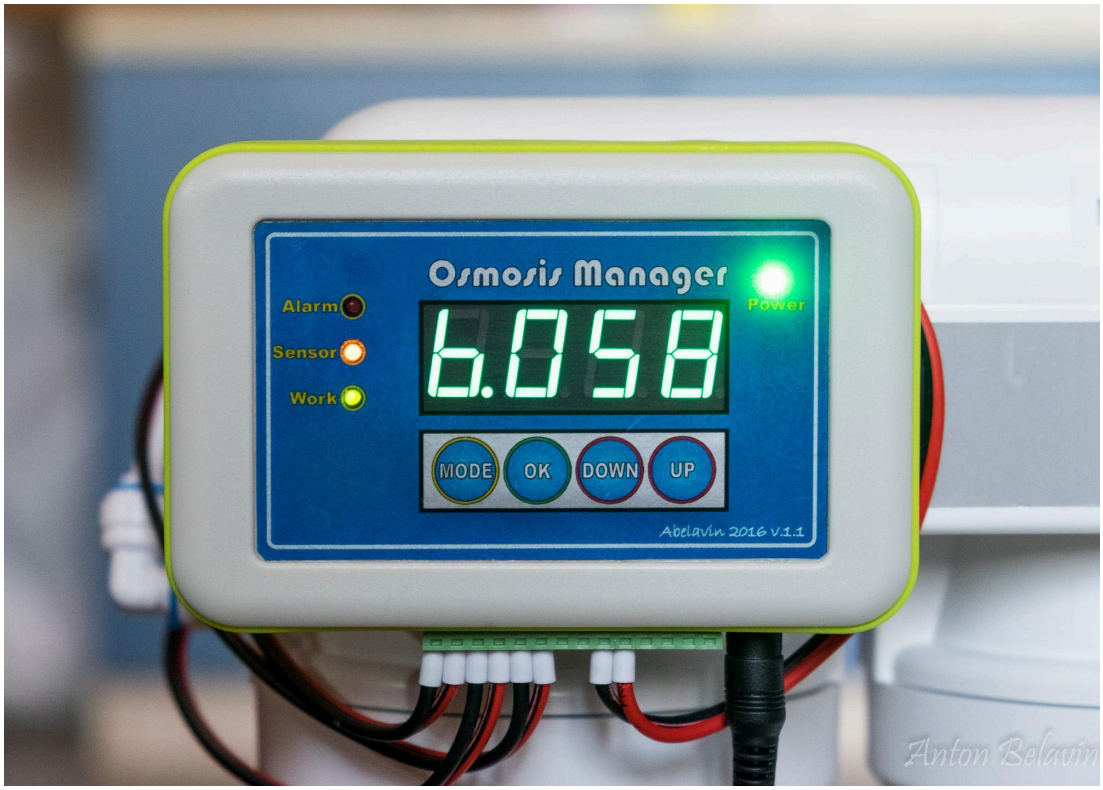


Osmosis Manager

Automatic RO driver and direct ATO system

Device description V1

Osmosis Manager is designed to automatically refill evaporated water in saltwater aquarium directly from the reverse osmosis unit with the function of washing and draining “dirty tails” (draining of non ideal pure water from the membrane at a fixed period of time to stabilize the TDS values). It is also well suited for automatic or semi-automatic filing of additional tanks or barrels, which are used to prepare salted water.

Advanced capabilities of the device:

Cyclic filling tanks for automatic water top off
High capacity filling mode "Barrel"
Using reliable and low cost plastic floats in top off tanks
Pressure control all filling lines on correct shut off time.
Multi-level protection against leaks
Control of the low water pressure in the water supply system (optional)
Adjustments of all timing cycles and types of sensor signals.

Design and principle of operation

The device consists of the following components:

The control unit - is a four programmable interval timer with microprocessor control, three additional sensor inputs and three current limit switches to control solenoid valves. Unit is powered from a standard 12V power supply 1a.

On the front panel control buttons (MODE, OK, DOWN, UP), the power indicator POWER. Indicators ALARM modes, SENSOR, WORK, TDS represent different states of the device. The center panel is a display indicating and adjusting work intervals.

At the bottom of the case there are the power connector and 14 pin connector common sensors, sensors and valves.

To block can be connected:

Up to three NC standard solenoid valves on 12 Volt.

