

Portable Reverse Osmosis System



PORTABLE REVERSE OSMOSIS SYSTEM

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SPECIFICATION & FUNCTION

Our R/O system is operated automatically by PLC control which is connected to Level switches of each filter tank and LPS & HPS. You can monitor the on-line Operation condition of the system the problematic situation of it by the below Graphic Board.

Also Permeate water's condition is on-line monitored by TDS Meter.

1. EQUIPMENTS SPECIFICATION & FUNCTION

MODEL	PRODUCT (L/DAY)	MEMBRANE (#8040)	POWER (KW)	SIZE(W*D*H) (R.O SYSTEM)
HINRO-180	180,000	10	15	3,200*1,400*2100
*WATER FLOW DIAGRAM				
RAW WATER TANK-->RAW WATER PUMP-->BAG FILTER-->SOFTNER FILTER-->CARBON FILTER-->MICRO FILTER-->ANTI-SCALANT UNIT-->HIGH PRESSURE PUMP-->RO MAMBRANE(+CIP UNIT)-->UV SYSTEM				
*FULL SYSTEM SIZE(W*D*H) : 4,000*4,000*2,100				

#R.O System's capacity of treated water & filter replacement period are subject to change depending on raw water's temperature, element and their circumstance.

NO.	item	specification	Q'ty
1	RAW WATER PUMP	CR 15-3(Grundfos) 20M3/HR*48MH, 3.7KW(5HP)*3PH*220-440V*60HZ	1
*This pump force water in raw water tank to flow into R/O system			
2	BAG FILTER	STS HOUSING(1BF2) : STS304, Φ216*H 1100MM, 0.9M3/MIN, IN-OUT : 50A	1
3		BAG : 7"*30"-10micron	
*The Bag filter removes suspended solids less than 10micron in the raw water preliminarily.			
*BAG FILTER 'S REPLACEMENT PERIOD : ABOUT 1 MONTH			
4	SOFTNER FILTER	#3672(Φ914*H1,830MM), FRP	1
5		CONTROL VALVE(TMF-77A) : IN-OUT 2", 15Ton/HR	
6		ION EXCHANGE RESIN(Na Type)	
7		TANK : PE 1TON	
* Softner filter removes hardness elements(Ca, Ma) in raw water through Na type strong acid Ion-exchange resin and its recycled by regeneration of it with purity 99.5% refined salt -the diluted 10% ratio.			
*ION EXCHANGE RESIN'S REPLACEMENT PERIOD : ABOUT 1YEAR			
8	CARBON FILTER	#3672(Φ914*H1,830MM), FRP	1
9		CONTROL VALVE(TMF-77A) : IN-OUT 2", 15Ton/HR	
10		ACTIVATED CARBON : 8-30MESH	
11		SAND+GRAVEL	

*Activated Carbon filter removes and adsorb organism, smell and gas etc in the raw water.

***ACTIVATED CARBON FILTER'S REPLACEMENT PERIOD : ABOUT 1YEAR**

12	MICRO FILTER	STS HOUSING : STS304, Φ400*H 1,350MM, 12-20M3/HR, IN-OUT : 50A	1
13		FILTER(30*60) : 30"(750mm)*5MICRON*12PCS	

*Micro filter removes suspended solid(matter) less than 5micron in the raw water secondarily

***MICRO FILTER'S REPLACEMENT PERIOD : ABOUT 2MONTHS**

14	ANTI-SCALANT UNIT	METERING PUMP(AX1-21-PFC-HWS-K / 5-25cc/min)	1
15		TANK : PE 200L	
16		CHEMICAL : FLOCON 300 (5-10ppm/Feed Water Ton)	

* The scale produced by some pile of organic& inorganic substances in raw water, clogs RO membrane and shortens R/O filter's service life. This system doses raw water with Anti-Scalant solution in pre-treated stages to minimizes these matters.

17	HIGH PRESSURE PUMP	CR 15-7(Grundfos) 20M3/HR*114MH, 11KW(15HP)*3PH*220-440V*60HZ, 50A	1
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* This pump pressurize pre-treated raw water into RO membrane filter.

18	RO VESSEL	VESSEL : R8040B30S2W, 300PSI, END PORT	5
19		COUPLING : SUS 304, 40A	
20		TUBE : SUS 304, 40A	
21	RO MEMBRANE	RE8040-FEN	10

***R.O MEMBRANE'S REPLACEMENT PERIOD : ABOUT 2YEARS**

22	MOTOR VALVE(BY PASS)	HMV-50SC-3L / 2.5SEC / 220V-60Hz	1
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* When R.O System operate, drain the stagnant water inside R.O Membrane and pipe lines for 30second by this valve

23	CIP UNIT	CR 15-2(GRUNFOS) 20M3/HR*25MH, 3KW(4HP)*3PH*220-440V*60HZ, 50A	1
24		TANK : PE 1TON	
25		CLEANER(Inorganic Matter : AQUAMATE M-213N)	
26		CLEANER(Organic Matter : AQUAMATE M-301N)	

*CIP (Cleaning In PLACE)

*The fouling R.O Membrane can cause the reduction of the treated water capacity and differential pressure, etc. At that moment, CIP unit shall be activated by right cleaner for Organic & Inorganic matter

*CIP operation timing : The R.O SYSTEM's performance is influenced by variable factors such as pressure, temperature, pH and recovery rate. Also the CIP performance timing can vary by raw water's elements (condition) and environmental feature For right time CIP performance, operate CIP unit when the treated water capacity(or flow) decreases by 15~20% from the initial treated water capacity (or flow) and differential pressure increases.

