AmeriWater
The Water Purification Specialists

Operation & Maintenance Manual

Break Tank-Fed Booster Pump

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www.ameriwater.com
Manufactured With Pride in the USA

098-0005, Rev B

TABLE OF CONTENTS

1 GENERAL INFORMATION

1.1 Preface

This operation and maintenance manual provides information required for trained technicians to use the device and perform the basic service and maintenance required.

Please read and understand all of the instructions carefully prior to using the device or carrying out any service or repairs.

CAUTION: No person should attempt to operate or service this system without prior authorization, instruction, and training from AmeriWater, the medical facility director, or an authorized dealer.

WARNING: **Before operating the unit, always check to see that the water and electrical connections are secure and not likely to cause a trip hazard.**

1.2 Intended Use

The variable speed Grundfos CME booster pump allows for water at a constant pressure to feed the pretreatment media in central system applications. A pressure transducer on the discharge of the pump provides feedback to the pump so that a constant pressure can be maintained. In addition, this system features a break tank that feeds the booster pump; this system has been made available for applications requiring an air gap to prevent backflow into the city water supply over a traditional backflow preventer.

1.3 Contact Information

Please read the operation manual before using the system. Contact AmeriWater Technical Service with any questions at: 1-800-535-5585, Monday through Friday, 8:00 A.M. to 5:00 P.M. Eastern Standard Time (EST). For after-hours emergencies, call 1-800-535-5585 and follow the instructions on the recorded message; our on-call technician will return your call as soon as possible. The entire operations manual should be read before operating or servicing the system. The operations manual should then be kept near the system and used as a reference and troubleshooting guide.

This manual is also available in .pdf format on our website, located at www.ameriwater.com.

2 HEALTH & SAFETY

WARNING: **This symbol is used to alert the user not to take a certain action, which if taken could cause a potential hazard and result in a serious adverse reaction, injury or even death. The warning symbol may also be used to alert the user to take a certain action to avoid a potential hazard. In all cases within this document, where this symbol is used it is important that you familiarize yourself with the nature of the potential HAZARD and any action that needs to be taken.**

CAUTION: A reminder or useful information that can be used to help explain a command or action or give guidance.

2.1 Safety Considerations

Requirements, standards, and regulations specific to the country in which the unit is used must be observed. Contact the local regulatory body for confirmation of these regulations and standards.

WARNING: **The device is not intended to be used in the following situations:**

- Outdoors.
- Washing down the system.
- Must not be allowed to freeze or be stored at temperatures below 5°C (41°F) or above 40°C (104°F).
- Outside maximum relative humidity 80% for temperatures up to 31°C (88°F) decreasing linearly to 50% relative humidity at 40°C (104°F).
- Any usage that falls outside of the "**Intended use**" description located in **Section 1.2.**

The system must:

- Always operate in well-ventilated area.
- Always operated on a firm and level surface.
- Always be free of leaks, spills, and tripping hazards.
- **NEVER** be sat or stood on, have items placed on top of, or used as a step.
- On no account should the unit be connected to the electrical supply when the control panel has been opened unless you are properly trained to service or repair the system.
- Only be serviced by AmeriWater or suitably trained/authorized technician.

Failure to observe the instructions provided in this manual may compromise the safety performance and reliability of the system and may void any warranty.

2.2 Residual Dangers

WARNING: **The following dangers may be present if operating the system with the cover of the controller assembly open:**

Electrical Shock: With the cover of the controller assembly open, the control system for the device will be exposed. Take necessary precautions to avoid shock when servicing or maintaining the system.

2.3 Handling

This device is intended to be used as a stationary device. Do not attempt to move the device while in operation.

2.4 Dealing with Leaks from the Unit

In the event that a leak forms, remove power to the system pump as well as controller assembly. Isolate system from inlet water supply. Isolate the source of the leak. If necessary, follow the procedure listed in **Section 6.1.1**. If the leak cannot be stopped or isolated, remove water from system, do not resume function, and contact AmeriWater.

2.5 Unauthorized Conversion and Manufacturing Replacement Parts

DO NOT, under any circumstances, modify or replace parts inside of the device with unauthorized parts or attempt to change or alter the functionality of the device. Installation of unapproved components may void the warranty of the device.

WARNING: **The system should be used in accordance with Section 1.2. The device is to be maintained and operated according to this operation manual. AmeriWater will not accept liability for any damage or injury resulting from improper use, maintenance, unauthorized repair or use of any unapproved parts.**

2.6 Warranty Claims and Liability

The buyer has a one-year warranty on all equipment and parts, excluding non-durable components (e.g., filter cartridges, reverse osmosis membranes, filter media, consumable chemicals, etc.); provided that the system is not subject to abuse, misuse, alteration, neglect, freezing, accident or negligence; and, provided further, that the system is not damaged as the result of any unusual force of nature such as, but not limited to, flood, hurricane, tornado, or earthquake.

The warranty covers the replacement of equipment and/or parts only. The warranty ***does not*** cover labor charges or travel expenses resulting from the service of equipment. The manufacturer is excused if failure to perform its warranty obligations is the result of strikes, government regulation, materials shortages, or other circumstances beyond its control. To obtain warranty service, notice must be given to the manufacturer within 30 days of the discovery of the defect.

There are no warranties on the AmeriWater system beyond those specifically described above. All implied warranties, including any implied warranty of merchantability or of fitness for a particular purpose are disclaimed to the extent they might extend beyond the above periods. The sole obligation of the manufacturer under these warranties is to replace or repair the component or part which proves to be defective within the specified time period, and the manufacturer is not liable for

consequential or incidental damages. No dealer, agent, representative, or other person is authorized to extend or expand the warranties expressly described above.

Some states do not allow limitations on how long an implied warranty lasts or exclusions or limitations of incidental or consequential damage, so the limitations and exclusions in the warranty may not apply. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

Manufacturer:

AmeriWater
3345 Stop 8 Road
Dayton, OH 45414
United States of America

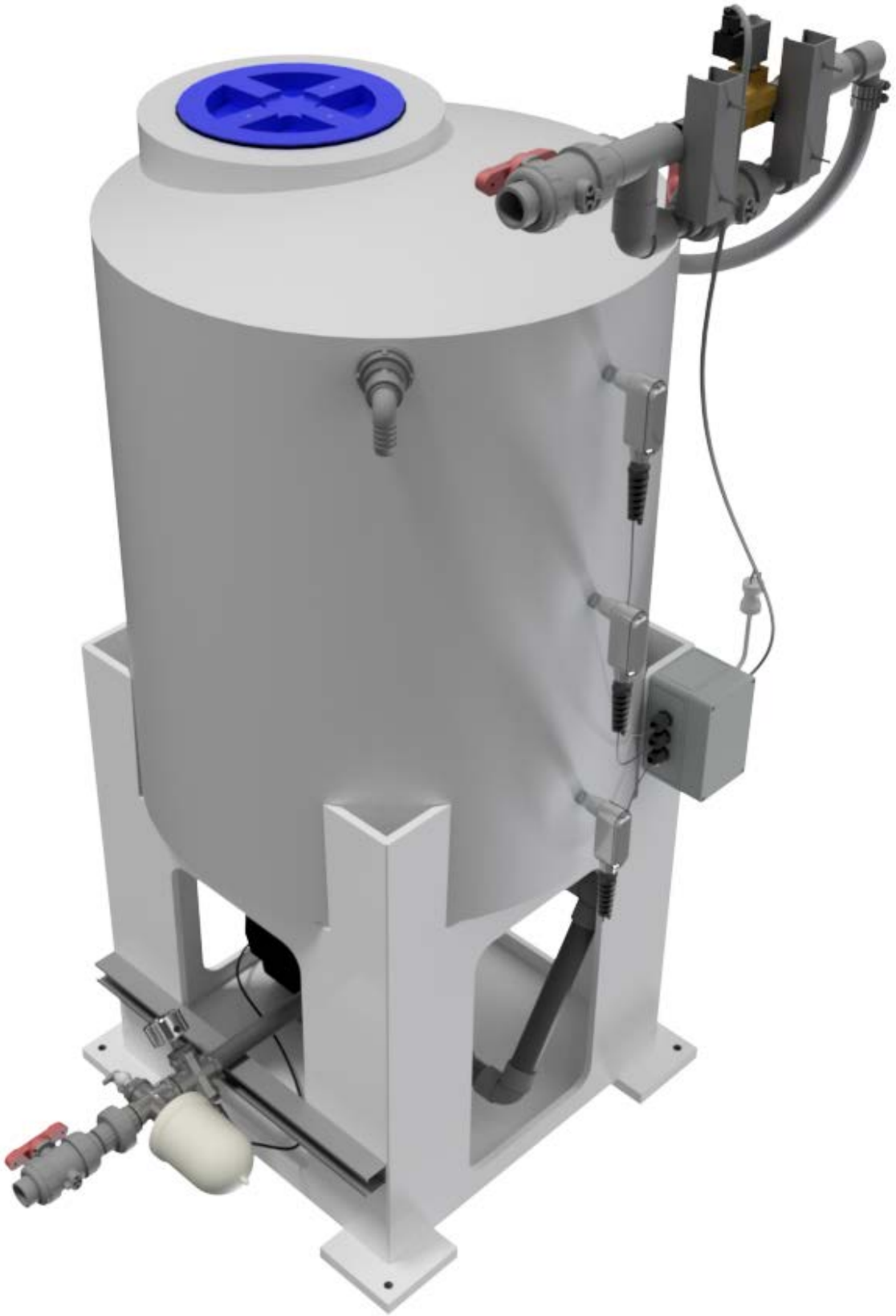
Telephone: 1-800-535-5585
Fax: 1-937-461-1988

3 ABOUT YOUR DEVICE

3.1 General Views

NOTE: Refer to **Section 7.1** for component identification.

