



Installation and Operation Manual



MWC-EM Series Ultraviolet Sterilizers

MWC-EM7 / MWC-EM10 / MWC-EM20

2022 VERSION

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Installation and Operating Instructions **for MWC-EM Series Ultraviolet Sterilizers**

Model #:

_____	MWC-EM7	7 gpm UV- ¾"
_____	MWC-EM10	10 gpm UV -¾"
_____	MWC-EM20	20 gpm UV -1"

CAUTION:

NEVER LOOK DIRECTLY AT THE ULTRAVIOLET LIGHT WITH THE NAKED EYE. View through a piece of ordinary glass or optical glasses. **ULTRAVIOLET LIGHT** may cause eye irritation if eye is not properly protected. You should never have to look directly at the **ULTRAVIOLET LIGHT** when installing or trouble-shooting one of our MWC-EM Water Sterilizers.

Shipping Description:

The UV unit is shipped complete as follows:

The large box contains the UV vessel and inside that box you will also find the following:

1. A box containing the gland nut, quartz o'ring, silicone, and UV brackets w/grounding lug.
2. A box containing the metered power supply with grounding wire attached.
3. A box containing either the (1) N/C ¾" SS or (1) N/C 1"SS normally closed solenoid.
4. A tube containing the germicidal lamp.
5. A tube containing the quartz sleeve.

FEATURE:

The UV meter has a built in safety feature that will de- energize the normally closed solenoid and shut off the water if lamp goes out or if the water quality changes!

Pre-Treatment:

A complete water test is recommended to determine if pre-treatment equipment is required before installation of the UV unit. **Water must meet criteria below:**

Contaminant	Maximum Allowable Level
Chloride	250 ppm
Color	None
Hardness	8 gpg
Iron	0.3 ppm
Manganese	0.05 ppm
pH	Range between 6 and 8.5
Total Dissolved Solids (TDS)	500 ppm
Turbidity	5 ntu

If untreated water quality exceeds the maximum allowable levels specified, this will result in bacteria passing through the UV unit and into the piping system.

Unit Location:

1. The MWC-EM unit must be installed after the well tank and any water pre-treatment equipment (softeners, filter, etc.). You must install a Cartridge type Dirt Filter before the MWC-EM unit to eliminate the possibility of a dirt build-up inside the stainless steel sterilization chamber. **(SEE PAGE 2, PIPING LAYOUT)**
2. Install at least 4 feet from a dedicated electrical outlet.

DO NOT INSTALL NEAR ANY HEATING SYSTEMS WHICH RAISE THE AIR TEMPERATURE OVER 100 DEGREES.

MWC-EM Solenoid and 304 Electro Polished SS Vessel

Installation:

1. The ultraviolet unit is designed to be installed in a vertical position. The unit is supplied with (2) brackets to support the unit.

NOTE: The upper bracket has a grounding lug attached to it

2. Place the top bracket (larger one) over the nipple located at the top of the vessel. The end of the bracket with the three holes should be facing up towards the top of the vessel.
3. Tighten the gray PVC ring onto the nipple. This will compress down onto the top of bracket.
4. Attach the smaller bracket to the bottom of the vessel. The bracket has a clip type fastener that attaches to the bottom rim of the vessel. The end of the bracket with the three holes should be facing down towards the bottom of the vessel.
5. Secure the top bracket to a wall by using three appropriate screws or fasteners (not provided).

Be sure to leave plenty of clearance above vessel for servicing the quartz tube and germicidal lamp. (For proper clearance, see Specification Table on page 2)

6. Secure the bottom bracket to the wall by using three screws or fasteners (not provided).
7. Use quality unions and ball valves on the inlet and outlet for servicing the unit. **See Page 2** for a typical installation piping layout. If sweat fittings are used, be sure soldering is done in such a manner as not to allow heat to reach the UV vessel. If Schedule 80 PVC or CPVC is used, make sure to follow the proper primer and solvent instructions.
8. Pipe the **inlet** into the **bottom** nipple of the UV vessel.
9. Install a 1" x 3/4" reducing bushing (not provided) into the inlet of the solenoid valve.
10. Install the 3/4" (for the EM7 and EM10 units) or the 1" (for the EM20 units) normally closed solenoid to the **outlet** on the **top** nipple of the UV vessel. Make sure that the solenoid is installed in the proper direction. **See page 2** There is an internal flow restrictor in the outlet nipple of all units. **It is recommended you install a boiler drain on the inlet piping of the unit. This will allow for easy draining of the vessel when replacing the UV quartz.**

