



CLEAN IN PLACE MODEL CIP3

For Larger RO Units



**Manufactured With Pride
In The USA**

www.amerewater.com • 800-535-5585

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Part Number: 98-0081
Revision: C

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OBJECTIVE

The objective of the Clean In Place (CIP) system is to introduce high pH and low pH membrane cleaners to the RO system at low pressure and high velocity. This action removes scale and organic contaminants from the RO membranes and improves system performance.

NOTE: Read the instructions supplied with the cleaning solution to verify the manufacturer's specified mixture ratio prior to using the CIP3 system.

CHEMICALS REQUIRED

AmeriClean A (P/N 37-0004) low pH cleaner for removing inorganic scale and metals from polyamide thin-film composite (3 lb (800 ml) of AmeriClean A powder is required per membrane cleaning). AmeriClean A effectively removes the following foulants:

- Calcium Carbonate
- Calcium Sulfate
- Barium Sulfate
- Strontium Sulfate
- Iron
- Metal Oxides

AmeriClean B (P/N 37-0005) high pH cleaner for removing acid insoluble foulants from polyamide thin-film composite (3 lb (1,110 ml) of AmeriClean B powder is required per membrane cleaning). AmeriClean B effectively removes the following foulants:

- Silt
- Colloids
- Organics
- Microbiological
- Acid Insolubles
- Mucilaginous Material

WARNING: Wear appropriate eye and skin protection when handling the membrane cleaning chemicals. The cleaners are high and low pH chemicals and may cause severe chemical burns. Read the MSDS for further information.

WARNING: Never allow AmeriClean A and AmeriClean B to mix! Mixing the chemicals will cause an exothermic reaction which may result in serious injury and/or damage to the equipment! Flush the CIP and RO+ systems thoroughly and verify the pH of the reject water is neutral prior to introducing other chemicals!

WARNING: AmeriClean A and B membrane cleaners are for polyamide thin-film membranes only and cannot be used on cellulose acetate membranes.

