

Framed Watermaker Installation Guide



Contents



- 1 Introduction**
- 2 System Layout**
- 3 Installation Fittings**
- ▼ **4 Physical Installation**
 - 4.1 Planning Configuration
 - 4.2 Mount Frame
 - 4.3 Install Breather Plug
 - 4.4 Mount Reverse Osmosis (RO) Unit
- ▼ **5 Internal Plumbing**
 - 5.1 HP Hose – Pump to RO
 - 5.2 HP Hose – RO to Valve/Gauge Assembly
 - 5.3 Product Water Fittings
- ▼ **6 External Plumbing**
 - 6.1 Product Water – Divert
 - 6.2 Product Water – Tank
 - 6.3 Product Water – Options
 - 6.4 Brine Waste
 - 6.5 Brine Waste – Options
 - 6.6 Intake Hose
 - 6.7 Intake Hose – Options
 - 6.8 Autoflush
- ▼ **7 Electrical Connections**
 - 7.1 AC Supply
 - 7.2 DC Supply
- ▼ **8 Autoflush Programming (Manual Control Only)**
 - 8.1 Flush Cycle Duration
 - 8.2 Flush Cycle Countdown



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Introduction

This instruction guide is for the installation of our Framed watermaker range. This includes the 240L Torrent system as well as the lower output 140L and 100L systems. The configuration is very similar between all three of these systems, but the power and fitting sizes vary somewhat. Most of the photos in this manual are for the 240L Torrent system, but the instructions apply equally to all types of Rainman framed systems.

More technical information can always be found on the [support section of our website](#).

Several icons are used throughout the text to indicate the purpose of the particular paragraph:



The 100L icon means the paragraph applies specifically to the largest 100lph system.



The 140L icon means the paragraph applies specifically to the 140lph (either 230VAC/50Hz or 115VAC/60Hz).



The 240L icon means the paragraph applies specifically to the largest 240lph Torrent system.



The 140L/100L icon means the paragraph applies specifically to the 140lph and 100lph units (either 230VAC/50Hz or 115VAC/60Hz).

