IT IS UNSAFE TO START USING THIS DEVISE
WITHOUT FIRST READING AND UNDERSTANDING
THIS MANUAL IN ITS ENTIRETY

OPERATOR MANUAL

FOR

BIPRO SDS CB200

BICARBONATE MIXERS

With
Touch Screens

IMPORTANT DOCUMENT
PLEASE SAFEGUARD

January 30, 2019

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USER ASSISTANCE INFORMATION

ASSISTANCE IS AVAILABLE: Monday through Friday (excluding holidays)

8:00 am to 4:00 pm Central time.

Call: 913-438-9700

Emergency assistance is available after normal operating hours,

Call: 913-269-5681

If the phone is not answered please leave a message, include your name and a phone number. Your call will be returned as soon as possible if you called the emergency assistance number or next business day for office calls.

GENERAL DESCRIPTION

The BiPro SDS CB200 Bicarbonate mixing and distribution system is a dual tank pump driven bicarbonate mixer. When operating instructions are followed mixing bicarbonate in quantities up to 100 gallons is easy and accurate. It is possible to disinfect the system with multiple disinfection solutions.

The specific instructions for all procedures are included in this manual.

WARNING: It is unsafe to operate the Bicarbonate system without first reading and understanding the Operator's Instruction Manual.

WARNING: Misuse, improper operation, and/or improper monitoring of the system could result in serious injury, death, or serious reactions to patients undergoing hemodialysis treatment.

CAUTION: When used as a medical device, Federal law restricts this device to sale by or on the order of a physician.

NOTE: Where water is mentioned, it must be AAMI standard quality water.

NOTE: Once the BiPro SDS CB200 system has been delivered to you, it is the responsibility of the Medical Director to ensure that the system is used, monitored, and maintained in such a manner so as to satisfy all applicable standards.

RECOMMENDATIONS:

Disinfection of this system prior to use and on a recurring schedule is required. Disinfection chemicals and quantities are to be determined by the Medical Director. Disinfection scheduling is to be determined by the Medical Director of the facility or facility policy.

Common disinfectants approved for use with this equipment are: chlorine bleach in a 100:1, ratio, Renlin in a 100:1 ratio, and Ozone @ a minimum of 0.2 ppm. Higher levels of Ozone are encouraged for increased efficacy of Ozone. Ozone should be @ a minimum of 0.1 ppm at the end of the loop. Test with approved facility testing methodology for the presence or absence of ozone.

Precipitate removal can be accomplished with vinegar, Citru-Clean or acetic acid used in a 20:1 ratio. Precipitate removal should be accomplished on a minimum of a monthly basis.

Times and quantities may be altered to accommodate lengthy or difficult loops. All changes are to be approved by the Medical Director.

Filter changes for the 0.2-micron air filters are to be accomplished on an annual basis. Carbon ozone elimination filters (if used) should be changed on an annual basis.

Stainless Steel Screen or plastic screen should be removed and rinsed on an annual basis.
Solenoids should be dissembled rinsed and evaluated on a semiannual basis.
Monthly, the Fill /Mix Solenoid should be removed and the screen in the nose of the solenoid cleared of any plastic from bicarb bags or test strips.

THESE PROCEDURES ARE INTENDED TO BE GUIDELINES FOR USE IN ESTABLISHING YOUR FACILITIES PROCEDURES

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BICARB MIXING AND DISTRIBUTION OPERATING INSTRUCTIONS SDS-CB200

MEDICAL SOLUTIONS INTERNATIONAL

800-326-5275

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BICARB MIXING PROCEDURE

Purpose: **To enable assigned staff to properly prepare BICARB**
Supplies: **BICARB powder**
Procedure: **Performed by trained staff**

1. Ensure all panel mounted switches are Turned Off.
Verify the BICARB Mixer is completely empty: Drain sample ports and close
____ **Open Mix** tank drain if necessary ..... Close Mix tank drain when empty.
____ **Open Day** tank drain..... LEAVE OPEN. This is a mandatory step do not ignore.

2. The Touch screen displays three operating modes;
F1,=Fill Menu, F2,=Mix Menu, & F3,=AUTO or MONITOR.

To enter the Fill mode from the main menu:
____ **PRESS, F1** Fill, The Screen will change and Display: "Enter Fill Count"
____ **PRESS**, the Blue Square in center of the screen, A numerical touch pad will appear,
____ **ENTER**, NUMBER OF LITERS DESIRED FOR THIS BATCH,
____ **PRESS,** THE ENTER ARROW (lower right) on the numerical touchpad.
FYI: (FOR 1BAG OF BICARB POWDER, ENTER 94 LITERS)
(FOR 2 BAGS OF BICARB POWDER, ENTER 188 LITERS)
(FOR 3 BAGS OF BICARB POWDER, ENTER 282 LITERS)
(FOR 4 BAGS OF BICARB POWDER, ENTER 376 LITERS)
____ PRESS, F8, Continue.
The fill count will show on the screen and will count up to the requested amount.
*OPEN THE DAY TANK LID TO ENSURE NO WATER IS FLOWING OR SPRAYING INTO THE DAY TANK!
** IF WATER IS OBSERVED FLOWING INTO THE DAY TANK, TURN SYSTEM OFF AND CALL YOUR BIO MED ON DUTY OR THE CONTACT NUMBERS ON PAGE 3 (USER ASSISTANCE).
When fill is complete, the flow will stop
____ Verify the water level in the Mix Tank.

3. ____ **PRESS, F5** Main Menu, TO RETURN TO THE MAIN MENU.

4. ____ **PRESS, F2** MIX, To enter the Mix mode from the main menu:

____ **PRESS, F8**, **Continue**. The pump will start. A default setting of 10 minutes is in the system.
**While it should not be necessary, if you need to alter the mix pump time run time:
PRESS F5, (this returns you to the main menu)
PRESS F2, (this enters you into the mix mode)
Press, the Blue Square, A numerical touch pad will appear,
ENTER NUMBER OF MINUTES DESIRED FOR THIS BATCH,
PRESS THE ENTER ARROW (lower right) on the numerical touchpad.
THEN PRESS F8.

5. Open the lid on the Bicarb Mixing Tank:
____**Slowly** add the appropriate number of BICARB packages. (Dumping powder damages the pump) Close the lid.
Allow solution to mix for full cycle. It will automatically shut off.

6. When Mix Cycle is complete:
____**PRESS, F5**, Main Menu TO RETURN TO THE MAIN MENU

7. ____ Capture a sample from the “Mix Tank” sample port for testing by.....
opening the Ball Valve and clear a few ounces into a container, throw away.
Then Capture a sample from the “Mix Tank” sample port.
Test your mixed BICARB to insure it meets your facility standards. If you test
For Specific Gravity your sample should be ____ with a tolerance of + or - ___. OR For Conductivity your sample should be____ with a tolerance of + or - ___.

8. When Batch is verified:
____ Turn on the Safety Switch (#4)
____ Turn on the Prime Loop Switch (#5) to prime the loop.
____ **PRESS, F2**, **MIX** To Enter Mix Mode:
____ **PRESS, F8, Continue**. (You are now purging the loop of rinse water and air.)
Continue to purge the loop for (3 to 5 minutes) Time is determined by length and size of loop.

9. After 3 to 5 minutes, Verify that pure mixed BICARB has filled the loop by drawing a sample from the loop sample port on the right of the control panel podium,
____ **Test** as you did in step #7. **Once Verified:**
____ **PRESS, F5** Main Menu, TO RETURN TO THE MAIN MENU.
____ **CLOSE THE DAY TANK DRAIN**

10. ____ **PRESS**, **F2**, **MIX**, to Enter Mix mode:
____ **PRESS**, **F8**, **Continue**.
____ **Turn On** the Transfer to Day Tank Switch (#8) this begins the transfer to day tank.
____ **Turn On** the Fill/Mix Switch, (#1) (This closes this valve and stops the flow to the mix tank) _
____ **Turn Off** the Prime Loop Switch (#5) to stop priming the loop.
Allow to transfer for 30 seconds,(to accumulate bicarb in the Day Tank) then proceed:

11.____ **ONLY After 30 seconds**, **Turn On** the Loop Pump Loop Switch (#6)
The unit will automatically shut off and sound the dry cut alarm when transfer is complete.

12. When the dry cut alarm sounds, transfer is complete,
____ **PRESS, F1,** TO MUTE,
____ **PRESS, F5** Main Menu, TO RETURN TO THE MAIN MENU.
____ **Turn Off** the Transfer to Day Tank Switch (#8).
____ **Turn Off** the Safety Switch (#4).
____ **Turn On** the Mix Pump Backwash Switch (#3).
____ **OPEN** MIX TANK DRAIN.

13. On the Touch screen,
____ **PRESS, F1**, (the total amount shown is not relevant)
____ **PRESS, F8**, Continue, Allow to flow for 5 liters
____ **Turn On** the Injector switch (#7),
____ **Turn Off** the Mix Pump Backwash Switch (#3). Allow to flow for 5 liters
____ **Turn On** the Spray Mix Tank Switch (#2)
____ **Turn Off** the Injector switch (#7), Allow to spray for 10 liters,
____ **Turn Off** the Fill/Mix Switch, (#1)
____ **Turn Off** the Spray Mix Tank Switch (#2). Allow to flow for 10 liters
____ **PRESS, F5** Main Menu, TO RETURN TO THE MAIN MENU.

14. On the Panel-view touch pad, To monitor the low tank alarm,
____ **PRESS, F3** AUTO/MONITOR. The Distribution System is now in normal operation.

MID DAY BICARB MIXING PROCEDURE

Purpose: **To enable assigned staff to properly prepare BICARB**
Supplies: **BICARB powder**
Procedure: **Performed by trained staff**

1. With the exception of the **Loop Pump switch (#6)**. (the loop should be recirculating).
   Ensure all panel mounted switches are **Turned Off**. Press F5 to return to main menu.
   ____ **Verify** the BICARB Mixing Tank is completely empty:
   ____ **Close** the Mix Tank Drain when empty. Drain Sample port and close.