INSTALLATION

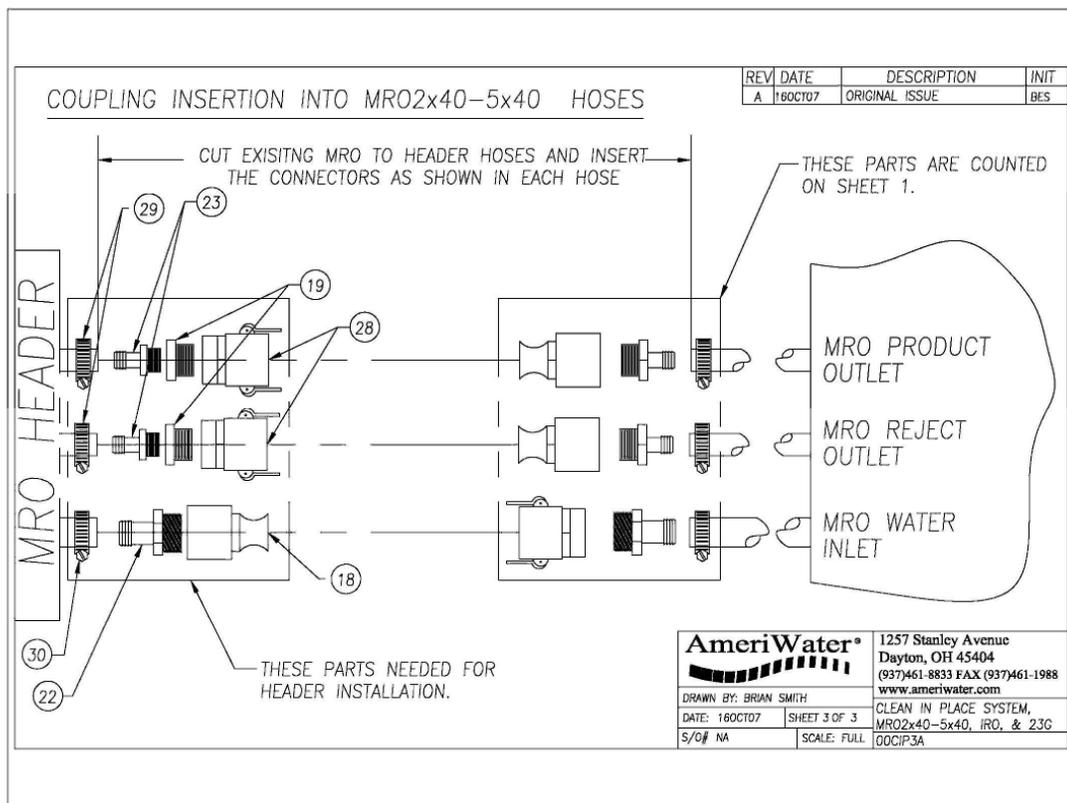


1. Remove the hoses and pump from the CIP tank (pump, hoses and fittings are shipped inside the tank from the manufacturer).
2. Rinse the CIP tank and hoses with clean water to remove any debris or contamination after un-packing or after the CIP system has been in storage.
3. Install 2 long hoses into the upper ports of the tank by screwing the 1" pipe thread adapter that is on the end of the hose into the pre-mounted bulkhead fitting. Install the 3rd long hose into the outlet of the pump (the outlet is the port facing upward on the pump). Use Teflon tape to aid installation and sealing of pipe threads.
4. Install the short hose (approximately 2' long) into the pump inlet (the port at the end of the pump facing horizontal).
5. Connect the pump inlet hose to the CIP3 tank using the cam-lock connector.

6. Turn off the RO before connecting the CIP3 system or breaking any water lines.
7. Choose the correct fittings supplied with the CIP3 system that will mate to the INLET, REJECT, AND PRODUCT ports of the reverse osmosis system to be cleaned, and install them.
8. Connect the CIP pump outlet hose only to the reverse osmosis water INLET.

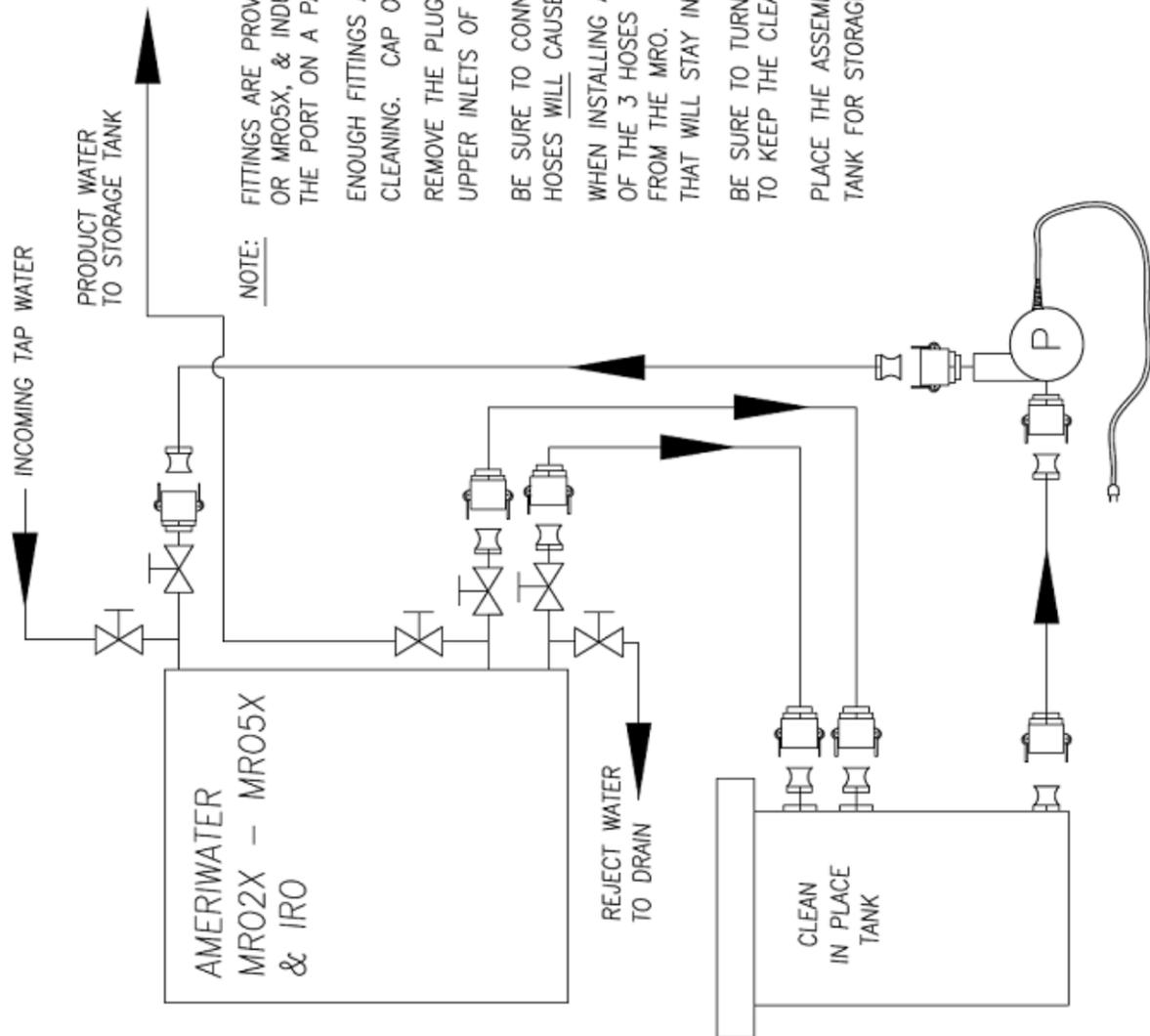
CAUTION: If the **PRODUCT** hose (PERMEATE) is momentarily pressurized by connecting the CIP in reverse flow, the membranes will be destroyed.

