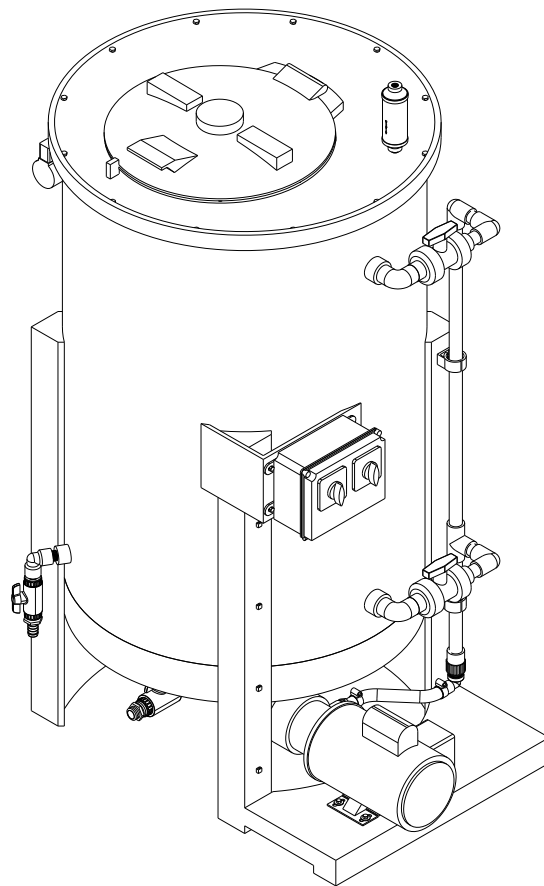


MCB 202EF SINGLE TANK MIX & DELIVERY BICARB SYSTEM

OPERATION & MAINTENANCE MANUAL



MCB 202EF Single Mix Bicarb
Installation, Operation, and Maintenance Manual

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CHAPTER ONE: GENERAL INFORMATION

1.1 General

This manual describes the installation and operation of a Mar Cor Purification MCB 202EF Single Mix Bicarb System. This Bicarb System designed and manufactured by Mar Cor Purification is safe, reliable and easy to use. This system will reduce staff time by providing consistent bicarb mixing, and thorough system cleaning and disinfection. This bicarb system is equipped with the optional electronic fill. This option includes a small control box mounted to the mixer that controls the fill solenoid valve and operates the mix pump. It also comes equipped with a high level float to eliminate the chance of overflowing the bicarb tank.





Standard features of the Bicarb System include:

- All Polyethylene tanks and control units for easy cleaning.
- 3/4 hp (100-gallon) or 1/2 hp (50-gallon) Totally Enclosed Fan Cooled (TEFC) motors.
- Electric fill solenoid valve.
- 50-Gallon or 100-Gallon Systems is available.

Model Number	Part Number	Description
MCB 202EF-50	200-02-253	Bicarb Mix, Electric Fill, 50 Gallon Tank
MCB 202EF-100	200-02-254	Bicarb Mix, Electric Fill, 100 Gallon Tank

1.2 Safety

Throughout this manual, the following safety words and symbols signify important safety issues with regard to installing and maintaining the system. This safety does not contain all of the safety statements in the manual. Other safety statements are included within the manual text by the following denotations and are highlighted in bold print.

	NOTE:	Statement that provides further clarification.
	CAUTION:	Statement used to identify conditions that could result in equipment or property damage. Failure to observe may result in damage to the system.
	WARNING:	Statement used to identify conditions that could result in personal injury or loss of life.
	PROTECTIVE CONDUCTOR TERMINAL:	The symbol shows the Protective Conductor Terminal label used in the equipment.

Read This Manual:

This manual needs to be read and understood prior to operating or servicing this device. Use this manual for future reference or training.

Electrical:

- a. To avoid electrical shock, do not open control panel.
- b. Plug should be removed from wall outlet during servicing.
- c. Do not use an extension cord for operation.
- d. Use only with a grounded outlet and ensure that ground is in plug.

Labeling:

Do not remove any system labels. All labels are important and necessary for understanding system operation. The warning label listed below should be adhered to at all times.