27	FLOW METER	DAT50A(SUS304) 60-300LPM	2
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*Treated water & Concentrated water Flow Meter

28	PRESSURE GAUGE	WIKA 213.53(BD60-10k, DD60-25k)	4
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*Each parts pressure gauge (FEED WATER, RO PUMP, PERMEATE WATER, CONCENTRATE WATER)

29	LPS, HPS	LPS-6K, HPS-20K	2
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*LPS(Low Pressure Switch) : When it detects no inflow of raw water through sensing the feed water pressure,

it stops the system operation

*HPS(High Pressure Switch) : When it detects over high pressure delivered to R/O membrane, it stops the system operation

30	TDS METER & SENSOR	TDS-230(48*96*100mm)	1
*TDS Meter indicates the Total Dissolved Solids (TDS) of a solution, It displays in parts per million (ppm)			
31	UV SYSTEM	UV48GPM-HTM(39W)	1

*Ultra-Violet Water Sterilizer / *UV LAMP LIFE : ABOUT 9,000hours

**** The consumable parts as Bag Filter, Micro Filter, R.O Membrane, Ion Exchange Resin, Activated Carbon etc, their replacement period is based on the general standard, those water condition, surrounding circumstance and system management can vary these filter replacement period.**

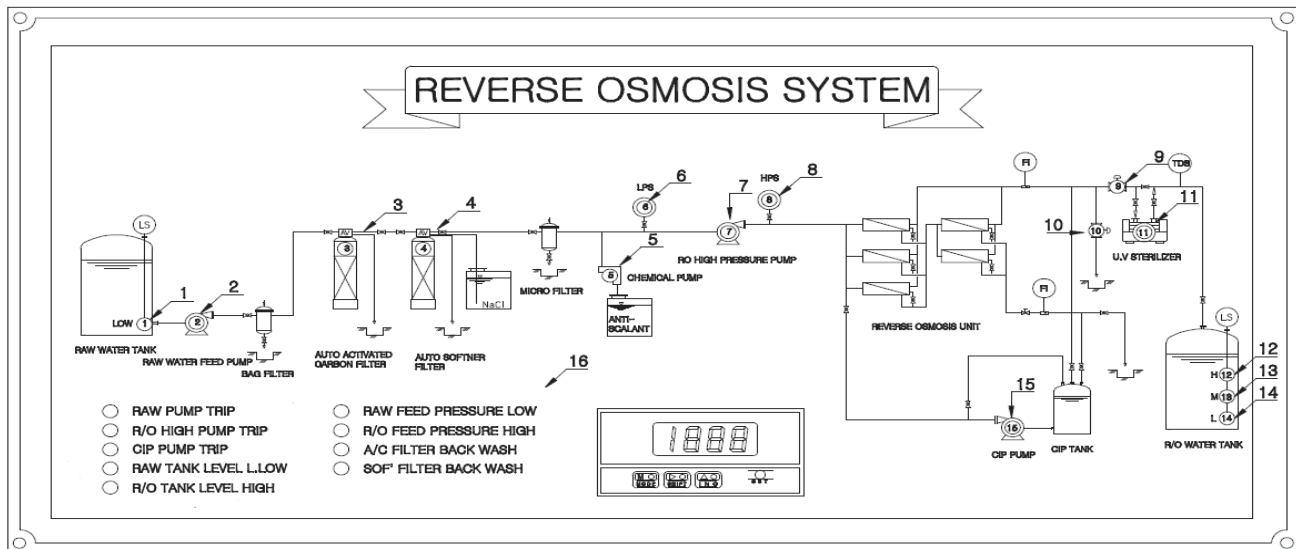
**** The pre-treatment filters shall be checked and replaced properly to be able to protect the RO membrane**

OPERATION OF R.O SYSTEM

1. DISPLAY OF SYSTEM'S OPERATION

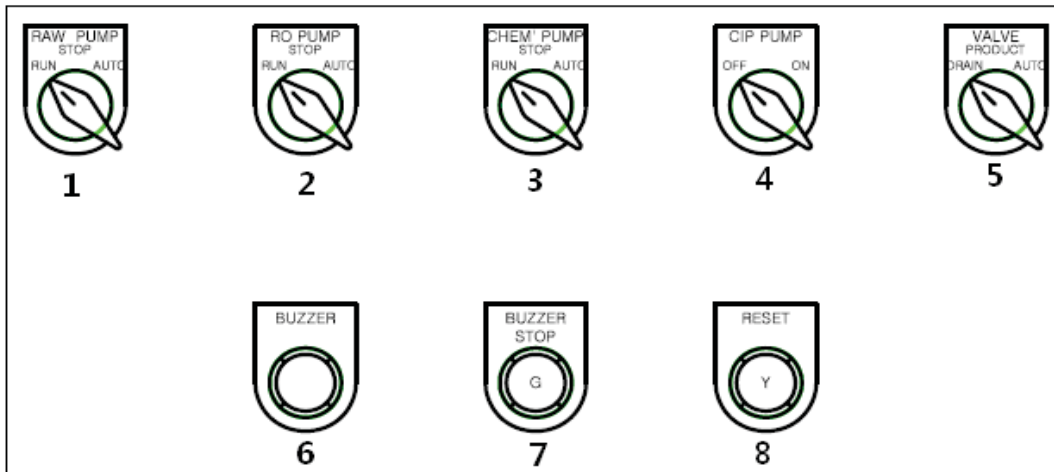
Our R/O system is operated automatically by PLC control which is connected to Level switches of each filter tank and LPS & HPS. You can monitor the on-line Operation condition of the system the problematic situation of it by the below Graphic Board.

Also Permeate water's condition is on-line monitored by TDS Meter



- 1 Light starts blinking once raw water level is low.
- 2 Light starts blinking once raw water feed pump operates
- 3 Light starts blinking once the carbon filter's regeneration
- 4 Light starts blinking once the softner filter's regeneration
- 5 Light starts blinking once metering pump operates
- 6 Light starts blinking once LPS can not detect inflow of raw water through sensing the feed water pressure
(Check the Raw water tank's water level, Pre- treated filter's clogging, Feed pump operating status)
- 7 Light starts blinking once R.O High pressure pump operates
- 8 Light starts blinking once HPS detects over high pressure delivered to RO membrane
(Check the R.O Membrane status and their pipe clogging etc)
- 9 Light starts blinking once motor valve directs to LPS permeate water
- 10 Light starts blinking once motor valve directs to drain side.
- 11 Light starts blinking once UV system operates
- 12 Light starts blinking once Permeate water tank's water level becomes high
- 13 Light starts blinking once Permeate water tank's water level becomes middle
- 14 Light starts blinking once Permeate water tank's water level becomes low
- 15 Light starts once CIP Pump operates
- 16 It displays the status of each systems

2. OPERATION SWITCH



1 RAW WATER FEED PUMP CONTROL SWITCH

- "RUN" Pump run
- "STOP" Pump stop
- "AUTO" Automatic Operation System by PLC program

2 R.O PUMP CONTROL SWITCH

- "RUN" Pump run
- "STOP" Pump stop
- "AUTO" Automatic Operation System by PLC program