The pressure sensor in the water supply system in the aquarium NC or NO type

Tap water pressure sensor (optional) NC or NO type

The electric water level sensor (optional) NC or NO type

The water level mechanical type plastic floater mounted in the each sump and/or barrel

The working algorithm of the device:

The working cycle of the device consists of a sequence of four consecutive time intervals. These are designated on the display by letters A, B, C, D.

Each time slot performs a specific task and can be adjusted in length.

A - A valve operating range: flushing of the membrane.

B - Valve operating range B: tails drain.

C - Valve operating range C: water addition to the control of water level and time topping

D - range expectations. After this interval, the cycle begins again with A.

Intervals A and B are measured in seconds from 1 to 999 minutes, C and D intervals are measured in hours and minutes, from 1 minute to 9 hours 59 minutes.

The system starts with the **interval A**. At this stage, it is the washing of the membrane. The recommended interval of timer **A** is 30-120 seconds. After washing of the membrane, the valve **A** closes, starts in the interval, opening the valve **B**.

The range comes in draining water from the residues into sewer systems. The so-called "discharge of tailings" or “dirty tales”. The recommended **interval B** is 120-300 seconds. At the start and end of work membrane TDS water generally has higher values, must be configured in the range experienced by specific membrane by measuring the time interval during which TDS is stabilized at a minimum value.

After draining the tailings will be produced, turn on the **interval C**, opening the valve **C**. At this stage, it is the topping up of water in the aquarium. (Topping up must be carried out in an aquarium tank with a variable water level, such as the return chamber or barrel). device switching to the next interval (**D**) is possible only in case of interval **C**.

The work pressure control probe (in the normal performance - high pressure sensor, increasing the line pressure is achieved by closing the float valve) waits if the device signal is received from the high valve pressure during the interval **C**, the unit will be transferred to the emergency mode. In this case all the valves are closed, the display will **Err02** inscription work buzzer. Restarting the device requires user intervention.

The **interval D** is a waiting interval between evaporation topping. In this mode, all valves are closed, the pressure in the line sensor readings are not used. The recommended interval value D 4-6 hours. After **interval D** system proceeds to the **interval A again**.

System response during a power outage

When a power outage occurs, all the valves devices are closed to eliminate leakage. The system remembers its state at the time of shutdown, so when the system is in the PAUSE mode or Err02 this mode is not canceled. When you need to use electricity without osmosis it is recommended to put the bypass valve on the valve C.

Key functions and menu settings

For safety reasons, the transition to the apparatus control modes always requires a long (more than 3 seconds) or keystroke combination.

Long press “MODE” button - activation mode "Barrel" to restart from the washing cycle A.

Long press “OK” button - switch to pause mode. In the pause mode, all valves are closed, the ability to quickly edit the duration of the current cycle by shortly pressing **OK**. Exiting a long pause **OK**. When disconnecting the power state of the device in the "Pause" mode is saved.

Long press “MODE + OK” - the entrance to the settings menu**.**

Long press “UP + DOWN” - repeat the current cycle again.

Menu commands

Menu:

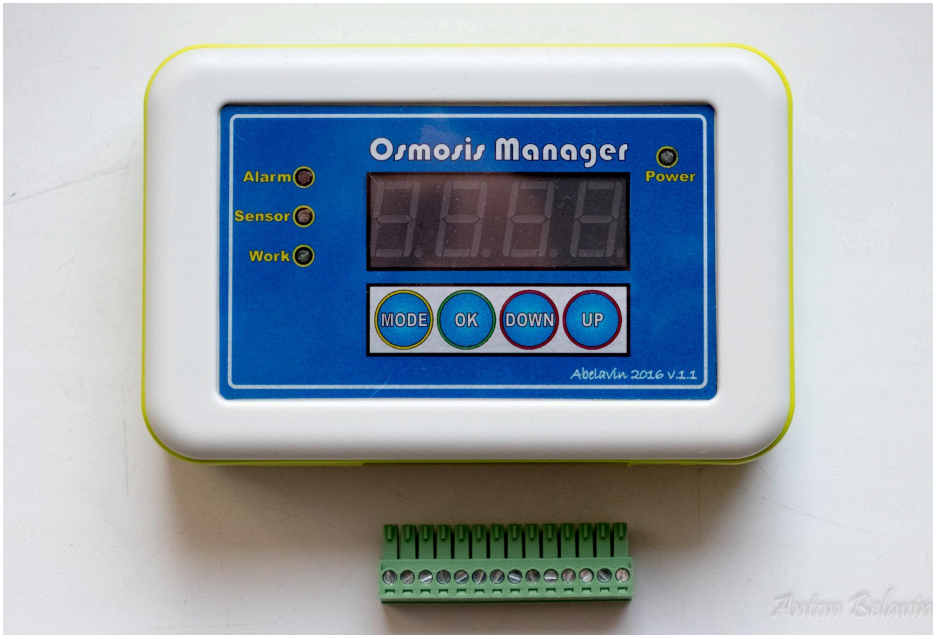
Mode - device mode (default 1), don't need to change.

