

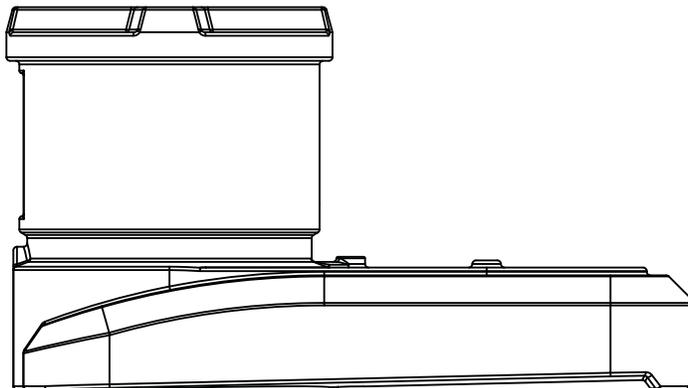
Installation Manual and User Guide



GREYWATER RECYCLING

**RESIDENTIAL
Series**

**Model - LB-300
"LOWBOY"**



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We here at **BRAC SYSTEMS INC.** are very proud of our products and we are completely committed to providing you with the best service possible. Your satisfaction is our #1 priority.

IMPORTANT: PLEASE COMPLETE AND MAIL IN THE PRODUCT REGISTRATION CARD FOUND AT THE BACK OF THIS MANUAL.

II. General Safety Rules

Your **BRAC SYSTEM** requires connection to your home's sanitary drain, and should only be installed by a licensed plumber. This installation guide is intended for general information purposes only.

WARNING: THIS GREYWATER SYSTEM IS FOR INDOOR USE ONLY. DO NOT USE IN DAMP LOCATIONS OR EXPOSE ELECTRICAL CONNECTIONS TO RAIN.

WARNING! The greywater from this unit is not fit for human consumption.

Note: Before beginning installation, carefully read these instructions. This will simplify the installation and ensure that the Brac greywater recycling system is installed correctly and safely. Leave these instructions near the system after installation for future reference.

WARNING!!! Water that has been recycled through the **BRAC SYSTEM** is not intended for drinking purposes! For this reason, do not install a permanent connection to the greywater spout (faucet). This outlet is only provided so you can connect a garden hose temporarily to water your garden, or to prime the system pump. Do not use a sprinkler or spray directly onto your vegetables with greywater. Always clearly mark any greywater outlet. **BRAC SYSTEMS INC.**, and its Representatives or Distributors are absolved of any responsibility, either real or intended, for the misuse of greywater by the consumer.

WARNING! To reduce the risk of fire, electric shock or personal injury, read all the instructions before using this unit. This system is intended for household use only as described in this manual. Any other use including but not limited to commercial, agricultural, or outdoor use, is not recommended by the manufacturer and may cause fire, electric shock, injury and/or damages.

WARNING: To avoid pump failure, double check that the pipe for the fresh water make-up has been connected to the right port on the unit, and that the pump is properly primed.

WARNING: Changes or modifications made to this equipment, not expressly approved by **BRAC SYSTEMS INC.**, or parties authorized by **BRAC SYSTEMS INC.**, could void the user's warranty.

NOTE: BRAC SYSTEMS INC. recommends that the **NORWECO** brand "Bio Sanitizer" Calcium Hypo-Chlorite tablets be used for optimal results. The dissolve rate from these 140-gram (5oz.) tablets has met the performance requirements set forth by **BRAC SYSTEMS**. The CHC tablets can be found at your local pool supply store.

III. Introduction

Congratulations on the purchase of your new **BRAC SYSTEM**. The **BRAC SYSTEM** can help you save over 30% on your indoor water consumption, which will help to sustain our most precious resource and provide for a better future for the generations to come.

When integrated into the plumbing of your home, the **BRAC SYSTEM** captures the water used in your shower, bathtub and clothes washing machine, and recycles it to flush your toilets.

(See figure 1)

The greywater from your shower, bath and laundry enters the **BRAC SYSTEM** through the greywater inlet pipe where it passes through a 100-micron pleated cartridge filter and collects in the lower portion of the **BRAC SYSTEM** tank. A 2" overflow pipe connected to your sewer line prevents the tank from overflowing.

A potable water inlet pipe, controlled by an ultra-sonic level sensor and solenoid valve, assures a minimum level of water in the tank, preventing the pump from running dry and making sure there is always water to flush your toilets.

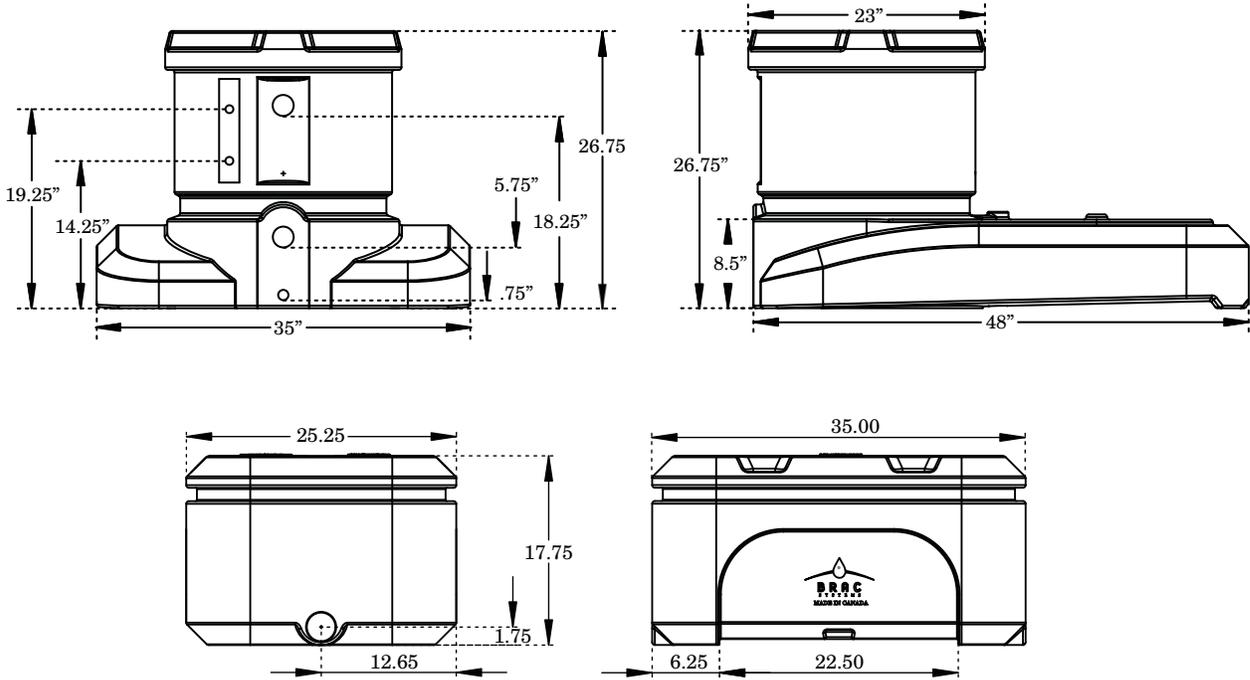
The collected water is drawn through a foot valve by a pump which provides greywater at pressure to the greywater outlet and the irrigation/ priming faucet, supplying greywater to your toilets and, if allowed, your garden.

An electronic chlorination system circulates the greywater through a separate chlorinator at programmable intervals, allowing the greywater to be treated to a safe level without becoming over-chlorinated. A built-in vacation mode assures that the greywater is not over-chlorinated. The filter is easily accessed for cleaning, and a clean-out valve is provided for flushing the tank.

Only a licensed plumber should install the **BRAC SYSTEM**. We recommend that your plumber also install a fresh water bypass and shutoff valve to provide backup clean water to your toilets in the event of a power failure, or should your system require removal for servicing. We also recommend a greywater bypass to overflow be installed (Figure 1), so that in the event of a filter obstruction, your bath and shower drains will not back up.

