

R.O water vending machine (USER MANUAL)



(ATTENTION)

Before the installation and operation of the system, check the manual carefully for the best system condition,

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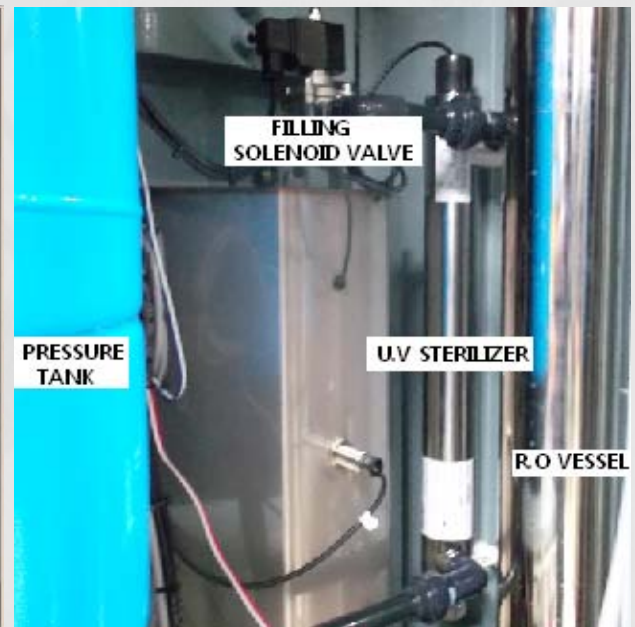
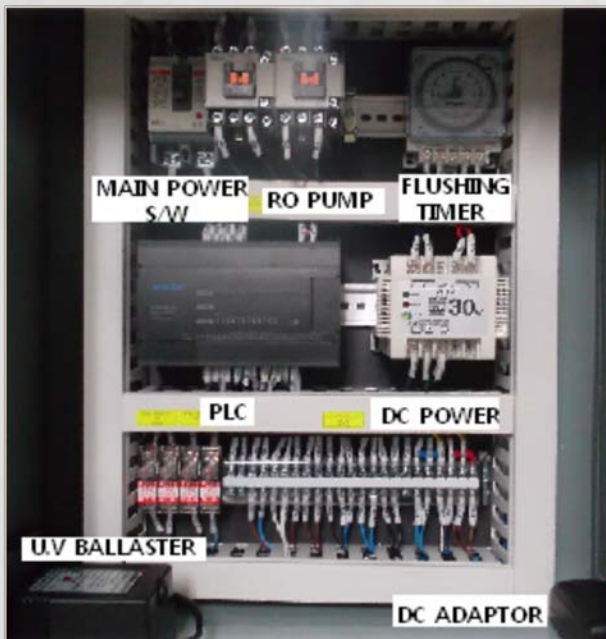
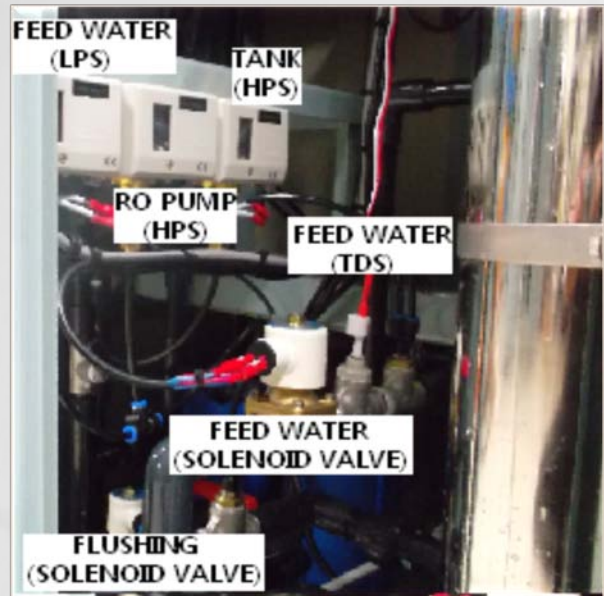
R/O WATER VENDING MACHINE (5gallon pc bottle)



1. SPECIFICATION

Capacity (Ton/Day)	R.O Membrane (#4040)	Operating Pressure(Kg/cm ²)	Electric Power (Kw)	Dimension (L*W*H mm)
7~8	2	8~10	1.2	900*800*1780