3 METERING PUMP CONTROL SWITCH

- "RUN" Pump run
- "STOP" Pump stop
- "AUTO" Automatic Operation System by PLC program

4 CIP PUMP CONTROL SWITCH

- "ON" Pump run
- "STOP" Pump stop

5 MOTOR VALVE CONTROL SWITCH

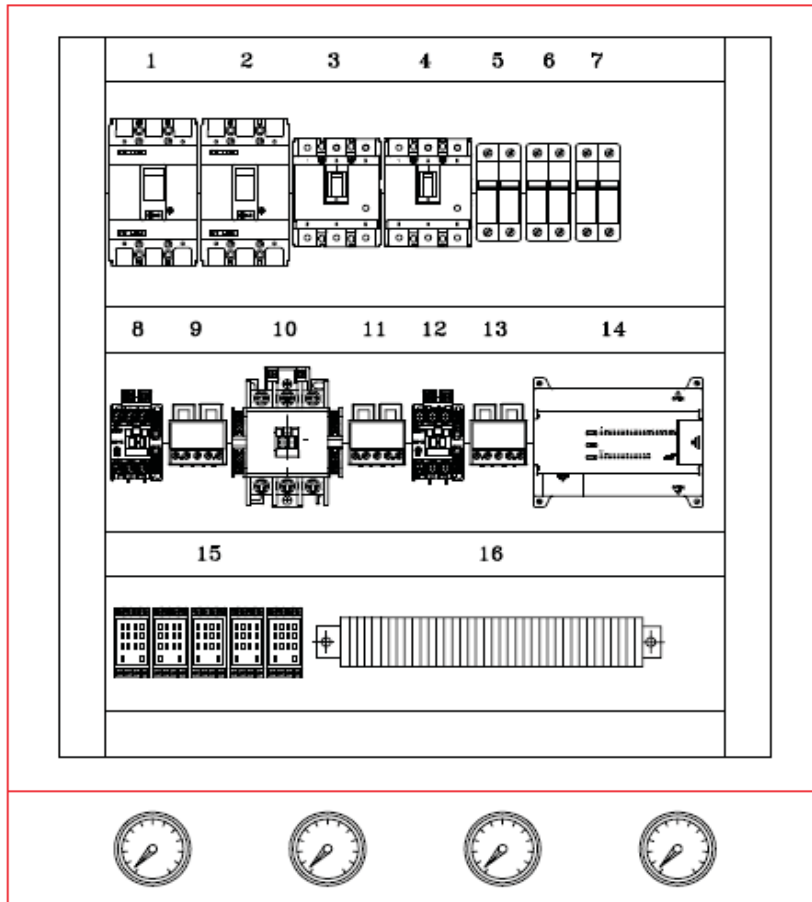
- "DRAIN" Open to the direction of drain
- "PRODUCT" Open to the direction of permeate water
- "AUTO" Automatic Operation System by PLC program

- 6 **BUZZER** Sound Buzzer when the system malfunctions
(Red light starts blinking onto the operation panel when the system malfunctions)

- 7 **BUZZER STOP** Buzzer sound off

- 8 **RESET** Restart the system after solving the problems

3. ELECTRIC PARTS



NO.	DESCRIPTION	REMARKS
1	MCCM ABN 63/60A	MEIN NFB
2	MCCM ABN 53/40A	R/O HIGH PRESSURE PUMP NFB
3	MCCM ABE 33/15A	RAW WATER FEED PUMP NFB
4	MCCM ABE 33/10A	CIP PUMP NFB
5	MCCM BKM 2P/6A	CHEMICAL PUMP NFB
6	MCCM BKM 2P/6A	U.V ST NFB
7	MCCM BKM 2P/6A	CONTROL POWER NFB
8	MAG' CON GMC-12	RAW WATER FEED PUMP
9	EOCR	RAW WATER FEED PUMP
10	MAG' CON GMC-50	R/O HIGH PRESSURE PUMP
11	EOCR	R/O HIGH PRESSURE PUMP
12	MAG' CON GMC-9	CIP PUMP NFB
13	EOCR	CIP PUMP NFB
14	K7M-DR30S	PLC
15	MY-4N	RELAY & SOCKET
16	TERMINAL BLOCK	

CIP & ANTI-SCALANT

1. CIP (Cleaning In Place)

1. What is CIP?

The R/O membrane -pore or surface can be contaminated by Silt, Colloidal Substances, Organic & Inorganic, etc dissolved in water and some piled scale on it.

Even the pre-treatment filter system is designed to remove those contaminants as much as possible for the treated water passed into R/O membrane filter, it can not eliminate all those matters.

Accordingly, those piled contaminants and scales onto R/O membrane filter's surface shall be cleaned by this CIP system (Cleaning In Place) periodically while the R/O system is operated.

2. CIP operation timing

R/O system's performance is influenced by Pressure, Temperature, PH, recovery rate, raw water's concentration, and other environmental feature and they can vary the treated water capacity and CIP operation timing.

(Specially in case of underground water or river water, the water condition can be changeable at each season)

In order to apply for the accurate data of those factors for the right time CIP operation, it's necessary to measure them with the relevant instruments under intensive management and to record them, Nevertheless it's difficult to have the correct CIP operation timing against those variable factors.

It's also very important to check the condition of the pre-treated filters(Bag filter, Softner filter, Micro filter) and replace them at a right time.

Accordingly, the general standard for the CIP operation timing is applicable like when the treated water capacity(or flow) decreases by 15~20% from the initial treated water capacity(or flow) and differential pressure increases, also when rejection rate decreases

CIP operation shall be operated within 3-9 months according to raw water and installation condition

3. CIP chemicals selection

In order to select the right chemicals it's necessary to analyze raw water and on scales though generally two chemicals are used, one is for inorganic matter(ACID cleaning: metal hydroxide, calcium carbonate, removal of scales) and the other chemical for organic matter(Alkali cleaner : removal of organism, silt, other particulate contaminants)

4. CIP cleaning sequence (circular cleaning)

- * The CIP operation takes time, thus it shall be operated after filling the treated water tank fully when water consumption is generally low
- Clean the PE tank of CIP system to remove inside piled foreign substances and open the ball valve to fill the PE tank with the treated water up to 1/2(500liters).
- Put cleaner(chemical) of 50liter(10%) for inorganic matter into the treated water(500liter) and mix them well
- Set all operation switches of Control panels on "STOP"
- Open the "GLOVE VALVE" which is placed under Control Panel for water flow control and shall let

this cleaner circulate to the R/O Vessel's Concentrate Water line(cleaning pressure 1~3bar)

- Control the each ball valve's switch as below to circulate cleaner well.