**Transporting:**

When lifting or carry the MCB 202EF use at least 2 persons or properly rated lifting equipment. Ensure all proper safety equipment is used when moving this device.

Use:

Do not use the MCB 202EF in hazardous atmospheres or with hazardous material for which the equipment is not designed. If the MCB 202EF is used in a manner not specified by the manufacturer the protective features of the unit might be impaired.

Electromagnetic Interference

This equipment generates, uses and can radiate frequency energy and, if not installed and used in accordance with these instructions, may cause harmful interference to other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference with other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving device
- Increase the separation between the equipment
- Connect the equipment into an outlet on a circuit different from that to which other device(s) is connected.
- Consult the field service technician or manufacturer for help

Disposal

Disposal of this product or parts must be carried out according to local disposal codes.

CHAPTER TWO: SYSTEM INFORMATION

2.1 Utility Requirements

NOTE: Prior to installing the MCB 202EF, it is necessary to provide and create an environment suitable for trouble free operation of the system.

2.1.1 Water:

RO or DI water produced to AAMI standards for Hemodialysis. A minimum of 20 PSI is recommended for consistent filling and a maximum of 60 PSI. It must not exceed 30 LPM (8 GPM).

2.1.2 Electrical:

System must be supplied with an 115V, Single Phase, 20 Amp, 60 Hz power supply. An 8 ft. cord with US type plug connector is supplied with every unit. Histories of power failure, power surges, and low line voltages should be noted and reported to the manufacturer or their agent as they may create adverse conditions for the equipment’s operation.

Machine Electrical Rating Table				
Part Number	Voltage Rating	Amperage Rating	Phase	HZ
200-02-253	115	8.4	1	60
200-02-254	115	10.7	1	60

Fuse Table			
Amp	Volt	Type	Number of Fuses
20	600	Time Delay	1
1	600	Time Delay	1

2.1.3 Drain

A drain outlet is required for the Bicarb mixer. A floor drain is recommended for proper operation (minimum 1”).

2.1.4 Piping

Plumbing materials can significantly contribute to the contamination of the system. Schedule 40 or 80 PVC pipes, polypropylene, PVDF, and other FDA recommended materials are suitable for the system. Care must also be exercised in the choice of a thread sealant. Teflon tape is suitable for all threaded connections in this system.

WARNING: Ordinary pipe dope must be avoided since it may leach objectionable and potentially dangerous impurities into the water. For thread sealing, use a product that is compatible with pure water applications.

2.2 Dimensions/Operating Space

The following are the system dimensions:

- Width: 3' 8"
- Depth: 3' 0"
- Height: 5' 1" (100 gallon) without vent filter
3' 7" (50 gallon) without vent filter

For easy and safe operation, we recommend that there be a minimum of 2 feet on each side and 4 feet in the front of the system. Due to the wet environment, we recommend that the system be placed in a curbed area with a drain. This area should be at least 5 feet by 5 feet. The floor drain can also be used as the system drain.

NOTE: Do not position the unit so it is difficult to disconnect the power cord from the outlet.

2.2.1 Operating Weight

<u>Part Number</u>	<u>Operating Weight</u>
200-02-253	600 LBS
200-02-254	1020 LBS

2.3 Installation

The bicarb system ships ready to operate. There are two system connections:

- Inlet (feed water): 3/4" schedule 80 PVC
- Drain: 1" schedule 80 PVC

NOTE: For the feed water line, we recommend that a valve be placed prior to the system for emergency system shut-off and that a 3 GPM flow restrictor also be installed to limit the amount of water that can be drawn off of the water system.

NOTE: For cleaning, we recommend a bypass around the flow restrictor to allow the unit the fill faster. This should substantially reduce the clean and disinfection time of the unit.

NOTE: Unions should be installed on all connections to allow the unit to be moved for servicing. Connections may be made with tubing.

2.4 Components of the Bicarb System

The following identifies and describes the function of each valve and test port. All valves are tagged or labeled.