2. PRODUCT PARTS



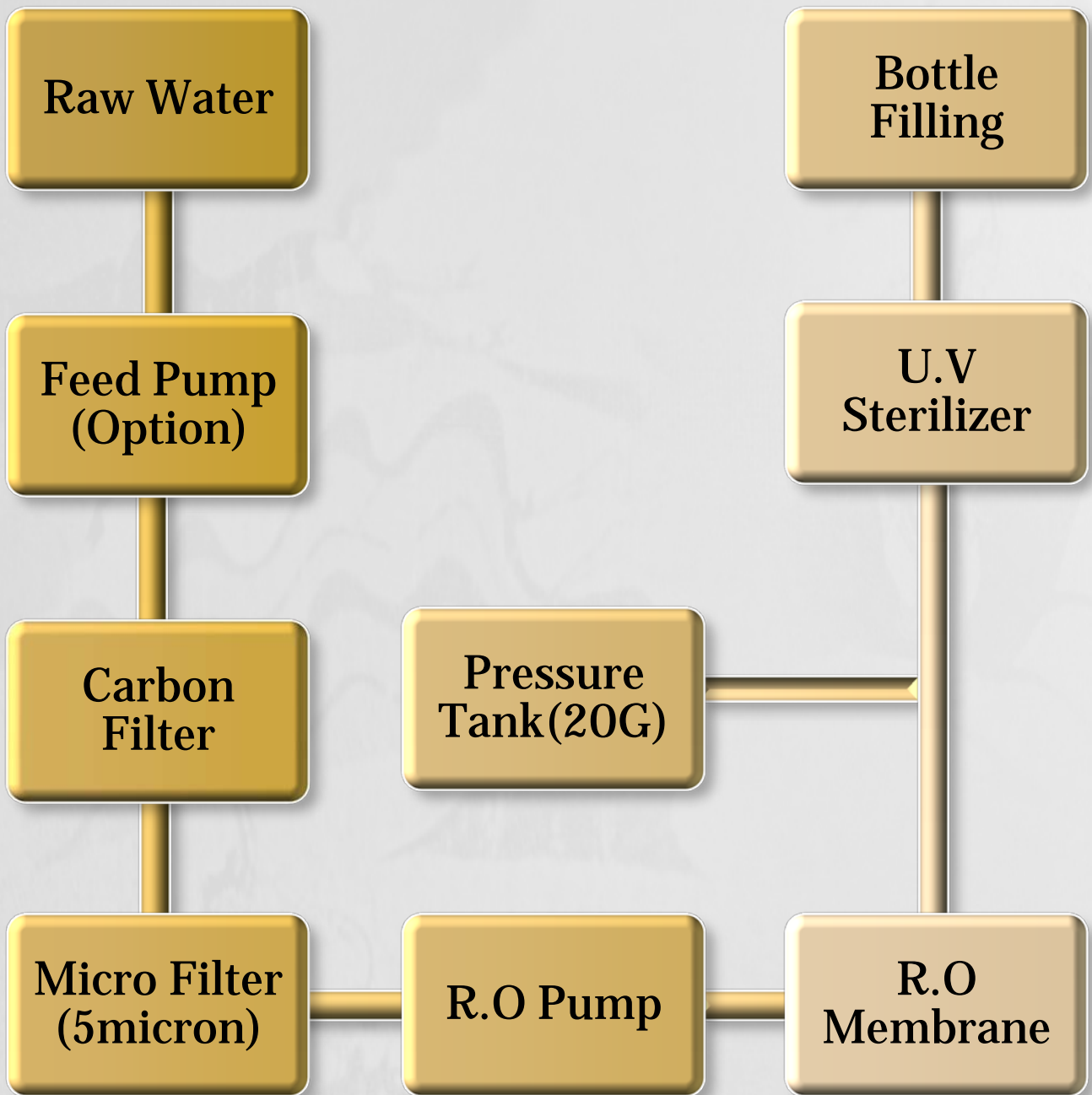
3. PRODUCT OVERVIEW

The R/O water vending machine is combined with the technology of R/O filtration system and vending machine

4. PRODUCT FEATURES

- 1) The system is operated automatically by PLC(Programmable Logic Controller) control
- 2) Automatic filling after putting the bottle into the system and pressing the button of “START”
- 3) U.V. sterilizing system at the filling stage
- 4) Dual TDS meter,
Available to indicate the TDS value of raw water and clean water by data link process
- 5) Capping system,
Available to do capping of the bottle upon the filtration of clean water
- 6) Compact design and Easy Installation
Easy to move and install
Possible to run the system immediately after connecting INLET and DRAIN pipes