UV Sensor Installation:

1. First, unwrap the sensor carefully. Being very careful not to drop or break the sensor eyepiece.
2. Wipe the sensor eyepiece with household alcohol to remove dirt, oil and fingerprints.
3. Before inserting the UV sensor into the vessel check the o'ring this is on the quartz eyepiece.
4. Insert the UV sensor assembly with gray gland nut. **Hand tighten only!**
5. Attach the other end of the UV sensors black amp electrical connection to the lower right side of the meter. Insert the amp into the twist lock connector. The connector will only fit into the connector one way. **Hand Tighten Only!**

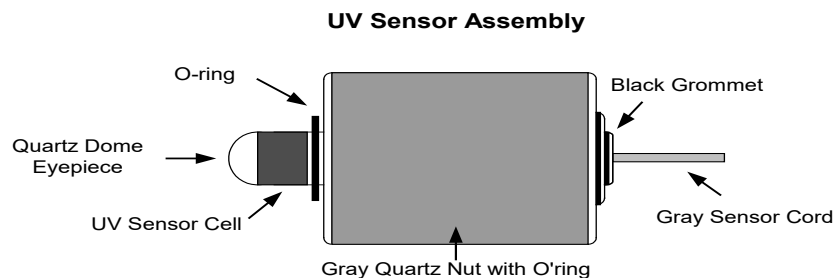


Figure 1

Electrical Requirements:

Always follow all local electrical codes when installing our water treatment equipment.

1. Provide an 115v/60Hz properly grounded dedicated electrical outlet. (It's very important that the polarity be correct)
Avoid using outlets that are switch controlled.
2. Maximum amperage required is 5 amps.
3. Make sure the electrical service provides power 24 hours per day. We recommend installing a **surge protector** to protect unit from power surges, which are not covered by warranty.

!!! DO NOT UNDER ANY CIRCUMSTANCE WIRE THE UV UNIT TO THE WELL PUMP SWITCH OR WELL PUMP ELECTRICAL SUPPLY!!!

Meter & Power Supply Installation:

1. Choose a wall placement that is dry and clear of all piping and metal objects, and within 4 feet of the UV vessel and the electrical outlet.
2. Remove cover from power supply for mounting.
3. Secure power supply to wall with screws (not provided).