2.4.1 Valve Labels

- V1** - System Fill Valve
- V2** - Mix Valve
- V3** - Jug Port Valve
- V4** - System Drain Valve
- V5** - Spray Nozzle Valve

2.4.2 Control Panel

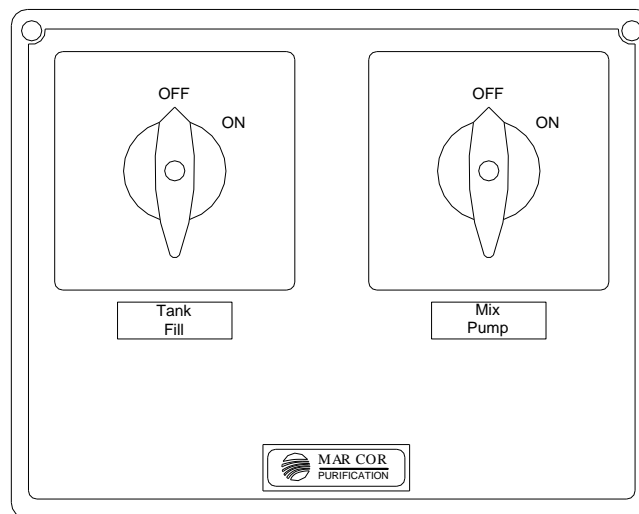


Figure 2.1- Control Panel

2.4.3 Mix Tank

The tank and stand is constructed of polyethylene. It includes an eductor, which creates a swirling motion in order to properly dissolve the powder into solution. The system comes equipped with a spray nozzle, which is used to conveniently and effectively clean and disinfect the tank. The tank includes a hinge-top lid.

2.4.4 Pump

The system is equipped with a magnetic drive pump and motor which is designed to mix the bicarb powder into solution. It is controlled by the control panel by operating the "Mix Pump" switch.

2.4.5 Mix Tank Float

The mixer is equipped with a high level float that closes the fill valve if the water in the tank exceeds the maximum fill level. The fill valve controller will not reactivate unless the water level is below this float level.

2.4.6 Fill Controller

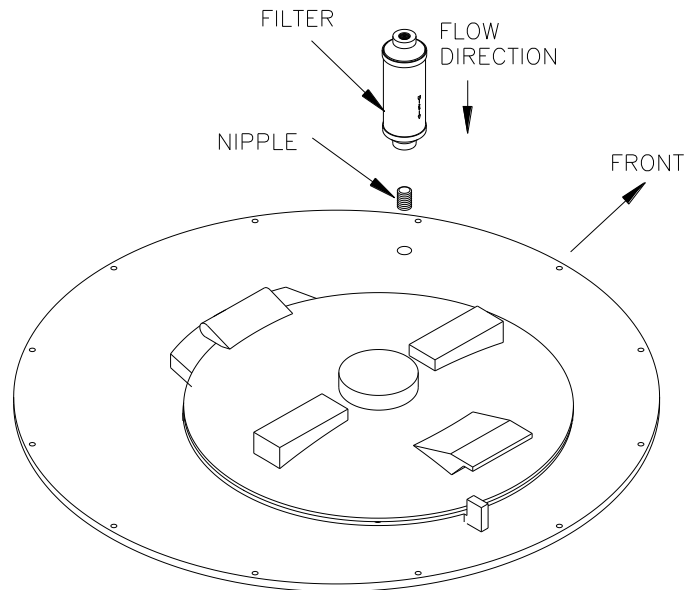
When activated, the feed water solenoid valve will open and allow water to fill the mix system. When enough water is received, the switch needs to manually be placed in the "OFF" position. There are no preset levels with this feature.

2.4.7 Vent Filter

A vent filter is installed on the tank cover. The cartridge style vent filter inhibits dust and debris from entering the tank.

2.4.8 Vent Filter Installation

Remove plug from tank cover vent filter opening. Remove dust plugs from vent filter housing ends. Apply thread tape to nipple. Install nipple into arrow end of vent filter. Install assembled parts into tank cover.



