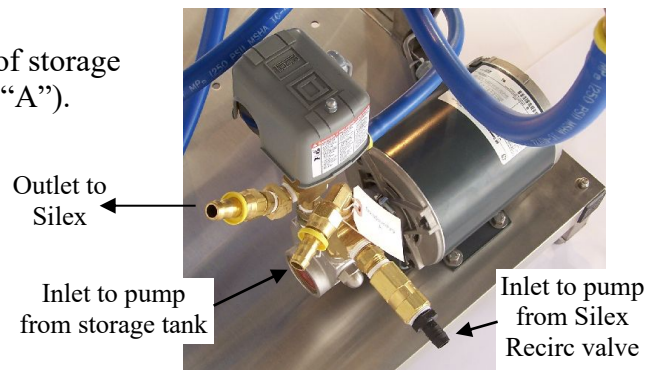
Run the system until the water turns clear, about 15 minutes. This will allow the feed water to flush out the RO system.

- J. After the water runs clear, unplug the 110V power plugs (tag marked “1 and 4”) and close the feed water ball valve.



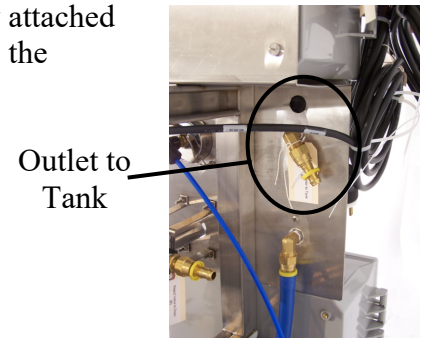
## Plumbing

- A. Run a section of ½” blue hose from outlet of storage tank to inlet of delivery pump (tag marked “A”).



- B. Run a section of 5/8” clear tubing from the storage tank over flow (tag marked “C”) to site supplied drain.

- C. Run the remaining section of ½” blue hose from the already attached service fitting on the service flow meter (tag marked “D”) to the storage tank.



- D. Run a section of ½” gray hose from the bottom of recirc valve on the Silex stand (tag marked “F”) to the washer inlet.
- E. Run a section of ½” blue hose to from the right side of the recirc valve to the inlet of the delivery pump (tag marked “G”).
- F. Install cellulose sediment filter in housing on right.  
Install carbon filters in the remaining housings.

NOTE: Failure to install the prefilters will result in Non-warranty damage to the system.

## Electrical

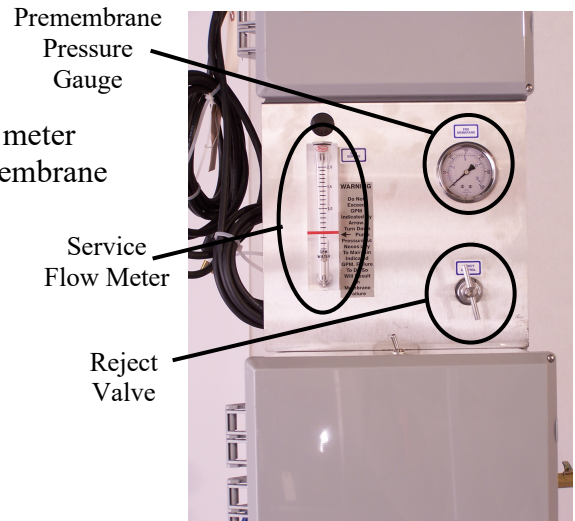
- A. Connect sensor “B” from the cable coming out of the left hand side of the quality water meter box to the sensor in the recirc assembly on the Silex stand.
- B. Plug in the following power cords:
- Plug for the Production pump (tag marked “4”).
  - Plug for the Quality Water Meter (tag marked “2”).
  - Plug for the Control Box (tag marked “1”).

DO NOT Plug in the plug for the Delivery pump (tag marked “3”). This will be done later.