Sc - screen brightness level (0-10) display in the Screen Saver mode (default 05)

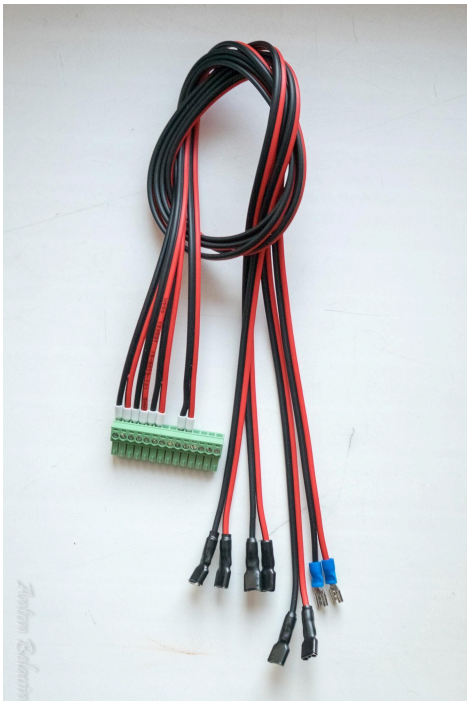
Br - increasing the multiplier (1-99) of the C-cycle time (filling mode) to use it once in “Barrel” mode. (default 05)

S1 - the inversion of the sensor S1 (default 0)
S2 - the inversion of the sensor S2 (default 1)
S3 - the inversion of the sensor S3 (default 0)
Reset - reset to factory settings
End - Exits the menu

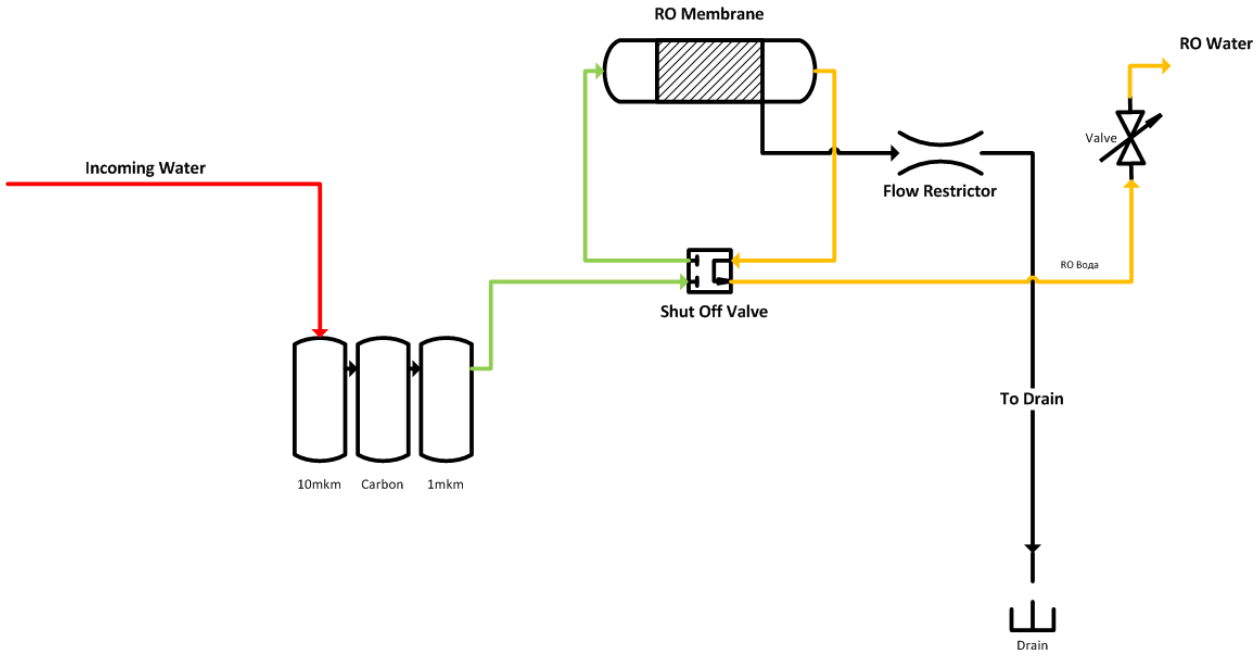
The appearance and the wiring diagram to the RO plants.