NOTE: When connecting the CIP2 to an AmeriWater MRO2X, MRO3X, MRO4X, or MRO5X, the existing MRO hoses (one 3/4" hose and two 1/2" hoses) will need to be cut about 12" from the hose ends opposite the MRO. Install the Cam-Lock male/female connector pair using the included hose barbs and hose clamps. Be sure that the Cam-Lock connectors are "gendered" in such a manner that the hoses can be connected to the correct fittings on the CIP3 tank (see below).



After the cleaning procedure is finished, the Cam-Lock connectors will remain in the hose ends, and will be re-connected to the corresponding hose as before the cleaning procedure.

9. Connect the REJECT AND PRODUCT hoses to the CIP hoses near the top of the CIP tank (hoses may be connected in either orientation).
10. Verify that all connections are watertight.



NOTE:

FITTINGS ARE PROVIDED TO FIT THE AMERIWATER MRO2X MRO3X, MRO4X, OR MRO5X, & INDUSTRIAL RO'S. CHOOSE THE CORRECT FITTINGS TO MATE TO THE PORT ON A PARTICULAR REVERSE OSMOSIS SYSTEM.

ENOUGH FITTINGS ARE PROVIDED TO LEAVE INSTALLED IN THE RO SYSTEM AFTER CLEANING. CAP OR PLUG THEM WHEN THE RO IS IN SERVICE.

REMOVE THE PLUGS AND INSTALL 2 OF THE LONG HOSES INTO THE TWO UPPER INLETS OF THE CIP2 TANK.

BE SURE TO CONNECT ALL HOSES AS SHOWN IN THE DIAGRAM. REVERSING THE HOSES WILL CAUSE DAMAGE TO THE CIP3 PUMP OR THE RO MEMBRANE.

WHEN INSTALLING A CIP2 FOR CLEANING AN AMERIWATER MRO2X - 5X, EACH OF THE 3 HOSES NEED TO BE CUT ABOUT 12" FROM THE END FARTHEST FROM THE MRO. HOSE BARBS AND A MALE-FEMALE COUPLINGS ARE PROVIDED THAT WILL STAY IN THE HOSES ONCE THE MRO IS PUT BACK INTO SERVICE.

BE SURE TO TURN OFF THE VALVES GOING TO THE STORAGE TANK AND REJECT TO KEEP THE CLEANING SOLUTION IN THE SYSTEM DURING CIRCULATION.

PLACE THE ASSEMBLED HOSES AND CIRCULATION PUMP INSIDE THE CIP2 TANK FOR STORAGE OR SHIPMENT.