2.5 Service Assistance

If service assistance is required, take the following steps:

1. Consult the “Trouble Shooting” section of this manual (Chapter 5.0). If the problem cannot be identified and corrected by any of the procedures found in that section, then . . .
2. Contact your Facility Equipment Technician. If the technician is unable to help, then . . .
3. Call Mar Cor Purification Technical Support Department at (800) 633-3080. Technicians are available for all calls between 7:00am and 7:00pm CST, Monday through Friday. Technicians are also available at other time for emergency calls only. Technicians will be on hand to discuss the problem with you and endeavor to rectify it over the phone. If the problem appears to be of a more serious nature, you will be given instructions regarding the action to be taken. Prior to making the phone call, you must be prepared to answer two questions.

1. What model do you have? _____

2. What is the serial number? _____

4. In addition, for non-Emergency issues you may email techserv@mcpur.com and a technician will respond generally within one working day.

2.6 Symbols and Abbreviations

AAMI	Association for the Advancement of Medical Instrumentation
AMP	Ampere
DI	Deionization
ft	Foot (feet)
GPM	Gallons Per Minute
hp	Horse Power
lbs	Pounds
LPM	Liters Per Minute
NPT	National Pipe Thread
PVC	Polyvinyl Chloride
RO	Reverse Osmosis
VAC	Volts Alternating Current

2.7 Environmental and Storage Considerations

- 2.7.1 Operating Temperature Range: 38 to 104°F.
- 2.7.2 Operating Relative Humidity: 45% to 85%, no condensing.
- 2.7.3 Storage Temperature Range: 38 to 104°F.
- 2.7.4 Storage Relative Humidity: 45% to 85% no condensing.

CHAPTER THREE: INITIAL SYSTEM START-UP

3.1 Bicarb System Set-Up

WARNING: The Bicarb System and Bicarb Distribution Loop needs to be cleaned and disinfected prior to being ready for patient use.

1. Place Bicarb System into position and attach AAMI quality feed water to the inlet and then make the necessary drain connections.
2. All valves should be in the closed position.
3. Plug the system in per specifications (Refer to Section 2.1).
4. The system should be cleaned and disinfected prior to initial use. Follow System Clean/Disinfect steps under Section 5.0.

CHAPTER FOUR: SYSTEM OPERATION**4.1 Bicarb Mixing**

WARNING: If the Cleaning/Disinfecting procedure was used prior to a new batch of bicarb being made, a residual test should be performed prior to the initiation of the mixing cycle (see the rinse procedure in Section 4.2 if necessary).

1. Open **V1** and turn the “Tank Fill” switch to the ON position. Fill tank to 95 liters (25 Gallons). Switch “Tank Fill” to OFF.
2. Open **V2** and ensure **V5** is closed.
3. Switch “Mix Pump” to ON.
4. Adjust mix flow using mix control valve **V2** to minimize vortex if necessary.
5. Slowly add bicarb powder through hinged lid.

CAUTION: If bicarb powder is added too fast, the pump may clog and could result in irreversible damage to the pump.

6. If necessary, switch “Tank Fill” to ON and fill the tank to the desired batch level.
7. Switch “Tank Fill” to OFF and continue mixing until powder is dissolved.

NOTE: Total mixing time should not exceed 10 minutes.

8. Switch “Mix Pump” to OFF.
9. Close **V2**.
10. Pull sample for testing from **V3**. Upon approval, proceed.
11. Fill jugs manually at Jug Access Port **V3**.

CHAPTER FIVE: SYSTEM CLEANING AND DISINFECTING

5.1 Introduction

NOTE: Disinfecting should be done every night after system operation unless proven documented results in accordance with customer's policies and procedures demonstrate otherwise so as to maintain bacteria and endotoxin levels that are in accordance with AAMI standards. It is recommended that the system be disinfected on a weekly basis.

For disinfecting, the recommended total contact time for the bicarb system is one (1) hour. This includes introducing the approved disinfecting agents (1% peracetic acid or household bleach 1% mixture by volume), recirculating the solution through the system, testing for positive presence at each point, dwell time, and rinsing. If less time (for example 30-45 minutes) is practiced and still maintains acceptable culture results than that can be used as an approved maintenance practice. However, if higher culture counts are noted than a change in the practice is required. Mar Cor Purification recommends that the system be rinsed every night following normal system operation.