Front View



Back Isometric View (Inlet Plumbing Shown)

3.2 Theory of Operation

The storage tank is equipped with high, medium, and low-level float switches (explained below). The booster pump located below the storage tank pushes the stored water through the system loop. The storage tank is equipped with a male hose barb inlet connection and outlet / overflow.

The break tank-fed booster pump system features a normally closed (N.C.) solenoid valve on the inlet plumbing which functions as the tank fill valve. Likewise, the break tank has three float switches installed. Both high and mid-level float switches open on water rise, while the low-level float switch closes. The fill solenoid valve is controlled by the high and mid-level floats. The fill solenoid valve opens / energizes when the mid-level float switch closes and closes /de-energizes when the high-level float switch opens. The low-level float switch's function is to stop the CME booster pump if the water level drops below it, preventing the pump from operating while dry.

3.3 Technical Specifications

- Electrical – Booster Pump: 1 x 208-230 V, MLE motor, 50/60 Hz
- Electrical – Controller Outlet for Solenoid: 120VAC
- Electrical – Tank Float Connections: 24 V Max Voltage, 500 mA Max Current.
- Electrical – Supply Voltage:
    - 1 x 208-230VAC ± 10%, 60 Hz, PE.
    - 1 x 110-120VAC, 60 Hz, PE.
    - Cable: 0.5 – 1.5mm^2 / 14-12 AWG.
    - See nameplate.
- Electrical – Fuse Sizing: Motor sizes from 0.37 to 1.1 kW: Max. 10 A.
    - Standard, as well as quick-blow or slow-blow fuses, may also be used.
- Mechanical – Break Tank Capacity: 100 Gallons
- Mechanical – CME Pump Flow Rate (Nominal | Max): Nominal = 26 GPM | Max = 33 GPM
- Mechanical – Booster Pump Ambient Temperature Maximum: 104°F (40°C)
- Mechanical – Booster Pump Pressure Maximum: 232 PSI
- Mechanical – Water Temperature (Min | Max): Min = 32°F (0°C) | Max = 95°F (35°C)
- Mechanical – Connections: Inlet & Outlet / Drain Line = 1" Male Hose Barb

4 INSTALLATION & COMMISIONING

4.1 Checklist

Step	Item	Section Reference	Complete?
1	Verify All Items Are Included	4.2	☐
2	Check Operating Environment	4.3	☐
3	Check Pressure Diaphragm Tank PSI	4.4	☐
4	Check Electrical Services	4.5	☐
5	System Install	4.6	☐
6	Electrical Safety Check	8.2	☐
7	Diagnose / Troubleshoot Errors (If Necessary)	9	☐
8	End-User Training	N/A	☐

4.2 Packing List

Item	QTY	Notes	Included?
CME Pump + Tank + Plumbing	1	System	☐
15’ Hose Sections	2	Inlet & Drain Hoses	☐
Hose Hardware	8	Clamps	☐
Anchor Bolts	4	Feet of Tank for Grounding	☐
O-Ring	1	Tank Lid	☐
Line Cord	1	Pump Power Cord / Plug	☐
Blend Valve Kit	1	See Section 4.2.1	☐

4.2.1 Blend Valve Installation Kit

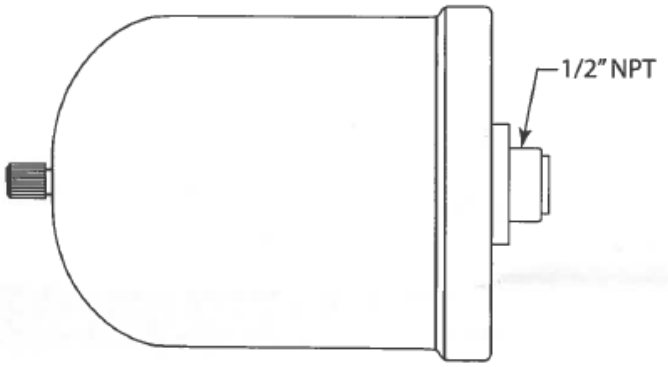
Quantity	Item	Included?
1	Pre-Assembled Blend Valve Assembly (Includes Solenoid)	☐
2	Unistrut	☐
2	Unistrut Clamps	☐
4	Unistrut Mounting Screws	☐
1	1” x ½” Socket Bushing	☐
30”	½” Piping	☐
1	1” x ¾” Socket Bushing	☐
30”	¾” Piping	☐
30”	1” Piping	☐
1	1” x 1-¼” Socket x Thread Bushing	☐
1	1-¼” Socket Coupling	☐
30”	1-¼” Piping	☐
1	1” x 1-½” Socket x Thread Bushing	☐
1	1-½” Socket Coupling	☐
30”	1-½” Piping	☐

4.3 Environment

The device should be used indoors on a firm, flat level surface in a clean and dry environment. The device should be operated in a well-ventilated area. Take care when making water and power connections to the rear of the device as to not create tripping hazards. Refer to **Section 2.1** for safety considerations when installing the system.

4.4 Setting/Adjusting Pressure Diaphragm Tank (Bladder Tank)

The system is equipped with a **diaphragm tank** (shown right) on the outlet of the pump, directly across from the sample port. Tank pre-charge pressure must be 0.7 * set point. The inlet pressure should be set to **31 psi** by AmeriWater but can be adjusted using the following steps.



1. Unscrew the plastic knob at the top of the diaphragm tank.
2. Use a tire-pressure gauge (not provided) to check air pressure, recommended by AmeriWater to be 31 psi.
3. Use air compressor to fill / empty diaphragm until desired amount of air is achieved.
4. Replace plastic knob.

4.5 Checking Electrical Services

WARNING: **To reduce the risk of electric shock, this equipment must only be connected to a supply main with protective earth connection. Always refer to local code for electrical connections.**

Once the proper electrical supply for the device is in place, plug the pump as well as the control panel assembly into the wall outlet using the supplied power cords. Refer to **Section 3.3** regarding technical specifications for system power.

WARNING: **Only use the included mains power cord or an AmeriWater approved alternative. Use of an inadequate mains power cord may result in damage to the equipment.**

4.6 Installation

Using the checklist provided in **Section 4.14.2**, the following procedure will outline general installation requirements. For a general system layout, refer to **Section 7.1**. Please note that the system inlet plumbing must be assembled at install with the normally closed solenoid valve included in it. Adapting fittings in checklist provided in **Section 4.2.1** can be used to adapt to any blend valve outlet purchased from AmeriWater.

1. Install system inlet plumbing such that:

    a. The inlet plumbing is adequately supported with the supplied Unistrut components.
    b. The 120VAC normally closed solenoid valve is included in the inlet plumbing (note that power for this valve is supplied via the booster pump assembly control box) and the manual bypass valve is plumbed in parallel with the solenoid valve.
    c. The inlet plumbing is downstream from a city water isolation valve.
    d. The inlet hose from the blend valve assembly connected to the tank inlet should be free of kinks and pinching.

2. Once the system has been configured to fit the water room, orient the tank into a generalized location, where the booster pump label on the front of the tank is facing forward. The control assembly should be placed near its designated electrical outlet. If local codes require the storage tank to be anchored to the floor:

    a. Locate the provided expansion anchors.
    b. Locate the storage tank on a firm, level foundation.
    c. Drill a quantity of four (4) 5/8” diameter holes into the concrete through the storage tank base feet a minimum of 4” deep.
    d. Install expansion anchors through the four holes in the pads to anchor the tank to the ground. A minimum of four threads for each anchor must be below the concrete prior to the application of 60 ft-lbs. of torque.

3. To ensure sufficient cooling of the motor and electronics, the following conditions must be observed:

    a. The cooling air (ambient) temperature must not exceed 40°C (104°F).
    b. Cooling fins and fan blades must be kept clean.

4. The size of the outlet piping from the variable speed pump should be 1”.

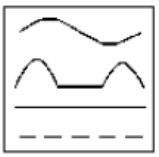
5. Follow all local plumbing and electrical codes. Ensure the motor is suitable for the electrical supply on which it will be used.

WARNING: **All electric supply circuits to the pump must be disconnected and the electrical panel properly locked and tagged out before working inside the pump terminal box. Never attempt to make any connections inside the pump terminal box until the electrical supply has been turned off for at least 5 minutes.**

6. A blade or service disconnect is not provided by AmeriWater; it must be installed. The pump must be connected as specified in **Section 5.3.2**.

WARNING: **The pump must be earthed and protected against indirect contact in accordance with national regulations. Protective earth conductors must always have a yellow/green (PE) or yellow/green/blue (PEN) color marking.**

7. If the pump is connected to an electric installation where an earth leakage circuit breaker is used as additional protection, this circuit must be marked with the following symbol (shown on right). When selecting an earth leakage circuit breaker, the total leakage current of all the electrical equipment in the installation must be accounted for. For reference, Earth leakage current < 3.5 mA, in accordance with EN 60 355-1.



    a. No external motor protection required; the pump is overvoltage protected.

