Better Water LLC

Single Tank Bicarb
Central Mix and Delivery

Installation Manual

rev. May 2016

TABLE OF CONTENTS

Visit our website to see our complete product line of water purification products!

www.betterwater.com

Better Water LLC; 698 Swan Dr; Smyrna, TN 37167; www.betterwater.com

Our Company

Better Water LLC is a leading integrated manufacturer of water treatment equipment and components for the industrial, commercial and institutional markets.

Located in Smyrna, Tennessee, Better Water LLC continues its history of manufacturing and distribution of equipment specifically designed for the renal dialysis market.

Founded in 1971, Better Water LLC has built a reputation for solving our customers' toughest problems with high quality products and unmatched service.

Contact Us

Better Water LLC
698 Swan Dr
Smyrna, TN 37167

Phone (615) 355-6063
Fax (615) 355-6065

Technical Support:
Phone (615) 355-6063, press "1"
Email support@betterwater.com

Customer Service:
Phone (615) 355-6063, press "3"
Email customerservice@betterwater.com

Technical Phone Support

Support is available regarding all Better Water LLC systems,
24 hours a day, 7 days a week.

- Normal business hours are Monday through Friday from 8:00 am until 3:30 pm, Central Standard Time (*excluding holidays*)

Call (615) 355-6063, press "1" for Technical Support

Emergency assistance is available after normal business hours *(including holidays)* by calling **(615) 708-8627.**

Technical Support Info Online

Our website, **www.betterwater.com**, which is updated frequently, contains a wealth of technical support information on the **SUPPORT** tab and includes:

- Operator and Service Manuals
- Consumables and Accessories Lists
- Technical Service Bulletins

For your convenience there are also online forms for placing **Orders** and requesting **Returned Goods Authorization**. These are Adobe forms that can be downloaded and either faxed or emailed to us.

Specific Contacts

Technical Support	Phone	(615) 355-6063, option “1”
	Email	support@betterwater.com
To Place an Order (*purchase orders*)	Fax	(615) 355-6065
	Email	orders@betterwater.com
	Phone	(615) 355-6063
Customer Service (*returns*)	Phone	(615) 355-6063, option “2”
	Fax	(615) 355-6065
	Email	customerservice@betterwater.com

Website **www.betterwater.com**

Helpful information and forms that can be found on our website:

- Operator & Service Manuals
- Technical Service Bulletins
- Consumables and Replacement Parts List
- Brochures
- Order Form
- Return Goods Authorization Request Form

Introduction

The Better Water LLC Bicarb unit is manufactured to the utmost quality. With proper care, preventative maintenance, and proper use, it should provide you with a very effective means of mixing and delivering the bicarbonate solution for dialysis treatments.

Before starting the installation you should first read and have a thorough understanding of this Installation Manual. It describes in detail the steps and procedures to safely install the Bicarb unit.

Once the this device has been delivered, it is the responsibility of the Medical Director to ensure that it is used, monitored, and maintained in such a manner so as to satisfy all applicable standards. Guidelines and other related information are available from:

- Food and Drug Administration (FDA)
- National Association of Nephrology Technicians/Technologists (NANT)
- Association for the Advancement of Medical Instrumentation (AAMI)

NOTE concerning pictures in this manual:
Pictures of devices and components may vary slightly due to product changes, and therefore should be for general reference only. Information concerning their use, functionality, or replacement will not differ unless noted.

WARNINGS

1. It is unsafe to operate or service this device without first reading and understanding the **entire** Operator's Manual. Keep this manual and other associated documentation for future reference.

2. Misuse, improper operation, and/or improper monitoring of this system could result in serious injury, death, or other serious reactions to patients undergoing hemodialysis treatment.

3. Misuse, improper use, or handling of disinfectants and chemical cleaning solutions could result in serious injury or even death. You must comply with the information contained in the Material Safety Data Sheet (MSDS) for the chemical being used.

4. To avoid electrical shock hazard, do not operate this device when the covers or panels are removed.

5. 

ELECTROMAGNETIC INTERFERENCE: This device can create and radiate radio frequency energy and may cause harmful interference if not installed according to the manufacturer's instructions.

CAUTIONS

1. When used as a medical device, federal law restricts this device to sale by or on the authority of a physician. Per CFR 801.109 (b)(1).

2. Improper operation of this device could result in a low or no-flow alarm on the dialysis machines.

3. Misuse or improper operation of this device will void any warranty.

4. Where water is mentioned, unless otherwise noted, it must be AAMI standard quality water.

5. Electrical and plumbing connections must adhere to local statutes and any facility codes. Connect this device to a proper ground connection in accordance with the National Electrical Code. Do not remove the ground wire or ground plug. Do not use an extension cord with this device.

6. Do not remove any Caution, Warning, or any other descriptive labels from the device.

7. Do not operate this device in an explosive environment or in the presence of flammable materials. Do not use this device to store, mix, or transfer flammable liquids.

8. Movement or vibrations during shipment may cause connections to loosen.

9. Do not operate this unit in an environment where temperatures may be below 50^{o} F or above 90^{o} F.

10. This device should not be used for purposes outside the device's stated applications, specifications, or limitations.