SEE PROPER GROUNDING INSTRUCTIONS ON NEXT PAGE

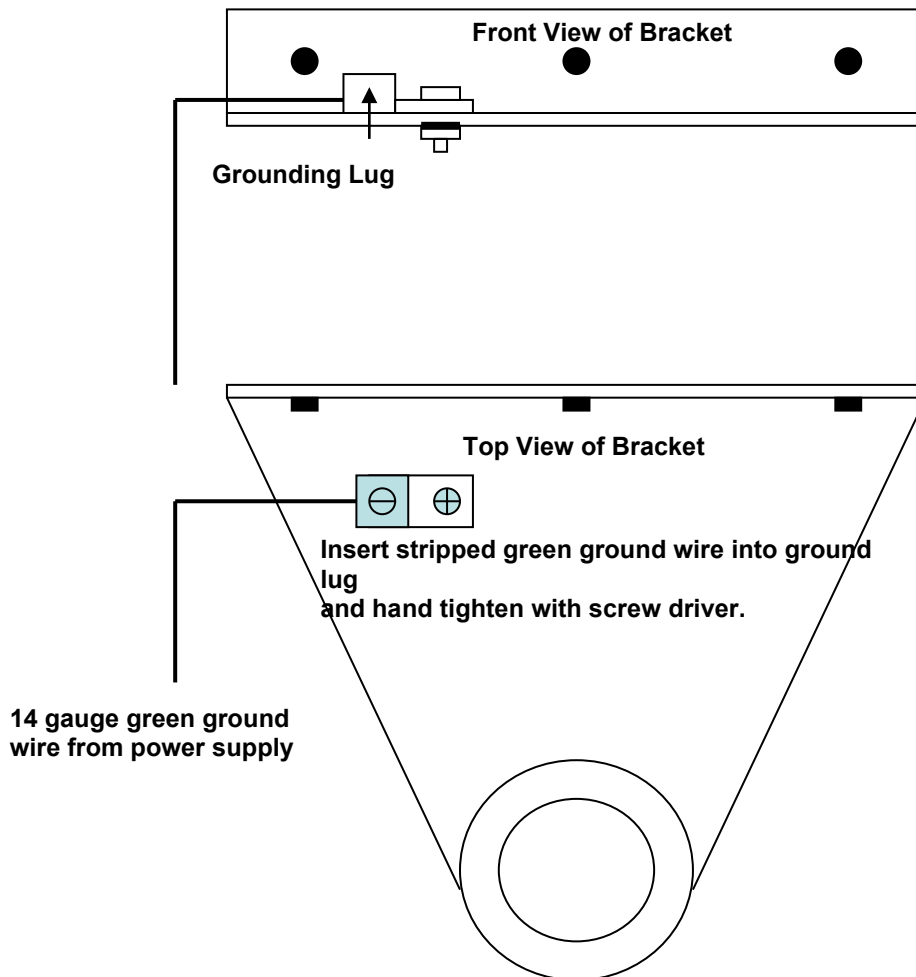


MWC-SERIES GROUNDING INSTRUCTIONS

IMPORTANT

All MWC-Series UV systems must be properly grounded. The vessel must be grounded to the MWC-Power Supply to make a complete ground.

MWC-SERIES Grounding Lug Installation



Quartz and O'ring Installation:

1. Wipe the quartz sleeve with household alcohol to remove dirt, oil and fingerprints.
2. Carefully place the quartz sleeve into the top opening of the vessel.
3. Lubricate the o'ring with silicone (which is supplied) then place the o'ring over the top of the quartz sleeve.
4. Hand-tighten the clear gland nut onto the nipple located on the top of the vessel. **Do not over tighten or the quartz sleeve may shatter. When operating, the clear gland nut will glow blue.**

Germicidal Lamp Installation:

1. Clean the germicidal lamp with household alcohol to remove dirt, oil and fingerprints.
2. Remove jumper wire from white-end connection of power supply and insert UV lamp pins in place of jumper wire.
3. Gently insert the germicidal lamp into the quartz sleeve through the center of the clear gland nut located at the top of the vessel. **Be careful not to drop the lamp inside the vessel. This could break the quartz sleeve.**
4. Slide the black fitting into the center of the clear gland nut.

Meter and Power Supply Start Up:

1. Before plugging the UV meter power supply into the electrical outlet. Locate the on/off switch on the lower left side of the meter and flip switch to the **off** position
2. Re-install cover.
3. Plug the meter into the surge protector (not provided) then into dedicated electrical outlet.
4. Turn the UV meter power supply to the **on** position. The MWC-EM unit will alarm immediately until the reading on the UV meter reaches 100%. Once it reaches the 100% it will continue to alarm until the time delay times out which could take several minutes.
5. Once the alarm goes off, the system is ready for the next step.

Filling the UV Unit with Water:

NOTE: Plug the 1" normally closed solenoid into a dedicated electrical supply. This is only during the filling and disinfection of the piping!

1. Open the inlet ball valve about 25% to fill the UV vessel slowly.
2. Open the inlet and outlet ball valve to their **full** open position.
3. Open cold water faucet in kitchen and run until all air is purged. Shut off faucet.
4. Inspect for leaks and repair if any are found.

Disinfecting the Piping System with Chlorine:

NOTE: The MWC-EM meter will drop from a 100% and start to alarm once the chlorine is induced into the system! This is common and is caused by the reaction when chlorine and water are mixed and the UV meter eye senses interference in the UV vessel.

