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PPO Innovations

Automated Wastewater Management System

Contents

1. Disclaimer
2. Introduction
3. Display Description
 - Tank Level Gauges
 - Buttons
 - Indicators
4. Emergency Stop Button and Indicator Lights
5. Alarms
6. Sewer Hose Connection
7. Shore Water supply
8. Manual Controls
 - Dump Valve Open/Close
 - Rinse Water
10. Auto Modes
 - Auto Dump Enabled
 - Single Dump
 - Quick Dump
11. User Responsibilities
12. Frequently Asked Questions

Handbook Use

This handbook describes the use and operation of the PPO Innovations Wastewater Management system. It is created for educational and instructional purposes only. It shall not be used to re-create, copy or reverse engineer any of the layout, images or operations of this system.

The use of this handbook for any other purpose or publication without the written consent of PPO Innovations Ltd is prohibited.

The “system” refers to the computerized portion of the PPO wastewater management system.

Any modification, mis-use, tampering with or general abuse of the supplied parts may invalidate any warranty and prevent the system from operating as intended.

All inquiries regarding this handbook should be addressed to the author at : info@ppoinnovations.co.uk

2 Introduction

Welcome to the future of RV'ing.

PPO Innovations Waste Water Management System takes the guesswork and concerns away from looking after your holding tanks.

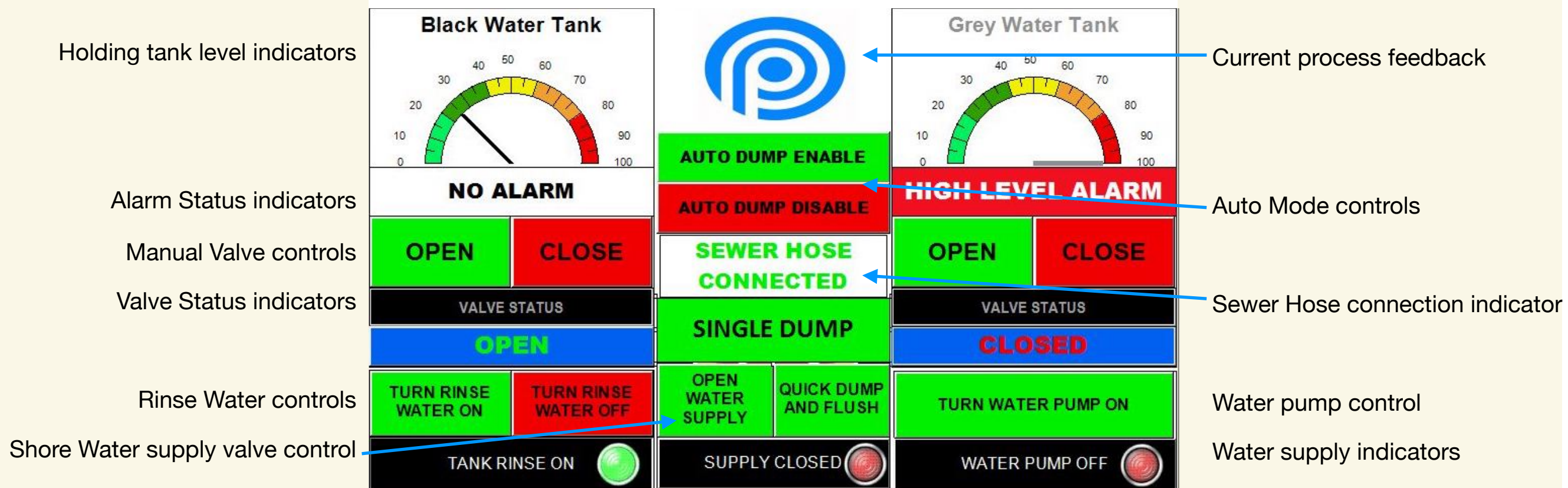
The logic and processes it uses to dump and flush the holding tanks, prevent overflowing of full tanks and wastewater spillage comes from years of experience of Recreational Vehicle owners, their mistakes and success.

Display Description

PPO's full color display screen is a waterproof single touch capacitive touchscreen. It gives feedback and allows the user to control modes, activate holding tank valves and water supply control.

Feedback of valve status, current process in action, alarms and water controls are all displayed in full color.