(CIP cleaner circulation sequence)

CIP Tank-->CIP Pump-->R.O Vessel-->Concentrate Water Line-->CIP Tank(repeated circulation)

- When things are ready as above, Turn the CIP PUMP operation switch of control panel "ON" to start cleaning.

(Demand quantity of Cleaner) PER 1 TIME

50kgs for each Inorganic matter and organic matter

5. CIP cleaning time

*CIP cleaning is operated by following sequece, and It takes each 3hours for organic & inorganic matter (total 6hours)

*If the membrane is too much contaminated, extend CIP cleaning time

- Cleaning time for Inorganic matter : about 1hour circulation-->about 1hour precipitation(TURN "OFF" CIP pump and close the valve)--> about 1hour recirculation

-Cleaning time for Organic matter : same with above process for Inorganic matter

6. CIP cleaning completion

* After CIP cleaning completion, Turn CIP PUMP switch "OFF" and return Ball valves of piping to normal operation condition then set control panel's operation switches "AUTO" on.

(At this time, do not adjust "Glove Valve" which is flow control)

(#5 Motor Valve's operation switch should be set "DRAIN" on)

* Drain all remain cleaner(chemicals) in R/O vessel and pipes from CIP cleaning by operating the R/O system normally for almost more than 10minutes

* Turn Glove Valve slowly up to the moderate pressure and drain enough CIP cleaning water passed over R/O membrane to treated water side

* Set #5 Motor Valve operation switch on "AUTO" after draining completely

7. Others

* Clean the CIP's tank inside after draining remain cleaning water completely

* This drain water with cleaner(chemical) shall be treated in accordance with the wastewater treatment condition (If necessary, wastewater treatment system shall be installed)

* Frequent cleaning could damage RO membrane and shorten the service life of it

*RO membrane's Permeate water influx is seriously influenced by raw water's temperature

(The Flow water rate is based on water temperature's +25C)

2. ANTI-SCALANT UNIT

1. What is Anti-Scalant Unit ?

* The scale produced by some pile of organic & inorganic matter dissolved in raw water, clogs R/O membrane pore and shortens R/O membrane's service life. This system doses raw water with Anti-Scalant solution in pre-treated stage to minimizes these matters.

2. Operation

When raw water inflows by raw water pump, the metering pump of Anti-Scalant unit works together to dose by PLS control,

3. Dosage of chemical (FLOCON 300/specific gravity 1.1)

Generally, inject(dose) 5~10ppm which is fit with raw water amount in accordance with raw water condition (Basis 5ppm)- 1g / 1ton of raw water.

* For HINRO-180, 15ton/hr for feed water amount is calculated considering the Recover rate (50%)

* 5ppm : 5g/Ton dosage-->15ton*5g=75g/hr-->75g/60min=1.25cc/min

* Metering Pump's dosage range : 5-25cc. It should be diluted with water

-Considering chemical tanks size(200L), Water 5(167L) + Chemical 1(33L=33kg) = 6times

-6times* 1.25cc = **7.5cc/min** injection to Metering Pump Setting

4. Demand of chemical (Supposed operation time 12hr/day)

-Demand of chemical : 75g/hr-->one day 12hr *75g=900g/day-->30days*900g=27kg/month

-Monthly Demand of chemical : 27kg

- This chemical tank can include 33kgs of diluted chemical with the treated water for about 37days use,

5 Dilution of chemical

* dilution water should be Permeated water. While the chemical diluted with water in chemical tank.

This chemical is hydrophilic, so need about 2-3minute to agitate with water,

SOFTNER FILTER MANUAL

1. FLOW CONTROL VALVE FOR SOFTNER

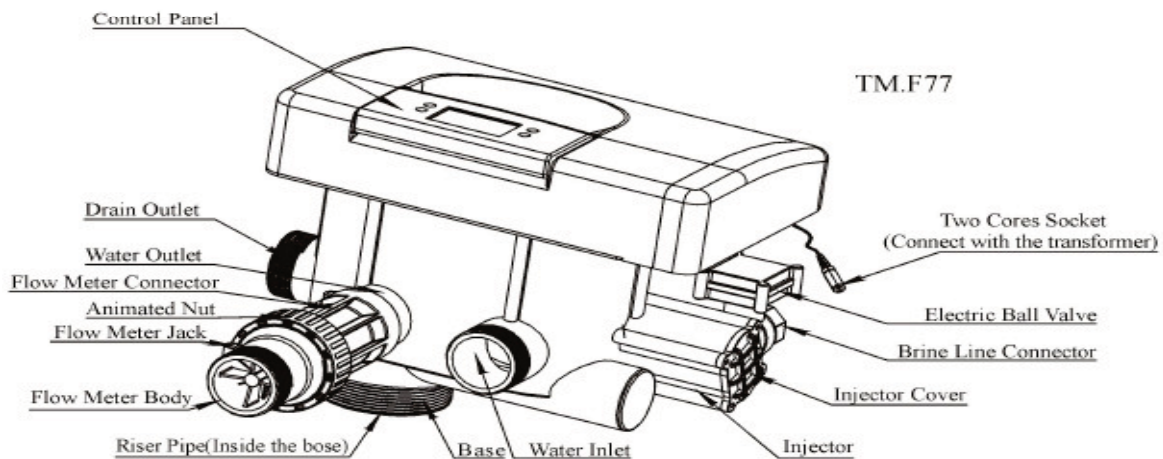
(CAUTION)

- 1) The "BACK WASH" and "REGENERATION" for water softner by control valve shall be activated when the R/O SYSTEM is not working mostly in the early morning,
Specially, it shall be set-up onto control valve with different time for Carbon filter's BACK WASH time.
- 2) The period of Back WASH & REGENERATION should be considered by raw water conditions and surrounding circumstance,
- 3) The brine tank should be activated with the clean treated water and the refined salt 99.5%
- 4) Fill the brine tank with clean water up to 70% of the tank and put the refined salt 200~300kgs (Frequently, check the Brine tank and fill it with refined salt)
- 5) To make salt melted well, set the air bubble device's operation timer of brine tank on for 30minutes before the REGENERATION -1hour advance by Flow control valve.