WARNING: **If the supply cable is damaged, it must be replaced by the manufacturer, the manufacturer's service partner, or a similarly qualified person in order to avoid a hazardous condition.**

8. The number of starts and stops by way of the mains voltage must not exceed four times per hour. When the pump is switched on by way of the mains, it will start after approximately five seconds. When the pump is started/stopped by way of an external on/off switch, it will start immediately.

9. Before operating the pump, verify the charge on the diaphragm tank is set according to **Section 4.4**.

WARNING: **If the supply cable is damaged, it must be replaced by the manufacturer, the manufacturer's service partner, or a similarly qualified person, in order to avoid a hazardous condition.**

10. When measuring voltage, use a voltmeter (set to the proper scale) to measure the voltage at the pump terminal box or starter. Measure between power leads L1 and L2 or L1 and N for 115 volts. When the motor is under load, the voltage should be within +6% to +10% of the nameplate voltage. Larger voltage variation may cause winding damage. Large variations in the voltage indicate a poor electrical supply and the pump should not be operated until these variations have been corrected. If the voltage constantly remains high or low, the motor should be changed. When measuring current, use an ammeter (set on the proper scale) to measure the current on each power lead at the terminal box or starter. See the motor nameplate for amp draw information. Current should be measured when the pump is operating at a constant discharge pressure.

4.6.1 Additional Information

Please note that the following steps are already completed at assembly for this product and is for reference only. The connection terminals inside the pump terminal box for the pressure sensor and

blade or service disconnect cord are shown in the figure below with installation directions listed, if necessary.

WARNING: **Never make connections in the pump terminal box unless the electricity supply has been switched off for at least five (5) minutes.**

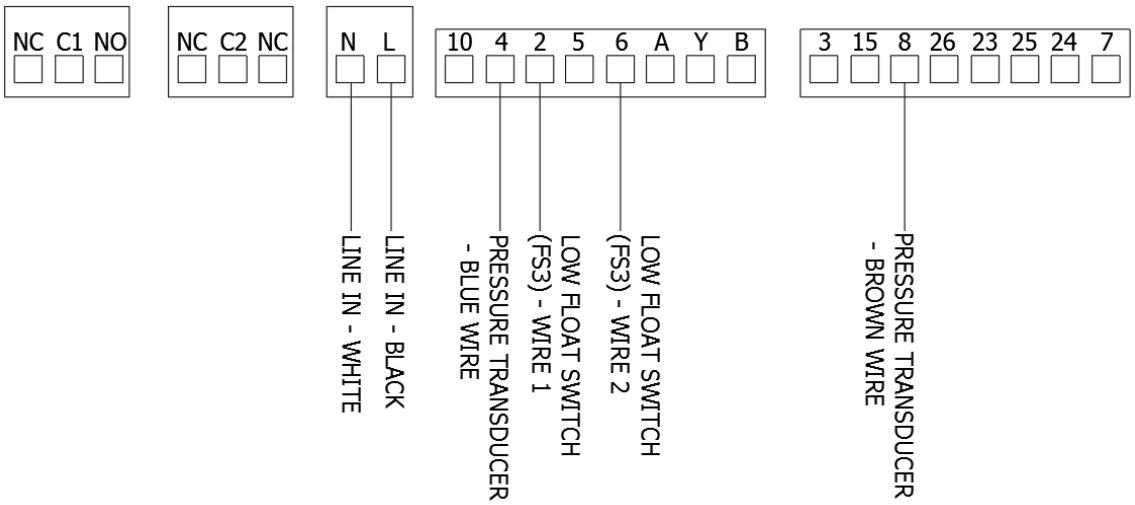


Figure – Pump Terminal Strip

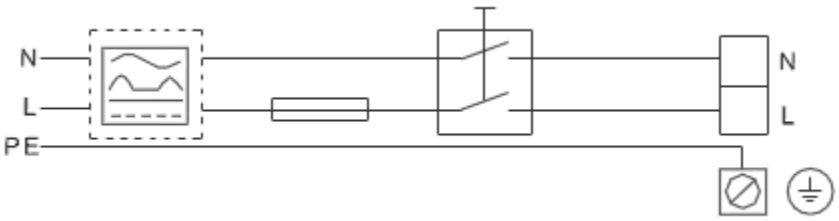
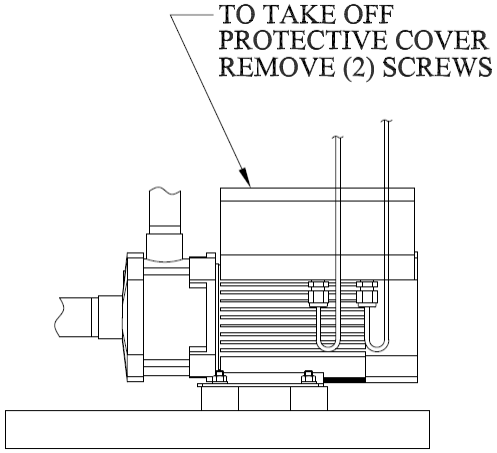


Figure – Example of Mains-Connected Pump with Mains Switch, Backup Fuses & Additional Protection

- **Pressure Sensor Installation**: With the protective cover off, bring the wire from the pressure sensor into the motor through the strain relief in the middle. Wire the blue wire into terminal 4 and the brown wire to terminal 8. Clip the remaining wires as they are not used. Make sure remaining wires are isolated from ground. Replace the access cover after all connections have been made.



- **Blade or Service Disconnect Cord Installation**: With the protective cover off, bring the line cord through the strain relief furthest from the pump inlet. Terminate the white wire into the connection marked N, the green wire to ground terminal and the black wire to L. Replace the grey protective cover after all connections have been made.

5 TECHNICAL INFORMATION

5.1 Specifications

5.1.1 Electrical Specifications

Electrical Supply	Cable	Notes
1 x 208-230 VAC ± 10%, 60 Hz, PE	14AWG, 3C	See nameplate
1 x 110-120 VAC ± 10%, 60 Hz, PE	18AWG, 3C	N/A

WARNING: **To avoid risk of electric shock, this equipment must be connected to a supply main with protective earth.**

For permanent installations, the mains supply must be provided with a branch circuit breaker, as specified. Refer to **Section 5.3.2** for details of rating and specification of branch circuit breaker.

5.1.2 Fuse Specification

- Motor sizes from 0.37 to 1.1 kW: Max. 10 A.
- Standard, as well as quick-blow or slow-blow fuses, may also be used.

NOTE: Fuses should only be replaced by an AmeriWater supplied, or AmeriWater approved fuse.

NOTE: The fuses on the device may be replaced by the operator or authorized service personnel.

5.1.3 Break Tank Specifications

Working Volume: 100 US gals (378.5 L)
Classification: Air gap to provide backflow prevention into city water supply
Material: Polycarbonate

5.1.4 Weights and Dimensions

Weight (lbs.)	Height (Inches)	Width (Inches)	Depth (Inches)
Dry: 169	65	43-3/16	33-1/4
Working: 1010			

5.2 Environmental / Transport

Location	Indoor
Altitude [m]	Up to 2000
Ambient Temperature range [°F]	50-104
Relative Humidity (Max)	80% for Temperatures Up to 88°F Decreasing Linearly to 50% Relative Humidity at 104°F.
Mains Supply Voltage Fluctuation	±10% of the Nominal Voltage

5.3 Connection to Mains Electrical Supply

5.3.1 Fixed Installation

For a “fixed installation”, see Section 5.1.1 for power supply requirements. The sockets must be easily accessible and unrestricted to allow isolation of the electricity supply if required.

5.3.2 Permanent Installation

See Section 5.1.1 for power supply requirements.

The incoming mains supply must be provided with a branch circuit breaker to the following specification: external all-pole mains switch with a contact separation of at least 3mm in each pole, with specification IEC 364.

6 OPERATION

6.1 Start-Up

6.1.1 Clearing Debris

Before the system can be used for the first time, it must first be purged of any installation debris trapped in the system and then fully rinsed out using RO water, in line with the procedure below.

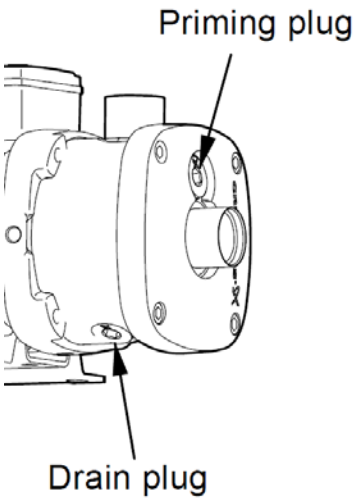
WARNING: **Do not touch the pump while running at high temperatures, as the pump can be extremely hot.**

To free system of debris prior to the pump:

- Ensure the following ball valves are positioned as follows:
  - Pump suction: closed
  - System bypass valve (blend valve assembly): open
  - System drain: open
- Ensure that the system controller is unplugged to disallow function of float switches and solenoid valve.
- Allow tank to drain for several minutes.
- Once an adequate time has passed to where debris has cleared, orient aforementioned valves to opposite position (closed to open and open to closed).