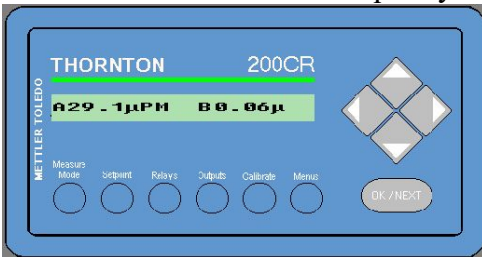
The RO production will start running at this point.

## Start-up

- A. If needed, adjust the reject valve on the front of the RO system until the widest part of the float in the Service flow meter is at .4 GPM, a red line on the flow meter indicates this point. DO NOT exceed 200 PSI on the membrane pressure.

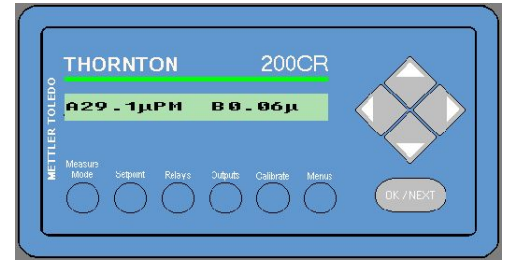


- B. Check the service water quality on the meter.



- C. The digital quality monitor should scroll through the following displays:
- A= Incoming TDS
  - a = Incoming Temperature
  - B = Outgoing TDS from the DI stand
  - b = Outgoing Temperature from the DI stand
- D. The digital quality monitor (labeled A) should display a reading of less than 10ppm TDS. If the reading is greater than 10ppm TDS, wait 15 more minutes and check again. (If a reading is not visible, push up or down arrow key until it is).
- E. Record operating parameters at this time on the provided log sheets
- F. Wait approximately 1 hour until the storage tank is full.
- G. Follow the instructions in the Silex manual for installing a resin sock in the Silex stand.
- H. Open the inlet valve on the Silex stand and the outlet valve on the storage tank.
- I. Open the recirc valve as much as possible.
- J. Plug in the power plug for the delivery pump (tag marked "3"). The pump will start up almost immediately. Once water begins to flow into the Silex unit, close the Silex inlet valve. The delivery pump will run until it builds up pressure in the pressure tank and turns off.
- K. Loosen the black plastic wing screw on top of the Silex stand to release the air in the Silex. Close the wing screw when water steadily comes out from underneath it.
- L. Have the wash station ask for water.

- M. Once the Silex unit has been started and water is going to the wash station, check the quality on the monitor. This will be labeled “B” on the screen. The reading should be greater than 16 meg/ohms after water has been flowing through the Silex unit for a minute or two. (If “B” screen is not visible, push the up or down arrow key until it does).



NOTE: If the DI water “B” will only be accurate if water is flowing to the wash station. If the display reads “xx:xx”, then the water is good and above readable quality.

- N. Have the wash station not ask for water anymore.
- O. Adjust the recirc valve on the Silex stand until the recirc pressure gauge is at 25 PSI.  
**WARNING: DO NOT INCREASE THE PRESSURE OVER 40 PSI. THIS WILL DAMAGE THE SILEX STAND.**
- P. Adjust the recirc valve until the recirc pressure gauge is at 35 PSI. The pump should turn off. If not, perform the following.
1. Remove cover on pressure switch on delivery pump.
  2. Unscrew the nut on the pressure switch until the delivery pump stops running.
  3. Put the cover back on the pressure switch and adjust the recirc valve to 25 PSI.

This is the end of start up.

## Operational Maintenance

**The PCZ-380 is designed as an automatic water treatment system. There is no need for operator input for the daily operation of the PCZ-380.**

### Prefilters

Prefilter should be changed on the following basis.

1. Chlorine is found in the feed water at the test port (tag marked “test port”) Filters should be changed ***immediately***; chlorine will cause damage to the membrane.
2. A pressure drop of greater than 20 PSI across the prefilters. Filters are plugged up.
3. Filters have been in longer than 120 days.