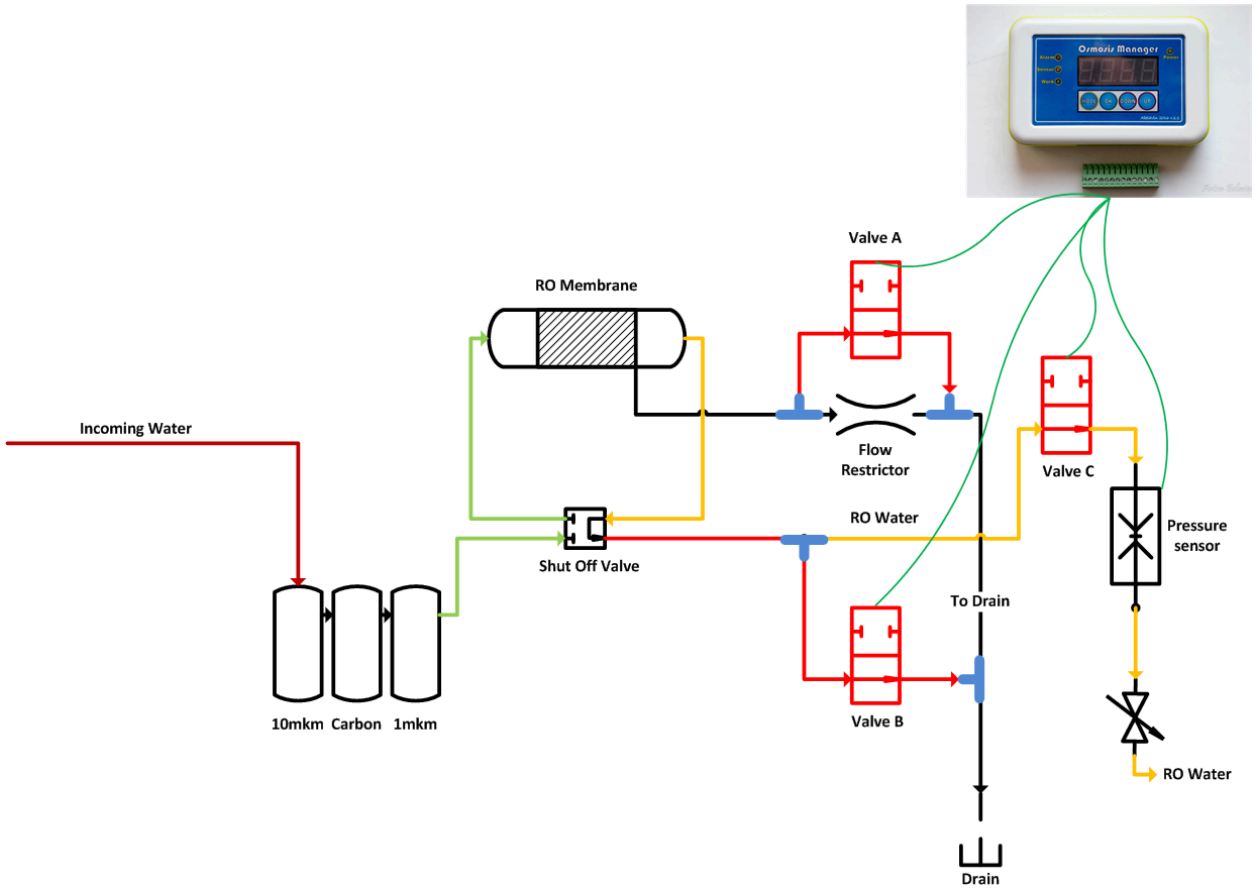
Connecting the control unit to the osmosis installation is made by connecting 14 pin connector. To connect the connector valves A, B, C and sensors S1, S2, S3 according to the device configuration. Polarity valve and pressure sensor is irrelevant. The connection must be made only in the de-energized state of the device. Wire connection cross section must be no less than 0.75 square meters. mm. Standard length cable loop when ordering - 70cm. Particular attention should be paid to the direction of water flow through the valves. The flow direction is indicated by an arrow at the bottom of the valve.