Then air bubble device mix the salt and water well

* Fill Softner Tank(1000L) with Ion exchange resin(Na Type) 70%(700L).

*** After putting this media-resin into tank it's necessary to do "BACK WASH" and "Drain" for 30minutes for cleaning the media**



Product Specification

Technical Parameter

Controller		Working Condition	
Controller Model	Volume Type	Suited Pressure	0.2~0.6MPa
Transformer Input	100~240V/50~60Hz	Suited Water Temperature	5~45°C
Transformer Output	DV24V	Turbidity of Water Inlet	<5FTU

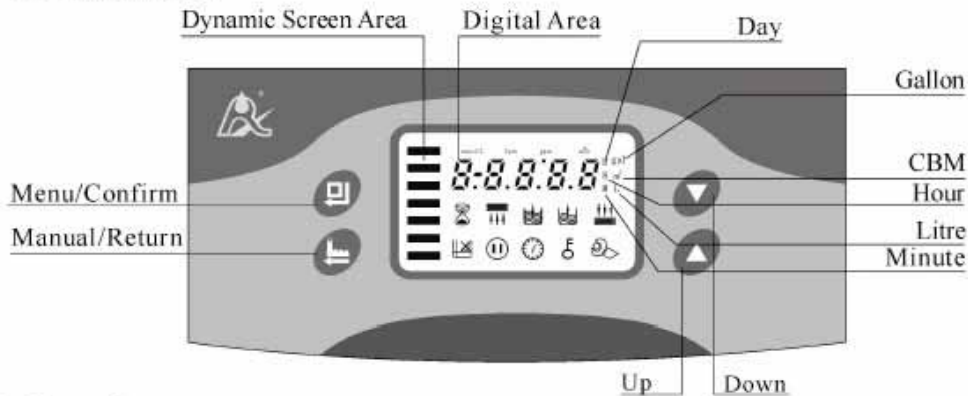
Control Valve

Model	Connection Size					Maximum Water Capacity m ³ /h	Regeneration Mode
	Inlet / Outlet	Drain Outlet	Brine Line Connector	Base	Riser Pipe		
TM.F77A3	2" M	2-1/2" M	3/4" F	4" -8UN	1-1/2" D-GB(50mm)	18	Down-flow

Remark: M — Male Thread F — Female Thread OD — Outer Diameter

Controller Operation Instruction

Control Panel



Button

- Press this button to enter into menu, the setting sign light, it could inquiry every parameter value.
- After entered into menu, press this button, the showing numerical value and the setting sign will flicker. Indicate it has entered into the setting state of this parameter.
- After set the parameter press this button, there is a sound 'DI', indicate it confirm setting and back to up step state.

Button

- Press this button when not in the menu state, it could finish the working state advance and go to the next working state immediately.
- Press this button when in the menu state and back to the up step menu.
- Press this button when in the setting state, the setting parameter has not preserved and back to the up step menu.

button

- Enter into the menu, press or continuously it could show each parameter value press up or down.
- When setting the parameter, Press or continuously it could adjust every parameter up or down.
- Press and two buttons together for 5 seconds, it could unlock the locked keyboard.

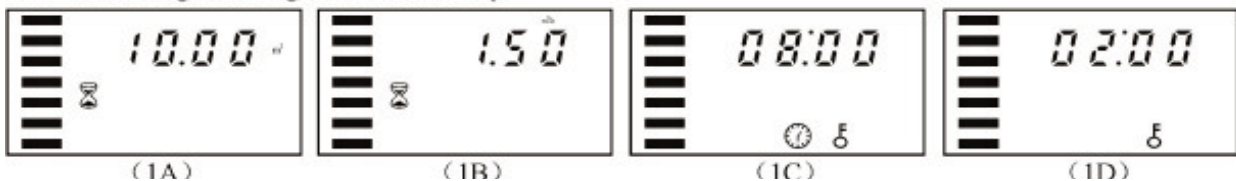
	● Setting or inquiring after unlock the keyboard.
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

1、 Show Screen

At the Service state, the screen will show the following figures every ten seconds circularly:






- ① Balance water treatment capacity (Five digits represent the balance water treatment capacity. Digital symbol is matched with figure symbol); such as 10.00m³.
- ② Current flow rate (no unit, see Picture 1B); such as 1.5m³/h, showing this current flow rate is 1.5m³/h.
- ③ Current time; (see Picture 1C) such as 08:00.
- ④ Regeneration start up time (see Picture 1D the sign clock do not light, this item is not exist in A-02/04); such as 02:00.

For example: The work mode is A-01/03, when it is in the service state, the screen will show the following four figures recurrently.










	<ul style="list-style-type: none"> ● The colorful strips on the left of screen flicker dynamically show the system at the station of service. ● The colorful strips on the left of screen do not flicker show the system at the station of regeneration. ● The sign  light shows the system at the station of inquiring; the sign  flicker dynamically shows the system at the station of setting. ● When the figure  light, the keyboard is at the locked state . ● When the  flicking , indicate it has been cut of for a long time. Then the value should be reset.
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● Digital area, figure area and paraphrase as follow:

Show		Paraphrase	Notice
Digital Area	Figure Area		
12:20		Current Time 12: 20	' : 'Flicker
02:00		Regeneration Start-up Time 2:00	' : 'Non-flicker A-02,A-04 do not have this item
2-10M		At the Backwash State, Left 10 Minutes	
3-60M		At Brine & Slow Rinse state, left 60 minutes	
4-10M		At Fast Rinse state, left 10 minutes	
5-05M		At Brine Refill state, left 5 minutes	

Establishment of Each Parameter

For example: The program is in the service state, if you want to set the current time 9:45 to 11:28, and the backwash time 10 minutes to 15 minutes, operate as the following steps:

1. If the screen shows  , indicate the keyboard is in the locked state, Press ▲ and ▼ two buttons together for 5 seconds , unlock the keyboard. If the screen don't show  , indicate the keyboard has not locked , then enter into the second step 2 directly.
2. Press  button to enter into menu, showing the current time of the first page of the menu, the setting sign  and the current time  light at meantime. Then ,the sign ' : ' flicker.
3. Press  button to enter into the setting state , time value and the setting sign  start to flicker.



4. Press ▲ button continuously until the time value 09 change to 11.



5. Press □ button, minute value and the setting sign ⚙ flickering at meantime, then press ▼ button continuously until the minute value 45 to 28.



