

AVIDITY
SCIENCE

Pico™

Water Purification System

Operation Manual

OP-000100

Revision D

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Important Safety and Service Information

The customer should comply with their organization's Electrical Safe Practices as recommended by the Occupational Safety and Health Administration (OSHA), or local and national safety codes.

This equipment must be operated by qualified persons who are knowledgeable and trained in its operation, and its associated hazards.

Use caution when operating, or servicing this equipment. It is the user's responsibility to read and understand the content of this manual before operating this equipment.

SAVE THESE INSTRUCTIONS

RoHS/WEEE Statement

Avidity Science water treatment, automated watering, environmental monitoring, and access control systems specified in this manual are manufactured in compliance with the RoHS Directive (EU Directive 2011/65/EU and subsequent amendments).

Hazard and Special Safety Notice Definitions

Below is a list of definitions of hazard symbols used on this product.



WARNING! Risk of electrocution or electrical shock resulting in death or severe personal injury.



WARNING! Could result in death or serious personal injury or equipment damage.



CAUTION! Minor or moderate injury or equipment damage

This manual may contain the following types of special notices.

IMPORTANT: Indicates information that is necessary to understanding a topic or performing a procedure.

NOTE: Indicates information that may be helpful in understanding a topic or performing a procedure.

Product Warnings



WARNING! Electric shock. The electrical equipment in this system must be connected to a ground fault interrupting circuit. Failure to do so can cause electrical shock resulting in severe personal injury or property damage.



WARNING! Electrocutation. Never stand in water when handling electrical equipment. Water is a conductor of electricity. Standing in water while operating this equipment can cause electrical shock or electrocution resulting in severe personal injury.



WARNING! Electric shock. Disconnect the main power before servicing any electrical components. Failure to do so can cause electrical shock resulting in personal injury.

Product Cautions



CAUTION! Equipment Damage. Follow all nationally and locally approved electrical codes when installing and operating this equipment. Failure to do so can result in equipment damage.

Contacting Technical Support

For up to one year after your system installation date, you may contact Avidity Science for free technical support. All contact information appears in the table below.

UK Support

Phone	E-mail	Web Site
01844 201142 Option 2	service@triplered.com	www.triplered.com

US Support

Phone	E-mail	Web Site
833 898 3420	labwater-service@avidityscience.com	www.avidityscience.com



Introduction

The Pico water purification system produces Type 2 (1 to 15 M Ω /cm) or Type 3 water at a rate of 10 to 20 liters per hour with the option of ultraviolet sterilization. The processed water is stored in a 35 liter reservoir (A) which can be dispensed with an included manual dispensing tap (B) as required.

All components are assembled around a reservoir chassis and are protected by a plastic housing designed for bench or wall-mounting. The plastic covers (C) can be removed for access to replaceable components.

Two threaded ports (D) on each side of the unit are for connecting equipment utilizing the purified water. All water and power connections and pressure adjustment (E) is located on the side of the unit.

All recorded data, warning messages and water quality information can be viewed from the controller display (F).

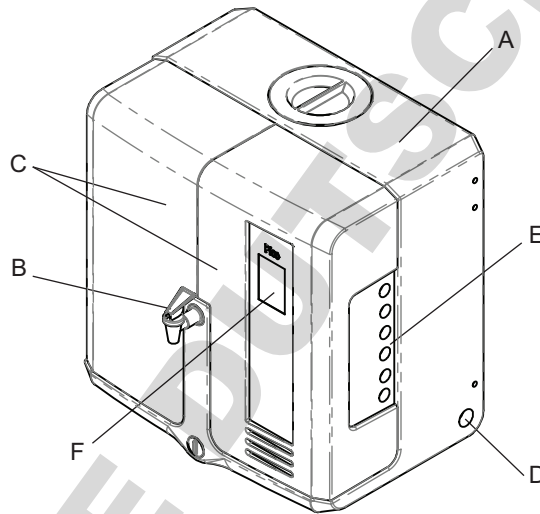


Figure 1. Pico Water Purification System

Pico Water Purification Models

The content in this manual applies to these models. Some models include an optional submersible ultraviolet (UV) light for sterilization.

Table 1. Pico Models

Model	Product Water Quality	Product Water Flow Rate	Model	Product Water Quality	Product Water Flow Rate
PICO10T2	Type 2	10 liters/hr	PICO10T3	Type 3	10 liters/hr
PICO10T2UV	Type 2	10 liters/hr	PICO10T3UV	Type 3	10 liters/hr
PICO20T2	Type 2	20 liters/hr	PICO20T3	Type 3	20 liters/hr
PICO20T2UV	Type 2	20 liters/hr	PICO20T3UV	Type 3	20 liters/hr

Purification Process

In normal operation mode, feed water enters the system through the inlet solenoid valve activating the production pump. The untreated water is pumped through a carbon-based, combination pretreatment and RO module to detain larger particles greater than 5 micron and chemicals such as insecticides, pesticides, herbicides and chlorides.

The RO membrane will reject almost all bacteria, viruses, heavy metal compounds and organics, as well as up to 98 percent of the salt content from the water. A percentage of the rejected concentrate water is sent to a drain through a flow restrictor.

For Type 2 water production, the RO water will flow through a DI (de-ionization) cartridge containing ion-exchange resins.

The purified water is sent to the reservoir. A conductivity sensor measures the quality of the permeate before it enters the tank. An optical sensor monitors the water level in the reservoir.

Feed Water Requirements

The feed water used must meet these requirements.