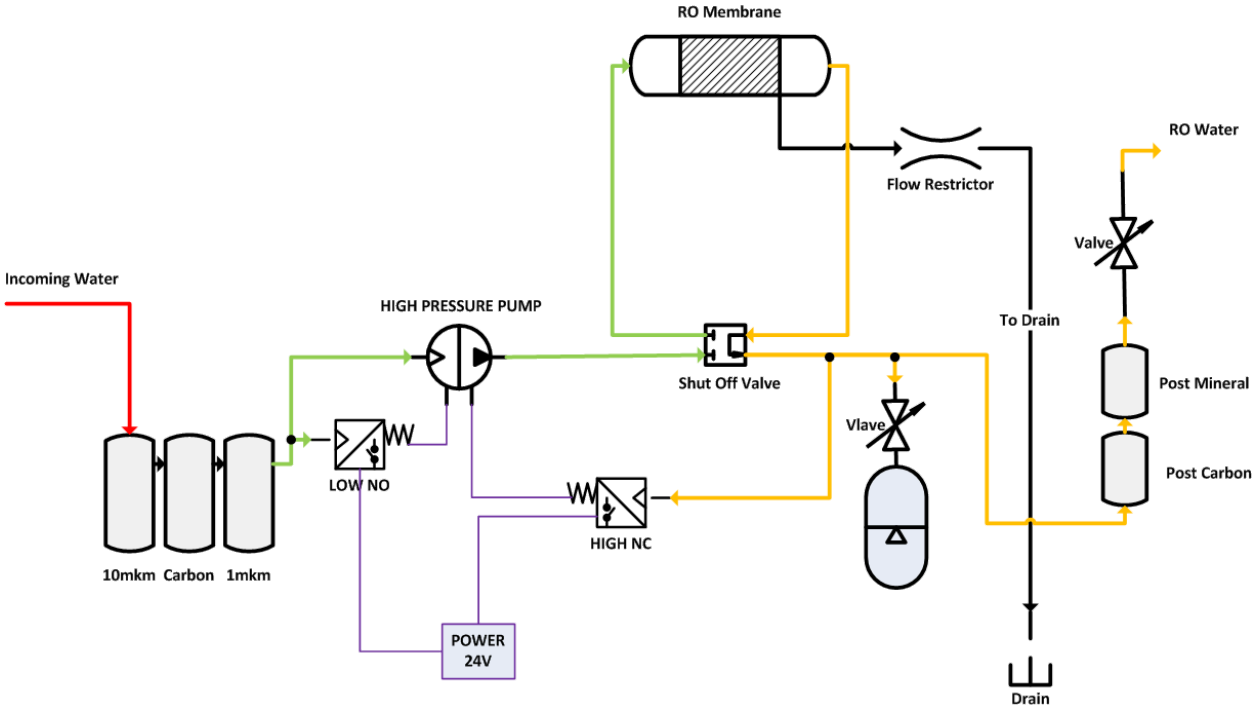
Driving osmosis installation type Atoll 560 without modification to the pump:



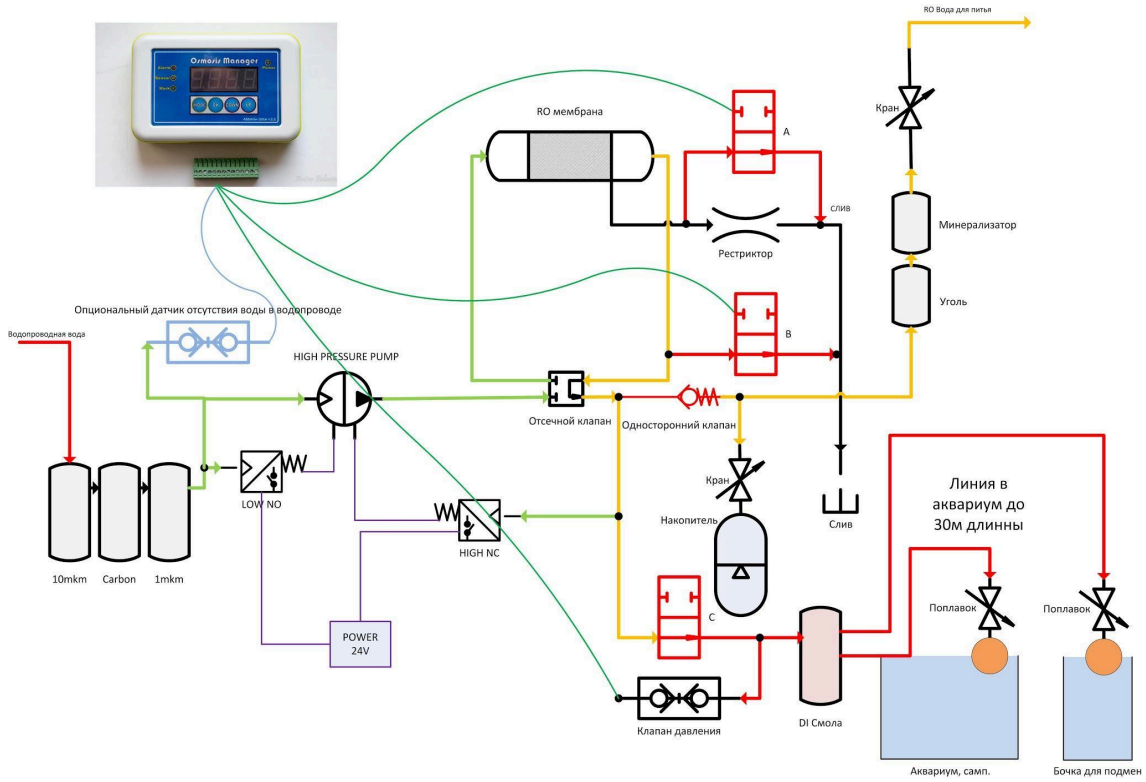
Driving osmosis installation without the pump type Atoll 560 after modification. Red shows the changes being made. Points - tee-fittings.