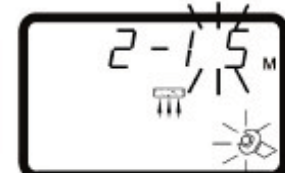
6. Press □ button, there is a sound 'DI' the figure stop flickering, the program back to the inquiring state.



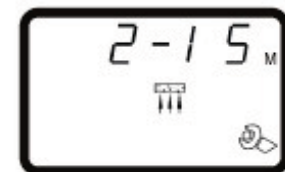
7. Press ▲ or ▼ button, until the backwash sign ☰ light, as the right figure shows.



8. Press □ button to enter into the setting state, numerical value 10 and the setting sign ⚙ start to flicker. Then press ▲ button continuously until the numerical value 10 change to 15.



9. Press □ button, there is a sound 'DI', the figure stop flickering and the program back to the inquiring state.



10. Press ⏪ button back to menu, the screen show the working state. If not operate key board in one minute, keyboard locked automatically, then the locked sign 🔒 light.



2. MAINTENANCE GUIDE

Part of Control Valve

Problem	Cause	Correction
1. Softener can not regenerate.	A. Device power off. B. Regeneration time set wrong. C. Controller damaged.	A. Check supply power whether normal or not. (Including fuse, plug, switch etc) B. Readjust time. C. Check or change controller.
2. Softener outputs hard water.	A. By pass ball valve opened B. No salt in brine tank C. Injector be blocked. D. No enough water refilled in brine tank. E. Leakage on riser pipe. F. Leakage in valve body side	A. Close the by pass ball valve. B. Make sure there is solid salt in tank. C. change or clean the injector. D. Check time of refill water to brine tank. E. Check riser pipe not broken, and check seal O-ring. F. Check and repair or change valve body.
3. Can not suck salt	A. Inlet pressure too low. B. Brine pipeline blocked. C. Leakage on brine pipeline. D. Injector damaged. E. Leakage in valve body inside.	A. Heighten inlet pressure. B. Check pipeline. Take out the stem. C. Check pipeline D. Change a new injection. E. Check and repair or change valve body.
4. Too much water in brine tank	A. Brine refill time too long. B. Too much water in brine tank after sucking salt	A. Readjusting brine refill time. B. Check whether it is blocked or not in injector or brine pipeline.
5. Water pressure damage	A. Pipeline leading to softener blocked by iron matter. B. Softener blocked by iron matter.	A. Clean up pipeline of softener. B. Clean up control valve. Add cleaning liquid to resin tank in order to increase the regeneration efficiency.
6. Resin flow out from drain pipe.	A. Air in system B. The strainer is damaged	A. Make sure exhaust normally in system. Check it whether dry or not B. Change the strainer.
7. Control valve continuously circulate.	A. Signal line be cutoff. B. Fault on controller. C. Wheel be locked by abnormal things.	A. Insert the signal line again B. Change the controller. C. Take out the abnormal things
8. Water flow out from the drain continuously.	A. Valve body inside leaking B. Power off when backwash or fast rinse.	A. Check and repair or change valve body. B. Switch by hand to service position or close by-pass valve. Reopen when power normal.

Controller

Problem	Cause	Correction
1. All sign and figures light in screen	<ul style="list-style-type: none"> A. The connect line between screen panel and control panel damaged. B. Main control panel damaged. C. Transformer get wet or damaged 	<ul style="list-style-type: none"> A. Change the connect line B. Change the main control panel. C. Check or change the transformer.
2. No show in screen	<ul style="list-style-type: none"> A. The connect line between screen panel and control panel damaged. B. Screen panel damaged. C. Main control panel damaged. D. Power cutoff. 	<ul style="list-style-type: none"> A. Change the connect line B. Change the screen panel. C. Change the main control panel. D. Check the cables and main power.
3. Only E1 show in screen and flickering	<ul style="list-style-type: none"> A. The connect line between locating panel and main control panel damaged. B. Locating panel damaged. C. Mechanical driving device damaged. D. Main control panel damaged. E. The connect line between driver and main control panel damaged. F. Driver damaged. 	<ul style="list-style-type: none"> A. Change the connectline. B. Change the locating panel. C. Check the mechanical gearing. D. Change the main control panel. E. Change the connect line between driver and control panel. F. Change the driver.
4. Only E2 show in screen and flickering.	<ul style="list-style-type: none"> A. Hall components on locating panel damaged. B. The connect line between locating panel and main control panel damaged. C. Main control panel damaged 	<ul style="list-style-type: none"> A. Change the locating panel. B. Change the connect line. C. Change the main control panel.
5. Interlock disorder	<ul style="list-style-type: none"> A. Interlock cable disconnect or interlock connectors wrong connection. B. Main control panel damaged. 	<ul style="list-style-type: none"> A. Connect cable in correct way. B. Change the main control panel.
6. Brine suck and refill out of control	<ul style="list-style-type: none"> A. Electric ball valve damaged B. Cable between electric ball valve and main control panel damaged. C. Main control panel damaged. 	<ul style="list-style-type: none"> A. Change the electric ball valve. B. Connect cable in correct way. C. Change the main control panel.

CARBON FILTER MANUAL

1. FLOW CONTROL VALVE FOR CARBON FILTER

(CAUTION)






- 1) The "BACK WASH" and "REGENERATION for Carbon filter by control valve shall be activated when the R/O SYSTEM is not working mostly in the early morning,
Specially, it shall be set-up onto control valve with different time for Water Softner's BACK WASH time.
(For example, set AM 01:00 (operating on 1H 30M)-->Carbon Filter shall be set AM 03:00)
- 2) The period of Back washing & regeneration should be considered by raw water conditions and surrounding circumstance,

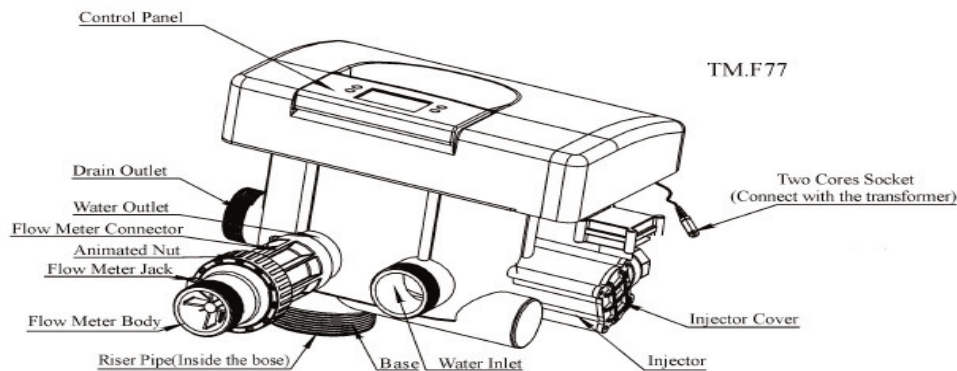
* Fill Carbon Filter Tank(1000L) with Sand & gravel by 10%+Activated carbon(8-30mesh) 60%.