Pressure: 0.1 to 6.0 bar [1.5 to 87 psi]

Minimum Flow: 60 liters per hour

Free Water Conductivity: Less than 1400 $\mu\text{s}/\text{cm}$

Free Chlorine: Less than 0.1 mg/liter

Carbon Dioxide (CO₂): 15 mg/liter

Silica: 15 mg/liter

Silt Density Index (SDI): Less than 3

Langelier Index (LI): Less than zero

Iron: Less than 0.1 mg/liter

Manganese: Less than 0.05 mg/liter

pH: 3 to 9

Temperature: 5 to 35 degrees C [45 to 90 degrees F]

Installation and Setup

Installation Kit

Figure 2 shows the components used in the installation of all Pico models.

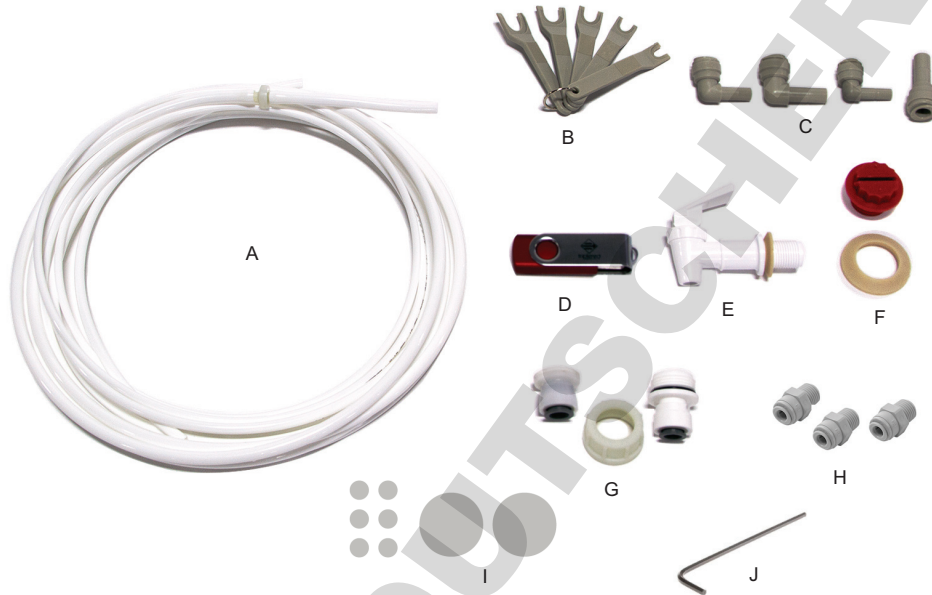


Figure 2. installation kit components

Table 2. Installation Kit Components

Item	Description
A	Tubing: 3/8-inch Inlet with non-return valve, 2 meters [6.5 feet] long 1/4-inch Concentrate outlet-to-drain with installed restrictor, 2 meters [6.5 feet] long 5/16-inch Permeate outlet, 2 meters [6.5 feet] long
B	Maintenance Keys for module and cartridge changes, and fittings
C	Straight and Elbow Fittings for tubing connections
D	Flash drive with the <i>Pico Water Purification System Operation Manual</i>
E	Dispenser Tap
F	Plug with Washer Seal for unused tap port
G	Dishwasher connection hardware
H	Feed Water Tubing Fittings 1/2-inch, 1/4-inch, and 3/8-inch male NPT
I	Stickers for covering screw heads and unused connections
J	Allen Wrench (4 mm) to remove right panel

Mounting the System

The Pico unit can be mounted to a wall or placed on a sturdy bench. Avidity Science recommends wall-mounting the unit to be sure that a connection to the lower dispenser-tap port is accessible. Refer to *Install Dispenser Tap* on page 5 for information on placement of the Dispenser Tap.

Bench Placement

The bench must be able to hold 60 kg [132 pounds] and located on an flat, level surface. The surface of the bench must be resistant to applied chemicals such as disinfectants, acids, dyes, and solvents.

Wall Mounting

The wall-mounting kit is separate. Use the included instructions as a supplement to this procedure to mount the Pico unit. In addition to the kit, these are the tools required to mount the Pico Water Purification unit to a wall.

- Wall Mounting kit, EI #1330-3000-001 (PICOWB)
- Pozi screwdriver
- Pen/pencil for marking wall
- Level
- Drill with 10 mm drill bit
- 4 mm Allen Head wrench/Hex key



CAUTION! Personal injury. The reservoir must be empty when mounting the Pico unit. A reservoir with water adds extra weight that can result in personal injury when lifting the unit onto the mounting brackets.

IMPORTANT: It is recommended that at least two people assist in mounting the unit.

Follow this procedure. Refer to Figure 3.

1. Measure the width of the Pico enclosure. This measurement (**A**) will be used as the spacing between mounting brackets.
2. Position and level the left mounting bracket (**L**) vertically at the location desired mounting location. Mark the bracket location and the four mounting hole locations on the wall.
3. Using a drill with a 10 mm masonry bit, drill four mounting holes at the marked locations deep enough to insert wall anchors.
4. Insert the wall anchors.
5. Position the left mounting bracket (**L**) holes over the anchors and secure the bracket with four anchor screws.
6. Position the right mounting bracket (**R**) from the left bracket the width measurement (**A**) acquired in step 1.
7. Make sure the right mounting bracket (**R**) is vertically level and level with the left bracket. Mark the bracket location and the four mounting holes on the wall.

8. Using a drill with a 10 mm masonry bit, drill four holes deep enough to insert wall anchors.
9. Insert the wall anchors.
10. Position the right bracket (**R**) slots over the anchors and secure the bracket with four anchor screws.

