# GrowoniX

TUNED FOR GROWING


# ROC-3

## Reverse Osmosis System Controller Owner Users Manual

WWW.GROWONIX.COM

Built in the U.S.A.

# FEATURES & COMPONENTS

## WHY USE A ROC-3 REVERSE OSMOSIS SYSTEM CONTROLLER?

The ROC-3 RO System Controller is an ideal solution for the monitoring and control of light commercial reverse osmosis units. This economical controller provides relays for the RO booster pump, inlet solenoid valve, and membrane flush solenoid valve.

The dry contact switch inputs monitor storage tank level, low and high pressure switch signal, and system lockout for pretreatment backwash or regeneration for on/off operation. All inputs and outputs are controlled with time delays for proper operation.

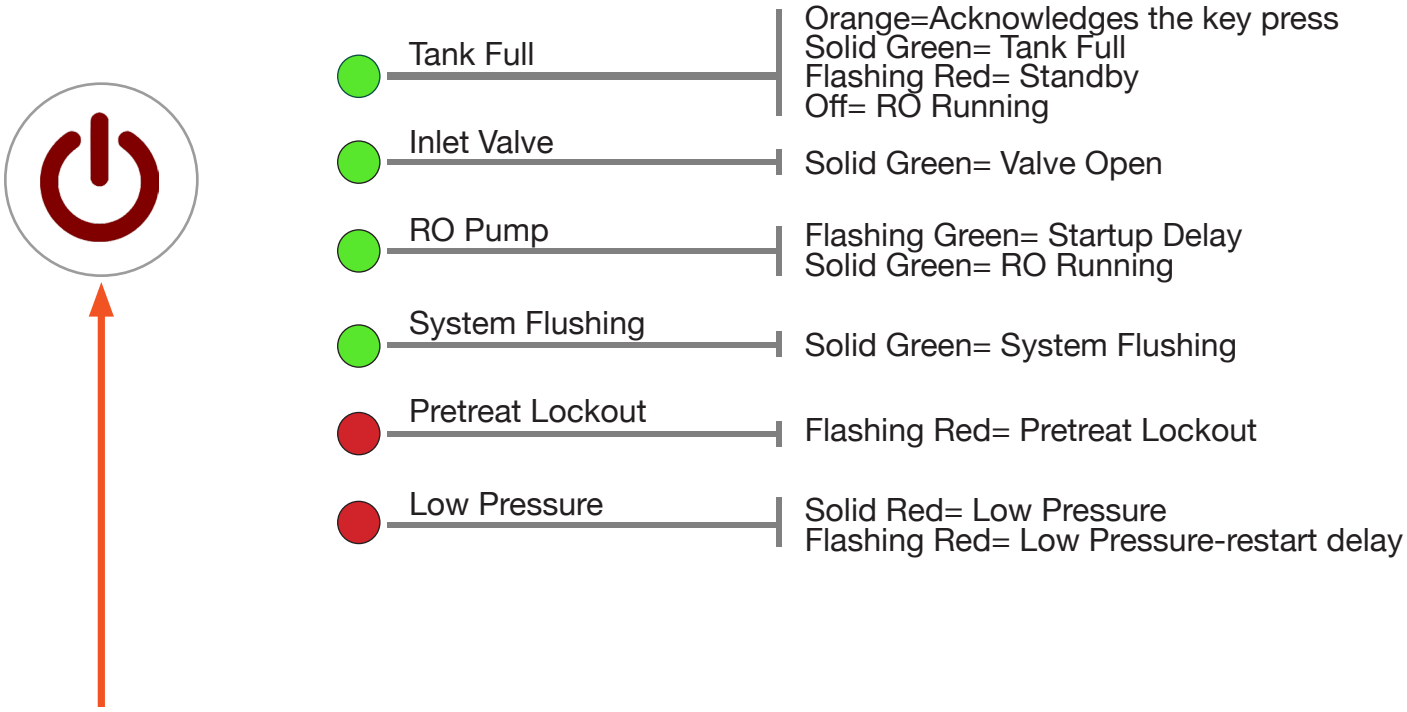
- Adds automatic membrane flush at startup, shutdown, and at timed intervals.
- Converts float switches to low voltage operation.
- Adds pre-treatment lockout for the addition of a carbon tank, softener, etc.
- Completely programmable—up to four separate programs.
- Works with all GrowoniX deluxe systems.