LAUNDRY OPTION: While laundry water is suitable for reuse, the presence of lint may increase the frequency of filter cleanings required. If using laundry water as a grey water source, **Brac Systems** **BRAC SYSTEMS INC.** offers a pre-filter that will increase the duty cycle of the primary filter. Contact your local dealer for more information. Research and testing has shown that in the average household, with each member taking an average of one shower per day, sufficient quantities of greywater are generated by bathing alone to match the amount of average flushes per day in the same household. So you may choose to omit capturing the laundry water when installing your system. You may also consider installing both a traditional drain alongside a greywater drain to the **BRAC SYSTEM** behind your washing machine. This will allow you to include or exclude your laundry water from greywater collection simply by moving the hooked drain hose behind your washer from one hole to the other. Just be sure to refasten the hose securely.

IV. Technical Data

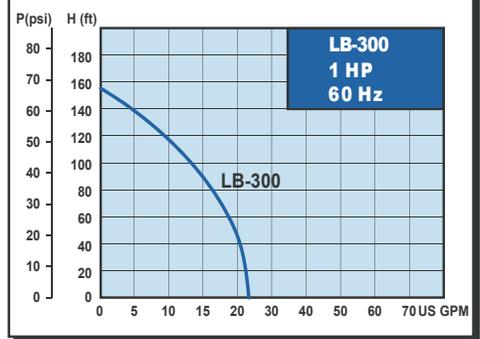


SECONDARY TANKS

Suction Lift Performance Table:

Model	Discharge Pressure in PSI	Capacity in US Gallons per Minute Suction Lift in Feet						Max Pump Boost Pressure
		0	5	10	15	20	25	
LB-300	10	22.4	22.1	21.7	21.3	20.8	20.5	67
	20	20.7	20.2	19.8	19.2	18.8	18.2	
	30	18.3	17.8	17.1	16.2	15.3	14.2	
	40	14.7	13.8	12.9	12.1	11.1	10.2	
	50	10.5	9.3	8.1	6.9	5.6	4.3	

Hydraulic Performance curve:



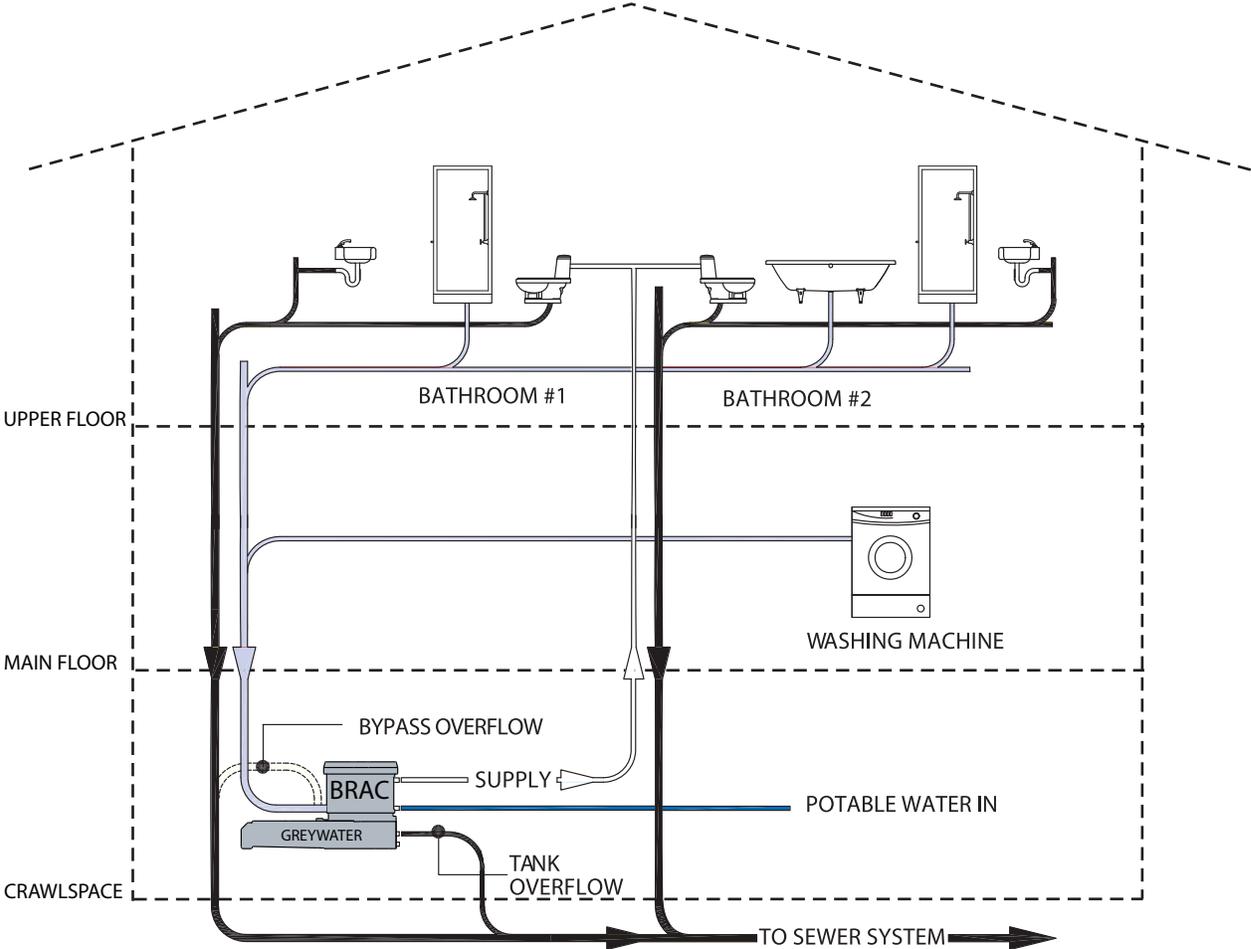
Specifications:

Model LB	Power (H.P.)	Cycle (Hz)	Phase (O)	Voltage (V)	Amp's (A)	H max. (ft.)	Q max. (GPM)
300	1	60	1	115/230	11/5.5	154	23.8

Technical Data:

Model	Capacity		Dimensions (inches)			Weight		Max People	Estimated Annual Consumption in Kw/h (by number of people)				Power (H.P.)	Start-up (watts)	IAPMO Approved
	Litres	Gallons	L	W	H	kgs.	lbs.		2	4	6	8			
LB-300	300	80	48.0	35.00	27	45.5	100	6	41	82	123	164	1	2800	YES