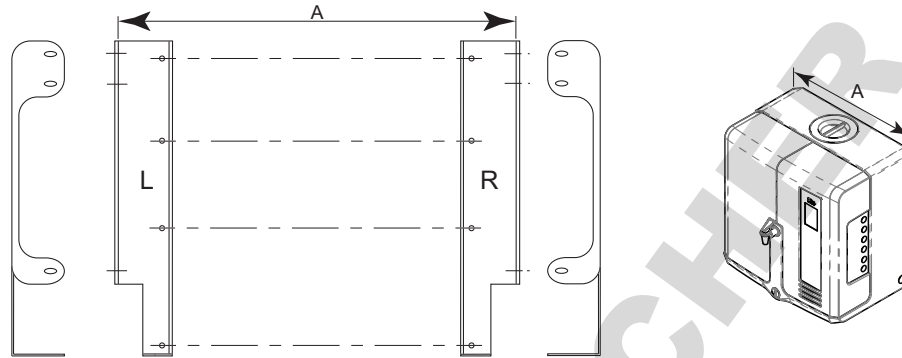


Figure 3. Align and secure left and right mounting brackets.

11. Use the level to be sure the brackets are aligned so the Pico unit will be level when mounted.
12. Using two people, place the Pico unit onto the mounting brackets. Be sure the mounting holes on the side of the unit align with the mounting slots on the brackets.
13. With one person holding the unit in place, secure the unit to the brackets with the 4 mm Allen head screws.

Install Dispenser Tap

The Dispenser Tap can be installed in either of two ports. Installation in the upper port is good for bench placement of the Pico unit where a large container can be placed on the bench as it is filled, but there will be no access to the remaining water in the reservoir once the level drops below the dispense port.

Installing the port in the lower port is best if the unit is wall-mounted and all water in the reservoir will be accessible.







Follow this procedure.

1. Remove the Dispenser Tap from its packaging.
2. Determine which port on the reservoir to install the Dispenser Tap and remove the plug.
3. Place a washer over threaded end of the Dispenser Tap. Be sure the beveled-side of the washer faces the threads of the tap.
4. Insert the threaded-pipe end of the tap through the hole. Hand-tighten only.
5. Place a washer over the red plug with the beveled side facing the threads and insert the plug into the unused port. Screw the plug into the hole until tightened. Make 1/4-turn past tight to ensure a proper seal.

Power and Water Connections

The power and Water connections are located on the right side of the unit. The table below identifies the power, pressure adjustment, and water connections to the Pico unit.

Table 3. Power and water connections for the Pico unit.

	Power Inlet from external 24 VDC power supply unit
	Feed water inlet. Low pressure, less than 1 bar [15 psi]
	Feed water inlet, High pressure, greater than 1 bar [15 psi]
	Pump pressure adjustment. Factory set to 5.5 to 6 bar [79 to 87 psi]
	Reservoir overflow connected to drain
	RO concentrate outlet connected to drain.

Fittings

The feed water, inlet and outlet tubing is inserted and secured through the fittings defined in Table 3. All fittings are plugged for shipping purposes. A plug must be inserted into any fitting that is not used.

To remove the plug, hold the plug in one hand and while pushing the fitting collar, pull out the plug.

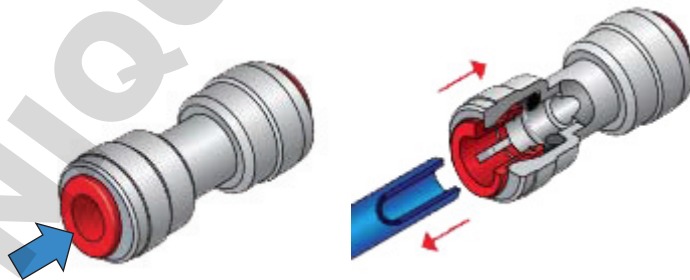


Figure 4. Fitting collar (left).

Tubing

These are general guidelines for connecting the tubing to the Pico connectors.

- Use a sharp blade to cut the tubing
- Be sure the tube is long enough to allow for disconnecting and reconnecting during service.
- Be sure tubing is clean and not cracked
- Be sure there are no obstructions in the tube before connecting
- Do not use excessive force when inserting tubing. Excessive force may damage the tubing resulting in leaks.
- Pull on the tube only once to be sure it is secured in the fitting
- After pulling once, insert the wrench under the collet and push the tube into the fitting once more for a secure fit.

Connect High or Low Pressure Feed Water Tubing

NOTE: Use the provided elbow connectors as necessary.

The 5/16-inch feed water tubing can be connected to the high pressure or low pressure inlet fitting depending on the known feed water pressure.

NOTE: If the pressure is not known, connect the feed water tubing to the high pressure fitting. A water pressure test will be conducted at the completion of the installation process to determine the required pressure.



Feed water inlet. Low pressure, less than 1 bar [15 psi]



Feed water inlet, High pressure, greater than 1 bar [15 psi]

Follow this procedure.

1. Measure and cut the length of the **5/16-inch** feed water tubing needed between the water source connection and the applicable feed water inlet fitting on the Pico unit. Add extra length to accommodate removal and reconnection of the tube.
2. Connect the check valve-end of the tubing to the applicable inlet fitting.

Connect Reservoir Overflow and RO Concentrate Tubing

The 3/8-inch tubing is connected between the Reservoir Overflow fitting and the drain. A check valve, to prevent back flow, is installed in one end of the tubing.

The 1/4-inch tubing is connected between the RO concentrate outlet fitting and the drain.

NOTE: Use the provided elbow connectors as necessary.



Reservoir overflow connected to drain



RO concentrate outlet connected to drain.

Follow this procedure to connect the tubing to the applicable fitting.

IMPORTANT: The tubing for both the reservoir overflow and the RO concentrate must be positioned downward toward the drain.