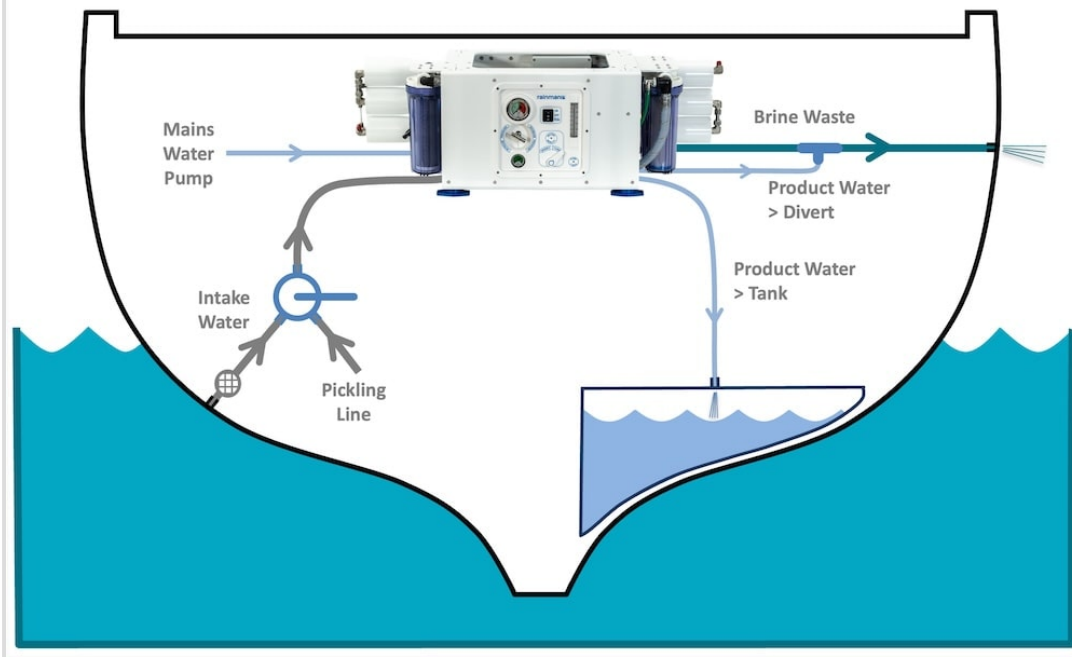


This icon indicates a specific warning, indicating actions to be taken to ensure safety or protection of your watermaker.

System Layout

The Framed Rainman watermaker is designed for an easy installation process. The plumbing incorporates one seawater intake, one brine waste output and three fresh water connections. The electrical will be an AC power source and low power 12-24VDC source for powering the control panel.

Rainman Framed Watermaker Installation



Installation Fittings

Rainman framed watermakers are shipped with most of the plumbing fittings required for installation. The Frame AC 240L Torrent has higher flow rates than the Frame AC 140L or Frame AC 100L, so the fittings are larger.

All boats are somewhat different, so there may still be fittings required for a given installation. There may also be extra fittings from the Rainman kit that go unused. The plumbing installation kit can be broken into four main categories:

1. Intake fittings required for seawater to get to the prefilter. A pickling line is also needed for long term storage.
2. Brine waste fittings for most of the seawater flow and all of the salt to get back overboard.
3. Product water fittings are required for getting water into a tank, with an option for a second tank or a testing tube.
4. Hoses are required for each of the above fittings to connect to the main watermaker.

The table below shows the fittings that are included with the system for any of the three framed options.

Select Tab For Your Model

Frame 240L	Frame 140L	Frame 100L
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240L

The 240L icon means the paragraph applies specifically to the largest 240lph Torrent system.



Seawater Intake

- 5 x 1" hose barbs
- 1 x 3/4" hose barb
- 1 x 1" BSP tee female
- 1 x 1" BSP 3 way valve 316 S/S
- 1 x 3/4" check valve
- 12 x Hose clamps
- 1 x 1"-3/4" hex nipple

1 x mounting bracket for 3 way valve



Brine Waste

2 x 1" hose barbs
1 x 1/2" hose barbs
1 x 10mm push-fit
2 x 1" BSP tee female
1 x 1" joining nipple
1 x 1"-1/4" bush
1 x 1"-1/2" bush
8 x Hose clamps



Product Water

1 x Plastic 3 way valve (diverter valve)
2 x 10mm push-fits
1 x Roll teflon tape



Installation Hoses

5 metre (16 ft) x 3/4" ID Intake Hose
6 metre (20 ft) x 1/2" ID Brine Waste Hose
18 metre (60 ft) x 10mm OD Product Water Hose

Physical Installation

Planning Configuration

1. Choose location for the watermaker to sit. Consider the overall size of the watermaker, including frame and reverse osmosis pressure vessels. Ensure you have easy access for prefilter, carbon filter change, lift pump impeller and high pressure pump oil change. Ensure there is a minimum of 100mm (4") gap on all sides and the area is well ventilated.

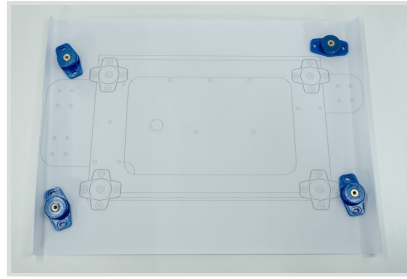
Ensure the mounting surface is level, can support the system weight, and take 20mm (7/8") self tapping screws.

2. Decide if reverse osmosis (RO) membrane unit should be mounted on rear or top of the frame. The pressure vessels can slide left or right a small amount within the mounting brackets.