GENERAL REQUIREMENTS & SPECIFICATIONS

1. Water Connections:

- RO Water Inlet and Outlet Connections:	1” stainless steel tee, female-pipe thread
- Feed and Return Line Connections:	3/4" Schedule 80 PVC pipe, female socket, solvent weld

2. Electrical Requirements:

- All Models:	115 VAC, 20 AMP, Dedicated GFCI Outlet
- Location:	5’ 6” to 6’ above finished floor, on the wall, within 5’ of the Control Box

3. Drain Requirements:

- 12” x 12” floor sink preferred	In close proximity to the Bicarb unit
- Drain Connection:	1” Schedule 80 PVC pipe, female socket, solvent weld

4. Floor Space:

- 60 Gallon Single Tank:	2’ 6” deep x 3’ 6” wide x 6’ 0” high
- 100 Gallon Single Tank:	3’ 3” deep x 4’ 0” wide x 6’ 2” high

5. Operating Weight:

- 60 Gallon Single Tank:	810 lbs
- 100 Gallon Single Tank:	1240 lbs

INSTALLATION OUTLINE *(see Appendix A for Installation Checklist)*

1. Unpacking the Bicarb Unit
Every care has been taken to ensure that your new Bicarb unit has been packed to arrive at your location without damage. Upon arrival at the final destination, please take a few minutes to inspect the crate for any apparent damage. If you should find any damages, please contact the delivery carrier and arrange for a claim.

Extreme care should be taken when unpacking the unit. Once the unit has been unpacked from its original shipping container, again, closely inspect the unit for any apparent damage. Extreme care should be taken when moving the unit to its final installation site.

CAUTION
DO NOT attempt to lift or move the unit by any of the pipes or wires.

Prior to Installation, a Plumbing Contractor should verify the location of all pipes; feed, fill, return, and drain.

2. Set the Bicarb unit in approximate location of final installation
Make sure that the unit sits level on the floor. Many times the floor is not level and will have to be adjusted to accommodate the Bicarb unit. Verify that there is ample room in all directions to perform the normal daily tasks associated with daily operations and disinfections. See the minimum floor space specifications under General Requirements. Also verify the location of where the plumbing header will be placed on the wall behind the Bicarb unit as well as the control box.

3. Locate Drain
It is preferred to have the drain (*floor sink*) located in close proximity of the Bicarb unit. If this is not the case, the drain pipes will have to be plumbed to the nearest floor sink. The Bicarb unit is equipped with a 1" schedule 80 PVC valve and the drain line should be run to a suitable drain with the same size pipe. Care should be taken to assure that there is sufficient decline in the pipe to allow for proper drainage. Normal declination is 1/4" fall to 1 foot of pipe.

4. Locate Power Source
The Control Box is supplied with a 10' power cord. See preferred location of the power source under General Requirements. All installed Bicarb units should be within this proximity of the power source. The outlet should be accessible in case the unit needs to be unplugged for service.

5. Set Unit in Final Position
Move the unit into its final position. Check again to ensure that the unit is level.

Hang and secure the plumbing header to the wall behind the final placement of the Bicarb unit with 1" SS Tee at 53" above finished floor. If the Bicarb unit has to be moved to accommodate the header's installation, verify that it is level when moved back to its final position.

6. Connect RO Water Inlet and Outlet to Plumbing Header(*see diagrams #1 & #2*)
The normal position of the Bicarb unit is after the Post Treatment section of the water treatment system and prior to treatment floor. Verify with the plumbing contractor, the positions of the water pipes from the system and the water pipes going to the treatment floor. Normal locations of the water lines on the Plumbing Header unit are as follows:

- 1" stainless steel (threaded) tee on the center lower portion of the Plumbing Header.
- The water flow can be either right to left or left to right, so either side of the tee can be used as the inlet, and the other side of the tee will be used as the outlet.

Care should be taken to connect each fitting carefully. All piping should be appropriately anchored to the wall as per local plumbing codes.

7. Connect Feed and Return lines to Plumbing Header (*see diagrams #1 & #2*)
Normal locations of the Feed & Return lines on the Plumbing Header are as follows:

- 3/4" schedule 80 union, vertically on the ***right*** **side is the FEED**
- 3/4" schedule 80 union, vertically on the ***left*** **side is the RETURN**.

Care should be taken to clean and glue each fitting carefully. All piping should be appropriately anchored to the wall as per local plumbing codes.

8. Connect Hoses from Plumbing Header to Bicarb Unit (*see diagrams #1 & #2*)
a. Connect the 3/4" Feed Hose (*supplied with the header*) from the plumbing header to the Feed Valve on the Bicarb unit. Connect securely with hose clamps.

b. Connect the 3/4" Return Hose (*supplied with the header*) from the plumbing header to the Bi-Carb Return nipple on the top of the Bicarb unit. Connect securely with hose clamps.

c. Run a drain line from the Red Handled "To Drain" valve on the plumbing header to a suitable drain. This piping is not included with the unit and can be run with either schedule 80 PVC pipe or flexible hose. This line should be at least 3/4". Securely fasten the hose or pipe to the wall or floor, allowing suitable declination to the drain.

d. Connect the 1/2" Fill Hose (*supplied with the header*) from the plumbing header to the "Fill" nipple on the upper front left side of the Bicarb unit. Connect securely with hose clamps.