6.1.2 Priming Pump

The pump must be filled with liquid and vented before startup (or if the pump has been drained), otherwise known as *priming*. To do so, proceed as follows:



- Ensure the following ball valves are closed:
  - Pump suction
  - Pump discharge
  - System drain

- Ensure the system controller is plugged into a wall outlet and that the pump disconnect is in the “On” position.
- Ensure the pump is not running by hitting the Start/Stop button on the pump interface.
- The system will now begin filling with water from the inlet solenoid. Allow the tank to fill to the top float switch.
- Remove the priming plug in the pump sleeve (shown on right).
- Open the pump suction /tank outlet-to-pump ball valve slightly.

WARNING: **Escaping liquid may be very hot; therefore, take care to ensure that the liquid does not cause personal injury or damage to other components.**

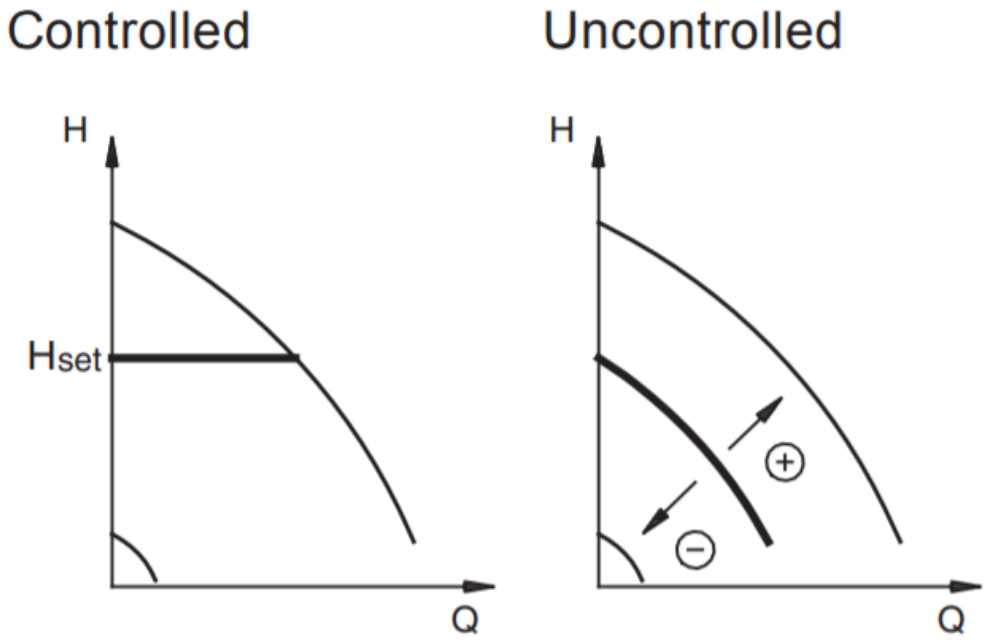
- Once a steady stream of liquid runs out of the pump priming port, replace priming plug and tighten securely.
- Open pump suction /tank outlet-to-pump ball valve fully.
- Start the pump by hitting the Start/Stop button on the pump interface and slowly open the discharge valve until it is fully open.

6.1.3 Pump Operation Overview

This pump has been factory-set to control mode **CONTROLLED** (see figure below for more information).

- In control mode **CONTROLLED**, the pump will adjust its performance, i.e., pump discharge pressure, to the desired set point for the control parameter.

- In control mode **UNCONTROLLED**, the pump will operate according to the constant curve set.

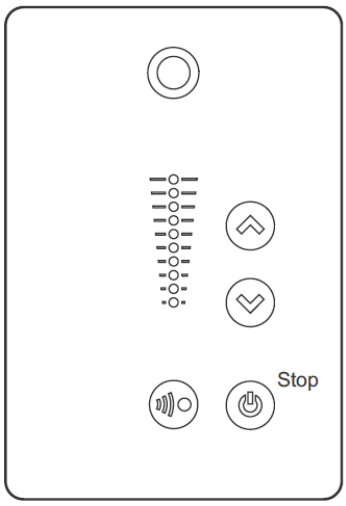


As noted in **Section 7.1**, the pump uses a pressure transducer to monitor the discharge pressure during operation. The transducer allows the pump to recognize when the pump is operating under a dead head condition (no water usage). Under this condition, the pump will shut off based on a maximum pressure limit allowed at the pump discharge. To increase or decrease the speed at which the pump operates, use the following steps.

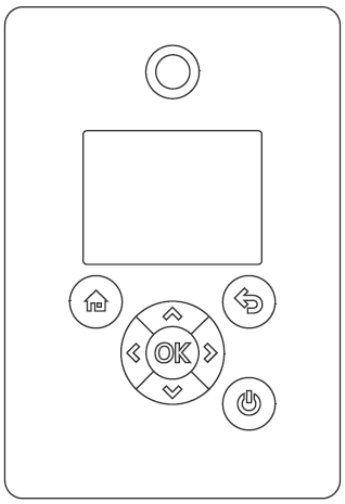
NOTE: All changes to set point are possible with the pump operating.

NOTE: The booster pump may have a “standard control panel” or “advanced control panel”. The “standard control panel” will require a Bluetooth “dongle” (AmeriWater P.N. 97-0003) to make changes to the pump program. Pumps with the “advanced control panel” utilize a display that will allow settings to be modified directly on the pump. See below for identification of the pump control panels.

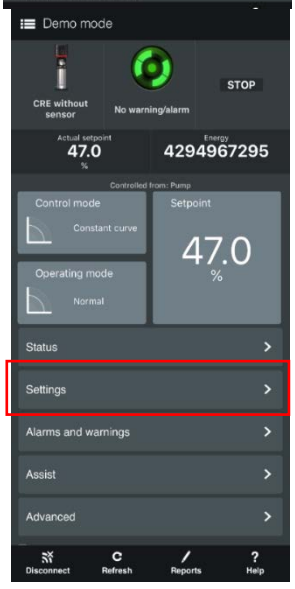
Standard Control Panel



Advanced Control Panel



6.1.4 Adjusting Set Point on Standard Control Panel



1. Connect Bluetooth dongle to Bluetooth-capable smartphone.

2. Download “Grundfos GO” application from IOS App Store or Google Play Store.

3. Open “Grundfos GO” application and select “**Connect**” in the IR menu. Point the Bluetooth dongle toward pump motor. The green light at top of the pump should flash green.

4. Once connected, the pump dashboard will display on the screen. Navigate to “**Settings.**”

5. Scroll down until “**Limit 1 Exceeded**” is displayed.

6. Select “**Measured**” and use the menu to select “**Not active.**” This will deactivate the dead head shutoff function of the pump.

WARNING **This setting should be turned back on after making the necessary changes to the pump operating speed. Failure to turn the setting on will lead to dry running of the pump on dead end loop systems. This may cause the pump to overheat.**

7. Use the arrow at the top left hand corner of the display to return to the previous menu. Scroll up until “**Set Point**” is displayed. Change the percentage displayed until the desired pump speed is achieved. The percentage displayed directly controls the operating speed of the pump (i.e. set point of 90%

will operate the pump at 90% of the maximum speed).

8. With the set point determined, navigate back to "**Limit 1 Exceeded.**"

9. Select "**Limit**" and set the value to approximately one psi above the operating pressure with the tank filled to the high level float.

10. Return to the previous menu and select "**Measured**" and set this to "**Discharge Pressure.**"

11. The pump shall now operate with no surging during operation. Shut the ball valve located after the pump discharge and verify that the pump shuts off at dead head.

NOTE: If the pump begins switching on and off after setting the shutoff limit, navigate to *Limit 1 Exceeded → Limit* and increase the shut off pressure in 0.1 psi increments until the pump functions as intended.

12. Open the discharge valve and return the system to normal operation.

6.1.5 Adjusting Set Point on Advanced Control Panel

1. Press the "OK" button on the controller to wake the screen. The home screen will be displayed on the pump.

2. Use the ◄ & ► keys to scroll over until the settings menu appears.

3. Use the ▼ key to scroll through the settings menu until "**Monitoring Functions**" is displayed. Press the "OK" key to enter the menu.

4. Use the ▼ key to select "**Limit-Exceeded Function**". Press the "OK" key to enter the menu.

5. Use the "OK" key to enter the "**Measured**" menu. Scroll up to "**Not Active**"and use the "OK" key to disable the dead head shutoff function.

WARNING **This setting should be turned back on after making the necessary changes to the pump operating speed. Failure to turn the setting on will lead to dry running of the pump on dead end loop systems. This may cause the pump to overheat.**

6. Use the back button to return to the settings menu.

7. Use the ▲ key to scroll up until the "**Set Point**" setting is displayed. Press the "OK" key to enter the set point menu.

8. Press the "OK"s key to modify the set point. Use the arrow keys to set the set point to the desired value. The percentage displayed directly controls the operating speed of the

pump (i.e. set point of 90% will operate the pump at 90% of the maximum speed).

9. Use the back button to return to the settings menu. Scroll to "**Monitoring Function**" using the ▼ key. Press the "OK" key to enter the menu.