V. Plumbing Diagram 1



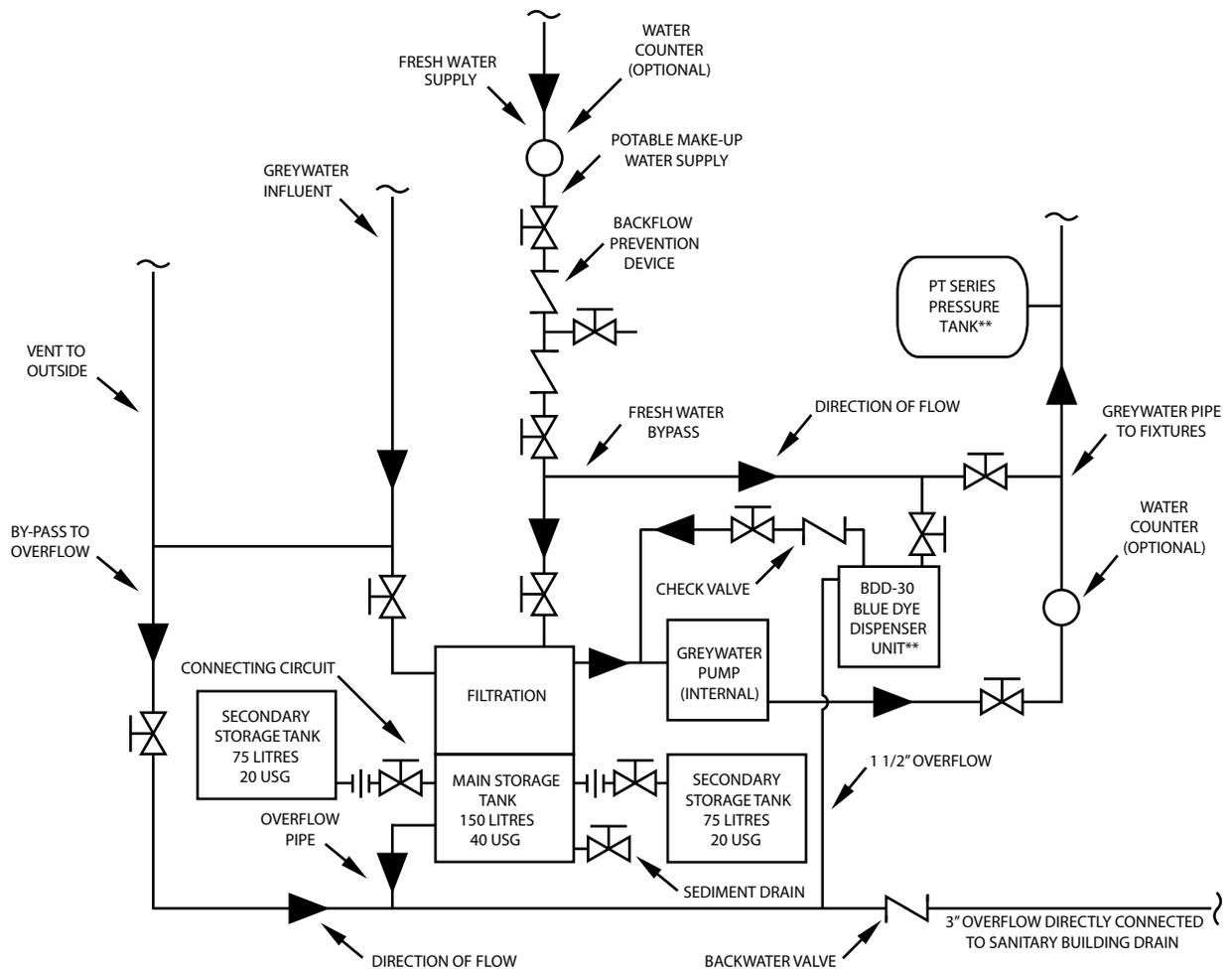
BRAC Systems Plumbing Network

Note: The bypass overflow valve and its piping must be installed by a certified plumber.

- Grey Water From Baths and Showers
- Grey Water From Brac System
- Black Water to Sewers
- Potable Water Inlet

Figure 1

VI. Plumbing Schematic



The backflow prevention device prevents contamination of the potable water system. The freshwater bypass valve provides water to toilets in case of power failure. The greywater bypass prevents the drains from backing up in case of a filter obstruction. The backflow preventer prevents contamination in the event of a sewage back up. The vent and overflow pipes must be at least the same size as the inlet pipe (maximum 2").

** Shown with optional BDD-30 Blue Dye Dispenser and PT Series pressure tank

VII. Installation Overview

Your **BRAC SYSTEM** requires connection to your home's sanitary drain, and should only be installed by a licensed plumber. This installation guide is intended for general information purposes only. Further discussion and diagrams of plumbing particulars, such as the bypass, cross connection contamination prevention, and backflow prevention, are included in Section VIII – Installation Instructions. For a diagram of the system components, see figure 4 on page 13.

Secondary Tanks: 2 - 75 litre (20 USG) saddle tanks. Positioned on either side of main tank and connected together with supplied 2" pipe and fittings. (fittings are supplied for this configuration only). See page 5 for dimensions.

Greywater inlet: 2" ABS-DWV fitting. Water from your showers, bathtubs, and laundry that is being recycled enters the **BRAC SYSTEM** here.

Ventilation Grates: These three 1-3/8" grates allow for air to circulate to and from the sealed upper portion of the tank in order to help cool the pump's motor.

Greywater outlet: A 3/4" male threaded fitting. Greywater flows out of the **BRAC SYSTEM** under pressure, to provide water to your toilets, or if allowed, your irrigation.

Fresh water inlet: A 3/4" male threaded fitting. Fresh potable water enters the **BRAC SYSTEM** here to provide a back-up volume of water, should your bathing and laundry activities periodically fail to provide the minimum volume of water necessary to operate the system.

The threads of the greywater outlet and fresh water inlet should be wrapped several times with Teflon tape before connecting. **DO NOT** over-tighten these connections and always use a back-up wrench on the fitting located inside the tank.

Priming and irrigation faucet: It is recommended that a standard hosebibb be installed on the greywater outlet piping downstream of the shut-off valve. See Figure 3 on page 11. This faucet will provide water at pressure for use in your garden and is also used to prime the system pump, and to release system pressure prior to servicing the pump.

Overflow: 2" ABS-DWV drainpipe fitting. Connects to sewer line. A bypass line and vent pipe must be connected to the overflow pipe, see figure 5 on page 14.

Vent: 2" ABS-DWV drainpipe fitting. The vent must terminate to open air, or be connected to another vent that terminates to open air.

Cleanout valve: 1" PVC ball valve, female threaded. Used to drain the tank. Will also connect to the sewer line (if required by local codes), or drains into an open trapped floor drain. To prevent damage during shipping, the ball valve has been removed and placed in the bag with the transformer and warning tape. **It must be reinstalled prior to system installation.**

VIII. Installation Instructions

Plumbing codes vary by jurisdiction. Your certified plumber will know the codes for your area. These notes are provided for informational purposes only, and as a general guide for your plumber to follow. About Cross Connection Control Devices (CCCD). CCCD is a generic term that refers to devices or methods that prevent potable water supplies from being contaminated by non-potable water. A CCCD can be as simple as an air gap, or as complex as a Reduced Pressure Back Flow Assembly (RPBA). Other common types of CCCD's include Double Check Valve Assemblies (DCVA), and simple check valves. Your local plumbing official will determine which type of CCCD is required for your particular installation.

Plumber's Installation Instructions:

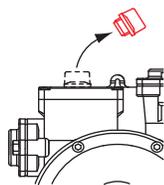
1. Position the **BRAC SYSTEM** in a location so that all connections will remain accessible. The two secondary 75 Litre tanks will connect to the main tank through 2" threaded ports located on either side of the main tank, and located on the ends of the secondary tanks. See page 5 for tank dimensions. All **BRAC SYSTEMS** tanks must be installed on a solid level surface in a dry area and must be protected from freezing.
2. Apply Teflon tape or liquid Teflon to the supplied 2" threaded adapters and install them into the connection ports of each tank. Each connection will have it's own shut-off valve and union connection which are also supplied. Install the shut-off valves so that the handles are in an upright position and can operate freely.
3. After all threaded connections are made, tighten each union connection as the final step in linking the tanks together.
4. Calculate the fixture units for the tubs & showers that will drain into the **BRAC SYSTEM**, then size the inlet, vent and overflow pipes accordingly. Maximum size of inlet piping can be no larger than 2" in diameter. This would be a maximum of 4 showers connected to the **Brac System**.
5. Following local plumbing codes, connect the drain lines from the fixtures to the greywater inlet port of the **BRAC SYSTEM**. (See figure 1)., Install a bypass and vent pipe to the overflow drain. For bypass piping, install a Tee "standing up", upstream of the greywater ball valve with a minimum of 6" horizontally between the bypass and vent Tee's, and then connect to the overflow piping upstream of the backwater valve. The 6" horizontal length will prevent the loss of greywater through the bypass during normal operation. (See figure 5).
6. Install a backwater valve (such as a swing check valve) down stream of the overflow port, and connect the overflow pipe directly to the building drain. (See figure 2).
7. The vent must terminate to open air, or be connected to another vent that terminates to open air. Check your local codes for venting requirements. (See figure 5).
8. Install a cross-connection control device (CCCD) on the potable water pipe to the "fresh water in" port of the **BRAC SYSTEM**. (See figure 3).
9. For reasons such as power failure, it is recommended that a bypass line with shut-off valves be installed between the "potable water in" and the "greywater out" lines, downstream of the CCCD. This will ensure that the toilets are supplied with pressurized water for normal operations at all times. (See figure 3).