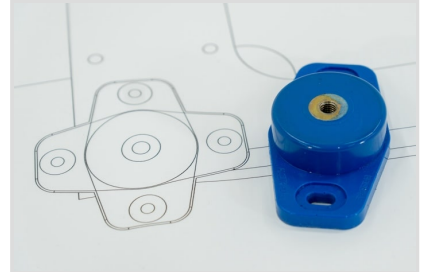


Mount Frame

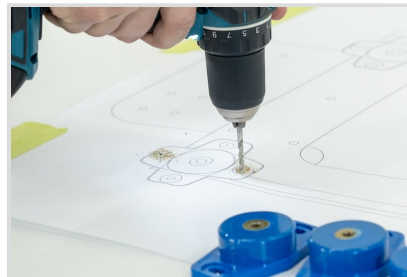
3. Lay out mounting template on location of installation. Tape paper into place.



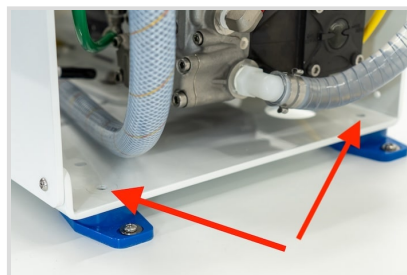
4. Remove blue vibration isolation mounting feet from frame. Determine desired orientation of feet.



5. Drill pilot holes for vibration isolation mounting feet and fix into position. Fixings not included in kit.



6. Set the frame on top of four vibration isolation mounts. Ensure holes in frame are aligned with holes in mounting feet.
7. Insert mounting washers under frame and on top of mounting feet.



8. Insert bolts into holes and secure frame to mounts.



Install Breather Plug

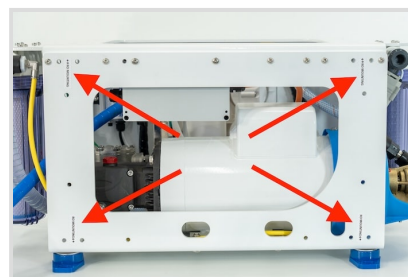
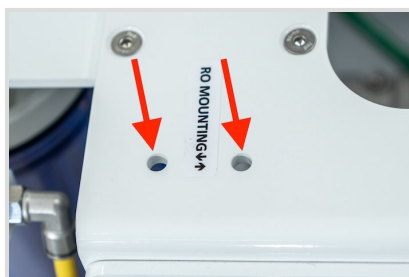
9. Replace the oil travel plug in the black high pressure pump with the breather plug.



Failure to use the breather plug will eventually lead to oil and or water leaks in the high pressure pump as it heats up during use.

Mount Reverse Osmosis (RO) Unit

10. The rear and top of the white frame has helpful indicators on which holes are used for mounting the RO brackets.



Select Tab For Your Model

Frame 240L	Frame 140L	Frame 100L
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Use this section for either the AC 240L Torrent or the AC 100L versions of the framed system with three membranes.

11. The 240L Torrent RO unit has eight holes for mounting to the frame. Four on each bracket.

It is also possible to mount the RO unit away from the frame completely. Two separate high pressure hoses will need to be customised to fit.



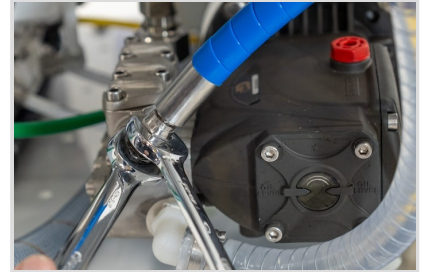
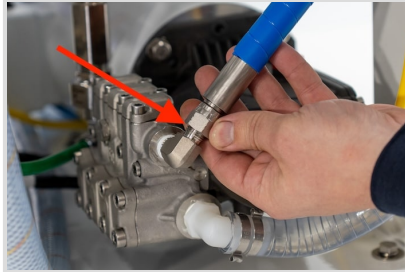
Internal Plumbing

HP Hose – Pump to RO

12. Attach high pressure hose to the RO unit on the side marked "HP HOSE FROM PSU". Hand tighten the compression fitting before final tightening with two spanners (wrenches).