## WHAT'S IN THE BOX?

1. ROC-3 Reverse Osmosis System Controller
2. Flush Valve
3. Pressure Switch



# CONTROLLER OVERVIEW




## Standby/ON Switch

Capacitive touch switch. Tank Full LED turns Red to confirm button contact. Touch switch for 1-2 seconds to switch Power On/Off. Also used to control a Manual Run and/or Manual Flush.

## Manual Run/Manual Flush

The ROC-3 controller can perform a timed manual run and a timed manual flush. The default duration is 5 minutes. The duration can be changed using our programming interface.

To start a Manual Run, the controller must be in the Tank Full state. Touch the ON switch briefly 2 times. Please note that the Tank Full LED turns Orange to acknowledge the key press. The RO will start and run normally. The RO pump LED turns Orange to indicate that the controller is performing a Manual Run/Flush.

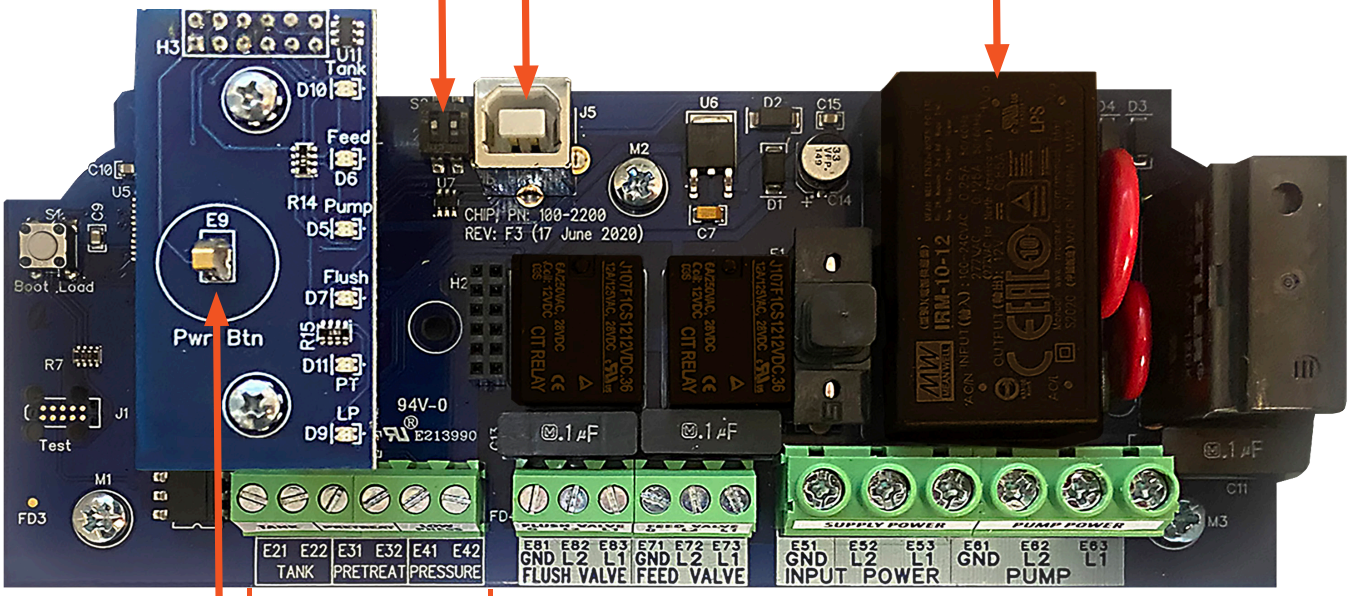
Once the controller is in Manual Run, a Manual Flush can be triggered by 2 more brief key presses. To end the
Manual Run/Flush, touch and hold the ON switch for 2 seconds.

# CONTROLLER DETAIL

**DIP Switches**
Select RO Program

**Programming Port**
Standard USB port for connection to computer for programming.

**Switching Power Supply**
Operates on 96-246VAC, Adjusts automatically to line voltage. Voltage at the supply terminals is the voltage for the pump and valves.