### Change Prefilters

- Unplug the production pump power cord. (tag marked “4”).
- Shut off inlet water valve to the RO system.
- Check filters pressure gauges for zero pressure. If pressure is present, push the red button on the center filter housing. This will relieve the water pressure.
- Using the supplied filter wrench, remove the sumps from the filter housing. Sumps will be full of water.
- Remove and discard old cartridges.
- Pour out water in housing.
- Make sure that the flat rubber washer has been removed from the bottom of the sump.
- Insert new filters. The filter should drop down over the sump in the bottom of the sump.
- Check that the O-Ring is in the groove on the top of the sump.
- Center the filter in the sump and thread onto the housing. *Hand tighten only*. Housing are O-ring sealed.
- Open the inlet valve on the RO system.
- Wait 10 minutes to purge the air.
- Plug in the production pump power cord.
- Production should restart.



### **Chlorine Test Procedures**

1. Always test for chlorine with production unit running.
2. Collect a sample of water at the feed water test port (tag labeled "Test Port").
3. Take one of the chlorine test strips and wave in the sample for 30 seconds.
4. Compare to the chart on side of test strip bottle. If any chlorine is present, prefilters need to be changed immediately.

For replacement test strips, call Pure Water Works at 800-248-7873.

### **Silex Unit**

Warning: Turn the switch on the bottom control box to OFF before changing the resin sock.

Change out the resin bag in the Silex unit is based on finished water. With water flowing through the Silex unit, the water quality displayed on the water monitor should never drop below 10 meg/ohms. If the water is below 10 meg/ohms, the resin bag should be changed.

Refer to the Silex manual for instructions on changing the resin sock.

\* For replacement coupons, call Pure Water Works at 800-248-7873.

## Troubleshooting


Symptom	Solution
Low R.O. Water Production	<p>Check water pretreatment equipment</p> <ul style="list-style-type: none"> <li>- <i>Improperly pretreated water can cause membrane to foul</i></li> </ul> <p>Check premembrane pressure</p> <ul style="list-style-type: none"> <li>- <i>If premembrane pressure is not maintained between 130 – 200 PSI loss in production will occur.</i></li> </ul>
Unable to Keep Premembrane Pressure between 130 – 200 PSI	<p>Check reject control valve</p> <ol style="list-style-type: none"> <li>1. <i>With the R.O. running, completely shut off the reject control valve. Pressure should climb well above the minimum pressure.</i> <ol style="list-style-type: none"> <li>a) <i>If pressure does not increase, pinch off the R.O. drain hose. If pressure does not increase, the production pump needs to be repaired or replaced.</i></li> <li>b) <i>If the pressure increases, the reject control valve needs to be replaced.</i></li> </ol> </li> </ol> <p>Check feed water rates</p> <ul style="list-style-type: none"> <li>- <i>The R.O. System requires at least 20 PSI feed water pressure. With low feed water pressure it may be difficult to maintain proper premembrane pressure.</i></li> </ul>
TDS is above 30 PPM	<p>Check raw water TDS</p> <ul style="list-style-type: none"> <li>- <i>If the raw water TDS is above 1000 PPM the R.O. System may have to be recalibrated to a different recovery rate.</i></li> </ul> <p>Check product water TDS</p> <ul style="list-style-type: none"> <li>- <i>Test the product water as it is being made. Sample the water as it goes to the storage tank (from the production water delivery hose).</i></li> </ul> <p><i>If the TDS is high it could be a seal in the system. TDS higher than 30 could mean that the membrane has fouled.</i></p> <p>Check storage tank TDS</p> <ul style="list-style-type: none"> <li>- <i>The storage tank is an atmospheric storage container which can make it prone to contamination. Routine cleaning of the tank will eliminate this problem.</i></li> </ul>