13. Connect the other end of the high pressure hose to the high pressure pump using compression fittings in the same manner.



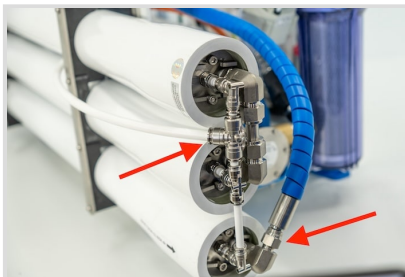
HP Hose – RO to Valve/Gauge Assembly

14. Attach one end of a high pressure hose to the rear of the control panel. Attach the other end to RO unit from side marked "HP HOSE TO VALVE/GAUGE". Hand tighten the compression fitting before the securing with two spanners (wrenches).

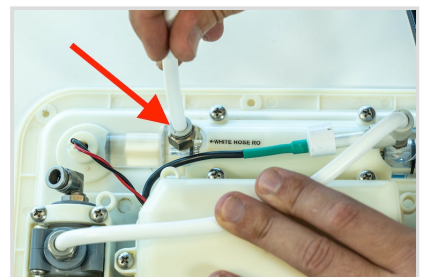


Product Water Fittings

15. One side of the RO unit has a number of product water fittings (same side as HP hose to valve/gauge assembly in control panel). Insert a segment of white product water hose into the pushfit fitting.



16. Cut the product white water hose to length so it reaches the control panel. Insert the hose into the pushfit on the rear of the control panel marked "Product water From RO outlet". This is the input to the analogue flow metre.



External Plumbing

Product Water – Divert

17. Cut length of white product water hose and connect to rear of control panel marked “PRODUCT DIVERT”. Connect this line to either a tasting/sampling connection or tee it into the brine waste line..



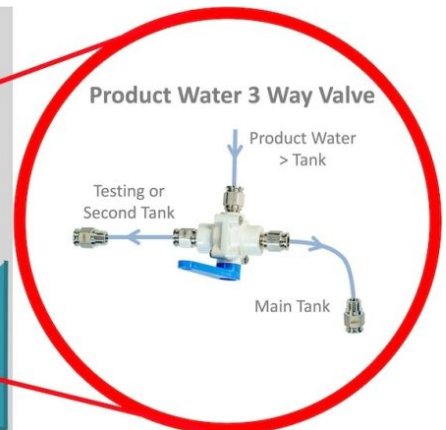
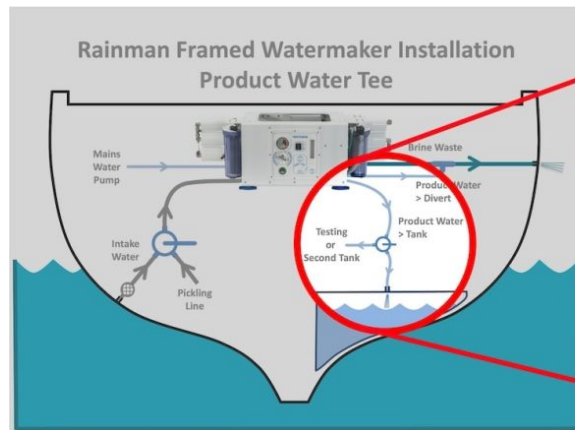
Product Water – Tank

18. Cut length of white product water hose and connect to rear of control panel marked “PRODUCT TANK”. Run this line into your fresh water tank. Two push-fits are included in the installation kit for connecting to your tank.

Product Water – Options

An extra 3 way valve for the product water is included to configure a testing port or to fill a second tank. This can be run off either the “Divert” or “Tank” line from the control panel. Additional 3 way valves can be used for further flexibility if required.

It is recommended to include a way to manually test the product water.