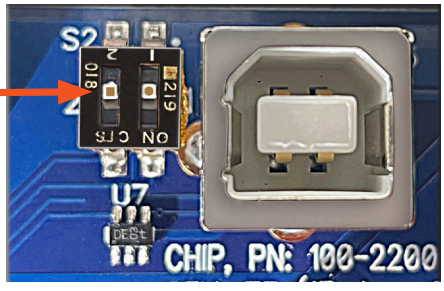



**Switch Inputs**
Dry Contact Only

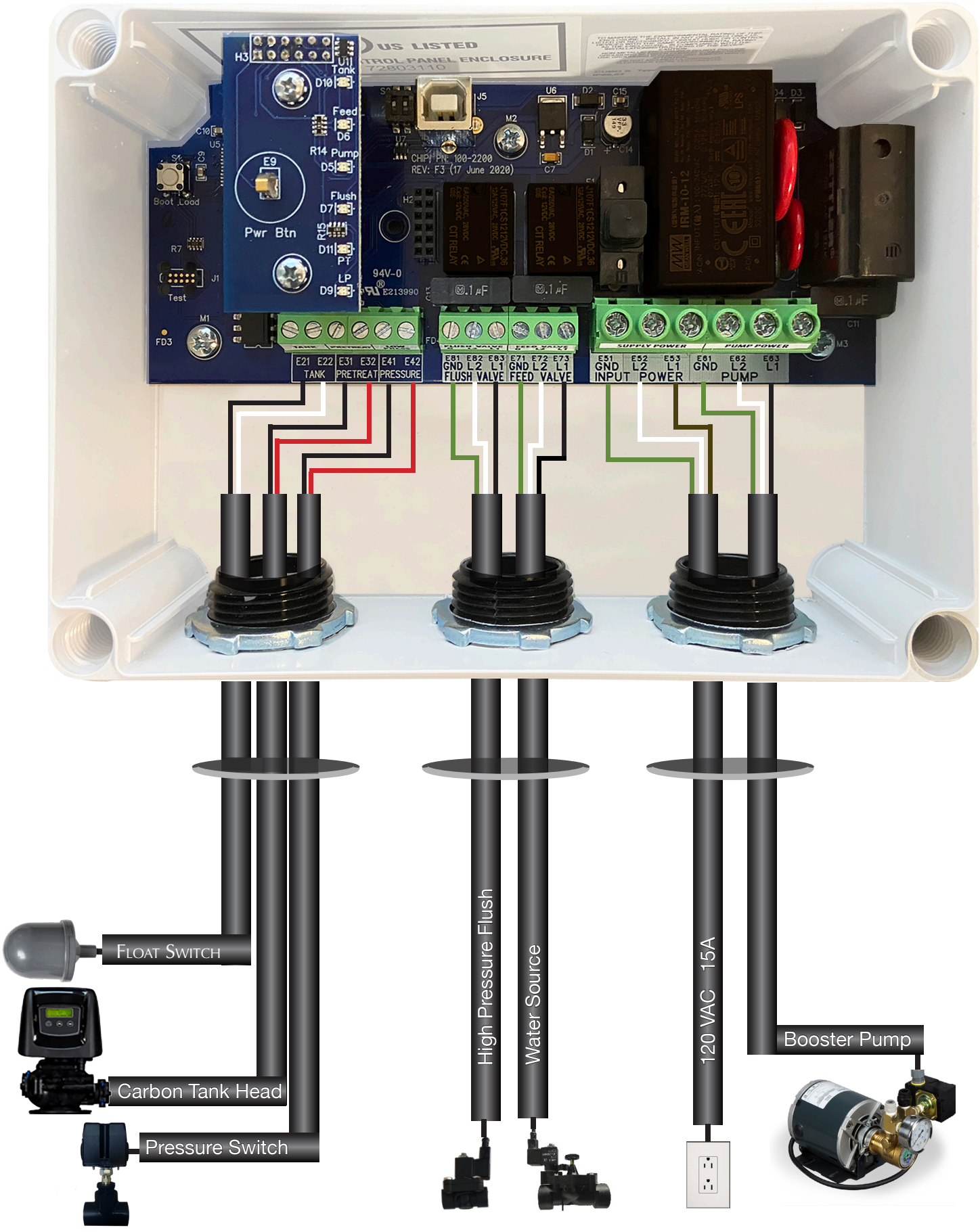
**Switch**
System ON/Standby
Capacitive touch sensor