2. The Touch screen displays three operating modes;
   F 1, = Fill Menu, F 2, = Mix Menu, & F 3, = AUTO/MONITOR.
   To enter the Fill mode from the main menu:
   ____ **PRESS, F1** Fill, The Screen will change and Display: "Enter Fill Count"
   ____ **PRESS**, the Blue Square in center of the screen, A numerical touch pad will appear,
   ____ **ENTER**, NUMBER OF LITERS DESIRED FOR THIS BATCH,
   ____ **PRESS,** THE ENTER ARROW (lower right) on the numerical touchpad.
   ____ **PRESS, F8**, Continue.
   The fill count will show on the screen and will count up to the requested amount.

*OPEN THE DAY TANK LID TO ENSURE NO WATER IS FLOWING OR SPRAYING INTO THE DAY TANK!
** IF WATER IS OBSERVED FLOWING INTO THE DAY TANK, TURN SYSTEM OFF AND
CALL YOUR BIO MED ON DUTY OR THE CONTACT NUMBERS ON PAGE 3 (USER ASSISTANCE).
   When fill is complete, the flow will stop,
   ____ Verify the water level in the Mix Tank.

3. To enter the **Mix** mode from the main menu:
   ____ **PRESS, F2, MIX**
   ____ **PRESS, F8, CONTINUE.** *The pump will start.*

4. **Open the lid** on the Bicarb Mixing Tank:
   ____ **Slowly** add the appropriate number of BICARB packages.
   (Dumping powder damages the pump)
   ____ **Close the lid.**

5. When Mix Cycle is complete:
   ____ **PRESS, F5 Main Menu, TO RETURN TO THE MAIN MENU.**

6. ____ **Capture a sample from the "Mix Tank" sample port**
   Test your mixed BICARB to insure it meets your facility standards.

7. If you are ready to transfer to the day tank: AND there is adequate space.
   ____ PRESS F5 and proceed.

OR If you want to wait until Bicarb is needed then resume at this point on your return.
   If waiting,
   ____ PRESS F3 Auto/Monitor, WHEN SYSTEM LOW TANK ALARM SOUNDS,

____ PRESS F1 TO MUTE,
____ F5 MAIN MENU TO CLEAR.

8. ____ **Turn On** the **Safety Switch (#4)**
____ **Turn On** the **Transfer to Day Tank Switch (#8)**,
____ **Turn On** the **Fill/Mix (#1), *(THIS WILL CLOSE THIS VALVE)***
____ **PRESS, F2, Mix**, to Enter the **Mix** mode from the main menu:
____ **PRESS, F8, Continue**.

9. *The bicarb will transfer until the mix tank is empty, and the dry cut alarm sounds*,

10. When the dry cut alarm sounds, transfer is complete,
____ **PRESS, F1,** TO MUTE,
____ **PRESS, F5** Main Menu, TO RETURN TO THE MAIN MENU.
____ **Turn Off** the Transfer to Day Tank Switch (#8).
____ **Turn Off** the Safety Switch (#4).
____ **Turn On** the Mix Pump Backwash Switch (#3).
____ **OPEN** MIX TANK DRAIN.

11. On the Touch screen,
____ **PRESS, F1**, (the total amount shown is not relevant)
____ **PRESS, F8**, Continue, Allow to flow for 5 liters
____ **Turn On** the Injector switch (#7),
____ **Turn Off** the Mix Pump Backwash Switch (#3). Allow to flow for 5 liters
____ **Turn On** the Spray Mix Tank Switch (#2)
____ **Turn Off** the Injector switch (#7), Allow to spray for 10 liters,
____ **Turn Off** the Fill/Mix Switch, (#1)
____ **Turn Off** the Spray Mix Tank Switch (#2). Allow to flow for 10 liters
____ **PRESS, F5** Main Menu, TO RETURN TO THE MAIN MENU.

12. On the Panel-view touch pad, To monitor the low tank alarm,
____ **PRESS, F3** AUTO/MONITOR.

The Distribution System is now in normal operation.

OPERATIONAL WARNINGS

If a dry cut alarm occurs during the Mix or Auto mode, the unit will stop and display DRY CUT ALARM. PRESS F1, then F5 to clear the alarm and exit to the main menu. (See Trouble Shooting Guide).

If a low tank alarm occurs, the tank alarm screen shows which sensor(s) are reading an alarm state. LOW TANK, refers to the Bicarb Day Tank. TO SILENCE the audio alarm, PRESS, F 1. This will shut off the alarm until the alarm condition clears or a new alarm occurs.

To resolve the alarm status, either more bicarb needs to be mixed, tested and transferred. If remaining quantity is sufficient to complete the operational day simply press, F5. If a new alarm occurs it will display but not alarm unless the first alarm has cleared.

RECOMMENDED CHEMICAL BICARB DISINFECTION PROCEDURE

Frequency: To be determined by Medical Director.
Purpose: To enable assigned staff to properly disinfect the system.
Supplies: Prescribed disinfectant, to be determined by Medical Director. Rubber Gloves and Goggles recommended.

BEFORE STARTING PROCEDURE, VERIFY THAT NO PATIENTS ARE RECEIVING TREATMENT

Testing times, points and methodology is determined by the facility policy. Flow quantities may have to be adjusted to account for the length of loop or to achieve desired test results.

1. Ensure all switches are **Turned Off**. Verify the tanks are completely empty:
   Open mix tank drain if necessary. **Press F5 to return to Main Menu.**
   ____ **Close Mix Tank Drain Valve**, Drain tank sample port and close
   ____ **Close Day Tank Drain Valve.** Drain tank sample port and close
2. The Touch screen displays three operating modes;
   Enter the **Fill** mode from the main menu:
   ____ **PRESS, F1, The Screen will change and Display: "Enter Fill Count"**
   ____ **PRESS,** the **Blue** Square, in center of screen a numerical touch pad will appear,
   ____ **ENTER, 100 LITERS, PRESS THE ENTER ARROW** (lower right) on the touchpad.
   ____ **PRESS, F8, Continue.**
   The fill count will show on the screen and count up to requested amount.
   When fill is complete the flow will stop, ***Verify the water level in the Mix Tank.***
   ____ **PRESS, F5 Main Menu, TO RETURN TO THE MAIN MENU.**

3. Step 3 ONLY Applies to systems with heated RO water disinfect systems.
   ____ Connect the RO water feed hose from the wall connection to the quick disconnect fitting on the loop return plumbing on the back inside left of the podium.

4. To enter the **Mix** mode from the main menu:
   ____ **PRESS, F2,**
   ____ **PRESS, F8, Continue.** *The pump will start. A default setting of 10 minutes is in the system.*

5. Open the lid on the Bicarb Mixing Tank:
   ____ Add the appropriate amount of the disinfectant of choice. **Close the lid.**

DO NOT OPEN THE LIDS AGAIN UNTIL AFTER RINSE PROCEDURE!!

6. ____ Capture a sample from the Mix Tank sample port for testing. Test for presence of disinfectant.
   ____ Once disinfectant level is verified: *TURN ON THE SAFETY SWITCH (#4)*
   ____ Turn On the Spray Mix Tank Switch (#2)..... After 30 seconds Turn Off this switch.
   ____ Turn On the Mix Pump Backwash Switch(#3)... After 10 seconds Turn Off this switch.
   ____ Turn On the Injector Switch (#7)..... After 30 seconds Turn Off this switch.
   ____ Turn On the Transfer to Day Tank Switch(#8).... After 30 seconds Turn Off this switch.
   ____ Turn On the Spray Day Tank Switch (#9)..... After 30 seconds Turn Off this switch.
   ____ Turn On the Prime Loop Switch (#5).....This switch is to be left ON.
   ____ Turn On the Loop Pump Backwash Switch(#10). After 10 seconds Turn Off this switch.

7. WITH THE PRIME LOOP SWITCH STILL ON: After +/- **5** minutes, verify that disinfectant has filled the loop, draw a sample from the loop sample port on the right of the podium.
____ **Tes**t as you did in step #6. When verified:
____ **Turn Off** the **Prime Switch (#5),**
____ **Turn On the Transfer to day tank switch (#8).**
Allow the level of the Day Tank to rise above the Sample port.
____ **Open the Sample port to expose to disinfectant and close.**
____ **Turn Off the Transfer to day tank switch.**
____ **Turn Off** the **Safety Switch. (#4)**
____ **PRESS, F5 Main Menu, TO RETURN TO THE MAIN MENU.**

8. ____**Turn On the Loop Pump switch (#6),** With the disinfectant solution re-circulating,

9. Step 9 ONLY Applies to systems with heated RO water disinfect systems.
____ PRESS, FI FILL (the amount called for is not important).
____ PRESS, F8 CONTINUE

10. Rinsing The wall station tubing and ports. (NOT AN OPTION)
____ Go to the patient floor area and **flush each wall station Bicarb port** to expose to disinfectant.
Follow your facility guide lines for testing for disinfectant at the wall stations.

11. After flushing wall station Bicarb ports to expose them to disinfectant:
____Turn Off the Loop Pump switch (#6).

12. Step 12 ONLY Applies to systems with heated RO water disinfect systems.
____ Disconnect the RO WATER FEED hose from the quick connect fitting on the back of the system podium,
Reconnect to Ro Water fitting.
____ PRESS, F5 TO RETURN TO MAIN MENU

13.____ Open Mix Tank Drain.
____ Open Day Tank Drain. Allow Disinfectant contact time. (minimum 30 min).
(Actual time to be determined by clinic policy)

14. After disinfectant contact time. Proceed to the Disinfectant Rinse Procedure.

NEVER LEAVE DISINFECTANT IN THE SYSTEM

DISINFECTANT RINSE PROCEDURE

Purpose: **To enable assigned staff to properly rinse the system.**
Supplies: **RO Water**
Procedure to be performed EVERY TIME the SYSTEM HAS BEEN DISINFECTED.

Testing times, points and methodology is determined by the facility policy. Flow quantities may have to be adjusted to account for the length of loop or to achieve desired test results.

1. Ensure all panel mounted switches are turned off. Press F5 to return to the Main Menu.
____ **Open Mix Tank Drain**, **Open Day Tank Drain.** Drain Tank Sample Ports
DO NOT OPEN HATCH LIDS UNTIL AFTER RINSE PROCEDURE!!

2. Enter the **Fill** mode from the main menu:
____ **PRESS, F!, FILL, The Screen will change and Display: "Enter Fill Count"**
____ **PRESS,** the **Blue** Square, (center of screen). A numerical touch pad will appear,
____ **ENTER, 900 LITERS, PRESS THE ENTER ARROW** (lower right) on the touchpad.
____ **PRESS, F8, Continue. Allow** to run to drain for approximately **10 LITERS**.