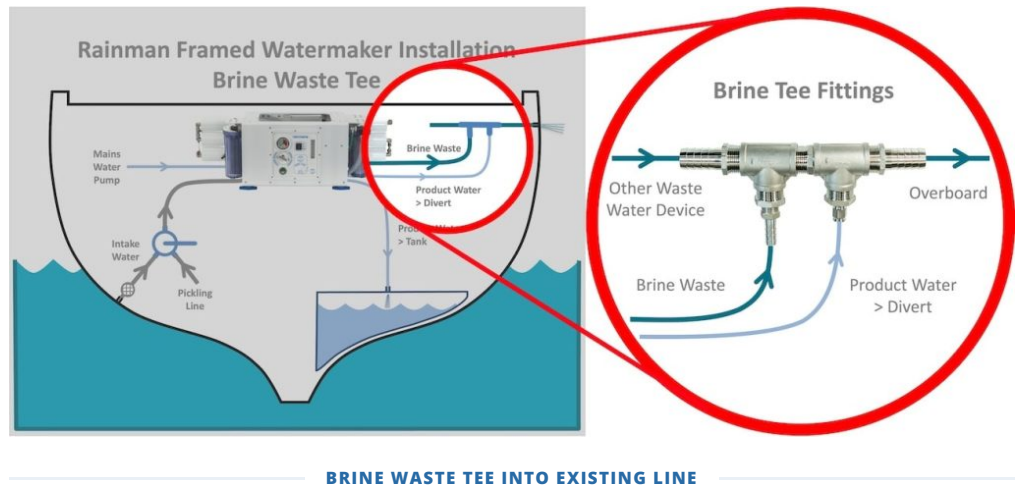
EXTRA PRODUCT WATER 3 WAY VALVE

Brine Waste

19. Cut length of brine waste water hose (braided clear for 240L, green for 140L or 100L) and connect to rear of control panel marked “BRINE OUTPUT”. Run this line to overboard waste.

Brine Waste – Options

Two tees are provided in the brine waste plumbing kit to allow for teeing both the brine and product water divert in to existing waste water line. This is recommended as the simplest configuration.



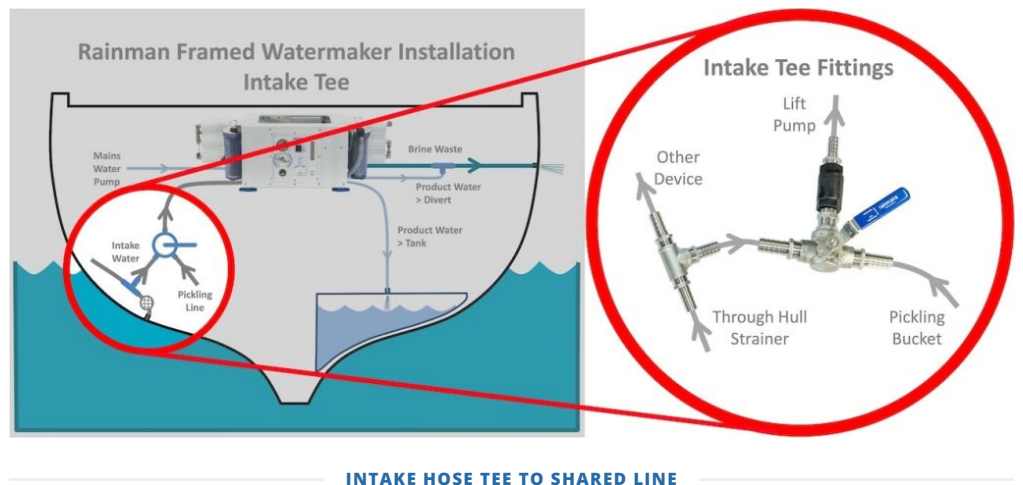
Intake Hose

20. Connect intake water hose to the input of the bronze lift pump. The check valve should maintain prime in intake line. Ensure you secure with double hose clamps. The third leg of the 3 way valve is used for pickling. Pickling instructions are in operations manual.