5. SYSTEM FLOW CHART



6. COMPOSITION and USE OF THE SYSTEM

ITEMS	FUNCTIONS
Feed Pump (Option)	This pump forces water to flow into R/O system
Carbon Filter (Activated Carbon)	Activated carbon filter removes and adsorbs organism, smell, and Remain chlorine etc. in water
Micro Filter (5Micron)	Micro filter removes suspended and floating solid in raw water
LPS (Low Pressure S/W)	When it detects no inflow of raw water through sensing the feed water pressure, it stops the system operation
R.O Pump (1.2HP, 1Ph)	R/O pump pressurize pre-treated water into R/O membrane filter
HPS-1 (High Pressure S/W)	It detects over high pressure delivered to R/O membrane and R/O pump to protect them
HPS-2 (High Pressure S/W)	It detects pressure tank's pressure
R.O Membrane (#4040)	R/O membrane removes ionic element, turbidity and many kind of Bacteria, heavy metal, etc in raw water (It's treated water capacity is depending on water temperature)
U.V Sterilizer (20W/service life : 9,000h)	Device to Sterilize many kind of bacteria, microorganism and protozoa in treated water(clean water)
(Electrical parts)	
MAIN POWER SWITCH	MCCB LS MEC-15A
MAGNET SWITCH	LS MC-9B
PLC	MASTER-K80S(K7M-DR30S)
DC POWER SUPPLY	KAKON EQ5 03024(30W / DC24V)
U.V BALLASTER	220V / 20W

6. COMPOSITION and USE OF THE SYSTEM

ITEMS	FUNCTIONS
(Electrical parts)	
DC ADAPTER	DC12V / 1A
FUSE(15A)	U.V & LED LIGHT PANEL
LED DISPLAY PANEL	DC12V / 1A
Constant voltage sensor	It detects full water level of bottle when the bottle is filled with clean water
Photo sensor	It detects whether the bottle is put in or not

7. CAUTION FOR THE INSTALLATION

1. The electricity is 220V, 50~60HZ, 1PH
2. The INLET pipe size should be 15A or bigger than 15A and the inflow rate should be also min. 15LPM(=450LPH)
(If there inflow rate is less than 15LPM, the feed pump is required to install for the enough raw water supply into the system)
3. The Drain pipe size should be min. 15A and the height of the drain pipe should not be higher than the system pipes level.
(If the drain pipe position is higher than the system pipes, the drain pump shall be installed for the smooth drain)
4. After connecting water supply, operate the system,
(If there were no inflow of water during the system operation, it can occur the fatal damage of feed pump by the pump's idling)
5. The installed filtration system is based on CITY water for R/O filter system.
If the city water could not meet the below city water's condition, it's required to install additional pre-treatment device to protect R/O filter and other filters.

(THE INFLOW CITY WATER CONDITION for R/O SYTEM)

- Flow Rate : 15Liter/min or more
- Water Pressure : 1~3Kg/cm²
- Water Temperature : 5~30°C
- P.H : 5.8~8.5
- Turbidity : 1NTU or less
- TDS : 300ppm or less
- Total Hardness : 80ppm or less

6. The proper operation pressure is 8~10kg/cm² and it should not be higher than the max 12kg/cm²(If the system is operated under the improper pressure it may cause pipes leakage)

7. The flow rate must not go over the ratio(5:5) of the clean water(treated water) to drain water (concentrated water).

(The clean water rate shall be controlled within max 50% or less, if you raise too much water pressure to increase the production rate, it can incur damage of R/O membrane and shorten the service life of it. And also it may cause the system pipes leakage)

The proper water treated rate - 4 (for clean water) : 6(for drain water)
or max. 5 : 5.

8. Installation place

- The place where there is not a hindrance for the maintenance of the product,
- The interior non-freezing place
- The non-solar ray place
- The well-ventilated place,

* Pls do not install the system in those place

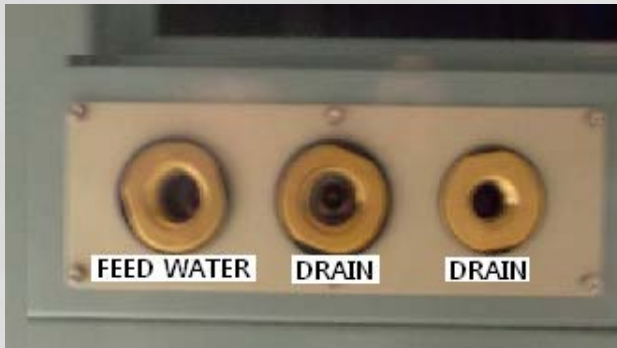
- The room temperature is too low like below 1 degree or too high over 50 degree,
- No ventilated place
- Not clean place with the contaminated water and oil
- The place with some vibration, shock,