1. Measure and cut the length of the **3/8-inch tubing** needed between the **reservoir overflow** fitting and the drain. Add extra length to accommodate removal and reconnection of the tube.
2. Connect the check valve-end to the reservoir overflow fitting.
3. Measure and cut the length of the **1/4-inch tubing** needed between the **RO concentrate outlet fitting** and the drain. Add extra length to accommodate removal and reconnection of the tube.
4. Connect the tubing to the applicable fitting.
5. Position the tubing downward and directed toward a drain.

Install Pre-Treatment and RO Module

The Pre-Treatment and RO module are combined in one canister.

IMPORTANT: A Pico unit with a DI cartridge is shipped with a bypass tube connected between the green RO water outlet tube and the white reservoir inlet tube. The bypass tube is required for rinsing a new Pre-Treatment and RO module before installing the DI cartridge. Do not discard the bypass tube.

Follow this procedure.

1. Remove the left front cover of the Pico unit.
2. Remove the combination Pre-Treatment and RO module from its packaging.
3. Insert the hooks of the canister into the slots located on the right side.

NOTE: The location is labeled **TC021** for a 10-liter unit or **TC022** for a 20-liter unit.

4. Connect the color tubing (blue, red, and black) to the fitting with the corresponding color label on the cartridge. See Figure 5.

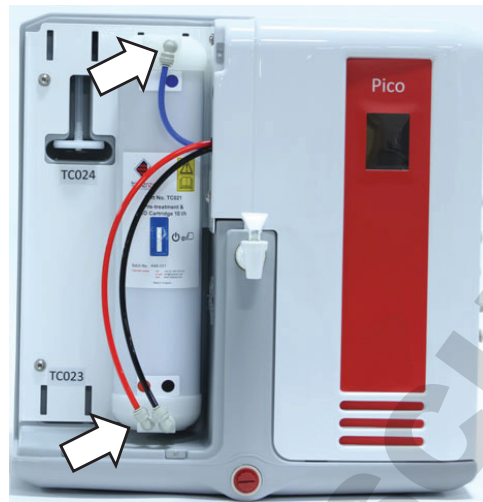


Figure 5. Pre-Treatment and RO module connections.

Connect Power Supply

Secure the power supply cord to connector  on the Pico unit. Plug the power supply into the applicable power outlet.

IMPORTANT: Be sure the feed water supply is turned on.

Touch 

Perform Water Pressure Test

A water pressure test will assist in verifying that the feed water tubing is connected to the correct inlet fitting. Follow this procedure.

1. Take one of these actions.

If a DI cartridge is...	Then...
Required	Go to step 2.
Not required	Go to step 3.

2. Connect one end of the bypass tubing (A) to the open end of the **green** RO water outlet tube (B) and the open end of the **white** reservoir inlet tube (C) as shown in Figure 6. Use the provided elbow fittings.

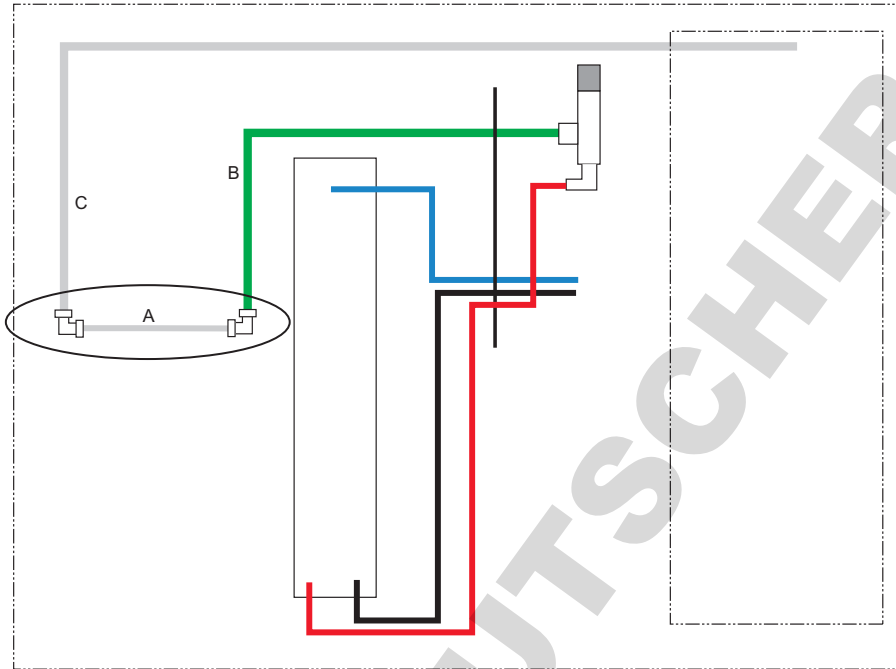








Figure 6. Bypass tubing connected.

3. On the control display, press .
4. Press .
5. Press . The inlet valve will open and begin flushing the unit.
6. When asked if RO module is installed, touch .
7. Allow the pressure to adjust and stabilize for approximately 3 minutes and then take one of these actions.

If the pressure is	Then,...
Less than 0.5 bar	Go to step 8.
Greater than 0.6 bar	Press OK and got to step 13

8. Turn off the water to the Pico unit.

9. When the pressure displayed is less than 0.1 bar, remove the feed water tubing from the high pressure inlet fitting and connect to the low pressure inlet fitting .
10. Turn on water to the Pico unit.
11. After 3 minutes check the pressure displayed on the screen. The pressure must be greater than 0.6 bar.
12. Press **OK**.
13. After 2 minutes, using a flat-blade screwdriver, adjust the pump pressure screw  on the right side of the unit until **6.0 bar** (± 0.2 bar).
14. Press **OK**.