3. Quick flush of fill plumbing
____ Turn On the Spray Mix Tank Switch (#2)
____ Turn On the Fill/Mix Switch (#1), This closes this flow path. Allow to spray for 5 liters
____ Turn On the Injector Switch (#7),
____ Turn Off the Spray Mix Tank Switch (#2) Allow to flow through injector for 5 liters
____ Turn On the Mix Pump Backwash Switch (#3).
____ Turn Off the Injector Switch (#7), allow to flow through the back wash for 5 liters
____ Turn On the *Safety Switch (#4).*
____ Turn On the Transfer to Day Tank Switch (#8).
____ Turn Off the Mix Pump Back Switch (#3), allow to flow to the Transfer for 5 liters
____ Turn On the Prime Switch (#5)
____Turn Off the Transfer Switch (#8), allow to flow to the Loop for 5 liters

4. Cleansing system Rinse
____ Turn Off the Fill/Mix Switch (#1),
____ Turn Off the Prime Switch (#5). Allow to run to drain for 30 liters
____ Turn On the Mix Pump Backwash Switch (#3).
____ Turn On the Fill/Mix Switch (#1). This closes this flow path.
Allow to run to drain for approximately 30 more LITERS.
____ Turn On the Injector Switch (#7),
____ Turn Off the Mix Pump Backwash Switch (#3) Allow to flow to drain for 30 more LITERS
____ Turn On the Spray Mix Tank Switch (#2), Turn Off the Injector Switch (#7)
Allow 80 more LITERS to spray into the mixing tank and run to drain.

5.____ Turn On the Loop Pump Backwash (#10)
____ Turn On the Transfer to Day Tank Switch (#8).
____ Turn Off the Spray Mix Tank Switch (#2). Allow 30 LITERS to flush the transfer plumbing.
____ Turn On the Spray Day Tank Switch (#9).
____ Turn Off the Transfer to Day Tank Switch (#8). Allow 80 LITERS to spray the Day Tank.
____ Turn On the Prime Switch (#5)
____Turn Off the Spray Day Tank Switch (#9)
Allow 40 LITERS to back flush the loop pump.
____ Turn Off the Loop Pump Backwash Switch (#10)

With Prime switch still on, Purge the loop for approximately 80 more LITERS

____ Verify disinfectant has been rinsed from the loop. Draw the samples from the loop sample port.

6. When No Disinfectant is detected at the loop sample port.

____ Turn Off the Prime Switch (#5) slow count to 5, Turn ON the Prime Switch (#5), slow count to
____ Turn Off the Prime Switch (#5) slow count to 5, Turn ON the Prime Switch (#5), slow count to
____ Turn Off the Prime Switch (#5) slow count to 5, Turn ON the Prime Switch (#5), slow count to
____ Turn Off the Prime Switch (#5) slow count to 5, Turn ON the Prime Switch (#5), slow count to
____ Turn Off the Prime Switch (#5) slow count to 5, Turn ON the Prime Switch (#5), slow count to
____ Turn Off the Prime Switch (#5) slow count to 5, Turn ON the Prime Switch (#5),
____ Allow rinse water to continue to purge the loop while testing loop sample port again until clear.

7. When no disinfectant is detected at the loop return sample port, proceed to the patient treatment floor. Follow the flow path of the loop and open each Bicarb Valve and allow rinse water to flow to drain.

THIS IS NOT AN OPTION

____**Test** for absence of disinfectant. Test with approved facility testing methodology and procedure. Return to Bicarb System,
____ **Retest** the end of the loop. **When clear, proceed**

8.____ **Turn On** the **Spray Day Tank Switch (#9).**
____ **Turn Off** the Prime Switch (#5).
Allow **30 more LITERS** to spray the Day tank.

9.____ **Close** the Mix Tank Drain,
____ **Turn Off** the **Fill/Mix switch (#1),**
____ **Turn Off** the **Spray Day Tank Switch (#9),**
____ Open the Mix tank sample port, (Have bucket under spout).
When the level in the Mix tank is higher than the sample port, water will flow through the sample port. After a few seconds,
____ **Begin testing** for absence of disinfectant. When clear, proceed

10.____ **Close** the Day Tank Drain.
____ **Turn On** the **Transfer switch (#8).**
____ **Turn On** the **Fill/Mix Switch (#1).** This closes this flow path.
____ **Open** the **Day tank sample port. (Have bucket under spout).**
When the level in the Day tank is higher than the sample port, water will flow through the sample port. After a few seconds,
____ **Begin testing** for absence of disinfectant. When clear proceed.

11. If you **DO NOT** want to Recirculate water through the loop over night:

____ **Turn On** the **Mix Pump Backwash Switch (#3).**
____ **Turn On** the **Loop Pump Backwash (#10)**
____ **Press F5 Main Menu, to return to the Main Men**
____ **Open the Mix Tank Drain.**
____ **Open the Day Tank Drain, WAIT For 30 seconds**
____ **Turn Off Any and All Remaining Switches.** **Allow to drain**

12. If you **DO** want to Recirculate water through the loop overnight:

____ **Turn On** the **Mix Pump Backwash Switch (#3).**
____ Press F5 Main Menu, to return to the Main Menu.
____ **Open the MIX Tank Drain, WAIT For 30 seconds.**
____ **Turn off Any and All Remaining Switches.**

____ **Turn on the Loop Pump Switch (#6).**

RECOMMENDED BICARB PRECIPITATE REMOVAL PROCEDURE

Purpose: **To enable assigned staff to properly rinse the system with acidic rinse.**
Supplies: **Prescribed Low pH (acidic) concentrate solution.**
Rubber Gloves and Goggles recommended

BEFORE STARTING PROCEDURE, VERIFY THAT NO PATIENTS ARE RECEIVING TREATMENT

Testing times, points and methodology is determined by the facility policy. Flow quantities may have to be adjusted to account for the length of loop or to achieve desired test results.

1. Ensure all switches are **Turned Off**. Verify the tanks are completely empty:
Open mix tank drain if necessary. **Press F5 to return to Main Menu.**
____ **Close Mix Tank Drain Valve**, Drain tank sample port and close
____ **Close Day Tank Drain Valve.** Drain tank sample port and close

2. The Touch screen displays three operating modes;
Enter the **Fill** mode from the main menu:
____ **PRESS, F1, The Screen will change and Display: "Enter Fill Count"**
____ **PRESS,** the **Blue** Square, center of screen A numerical touch pad will appear,
____ **ENTER, 100 LITERS, PRESS THE ENTER ARROW** (lower right) on the touchpad.
____ **PRESS, F8, Continue.**
The fill count will show on the screen and count up to requested amount.
When fill is complete the flow will stop, ***Verify the water level in the Mix Tank.***
____ **PRESS, F5 Main Menu, TO RETURN TO THE MAIN MENU.**

3. To enter the **Mix** mode from the main menu:
____ **PRESS, F2,**
____ **PRESS, F8, Continue.** *The pump will start. A default setting of 10 minutes is in the system.*

4. Open the lid on the Bicarb Mixing Tank:
____ Add the appropriate amount of the Low pH acidic solution of choice.
____ **Close the lid.**

DO NOT OPEN THE LIDS AGAIN UNTIL AFTER RINSE PROCEDURE!!

5.____ Capture a sample from the Mix Tank sample port for testing. Test for presence of low pH solution.
____ Once disinfectant level is verified: *TURN ON THE SAFETY SWITCH (#4)*
____ **Turn On** the **Spray Mix Tank Switch (#2).....** After 30 seconds Turn Off this switch.
____ **Turn On** the **Mix Pump Backwash Switch(#3)...** After 10 seconds Turn Off this switch.
____ **Turn On** the **Injector Switch (#7**)..... After 30 seconds Turn Off this switch.
____ **Turn On** the **Transfer to Day Tank Switch(#8)**.... After 30 seconds Turn Off this switch.
____ **Turn On** the **Spray Day Tank Switch (#9)**..... After 30 seconds Turn Off this switch.
____ **Turn On** the **Prime Loop Switch (#5)**.....This switch is to be left ON.
____ **Turn On** the **Loop Pump Backwash Switch(#10)** After 10 seconds Turn Off this switch.

6. WITH THE PRIME LOOP SWITCH STILL ON: After +/- **5** minutes, verify that the low pH solution has filled the loop, draw a sample from the loop sample port on the right of the podium

____ **Tes**t as you did in step #6. When verified:

____ **Turn Off** the **Prime Switch (#5),**

____ **Turn On the Transfer to day tank switch.**
Allow the level of the Day Tank to rise above the Sample port.

____ **Open the Sample port** and allow low pH solution to flow out into a bucket to expose the Sample Port to the solution.

____ **Turn Off the Transfer to day tank switch.**

____ **Turn Off** the **Safety Switch. (#4)**

____ **Turn On** the **Mix Pump Backwash Switch (#3).**

____ **PRESS, F5 Main Menu, TO RETURN TO THE MAIN MENU.**

7. ____ **Turn On the Loop Pump switch (#6),**
The low pH solution will begin re-circulating through the loop.

8. **Rinsing The wall station tubing and ports. (NOT AN OPTION)**

____ Go to the patient floor area and **flush each wall station Bicarb port** to begin flushing the wall station ports to expose the low pH solution.
Follow your facility guide lines for testing for solution at the wall stations.

9. **After flushing wall station Bicarb ports to expose them to** low pH solution:
____ Turn Off the **Loop Pump switch (#6).**

10.____ **After 10 seconds, Press F5 to return to the Main Menu.**
Allow Low pH Solution contact time. (minimum 30 min).
(Actual time to be determined by clinic policy)

11. **After Low pH solution contact time.**
____ **Open Mix Tank Drain.**
____ **Open Day Tank Drain.**
Proceed to the Disinfectant Rinse Procedure.

NEVER LEAVE LOW PH SOLUTION IN THE SYSTEM.

PRE OZONATION-RINSE PROCEDURE

Purpose: **To enable assigned staff to properly rinse the system prior to Ozonation.**
Supplies: **RO Water**

BEFORE BEGINNING PROCEDURE, VISUALLY VERIFY THAT NO PATIENTS ARE RECEIVING TREATMENT.