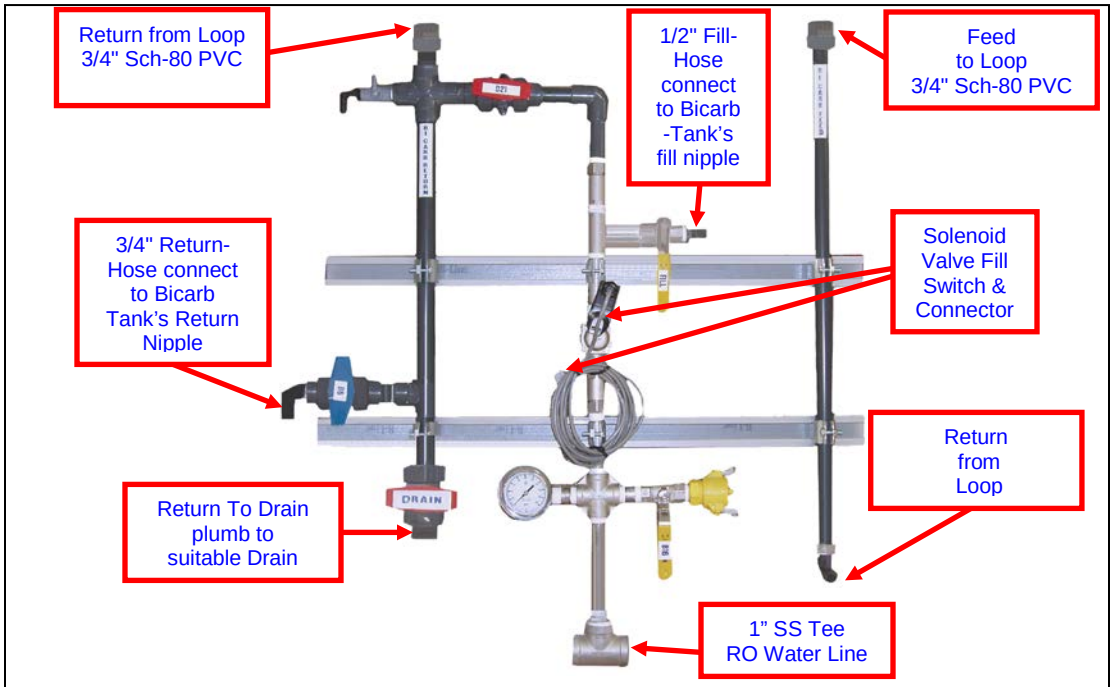


Diagram #1 – Plumbing Header

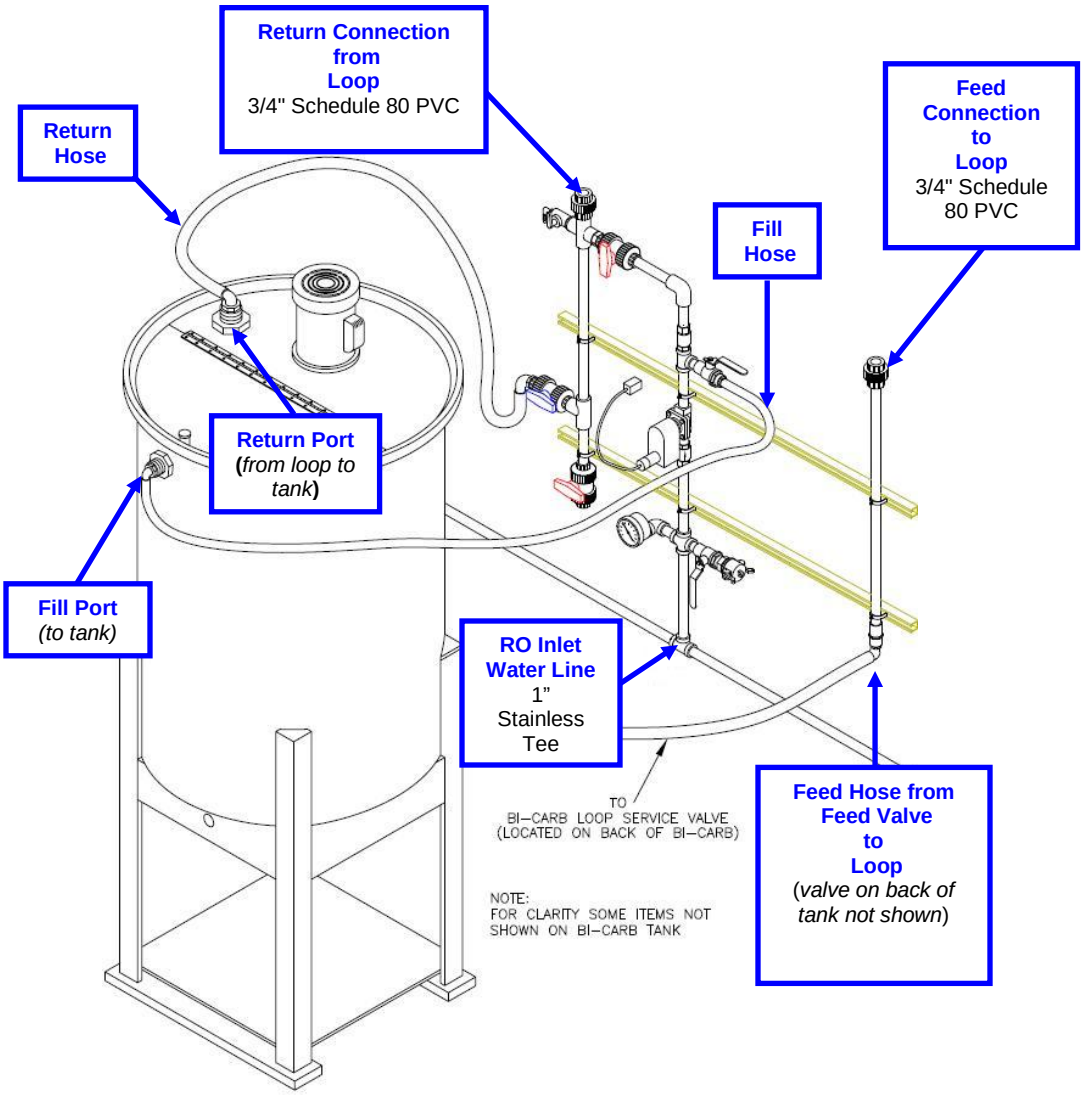


Diagram #2 – Plumbing Header and Tank

Reference DWG 3489

9. Install Jug-Fill

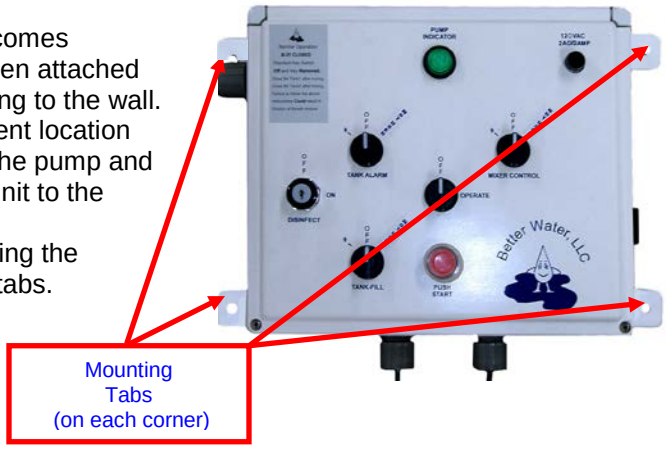
Locate the Jug Fill valve included in the Accessory Box, supplied with the Bicarb unit. Remove the Jug Fill Valve from the plastic bag and attach to the front of the unit at the union, making sure that the union is tight and the valve is in the closed position.

10. Mount Control Box on Wall

The Control Box supplied with this unit comes with mounting tabs that have already been attached to the back of the control box for mounting to the wall.

a. Position the Control Box in a convenient location close enough to the Bicarb unit, where the pump and mixer cords can reach from the Bicarb unit to the Control Box.

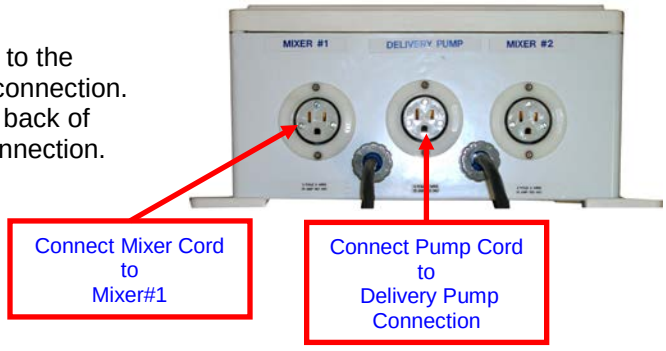
b. Secure the Control Box to the wall using the screws provided, through the mounting tabs.