1. Shut off the water to the inlet and outlet of the cartridge filter.
2. Remove the cartridge sump and empty all water. Fill with household chlorine (Clorox, non-scented), 5.25% sodium hypochlorite.
3. Re-install the sump to the filter assembly and open the inlet and outlet valves.
4. Open the cold water faucet at the furthest point in the piping until you detect chlorine odor. Once the odor is detected, close that faucet. Continue this procedure until the chlorine odor has been detected at every faucet. If chlorine odor is not detected at all faucets, repeat steps 1 through 4.
5. Close ball valve on outlet of cartridge filter.
6. Allow the water to stand for at least (4) hours to kill the bacteria residual in the piping system.
7. Unplug solenoid from outlet and plug into the lower right side of the MWC-EM Meter Power Supply.

**** No water should be used during disinfection. ****

Final Check:

1. Open outlet ball valve on UV unit.
2. Make sure the MWC-EM UV Unit is plugged into a surge protector (not provided) then a dedicated electrical outlet with power 24 hours per day.
3. Check all piping for leaks, repair if necessary.
4. Unplug the 1" normally closed solenoid from the electrical outlet and plug the solenoid into the lower right side of the UV Meter Supply.
5. Open cold water lines and flush out until chlorine odor is no longer detected.

Before consumption of water, an EPA Lab Test is suggested.

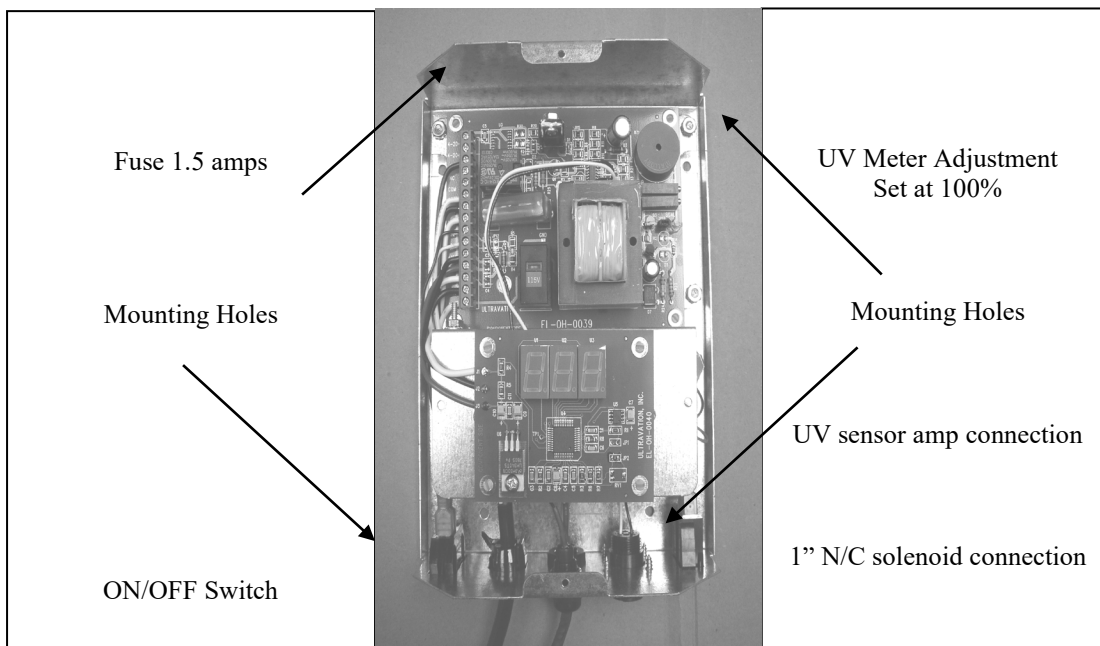
MWC-EM UV INTENSITY ADJUSTMENT:

1. Once the unit has been in operation it maybe necessary to reset the UV meter to 100%.

NOTE: All MWC-EM units are tested and calibrated at the factory.