9. Other installation condition

If the inlet power supply is unstable, it can incur some damage of machine, it's required to install AVR for stable power supply

8. INSTALLATION

1. Place the system where it's installed and fix the system by turning the caster levers properly,
2. Connect the feed water pipes and Drain water pipes (1.5" size) in the back of the system to water supply and let raw water flow into the system
(The Drain pipes height shall be lower than the system's pipes level)
Open all ball valves after pipes connection,

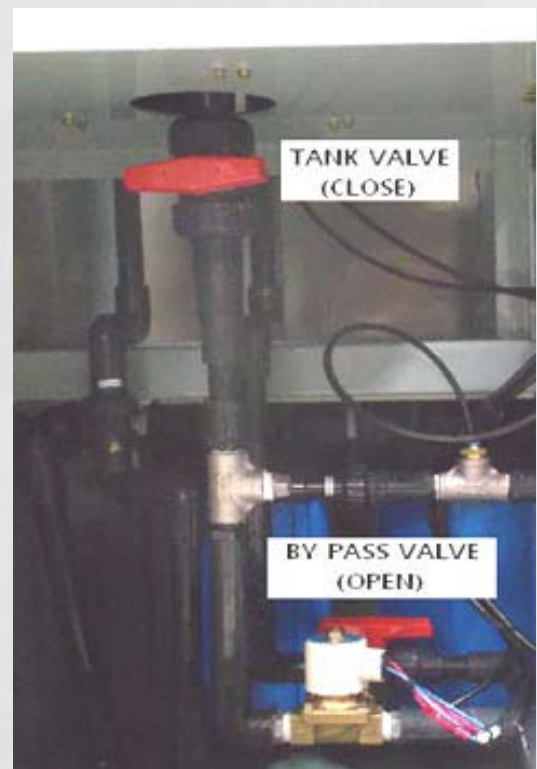


3. For the cleaning and drain (BY PASS) of R/O membrane and pipes at the initial installation stage, the CLEAN PVC VALVE is set as below and released from the factory.

- TANK VALVE- is closed to prevent the inflow of drain water to the tank,
- BY PASS VALVE- is opened for the complete drain of cleaning water

(* USE this BYPASS valve by opening it for the initial system installation stage and when filters are flushed after filter replacements)

4. Turn the "FLOW CONTROL VALVE (NEEDLE VALVE)" of the water flow controller located to the front of the system to the left side completely



5. Open the feed water valve and let raw water flow into the system,
6. Turn on the Main power switch of the electric operating panel
 - * Certainly turn on the Main power switch after connecting the water supply and when the relevant valves stay in proper position



- * Upon the installation of the system, any air inside the pipes shall be removed, Accordingly, remove those air inside pipes by pressing the AIR bent button as the photo until water comes out ,



- When turning on the Main power switch, the LED LIGHT PANEL and POWER LAMP of the indicator light
- And R/O pump starts operating and initial flushing is executed
- After flushing, this flushing water is drained through the R/O membrane filter and pipes,
- Do this initial flushing for min.20~30minutes for the satisfactory cleaning effect of R/O membrane even the TDS value of Dual TDS meta reaches to under 10ppm

7. After finishing the flushing, control each valve as below while the system is operating,
- 1) First, open the tank valve
 - 2) Next, close the BYPASS



8. Fix the flowing rate and the R/O pump pressure for the right operating condition by turning the FLOW CONTROL VALVE to the right side slowly

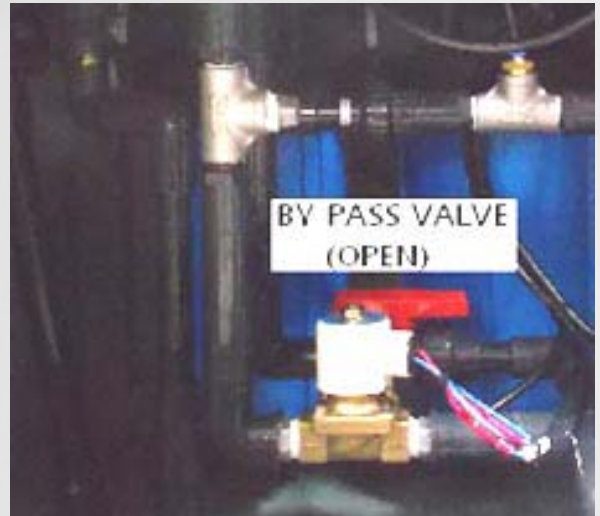
- RO pump's proper operation pressure is $8 \sim 10 \text{ kg/cm}^2$ and it should not be higher than the max. 12 kg/cm^2
- The proper clean water rate against drain water is 4(for clean water) : 6(for concentrated water-drain water) or 5 : 5, if you raise too much water pressure to increase the production rate, it can incur damage of R/O membrane and the water leakage from pipes