11. Connect Pump and Mixer Cords

a. Connect the cord from the Bicarb Mixer to the back of the Control Box to the “Mixer #1” connection.

b. Connect the cord from the Pump to the back of the Control Box to the “Delivery Pump” connection.



12. Connect all Control Wires

All control wires are supplied with the unit with the exception of the Remote Alarm Cable. All control wires are labeled at each connector and these labels correspond to the matching end that they connect to. Connect the following control connections from the Control Cable to its corresponding Control Box Connection Wire to the item specified:

a. Connect one end of the Control Cable labeled "1 HIGH" to Control Box Connection Wire pigtail "1 HIGH", and the other end to the High Level Sensor Wire on the Tank.

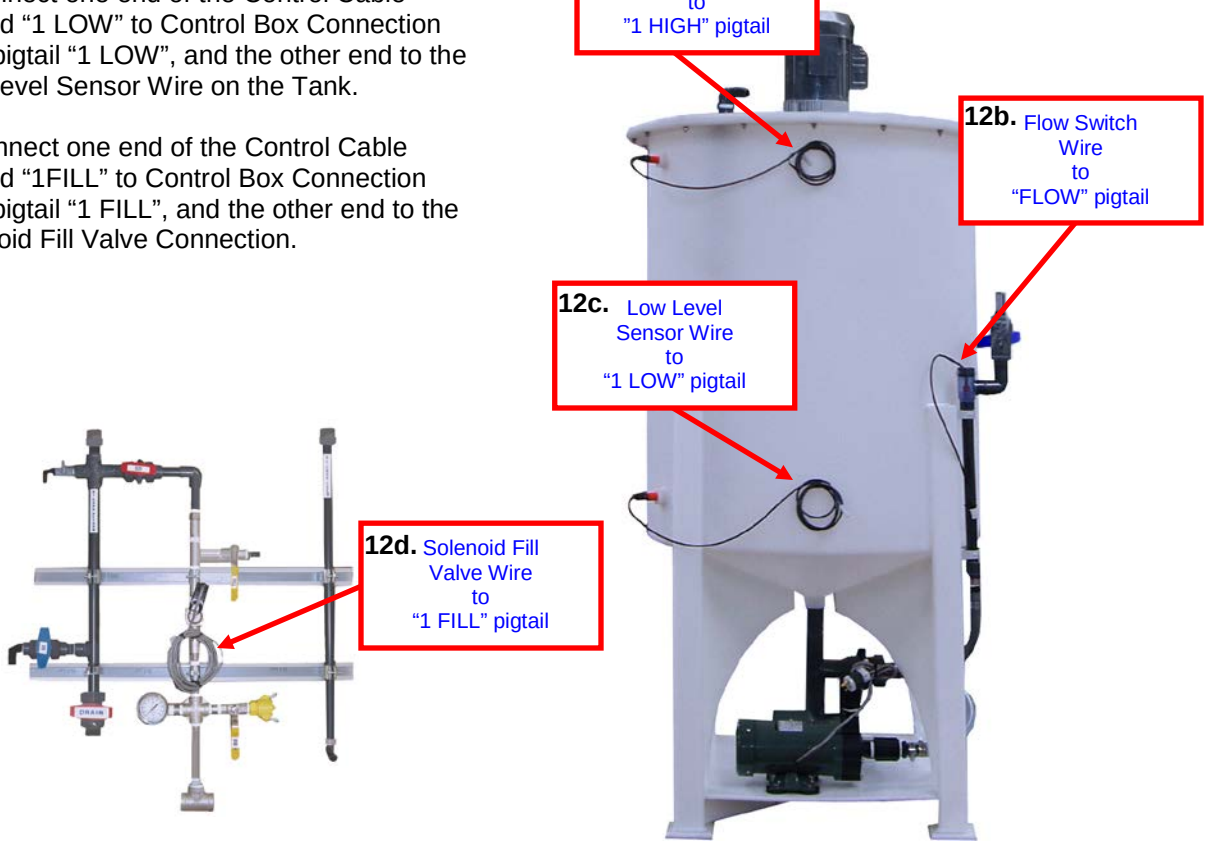
b. Connect one end of the Control Cable labeled "FLOW" to Control Box Connection Wire pigtail "FLOW", and the other end to the Flow Switch Wire on the Tank.