AMERI WATER MRO2X–MRO5X AND IRO CLEANING

HIGH pH CLEANING

AmeriClean B is used first for the removal of biological and colloidal foulants.

1. Fill the CIP tank with RO product water (or softened water) to about 25” deep in the tank. Water at 25” deep in the tank is approximately 27 gallons. Water should be at or near 86°F for maximum cleaning effect.
2. Slowly add 3 lb (1,110 ml) [3 full bags] of **AmeriClean B** powder to the water in the cleaning tank.
3. Agitate the solution until the powder is completely dissolved. **It is important to make sure all of the powder is dissolved before continuing.**

WARNING: Wear appropriate eye and skin protection when handling the membrane cleaning chemicals. The cleaners are high and low pH chemicals and may cause severe chemical burns. Read the MSDS for further information.

4. Open the valves that are connected to the CIP INLET, PRODUCT, and REJECT hoses to permit flow from the CIP3 through the RO and back to the CIP3 only.

CAUTION: Do not to allow any cleaning solution to enter the PRODUCT line going to the storage tank or point of use.

5. The RO should be turned off (STANDBY) at this point.
6. Remove the rear cover on the MRO (or open the main panel door on an IRO; the power disconnect must be turned off to open the panel door).
7. A CIP toggle switch is located on the back side of the RO controller. Move the toggle switch to the “ON” position to allow the RO to operate with the CIP3 connected without sending the RO system into an alarm condition.
8. Close the rear cover on the MRO (or shut the main panel door on the IRO and turn the power disconnect to “ON”).
9. Connect the CIP3 pump’s power cord to a 120 VAC receptacle to begin circulating the cleaning solution.
10. Verify that the RO power is connected and press the POWER key on the front of the RO controller. Cleaning solution will be pumped through the RO with a steady stream flowing back into the CIP3 tank through the reject hose.

11. Allow the cleaning solution to recirculate for a minimum of 50 minutes.
 - a. Depending on the nature of the fouling, a soak period may be necessary. If the membranes are not heavily fouled, proceed to step 12.
 - b. In cases of heavy fouling, turn off the RO and CIP pump and allow the system to soak for a minimum of 30 minutes.*

** Contact AmeriWater Technical Support or your local AmeriWater dealer for custom cleaning procedures if necessary.*
 - c. After the soak time, turn on the CIP pump and RO, and allow the cleaning solution to recirculate again for 30 minutes.
12. Disconnect the pump outlet hose from the CIP tank and direct the hose to a drain. Continue running to drain until the CIP tank is empty (some solution may need to be manually dumped out of the CIP tank).

CAUTION: Neutralization of the spent cleaning solution may be required by local regulations. Verify the requirements of local regulations prior to emptying the cleaning solution into the drain. Use an approved waste container for chemical waste disposal if required.

13. After removing the spent chemical from the CIP tank, and with the CIP pump discharge directed to drain, turn on the MRO and allow fresh water to flow into and through the RO and CIP for 10 minutes or until the pH of the water at the pump discharge is neutral (between 6 and 8).
14. Proceed to the low pH cleaning.

WARNING: Never allow AmeriClean A and AmeriClean B to mix! Mixing the chemicals will cause an exothermic reaction which may result in serious injury and damage to the equipment! Flush the system thoroughly and verify the pH of the reject water is neutral prior to switching chemicals!

LOW pH CLEANING

AmeriClean A is used second for the removal of inorganic scale and metals.

15. Repeat steps 1 through 12 using 3 lb (800 ml) [3 full bags] of AmeriClean A rather than AmeriClean B.
16. After completing steps 1 through 12 with AmeriClean A, turn OFF the RO and disconnect the CIP3 system from the RO.
17. Press the POWER key on the front of the controller to put the unit into "STAND-BY"
18. Move the CIP toggle switch on the back of the RO controller to the OFF position. This will allow normal fault alarms to be active.

19. To return the RO to “service”, close the PRODUCT AND REJECT valves going to the CIP3, then, open the “in-service” PRODUCT AND REJECT so that flow is routed as intended in the “in-service” mode.
20. Cap or plug the fittings on the RO that were used to connect to the CIP3 accordingly.
21. At this point the RO is ready to be turned on and operated. Press the POWER key to start the RO and monitor all the connections to be sure there are no leaks.
22. Monitor the RO output and verify that conductivity is within specified range.