## DIP SWITCH SETTINGS

| Switch 1 | Switch 2 | Program |
|---|---|---|
| OFF | OFF | 1 |
| ON | OFF | 2 |
| OFF | ON | 3 |
| ON | ON | 4 |



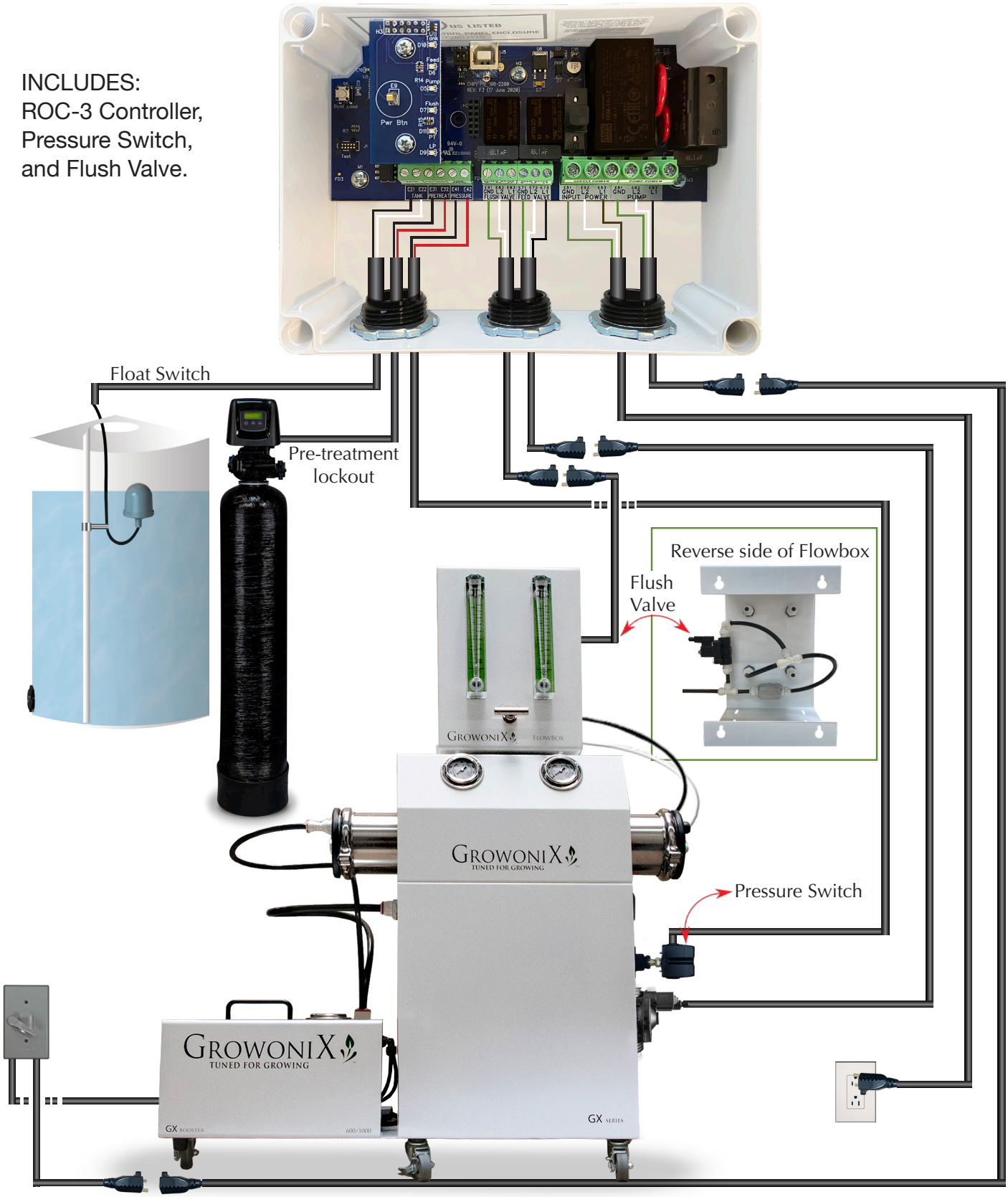
# CONTROLLER WIRING DETAIL



# WIRING DIAGRAM

## ROC-3 Controller with GX1000 FlowBox Deluxe

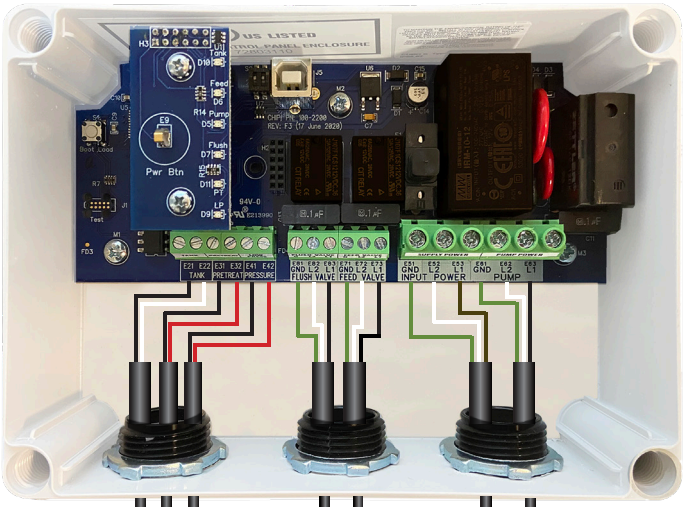
INCLUDES:
ROC-3 Controller,
Pressure Switch,
and Flush Valve.