Intake Hose – Options

Although dedicated thru hull is preferred, it is possible to share a thru hull via a provided tee. Ensure watermaker is not forced to compete for water when operating.



If sharing a through hull via a tee fitting, ensure your watermaker is not competing for water while operating. This will starve the HP pump of water, cause cavitation, and damage your pump.

Autoflush

The autoflush valve connects to the vessel's fresh water pump. Since a wide variation exists in configurations, hardware is not supplied. The below instructions are a sample of one way to configure the autoflush supply. The autoflush valve is supplied

with a 1/2" BSP female connection.

The supply pressure should not exceed 3 bar (43 psi) or the lift pump's shaft seal may begin to leak. In such cases, a 20 to 30 PSI pressure regulator should be employed.

21. Connect mains pump water supply to autoflush motor valve.



Electrical Connections

AC Supply

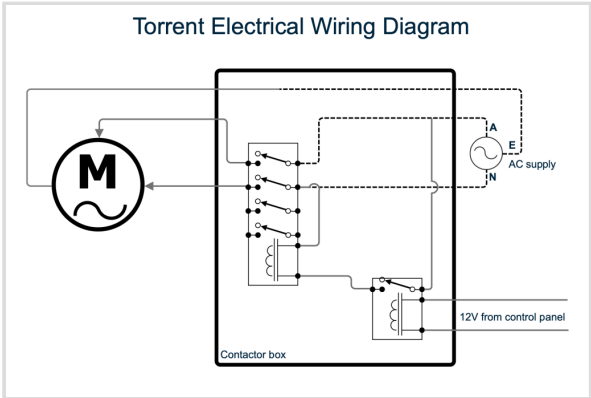
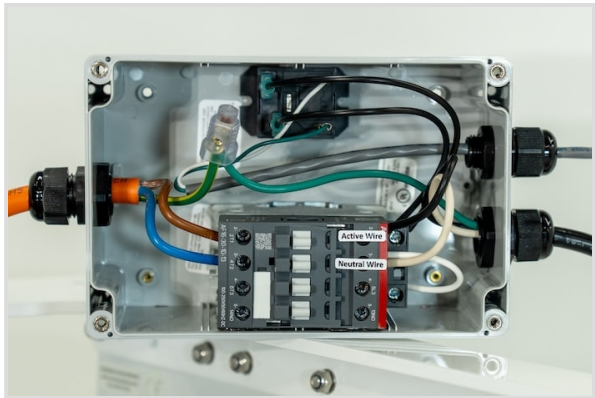
Select Tab For Your Model

Frame 240L	Frame 140L	Frame 100L
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Specific wiring info for torrent

22. Have qualified electrician wire the system accordingly. Recommended wiring of at least 4mm².



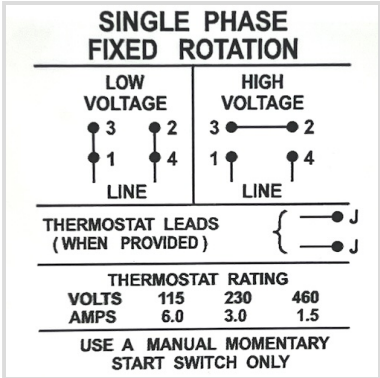
Rainman Frame-AC-240L-Torrent system incorporates dual voltage AC motor which allows the operations of the same machine on the boats of different AC power setups.

All Rainman Frame-AC-240L-Torrent system motors are shipped wired for high voltage (220-240V).

If low voltage (110-120V) is required, the diagram printed directly on the motor shows how the motor should be wired.