IX. Priming and Start-Up

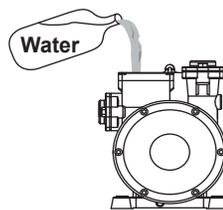
After the **BRAC SYSTEM** has been completely installed, follow these steps to prime and power up the system.

- Open the ball valve on the freshwater IN pipe to allow the line to pressurize.
- Plug in the transformer cord to a wall outlet. The fresh water solenoid valve should open and the tank should begin to fill with clean water. When the water level reaches the minimum amount required for the pump to operate safely, approximately 38 litres (10 USG), the valve will automatically close and shut-off the fresh water supply. Make sure to have filled the suction pipe with water prior to installing.
- Remove the small red cap from the top of the pump housing. Fill the small compartment revealed under the red cap with water then replace the cap. See Figure A. **TIP:** If a freshwater bypass line has been installed, open the bypass shut-off valve to allow the lines to pressurize. Place a bucket under, or connect a short hose to, the external irrigation/priming faucet and open faucet to expel any remaining air in the lines. Close the bypass shut-off valve.
- Plug in the pump's power cord. The pump should begin drawing water and pressurizing the service lines. Once the pump is primed and the greywater OUT line is pressurized, it will take 8 seconds before the pump shuts off. If the pump fails to prime, unplug the pump, and repeat the three previous steps. Do not let the pump continuously run when not primed. It may take multiple repeats of this step to get the pump primed. Use the above **TIP** if possible.
- Place a bucket under, or connect a short hose to, the external irrigation faucet and open the faucet to test for adequate flow and proper pump function. This will also release any additional air trapped in the system. Flush the toilets to test their function, and to release any additional air trapped in the service lines.
- If the pump fails to start or stop, the factory set pressure switch may need to be adjusted. The instructions for the location and adjustments of the pressure switch can be found in Section XV – Pump Manual.

a. Remove the filling plug



b. Fill water in chamber



c. Replace the filling plug

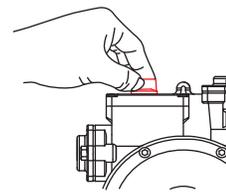


Figure A

IF YOU ARE STILL EXPERIENCING PROBLEMS WITH THE START-UP PROCEDURES AND HAVE FOLLOWED ALL INSTRUCTIONS THOROUGHLY, CALL YOUR LOCAL BRAC SYSTEMS DEALER OR OUR TOLL-FREE SUPPORT LINE AT 1.866.494.2722