Testing times, points and methodology is determined by the facility policy. Flow quantities may have to be adjusted to account for the length of loop or to achieve desired test results.

1. Ensure all panel mounted switches are turned off.
   If necessary, Press F5 to return to the Main Menu.
   ____ **Open Mix Tank Drain**, **Open Day Tank Drain. Leave open**
   ____ Drain sample ports (Open and close)

2. Enter the **Fill** mode from the main menu:
   ____ **PRESS, FILL, The Screen will change and Display: "Enter Fill Count"**
   ____ **PRESS,** the **Blue** Square, (center of screen) A numerical touch pad will appear,
   ____ **ENTER, 300 LITERS, PRESS THE ENTER ARROW** (lower right) on the touchpad.
   ____ **PRESS, F8, Continue. Allow** to run to drain for approximately **10 LITERS**.

3. Cleansing system Rinse
   ____ **Turn On** the **Mix Pump Backwash Switch(#3).**
   ____ **Turn On** the **Fill/Mix Switch (#1),** This closes this flow path.
   Allow to run to drain for approximately **10 more LITERS.**
   ____ **Turn On** the **Injector Switch(#7),**
   ____ **Turn Off** the **Mix Pump Backwash Switch (#3) Allow** to flow for **10 more LITERS**
   ____ **Turn On** the **Spray Mix Tank Switch (#2),**
   ____ **Turn Off** the **Injector Switch,(#7)** Allow **20** more **LITERS** to spray into the mixing tank.

4. ____ **Turn On** the ***Safety Switch (#4).***
   ____ **Turn On** the **Loop Pump Backwash (#10)**
   ____ **Turn On** the **Transfer to Day Tank Switch (#8).**
   ____ **Turn Off** the **Spray Mix Tank Switch (#2). Allow 10 LITERS to flush the transfer plumbing.**
   ____ **Turn On the Spray Day Tank Switch (#9).**
   ____ **Turn Off the Transfer to Day Tank Switch (#8).** Allow 20 LITERS to spray the Day tank.

5. ____ **Turn On** the **Prime Switch (#5),** (This will remain on.)
   ____ **Turn Off** the **Spray Day Tank Switch (#9)**
   Allow 10 LITERS to back flush the loop pump.
   ____ **Turn Off** the **Loop Pump Backwash Switch (#10)**
   With Prime switch still on, ***Purge*** *the loop for approximately* **40 more LITERS**
   ____ Verify Bicarbonate solution has been rinsed from the loop, draw the samples from the loop sample port. Allow to continue to purge the loop while testing until clear.

6. ____ **Turn Off** the **Fill/Mix switch (#1)**
   ____ **Turn Off** the **Prime Loop Switch (#5)**
   ____ **Turn Off** the **Safety Switch (#4)**

7. ____ **Turn Off Any and All Remaining Switches.**
   ____ Press F5 Main Menu, to return to the Main Menu

Proceed to **Ozonation Procedure.**

OZONATION PROCEDURE

Purpose: **To enable assigned staff to properly rinse the system.**
Supplies: **RO Water**
Procedure to be performed to disinfect the system with ozone.

Testing times, points and methodology is determined by the facility policy. Flow quantities may have to be adjusted to account for the length of loop or to achieve desired test results.

BEFORE STARTING PROCEDURE, VERIFY THAT NO PATIENTS ARE RECEIVING TREATMENT

1.____ Ensure all panel mounted switches are deactivated.
____ PRESS F5 TO RETURN TO THE MAIN MENU, (Assuming not done at the end of last procedure)
____ Close the Mix Tank Drain Valve, (Assuming not done at the end of last procedure)
____ Open the Day Tank Drain Valve. (Assuming not done at the end of last procedure)
____ Drain both sample ports, open, then close when flow stops.

2. Enter the **Fill** mode from the main menu:
____ **PRESS F1, The Screen will change and Display: To "Enter Fill Count"**
____ **Press,** the **Blue Square**, A numerical touch pad will appear,
____ **ENTER, 160 LITERS,** (this level can be adjusted to accommodate larger loops)
____ **PRESS THE ENTER ARROW** (lower right) on the touchpad.
____ **PRESS, F8 Continue.**

3. **When Mixing tank is filled to 160 Liters,**
____ **PRESS F5** TO RETURN TO THE MAIN MENU.

4. **To Enter a Mix time change:**
____ **PRESS F2,** *(this enters you into the mix mode)*
____ **PRESS,** the Blue Square, A numerical touch pad will appear,
____ **ENTER, 60 MINUTES for this procedure,** you may not need it all but it will be there if you do.
PRESS, THE ENTER ARROW (lower right) on the numerical touchpad.
____ **PRESS, F8 Continue.**

5.____ Connect, the Ozone Generator feed tubing **Switch the** Ozone unit to: **ON**.
____ **Turn On** the **Injector Switch (#7)**,
____ **Turn On** the **Fill/Mix Switch (#1).**

The recirculating water will be diverted through the Injector (venturi)

6. After **8** minutes:
____ Begin **Testing** at the **Mix Tank Sample Port** to insure it meets facility standards.
MSI's target for the Mixing tank is 0.20 ppm or greater. Higher levels are encouraged to increase efficacy. Test with facility approved testing practice.

7. **Step 7 ONLY Applies to systems with heated RO water disinfect systems.**
____**Connect** the RO water feed hose from the wall connection tee to the quick disconnect fitting on the loop return plumbing on the inside left of the podium.

8. With the Mix pump running:
____ **Turn On** the **Safety Switch (#4),**
____ **Turn Off** the **Fill/Mix Switch (#1)**
____ **Turn On** the **Mix Pump Backwash Switch (#3)**
After 20 Seconds
____ **Turn On** the **Fill/Mix Switch (#1)**
____ **Turn Off** the **Mix Pump Backwash Switch (#3)**
____ Turn On the **Spray Mix Tank Switch (#2)**
After 1 minute
____ **Turn On** the **Transfer To Day Tank Switch (#8)**
____ **Turn Off** the **Spray Mix Tank Switch (#2)**
After 15 seconds
____ **Turn On** the **Spray Day tank Switch (#9)**
____ **Turn Off** the **Transfer To Day Tank Switch (#8)**
After I Minute
____ **Turn On** the **Prime Loop Switch (#5)**
____ **Turn On** the **Loop pump Backwash switch (#10)**
____ **Turn Off** the **Spray Day tank Switch (#9).**
After 15 seconds
____ **Turn Off the Loop pump Backwash switch (#10)** Ozonated water will now continue to purge the loop.

9. After 5 minutes:
____ Begin testing at the Loop Sample Port for presence of Ozone.
MSI's target for the end of the loop is 0.10 or greater. **When target levels are achieved**:

10. ____ Start with the first wall station on the loop and flush **each** wall station Bicarb port completely.
____ Test at each port or selected ports as your facility policy requires.

11. Return to control panel,
____ **Close** the day tank drain,
____ **Turn On** the **Transfer To Day Tank Switch (#8),**
____ **Turn Off** the **Prime Loop Switch (#5),**
____ **Turn Off** the **Injector Switch (#7),**
____ **Turn Off** and **disconnect the ozone generator**

12. Wait for 30 seconds
When the Mix Pump Dry cut alarm sounds:
____ PRESS, F1 then Press F5 Main Menu to clear the alarm.
____ Turn Off the Fill/Mix Switch (#1),
____ Turn Off the Transfer Switch (#8).
____ Open and Flush the Day Tank Sample Port.

13. Step 13 ONLY APPLIES TO SYSTEMS WITH CWP HEATED RO WATER DISINFECT SYSTEMS.
____ Activate the Loop Pump switch (#6),
____ PRESS, F1, FILL (the total amount shown is not relevant)
____ PRESS, F8, Continue
Allow ozonated water to recirculate for 5 minutes, After the 5 minutes are up:
____ Disconnect the RO WATER FEED hose from the quick connect on the back of the System.
____ Reconnect the hose to the RO Water loop tee fitting.

14.____ Press F5 to return to the main menu, Turn Off all panel mounted switches.
____ **Open** the **Mix Tank Drain**. **Open** the **Day Tank Drain**.
Allow system to drain, proceed to **Expunging Ozone from the System**

EXPUNGING OZONE FROM THE SYSTEM

Purpose: **To enable assigned staff to properly rinse the system.**
Supplies: **RO Water**
Procedure to be performed to rinse ozone from the system.

Testing times, points and methodology is determined by the facility policy. Flow quantities may have to be adjusted to account for the length of loop or to achieve desired test results.

1. Ensure all panel mounted switches are deactivated.
____ **Press F5 to return to the Main Menu,** (Assuming not done at the end of last procedure)
____ **Open Mix Tank Drain Valve,** (Assuming not done at the end of last procedure)
____ **Open Day Tank Drain Valve,** (Assuming not done at the end of last procedure)
____ **Open** and **Drain** Both of the Tank sample ports, then close.

2. Enter the **Fill** mode from the main menu:
____ **Press F1, The Screen will change and Display: To "Enter Fill Count"**
____ **Press,** the **Blue Square**, A numerical touch pad will appear,
____ **Enter, 550 LITERS,** (this number can be changed to meet facility's needs).
____ **Press the Enter Arrow** (lower right) on the touchpad.
____ **Press, F8 Continue.**
Allow to flow to drain for 10 liters

3.____ **Turn On the Safety Switch (#4),**
____ **Turn On the Prime loop Switch (#5),**
____ **Turn On the Fill Mix Switch (#1)**
Allow 40 LITERS to flow through the loop and run to drain.