c. Connect one end of the Control Cable labeled "1 LOW" to Control Box Connection Wire pigtail "1 LOW", and the other end to the Low Level Sensor Wire on the Tank.

d. Connect one end of the Control Cable labeled "1FILL" to Control Box Connection Wire pigtail "1 FILL", and the other end to the Solenoid Fill Valve Connection.

Control Box Pigtail Connections

12a. "1 HIGH" pigtail
12b. "FLOW" pigtail
12c. "1 LOW" pigtail
12d. "1 FILL" pigtail
13b. "REMOTE" pigtail

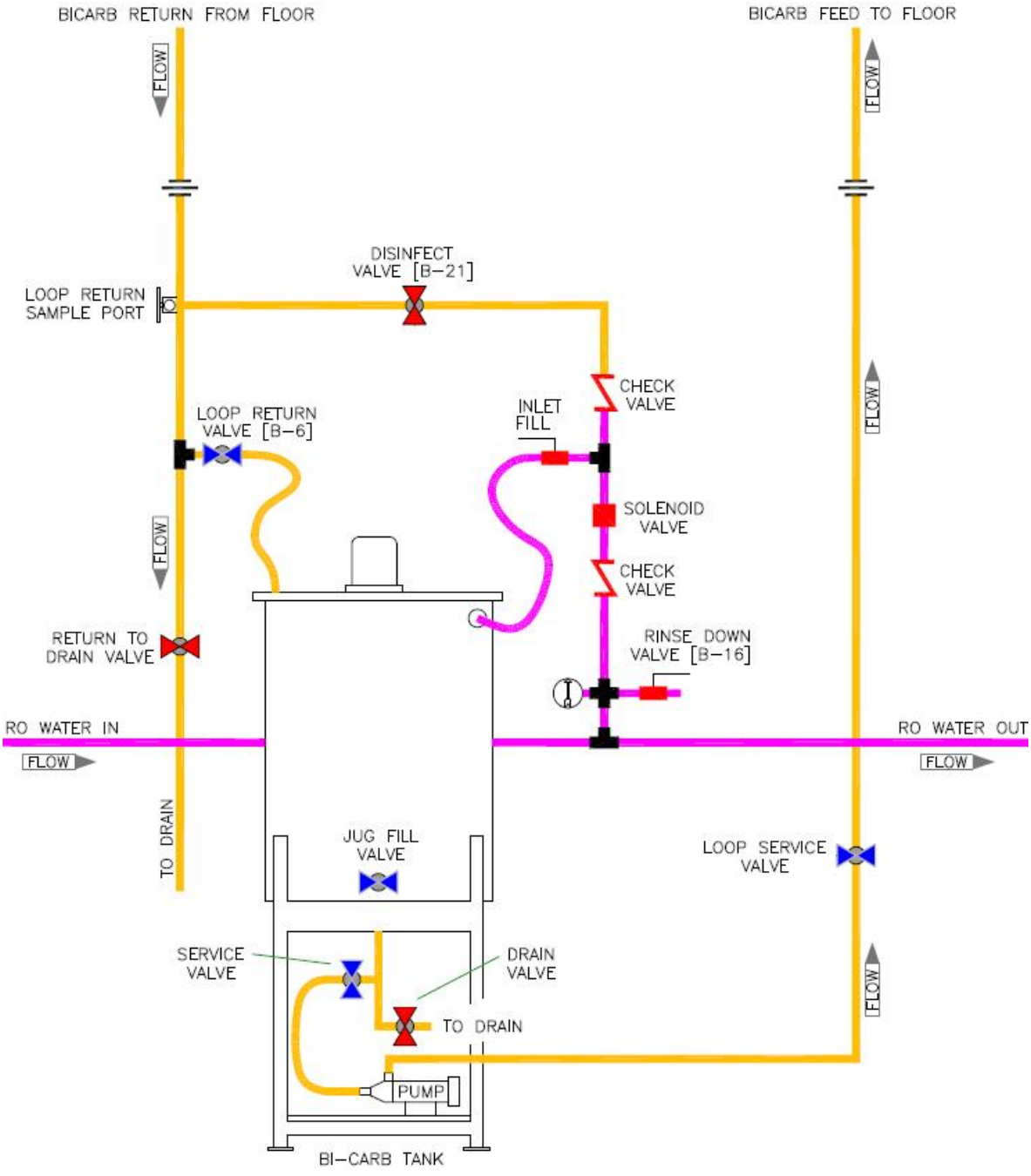


13. Install the Remote Alarm Box (*if used*)
a. Install the remote alarm box in a location that is convenient to clinic personnel during normal daily duties.
b. Connect one end of the Control Cable labeled “REMOTE” to Control Box Connection Wire pigtail “REMOTE”, and the other end to the Remote Alarm Wire Connection.

14. Connect Power Cord into Outlet
a. Make sure all of the switches on the control panel are in the OFF position and plug the cord from the mixer into the receptacle on the bottom of the Control Box labeled “MIXER 1”.
b. Plug the cord from the pump into the receptacle on the bottom of the control box labeled “PUMP”.
c. Plug the cord from the Control Box into a 115vac, 20 amp, dedicated GFCI outlet.

15. Ready Bicarb Unit for Field-Test
a. Clean the areas on and around the tops of the tank, making sure that no fittings, rags, pipe shavings, etc. fall into the tanks.
b. Allow sufficient time for all glued connections to cure properly.
c. You are now ready to field-test Bicarb unit.

BICARB UNIT FLOW DIAGRAM



** Reference DWG 3742*

FIELD TEST

(see Appendix A for Field Test Checklist)

Your Bicarb unit was thoroughly tested in all aspects of operation before it was allowed to leave the factory. In the event that damage has occurred during transport and/or delivery, the following Field Test should prove effective in discovering any problems and/or damage that has occurred since leaving the factory. The field test will cover all aspects of the operations of the unit and when properly completed, will assure that the unit is working safely and without problems.

With RO water circulating in the RO Loop:

1. Close all other valves on Bicarb unit

2. Turn **ON-OPERATE Switch** to the **OPERATE** position

3. Turn **TANK ALARM Switch** to **#1** position and the low level alarm should sound

4. Turn **TANK ALARM Switch** to **OFF**
   a. Make sure **DISINFECT Switch** is in **OFF** position
   b. Turn **TANK FILL Switch** to **#1** position