2. The MWC-EM meter is very sensitive to the water quality and room temperature!
3. When resetting the meter to 100%, unit must be running for minimum of 1 hour.
4. You will need a very small flat head screw driver. Remove the black cap located on the upper right side of the meter
5. With the unit on and operating turn the lower screw clock wise $\frac{1}{4}$ turn at time until you reach 100%. The MWC-EM unit is now working properly, you may now re-install the black cap.

NOTE: Never adjust or turn the upper screw on the meter board! This has been set at the factory and cannot be field adjusted! If it is changed it must be sent back to the factory for recalibration!



ANNUAL MAINTENANCE PROCEDURE:

Annual Germicidal Lamp Replacement and Quartz Cleaning:

1. Unplug the UV Meter power supply from surge protector and the electrical outlet.
2. Open the ball valve/test port on outlet side of UV unit to depressurize vessel. When completed, close ball valve/test port.
3. Pull the black cap from the center of the clear gland nut.
4. Carefully lift the germicidal lamp out of the quartz sleeve by pulling up on the gray harness wire and discard the lamp. Remember the lamp is glass and can cause injury to you if the lamp is dropped.
5. Open the ball valve/test port on outlet side of UV unit to depressurize vessel. When completed, close ball valve/test port.
6. Carefully remove clear gland nut, gently grasp quartz sleeve and lift out.
7. Remove clear gland nut and O-ring from quartz sleeve.
8. Clean quartz sleeve with household alcohol. If stained, replace.
(Reference Quartz Installation)
9. Follow with germicidal lamp installation Remove the UV meter eye and clean with household alcohol and reinstall.

MWC-EM SERIES

TROUBLESHOOTING

Symptom: No flow of water no Alarm and Gland Nut not glowing

Cause	Solution
Electric Supply	Check electrical outlet and breaker box for power. Replace fuse in Meter Power Supply

Symptom: No flow of water no Alarm and *Gland Nut* is *glowing blue* and meter is reading 100%

Cause	Solution
Solenoid	Turn off water and release pressure to the MWC-EM unit. Remove solenoid coil and clean port and plunger. Defective solenoid replace

Symptom: Alarm is on and no flow of water and Meter is reading less than 50% and Lamp is on and *Gland Nut* is *glowing blue*.

Cause	Solution
Lamp is over a year old	Replace lamp See Germicidal Lamp Replacement.
Quartz Sleeve is dirty	Remove quartz sleeve and clean
UV sensor eye dirty	Remove Sensor Eye and clean

Symptom: Alarm is on and no flow of water and Lamp is out and Meter is reading 0%

Cause	Solution
Lamp	Replace lamp See Germicidal Lamp Replacement. Remove quartz sleeve and clean Remove Sensor Eye and clean MWC-EM power supply defective replace

4 YEAR LIMITED WARRANTY

As of November 2022

This MWC-E, ES & EM Series Ultraviolet Sterilizer is warranted for a period of **four years** from date of purchase by first user against defects in materials and workmanship, except for the Ultraviolet Lamp which is warranted for 90 days and a UV Meter Eyepiece Assembly which is warranted for one year from date of purchase against defects in materials and workmanship. Except, as specifically set forth in this paragraph, Master Water Conditioning Corporation makes no other warranties, express or implied.

This warranty shall be void if the ultraviolet sterilizer is moved from the place of original installation, or if damage is caused by misuse, misapplication, accident, freezing, flood, fire or if not installed in accordance with instructions furnished by Master Water Conditioning Corporation.

This warranty shall be void in the event of damages from external sources or where the ultraviolet sterilizer has been operated at pressure in excess of 100 pounds per square inch or at a temperature in excess of 100 degrees F., or below 32 degrees F. Incidental costs or consequential damages are not covered by this warranty.

All defective parts shall be returned prepaid to Master Water Conditioning Corporation for inspection. Master shall not be liable for labor charges other than Master factory repairs.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state. Some states do not allow limitations on duration of implied warranties or exclusion of incidental or consequential damages, so the above limitations may not apply to you.