Rinse RO Module






The RO portion of the combination Pre-Treatment and RO module must be rinsed before first use. If a DI cartridge is required for Type 2 water, the bypass tube must be connected between the green RO water outlet tube and the white reservoir inlet tube

IMPORTANT: Do not connect the DI cartridge (if applicable) before the RO module is rinsed. Bypass tubing must be connected between the green RO water outlet tube and the white reservoir inlet tube.

Follow this procedure.

1. Take one of these actions.

If a DI cartridge is...	Then...
Required	Be sure the bypass tube is connected. See Figure 6.
Not required	Go to step 2.

2. On the control display, press .
3. Touch .
4. Select **TC021/TC022**.
5. When **Remove old TC021/TC022** appears, touch .
6. When instructed to insert new TC021/TC022, touch . The module will rinse for one hour.
7. When operation is complete, touch .
8. If the bypass tube was connected, disconnect the bypass tube. Store the bypass tube in a safe location.

- Press firmly at the center of the 12-month timer label sticker until a thin red line appears. See Figure 7.

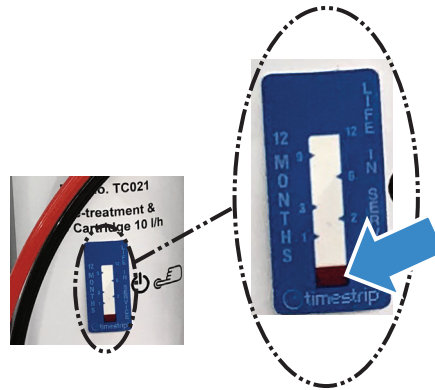


Figure 7. Red line shows RO module 12-month timer is activated.

- Take one of these actions.

If the required water is...	Then,...
Type 2,	Go to section <i>Install DI Cartridge (for Type 2 water quality only)</i> on page 12.
Type 3,	Go to section <i>Empty the Reservoir Tank</i> on page 13.

Install DI Cartridge (for Type 2 water quality only)

Type 2 water requires de-ionization of the RO water. Follow this procedure.

- If necessary, remove the left front cover of the Pico unit.
- Remove the DI cartridge from its packaging.
- Be sure the green RO water outlet tube and white reservoir inlet tube are connected according to the color labels on the cartridge.



Figure 8. DI cartridge tube connections.

4. Secure the tubes into the clamps near the connections.
5. Replace and secure the left front cover of the Pico unit.

Rinse DI Cartridge (for Type 2 water quality only)

The DI cartridge must be rinsed before first use. Follow this procedure.






1. On the control display, press .
2. Press .
3. Select **TC023**.
4. When **Remove old TC023** appears, touch .
5. When instructed to insert new TC023, touch . The module will rinse for 10 minutes.
6. When operation is complete, touch .
7. When operation is complete, press firmly at the center of the timer label button until a thin red line appears. See Figure 9.



Figure 9. Activate DI cartridge 6-month timer.

8. Replace the left cover over the unit.

Empty the Reservoir Tank

Some water has accumulated in the reservoir during the setup process. Empty the reservoir to ensure optimum quality of the first batch of water.

Fill the Reservoir Tank

An optical sensor detects when the reservoir needs to fill and will issue a command to fill. Figure 10 shows the screen indicating the reservoir is filling.

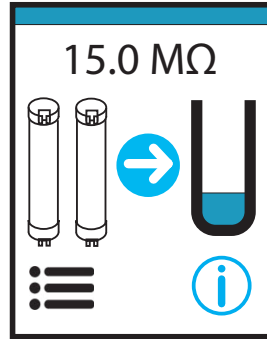


Figure 10. Screen displayed when reservoir is filling.

Figure 11 shows the screen indicating the reservoir is full.

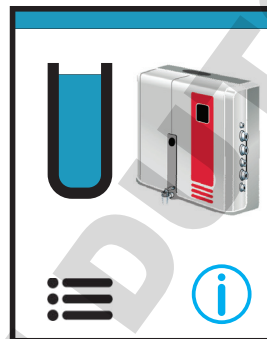






Figure 11. Screen displayed when reservoir is full.

Reset RO Quality Set Point

The RO Quality set point is set at the factory. Circumstances may require changing the setting.

IMPORTANT: Contact Avidity Science Technical Support before changing the setting.

Follow this procedure.





1. Touch 
2. Touch 
3. Touch 
4. Touch + or - for the desired RO quality setting.
5. Touch 

Reset DI Quality Set Point

The DI Quality set point is set at the factory. Circumstances may require changing the setting.

IMPORTANT: Contact Avidity Science Technical Support before changing the setting.

Follow this procedure.

1. Touch 
2. Touch 
3. Touch 
4. Touch + or - for the desired DI quality setting.
5. Touch 

Cover Screw Heads and Unused Connections














If desired, use the included stickers to cover exposed screw heads and connections that are not used.

DOMINIQUE DUTSCHER SAS

Control Display Operation

Function Keys







Below are the main control display function keys. Other functions are available within these functions.

	Consumable Timer		Q1. RO Alarm Set Point
	Replacement of Consumables		Q2. DI Alarm Set Point
	Menu		Pressure Test and Pump Adjustment
	Alarms		Settings
	Power On and Off		Time and Date Adjustment
	View daily operating data		Language Selection
			Technician use only. Password protected.

Set Date and Time

Follow this procedure.

IMPORTANT: the date is set in YY/MM/DD format.

1. If necessary, touch 
2. Touch 
3. Touch 
4. Touch 
5. On the keypad, touch the 2-digit year
6. Touch the 2-digit month
7. Touch the 2-digit day
8. Touch 
9. When the display changes to the time screen, touch the 2-digit hour.
10. Touch the 2-digit minutes.
11. Touch the 2-digit seconds.
12. Touch 

Warning Messages and Solutions

Below are warning messages that appear on the control display. Refer to *Replacement Parts* for the part numbers to order for replacement.