X. Safety Components

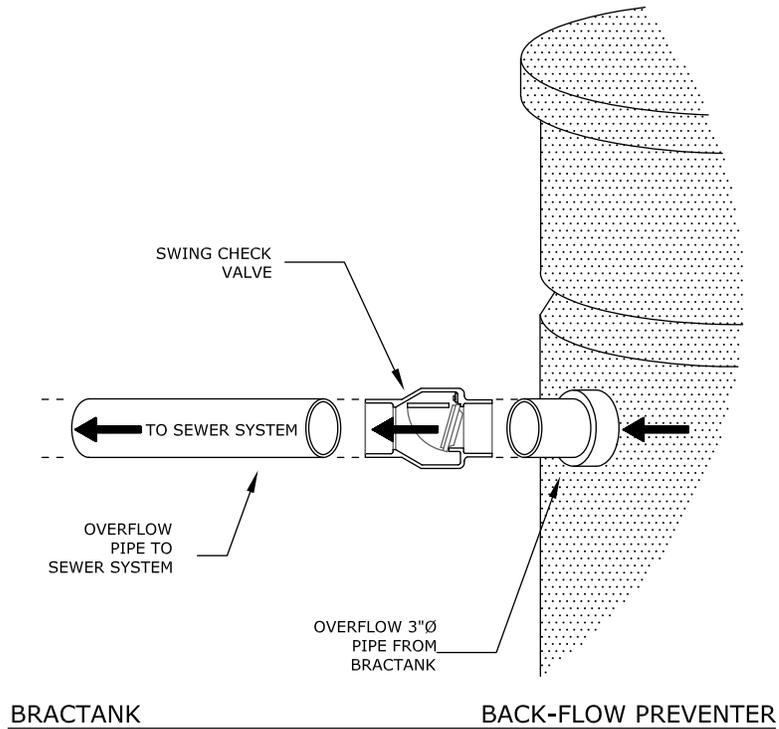


Figure 2

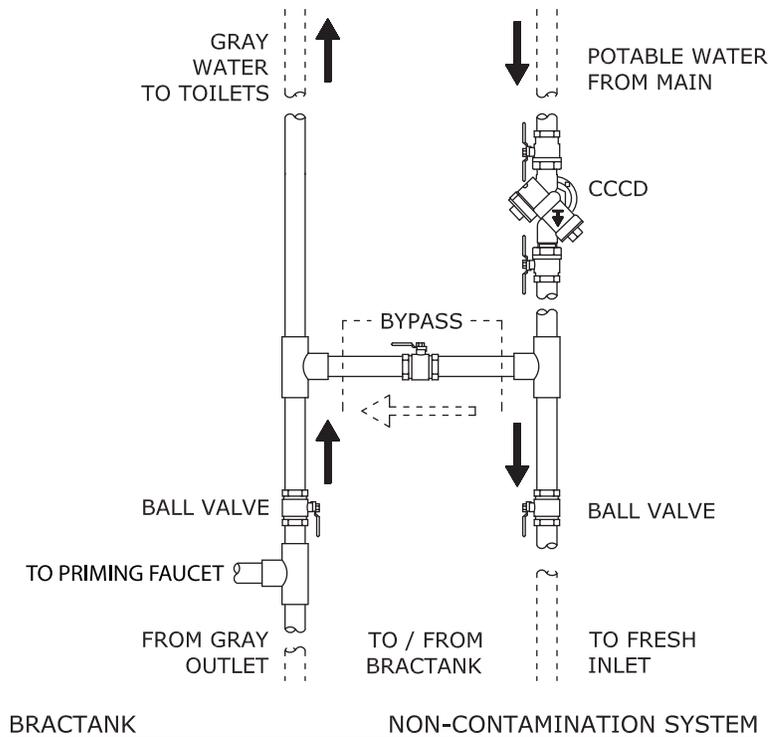


Figure 3

XI. System Components

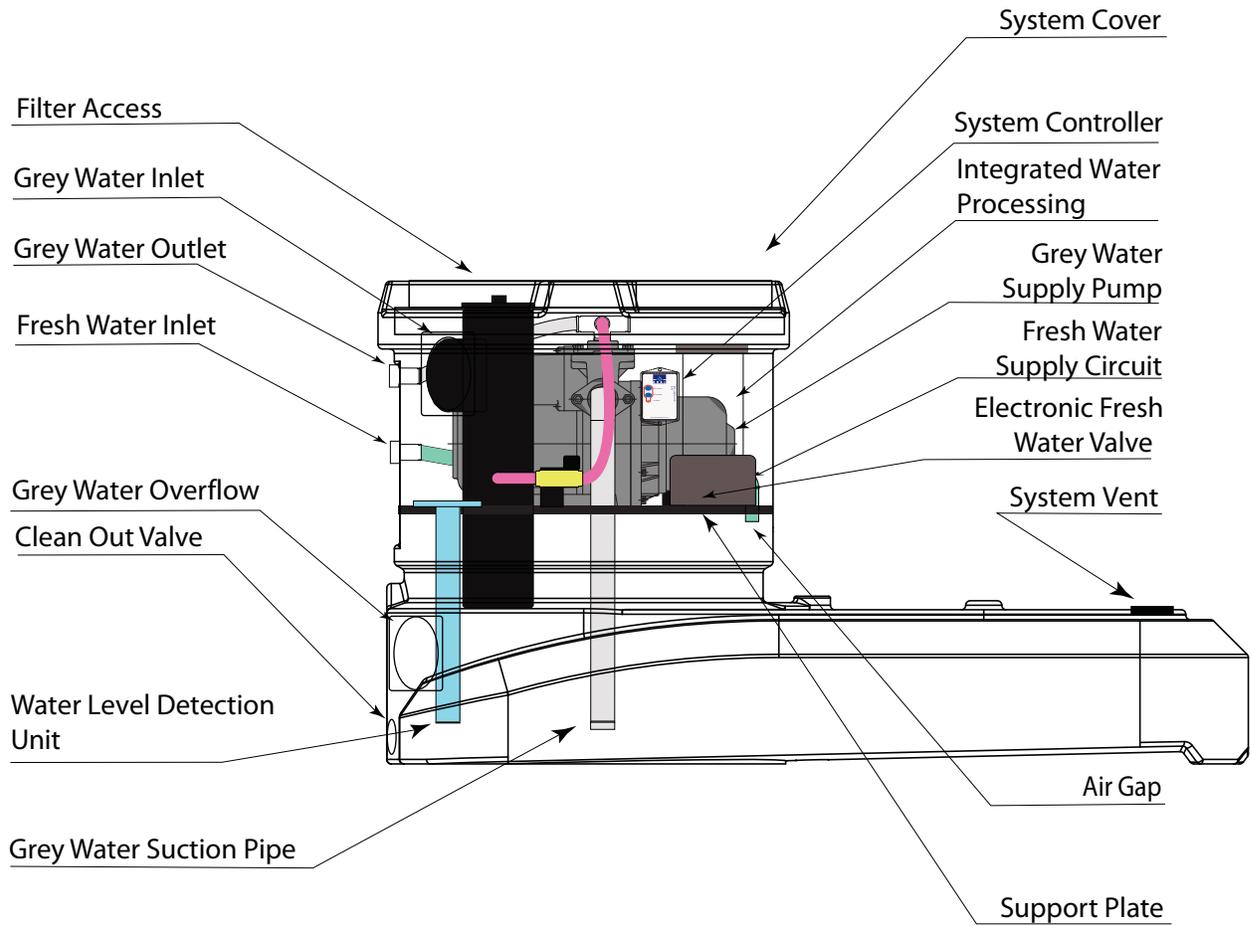
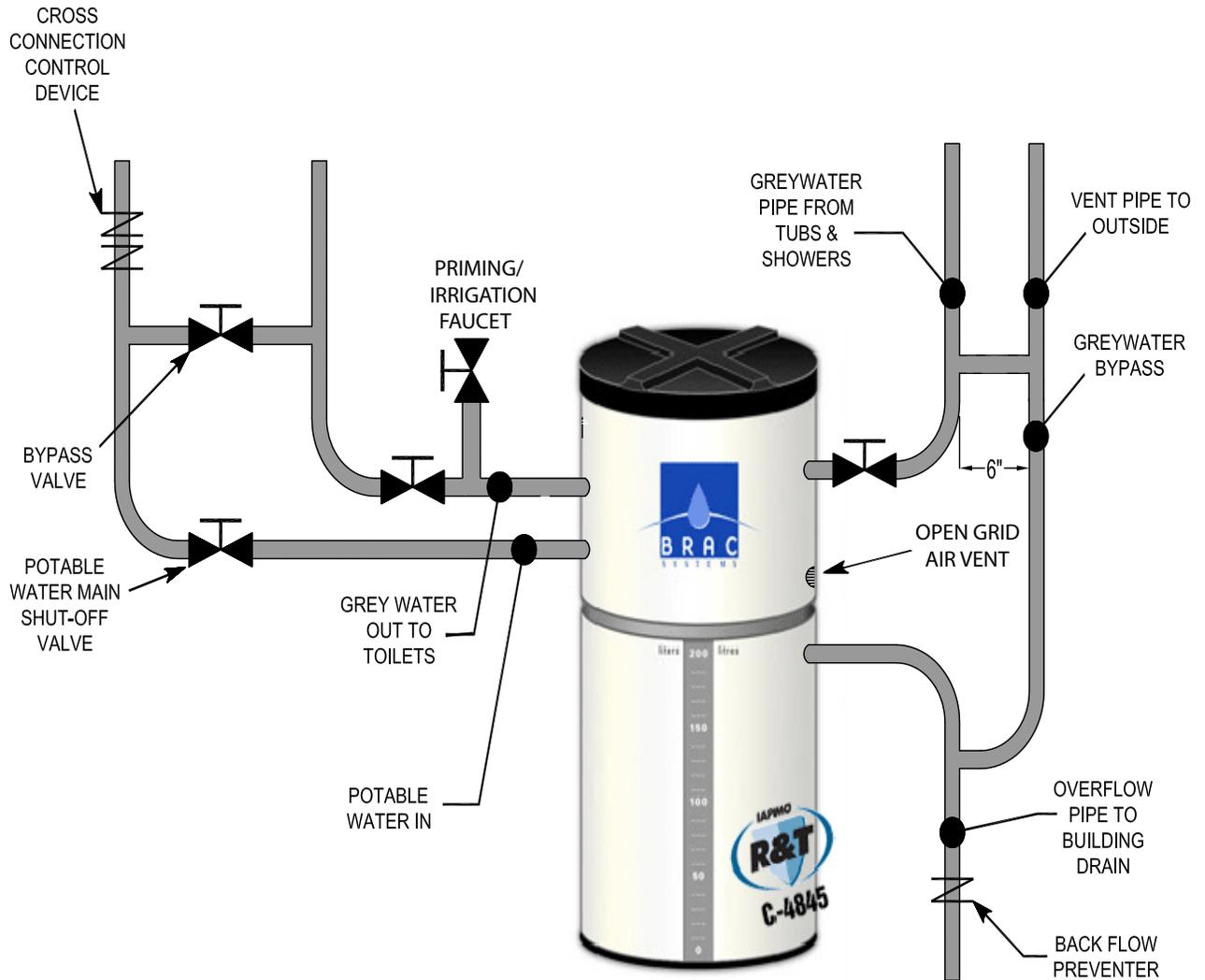


Figure 4

XII. Plumbing Diagram 2



The cross connection device prevents contamination of the potable water system. The bypass valve provides water to toilets in case of power failure. The greywater bypass prevents the drains from backing-up in case of filter obstruction. The backflow preventer prevents contamination in the event of a sewage back-up. The vent and overflow pipes must be at least the same size as the inlet pipe (maximum 3").

Figure 5

XIII. Water Management Set-Up

Brac Controller BC-100

Your **BRAC SYSTEM** is equipped with the BC-100 Water Management Controller.

The Water Management Controller in your system has been factory pre-set to manage the greywater throughout the day for optimal disinfection with minimal free chlorine levels. There are 16 possible settings ranging from twice per day chlorination (0 setting), to maximum chlorination (15 setting). The default setting is level 6 chlorination which will keep optimal levels of free chlorine in the greywater based on daily flow volumes of 250 litres (66 USG). If more or less daily flow volumes are expected, then the setting should be adjusted accordingly. Each setting will increase or decrease the free chlorine level by 0.5 ppm.

The Water Management Controller will process the greywater at a minimum twice per day every 12 hours based on the quantity of water in the main holding tank. If the switch setting is set to 1 or more, the system will monitor in real time the greywater entering the system and will process on an ongoing basis to insure proper water quality. If the system is unused for more than 12 hours, the system will enter "holiday mode" and will process the greywater to optimize the resources such as electricity, water and chlorine.

Please take note that regardless of the switch settings, the system will process the water at a minimum of every 12 hours. The system clock starts at 0 hour when powered on. To avoid pump starts during the night, we recommend that the unit be powered ON between 6-10 AM or 6-10 PM. This way, the system will go through its water processing cycles at more convenient times for the household.

The Enabled LED should be green to show that the system is operational. If the LED flashes from green to red, this indicates that there is a problem with the water level sensor.