4.____ **Turn On** the **Injector Switch (#7)**
____ **Turn Off** the **Prime loop Switch (#5),**
Allow to flow to drain for 10 liters
____ **Turn On** the **Mix Pump Backwash Switch (#3)**
____ Turn Off the **Injector Switch (#7)**
Allow to flow to drain for 10 liters
____ **Turn On** the **Spray Mixing tank Switch (#2).**
____ **Turn Off** Mix **Pump Backwash Switch (#3)**
Allow to spray mix tank and flow to drain for 40 liters

5.____ **Turn On** the Transfer to day tank Switch (#8)
____ **Turn Off** the Spray Mixing tank Switch (#2)
Allow to flow to drain for 10 liters

6.____ **Turn On** the **Spray Day tank Switch (#9)**
____ **Turn Off** the **Transfer To Day Tank Switch (#8)**
Allow to spray for 20 liters
____ **Turn On** the **Prime Loop Switch (#5)**
____ Turn Off the **Spray Day Tank Switch (#9**)
Allow 40 LITERS to flow through the loop and run to drain.
____ Test at the Loop Sample Port for absence of Ozone, insure it meets facility standards.
When clear proceed. (MSI's target for the absence of Ozone is 0.05ppm or less)

7. ____ Proceed to the patient treatment floor and open each Bicarb Valve and allow rinse water to flow to drain.
____ **Test** for absence of Ozone. **Follow facility policy for testing.**
When complete, Return to Bicarb System,
____ **Retes**t the end of the loop, **Follow facility policy for testing.**
When clear, proceed

8. ____ **Turn Off** the **Fill Mix Switch (#1)**
____ **Turn Off** the **Prime Loop Switch (#5)**
____ **Press F5 to return to the Main Menu**.
____ **Close** the Mix Tank Drain.

9. **Enter the Fill mode from the main menu:**
____ **PRESS F1, The Screen will change and Display**: **To "Enter Fill Count"**
____ **Press,** the **Blue Square**, A numerical touch pad will appear,
____ **ENTER, 385 LITERS,**
____ **PRESS THE ENTER ARROW** (lower right) on the touchpad.
____ PRESS, F8 Continue.

10.____ **Open** Mix **Tank Sample Port**.
When the level in the Mix tank is higher than the sample port, allow water to flow through the tank sample port, after a few seconds.
____ **Begin** testing at the **Mix Tank Sample Port** for absence of ozone.
Follow facility policy for testing. When clear, close valve and proceed.
Allow water to accumulate in the Mixing tank. When Tank has filled. Fill will stop,
This process fills the tank expunging the Ozone through the ozone elimination filter (top of tank).

11.____ **PRESS, F5 Main Menu**, **TO RETURN TO THE MAIN MENU**.
____ **Close** the **Day tank Drain.**
____ **Press F2 MIX**
____ Press F8 **Continue**. (mix pump will come on)
____ **Turn On** the Transfer to day tank Switch (#8)
____ **Turn On** the **Fill/Mix Switch (#1)**

12.____ **Open DAY Tank Sample Port**.
When the level in the Mix tank is higher than the sample port, allow water to flow through the tank sample port, after a few seconds.
____ **Begin** testing at the **Mix Tank Sample Port** for absence of ozone.
Follow facility policy for testing. When clear, close valve and proceed. Allow water to accumulate in the Mixing tank. When Tank has filled. Fill will stop,
This process fills the tank expunging the Ozone through the ozone elimination filter (top of tank).

13. **When Dry/cut alarm sounds,**
____ **Press F1,**
____ PRESS, F5 Main Menu,
Contents of Mix tank will have been transferred to and should fill the Day tank.
This process fills the tank expunging the Ozone through the ozone elimination filter (top of tank).
____ **Turn Off** the **Transfer To Day Tank Switch (#8)**

14.____ **Turn Off any and all panel mounted switches that remain on.**
____ **Open Mix Tank Drain,**
____ **Open Day Tank Drain.**
____ **Open both Tank Sample Ports when level of tank is below port, close after clearing.**

END OF DAY RINSE PROCEDURE

Purpose: **To enable assigned staff to properly rinse the system.**
Supplies: **RO Water**

Procedure to be performed at the end of the operational day with no patients receiving treatment.

Testing times, points and methodology is determined by the facility policy. Flow quantities may have to be adjusted to account for the length of loop or to achieve desired test results.

1. Ensure all panel mounted switches are turned off.
____ Press F5 to return to the Main Menu.
____ **Open Mix Tank Drain**, **Open Day Tank Drain.**
____ Drain both tank sample ports and close.

2. Enter the **Fill** mode from the main menu:
____ **PRESS, FILL, The Screen will change and Display: "Enter Fill Count"**
____ **PRESS,** the **Blue** Square, (center of screen) A numerical touch pad will appear,
____ **ENTER, 900 LITERS, PRESS THE ENTER ARROW** (lower right) on the touchpad.
____ **PRESS, F8, Continue. Allow** to run to drain for approximately **10 LITERS**.

3. Cleansing system Rinse
____ **Turn On** the **Mix Pump Backwash Switch(#3).**
____ **Turn On** the **Fill/Mix Switch (#1),** This closes this flow path.
Allow to run to drain for approximately **30** more **LITERS**.
____ **Turn On** the **Injector Switch(#7),**
____ **Turn Off** the **Mix Pump Backwash Switch (#3) Allow** to flow for **30** more **LITERS**
____ **Turn On** the **Spray Mix Tank Switch (#2)**, ____ **Turn Off** the **Injector Switch,(#7)**
Allow **80** more **LITERS** to spray into the mixing tank and run to drain,

4.____ **Turn On** the ***Safety Switch (#4).***
____ **Turn On** the **Loop Pump Backwash (#10)**
____ **Turn On** the **Transfer to Day Tank Switch (#8).**
____ **Turn Off** the **Spray Mix Tank Switch (#2).** Allow 30 Liters to flush the transfer plumbing.
____ **Turn On** the **Spray Day Tank Switch (#9)**
____ **Turn Off** the **Transfer to Day Tank Switch (#8). Allow 80 Liters to spray the Day tank.**

5.____ **Turn On** the **Prime Switch (#5)**, (This will remain on.)
Allow 20 LITERS to back flush the loop pump.
____ **Turn Off** the **Loop Pump Backwash Switch (#10)**
____ **Turn Off** the Spray Day Tank Switch (#9).
With Prime switch still on, Purge the loop for approximately 80 more LITERS
____ Verify Bicarbonate solution has been rinsed from the loop, draw the samples from the loop sample port. Allow to continue to purge the loop while testing until clear

6. When No Bicarbonate solution is detected at the loop sample port.
____ **Turn Off** the **Prime Switch (#5) slow count to 5, Turn ON the Prime Switch (#5), slow count to 5,**
____ **Turn Off** the **Prime Switch (#5) slow count to 5, Turn ON the Prime Switch (#5), slow count to 5,**
____ **Turn Off** the **Prime Switch (#5) slow count to 5, Turn ON the Prime Switch (#5), slow count to 5,**
____ **Turn Off** the **Prime Switch (#5) slow count to 5, Turn ON the Prime Switch (#5), slow count to 5,**
____ **Turn Off** the **Prime Switch (#5) slow count to 5, Turn ON the Prime Switch (#5), slow count to 5,**
____ **Turn Off** the **Prime Switch (#5) slow count to 5, Turn ON the Prime Switch (#5),**

Allow rinse water to continue to purge the loop while testing loop sample port again until clear.

7. When no Bicarbonate is detected at the loop return sample port, proceed to the patient treatment floor. Follow the flow path of the loop and open each Bicarb Valve and allow rinse water to flow to drain. **THIS IS NOT AN OPTION**

____**Test** for absence of Bicarbonate. Test with approved facility testing methodology.
Return to Bicarb System,
____ **Retest** the end of the loop. **When clear, proceed**

8. ____ **Turn On** the **Spray Day Tank Switch (#9).**
____ **Turn Off** the **Prime Switch (#5).**
Allow **30 more LITERS** to spray the Day tank.

9. ____ **Close** the Mix Tank Drain,
____ **Turn Off** the **Fill/Mix switch (#1),**
____ **Turn Off** the **Spray Day Tank Switch (#9),**
____ **Open** the **Mix tank sample port, (Have bucket under spout).** When the level in the Mix tank is higher than the sample port, water will flow through the Tank sample port. After a few seconds,
____ **Begin testing** for absence of Bicarbonate. When clear, proceed

10. ____ **Close** the Day Tank Drain.
____ **Turn On** the **Transfer switch (#8).**
____ **Turn On** the **Fill/Mix Switch (#1).** This closes this flow path.
____ **Open** the **Day tank sample port. (Have bucket under spout).** When the level in the Day tank is higher than the sample port, water will flow through the Tank sample port. After a few seconds,
____ **Begin testing** for absence of Bicarbonate. When clear proceed.

11. If you **DO NOT** want to Recirculate water through the loop over night:
____ **Turn On** the **Mix Pump Backwash Switch (#3).**
____ **Turn On** the **Loop Pump Backwash (#10)**
____ **Press F5 Main Menu, to return to the Main Men**
____ **Open the Mix Tank Drain.**
____ **Open the Day Tank Drain, WAIT For 30 seconds**
____ **Turn Off Any and All Remaining Switches. Allow to drain**

12. If you **DO** want to Recirculate water through the loop overnight:
____ **Turn On** the **Mix Pump Backwash Switch (#3).**
____ **Press F5 Main Menu, to return to the Main Men**
____ **Open the MIX Tank Drain, WAIT For 30 seconds**
____ **Turn off Any and All Remaining Switches.**
____ **Turn on the Loop Pump Switch (#6),**

Don't forget, if a switch is left on the solenoid will over heat and short out the system.

RECOMMENDED INLET WATER PATHWAY CHEMICAL DISINFECTION PROCEDURE

Frequency: **To be determined by Medical Director.**
Purpose: **To enable assigned staff to properly disinfect the inlet water pathway.**
Supplies: **Prescribed disinfectant, to be determined by Medical Director.**
Rubber Gloves and Goggles recommended.

BEFORE BEGINNING PROCEDURE, PERSONALLY VISUALLY VERIFY THAT NO PATIENTS ARE RECEIVING TREATMENT.

This Procedure is only to be performed during the chemical disinfection of the clinic's existing pure water (RO) Water distribution loop system.

(not a heat disinfection system)

WITH YOUR DISINFECTANT OF CHOICE RECIRCULATING THROUGH YOUR RO WATER LOOP:

1. Ensure all panel mounted switches are turned off.
   ____ Verify the tanks are completely empty:
   ____ Open mix tank drain if necessary.
   ____ Press F5 to return to main menu.

2. Enter the **Fill** mode from the main menu:
   ____ PRESS, F1, The Screen will change and Display: "Enter Fill Count"
   ____ **PRESS,** the **Blue** Square, A numerical touch pad will appear,
   ____ **ENTER, 100 LITERS,**
   ____ **PRESS THE ENTER ARROW** (lower right) on the touchpad.
   ____ PRESS, F8, Continue.
   With the Mix tank Drain Open allow fill to run to drain. When count is complete the flow will stop,
   ____ PRESS, F5 TO RETURN TO THE MAIN MENU.