Message	Solution
TC021 timer expired	Replace the applicable Pre-treatment and RO Module
TC022 timer expired	
RO quality above set point	
TC023 timer expired	Replace the DI Cartridge
DI quality above set point	
TC024 timer expired	Replace the Air Vent
TC025 timer expired	Replace the UV Lamp
Pump pressure LOW	Check the feed water and pump
Pump pressure HIGH	Adjust pump pressure

Maintenance

This section contains procedures for routine maintenance of the Pico Water Purification System.



WARNING! Disconnect the main power before servicing any electrical components. Failure to do so can cause electrical shock resulting in personal injury.



WARNING! Electrocutation. Never stand in water when handling electrical equipment. Water is a conductor of electricity. Standing in water while operating this equipment can cause electrical shock or electrocution resulting in severe personal injury.



WARNING! Equipment damage. do not open the enclosure unless you are trained in the operation and service of the electrical equipment. Failure to do so can result in equipment damage and personal injury.

Table 4 specifies the recommended service procedures and performance frequency.

Table 4. Recommended Service.

Recommended Service	Parts Required	Frequency of Service
Preventive maintenance by trained Avidity Science Technical service personnel	As necessary. See section <i>Replacement Parts</i>	Every 12 months
Pre-Treatment and RO module replacement	See section <i>Replacement Parts</i>	Once a year
DI Cartridge replacement		No longer than six months. May be sooner depending on feed water quality and usage.
Ultraviolet (UV) Lamp replacement (if applicable)		Once a year
Tank Vent Filter replacement		Once a year



Replace Tank Vent Filter




The tank vent filter is located in a compartment on the left side of the back wall of the unit. The filter is located behind the DI cartridge if installed.





Figure 12. Tank vent filter.

Follow this procedure.

1. Remove the left cover from the Pico unit.
2. On the control display, press .
3. Press .
4. Touch **TC024**.
5. Touch **TC024**. Wait for the pressure to be released which will take approximately 4 minutes.
6. When **Remove TC023** appears, carefully lift the DI Cartridge out of the way, to expose the tank vent filter.

NOTE: Appears for Type 2 water models only.
7. Touch .
8. When instructed to remove the tank vent filter, pull the tank vent filter from the silicone tube.
9. Touch .
10. Remove a new tank vent filter from its packaging.
11. Insert the barbed fitting of the tank vent filter into the silicone tube and place it in the slot.
12. Touch .
13. When instructed to **Refit TC023**, carefully mount the DI cartridge back into its mounting slots. Be sure all tubing and fittings are secure.

NOTE: Appears for Type 2 water models only.
14. Touch . The DI cartridge will rinse for 10 minutes.
15. While the DI cartridge is rinsing, replace the left cover over the unit

16. When Change Complete appears, touch 
17. Replace the left cover.

Replace Pre-Treatment / RO Module

The Pre-Treatment and RO module are combined in one canister. Once the Pre-Treatment/RO Module has been replaced it will have to be rinsed.



CAUTION! De-pressurize the system before disconnecting the Pre-Treatment and RO module. Failure to do so can result in personal injury and equipment damage.

IMPORTANT: If a DI cartridge is required for Type 2 water production, the bypass tube will need to be connected between the green RO water outlet tube and the white reservoir inlet tube.

Follow this procedure.

1. Remove the left cover from the Pico unit.

1. On the control display, press  .

2. Press  .

3. Select **TC021/TC022**. Pressure is relieved from the module.
4. Disconnect the Blue inlet tubing from the top of the module
5. Disconnect the Red permeate and Black concentrate tubing from the module.
6. Lift the module from the mounting slots on the back wall of the unit.
7. Remove the new Pre-Treatment and RO module from its packaging.
8. Insert the hooks of the canister into the slots located on the right side.

9. Connect the color tubing to the fitting with the corresponding color label on the cartridge. See Figure 13.



Figure 13. Pre-Treatment and RO module connections.

10. Secure the tubes into the clamps near the connections.
11. Touch .
12. Take one of these actions.

If a DI cartridge is...	Then...
Required	Go to step 13.
Not required	Go to step 21.

13. Connect one end of the bypass tubing (A) to the open end of the **green** RO water outlet tube (B) and the open end of the **white** reservoir inlet tube (C) as shown in Figure 14. Use the provided elbow fittings.

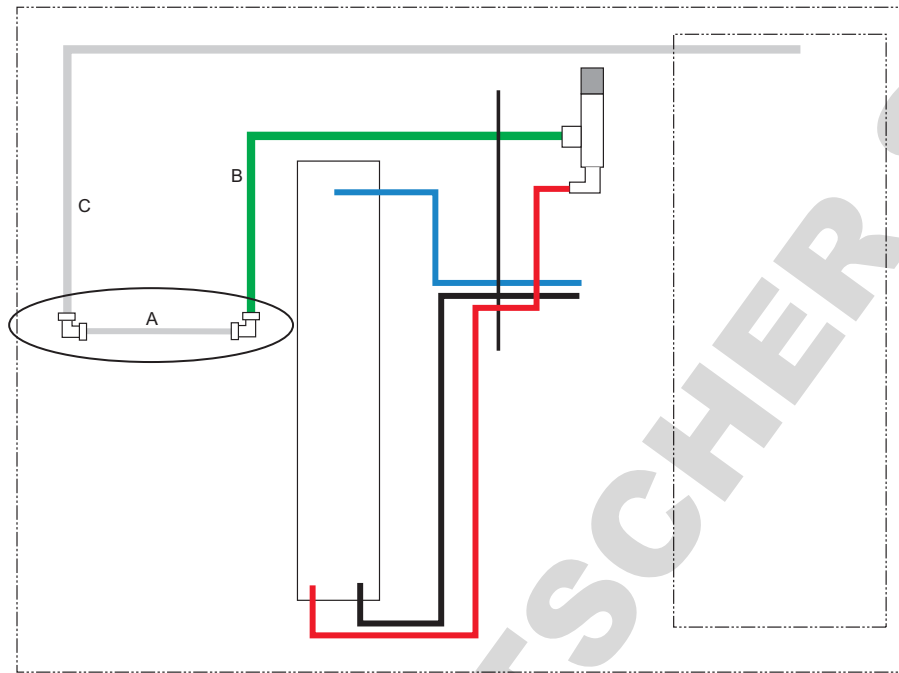





Figure 14. Bypass tubing connected.