XIII. Water Management Set-Up



<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 0	No Extra Chlorination	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 8	Level 8 Chlorination
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1	Minimal Chlorination	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 9	Level 9 Chlorination
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 2	Level 2 Chlorination	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 10	Level 10 Chlorination
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 3	Level 3 Chlorination	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 11	Level 11 Chlorination
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 4	Level 4 Chlorination	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 12	Level 12 Chlorination
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 5	Level 5 Chlorination	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 13	Level 13 Chlorination
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 6	Level 6 Chlorination	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 14	Level 14 Chlorination
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 7	Level 7 Chlorination	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 15	Maximum Chlorination

The chlorination cycle can also be manually operated by pressing the blue “Chlorinator” button on the BC-100 controller. The chlorination valve will operate only while the “Chlorinator” button is pressed. Once you release the button, the chlorination valve will close.

The fresh water make-up circuit is automatically managed by the BC-100 controller. It too can be manually operated by pressing the blue “Fresh Water” button on the BC-100 controller. The fresh water make-up valve will operate only while the “Fresh Water” button is pressed. Once you release the button, the fresh water make-up valve will close.

Warning: Do not depress the blue buttons on the BC-100 controller for an extended period of time. This could cause damage to the controller. Either the “Fresh Water” button or the “Chlorinator” button should not need to be pressed for more than one minute at a time.

XIV. Care and Maintenance

There are three main areas of routine maintenance that must be attended to:

- **Maintenance of the chlorinating system**
- **Filter cleaning**
- **Tank cleaning**

Chlorinating system

When left untreated, greywater can quickly turn to black water within 72 hours. The **BRAC SYSTEM** features an electronic chlorination system that circulates the greywater through a separate chlorinator at programmable intervals, allowing the greywater to be treated to a safe level without becoming over-chlorinated. A built-in vacation mode assures that the greywater is never over-chlorinated. While the timer controlling this system is preset at the factory, proper chlorinating requires the user to visually inspect the chlorine tablets and add new ones when necessary. Visual checks of the chlorine tablets should be done during the filter cleaning procedure. (See next section – “Cleaning the filter”).

BRAC SYSTEMS INC. recommends that the **NORWECO** brand “Bio Sanitizer” Calcium Hypo-Chlorite tablets be used for optimal results. The dissolve rate from these 140-gram (5oz.) tablets has met the performance requirements set forth by **BRAC SYSTEMS**. The CHC tablets can be found at your local pool supply store. The CHC tablets are stacked one on top of the other in a separate chlorinator providing a continuous use that should last approximately 3 months, depending on usage.

Directions: Remove lid of chlorinator by turning lid counter-clockwise. **Warning:** Be careful of chlorine gas when opening lid. Do not put nose directly over open chlorinator as serious injury may occur!

Following the manufacturers CHC handling instructions, refill the **BRAC SYSTEMS** chlorinator. The chlorinator will hold eight (8) 140-gram (5oz.) tablets. Replace the chlorinator lid and tighten securely.

Some jurisdictions require that greywater be dyed blue or green before being served to Toilets or urinals. In this case, please refer to the products page on the **BRAC SYSTEMS** website, then click on the BDD-30 Blue Dye Dispenser for more information.

The CHC tablets can be found at your local pool supply store. If your local pool supply store does not carry the **NORWECO** brand CHC tablets, contact your local **BRAC SYSTEMS** dealer or representative for further assistance.

XIV. Care and Maintenance

Cleaning the filter

As we are unable to determine the number of family members in each particular household, we recommend that you inspect and clean the filter every week. If you realize that the build up of residue in the filter does not warrant cleaning the filter every week, we recommend that you decrease the frequency of inspecting and cleaning of the filter by three days at a time, (every ten days, every thirteen days, every sixteen days, and so on...), until you determine the proper time interval for your particular situation. To reduce the frequency of required filter cleanings, it is recommended that users install an inexpensive hair filter in the bath and shower drains or a “Y” Strainer on the grey water line before the BRAC Systems filter housing. Also bear in mind that the capture of laundry water will cause the filter to clog more frequently, due to laundry lint.

Procedure:

1. If the potable water bypass is installed, open the bypass valve to allow the toilets to operate on potable water during this procedure.
2. If the greywater bypass is installed, close the bypass valve to divert any bath drainage to the sewer during this procedure.
3. Unplug both the pump power cord and the transformer from the power source to secure the system.
4. Remove the tank lid and the screw cap from the filter housing.
5. Carefully remove filter from housing.
6. Rinse the cartridge filter in the sink or outside with a garden hose. If necessary, soak filter in 50% water and 50% cartridge filter cleaning solution for 12 hours and then rinse with water. Use the replacement filter while filter is soaking.
7. Return the filter to the housing, replace filter housing cap and tank's lid. Apply a thin layer of petroleum jelly to the rubber o-ring on the screw cap to ensure a proper seal.
8. Close potable bypass valve, and greywater bypass valve, if applicable.
9. Plug in the transformer and pump's power cord.

If the filter is damaged, or has to be replaced, please use the extra filter, which has been supplied by **BRAC SYSTEMS**. We recommend that you purchase new filters from your local **BRAC SYSTEMS** dealer or representative so that you always have an extra filter on hand. **Tip:** Some users have found it convenient to alternate the use of the factory-installed filter and the extra filter provided at each cleaning procedure.

XIV. Care and Maintenance

Cleaning the tank

Note: It has been our experience that with a properly chlorinated system there will be no sludge build-up in the bottom of the tank and this procedure is unnecessary. However, we leave the procedure in place in the event that a user does find it necessary to clean the tank.

The same principal used for determining the time interval of cleaning the filter holds true for the cleaning of the tank. Under normal circumstances, it should be sufficient to clean the tank once a year. Initially, we recommend that you inspect and clean the tank every three months until you have determined the proper cleaning interval.

Procedure:

1. Unplug the pump power cable and the transformer from the power source.
2. If a greywater bypass is installed, close the bypass valve to direct any bath drainage to the sewer during this procedure. **IMPORTANT:** If a greywater bypass has not been installed, do not use the bath, shower or laundry while cleaning the tank.
3. If a potable water bypass is installed, open the bypass valve to provide potable water service to the toilets during this procedure.
4. Make sure that the clean-out valve is connected to your sewer pipe, or drains into an open trapped drain.
5. Open clean-out valve and empty tank.
6. Close clean-out valve.
7. Remove the screw cap for the filter housing and remove the filter.
8. Pour a minimum of five litres of household vinegar through the filter housing, and allow to stand in the tank for fifteen to twenty minutes.
9. Return the filter to the housing, replace filter-housing cap. Apply a thin layer of petroleum jelly to the rubber o-ring on the screw cap to ensure a proper seal.
10. Plug in the transformer to the power source, but do not plug in the pump cable yet. Potable water should start flowing into the tank.
11. Open the clean-out valve to allow the vinegar to drain as fresh water is added to the tank. Allow the tank to self-flush with potable water for five minutes.
12. Close clean-out valve, and with the fresh water supply still running, allow the tank to fill until the float valve turns off the fresh water.
13. Close the fresh water bypass valve, and open the greywater bypass valve, if applicable.
14. Plug in the pump power cable.
15. Replace the tank lid.

After cleaning the tank, flush each toilet once to ensure proper function. During the cleaning process of the tank, do a visual inspection of all fittings, connections and the tank to ensure there are no leaks anywhere.

The overall time required for this procedure is approximately 30 minutes.

XV. Pump Manual

Operating conditions:

1. Ambient temp: Max. + 40° C (104°F)
2. Liquid Temp: + 4° C (39°F) ~ + 40°C (104°F) Max.
3. System pressure: Max. 120 psi
4. Relative humidity: Max. 85% (RH)

Electrical connection:

Ensure the mains voltage is the same as the value shown on the motor plate and that the pump is safely connected to ground.

Precautions:

1. The pump should be shut down and the trouble corrected if the pump is running at speed and found to have any of the following problems: - No liquid discharged - not enough liquid discharged – Excessive vibration – Motor runs hot.

2. Do not allow pump to continually start/stop (cycling). This will reduce motor life.

3. Cycling can occur on pressure units when pressure tank pre-charge drops, or when there is a leak in the discharge plumbing.