10. Use the ▼ key to scroll down to "**Limit-Exceeded Function**". Press the "OK" key to enter the menu.

11. Use the ▼ key to select "**Limit**" and adjust the limit to approximately one PSI over the operating point of the pump at the new speed using the arrow keys.

12. Use the back button to return to the "**Limit-Exceeded Function**" menu. Use the ▲ key to select "**Measured**". Press OK to enter the menu.

13. Select "**Discharge Pressure**" from the menu.

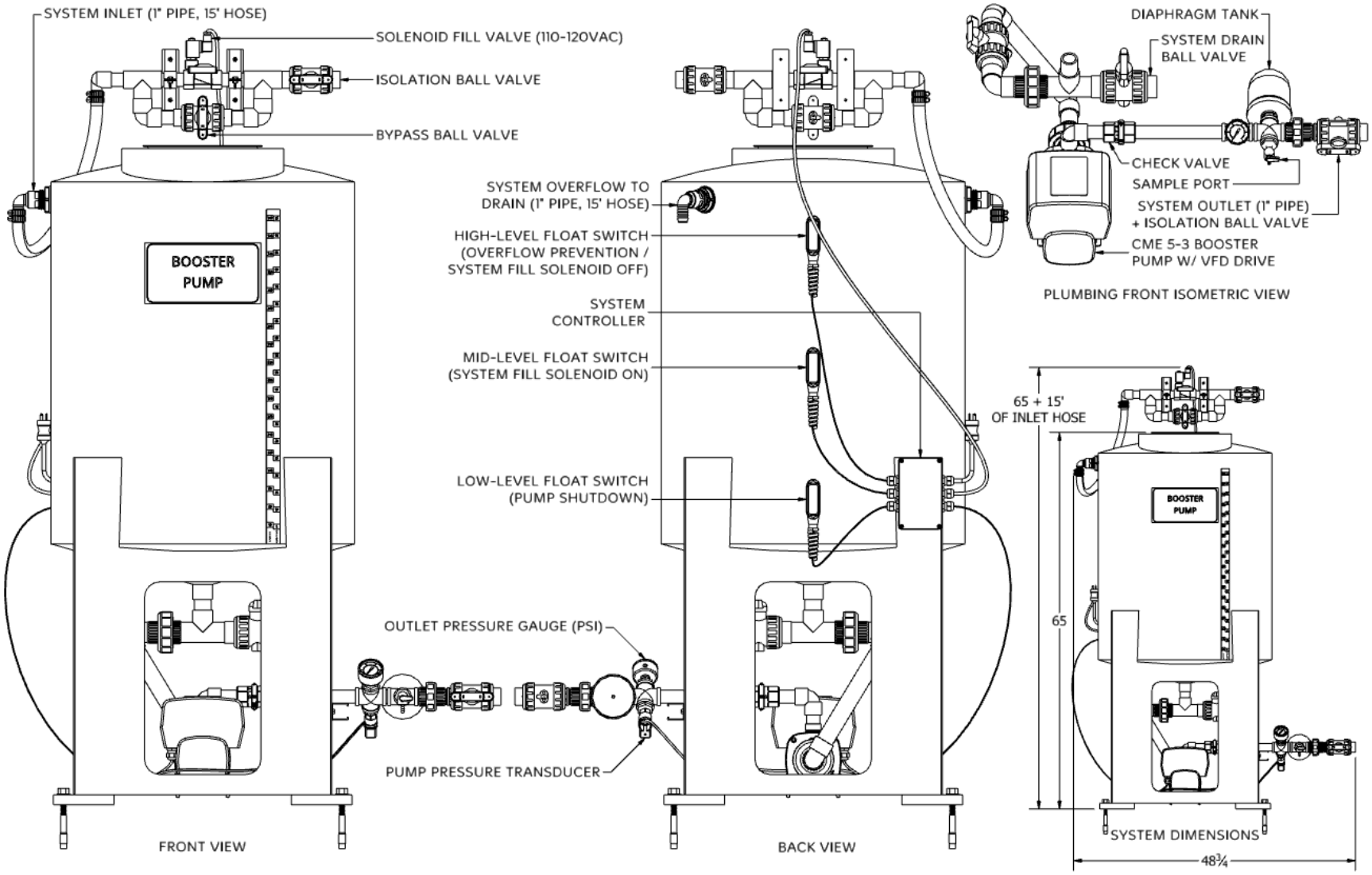
14. The pump shall now operate with no surging during operation. Shut the ball valve located after the pump discharge and verify that the pump shuts off at dead head.

NOTE: **If the pump begins switching on and off after setting the shutoff limit, navigate to *Limit 1 Exceeded → Limit* and increase the shut off pressure in one PSI increments until the pump functions as intended.**

15. Open the discharge valve and return the system to normal operation.

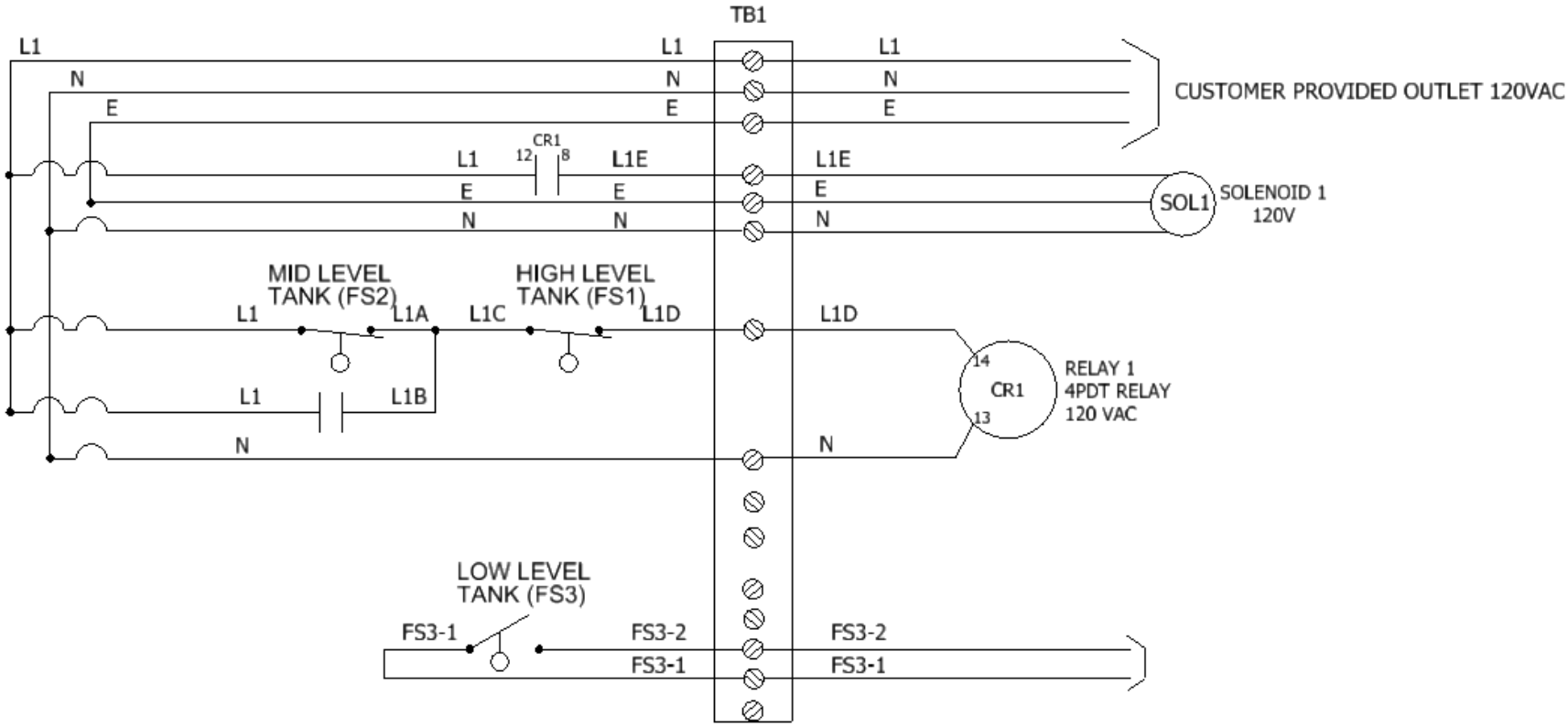
7 COMPONENT IDENTIFICATION AND SCHEMATICS