   ALLOW FOR DISINFECTANT CONTACT TIME, (TO BE DETERMINED BY MEDICAL DIRECTOR)

AFTER YOUR PURE RO WATER LOOP IS RINSED AND TESTED CLEAR OF DISINFECTANT:

Go to Disinfectant Rinse Procedure Page 12 and 13 of this manual.

EMERGENCY MIXING

ONLY IF THE TOUCH PAD IS NOT FUNCTIONING

1. Disconnect the black cube electric connection from the Mix Pump Backwash solenoid under the mixing tank.

2 Bring the black cube connection back through to the inside of the podium and replace the black cube electrical connection on the Fill solenoid (top right inside corner of the podium where the water enters) with the black cube from the mix pump backwash solenoid.

3. Look at the two gray electrical receptacles in the top left of the back inside podium, Remove the wire plug from the mix pump receptacle and plug it into the receptacle marked "Injector**".**

4. Return to the front of the system on the Control Panel, and with a temporary sticker mark the Mix Pump Backwash Switch #3 as **FILL SWITCH**.
Mark the Injector Switch #7 as **MIX PUMP SWITCH**.

5. **You can now fill with the Mix Pump Backwash Switch #3;** it will not count the liters.
It will not know when to stop it is a manual switch and will have to be monitored.

6. **You can now mix with the Injector switch #7,** it will not keep track of time.
It will not know when to stop it is a manual switch and will have to be monitored.

IF THE ENTIRE CONTROL PANEL IS NOT FUNCTIONING

1. Check the internal fuse and circuit breaker (orange handle should be up). If that fails continue.

2. Close the water fill valve on the wall that leads to the bicarb mixer.

3. Disconnect the water hose from the back of the mixer.

4. Place the hose into the mixing tank.

5. Open valve on the wall to fill the mixer.

6. When mixing tank is filled to the desired level,

7. Disconnect the Mixing Pump plug from the back of the podium and plug into an extension cord.
The Mixing Pump should come on, add powder and mix. It will not know when to stop it is a manual switch and will have to be monitored.

8. When mixed dispense into jugs from the sample port in front of the mixer.

BICARB SYSTEM TROUBLE SHOOTING GUIDE

MEDICAL SOLUTIONS INTERNATIONAL 800-326-5275

PROBLEM: WATER FILL COUNT IS DIFFERENT THAN REQUESTED

SOLUTION: First determine that the water is in fact flowing only in to the mixing tank, and not through a defective solenoid. The best way to determine if no solenoids are defective is to turn all the solenoid valve switches off. Turn on Fill/Mix Switch #, start the Fill sequence. If the fill count remains at zero then all solenoids are working properly. If water flows into the system, look into both tanks to determine which solenoid is leaking and review solenoid repair section below. If the water fill count remains at zero then the problem is with the fill meter not a stuck open solenoid.

REPAIRING THE FILL METER

1. On the older clear bowl meters, usually the problem is a loose or corroded wire. Remove the offending corrosion or replace conductor wire. Reattach the lock nuts. Sometimes it is necessary to check the control panel connection. Open the control panel cover and inspect the connections at terminal block slots #11 and #12. It is very rare that the fill meter is defective.
However, if you determine that the fill meter is not counting correctly, it can easily be replaced.
(It is always important to check the condition of the post meter check valve. and replace if necessary.)

2. On the black meters with a closed black door, the problem can be a loose screw on the pick-up lead on the face of the meter, tighten carefully so as not to strip the thread. If pick up is tight then call for a replacement of the pickup lead. If the meter proves to be bad that can also be replaced easily.

PROBLEM: SOLENOID MALFUNCTION

SOLUTION: SOLENOID FAILURE FALLS IN TO TWO CATEGORIES, 1. Electrical failure is usually caused by leaving the solenoid on for an extended period of time (greater than 1/2 hours). The result is the solenoid heats up and the wires melt together shorting out the solenoid. 2. Foreign matter and/or residual bicarb inside the actuator gets toasted by the heat of the solenoid and impairs the plunger from activating the solenoid.

REPAIRING A SOLENOID: Inspect the offending solenoid. Remove the retaining nut from the coil and remove the coil. It should easily slide off. If you experience resistance, that is an indication that the solenoid is burned. The solution is to replace the entire solenoid. If you experience no resistance when you remove the coil, remove the retaining nuts from the solenoid base. Check the spring and plunger for signs of toasted bicarb. If observed, soak parts in vinegar to remove. Rinse off the plunger and diaphragm. Inspect the diaphragm and interior of the solenoid body for foreign mater. Remove the foreign mater if found, reassemble the solenoid and test. There is a blowup drawing of a solenoid on page 18 of our product catalogue(www.medicalsolutionskc.com)

PROBLEM: CONTROL PANEL SOLENOID SWITCHES ARE ALL DEAD

SOLUTION: FIRST THE CAUSE: Most likely a single or multiple solenoids were left on for an extended period of time. The solenoid got so hot it melted the coil cover and shorted out the solenoid. When this happens, a fuse will blow. (See fuse changing below). Systems manufactured after 01/01/12 have a circuit breaker. In this case, just flip the orange T bar handle back up (it should show a red square). The solution is to first find the offending solenoid and repair or replace it. (See Above). If the offending solenoid is not obvious then buy extra fuses and sacrifice a few by testing all the valves, by replacing the fuse and turning on/off each solenoid until you blow the sacrificial fuse. Once the bad solenoid is located proceed to repair or replace it.

REPLACING A FUSE: Remove and test both fuses located on the upper right of the inside control assembly. They are marked FU-1 & FU-2. The 6.25-amp (FU-2) fuse is the primary 24-volt solenoid fuse. Red wires are attached to this fuse. If one of the pumps has shorted out it will blow the 120-volt 20-amp fuse (FU-1). (black wires) Remember that other things (like flooding any electrical connection) can cause fuses to blow. Be sure and tighten all wires leading to and from both fuse holders.

PROBLEM: MICROPROCESSOR MALFUNCTIONING

SOLUTION: This is extremely rare. It has happened when there is an evident cause like water damage or power fluctuation. With a power fluctuation the first and almost always effective solution is to unplug the entire bicarb system for 15 seconds. When energy is restored, the unit will reset all of the defaults and function properly again. With water damage and the like the problem is more difficult to resolve. First, attempt to dry everything. At this point it is best to call for assistance (800-326-5275).

PROBLEM: MIXING PUMP NOT WORKING OR LEAKING

SOLUTION: If the pump is shorting out, it is probably flooded. Wait for it to dry or force drying. If shorted out beyond repair you will have to replace at least the motor. It may be easier to replace the entire pump. If it is leaking, then it is most likely the Impeller Housing is cracked. It easy to replace and it is inexpensive. Consider having an extra one on your repair shelf. Here again it may be easier to replace the entire wet end kit, especially if your pump has some age on it (3+ years).

At this point it is best to call for assistance (800-326-5275).

PROBLEM: LOOP PUMP NOT WORKING PROPERLY

SOLUTION: Assuming that the loop filter (not on all models) on the return of the loop is not clogged, the best and easiest solution is to replace the wet end with a wet end kit. But we should also address the cause. Bicarb precipitate is probably chewing up the impeller. You should increase the number of times that you purge the system with a low pH cleaner (vinegar). See Bicarb Precipitate Removal Procedure page 14.

PROBLEM: DRY CUT ALARM WILL NOT ALLOW MIXING OR TRANSFERRING

SOLUTION: The dry cut alarm monitors the flow from the mixing pump. If the pump is not functioning, the mixing tank is empty, or either the Fill/Mix or the Transfer Solenoid are not functioning the Dry cut alarm will sound. Look into the tank with the Fill/Mix solenoid open and turn on the mix pump. If no water re-circulates through the tank, your Fill/Mix solenoid is bad (see solenoid repair). Similarly, check the transfer solenoid. These solenoids can also be checked by keying in the system to fill. Turn the Fill/Mix solenoid on, if water comes in the solenoid is not functioning. Test the Transfer solenoid in the same fashion. It is also possible that there is foreign matter in the Flow Sensor, you can remove and clean the flow sensor by sliding out the retaining bars and lifting out the vertical float, remove the foreign matter and replace. A loos wire on the Flow Sensor will also cause the alarm to activate. Flow Sensor is located above and attached to the mix pump.

PROBLEM: Failure of, or false alarming of the Low Tank Alarm

SOLUTION: Check the physical condition of the horizontal float switch by looking in the day tank and observing that it is still intact. Next check that the wire connections are not corroded or separated. Finally, check in the control panel terminal strip slots #19 & #20. Correct any obvious defect. Failing that, replace the float switch.

We also get calls that the Low Tank Alarm is not alarming at all, many times it is because the procedure has not been followed and the Low Tank Float is not activated by pressing F3 Auto/Monitor.

PROBLEM: TAKES A LONG TIME TO TRANSFER OR PRIME

SOLUTION: Change or clean the filter screens that are clogged. There are the obvious screens like the one hanging down it the middle of the system and there are screens in the nose of some important solenoids. The Fill Mix Solenoid would be the one to cause you trouble so remove the solenoid and look in the nose and clear anything blocking the screen. If it is small pieces of black plastic that would tell you that the pump impeller is being chewed up by powder being dumped into the mixing tank. You need to install a new wet end kit and advise the staff to pour the powder in slowly.

PROBLEM: AIR IN THE LOOP OR NO FLOW TO THE STATIONS

SOLUTION: Air in the loop, The air in the loop is caused by not fully priming the loop. The instructions say to test the end of the loop when priming to determine that pure mixed bicarb is returning to the system. That is the only way you will know that the loop is properly primed. Failure to prime the loop will leave air in the loop, the only solution is to mix a small (1 bag) batch of bicarb and re-prime the loop, with the mixing pump. All dialysis machines will have to be disconnected or valves closed when re-priming.

SOLUTION: No flow to stations. If the problem is no flow to the stations that means that the loop pump is defective or has an air embolism that has to be cleared. The air embolism is caused by not waiting the 30 seconds after transfer valve is turned on to get enough bicarb into the day tank. The only way to clear is to follow the flow from the loop pump past the adjusting valve, past the pressure gauge to where the loop tubing is connected to the bicarb system. Slowly unscrew the black cap on the black Parker fitting and the moment it is clear you will feel or see a burst of pressure and bicarb will try to spurt out, quickly reconnect the tubing and that should solve your problem.