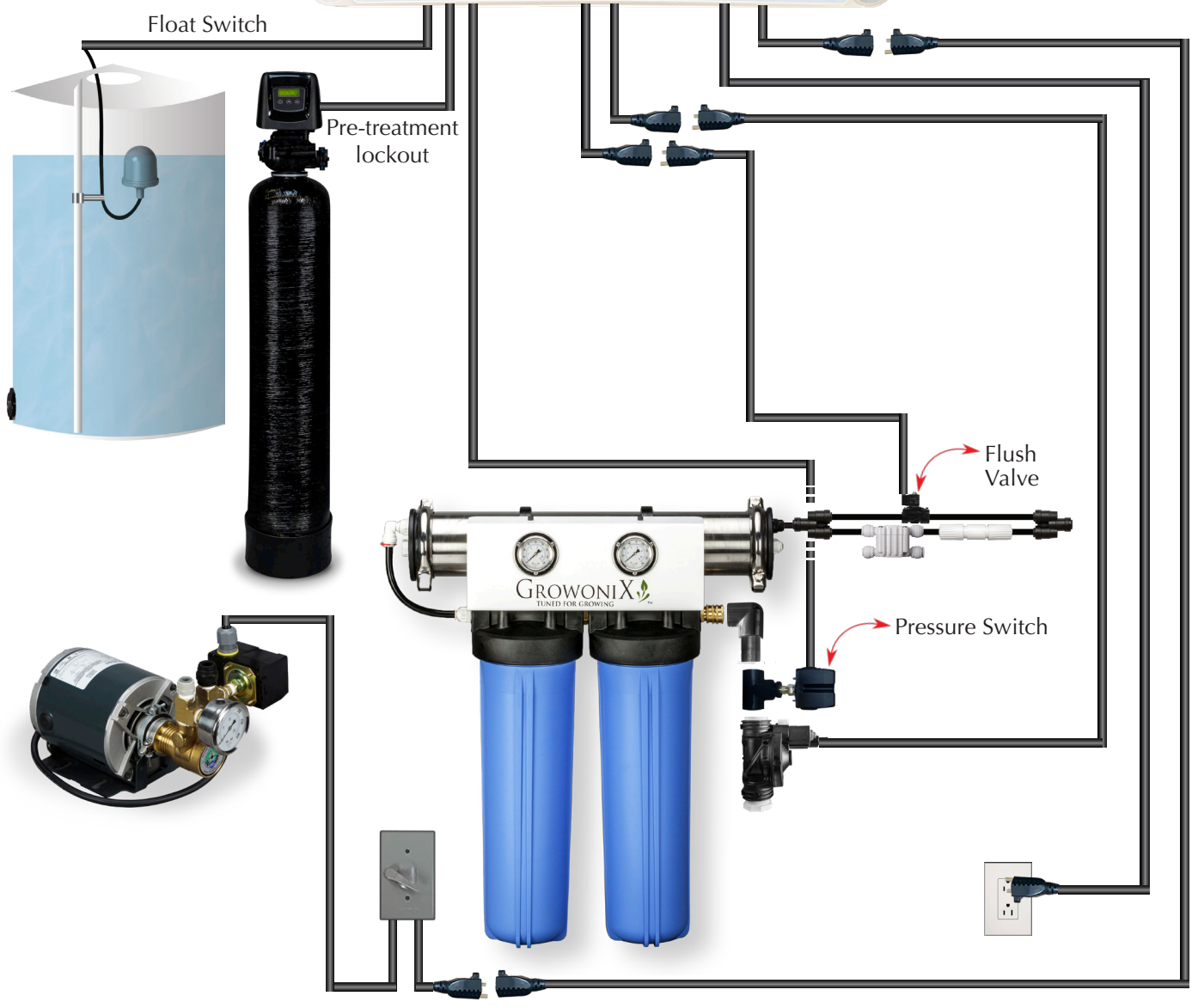


# WIRING DIAGRAM

## ROC-3 Controller with EX1000-T

INCLUDES:
ROC-3 Controller,
Pressure Switch,
and Flush Valve.





# PROGRAMMING: PROGRAM SELECTIONS

The controller has 4 separate user-selectable sets of settings for configuring the RO. The factory default settings are shown below. The settings are identical except for variations in the Flush Behavior.

- **Program 1:** High Pressure Flush
- **Program 2:** No Flush
- **Program 3:** Permeate Flush, (low pressure, inlet valve closed)
- **Program 4:** Low Pressure, feed water flush
- See the previous page for instructions on how to select these programs.
- See Appendix A for a detailed explanation of the Parameters and their affect on the RO's operation.
- See Appendix B for information on the programming interface for use in modifying these settings.

**Appendix A**

| Parameter | Value | Program 1 | Program 2 | Program 3 | Program 4 |
|---|---|---|---|---|---|
| Tank Level Switch delay (actuation and de-actuation) | Seconds | 2 | 2 | 2 | 2 |
| Pressure Switch delay (actuation and de-actuation) | Seconds | 2 | 2 | 2 | 2 |
| Pretreat Switch delay (actuation and de-actuation) | Seconds | 2 | 2 | 2 | 2 |