7.1 Component Identification

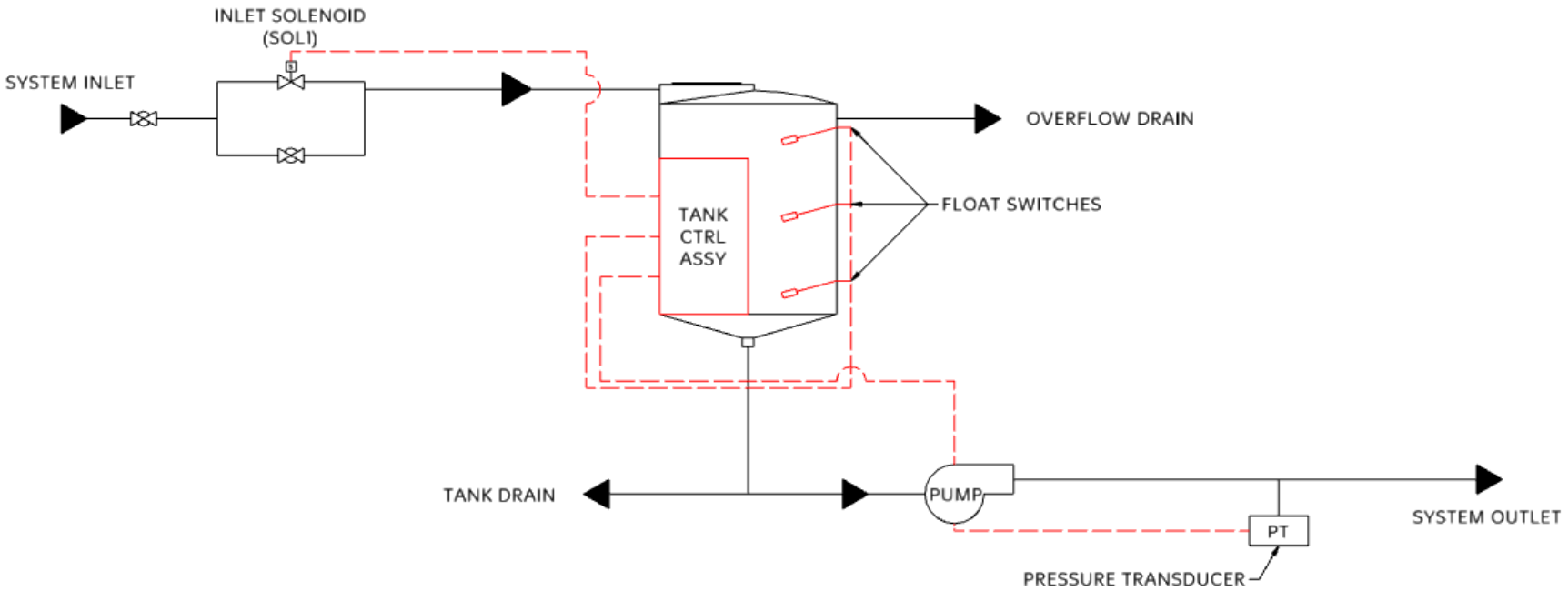


7.2 Electrical Schematics

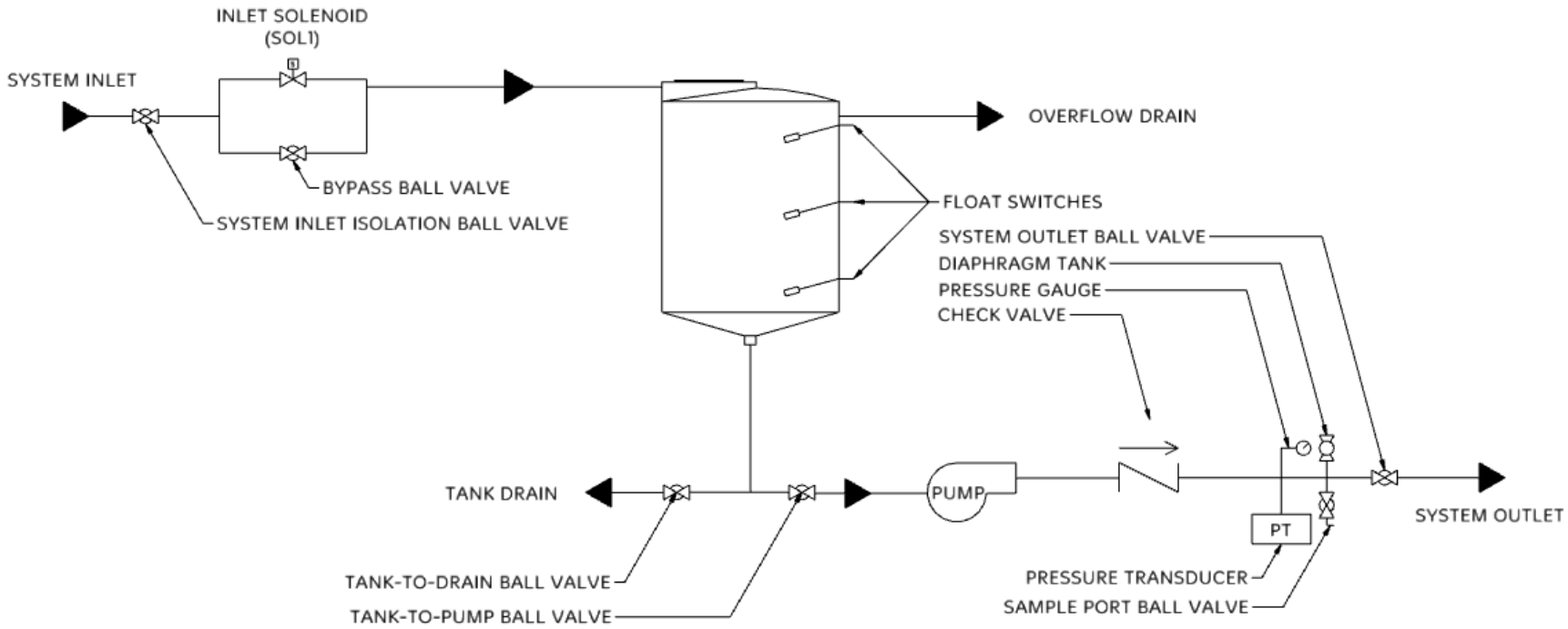
7.2.1 Control Assembly



7.2.2 System


INLET SOLENOID
(SOL1)
SYSTEM INLET
OVERFLOW DRAIN
FLOAT SWITCHES
TANK
CTRL
ASSY
TANK DRAIN
PUMP
PT
SYSTEM OUTLET
PRESSURE TRANSDUCER

7.3 Flow Schematic



8 MAINTENANCE

WARNING: **If any component of the water treatment system is changed or replaced, the user should conduct appropriate tests to ensure that the revised system meets all standards to which it was initially tested.**

8.1 Planned Routine Checks

It is recommended that checks are carried out on the device and its performance to ensure safe and uninterrupted operation. Refer to the table below for details.

NOTE: The frequency of performing the checks indicated should be considered as a guide only and will depend on how often the device is used.

Frequency	Task
Yearly	• Equipment functionality test

To perform an equipment functionality test, the following general procedure will overview correct functionality on the following equipment:

Test	Notes
Inlet solenoid valve	Ensure inlet bypass ball valve (located below inlet solenoid valve) is entirely closed (handle oriented completely vertical), the inlet isolation ball valve (located to the right of the inlet solenoid valve) is entirely open (handle oriented completely horizontal), and the tank outlet-to-drain ball valve (located below immediately exiting the tank) is entirely closed (handle oriented completely vertical). If the valves listed are in the orientation described and the system is not filling with water, the inlet solenoid valve is closed and is considered successfully closed. Perform procedure outlined in **Section 6.1**. If the system is powered on and the break tank begins filling with water, the inlet solenoid valve is open and is considered successfully open. No further action is required.
Inlet bypass and isolation ball valves	See “Inlet solenoid valve” test above. The valve handle position is parallel to the valve in the “opened” position, while perpendicular to the valve in the “closed” position. Flow will be halted when the ball valve is placed into the closed position.
Tank float switches (high, medium, low)	High: The normal position of this switch with no working fluid is in the “normally closed” position, meaning this switch will open once the level of operating fluid reaches the float switch. Upon reaching the top of the tank, the inlet solenoid valve will shut off, assuming correct operating conditions. Medium: The normal position of this switch with no working fluid is in the “normally closed” position, meaning this switch will open once the level of operating fluid reaches the float switch. Upon reaching the middle of the tank, the inlet solenoid valve will turn on, assuming correct operating conditions. Low: The normal position of this switch with no working fluid is in the “normally

	open" position, meaning this switch will close once the level of operating fluid reaches the float switch. Upon reaching the bottom of the tank, the booster pump will turn off, assuming correct operating conditions.
Tank outlet-to-drain ball valve	See "Inlet solenoid valve" test above. The valve handle position is parallel to the valve in the "opened" position, while perpendicular to the valve in the "closed" position. Flow will be halted when the ball valve is placed into the closed position.
Tank outlet-to-pump isolation ball valve	The valve handle position is parallel to the valve in the "opened" position, while perpendicular to the valve in the "closed" position. Flow will be halted when the ball valve is placed into the closed position. It is not recommended to close the valve while the system is operating normally. This valve is used entirely for serviceability to isolate the operating fluid from the pump. Closing this valve while the pump is operating will starve the pump, causing the pump to overheat and/or premature failure.
System outlet ball valve	The valve handle position is parallel to the valve in the "opened" position, while perpendicular to the valve in the "closed" position. Flow will be halted when the ball valve is placed into the closed position. It is not recommended to close the valve while the system is operating normally. This valve is used entirely for serviceability to isolate the operating fluid from the pump. Closing this valve while the pump is operating will cause the outlet pressure to increase and may over-pressurize the plumbing, which may cause injury.
System outlet sample port	The valve handle position is parallel to the valve in the "opened" position, while perpendicular to the valve in the "closed" position. Flow will be halted when the ball valve is placed into the closed position.