BiPro SDS CB200 Bicarbonate Mixer Parts List:

CB-L820C	20 AMP CIRCUIT BREAKER
CB-L881C	8 AMP CIRCUIT BREAKER
CV-4529-015	1 1/2" CHECK VALVE TRUE UNION BALL CHECK
CV-68712F12F	3/4" CHECK VALVE, Black
FIL-75-BH	3/4" FILTER CLEAR BULB HOUSING
FIL-75H-SS	3/4" COMPLETE FILTER ASSMBLY (Bulb, housing and screen)
FIL-75X100	FILTER FOR 3/4" HOUSING
FIL-DCP02000	.2 MICRON AIR FILTER
FU-MXR-20	20 AMP FUSE (120 volt. System)
GV-2021-010	1” GATE VALVE THREADED
HHC-711	HINGED HATCH COVER
K-FSA	FLOW SENSOR ASSEMBLY
K-LOOPRA	BICARB LOOP RETURN SAMPLE PORT KIT-PREPOCKET

Mixer Parts List (continued)

K-SOL-TU N/C	SOLENOID ASSEMBLY Normally/Closed WITH PLUMBING ATTACHED
K-SOL-TU N/O	SOLENOID ASSEMBLY Normally/Open WITH PLUMBING ATTACHED
KM-CA-75	CARLON 3/4" WATER METER
KM-CA-WL	CARLTON REED SWITCH W/WIRE LEAD
M-RA02	REMOTE ALARM W/RESET MUTE FOR BICARBONATE SYSTEM
PG-S-254CLM-30	PRESSURE GUAGE SS LOWER MOUNT 0 - 30
PMP-IW-55RLT	IWAKI PUMP 55RLT – PUMP WITH WET END KIT
PMP-IW-55RLT-WEK	WET END KIT FOR IWAKI PUMP 55RLT
PMP-M-TE7R	MARCH PUMP TE7R – PUMP WITH WET END KIT
PMP-M-TE7R-WEK	WET END KIT FOR MARCH PUMP TE7R
SOL-04-SAN-D	SANILITE DIAPHRAGM FOR ZERO DIFFERENTUAL SOLENOID
SOL-7524VNC	SOLENOID 3/4” 24 VOLT Normally/Closed AC (systems 1997- 2019)
SOL-7524VNO	SOLENOID 3/4" 24 VOLT Normally/Open AC (systems 1997 – 2019)
SOL-75DC-VNC	SOLENOID 3/4" 24 VOLT Normally/Closed DC (systems built 2020 and after)
SOL-75DC-VNO	SOLENOID 3/4" 24 VOLT Normally/0pen DC (systems built 2020 and after)
SWT-120RS	120 VOLT AC ROCKER SWITCH (systems 1997- 2019)
SWT-120RS/BR	120 VOLT DC ROCKER SWITCH (systems built 2020 and after)
SWT-24RS	24 VOLT AC ROCKER SWITCH (systems 1997- 2019)
SWT-24RS/BR	24 VOLT DC ROCKER SWITCH (systems built 2020 and after)
SWT-SAFETY	CB200 SAFETY SWITCH

COMPONENT LIST

1. FILL/MIX SOLENOID
2. SPRAY MIX TANK SOLENOID
3. MIX PUMP BACKWASH SOLENOID
4. SAFETY SWITCH (NOT SHOWN ON DIAGRAM)

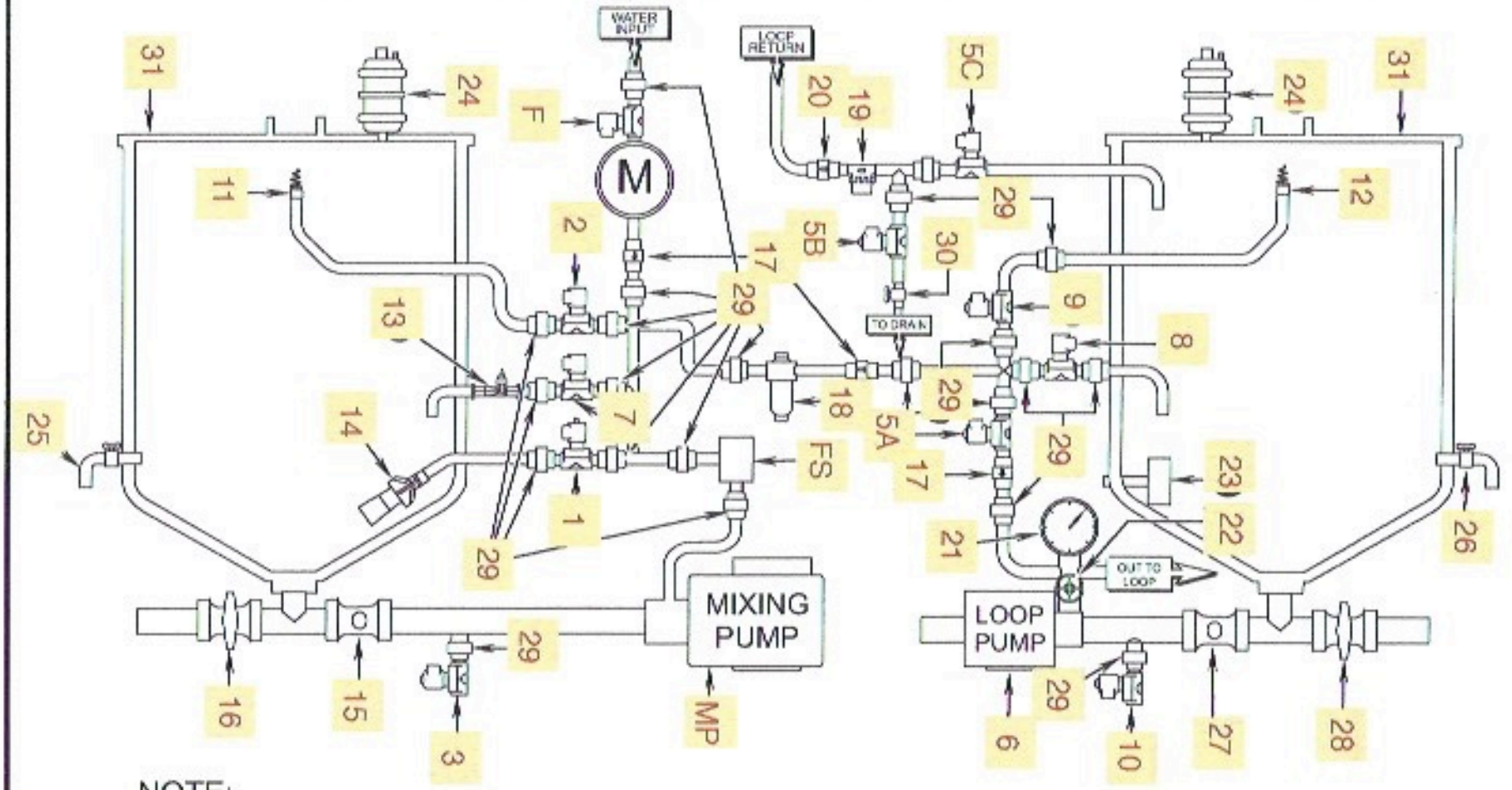
5A. PRIME LOOP SOLENOID
5B. LOOP DRAIN SOLENOID
5C. RECIRCULATION SOLENOID

6. LOOP RECIRCULATION PUMP
7. INJECTOR SOLENOID
8. TRANSFER TO DAY TANK SOLENOID
9. SPRAY DAY TANK SOLENOID
10. LOOP PUMP BACKWASH SOLENOID

F. FILL SOLENOID (CONTROLLED BY MICROPROCESSOR)
M. WATER METER (CONTROLLED BY MICROPROCESSOR)
MP. MIXING PUMP (CONTROLLED BY MICROPROCESSOR)
FS. FLOW SENSOR (CONTROLLED BY MICROPROCESSOR)

11. SPRAY MIX TANK NOZZEL
12. SPRAY DAY TANK NOZZEL
13. VENTURI INJECTOR
14. TURBULENCE MULTIPLIER-EDUCTOR
15. CHECK VALVE 1.5"
16. MIX TANK DRAIN VALVE 1.5"
17. BLACK 3/4" CHECK VALVE
18. CLEAR BOWL 3/4" STRAINER
19. CLEAR BOWL 1/2" STRAINER
20. BLACK 1/2" CHECK VALVE
21. LOOP PRESSURE GUAGE
22. LOOP PRESSURE ADJUSTMENT VALVE
23. LOW DAY TANK FLOAT SWITCH
24. SUB MICRON AIR FILTER
25. MIX TANK SAMPLE PORT
26. DAY TANK SAMPLE PORT
27. CHECK VALVE 1"
28. DAY TANK DRAIN 1.5"
29. TRU-UNION COUPLERS 3/4"
30. END OF LOOP PORT
31. TANK LID

COMPONENT LIST AND DESCRIPTION



NOTE:

1. SEE PAGES 2 & 3 FOR COMPONENT LIST, DESCRIPTION, FUNCTIONALITY, AND MANUFACTURERS TABLE

MEDICAL SOLUTIONS INTERNATIONAL, INC.
11622 WEST 90TH STREET, SHAWNEE MISSION, KS 66214
PH: 913-438-9700 FAX: 913-438-9701

UNIT: SDS-CB200	TITLE: COMPONENT LIST			
MATERIAL: N / A	SCALE: NONE	APPROVED BY: JACK R. DILLON	DRN: JLS	
FINISH: N / A	DATE: 08/12/07		REV: 1	
TOL UNLESS NOTED: XX ± .XXX ± ANGLES ±	NEXT ASSEMBLY: N / A	DOCUMENT #: —	SHT 1 OF 3	