Buttons and Feedback



4 Emergency Stop and Indicator Lights

Indicator Lights

Top right of the screen is a small red power indicator for the display, whenever power is applied to PPO this light is on. The screen will go into power saving mode and go blank after 15 minutes.

Just touch the screen when it is blank to wake it up.

Right of the screen are 2 indicator lights. The Red indicator shows when the high level alarm is active on either tank or the Emergency Stop button is depressed.

The green indicator shows whenever PPO is in an Auto Mode.

Emergency Stop

This clearly identified physical button located on the front of the PPO control box is the master switch for the system. While pressed in it will prevent water from entering or exiting the plumbing system.

In the case of a flood, burst pipe or any issue with the water within the coach, simply pressing in the EMERGENCY STOP button closes all valves and stops and functions of PPO. PPO is based on a computer system. most program issues within PPO can be resolved by pressing and resetting the EMERGENCY STOP button. To reset, rotate the button 90 degrees clockwise and the button will pop out.



HIGH LEVEL ALARM

A High Level Alarm occurs when either Black or Grey tanks reach maximum volume.

The display will indicate **HIGH LEVEL ALARM** under the full tank level indicator.

The alarm occurs because the system is not left in **AUTO DUMP**. This can be because it has not been enabled, or because the Sewer Hose is not connected.

The Alarm is based on a high level sensor, not the level indicator, therefore the tank volume level may not show 100% but be full enough to activate the sensor.

When a **HIGH ALARM** is active, the water supply to the coach will automatically close and the water pump will not be allowed to run, preventing any more water entering both tanks.

An alarm will be sounded within PPO and the red alarm light will show.

To silence the alarm press in the Emergency Stop button.

Clearing a High Level Alarm

To clear the alarm allowing the water pump to run and shore water supply to open, the tank volume must be reduced.

If the Emergency Stop button is pressed in, all functions of PPO will be stopped. The First step in clearing the alarm is to ensure that the Emergency Button is not engaged by twisting it 90 degrees clockwise so that it pops out.

Holding tank dump valves will be prevented from opening while the sewer hose is not connected. The display will also show **SEWER HOSE NOT CONNECTED** when a hose is not present.

Once a sewer hose is attached to the coach **SEWER HOSE CONNECTED** will be displayed. (This only indicates that the sewer hose is connected to the coach, before proceeding you must ensure that the sewer end of the hose is connected to a sewer drain and secured properly to prevent spillage.

Once connected, the holding tank dump valve controls will appear on the display.

Tap the OPEN button on the tank with the **HIGH LEVEL ALARM** to open the dump valve and allow the tank to drain.

Once the tank volume drops below the High Level Alarm, auto features become available.

Sewer Hose Not Connected

While a sewer hose is not connected to the coach, the system prevents certain functions from being available. This is to prevent accidents and is a major safety lockout in the PPO system.

The system will not allow the Dump Valves or the tank rinse water to operate without a sewer hose attached.

Using modified sewer hoses or fittings that do not make full use of the 4 locking fingers of the coach sewer outlet may result in unreliable or prevent functioning of the system.

Disconnection of a sewer hose from the coach results in the closing of all open dump valves and cancellation of any Automatic Modes.

Without a sewer hose connected, you can only control the shore water supply valve and the water pump.

Sewer Hose Connected

As soon as an approved sewer hose connection is attached to the coach the touch screen will display manual control buttons for the Black Dump Valve, Grey Dump Valve, Tank Rinse options and Auto Modes.



City Water, Shore Supply

There are many terms for it but shore supply refers to a pressurized supply of fresh drinkable (potable) water into the RV from a pedestal or faucet. One of the system components is an electrically operated valve to control the flow of the shore supply into the RV.

The Shore water valve in normal operation will automatically close to prevent over filling of either holding tank and therefore prevent flooding inside of the coach.

When disconnecting from a shore pedestal water connection you can operate the shore supply valve to close the valve immediately at the coach water supply entry, helping prevent dust and bacteria from entering the coach fresh water plumbing.

While the shore water supply valve is closed, certain functions that require freshwater such as the Tank Rinse are unavailable.

The shore supply can be manually controlled by pressing **OPEN WATER SUPPLY** or **CLOSE WATER SUPPLY**.

The system makes use of your shore water supply for the tank rinse function. The rinse feature is plumbed into your RV's freshwater plumbing. RV's use multiple protection devices to prevent a full wastewater tank from contaminating the freshwater system. Rest assured that the PPO system takes into consideration and adds additional protection by use of spring loaded check valves and electric solenoids to prevent any contamination.