   c. Open **Tank Fill Valve** to tank and water should begin filling tank
   d. Allow to fill till the water shuts off, by the High Level Float Switch
   e. Close **Tank Fill Valve**
   f. Turn **TANK Fill Switch** to **#1** Tank and low level alarm should not sound
   g. Drain tank to approximately half-full by opening the **Drain Valve**, then close the **Drain Valve** when the tank is half full

5. Open **Feed Valve**

6. Open **Return to Drain Valve**

7. Push **PUMP START Button** and hold till the green light stays on and pump keeps running

8. Allow the water to pump till it returns to drain.

9. Allow water to flow to drain for approximately 10 minutes which allows time to remove any debris from entire Bicarb Distribution Loop

10. Open **Tank Return Valve**

11. Close **Return to Drain Valve**

12. At this point, RO Water should be circulating in Bicarb Distribution Loop and returning to tank

13. Turn on **TANK MIXER Switch** to the **#1** position, and allow to time out which should take approximately 10 minutes

14. Check entire unit for leaks

Field Test is now complete. The new Bicarb unit and the Bicarb Distribution Loop are ready to for disinfection.

INITIAL DISINFECTION

Care must be taken to keep the Bicarb Distribution Loop clean once water has been introduced to the unit and loop, because of its susceptibility to bacterial growth. Until the Bicarb starts normal operation it is suggested that you keep the system circulating with RO Water and do the following:

1. Change out the RO water daily
2. Disinfect weekly

Perform a complete disinfect of the unit just prior to operational start-up, per the disinfection instructions in the Operator's Manual.

NOTE

This Bicarb unit is NOT heat disinfectable, but it is compatible with most RO Water Loop Heat Disinfect Systems. The only part of this system that is tolerant of water heated to 194º F is the Water Supply Loop.

BICARB REMOTE ALARM BOX (*optional*)

part#
EQASSYBCB01709
Bicarb Remote Alarm Box

Description

The Bicarb Remote Alarm Box is an optional piece of equipment. This device is a box containing a light and an audible alarm is usually located on the patient floor, where it can be easily monitored by clinic personnel. This box is equipped with audible and visual alarms that monitor the Low Level Alarm on the Bicarb unit. It requires no additional power but receives 24 VAC power and signals from the Bicarb unit via the Remote Alarm Wire (*4-cable wire*).