8.2 Electrical Safety Inspection

It is recommended that an electrical safety inspection is carried out:

- On newly acquired equipment prior to being accepted for use
- During routine planned preventative maintenance
- After repairs have been carried out on equipment

8.3 Cleaning External Surfaces

Use a clean damp cloth to wipe down the surface of any device used on the system. Take care not to get excess liquid around electrical components. A ratio of 1:10 bleach concentration (on a towel or pre-wetted wipes) is an acceptable surface disinfectant for the external surfaces of the device.

8.4 Booster Pump

NOTE: Under normal operating conditions, the pump is maintenance-free. However, it is recommended to keep the pump clean.

WARNING: **Never touch the electronics unless the pump has been switched off for at least five minutes.**

- Keep the motor cooling fins and fan blades clean to ensure sufficient cooling of the motor and electronics.
- The motor bearings are of the closed type and greased for life. The bearings cannot be re-lubricated.

9 TROUBLESHOOTING

9.1 Storage Tank

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Water not entering tank	Inlet hose kinked Leak occurring	Free inlet hose of restrictions. Inspect for leaks.
	Solenoid valve failure (stuck closed)	Replace valve. Use bypass valve as temporary bypass.
Water not leaving tank	Outlet valves closed	Open valves to pump. Ensure drain valve is closed.
Water continuously fills tank	Pump is not turned on	See Section 9.2.
	High float switch stuck open	Turn off inlet water supply. Drain tank. Unthread and inspect float switch. Attempt to unstick. If not possible, replace float switch. Use bypass if necessary.
Water does not fill tank	High float switch stuck open	Turn off inlet water supply. Drain tank. Unthread and inspect float switch. Attempt to unstick. If not possible, replace float switch. Use bypass if necessary.
Tank fills every time top float switch is reached (continuous fill)	Mid-high float switch stuck open	Turn off inlet water supply. Drain tank. Unthread and inspect float switch. Attempt to unstick. If not possible, replace float switch. Use bypass if necessary.
Tank does not hold adequate volume of water	Mid-high float switch stuck closed	Turn off inlet water supply. Drain tank. Unthread and inspect float switch. Attempt to unstick. If not possible, replace float switch. Use bypass if necessary.
Pump will not run	Low float switch stuck open	Turn off inlet water supply. Drain tank. Unthread and inspect float switch. Attempt to

		unstick. If not possible, replace float switch. Use bypass if necessary.
Pump runs dry	Low float switch stuck open	Turn off inlet water supply. Drain tank. Unthread and inspect float switch. Attempt to unstick. If not possible, replace float switch. Use bypass if necessary.
Tank is overflowing	Is water coming from tank lid? If not, is a float switch stuck?	See above measures for float switch diagnostics. Ensure tank vent filter drain hose is routed to drain. Cease operation of inlet water supply.

9.2 BOOSTER PUMP

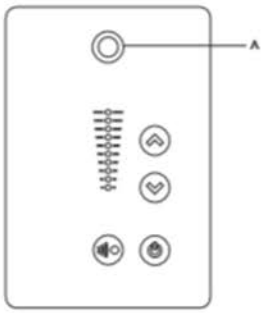
Hazardous voltages are present when power is applied to the unit. Care should be taken when troubleshooting any of the input power or output circuits. When disconnecting or connecting any board or accessory, be sure power is unplugged.

Before contacting AmeriWater for technical help, verify the status of all lights and indicators. The more information available when you contact us, the easier it will be to determine the source of the problem.

Indicator lights		Signal relay activated during:				
Fault (red)	Operation (green)	Fault/Alarm, Warning and Relubricate	Operating	Ready	Pump running	Description
Off	Off					The power supply has been switched off.
Off	Permanently on					The pump is operating.
Off	Permanently on					The pump is stopped by the stop function.
Off	Flashing					The pump has been set to stop.
Permanently on	Off					The pump has stopped because of a *Fault/Alarm* or is running with a *Warning* or *Relubricate* indication. If the pump was stopped, restarting will be attempted (it may be necessary to restart the pump by resetting the *Fault* indication). If the cause is "external fault", the pump must be restarted manually by resetting the *Fault* indication.
Permanently on	Permanently on					The pump is operating, but it has or has had a *Fault/Alarm* allowing the pump to continue operation or it is operating with a *Warning* or *Relubricate* indication. If the cause is "sensor signal outside signal range", the pump will continue operating according to the 70 % curve and the fault indication cannot be reset until the signal is inside the signal range. If the cause is "setpoint signal outside signal range", the pump will continue operating according to the min. curve and the fault indication cannot be reset until the signal is inside the signal range.
Permanently on	Flashing					The pump has been set to stop, but it has been stopped because of a *Fault*.

16.7.1 Grundfos Eye

The operating condition of the Hydro Multi-E is indicated by the Grundfos Eye on the pump control panels.



Grundfos Eye	Indication	Description
	No lights on.	Power off. Motor not running.
	Two opposite green indicator lights rotating in the direction of rotation of the motor when seen from the non-drive end.	Power on. Motor running.
	Two opposite green indicator lights permanently on.	Power on. Motor not running.
	One yellow indicator light rotating in the direction of rotation of the motor when seen from the non-drive end.	Warning. Motor running.
	One yellow indicator light permanently on.	Warning. Motor stopped.
	Two opposite red indicator lights flashing simultaneously.	Alarm. Motor stopped.
	The green indicator light in the middle flashes quickly four times. 	Remote control with the Grundfos Go Remote via radio. The motor is trying to communicate with the Grundfos Go Remote. The motor in question is highlighted in Grundfos Go Remote display to inform the user of the location of the motor.
	The green indicator light in the middle flashes continuously. 	When the motor in question is selected in Grundfos Go Remote menu, the green indicator light in the middle will flash continuously. Press on the pump control panel to allow remote control and data exchange via Grundfos Go Remote.
	The green indicator light in the middle is permanently on. 	Remote control with the Grundfos Go Remote via radio. The motor is communicating with the Grundfos Go Remote via radio connection.
	The green indicator light in the middle flashes quickly while Grundfos Go Remote is exchanging data with the motor. It will take a few seconds. 	Remote control with the Grundfos Go Remote via infrared light. The motor is receiving data from Grundfos Go Remote via infrared communication.

GRUNDFOS GO PROGRAM SETUP, 999-3670 REFERENCE			
PARAMETER	VALUE	PARAMETER	VALUE
SETPOINT	45 PSI	>SENSOR UNIT	PSI
OPERATING MODE	NORMAL	>MINIMUM	0.0
CONTROL MODE	CONSTANT PRESSURE	>MAXIMUM	145.0
PIPE-FILLING FUNCTION	NOT ACTIVE	ANALOG INPUT 2	NOT ACTIVE
BUTTONS ON PRODUCT	ACTIVE	DIGITAL INPUT 1	EXT STOP
STOP FUNCTION		DIGITAL INPUT/OUTPUT	
>LOW FLOW STOP	HIGH-COMFORT MODE	>MODE	DIGITAL INPUT
>SET ON/OFF BAND	5%	>FUNCTION IF INPUT	NOT ACTIVE
>DIAPHRAGM TANK VOLUME	1 LITER	>FUNCTION IF OUTPUT	NOT ACTIVE
CONTROLLER		PULSE FLOWMETER	
>Kp	3.0	>VOLUME PER PULSE	0 LITERS
>Ti	5.0 s	PREDEFINED SETPOINT	NOT SET
OPERATING RANGE		EXTERNAL SETPOINT FUNCTION	NOT ACTIVE
>MINUMUM	13%	SIGNAL RELAY 1	NOT ACTIVE
>MAXIMUM	100%	SIGNAL RELAY 2	NOT ACTIVE
RAMPS		LIMIT 1 EXCEEDED	NOT ACTIVE
>RAMP UP TIME	1.0 s	LIMIT 2 EXCEEDED	NOT ACTIVE
>RAMP DOWN TIME	1.0 s	STANDSTILL HEATING	NOT ACTIVE
NUMBER	1	MOTOR BEARING MONITOR	ACTIVE
RADIO COMMUNICATION	ACTIVE		
ANALOG INPUT 1			
>FUNCTION	FEEDBACK SENSOR		
>MEASURED	DISCHARGE PRESSURE		
>SIGNAL TYPE	4-20 mA		

9.2.1 Resetting a Fault Indication

Use the following methods to reset a fault condition:

- Briefly press the “up” or “down” button on the pump. This will not change the setting of the pump. A fault indication cannot be reset by means of or if the buttons have been locked.
- Switch off the power supply until the indicator lights are off.
- Switch the external start/stop input off and then on again.