9. After fixing the operation condition, the clean water flows into the clean water tank and the concentrated water is drained through the drain pipes
Now the system's operation becomes normal
When tank is filled with clean water, R/O pump stops working by the pressure switch

10. Turn Off the MAIN POWER switch for cleaning the clean water tank and open the BYPASS only for the drain of water in the tank for almost 2~3 minutes,

*** SURELY, at this stage the Main Power Switch shall be "OFF" otherwise, when BYPASS valve is opened, R/O pump starts operating and it interrupts the complete drain of water in tank**



11. Turn on the MAIN POWER switch again, R/O pump starts operating again and the tank becomes filled with the clean water

12. AUTO FLUSHING,

- Lastly, set the "AUTO FLUSHING" time to be able to drain the whole congested water in the system within the limited time for the supply of the clean and safe water ,

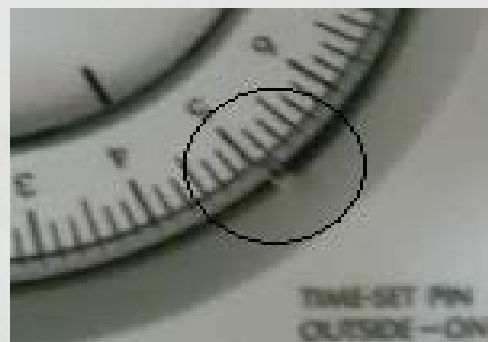
Do the AUTO FLUSHING in the early morning when the system is not on the operation

- AUTO FLUSHING,

Drain water in the clean water tank for 5 minutes and drain the congested water in the R/O membrane and pipes for 1 minute, totally do the AUTO FLUSHING for 6 minutes, After this auto flushing the clean water tank becomes filled with the clean water and turned out to be "STAND BY"

(HOW TO SET THE AUTO FLUSHING TIMER)

Open the TIMER COVER as the below photo and set the current time by turning the minute hand, After setting the current time, pull out a minute hand by any pincers for your required FLUSHING TIME as the below photo of the right side



- The minute hand of TIMER consists of 24 hours, one minute hand is 10 minutes
- The above photo of the right side is showed that it's set for the AUTO FLUSHING at 5 : 10AM

(ATTENTION)

The unit of a minute hand is 10 minutes, it's not mean to do AUTO FLUSHING for 10 minutes it functions to send the signal to the PLC within designated time. The AUTO FLUSHING TIME shall be totally 6 minutes(5 min + 1min)

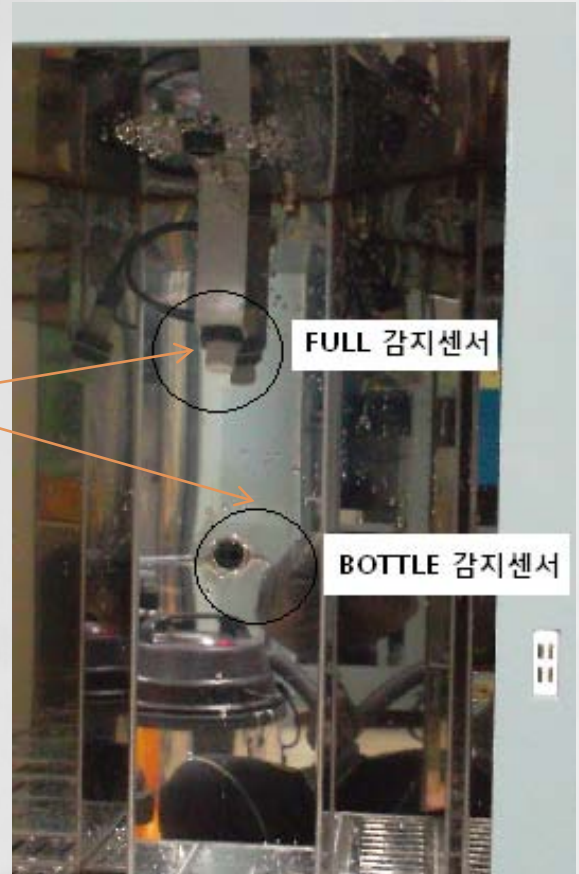
13. Assembly of the capping machine

Fix the fixing valve as the below photo and adjust the height of it by regulate ring