WARNING: DO NOT connect the MRO to the point of use and/or place the MRO in service until the Product Water conductivity remains below the setpoint and is not in alarm! Serious injury or illness to the patient may result!

23. Drain the CIP3 system of residual water, place the hoses and pump back into the tank, and move the CIP3 system to a place for storage until the next use.
24. Flush the RO in accordance to instructions in the RO operation manual prior to returning to service. Product water is safe for use when the pH is between 6 and 8, and the conductivity is below the alarm set point.

SPARE PARTS

REFER TO THE FOLLOWING DRAWING FOR SPARE PARTS

REV	DATE	DESCRIPTION	INIT
A	16OCT07	ORIGINAL ISSUE	BES

NOTES

- REFER TO TM#15 DURING TEST AND ASSEMBLY.
- USE FORM #68 TO RECORD ALL PERTINENT INFORMATION.
- ALWAYS COMPARE THE WORK ORDER TO ON-HAND DRAWINGS, TEST PROCEDURES, FORMS, AND LAMINATED BOM TO ASSURE THAT LATEST OR CORRECT REVISION LEVEL IS BEING BUILT.
- ATTACH THE FOLLOWING LABELS AS SHOWN:
SERIAL NUMBER & AMERI WATER
APPLY TEFLON TAPE AND THREAD SEALANT TO ALL THREADED CONNECTIONS. REFER TO P-WKI #17 FOR INSTRUCTIONS.

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AFFIX SERIAL NUMBER TO AMERI WATER LABEL

AWI P/N	ITEM#	QTY	DESCRIPTION
93750123	32	4	WASHER LOCK .38IN. SS
92531903	31	4	WASHER 3/8 FLAT SS
15850075	30	2	CLAMP HOSE .75 SST (NOT SHOWN)
15850050	29	4	CLAMP HOSE .5 SST (NOT SHOWN)
16-0041	28	4	O-COM 1" CL CAP POLYGLASS
99-00CP2.8	27	1	LABEL .000P2.8
98-0008	26	1	MANUAL CH2 (NOT SHOWN)
021720170	25	3	PIPE T PVC80
041720167	24	3	EL 1 SOC PVC80
14520509	23	4	ADPT. 75MPTX.5HB.PP
14531145	22	2	ADPT. 1MPTX.75HB.PP
041531829	21	3	NIPPLE .75XCL PVC80
041720151	20	3	NIPPLE 1XCL PVC80
046520853	19	5	BUSH 1X.75 THRO.PP
16-0040	18	5	O-COM 1" CL INS T TPT.POLYGLASS
14520215	17	2	ADPT. 1MPTX 1HB.PP
041567001	16	1	BUSH 1.25X1 THRO.PVC80
041617151	15	1	BUSH 1.5X1 THRO.PVC80
92750235	14	4	BOUL.36-16X1.PEX THD.SS
91750212	13	4	UNST.SPRING NUT .36.PTD
91750085	12	2	UNST.1.625.FIBERGLASS VE
16-0039	11	1	O-COM 1" PLUG.POLYGLASS
16-0038	10	5	O-COM 1" CL CAP.POLYGLASS
16-0037	9	4	O-COM 1" CL INS.MPT.POLYGLASS
16-0036	8	6	O-COM 1" CL CAP.POLYGLASS
66760175	7	1	LINE CORD.14/3.15A.120V.15IN
66510612	6	1	STRAIN RELF LIG-TITE.SNPT.SPR
80510923	5	1	PUMP MOTOR. AC75-3/4 HP.
15850100	4	8	CLAMP HOSE 1 SST
1287135	3	3	HOSE.MED.1" STYLE 5000
041531839	2	3	BULKHD.1.7X5.PVC80
30550420	1	1	TANK BRINE 24 X 54 BLK. W/LD

Ameri Water®
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CLEAN IN PLACE, MRO2x40
-5x40, IRO, & 23C
00CIP3A

SCALE: FULL

AWI P/N ITEM# QTY DESCRIPTION

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 **WARNING**

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

Dear Valued Customer,

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

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

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