14. On the control display, press .
15. Press .
16. Select **TC021/TC022**.
17. Press  until **Rinse** is displayed.
18. Press **OK**. The unit will run for one hour and automatically stop when complete.
19. Disconnect the bypass tube.

20. When operation is complete, press firmly at the center of the timer label sticker until a thin red line appears. See Figure 15.

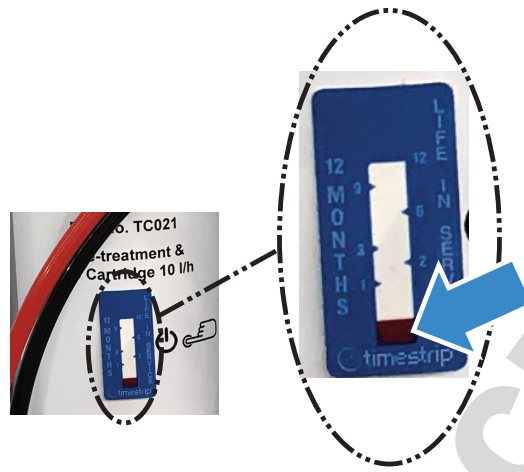


Figure 15. Red line shows RO module timer is activated.

21. If a DI cartridge is not used, replace and secure the left front cover of the Pico unit.

IMPORTANT: If applicable, replace the DI cartridge for Type 2 water production.

Replace DI Cartridge (for Type 2 water quality only)



CAUTION! De-pressurize the system before disconnecting the DI cartridge. Failure to do so can result in personal injury and equipment damage.

Follow this procedure.

1. Remove the left cover from the Pico unit.

1. On the control display, press



2. Press



3. Select **TC023** for the DI cartridge. The pressure is relieved from the cartridge.
4. Disconnect the green tubing from the bottom of the cartridge.
5. Disconnect the white tubing from the top of the cartridge.
6. Lift the cartridge from the mounting slots on the back wall of the unit.

7. Remove the DI cartridge from its packaging.
8. Be sure the green and white tubes are connected according to the color labels on the cartridge.



Figure 16. DI cartridge tube connections.





9. Secure the tubes into the clamps near the connections.
10. Touch .
11. On the control display, press .
12. Press .
13. Select **TC023**.
14. Press  until **Rinse** is displayed.
15. Press **OK**. The unit will run for 10 minutes and automatically stop when complete.
16. When operation is complete, press firmly at the center of the timer label sticker until a thin red line appears. See Figure 17.



Figure 17. Activate DI cartridge timer.

17. Replace and secure the left front cover of the Pico unit.

Dispose of Used Module and Cartridge

Dispose of the used Pre-Treatment and RO Module and the DI cartridge according to local environmental disposition requirements.

Replace Ultraviolet (UV) Lamp

The UV lamp socket is located behind the right panel above the tap dispenser. The lamp is located in the tank. The water level must be lowered below the UV lamp for access.



WARNING! Disconnect the main power before servicing any electrical components. Failure to do so can cause electrical shock resulting in personal injury.

You will need these tools.

- 4 mm Allen Head wrench
- UV lamp (see *Replacement Parts* for part number)

Follow this procedure.


1. Disconnect the power supply.
2. Lower the reservoir water level below the UV lamp.
3. Remove the left cover of the unit.
4. Remove the four hex head screws that secure the right cover and carefully remove the cover.

IMPORTANT: When removing the right cover be careful not to pull the cables from the display circuit board.

5. Unscrew the cap from the top of the reservoir and look to be sure the water level is significantly below the UV lamp socket. Drain additional water as necessary.
6. Disconnect the UV lamp at the adjacent power connector.
7. While holding the socket on the outside of the tank, insert your hand into the reservoir and loosen and remove the nut that secures the UV lamp.
8. Pull the lamp socket from the tank.
9. Unscrew the nut from the new UV lamp and insert the socket through the hole into the tank.
10. Secure the nut to the lamp socket from inside the tank. Hand-tighten only.
11. Connect the UV lamp to its power connector.
12. Place the right front panel into position.
13. Reconnect the power supply.

14. On the control display, press 

15. Select **TC025**.

16. When prompted to remove the UV light, select .

17. When prompted to install the new UV light select . The reservoir will begin to fill.

18. Check for leaks from the UV lamp connection at the reservoir.
19. Take one of these actions.

If a leak is...	Then...
Not present,	Go to step 27.
Present,	go to step 20.

20. Drain the reservoir until the water level is below the UV lamp.
21. Disconnect the power supply.
22. Remove the right front panel.
23. Disconnect the UV lamp from its power connector.
24. While holding the socket on the outside of the tank, insert your hand into the reservoir and loosen and remove the nut that secures the UV lamp.
25. Again, while holding the lamp socket in place, secure the nut to the socket from inside the reservoir.
26. Repeats steps 11 through 19.
27. Secure the cap to the top of the reservoir.
28. Secure the right cover with the four hex head screws and replace the left cover.
29. Secure the left cover into position.