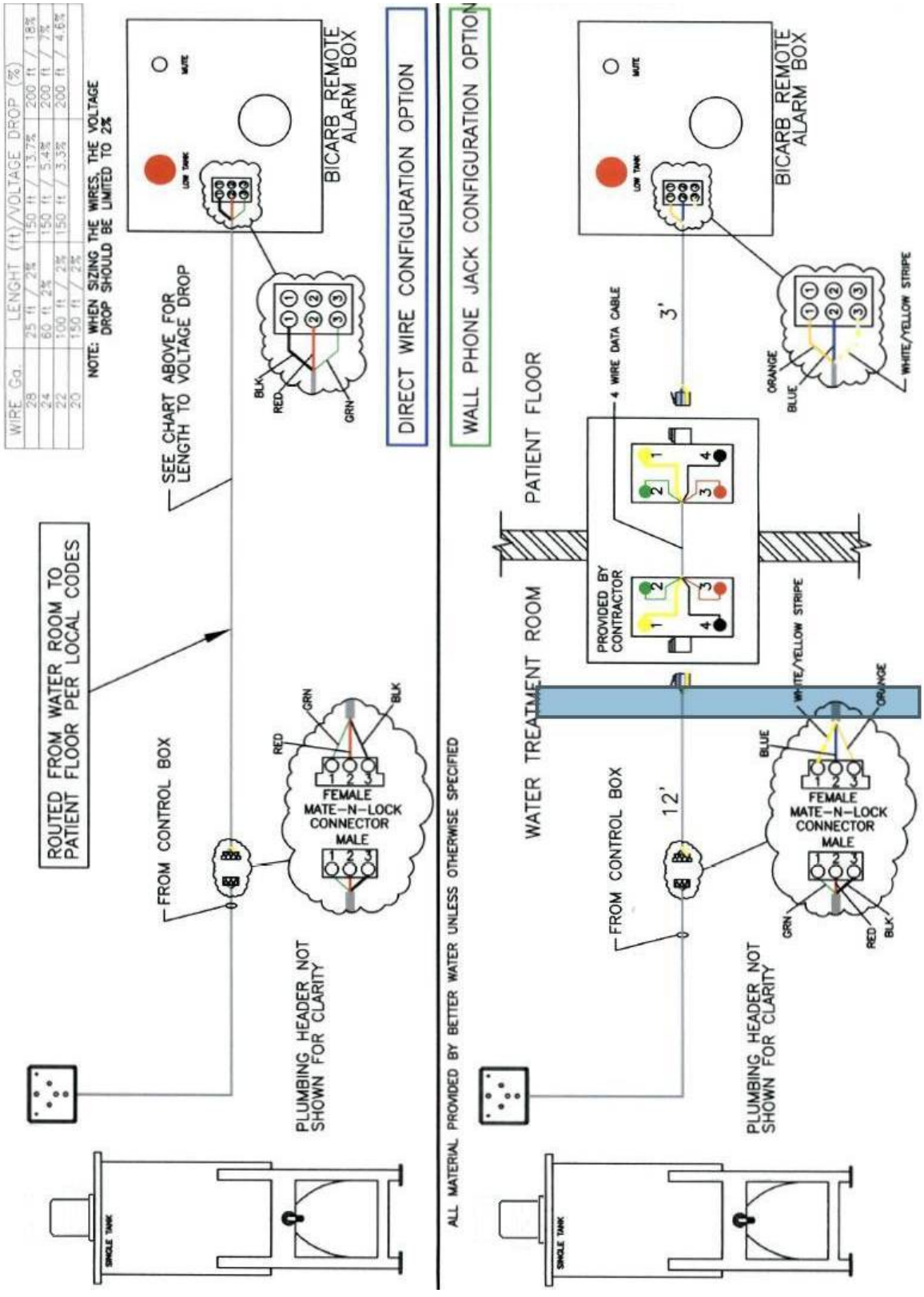
Bicarb Remote Alarm Box Installation

The final placement of the Bicarb Remote Alarm Box is left to the discretion of the final user, but should be placed in a position where it can be easily monitored by clinic personnel.

1. The box is equipped with mounting tabs on the sides and should be attached to the wall with suitable anchors.

2. Connect cable from Bicarb Control Box pigtail labeled “REMOTE” to Remote Alarm Box.
- A 4-cable wire or a phone jack and cable can be used.
* *See Drawing 3483 below for specific wire connection locations.*

Special attention should be given to connecting the wires to the proper locations as incorrect wire placement will prevent the Remote Alarm Box from proper operation and monitoring.



Reference DWG 3483

LIMITED WARRANTY TERMS and CONDITIONS

a. This limited warranty is given only to the original buyer and covers the equipment delivered with this limited warranty.
b. The buyer shall be barred from any recovery on this limited warranty or otherwise for damages due in whole or in part to…

… unreasonable use
… improper operation
… use beyond normal fashion
… failure to follow instructions
… failure to maintain the product in good condition and repair
… or the like.

c. If the buyer discovers or should have discovered a defect in which it is reasonable to conclude that damage, either personal, property, or economic, may result, the buyer's continued use of the product shall constitute any assumption of risk by the buyer and a bar to any recovery for breach of this limited warranty or otherwise.
d. No oral or written representation, information, or advice given by Better Water LLC or any of its representatives shall create a warranty or in any way increase the scope of this express limited warranty and shall not form a part of the basis for bargain.

WHAT IS WARRANTED AND FOR HOW LONG?

a. All equipment, excluding ion exchange and filtration media and cartridges, are warranted to be free from factory defects in materials, and workmanship under normal use for a period of one (1) year from the date of shipment.
b. It is a condition precedent to recovery on this limited warranty that the buyer strictly comply with all operating and maintenance guidelines established by Better Water LLC and that the serial number (*if applicable*) is intact and legible on the equipment.
c. It is a condition precedent to recovery on this limited warranty for damage to the external finish of the equipment that the buyer notifies Better Water LLC at the time of the installation that the finish is damaged.