*** After putting this media-resin into tank it's necessary to do "BACK WASH" and "Drain" for 30 minutes for cleaning the media**

Flow control valve setting for Carbon filter is same with water softner but there is no process for "RINCE" and "Brine Refill" by salt so that it should be set on TIME "00".

● Digital area, figure area and paraphrase as follow:

Show		Paraphrase	Notice
Digital Area	Figure Area		
12:20		Current Time 12: 20	' : 'Flicker
02:00		Regeneration Start-up Time 2:00	' : 'Non-flicker A-02,A-04 do not have this item
2-10M		At the Backwash State, Left 10 Minutes	
3-00			
4-10M		At Fast Rinse state, left 10 minutes	
5-00			



Product Specification

Technical Parameter

Controller		Working Condition	
Controller Model	Volume Type	Suited Pressure	0.2~0.6MPa
Transformer Input	100~240V/50~60Hz	Suited Water Temperature	5~45°C
Transformer Output	DV24V	Turbidity of Water Inlet	<5FTU

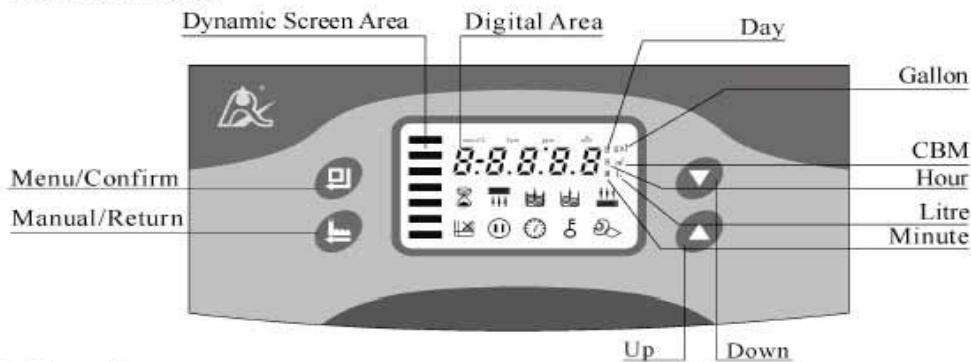
Control Valve

Model	Connection Size				Maximum Water Capacity m ³ /h	Regeneration Mode
	Inlet /Outlet	Drain Outlet		Base		
TM.F77A3	2" M	2-1/2" M		4" -8UN	18	Down-flow



Remark: M — Male Thread F — Female Thread OD — Outer Diameter

Controller Operation Instruction

Control Panel



Button


- Press this button to enter into menu, the setting sign  light, it could inquiry every parameter value.
- After entered into menu, press this button, the showing numerical value and the setting sign  will flicker. Indicate it has entered into the setting state of this parameter.
- After set the parameter press this button, there is a sound 'DI', indicate it confirm setting and back to up step state.

Button

- Press this button when not in the menu state, it could finish the working state advance and go to the next working state immediately.
- Press this button when in the menu state and back to the up step menu.
- Press this button when in the setting state, the setting parameter has not preserved and back to the up step menu.

▲ and ▼ button

- Enter into the menu, press ▲ or ▼ continuously it could show each parameter value press up or down.
- When setting the parameter, Press ▲ or ▼ continuously it could adjust every parameter up or down.
- Press ▲ and ▼ two buttons together for 5 seconds, it could unlock the locked keyboard.

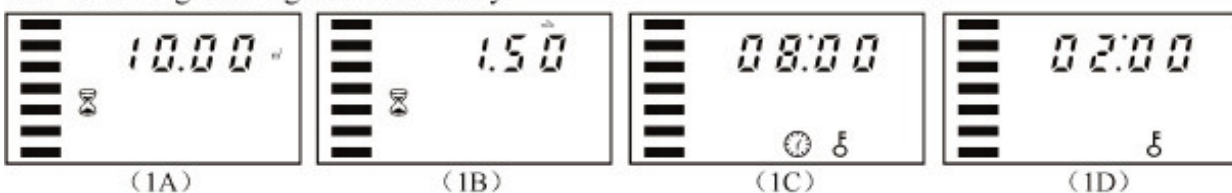
	● Setting or inquiring after unlock the keyboard.
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

1、 Show Screen

At the Service state, the screen will show the following figures every ten seconds circularly:






- ① Balance water treatment capacity (Five digits represent the balance water treatment capacity. Digital symbol is matched with figure symbol); such as 10.00m³.
- ② Current flow rate(no unit, see Picture 1B); such as 1.5m³/h, showing this current flow rate is 1.5m³/h.
- ③ Current time; (see Picture 1C) such as 08:00.
- ④ Regeneration start up time (see Picture 1D the sign clock do not light, this item is not exist in A-02/04); such as 02:00.

For example: The work mode is A-01/03, when it is in the service state, the screen will show the following four figures recurrently.





	<ul style="list-style-type: none"> ● The colorful strips on the left of screen flicker dynamically show the system at the station of service. ● The colorful strips on the left of screen do not flicker show the system at the station of regeneration. ● The sign  light shows the system at the station of inquiring; the sign  flicker dynamically shows the system at the station of setting. ● When the figure  light, the keyboard is at the locked state . ● When the  flicking , indicate it has been cut of for a long time. Then the value should be reset.
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

● Digital area, figure area and paraphrase as follow:

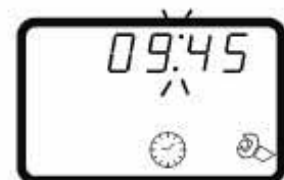
Show		Paraphrase	Notice
Digital Area	Figure Area		
12:20		Current Time 12: 20	' : 'Flicker
02:00		Regeneration Start-up Time 2:00	' : 'Non-flicker A-02,A-04 do not have this item
2-10M		At the Backwash State, Left 10 Minutes	
3-00			
4-10M		At Fast Rinse state, left 10 minutes	
5-00			



Establishment of Each Parameter

For example: The program is in the service state, if you want to set the current time 9:45 to 11:28, and the backwash time 10 minutes to 15 minutes, operate as the following steps:

1. If the screen shows  , indicate the keyboard is in the locked state, Press ▲ and ▼ two buttons together for 5 seconds , unlock the keyboard. If the screen don't show  , indicate the keyboard has not locked , then enter into the second step 2 directly.