1. There are 3 basic steps to disinfecting the bicarb system:
 - a. STEP 1: System Pre-Rinse (Section 5.2) – designed to rinse bicarb from the system. This procedure should be done nightly after normal operation.
 - b. STEP 2: System Disinfecting (Section 5.3) – procedures for cleaning/disinfecting the bicarb system.
 - c. STEP 3: System Rinsing (Section 5.4) – procedures for rinsing out the cleaning/disinfecting solution in order to return the system to normal operation.

WARNING: System disinfecting should NOT be done while the bicarb system is in use for patients or possible harm could occur.

5.2 Bicarb System Pre-Rinse

1. After completion of jug filling, drain any solution left using valve **V4**.
2. Close valves **V2, V3, V4** and **V5**.
3. Using valve **V1** fill tank 1/3 full of water then close **V1**.
4. Open valve **V2**.
5. Turn pump ON with manual switch.
6. Allow to circulate for approximately 2 minutes
7. Turn pump OFF with manual switch.
8. Close valve **V2** and open valve **V5**.
9. Turn the pump ON and circulate through spray nozzle for approximately 5 minutes.
10. Turn the pump OFF.
11. Drain all rinse solution using valve **V4**.

5.3 Bicarb System Disinfecting

1. Drain any solution left using valve **V4**.
2. Close valves **V2**, **V3**, **V4** and **V5**.
3. Using valve **V1** fill tank 1/3 full of water then close **V1**. Add the correct amount of disinfectant.
4. Open valve **V2**.
5. Turn the pump ON.
6. When disinfecting test solution per manufacturer's specification at **V3**.
7. Turn the pump OFF.
8. Close valve **V2** and open valve **V5**.
9. Turn the pump ON. Recirculate for approximately 5 minutes.
10. Turn the pump OFF.

NOTE: Allow the system to dwell for 1 hour. Recirculate every 10-15 minutes for approximately 3-5 minutes. When disinfecting, the recommended total contact time is 1 hour. Contact time begins at the time the disinfect solution was introduced into the system.

11. After the necessary contact time has expired, close **V5** and drain all solution using valve **V4**.
12. Rinse as described in Section 5.4.

5.4 Bicarb System Rinse

1. Using valve **V1**, fill the tank 1/3 full of water then close **V1**.
2. Open valve **V2**.
3. Turn the pump ON.
4. Allow to circulate for approximately 2 minutes.
5. Turn the pump OFF.
6. Close valve **V2** and open valve **V5**.
7. Turn the pump ON and circulate through spray nozzle for approximately 5 minutes.
8. Turn the pump OFF.
9. Drain all rinse solution using valve **V4**.
10. Rinse as required following steps 1 through 11 until a negative result is achieved at **V3** and **V4**.

WARNING: Due to the possibility of disinfectant rebound, a residual test should be performed prior to the initiation of the mixing cycle for bicarbonate.

CHAPTER SIX: SYSTEM MAINTENANCE

6.1 Bicarb Components

1. Pump - The pump is a 3/4 hp (100 gallon) or 1/2 hp (50 gallon) TEFC motor that requires no maintenance.

CAUTION: The mix pump must be kept clean to assure long life with minimal interruptions. We recommend the use of vinegar in the pump on a quarterly basis to keep bicarb from calcifying in the pump head.

2. Inspect the unit’s hoses, fittings and PVC pipes every week for leaks or damage. Replace as needed. The spare part numbers for the hoses and fittings can be found in Section 8 of this manual. Contact Mar Cor’s Technical Service Department for assistance.
3. System Disinfecting – Disinfection should be done with agents that meet the following criteria:
 - a. Peracetic Acid – Per manufacture’s specifications (1% Minncare is standard and recommended).
 - b. Bleach, Household – 1% mixture (By Volume).

Chemical Mix Table						
Disinfectant	QTY	%		Decalcifier	QTY	%
Bleach (Household)	0.95 Liters or 32 ounces	1%		Acetic Acid	4.73 Liters or 1.25 Gallons	5%
Peracetic Acid (Minncare)	0.95 Liters or 32 ounces	1%		Citric Acid	4.73 Liters or 1.25 Gallons	5%

NOTE: Add quantities listed to 95 liters (25 gallons) of water.