Symptom	Solution
Low Water Cut-off Keeps Activating	<p>Check prefilter</p> <ul style="list-style-type: none"> <li>- <i>Change prefilter cartridge</i></li> </ul> <p>Cuts off during high water usage</p> <ul style="list-style-type: none"> <li>- <i>Increase water feed supply.</i></li> </ul>
Production Pump Won't Start	<p>No power to the R.O. System</p> <ul style="list-style-type: none"> <li>- <i>Check the source power and make sure it is turned on.</i></li> </ul> <p>Low water pressure to R.O.</p> <ol style="list-style-type: none"> <li>1. <i>Check to see if prefilter needs to be changed.</i></li> <li>2. <i>Check to see if incoming water pressure is at least 30 PSI.</i> <ol style="list-style-type: none"> <li>a. <i>If water repressure is ok check low water pressure switch.</i> <i>Jump 4 and 5 on the time delay relay.</i> <i>If system operates, replace low water pressure switch .</i></li> </ol> </li> </ol> <p>High level float switch is not working</p> <ul style="list-style-type: none"> <li>- <i>Using a jumper wire, jump terminals 2 and 3 on terminal strip.</i> <i>If system starts check wire from control box to float switch.</i></li> </ul> <p>Blown fuse on transformer</p> <ul style="list-style-type: none"> <li>- <b>Disconnect power to system.</b> <i>Refer to the electrical diagram and check the fuse.</i></li> </ul> <p>Check motor contactor</p> <ul style="list-style-type: none"> <li>- <i>Inspect the motor contactor and contacts.</i> <i>The motor contactor should have 24 volts between A1 and A2 on the motor contactor when the motor should be running.</i></li> <li>- <i>If voltage is present and the contactor does not pull in, it is defective and will need to be replaced.</i></li> </ul> <p>Production pump motor is bad</p> <ul style="list-style-type: none"> <li>- <i>Check for proper voltage at the pump motor.</i> <i>Have motor repaired or replaced.</i></li> </ul>

Symptom	Solution
Production Pump Won't Stop	<p>High level float switch</p> <ul style="list-style-type: none"> <li>- <i>Remove the upper float wire from terminal 3 on the terminal strip. If the production pump turns off replace the high level float switch.</i></li> </ul> <p>Check motor contactor</p> <ul style="list-style-type: none"> <li>- <i>Inspect the motor contactor and contacts.</i></li> </ul>
Delivery Pump Turns On and Off Rapidly	<p>Pressure switch</p> <ol style="list-style-type: none"> <li>1. <i>Jump the two terminal on the pressure switch that have wires going to them.</i> <ol style="list-style-type: none"> <li>a. <i>If the delivery pump runs smooth, then replace the pressure switch.</i></li> </ol> </li> <li>2. <i>Replace the check valve on the delivery pump.</i></li> <li>3. <i>Low voltage going to the motor contactor.</i></li> </ol>
Delivery Pump Won't Start	<p>Check for low water</p> <ul style="list-style-type: none"> <li>- <i>Low water in storage tank will cause the delivery pump to shut off.</i></li> </ul> <p>Check low water float switch</p> <ul style="list-style-type: none"> <li>- <i>Using a jumper wire, jump terminals 2 and 5 on the terminal strip to bypass the low water switch.</i></li> </ul> <p><i>If delivery pump starts, replace low water switch.</i></p>

# Water Quality Meter

## Meter Wiring

- A. Power – 110V AC
  - a. Black wire to terminal labeled L
  - b. White wire to terminal labeled N
  - c. Green wire to terminal labeled 
  
- B. Sensor A
  - a. Black (6) wire to terminal GND (6)
  - b. Red (5) wire to terminal SIG5 (5)
  - c. Green (4) wire to terminal SIG4 (4)
  - d. White (3) wire to terminal SIG3 (3)
  - e. Clear (2) wire to terminal SIG2 (2)
  - f. White/Blue (1) wire to terminal SIG1 (1)
  