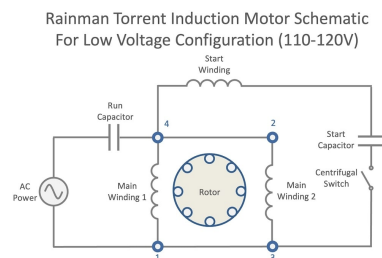
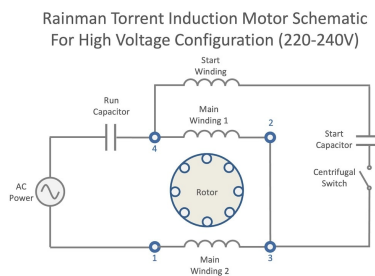
Ensure power is disconnected prior commencing work with electrical wiring.

Wires to be re-configured are behind the lid on the smaller terminal box on the side of the motor. The box on top of the motor is motor capacitor enclosure and does not require to be opened.



For reference, the Frame-AC-

240L-Torrent motor schematics, showing the low voltage and high voltage configurations.



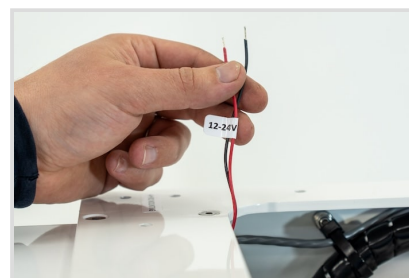
Use a qualified electrician for AC wiring. The installation shall include a means of disconnection from the supply mains with contact separation in all poles, suitable for overvoltage category III conditions, in accordance with the wiring rules.



If the supply cord is damaged, it must be replaced by the manufacturer, its service agent, or similarly qualified persons in order to avoid a hazard.

DC Supply

23. The red and black wires on the Duetsch plug should be connected to a 12-24VDC battery source. This provides power for the control panel. Using a DC power source that is not directly from a battery may add slight noise and interfere with accuracy of the sensitive salinity sensor.



Autoflush Programming (Manual Control Only)

The framed system has an integrated autoflush system. Programming the system is quite simple and can be performed by accessing the small silver flush timer box inside the frame.

Flush Cycle Duration

The flush timer box is programmable from two minutes to eight minutes, in two minute increments. Eg: 2, 4, 6, or 8 minute flush cycle durations.

Press and hold the button for 2.5 seconds to go into programming mode. While holding the button down, a single green flash will indicate when to release the button. After releasing the button, a few rapid green flashes will indicate you are in flush cycle programming mode. The green LED will then flash twice for 2 minute flush duration, four times for 4 minutes, six times for 6 minutes and eight times for 8 minutes. After the green LED flashes 2, 4, 6, or 8 times, pressing the button selects that particular flush duration. The timer then exits programming mode and the green LED will flash the number of minutes in which the flush timer is set before re-entering countdown mode. At this point, the blue LED flashes according to the number of days remaining in the countdown. It remembers where it was at in the countdown. If you do not select any time while in programming mode, the timer will eventually revert back to countdown timer mode, resuming the most recent flush duration setting.



Example: To set a four minute flush duration

1. Long press the flush timer button for 2.5 seconds. Release after green LED flashes once.
2. The green LED will quickly flicker for one second, then off for one second.
3. The green LED will start its flashing sequence, wait for the four flashes to appear, then press the button.
4. The green LED will again quickly flicker for one second, then off for one second.
5. The flush timer will respond by flashing the green LED four times, then a pause, then flash four times again. This allows the operator to verify the new setting is correct.
6. The Rainman flush timer will now switch back to normal countdown operation, and the seven day countdown resumes where it was prior to programming.
7. To test the new flush duration, press the push button again to initiate a flush cycle. After the flush cycle, the timer will reset to seven days.

Determining how long to set flush duration, consider that you will want approximately 10 litres (~2.5 gallons) of water to be pushed through the system on each flush cycle. The best way to determine this is by measuring the brine discharge during a flush cycle and programme the timer accordingly.

Flush Cycle Countdown

The flush cycle countdown time is designed to be fixed at seven days. This cannot be changed.