2. Press  button to enter into menu, showing the current time of the first page of the menu, the setting sign  and the current time  light at meantime. Then ,the sign ' : ' flicker.



3. Press  button to enter into the setting state , time value and the setting sign  start to flicker.



4. Press ▲ button continuously until the time value 09 change to 11.



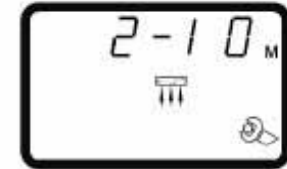
5. Press □ button, minute value and the setting sign ⌚ flickering at meantime , then press ▼ button continuously until the minute value 45 to 28.



6. Press □ button , there is a sound 'DI 'the figure stop flickering, the program back to the inquiring state.



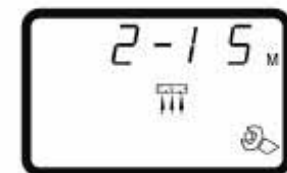
7. Press ▲ or ▼ button , until the backwash sign 111 light, as the right figure shows.



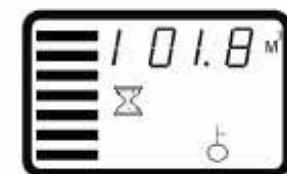
8. Press □ button to enter into the setting state, numerical value 10 and the setting sign ⌚ start to flicker. Then press ▲ button continuously until the numerical value 10 change to 15.



9. Press □ button , there is a sound 'DI ', the figure stop flickering and the program back to the inquiring state.



10. Press ⏪ button back to menu, the screen show the working state. If not operate key board in one minute, keyboard locked automatically , then the locked sign ⏸ light.



2. MAINTENANCE GUIDE

Part of Control Valve

Problem	Cause	Correction
1. Softener can not regenerate.	A. Device power off. B. Regeneration time set wrong. C. Cotroller damaged.	A. Check supply power whether nomal or not. (Including fuse, plug, switch etc) B. Readjust time. C. Check or change controller.
2. Softener outputs hard water.	A. By pass ball valve opened B. No salt in brine tank C. Injector be bloked. D. No enough water refilled in brine tank. E. Leakage on riser pipe. F. Leakage in valve body side	A. Close the by pass ball valve. B. Make sure there is solid salt in tank. C. change or clean the injector. D. Check time of refill water to brine tank. E. Check riser pipe not broken, and check seal O-ring. F. Check and repair or change valve body.
3. Can not suck salt	A. Inlet pressure too low. B. Brine pipeline blocked. C. Leakage on brine pipeline. D. Injector damaged. E. Leakage in valve bady inside.	A. Heighten inlet pressure. B. Check pipeline. Take out the stem. C. Check pipeline D. Change a new ejection. E. Check and repair or change valve body.
4. Too much water in brine tank	A. Brine refill time too long. B. Too much water in brine tank after sucking salt	A. Readjusting brine refill time. B. Check whether it is blocked or not in injector or brine pipeline.
5. Water pressure damage	A. Pipeline leading to softnrer blocked by iron matter. B. Softener blocked by iron matter.	A. Clean up pipeline of softener. B. Clean up control valve. Add cleaning liquid to resin tank in order to increase the regeneration efficiency.
6. Resin flow out from drain pipe.	A. Air in system B. The strainer is damaged	A. Make sure exhaust normally in system. Check it whether dry or not B. Change the strainer.
7. Control valve continuously circulate.	A. Signal line be cutoff. B. Fault on controller. C. Wheel be locked by abnormal things.	A. Insert the signal line again B. Change the controller. C. Take out the abnormal things
8. Water flow out from the drain continuously.	A. Valve bady inside leaking B. Power off when backwash or fast rinse.	A. Check and repair or change valve body. B. Switch by hand to service position or close by-pass valve. Reopen when power normal.

Controller

Problem	Cause	Correction
1. All sign and figures light in screen	<ul style="list-style-type: none"> A. The connect line between screen panel and control panel damaged. B. Main control panel damaged. C. Transformer get wet or damaged 	<ul style="list-style-type: none"> A. Change the connect line B. Change the main control panel. C. Check or change the transformer.
2. No show in screen	<ul style="list-style-type: none"> A. The connect line between screen panel and control panel damaged. B. Screen panel damaged. C. Main control panel damaged. D. Power cutoff. 	<ul style="list-style-type: none"> A. Cahnge the connect line B. Change the screen panel. C. Change the main control panel. D. Check the cables and main power.
3. Only E1 show in screen and flickering	<ul style="list-style-type: none"> A. The connect line between locating panel and main control panel damaged. B. Locating panel damaged. C. Mechaniccal driving device damaged. D. Main control panel damaged. E. The connect line between driver and main control panelddamaged. F. Driver damaged. 	<ul style="list-style-type: none"> A. Change the connectline. B. Change the locating panel. C. Check the mechanical gearing. D. Change the mai control panel. E. Change the connect line between driver and control panel. F. Change the driver.
4. Only E2 show in screen and flickering.	<ul style="list-style-type: none"> A. Hall components on locating panel damaged. B. The connect line between locating panel and main control panel damaged. C. Maincontrol panel damaged 	<ul style="list-style-type: none"> A. Change the locating panel. B. Change the connect line. C. Change the main control panel.
5. Interlock disorder	<ul style="list-style-type: none"> A. Interlock cable disconnect or interlock connectors wrong connection. B. Main control panel damaged. 	<ul style="list-style-type: none"> A. Connect cable in correct way. B. Change the mai control panel.
6. Brine suck and refill out of control	<ul style="list-style-type: none"> A. Electric ball valve damaged B. Cable between electric ball valve and main control panel damaged. C. Main control panel damaged. 	<ul style="list-style-type: none"> A. Change the electric ball valve. B. Connect cable in correct way. C. Change the main control panel.