4. Pressure tank pre-charge should be checked at regular intervals of every 3 months and after the pump has not been used for a prolonged period. To check the pressure tank air pressure, turn off power, open a tap on the discharge line to release pressure from the pump, unscrew the black plastic cover and apply an accurate pressure gauge to the valve. Pressure should be adjusted to the original pre-charge as follows: TQ400: 21 psi - TQ800: 28 psi

Maintenance:

Under normal operating conditions, the pump does not require any maintenance as long as the following points are observed:

1. Periodically check the condition of the check valve located under the red fill cap. Remove the prime cover to check the condition of the check valve.
2. Periodically check the condition of the pump strainer located on the inlet of the pump. Remove the two flange bolts from the suction pipe assembly to access the strainer.
3. If the pump sticks after periods of inactivity, a screwdriver slot is provided on the motor shaft end to free up the pump/motor. To do so, insert a screwdriver in the slot in the motor shaft and turn to free the rotor.

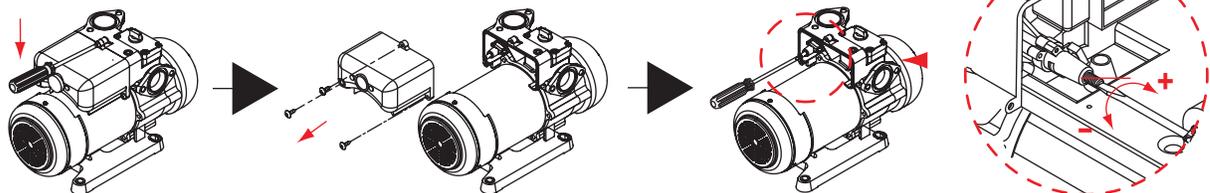
Adjusting pressure switch

A hole has been provided in the plastic cover corresponding with the pressure switch bolt location. Insert a small screwdriver into the hole to adjust the pressure switch. Make sure the system is primed. The pump is supplied with a preset pressure in the pressure switch. In some cases a different pressure may be required. This can be done by following the instructions below.

1. If pump does not start when priming faucet is open, adjust clockwise (“+”) until it starts.
2. If pump does not stop when priming faucet is closed, adjust counter-clockwise (“-”) until it stops.
3. After adjustment is made, open and close priming faucet several times to make sure the pump operates normally.

TQ 400/800

Open the cover to adjust the pressure



XVI. Frequently Asked Questions

-What is greywater?

Greywater is the water generated from the use of the shower, bathtub, hand sink, laundry, kitchen sink, and dishwasher.

-Is greywater different from wastewater?

Yes. Household wastewater, also known as sewage, is composed of two distinct sources:

- “**Black water**” is wastewater contaminated by feces or urine, and includes wastewater arising from toilet, urinal, or bidet.
- “**Greywater**” is the remaining wastewater coming from the laundry, bathroom and kitchen.

-Is it safe to reuse greywater?

Yes, if used in an appropriate way. Greywater can contain disease-causing micro-organisms such as bacteria, protozoa, viruses and parasites. It may also contain fats, oils, detergents, soaps, salt, nutrients, food and hair derived from household and personal cleaning activities. These constituents can pose both health and environmental risks. However, the public health risks associated with onsite reuse of domestic greywater are considered low, as the source of the contamination would be from the immediate family. Other sources of transfer of pathogens around the immediate family are considered a higher risk, such as direct contact or sharing of food and utensils. Similarly, the risk of environmental damage from the careful use of greywater is low.

-How can I reduce the risks associated with greywater reuse?

The following measures will reduce the health and environmental risks associated with the use of greywater:

- Do not use sprinklers to distribute greywater;
- Use subsurface irrigation systems;
- Do not spray greywater directly onto food plants;
- Do not put greywater on lawns where children are likely to play;
- Do not irrigate with greywater during periods of wet weather;
- Do not allow greywater to enter the storm water system;
- Make sure greywater does not create a nuisance, for example through odors or ponding.

-Can greywater from all parts of the house be reused?

Kitchen: Kitchen wastewater could be heavily polluted with food particles, oils, fats, and other wastes. It can also contain high concentrations of micro-organisms. It is often polluted with detergents and cleaning agents, particularly those from dishwashers, which are very alkaline and may be harmful to soils and plants by altering their characteristics in the long term. For these reasons kitchen greywater is not recommended for use.

Bathroom: Chemical constituents of bathroom greywater include soap, shampoo, hair dyes, toothpaste and cleaning chemicals. Greywater from hand basins is more polluted than bath or shower greywater, but is much lower in volume.

Some of these contaminants act as plant nutrients and can be beneficial in the garden, but others can adversely affect plants or soil structure. Concern is often expressed about people urinating in showers and baths and the associated health aspects of using greywater in the garden. However, urine in a healthy person is sterile. While some bladder infections may pass micro-organisms in urine, the potential for these organisms to survive and cause infection is considered remote. Greywater from the bathroom is suitable for reuse.

Laundry: Greywater from the laundry improves in quality from wash water to first rinse water to second rinse water. Bacterial loads in laundry greywater are not usually high, except when diapers are washed. Chemical contaminants of the wash cycle water are soap, salt, sediment and organic material. If used for garden watering, the wash cycle water can damage plants and soils and create bad odors.

XVI. Frequently Asked Questions

Continued. Rinse water contains a much lower pollutant load and the use of this water poses a much lower threat to the environment and to the public health. Domestic pets, which are washed in the laundry tub, can be a further source of contamination for greywater. Greywater from the laundry, particularly rinse water is suitable for reuse.

-Can I store greywater on my property before I use it?

It is recommended that untreated greywater is not stored for more than 24 hours. When the immediate reuse of greywater is not practical, for instance during periods of wet weather, greywater should be directed to the sewer system.

-What is a greywater treatment system?

A treatment system will remove the bacterial load and chemical pollutants from greywater so that it can be stored. However, satisfactory treatment tends to be neither simple nor cheap. Treatment processes can include filtering, settling of solids, anaerobic or aerobic digestion, chemical removal of pollutants, and disinfection.

-What are the environmental risks associated with reusing greywater?

Soil or plants can process many of the contaminants in greywater if the system is not overloaded, including organic material, nutrients, salt and sediment. Nutrients can even be beneficial in moderate concentrations, for example, on lawns but not on native plants.

Some greywater contaminants are not capable of being treated or degraded in the soil. Principal among these is salt, which can comprise up to 30% of some laundry detergents and can cause soil degradation.

-How can I improve greywater quality by using different types of soaps?

The choice of cleaning products can reduce the environmental impact of greywater. Common washing powders contain sodium salts as bulking agents that produces a saline (salty) greywater. Some detergents and powder cleansers contain boron that can be toxic to plants in high concentration. It is recommended that for clothes washing you select products low in sodium - either liquid concentrates or powdered products that use potassium salts. There are websites that list the sodium content of a range of laundry products.

-Will the chlorine tablets cause problems with my septic tank?

Considering the concentration of chlorine in the volumes of water involved, the chlorine in your greywater shouldn't cause any problems in a modern, healthy septic system. While we haven't had any reports of problems, there could be issues with older, smaller septic systems that are already operating on the edge of failure. In such cases, there are a variety of products available, such as "Septic Miracle" and "Organica Cesspool/Septic Treatment", to name two, that can help boost the bacterial culture of a struggling septic system. Consult with a waste professional if you have concerns about your septic system. Not using tablets at all is **not** recommended and the resulting bacteria growth could cause harm to the functioning parts of the system. Unpleasant odours will almost certainly result after a few weeks.

-What happens in the event of an extended power outage, or if my BRAC SYSTEM needs to be removed for some reason?

When your plumber installs your **BRAC SYSTEM**, he should install a fresh water bypass with ball and check valves between the fresh water supply and the grey water outlet lines. This will allow you to easily supply your toilets with fresh water (and prevent the contamination of your fresh water with grey water) in the event of an extended power outage or removal of the tank.

XVI. Frequently Asked Questions

-Why does the Brac System have a potable water connection?