WARNING: Do Not Mix Chemical Together.

WARNING: Follow all applicable Material Safety Data Sheet (MSDS) precautions and OSHA Standards when handling any chemical. Use the appropriate Personal Protective Equipment when handling any chemical. Follow all local, state, and federal regulations when disposing of any chemical.

4. Check the bicarb vent filter monthly for the presence of water. Remove the filter and shake it with a downward motion, expelling any water. Replace the vent filter if any water is expelled.
5. Check the bicarb tank manway lid for cracks or degradation. Replace if necessary.

6.2 Schedule

1. Daily Maintenance. The Bicarb System should be cleaned every evening after the final patient shift. See Section 5.1.
2. Weekly Maintenance. The Bicarb system should be rinsed and disinfected after the final patient shift. See Section 5.1. The unit must then be rinsed of the disinfectant and have a negative result. Inspect the system for leaks or damage. Repair as necessary.
3. Monthly Maintenance. Bacterial monitoring should be performed on a monthly basis once the initial cultures have been performed on the system. After disinfection and rinse, the bacteria samples should be retaken and tested accordingly. Follow clinic procedures as required.
4. Quarterly Maintenance. The Bicarb System should be decalcified. Acetic acid (e.g. vinegar) or citric acid is an acceptable solution. This may need to be performed more often depending upon precipitation formation.

CHAPTER SEVEN: TROUBLESHOOTING**7.1 Mix Pump**

1. Pump Noisy
 - a. Verify fluid availability.
 - b. Ensure proper ball valve orientation. Pump will not function properly without fluid.
 - c. Clean the pump to remove any bicarbonate build-up.
 - d. Inspect the pump for damage.
 - e. Replace the pump.
2. Pump Does Not Run
 - a. Verify fluid availability.
 - b. Make sure the unit is plugged in and with power to the outlet.
 - c. Blown fuse, replace the fuse.
 - d. Faulty motor, replace the pump.
3. Pump Continues Running
 - a. Check the pump control switch function.
 - b. Unplug the MCB202 from the electrical power source.

7.2 Fill Solenoid Valve

1. Valve Fails to Close
 - a. Check wiring connections.
 - b. Disassemble and clean.
 - c. Replace the valve.
2. Valve Fails to Open
 - a. Check to make sure purified water is turned on or opened to the unit.
 - b. Check wiring connections.
 - c. Replace the valve.

CHAPTER EIGHT: SPARE PARTS & SUPPLIES

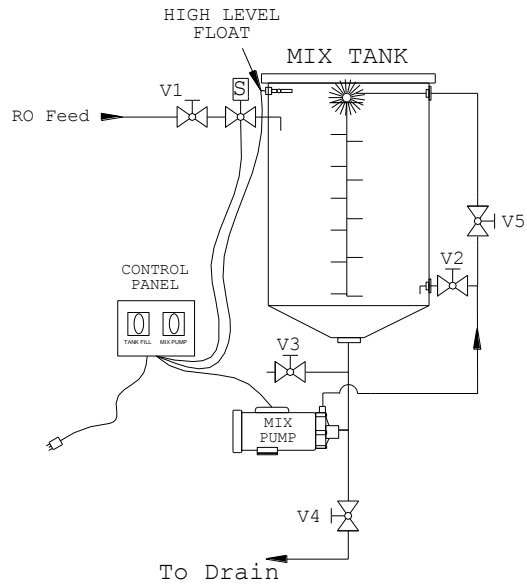
Supplies and replacement parts are available from Mar Cor Purification by calling 1-800-752-1402. Replacement parts can be ordered by referring to the system diagram. The following supplies are available and can be shipped immediately:

Spare Parts List:

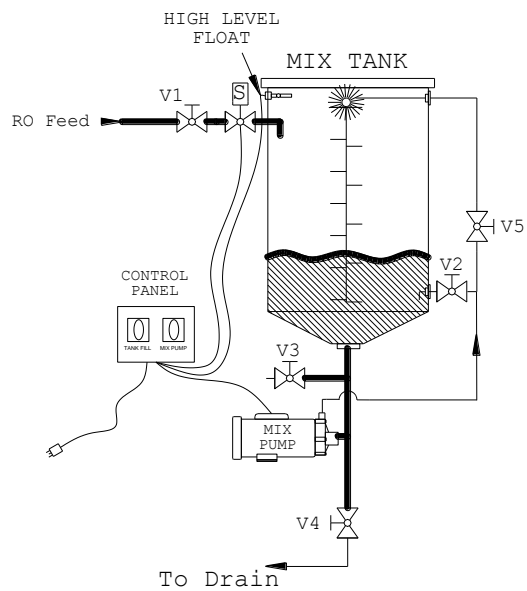
Description	Part Number
Minnicare 400 Cold Sterilant, 4 x 1 quart, case	176-01-001
Minnicare 1% test strips	185-40-005
Minnicare residual test strips	185-40-004
¾ hp Mix pump (100 gallon)	028-07-001
½ hp Mix pump (50 gallon)	028-06-002
Pump Wet End Kit (100 gallon)	028-83-176
Pump Wet End Kit (50 gallon)	028-83-174
¾" Compact Ball Valve, PVC	425-04-103
1" Compact Ball Valve, PVC	425-04-104
¾" T/U Ball Valve, PVC	425-01-162
¾" MNPT x ¾" MGHT Dixon	350-11-004
¾" MNPT x ½" HB 90 Dixon	350-15-012
20 amp fuse	250-13-541
1 amp fuse	250-13-513
Flow control nipple, PVC, 3 gpm	425-27-239
Filter,5 micron,tank cover	ME41383
O-ring,16" DIA, EPDM	1236603

CHAPTER NINE: DRAWINGS

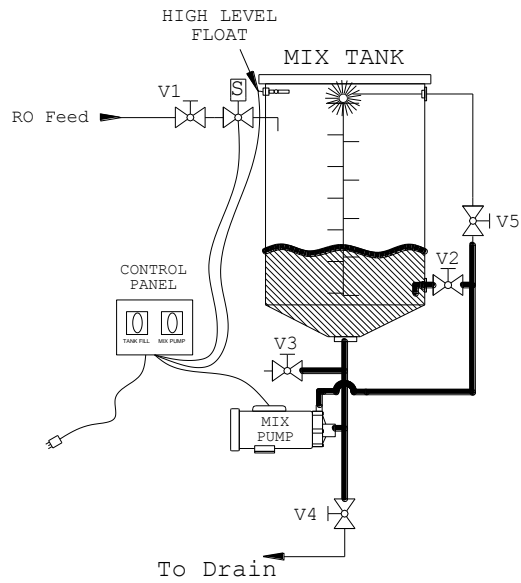
MCB202 EF - Bicarb Mix Tank With Electronic Fill



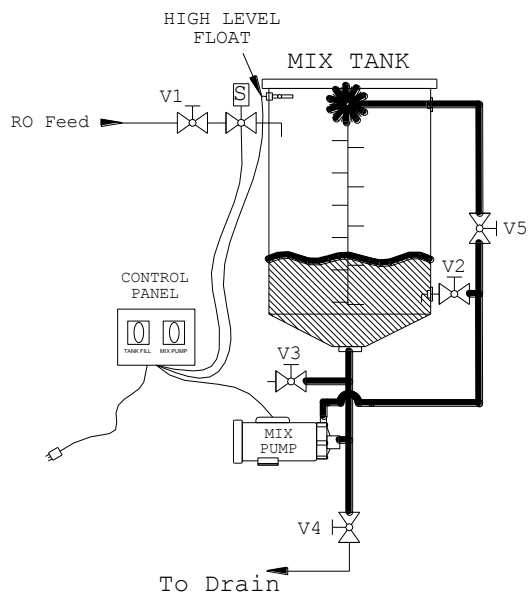
Fill Mode



Mix Mode



Clean & Disinfect Mode



Notes:

Call **(800) 633-3080** for additional information or visit **www.mcpur.com**.



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