14. The Filling test

- There are two sensors inside bottle entrance. One is the sensor for a incoming bottle and the other is the sensor for the full water bottle level.
- BOTTLE SENSOR(detector) : If it does not sense the bottle inside, the clean water does not come even you do press the button of "START"
- FULL WATER BOTTLE LEVEL SENSOR, It shuts off the filling into the bottle when it senses full water bottle level,



* HOW TO DO THE FILLING TEST,

- Place the bottle onto the capping machine and put the bottle in to draw the bottle right up against the internal wall,
- Close the door and press the button of "START" then the LED lamp of "FILLING" onto the indicator lights and start the filling of the clean water onto the bottle,
- When the bottle is filled with the clean water, the FULL WATER BOTTLE LEVEL sensor detects it and the "LED lamp of "FINISH" lights. The system stops filling,
- Open the door and take the bottle out then LED lamp lights out.

Through repeating this filling and draining process few times, check the feed water's TDS value and the clean water's TDS value by DUAL TDS METER

9. OPERATION



1. Place the bottle onto the capping machine, Open the door and push the bottle in, (push the bottle in to the end in order to draw the bottle right up against the internal wall)



2. Close the door and press the button of "START" gently, (The filling of clean water starts when the "Filling lamp" of the front indicator lights)



3. Once the "Filling is completed, ("FINISH" LED lamp lights) open the door and take the bottle out. And close the door,

9. OPERATION



4. And do capping the bottle inlet port and press it by the hand,



5. Place the bottle onto the capping machine and press the cap completely by the capping leva (complted)

10. Maintenance Guide

1. Consumables parts replacements and maintenance

Check consumables parts and filters regularly and replace them on time

(Replacement cycle)

* This Filter replacement cycle can vary by the site's raw water source condition,

- Micro filter : about One month,
(This pre filter's condition can affect R/O filter's service life)
- Carbon filter : about One month
(This pre filter's condition can affect R/O filter's service life)
- R/O membrane filter :
The general service life of R/O membrane filter is about 2 years but there are many environmental features and raw water condition which affect the R/O filter's service life. Thus the right replacement time is when the treated water capacity(or flow) decreases by 15~20% from the initial treated water capacity(or flow), differential pressure increase, and also when TDS value increases severely
- U.V. lamp : 8,000 hours, (when it's broken the "FAIL" LED lights)

2. Fault Diagnosis

1) Power supply failure,

- Check the proper power connection from outside
- Check whether the circuit breaker of control box is "ON or OFF"
- Check the any case of wire disconnection,

2) No production of treated water

- Check whether raw water supply is ok
- Check whether each ball valve works well by closing and opening rightly
- Check whether the Solenoid valve works well
- Check the pre-filtration condition- whether it's blocked or not
- Check the drain status of concentration water

10. Maintenance Guide

3. How to RESET,

- 1) In case you press the Emergency S/W and the system stops working,
After solving the problem, pls do turn the button of "EMERGENCY" as the marked arrow (clockwise)
- 2) In case of the system malfunctions the LED lamps of the front indicator lights out(turns off)→the system operation stops
 - * "FILLING" LAMP turns off : When LPS(Low Pressure Switch) detects no feed water
 - * "FINISH" LAMP turns off : BY PUMP HPS by the below situation,
 - HPS shuts off the system operation when RO PUMP's pressure increases too much by controlling the FLOW CONTROL VALVE improperly,
 - HPS shuts off the system operation when R/O PUMP's pressure increases too much when RO membrane is blocked by the piled substances or some matter occurs to the R/O membrane,
 - * "FILLING" & "FINISH LAMP" turn off at the same time : when the filling timer works
 - FILLING TIMER
When the FULL WATER BOTTLE LEVEL is malfunction and does not detect full water level within 5minutes during the bottle filtration, this FILLING TIMER shuts off the filling into the bottle to prevent any overflows.

Under the above situation, pls do RESET as below,

After solving the problems push and hold the both buttons of "START" and "EMERGENCY" at the same time for 5 seconds, and turn the button of "EMERGENCY" as that marked arrow(clockwise). Then the system works normally,