The pump in the system can be severely damaged by allowing it to run dry. While an average household will produce enough greywater to keep plenty of water in the tank, there will be occasions when the demand will exceed the supply. The fresh water system insures that there is always enough water in your tank to prevent the pump from running dry. An electronic float switch connected to a fresh water valve will add potable water from your home's plumbing system when the level of water in your tank reaches a minimum level, and will automatically stop adding water when the water reaches a safe level.

TQ Pump frequently asked questions:

-What causes the TQ to start?

The TQ has the built-in pressure switch and internal flow switch. Each of these can turn the pump on depending on water consumption. The pump will start when:

- The pressure is BELOW the pressure switch activation point. OR
- The flow rate is greater than 0.7 GPM.

The preset activation point for each model is provided in the pump specifications. The cut in pressure must be lower than the preset activation pump; otherwise the pump will not start.

-What is the maximum pressures switch activation point?

Adjust the pressure only when the cut in pressure is higher than the preset activation point. Do not adjust the pressure to exceed the maximum pressure range of 67 psi, this may cause the pump to not stop.

-What causes the TQ to stop?

The flow switch is designed to automatically stop the TQ pump when flow drops to below 0.7 GPM. The pump will shut off in 8 seconds after flow stops. In addition, the TQ will be turned off in the event of dry-run or over temperature alarm.

-What is the purpose of the built-in pressure tank?

The pressure tank comes preset from the factory at 21 psi (1.5 Kg/cm²) for the TQ400 and 28 psi (2.0 Kg/cm²) for the TQ800, (with the pump pressure at zero). It is designed to minimize motor start-up due to small flow demand or minor leak of the pipeline.

-How is the dry-run condition determined and the protection provided?

The dry-run is defined when the motor is running AND the flow rate is less than 0.3 GPM AND when pressure is less than the pressure switch setting. The protection is provided by a temperature sensor that will cut off the pump when the temperature reaches 131°F (55°C). It will attempt to restart when the temperature drops to 104°F (40°C).

XVII. Troubleshooting Guide

Pump runs continuously, or with only brief pauses - level of water in lower tank is at or above “Minimum” level:

- Irrigation faucet is in use - normal condition. Hose pressure is provided by the pump and pressure tank.
- Toilet leaking - check toilet flapper valves. A leaking toilet will cause the pump to run continuously.
- Pump has lost it's prime – Reprime pump following priming instructions located on page 10 of this manual.

Pump runs continuously, or with only brief pauses - water level in lower tank is below “Minimum” level:

- No fresh water supply - unplug pump to prevent damage to pump. Check fresh water connections to the tank, and make sure that all the valves are open. If all valves are open, and there is still no fresh water supply, let the water in your shower or bath run until there is an adequate supply of water in the tank, and contact your Brac service person.
- Pump has lost it's prime – Reprime pump following priming instructions located on page 10 of this manual.

Lower tank is full, and draining out of overflow pipe

- Greywater supply exceeds usage - normal condition. Confirm by flushing toilets several times, without running any showers, baths, or laundry, and observing that the water level in the tank drops, and does not immediately rise again.

Lower tank is not filling with greywater when tub/shower is draining

- Filter is clogged - check filter by carefully opening filter housing cap. Rinse filter following recommended cleaning procedure then replace filter back into filter housing. For extra filters call **Brac Systems** or your Brac service rep.

Toilet water emanates noxious odors

- Chlorination tablet expended - check and replace chlorination tablet. If chlorination tablet is fine: Malfunction of chlorination recirculation system, call **Brac Systems** or your Brac service rep.

XVII. Troubleshooting Guide

Before starting work on the pump, make sure that the electricity supply has been switched off and that it cannot be accidentally switched on.		
PROBLEM	CAUSE	REMEDY
1. Pump does not start	a. No power supply	Connect the electricity supply
	b. Too low/high voltage	Check if supply voltage is within +/- 10%
	c. Inadequate pressure at suction discharge	Adjust pressure switch. See section XV. Pump Manual
	d. Seized-up pump	Place a screwdriver against the shaft end of the motor to check if the rotor will spin freely, and contact your local dealer.
2. Pump cuts out during operation.	a. Overloaded motor	Unplug the power supply and plug back in. This will reset the pump. Contact your local dealer.
	b. Poor water supply	Check if pump suction inlet is blocked.
	c. Overheating due to excessive water temperature	1. Wait until water temperature cools down before restarting the pump. 2. Check water supply source.
3. Pump starts when no water is consumed	a. Leak in piping	Fix the leakage.
	Defective check valve or foot valve	Inspect and clean check valve and/or foot valve. Replace if necessary.
4. Pump starts and stops too frequently	a. Leakage in suction pipe or air in water	Check the suction pipe and water supply.
	b. Discharge flow is too low	Adjust fixture to a higher water flow.
	c. Air tank pressure is too low	Check air tank pressure and recharge.
5. Electric shock	a. Ineffective grounding	Reactivate grounding.
6. Pump does not stop when water is not consumed	a. Low water level in tank. Pump is sucking air	1. Unplug the power cord and open the red filling plug to release air. 2. Check make-up water connection for adequate flow.
	b. Pressure is set too high	Adjust pressure. See section XV Pump Manual.
	c. Flow is set too low	
	d. Defective check valve or foot valve	Inspect and clean check valve and/or foot valve. Replace if necessary.
7. Pump runs normal but with very low discharge flow	a. 3-phase motor runs in wrong rotation	Switch any of the two wires from motor terminal to correct rotation.
	b. Poor water supply	Check if water supply is adequate and if the suction pipe is blocked.

XVIII. Consumer Warranty

BRAC SYSTEMS CONSUMER WARRANTY

1. Your warranty is valid for a period of 2 years, from date of purchase.
2. This coverage applies against failure, due to factory defects and workmanship. Should the unit fail it will be repaired or replaced F.O.B. our factory without charge, provided that the unit is returned to our factory prepaid.
3. This warranty does not include labour or service charges incurred by removing or reinstalling the unit and damage caused by abuse or a faulty installation.
4. The company shall not be responsible for or have any obligation whatsoever for direct or indirect loss, consequential damage or otherwise inconvenience arising from any failure of the equipment.

BRAC SYSTEMS INC. assumes no responsibility whatsoever if the greywater recycling system should fail during the warranty period by reason of:

- Misuse, negligence, physical damage or accidents.
- Lack of maintenance (see instruction for proper maintenance).
- Repair by any unauthorized party during the warranty period.
- Damage caused by connection to an improper source or for improper use.

IMPORTANT NOTICE TO THE CONSUMER

If you require any additional information or warranty service with the product you have purchased, please call your original point of sale or representative before advising or returning the product to the original point of purchase.

This product is warranted two (2) years from date of purchase.

All warranty claims must be directed to the factory. The product will be repaired or replaced at our option. Units covered under warranty will be returned to sender freight "prepaid". Units no longer on warranty will be returned to sender freight "collect".

Please be advised that 99% of system problems are caused by an improper installation or user activity. By simply contacting our customer service department, we will be pleased to help you with any questions you may have.

Thank you for choosing **BRAC SYSTEMS**, the product purchased has been designed to give you years of trouble free service.

All of us at **BRAC SYSTEMS** are committed in building the highest quality product available, and to give our customers the satisfaction they deserve.

The **BRAC SYSTEMS** Team

YOU CAN MAKE A DIFFERENCE

XIX. Consumer Warranty Card

**PLEASE MAKE A PHOTOCOPY OF THIS PAGE THEN COMPLETE THE
REGISTRATION INFORMATION AND RETURN TO BRAC SYSTEMS INC.**

Consumer name:

Consumer address:

Consumer telephone and/or email address:

Dealer or distributor name:

Dealer or distributor address:

BRAC SYSTEMS MODEL

Serial number

Purchase date

IMPORTANT: To activate your warranty and register your product, this card must be filled out and returned within thirty (30) days of purchase.

Consumer's signature

Mail to:
Brac Systems Inc.
4034 Poirier Blvd.
St. Laurent, Montreal
Quebec H4R 2A5