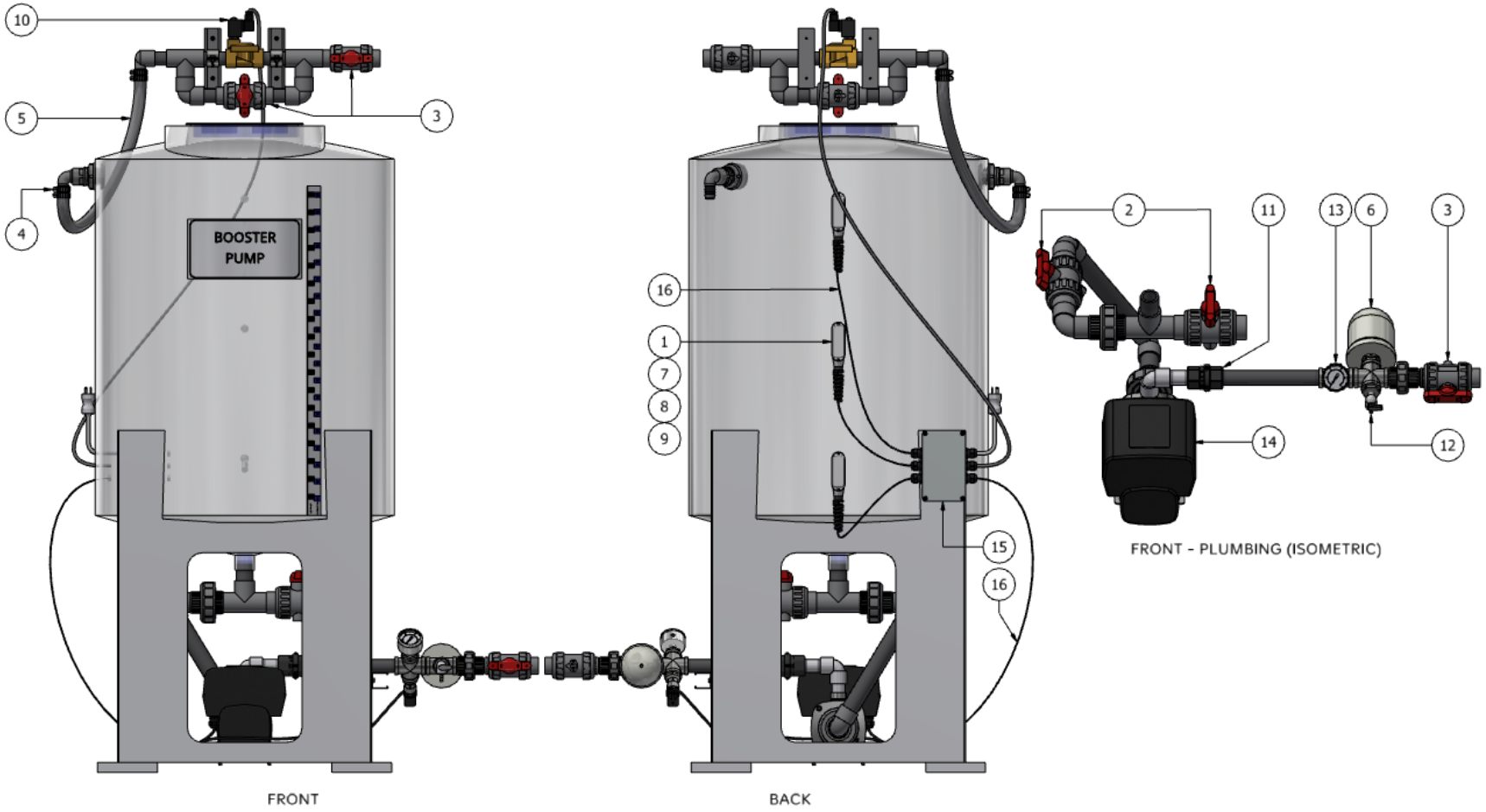
NOTE: If the pump does not start when the fault has been corrected, or if the fault cannot be corrected, contact AmeriWater or Grundfos for further information.

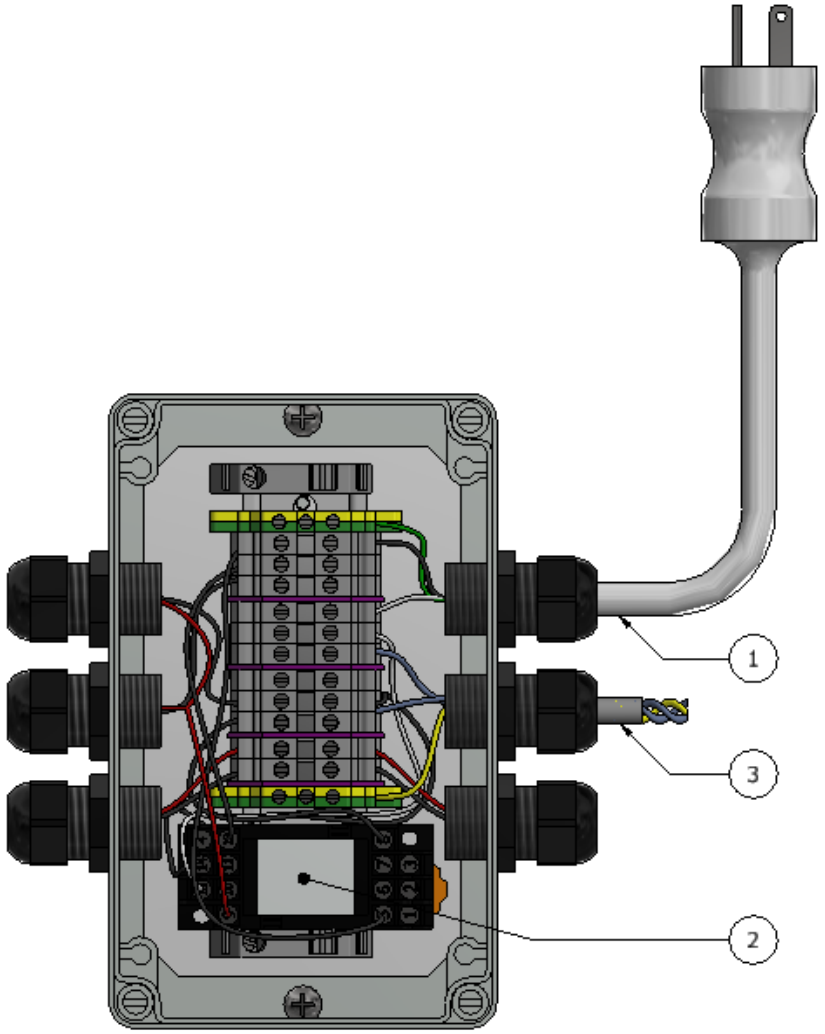
Before removing the terminal box cover, make sure the electrical supply is **disconnected** and the electrical box is properly locked and tagged out**.**

WARNING: **The pumped liquid may be scalding hot and under high pressure. Before any removal or dismantling of the pump, the system must be drained, or the suction & discharge valves must be closed.**

Fault	Cause(s)
Pump capacity not constant	• Pump inlet pressure is too low • Inlet pipe partially blocked by impurities • Pump takes in air
Pump runs but discharges no water	• Inlet pipe partially blocked by impurities • Suction valve blocked in closed position • Leakage in inlet pipe • Air in inlet pipe or pump
Pump runs backwards when switched off	• Leakage in inlet pipe • Suction valve defective • Suction valve blocked in open position • Suction valve blocked in partly open position

10 REPLACEMENT PARTS





CONTROLLER (FRONT COVER REMOVED)

16	66-0055	WIRE,18AWG,2C
15	001-053-0004	CTRL,ASSY,PUMP,BOOSTER,120VAC
14	001-080-0022	PUMP,ASSY,CME 5-3,1.5HP,1PH,208-230V
13	43-0021	GAUGE,0-100,.25,CBM,2.5,LF,SS/SS
12	051-0001	VAL,BALL,.25" MNPT X .25" HB,90 DEG EL,PP
11	55-0026	VAL, CHECK, 1.0 NPT, BLACK, 2 PSI SPRING, PP
10	59-0028	VAL,SOL,1,120V,NC, 3-WIRE,DIN,BRASS
9	66-0165	COND,BODY,FORM 85,TYPE LB,.5,FNPT,AL
8	66-0166	COND,CVR,FORM 85,AL
7	66-0167	COND,GSKT,CVR,FORM 35,NEO
6	85-0068	TANK, PRESSURE, DIAPHRAGM, 1 LITER
5	12677135	HOSE,MEDICAL,1",STYLE 5000
4	15650100	CLAMP,HOSE,1,SST
3	041720169	VAL,BALL,1,TU, SOC,PVC80
2	041732001	VAL,BALL,1.25,TU,PVC80
1	66510612	STRAIN REL,1/2"NPT,STRAIGHT,LIQ-TITE,SPIRAL
ITEM	PART NUMBER	DESCRIPTION
SYSTEM PARTS LIST		

3	66-0087	18 GAUGE,3-CONDUCTOR,PVC JACKET
2	64760239	RELAY,ICE CUBE,4PDT,110/120VAC COIL,5A CONTACT
1	66932111	LINE,CORD,120V,14/3,HOSP GRADE,STRIPPED ENDS
ITEM	PART NUMBER	DESCRIPTION
CONTROLLER ITEM LIST		

11 APPENDIX

11.1 E-Waste

Disposal of the unit or any electrical component from the unit must be in accordance with local requirements in your province or state for the disposal of electrical waste (E-Waste).

Your healthcare provider will be responsible for the disposal of any such items and for the disposal of the unit if required.

Disposal of the device is the responsibility of the Medical Director of the facility. All local codes and regulations regarding the disposal must be followed. **AmeriWater** recommends that the entire device be cleaned/decontaminated prior to beginning the disposal process. Many of the major components may be eligible for recycling in your area, except for the controller. It is recommended that these items be incinerated.

⚠ WARNING

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

Dear Valued Customer,

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

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

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