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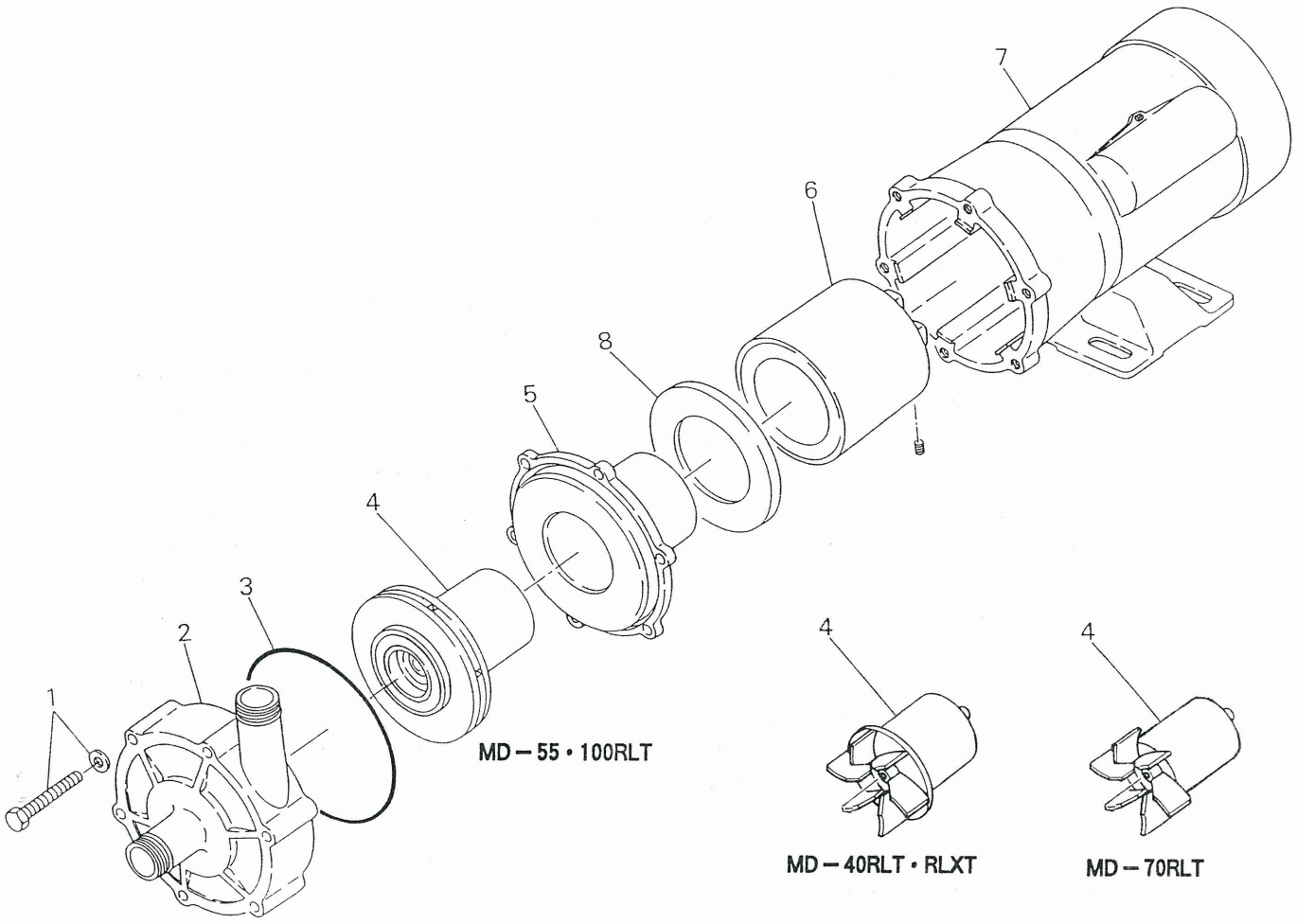
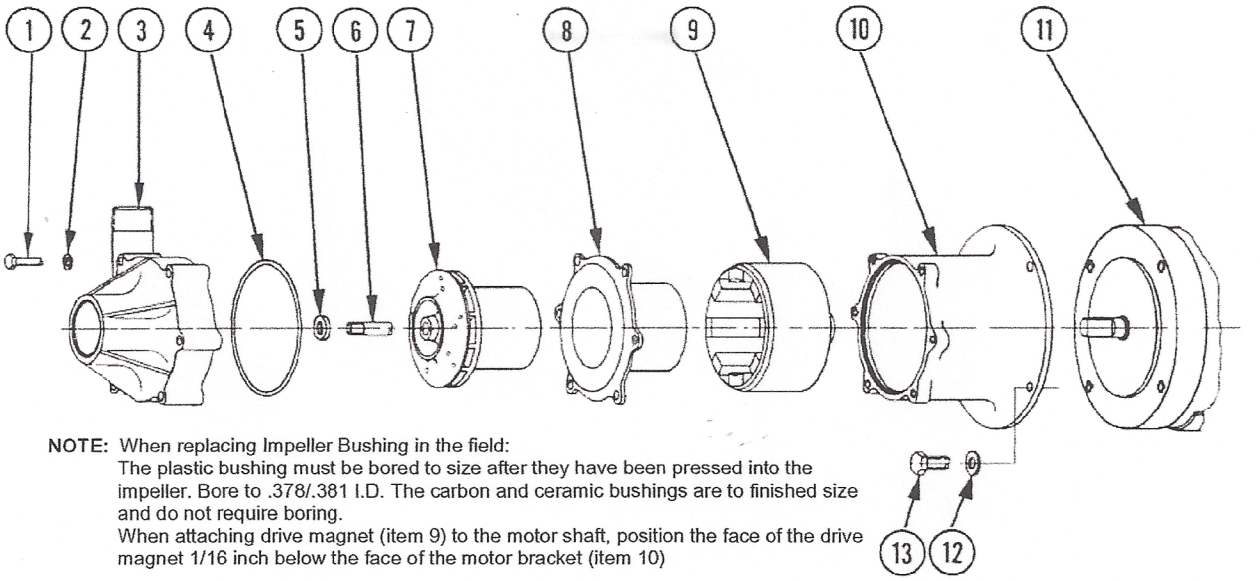
MD-40,55,70,100RL Parts list



□MD-40,55,70,100RL

Item	Description	Material	Q'ty	Parts No.				
				MD-40RLT	MD-40RLXT	MD-55RLT	MD-70RLT	MD-100RLT
1	Bolts and washers	304-SS EQUIV.	6 sets	0150100140	0150100141	0150100141	0150100140	0150100154
2	Front casing	GFRPP	1	1000026800	1000026900	1240300100	1000032100	1000034200
3	O ring	FKM	1	0325300043	0325300043	0325700017	0325700017	0325700018
4	Impeller with spindle	GFRPP/Alumina ceramics	1	1240321900	2230111800	1240290700	1230045000	1240144900
5	Rear casing	GFRPP	1	2230009900	2230009900	1240292200	2230010200	2240145100
6	Drive magnet ass'y		1	2240076100	2240076100	1240286600	2000029300	2000613500
7	Motor, 115V, 1φ, 60Hz		1	1000602300	1000602300	1230310800	1000602400	1000599800
8	Retainer ring		1	———	———	———	———	1240150100
	·GFRPP···Glass-reinforced polypropylene		·FKM·····Fluoro rubber					



NOTE: When replacing Impeller Bushing in the field:
The plastic bushing must be bored to size after they have been pressed into the impeller. Bore to .378/.381 I.D. The carbon and ceramic bushings are to finished size and do not require boring.
When attaching drive magnet (item 9) to the motor shaft, position the face of the drive magnet 1/16 inch below the face of the motor bracket (item 10)

REPAIR PARTS				
USED IN	ITEM	DESCRIPTION	QTY.	PART NO.
All 7s	1	Screw – Stainless	6	0155-0014-1000
7R, 7K	2	Washer – Stainless	6	0155-0021-1000
7R	3	Front Housing – Polypropylene	1	0155-0011-1000
7K	3A	Front Housing – Kynar®	1	0155-0125-1000
7S	3B	Front Housing – 316 Stainless	1	0155-0036-0000
All 7s	4	"O" Ring – Viton®	1	0155-0010-1000
All 7s	5	Washer – Ceramic	1	0155-0009-1000
7R, 7K	6	Shaft – Ceramic	1	0155-0039-1000
7S	6A	Shaft – Ceramic	1	0155-0117-1000
7R	7	Impeller Assembly – Polypropylene (w/Teflon® / Ryton® Bushing)	1	0155-0159-0500
7K	7A	Impeller Assembly – Kynar® (w/Carbon Bushing)	1	0155-0160-0200
7S	7B	Impeller Assembly – 316 Stainless (w/Carbon Bushing)	1	0155-0112-0400
7R	8	Rear Housing – Ryton (w/Rear Ceramic Thrust Washer)	1	0155-0067-0100
7K	8A	Rear Housing – Kynar (w/Rear Ceramic Thrust Washer)	1	0155-0124-0100
7S	8B	Rear Housing – 316 Stainless	1	0155-0035-0000
All 7s	9	Drive Magnet Assembly	1	0155-0130-0200
All 7s	10	Motor to Pump Connecting Bracket – Ryton	1	0155-0092-0100
7R, 7K	11	Motor – TEFC – ¾ H.P. – 1 Phase – 115/230 Volts	1	0155-0016-1000
7R, 7K	11A	Motor – TEFC – ¾ H.P. – 3 Phase – 208/230/460 Volts	1	0155-0022-1000
7S	11B	Motor – TEFC – 1 H.P. – 1 Phase – 115/230 Volts	1	0155-0173-1000
7S	11C	Motor – TEFC – 1 H.P. – 3 Phase – 208/230/460 Volts	1	0155-0174-1000
All 7s	12	Washer – Stainless	4	0155-0019-1000
All 7s	13	Screw – Stainless	4	0155-0017-1000

Alternate materials are available. Contact the factory for assistance in determining the best recommended materials for your particular applications.

LIMITED WARRANTY

March pumps are guaranteed only against defects in workmanship or materials for a period of one year from date of manufacture pumping water. On all other solutions, contact the factory for application assistance. March Pump Application Worksheet 750-130-10 is available for additional warranty information.

MARCH MANUFACTURING INC.
1819 PICKWICK AVE., GLENVIEW, IL 60026-1306, U.S.A
PHONE: (847) 729-5300 · FAX: (847) 729-7062 · www.marchpump.com

Medical Solutions

INTERNATIONAL

5646 Merriam Drive Merriam, Kansas 66203
913-438-9700 Fax 913-438-9701 800-326-5275
www.medicalsolutionskc.com