| Pump start delay | Seconds | 10 | 10 | 10 | 10 |
| Inlet Solenoid stop delay | Seconds | 1 | 1 | 1 | 1 |
| Pump start retry interval (restart delay after LP fault) | Seconds | 60 | 60 | 60 | 60 |
| Low pressure fault shut-down, # of faults | Faults | 5 | 5 | 5 | 5 |
| Low pressure fault shut-down, time period to count faults | Minutes | 10 | 10 | 10 | 10 |
| Low pressure fault shut-down, reset after shut-down | Minutes | 60 | 60 | 60 | 60 |
| Low pressure time-out fault | Seconds | 60 | 60 | 60 | 60 |

| Flush Behavior | Value | High Pressure | No Flush | Permeate Flush | Low Pressure Flush |
|---|---|---|---|---|---|
| Start-up Flush: Minutes from last flush | Minutes | 0 | 0 | 0 | 0 |
| Start-up Flush: Duration | Seconds | 0 | 0 | 0 | 30 |
| Periodic Flush: Interval | Minutes | 60 | 0 | 0 | 0 |
| Periodic Flush: Duration | Seconds | 30 | 0 | 0 | 0 |
| Shut-down Flush: Time from last flush | Minutes | 10 | 0 | 0 | 0 |
| Shut-down Flush: Minimum operation | Minutes | 30 | 0 | 0 | 0 |
| Shut-down Flush: Duration | Seconds | 60 | 0 | 60 | 60 |
| Idle Flush: Interval * | Minutes | 0 | 0 | 0 | 0 |
| Idle Flush: Duration * | Seconds | 0 | 0 | 0 | 0 |
| Timed Manual Run | Minutes | 5 | 5 | 5 | 5 |
| Timed Manual Flush | Minutes | 5 | 0 | 5 | 5 |