All claims must be submitted in writing to Master Water Conditioning Corporation at 224 Shoemaker Road, Pottstown, Pennsylvania 19464, within thirty (30) days from the discovery of the defect. Master Water Conditioning Corporation thereafter will correct defective parts and workmanship or rusting, corrosion or bursting within sixty (60) days.



224 Shoemaker Rd. Pottstown, Pa. 19464

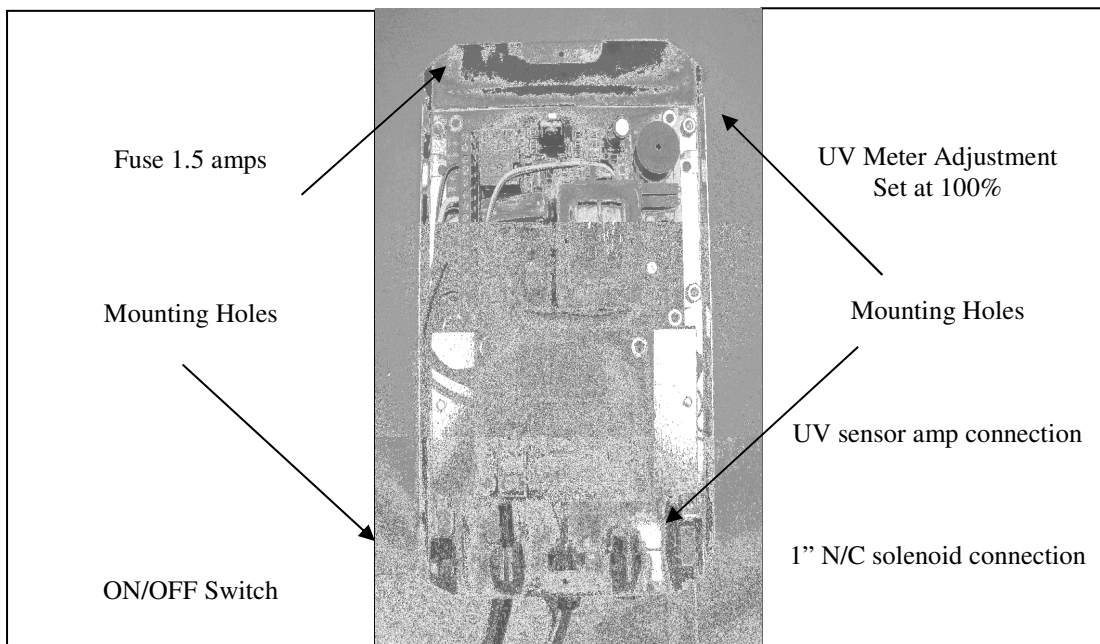
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3. When resetting the meter to 100%, unit must be running for minimum of 1 hour.
4. You will need a very small flat head screw driver. Remove the black cap located on the upper right side of the meter
5. With the unit on and operating turn the lower screw clock wise $\frac{1}{4}$ turn at time until you reach 100%. The MWC-EM unit is now working properly, you may now re-install the black cap.

NOTE: Never adjust or turn the upper screw on the meter board! This has been set at the factory and cannot be field adjusted! If it is changed it must be sent back to the factory for recalibration!



UV Sensor Installation:

1. First, unwrap the sensor carefully. Being very careful not to drop or break the sensor eyepiece.
2. Wipe the sensor eyepiece with household alcohol to remove dirt, oil and fingerprints.
3. Before inserting the UV sensor into the vessel check the o'ring this is on the quartz eyepiece.
4. Insert the UV sensor assembly with gray gland nut. **Hand tighten only!**
5. Attach the other end of the UV sensors black amp electrical connection to the lower right side of the meter. Insert the amp into the twist lock connector. The connector will only fit into the connector one way. **Hand Tighten Only!**