Instructions for Shore Supply connection

To operate the Shore Water supply, firstly check that the display indicates Supply Closed, press **Close Water Supply** if the display indicates that the supply is open.

Next connect your freshwater hose to the supply faucet, test that water is available and clean by opening the faucet partially and allow to run for a minute out of the open end of your hose and then shut the faucet.

Connect the open end to the RV. Open the faucet fully and check for any leaks.

Once satisfied that the hose is connected properly and pressurized, press the **Open Water Supply** button.

Your RV should now have a fresh water supply.



Valve Operation

The RV's existing gate valves, that you normally would pull the handle on to open, are now electrically operated by a set of motors with PPO.

These motors are controlled by the system to prevent accidental opening due to user error.

Without a sewer hose connected the valve control options are not available and the valves remain closed.

The **OPEN** and **CLOSE** buttons become available as soon as a sewer hose is connected to the coach.

Pressing the green **OPEN** button opens the dump valve.

The Valve status below indicates the valve position.

The valve will stay open until either the **CLOSE** button is pressed or a **HIGH LEVEL ALARM**, **SEWER HOSE DISCONNECTED** or the **EMERGENCY STOP** button is pressed.

The **OPEN** and **CLOSE** buttons are not available when the system is in Auto Mode. Touching the area where the buttons are normally located when in Auto Mode cancels the Auto Mode.

To Operate a Dump Valve Manually

- Connect Sewer Hose to campground or dump station sewer system with a screw in or secure means of attachment .
- Ensure sewer hose is not obstructed or kinked and check for any visual signs of damage. (Do not use a damaged hose)
- Connect RV end of Sewer Hose to Valve system. **SEWER HOSE CONNECTED** will be displayed on the screen.
- Press once the **OPEN** button of the valve you wish to operate. The valve will open fully and the display will show **OPEN** in the valve status.
- Once operation is complete, press **CLOSE** once and the valve will fully close. **CLOSED** will be displayed in the valve status.
- It is advised that the dump valves are normally left closed to prevent solids building up in the tanks and anything from entering the holding tanks from the sewer system.



Tank Cleaning

The Rinse function is a manual way to flush the black tank with fresh water.

The rinse button is only available when the following criteria is met:

- Sewer hose is connected
- The system is not in an auto mode (no green indicator light)
- Shore water supply is connected
- Supply valve open
- Black water dump valve must be closed.
- Black tank shows less than 75% full

When the rinse function is available the **Turn Rinse Water On** button is displayed

Instructions for manually flushing or adding fresh water to the black tank

- Ensure the sewer hose is properly connected to the sewer system and RV.
- Ensure the shore water supply is connected to the RV and the supply valve is open.
- If the green Auto Mode indicator is lit or Auto Dump Enabled displayed on the screen, press Auto Dump Disable.
- When the rinse function is available the **Turn Rinse Water On** button is displayed.
- Press **Turn Rinse Water On** and the black tank will start filling.
- Black Tank Filling will be displayed on the screen.
- When the tank reaches 75% full, the rinse water will shut off.
- At any time while filling you can stop the rinse by pressing **Turn Rinse Water Off** or the Emergency Stop button.
- Follow instructions for manually operating dump valve to drain the tank.



Auto Dump Enable

Fully automated dumping and flushing of black tank and dumping of grey tank.

PPO Is designed to be a fully automatic Wastewater Management system.

Simply by connecting a shore water supply and a sewer hose allows the user to place the system into full auto mode by pressing the button **AUTO DUMP ENABLE**.

At this point PPO constantly monitors the tank levels of both the Black and Grey holding tanks.

When either tank reaches 75% volume, the holding tank dump valve for that tank will open.

The system will monitor the progress of the tank draining and allow sufficient time for the tank to be fully empty before closing the dump valve.

In the case of the Grey Water Dump valve the system will continue to monitor the tank level and will open and close automatically.

The Black Tank Auto Flush, once fully drained and the valve closed makes use of the rinse water function and automatically proceeds to flush the tank with freshwater until again it reaches 75%.

At which point the flush valve is shut off and the tank drained fully again.

Once the tank is completely empty, PPO closes the black dump valve and opens the grey dump valve allowing any contained grey water to pass through the sewer hose until the grey holding tank is fully emptied and ready again for use.