NOTE ***These features are disabled by default due to the potential for confusion on the part of the end-users in the field. They can be enabled when needed via the OEM PC programming interface which allows changes to all of the values shown above.***

## Appendix A

| Parameter | Value | Example |
|---|---|---|
| **Input Switch Behaviors** | | |
| Tank Level Switch delay (actuation and de-actuation) | Seconds | 2 |
| This specifies the time that the Tank Switch must be Closed or Open before the controller accepts it as a valid condition. The function is to prevent nuisance tripping of the RO, especially in small or turbulent tanks. | | |
| Pressure Switch delay (actuation and de-actuation) | Seconds | 3 |
| This specifies the time that the Pressure Switch must be Closed or Open before the controller accepts it as a valid condition. Since pressure switches usually have built-in hysteresis, this value is set at 0. | | |
| Pretreat Switch delay (actuation and de-actuation) | Seconds | 2 |
| This is the time that the Pretreat Switch must be OPEN before the controller accepts it as a valid condition. | | |
| **Pump/Inlet Solenoid Behaviors** | | |
| Pump Start delay | Seconds | 10 |
| On RO start-up, after the tank switch opens, the inlet solenoid valve is energized. When the inlet pressure switch closes, this begins the “Pump Start delay”. If the pressure switch remains closed, the pump will start after 10 seconds. | | |
| Inlet Solenoid stop delay | Seconds | 1 |
| This value sets the delay for the inlet solenoid valve to be de-energized following the de-energizing of the motor on the RO shutdown. The purpose is to prevent the pump from operating against a closed suction as the pump spins down. | | |
| **Low Inlet Pressure Behaviors** | | |
| Pump start retry interval (restart delay after LP fault) | Seconds | 60 |
| When the inlet pressure switch opens, the controller de-energizes the motor and the inlet solenoid valve remains open. The controller will continue to monitor the inlet pressure switch. After the switch is closed for the duration of the “Pump start retry interval”-The motor is re-energized. | | |
| Low pressure fault shutdown, # of faults | Faults | 5 |
| Low pressure shutdown, time period to count faults | Minutes | 10 |
| Low pressure shutdown, reset after shutdown | Minutes | 60 |
| These three values work together to determine how the RO handles Low Pressure conditions. The first two values, “# of faults” and “time period to count faults”, sets the limit for the number of low pressure fault conditions over time that are required to place the RO in “Low Pressure Fault Shutdown”. The third value sets the duration of the “Low Pressure Fault Shutdown”, which is the period that the RO will remain idle before trying to restart. The purpose of the Low Pressure Fault Shutdown is to prevent an RO from turning OFF/ON repeatedly without any limit. | | |
| Low pressure timeout fault | Seconds | 60 |
| If the inlet valve is open, but the pressure isn’t sufficient to close the inlet pressure switch, the RO would run indefinitely on line pressure. This value sets the time limit for the RO to operate with the inlet valve open with Low Pressure as indicated by an Open inlet pressure switch before a Low Pressure Fault is added to the counter above. | | |

**Appendix A**

| Flush Behavior | Value | Example |
|---|---|---|
| Time from last flush before Flush on Shutdown | Minutes | 15 |
| Minimum operation before Flush on Shutdown | Minutes | 60 |
| Flush duration on Shutdown | Seconds | 60 |
| Periodic Flush: Interval | Minutes | 60 |
| Periodic Flush: Duration | Seconds | 30 |
| Unit idle Flush interval * | Minutes | 0 |
| Shut-down Flush: Minimum operation | Minutes | 0 |
| The Unit Idle Flush Interval sets a time after which the RO will start-up and run in the flush mode. This is disabled by default because of the danger of over-flowing a tank if not properly implemented. It is intended for environments where leaving the RO idle for long periods would invite bio-fouling. (0)=disabled | | |
| Unit Idle Flush duration * | Seconds | 0 |
| Sets the duration of the Idle Flush. (0)=disabled | | |