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Recording Monthly Operating Data

This section describes the parameters that are to be monitored monthly and recorded on the *Pico Water Purification System Monthly Log Sheet* is located at the end of this chapter. Copy the log sheet as necessary and post it near the system.

IMPORTANT: To view the parameters, the system must be operating.

Permeate Water Conductivity

The conductivity of water that has successfully passed through the membrane and before chemical treatment. Permeate water conductivity is measured in micro-siemens per centimeter ($\mu\text{S}/\text{cm}$). To view the permeate water conductivity, press  from the power display.


Feed Water Conductivity

Feed water conductivity is the conductivity of the facility supply water. The reading can be checked by using a hand-held conductivity meter. A meter is included in the Avidity Science Water Quality Monitoring Kit 2400-0100-100.


Concentrate Water Conductivity

Conductivity of the concentrate water can be determined by drawing a sample of the water before it goes to drain using a hand-held conductivity meter.


Feed Water Temperature

The permeate temperature is the temperature of the permeate (product) water after it passes through the membrane. A rapid increase in permeate water temperature may damage the membrane. To view the permeate water temperature, press  from the power display.

Operating Pressure

The pressure of the source water entering the Pico machine. To view the permeate water pressure, press  from the power display.

DI Quality

DI Quality is the quality of the water after passing through the De-ionization cartridge. To view the DI water quality, press  from the power display.

Percent Rejection

A percent rejection setting of 95 percent is used to rate the performance of a reverse osmosis water machine. A noticeable decrease in the percent of rejection is an indication that a membrane should be replaced. Membrane fouling and/or scaling, hydraulic plugging, membrane hydrolysis (degradation), and mechanical failures can plug up the membrane and the percent of rejection can increase.

Membrane fouling and/or scaling is the presence of organic or biological foulants and/or mineral scale buildup directly on the membrane surface.

Hydraulic plugging is the presence of material (foulant, scale or particles) that obstructs the flow-channel spacing between the membrane leaves of a spiral wound membrane.

Table 5 lists some of the issues that can be identified by a change in the percent rejection rate. In addition to these issues, a drop in the percent of rejection may be a sign of an improper pH level, a sign the percent recovery rate is set too high, or a sign the composition of the feed water has changed.

Table 5. The Effect of Various Problems on Percent Rejection.

Problem	Percent of Rejection	Rate of Change
Biofouling	initial increase, decrease after cleaning	gradual
Chemical scale	decrease, especially in last membrane	rapid
Colloidal fouling	initial slight decrease, much greater later	gradual
Aluminum sulfate scale	little to no change	gradual
Leaking o-rings	decrease	immediate
RO unit pump pressure too low	decrease	immediate

Below are the formulas required to calculate the Percent Rejection.

$$\text{AverageConductivity} = \frac{\text{FeedWaterConductivity} + \text{ConcentrateConductivity}}{2}$$

$$\text{PercentRejection} = \frac{\text{AverageConductivity} - \text{PermeateConductivity}}{\text{AverageConductivity}} \times 100$$

NOTE: RO machine operating data descriptions are located in chapter *Recording Monthly Operating Data*.

Pico Operating Data	Normal	Sun	Mon	Tue	Wed	Thurs	Fri	Sat
Permeate Conductivity $\mu\text{S/cm}$ Touch ⓘ	0 to 80							
Feed Water Conductivity $\mu\text{S/cm}$ <i>Obtain from hand-held meter using a sample drawn from the feed water sample valve.</i>	Less than 1400							
Feed Water Temperature^a C [°F] Touch ⓘ	5° to 35° [45° to 90°]							
Operating Pressure bar [psi] Touch ⓘ	5.5 to 6.0 [14.5 to 87]							
DI Quality (Type 2 water only) $\text{M}\Omega/\text{cm}$ Touch ⓘ	1 to 15							
Percent Rejection <i>See section Percent Rejection on page 30.</i>	Greater than 95							

a. For every one degree below 15° C [59° F], expect a 3 percent reduction in the permeate production.

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Replacement Parts

Below are the replacement parts for the Pico Water Purification Systems.



CAUTION! Use only original factory-supplied replacement parts. Failure to do so can result in equipment damage and will void product warranty.

Item	Description	Pico Model	Manufacture Number	EI Number
1	Combination Pre-Treatment and RO Module (10 lph)	PICO10T2 PICO10T2UV PICO10T3 PICO10T3UV	TC021	7120-3000-101
	Combination Pre-Treatment and RO Module (20 lph)	PICO20T2 PICO20T2UV PICO20T3 PICO20T3UV	TC022	7120-3000-102
2	DI Cartridge	PICO10T2 PICO10T2UV PICO20T2 PICO20T2UV	TC023	7120-3000-103
3	Tank Vent	All	TC024	7120-3000-104
4	Ultraviolet (UV) Lamp	PICO10T2UV PICO10T3UV PICO20T2UV PICO20T3UV	TC025	7120-3000-105
5	Power Supply Unit	All	POWE00002	7120-3000-106
6	Pump Assembly		PUMP00006	7120-3000-107
7	Pressure and Temperature Sensor w/ T-fitting		SENS00013	7120-3000-108
8	Wire Harness		LOOM00010	7120-3000-109
9	Tank Level Sensor		SENS00011	7120-3000-110
10	DI Quality Sensor		SENS00003	7120-3000-111
11	Check Valve		VALV00002	7120-2200-106
12	Inlet Solenoid Valve		VALV00004	7120-2200-107
13	Permeate Water Conductivity Sensor		SENS00005	7120-2200-111
14	Flow Restrictor (green)		REST00002	7120-2200-115

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