WHAT IS REMEDY FOR BREACH OF THIS LIMITED WARRANTY or NEGLIGENCE BY BETTER WATER LLC

a. Buyer's sole and exclusive remedy for any breach of this limited warranty or negligence by Better Water LLC shall be repair or replacement of the defective part, at the option of Better Water LLC, provided such defective part is returned to Better Water LLC for inspection.
b. Better Water LLC shall not be obligated to supply an exact replacement of the defective part and reserves the right to substitute new and improved parts.
c. Better Water LLC shall provide at no cost to buyer, labor to remove and/or replace defective parts covered by this limited warranty for a period of ninety (90) days from the date of installation by Better Water LLC of the equipment.
d. After such ninety (90) day period, buyer shall be responsible for any labor or service charge for the removal and/or replacement of any defective parts.
e. Buyer shall be responsible for all travel expenses and freight charges at all times.
f. Better Water LLC shall have no obligation to repair or replace any defective part if buyer fails to follow the procedure set forth in “HOW TO OBTAIN A REPLACEMENT PART UNDER LIMITED WARRANTY”.

IN NO EVENT SHALL THIS LIMITED WARRANTY BE CONSTRUED TO COVER, NOR SHALL BETTER WATER LLC BE LIABLE TO BUYER AS ANY OTHER PERSON FOR, ANY CONSEQUENTIAL, INCIDENTIAL, ECONOMIC, DIRECT, INDIRECT, GENERAL OR SPECIAL DAMAGES, WHICH ARE HEREBY EXPRESSLY DISCLAIMED.

HOW TO OBTAIN A REPLACEMENT PART UNDER LIMITED WARRANTY

a. Buyer should contact the Customer Service or Technical Support Departments and request a Return Goods Authorization.
b. Described part(s) will be sent with a purchase order.
c. The returned part(s) will be returned to the factory for limited warranty consideration. If part(s) are not covered under the limited warranty, part(s) will be considered billable against the purchase order supplied.

WHAT IS NOT COVERED BY THIS LIMITED WARRANTY:

By way of example and not limitation, this limited warranty does not cover:

- Damage to or replacement of any ion exchange resin of filter media
- Labor or service charges for the removal and/or replacement of any defective parts after the ninety (90) day period from the date of installation or sale by Better Water LLC
- Freight charges and travel expenses
- Damage from inadequate or defective wiring, improper voltage, improper connections or electrical service, inadequate or defective plumbing, water supply, or water pressure, or in violation of applicable building, plumbing or electrical codes, laws, ordinances or regulations.
- Damage from improper installation or operation, including but not limited to, abuse, accident, neglect, improper maintenance, freezing and fires, or abnormal use.
- Damage caused by contaminants in Buyer's water supply, including hardness, chlorine, chloramines, sulfur, bacterial iron, tannin, algae, oil, organic matter or other unusual substances, if special equipment has not been installed by Better Water LLC to remove such contaminants
- Damage to or caused by filters/membranes or other replacement parts not purchased from Better Water LLC or damage caused by modification, alteration, repair or service of the equipment or any of its parts by anyone other than Better Water LLC or its expressly authorized representatives.

APPENDIX A

CHECKLISTS

INSTALLATION CHECKLIST

Task	Check When Complete
Unpack Bicarb Unit	
Check for damage	
Determine location for Bicarb Unit, Header, and Control Box	
Verify requirements for Drain, Water Source, and Electrical	
Set Bicarb Unit into final position and level	
Hang and secure the Header	
Connect the RO Water Inlet and Outlet to the Header	
Connect Feed and Return Lines to the Header	
Connect Hoses from the Bicarb Unit to the Header:	
- 3/4" Feed Hose	
- 3/4" Return Hose	
- Drain Line	
- 1/2" Fill Hose	
Install the Jug-Fill Valve	
Mount Control Box on the Wall	
Connect Pump and Mixer Cords	
Connect Control Wires:	
- Connect Control Wire for High Level Sensor	
- Connect Control Wire for Fill Valve	
- Connect Control Wire for Flow Switch	
- Connect Control Wire for Low Level Sensor	
Mount Remote Alarm Box (*if used*)	
- Connect Control Wire for Remote Alarm Box	
Connect Control Box Power Cord to Electrical Outlet	
Clean Around Tank	
Allow Time for Glued Connections to Cure	
Field Test Bicarb Unit – Completed	
Initial Disinfection - Completed	

Installation Complete:

Name _____ Date _____

BICARB UNIT FIELD TEST CHECKLIST

Task	Check when Complete
Verify RO Water circulating in the RO Loop	
Close all valves on the Bicarb Unit	
Turn ON-OPERATE Switch to OPERATE	
Turn Tank Alarm Switch to #1	
- Low Level Alarm Should Sound	
Turn Tank Alarm Switch to OFF	
Turn Disinfect Switch to OFF	
Open Tank Fill Valve to Tank to begin filling Tank with water	
- Water should shutoff automatically by the High Level Sensor	
Close Tank Fill Valve	
Turn Tank Switch to #1 Tank	
- Low Level Alarm Should NOT Sound	
Open Drain Valve	
- Drain Tank until only half-full then close Drain Valve	
Open Feed Valve	
Open Return to Drain Valve	
Start Pump and allow water to pump till it returns to Drain	
- Allow water to drain for approximately 10 minutes	
Open Tank Return Valve	
Close Return to Drain Valve	
Verify RO Water is circulating in the Loop and returning to the Tank	
Turn Tank Mixer to #1	
- Allow to time-out which should take approximately 10 minutes	
Check entire unit for leaks	

Field Test Complete:

Name _____ Date _____

NOTES


BETTER WATER LLC
Smyrna, Tennessee