# SPECIFICATIONS

NOTE

- ***The Tank, Low Pressure and Pretreat Inputs are 50% duty cycle square wave, 10VDC peak @10mA max. The High Pressure Input is 10VDC @ 10mA max.***
- ***All switch inputs are dry contacts. Voltage applied to the switch inputs will damage the controller.***
- ***The switching power supply automatically adjusts to supply voltage.***
- ***Voltage applied to the input is the voltage the motor and valves will operate on.***

**Table 1**

| INPUTS | |
|---|---|
| Tank Level Switch | Normally-Closed, RO runs on switch closure |
| Input Pressure Switch | Normally-Open, Switch opens on low pressure |
| Pretreat Lockout Switch | Normally-Open, Pretreat lockout active with switch closure |
| Controller Power | 120/240 VAC 1PH, 60/50Hz |

| OUTPUT CIRCUIT RATINGS | |
|---|---|
| Feed Solenoid | 1A. Output voltage is the same as the supply voltage |
| Flush Solenoid | 1A. Output voltage is the same as the supply voltage |
| Motor | 1.0 HP @ 120 VAC, 1PH, Output voltage is the same as the supply voltage |
| Motor | 2.0 HP @ 120 VAC, 1PH, Output voltage is the same as the supply voltage |

NOTE

- ***Branch circuit protection, motor and valve protection must be provided externally.***

| CIRCUIT PROTECTION | |
|---|---|
| Power Fuse | F1 5 x 20mm 1/4(.025) Amp Little Fuse 0218.250MXP |

# ROC-3 CONTROLLER WARRANTY

## What The Warranty Covers:

GrowoniX warrants the ROC-3 controller to be free from defects in materials and workmanship during the warranty period. If a product proves to be defective during the warranty period, GrowoniX will repair or replace the product with a like product. Replacement product or parts may include remanufactured or refurbished parts or components.

## How Long The Warranty Is Effective:

The ROC-3 is warranted for one (1) year for parts and labor from the date of the first consumer purchase or 15 months from ship date, whichever comes first.

## What The Warranty Does Not Cover:

1. Damage, deterioration or malfunction resulting from:
    a. Accident misuse, neglect, fire, water, lightning or other acts of nature, unauthorized product
    b. Modification or failure to follow instructions supplied with the product.
    c. Repair or attempted repair by anyone not authorized by GrowoniX.
    d. Any damage of the product due to shipment.
    e. Causes external to the product such as electric power fluctuations.
    f. Use of supplies or parts not meeting GrowoniX' specifications.
    g. Normal wear and tear.
    h. Any other use which does not relate to a product defect.
2. Transportation costs necessary to obtain service under this warranty.
3. Labor other than factory labor.

## How To Get Service:

1. To obtain warranty service, contact GrowoniX for a Return Material Authorization (RMA).
2. You will be required to provide:
    a. Your name and address
    b. A description of the problem
3. Package the controller carefully for shipment and return it to GrowoniX, freight prepaid.

## Limitation Of Implied Warranties:

There are no warranties, expressed or implied, which extend beyond the description contained herein including the implied warranty of merchantability and fitness for a particular purpose.

## Exclusion Of Damages:

GrowoniX's liability is limited to the cost of repair or replacement of the product. GrowoniX shall not be liable for:

1. Damage to other property caused by any defects in the product, damages based upon inconvenience, loss of use of the product, loss of time, loss of profits, loss of business opportunity, loss of goodwill, interference with business relationships or other commercial loss, even if advised of the possibility or such damages.
2. Any other damages, whether incidental, consequential or otherwise.
3. Any claim against the customer by any other party.

## Effect Of State Law:

This warranty gives you specific legal rights, you may also have other rights which vary from state to state. Some states do not allow limitations on implied warranties and/or do not allow the exclusion of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

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