Driving osmosis installation type Atoll 560 increases the pressure pump to modification:



Driving osmosis installation with a pump type Atoll 560 after modification. Red shows the changes being made. Points - tee-fittings.

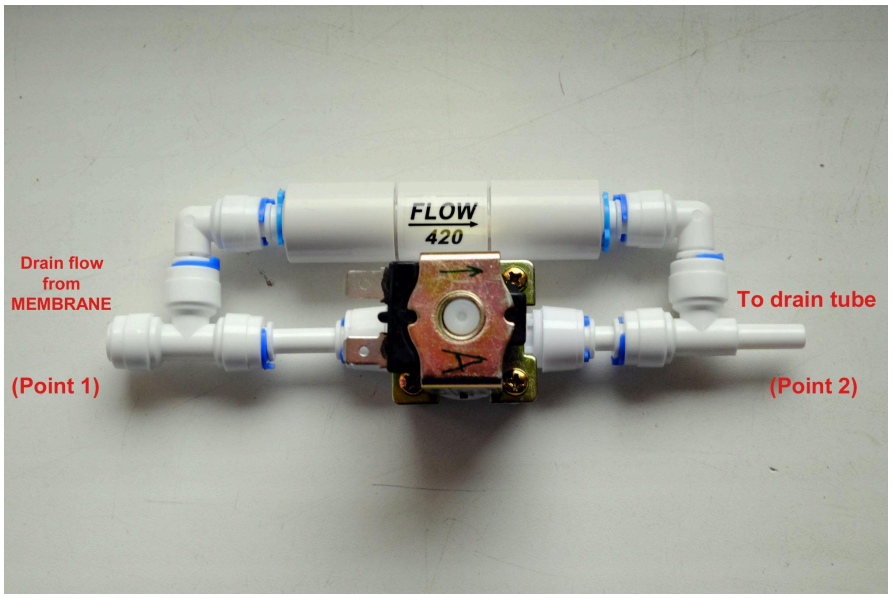


The pressure sensor in the line of the float may be in two different versions. Low and high sensitivity. low sensitivity sensor comes as standard and allows you to use longer lines for connecting the float. Connecting low sensitivity of the sensor is carried through, the cut of water supply line to the float. To connect the sensor of high sensitivity or water presence sensor in the water removal is required with the optional tee.