- C. Sensor B
  - a. Black (6) wire to terminal GND (6)
  - b. Red (5) wire to terminal SIG5 (5)
  - c. Green (4) wire to terminal SIG4 (4)
  - d. White (3) wire to terminal SIG3 (3)
  - e. Clear (2) wire to terminal SIG2 (2)
  - f. White/Blue (1) wire to terminal SIG1 (1)

## Thornton 200CR Meter Programming

### Setting the Auto Scroll

1. Press “Menus” button.
2. Press ↑ or ↓ until “Display Menu” is displayed.
3. Press “OK/NEXT”.
4. “Set: Auto Scroll” should be displayed.
5. Press “OK/NEXT”.
6. “Auto Scroll = off” will be displayed.
7. Press ↑ or ↓ to display “Auto Scroll = on”.
8. Press “OK/NEXT”.
9. “Save Changes Yes” will be displayed.
10. Press the “OK/NEXT” button.
11. “Saving Changes” will display for a second then go to normal screen.

### Configuring the Probes

1. Press “Measure Mode” button, “A=S/cm (Auto)” should be displayed.
2. Press ↑ or ↓ until “A=TD (Auto)” is displayed.
3. Press → “Auto” is flashing.
4. Press ↑ until “PPM” is flashing.
5. Press “OK/NEXT”.
6. “a=DegC ( )” should be displayed.
7. Press ↑ until “a=DegF ( )” is displayed.
8. Press “OK/NEXT”.
9. “B=S/cm (micro)” should be displayed.

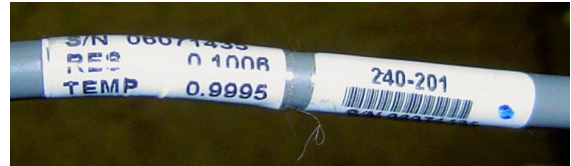
10. Press  $\uparrow$  or  $\downarrow$  until “B=s/cm U (micro)” is displayed.
11. Press  $\rightarrow$  until “micro” is flashing.
12. Press  $\uparrow$  or  $\downarrow$  until “Auto” is selected.
13. Press “OK/NEXT”.
14. “b=DegC (    )” will be displayed.
15. Press  $\uparrow$  until “b=DegF (    ) is displayed.
16. Press “OK/NEXT”.
17. “Save Changes Yes” will be displayed with “Yes” flashing.
18. Press the “OK/NEXT” button.
19. “Saving Changes” will display for a second then go to normal screen..

## Calibrating the Probes

Probe A (located on the RO system)

RES

1. Press “Menu” button.
2. Press  $\uparrow$  or  $\downarrow$  until “Edit Sensor Cal” is displayed.
3. Press “OK/NEXT”.
4. “A Cell M=0.1000\_” will be displayed with “A Cell” flashing .
5. Press  $\rightarrow$  until the first zero “0.1000\_” is flashing.
6. Change the digits to match the RES number on the probe cables by pressing  $\uparrow$  or  $\downarrow$ .
7. Press  $\leftarrow$  or  $\rightarrow$  until the “A Cell” starts flashing.



TEMP

8. Press  $\uparrow$  until “A Temp M=1.0000\_” is displayed with “A Temp” flashing.
9. Press  $\rightarrow$  until the one “1.0000\_” is flashing.
10. Change the digits to match the TEMP number on the probe cables by pressing  $\uparrow$  or  $\downarrow$  Press  $\leftarrow$  or  $\rightarrow$  until the “A Temp” starts flashing.

Probe B (located on the output of the Silex stand)

1. Press  $\uparrow$  until “B Cell M=0.1000\_” is displayed with “B Cell” flashing.
2. Repeat steps 5 – 10 to calibrate the B probes.
3. After calibrating the B probes, press the “OK/NEXT” button.
4. “Save Changes Yes” will be displayed with “Yes” flashing.
5. Press the “OK/NEXT” button.
6. “Saving Changes” will display for a second then go to normal screen.



## Programming is Complete

# RO Electrical Wiring Diagram

PCZ-380

High Purity Water System