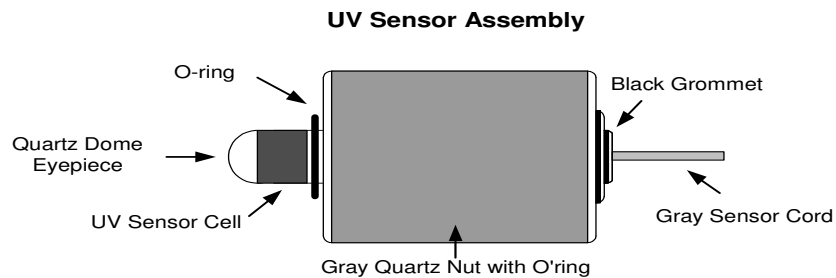


Figure 1

CAUTION:

NEVER LOOK DIRECTLY AT THE ULTRAVIOLET LIGHT WITH THE NAKED EYE. View through a piece of ordinary glass or optical glasses. **ULTRAVIOLET LIGHT** may cause eye irritation if eye is not properly protected. You should never have to look directly at the **ULTRAVIOLET LIGHT** when installing or trouble-shooting one of our MWC-EM Water Sterilizers.

MWC-EM FACTS SHEET

IMPORTANT

GROUNDING INSTRUCTIONS

All MWC-SERIES UV Systems must be grounded! The green 14# copper wire coming out of the power supply must be grounded to the UV Vessel! Attach the copper wire to the grounding lug to the upper mounting bracket and tighten the screw.

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Pre-Treatment:

A complete water test is recommended to determine if pre-treatment equipment is required before installation of the UV unit. **Water must meet criteria below:**

<u>Untreated Water Quality</u>	<u>Maximum Allowable Level</u>
Chloride	250.00 ppm
Color	0.00 units
Hardness	8.00 gpg
Iron	0.30 ppm
Manganese	0.05 ppm
pH	6.0 to 8.5
Total Dissolved Solids	500.00 ppm
Turbidity	5.00 ntu

If untreated water quality exceeds the maximum allowable levels specified, this will result in bacteria passing through the UV unit and into the piping system.

Unit Location:

1. The MWC-EM unit must be installed after the well tank and any water pre-treatment equipment (softeners, filter, etc.). You must install a Cartridge type Dirt Filter before the MWC-E unit to eliminate the possibility of a dirt build-up inside the stainless steel sterilization chamber. **(SEE PAGE 2, PIPING LAYOUT)**
2. Install at least 4 feet from a dedicated electrical outlet.

DO NOT INSTALL NEAR ANY HEATING SYSTEMS WHICH RAISE THE AIR TEMPERATURE OVER 100 DEGREES.

Disinfecting the Piping System with Chlorine:

1. Shut off the water to the inlet and outlet of the cartridge filter.
2. Remove the cartridge sump and empty all water. Fill with household chlorine (Clorox, non-scented), 5.25% sodium hypochlorite.
3. Re-install the sump to the filter assembly and open the inlet and outlet valves.
4. Open the cold water faucet at the farthest point in the piping until you detect chlorine odor. Once the odor is detected, close that faucet. Continue this procedure until the chlorine odor has been detected at every faucet. If chlorine odor is not detected at all faucets, repeat steps 1 through 4.
5. Close ball valve on outlet of cartridge filter.
6. Allow the water to stand for at least (4) hours to kill the bacteria residual in the piping system.

**** No water should be used during disinfection. ****

Before consumption of water, an EPA Lab Test is suggested.

MWC-EM SERIES

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Symptom: No flow of water no Alarm and *Gland Nut* is *glowing blue* and meter is reading 100%

Cause	Solution
Solenoid	Turn off water and release pressure to the MWC-EM unit. Remove solenoid coil and clean port and plunger. Defective solenoid replace

Symptom: Alarm is on and no flow of water and Meter is reading less than 50% and Lamp is on and *Gland Nut* is *glowing blue*.

Cause	Solution
Lamp is over a year old	Replace lamp See Germicidal Lamp Replacement.
Quartz Sleeve is dirty	Remove quartz sleeve and
UV quartz eye dirty	Remove Quartz Eye and clean

Symptom: Alarm is on and no flow of water and Lamp is out and Meter is reading 0%

Cause	Solution
Lamp	Replace lamp See Germicidal Lamp Replacement. Remove quartz sleeve and clean Remove Quartz Eye and clean