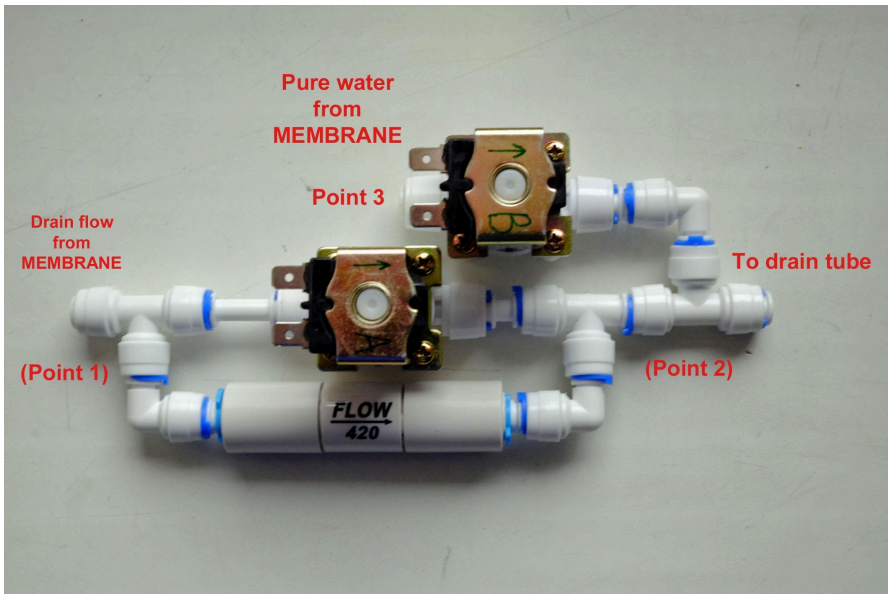
An example of the type of standard modifications Atoll osmosis, Water of Life, and so.

We begin to collect from the valve A.

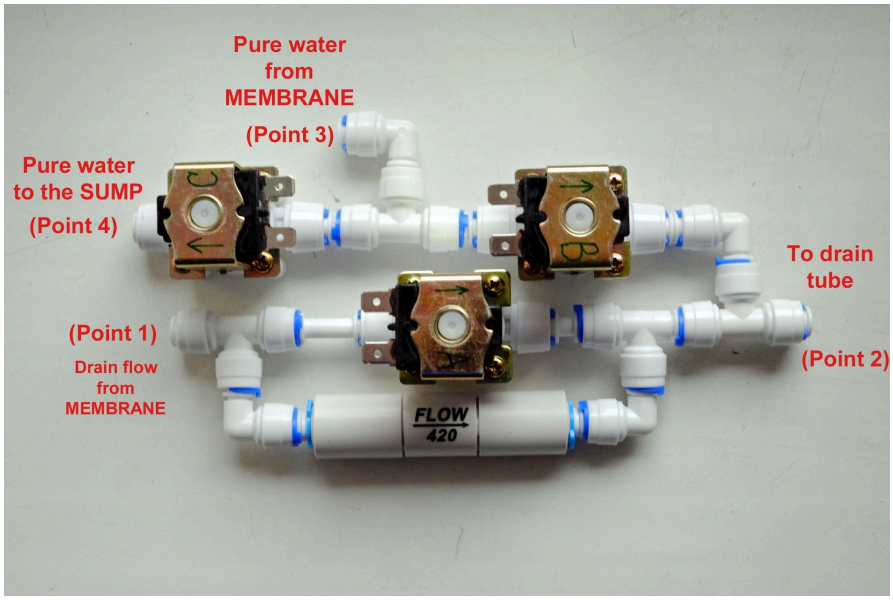
Our task is to put the valve A bypass flow restrictor, thereby, when it is energized, it will open completely drain at 100% and the flow of water will wash the membrane.



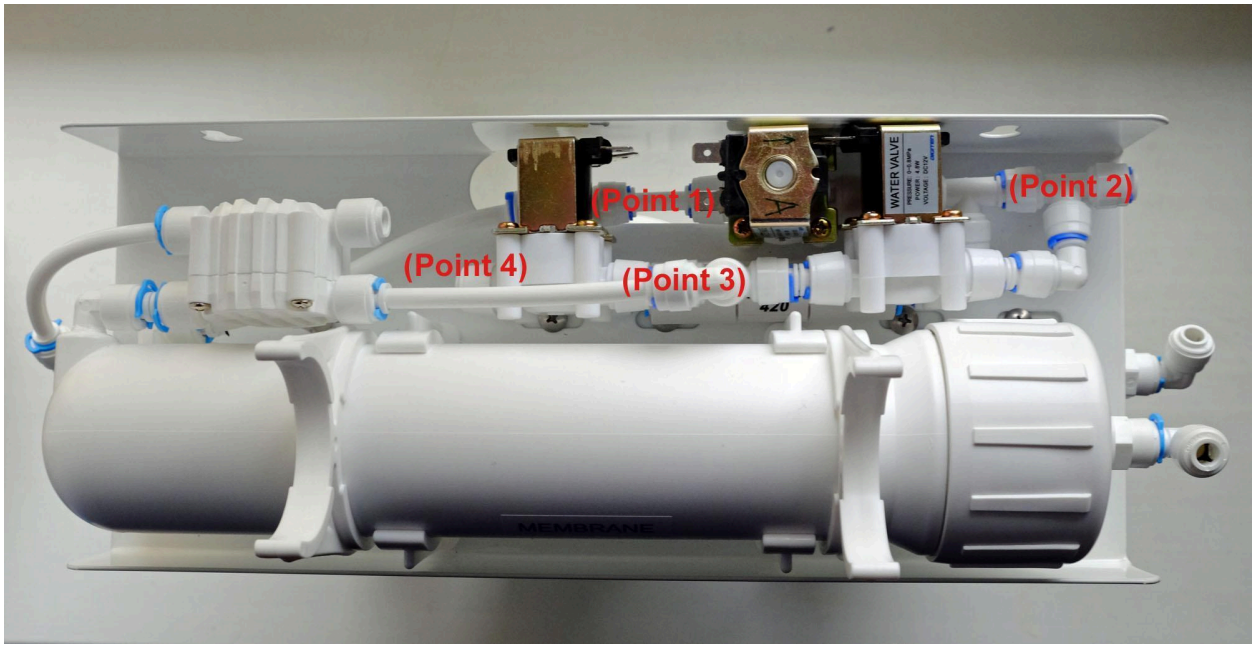
Now add to it the valve V. This valve drains the very unfortunate "tails." That is, it goes from one tube membrane with pure water, and the second is attached to the common point of discharge into the sewer.