Once an automatic draining is completed, the system returns automatically to standby, monitoring for the next dump cycle.

While in any Auto Mode, the green indicator light displays to show that an Auto function is engaged.

While in standby in the Auto Dump mode, Auto Dump Enabled is displayed on the screen.

10 Automatic Modes

Single Dump

Single dump of black and grey tanks, no flushing.

Single dump is a one time use Auto Mode. Once the process is completed it will not continue to monitor for the next dump cycle like when Auto Dump is enabled.

Single Dump is designed for dump station use or locations where a potable shore supply is not present and simple emptying of the Black and Grey Holding tanks is necessary.

No flushing takes place and the system returns to manual mode once completed.

Both Black and Grey tanks are emptied in turn and let to drain fully before closing of the dump valves.

While in Operation, the green light will be lit and **SINGLE DUMP ACTIVE** displayed in the centre of the screen.

Quick Dump

Immediately start auto dump and flush of black and dumping of grey tanks.

Quick Dump is available when **AUTO DUMP** is enabled.

Pressing **QUICK DUMP** activates the rinse water to fill the black tank to 75%.

Once the tank reaches 75% this begins the process of the Black Tank Auto Flush.

Once the black tank is emptied, flushed and left empty, the grey tank valve will be opened to empty the grey water tank.

With the process completed, both tanks are left empty and with tank valves closed.

This function helps with campground pack-up or even maintenance flushes while semi-permanently connected to a sewer.

It is the users responsibility to remember to check that the sewer end of the hose is connected securely to a sewer system by means of an approved screw, cam lock or twist fit sewer connector to prevent waste spillage. If the coaches sewer hose is inserted into a fitting or opening of a sewer system without a secure seal then **AUTO DUMP** should not be used and any time the **Black or Grey Valves** are open or opening/closing, the sewer hose should be monitored closely for leaks.

It is the users responsibility to prevent wastewater spillage. PPO is a great start towards this but still requires the User to understand where wastewater can be safely disposed of safely and to follow campground rules and their wastewater policies.

PPO Innovations Ltd are not responsible for any damage, spills or liabilities resulting from the misuse, modification or lack of maintenance of a users wastewater holding tank system or its connected plumbing.



12 Frequently Asked Questions

Q. What happens if I don't have a sewer connection?

A. Without a sewer hose connected, the dump valves are not able to open and auto modes won't be available but you can still use your RV as normal. Instead of automatically dumping at 75% your tanks can fill to 100%

Q. What happens when my tanks reach 100%?

A. When either tank reaches 100% the shore water supply will be closed and the water pump disabled. This prevents water from overflowing the tanks until they can be emptied. An alarm will also be sounded.

Q. Why does the system dump the tanks at 75%?

A. At 75% the tank still has some room in case of suddenly being unable to dump. Experience has shown that when a tank is mostly full, the flow of water pulls any solid waste out of the tank.

Q. Can I change the 75% to a different amount?

A. No, PPO is designed with years of RV owners tried and tested methods in mind. The program that the system runs allows for the best use of the available tank space. However we can customize your system, please contact us to discuss any changes.

Q. Can I override the system to bypass a sensor or valve?

A. No, the system is designed to prevent spills and accidents. The troubleshooting guide will help to diagnose a sensor issue, please call for support.

Q. What happens if I'm in the shower and the grey tank fills up?

A. When PPO is in Auto Dump, whenever either tank fills to 75% it automatically empties. Your shower will never flood and you won't need to stop your shower to empty the tank.

Q. What happens if I lose power?

A. In the case of 12v power loss in the RV, PPO may not operate. The shore water supply valve and dump valves will remain in their current states. The electric actuators on the dump valves can be easily disconnected and operated by hand. If necessary the wet bay water outlet can be used as a backup water inlet. Check PPOInnovations.co.uk for videos.

Q. What happens if I leave my RV with someone who doesn't know how to dump the tanks?

A. PPO is perfect for these situations. Because the system works fully automatically you can rest assured that no one needs to attend to the wet bay.

Q. What kind of RV's can PPO be installed on?

A. PPO is designed for all types of RV's that have holding tanks. Whether its a Travel Trailer, Fifth Wheel, or Class A, we customize the system to fit all types.

Q. Where can I buy and get PPO installed?

A. PPO is currently only available for purchase and installation by PPO Innovations, please contact us to discuss availability.



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