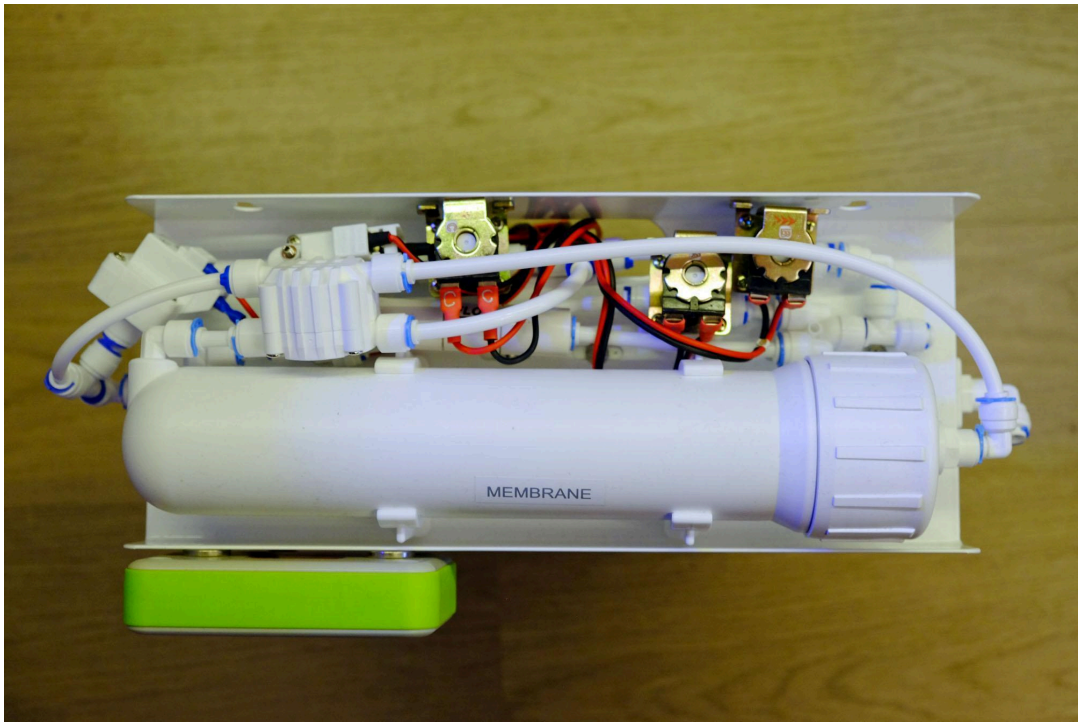
Now we have to install the valve C. This valve is pure water. Its task is to supply water on a schedule in our aquarium. For these valves is put only controls the pressure sensor. Further already provides the water to the resin flask and further into the sump.



Carefully install all this stuff in osmosis, cut the tube, move, if you want four-way valve closer to the membrane.



Will put the pressure sensor at the point 4 and replace the water supply pipe to the membrane. Connect a control loop.



Ready-assembled system. In all it took 15 minutes!

For all questions about setup, maintenance, warranty and service you can contact the following address: megapump@globalserver.ru