INSTRUCTION MANUAL
FOR
AUTO STILL

Models: ＷＧ５１０
ＷＧ７１０
ＷＧ７３０

Second Edition

Yamato Scientific Co., LTD

Congratulations on your selection of Yamato Scientific's AUTO STILL
Please read these instructions and instructions for AUTO STILL, user notes and the warranty card thoroughly before the initial operation of your AUTO STILL.
This will ensure proper operating procedures and extended life for the unit.
Please keep the operating instructions together with the warranty card for easy access whenever you need them.

Attention: Read the warnings in the operating instructions carefully to familiarize yourself with the initial operation of your Demineralized water manufacturing device.

Depending on the extent and nature of danger, the warnings given in these operating instructions are classified into the following two categories by symbol.

To protect operators from accident --
Negligence of this warning may result in a serious accident.

To protect the AUTO STILL from damage --
Negligence of this warning may result in damage to the AUTO STILL.
This warning also gives you tips on performance that are useful in its operation and maintenance or indicates the common mistakes that operators often make.

TABLE OF CONTENTS

MEANING OF ILLUSTRATED SYMBOLS

Illustrated Symbols Various symbols are used in this safety manual in order to use the unit without danger of injury and damage of the unit. A list of problems caused by ignoring the warnings and improper handling is divided as shown below.

Be sure that you understand the warnings and cautions in this manual before operating the unit.

Warning If the warning is ignored, there is the danger of a problem that may cause a serious accident or even fatality.

Caution If the caution is ignored, there is the danger of a problem that may cause injury/damage to property or the unit itself.

Meaning of Symbols

This symbol indicates items that urge the warning (including the caution).
A detailed warning message is shown adjacent to the symbol.

This symbol indicates items that are strictly prohibited.
A detailed message is shown adjacent to the symbol with specific actions not to perform.

This symbol indicates items that should be always performed.
A detailed message with instructions is shown adjacent to the symbol.

The self-diagnosis function is installed in this machine.
When trouble of the breakdown of the device in use etc. happens, lighting the lamp of "TROUBLE" is blinked to the operation panel and the error code is displayed.
Please cut the earth leakage circuit-breaker of this machine after confirming the error code when is generated abnormally and shut the plughole (cock).

Trouble sign, error code /causes

Defective of the electronic circuit system.

E.15

・Blinking "TROUBLE"
・Lighting E.15

Water leak.

E.31

・Blinking "TROUBLE"
・Lighting E.31

Overheating or a disconnection of the heater.

E.32

・Blinking "TROUBLE"
・Lighting E.32

Defective of Distilled water tank or float switch.

E.34

・Blinking "TROUBLE"
・Lighting E.34

Trouble of boiler water level

E.35

・Blinking "TROUBLE"
・Lighting E.35

Defective of float switch for the boiler water level control.

E.36

・Blinking "TROUBLE"
・Lighting E.36

Method of treatment

Please record the error code, turn off the power supply at once,and shut the plughole (cock) when you come out of these error codes.When trouble happens, the exchange of the check of the device (Refer to the page 27 to "Self-diagnostic functions") or parts is needed.Please report to the shop of purchase or the our company office and the service section. Please inform of the error code always generated when reporting.

⚠ Warning

⃠ Do not use the unit in an area where there is flammable or explosive gas.

● Never use the unit in an area where there is flammable or explosive gas.
The unit is not explosion-proof. An arc may be generated when the power switch is turned on or off, and fire/explosion may result.

❗ Always ground the unit.

● Always ground the unit on the power equipment side in order to avoid electrical shock due to a power surge.

❗ If a problem occurs, you should:

● If smoke or strange odor should come out of the unit for some reason,turn off the power key right away, then turn off the circuit breaker and the main power. Immediately contact a service technician for inspection. If this procedure is not followed, fire or electrical shock may result. Never perform repair work yourself, since it is dangerous and not recommended.

⃠ Do not use the power cord if it is bundled or tangled.

● Do not use the power cord if it is bundled or tangled.If it is used in this manner, it can overheat and fire may be caused.

⃠ Do not process, bend, wring, or stretch the power cord forcibly.

● Do not process, bend, wring, or stretch the power cord forcibly.
Fire or electrical shock may result.

⃠ Substances that can not be used.

● Never use explosive substances, flammable substances and substances that include explosive or flammable ingredients in the unit. Explosion or fire may occur.

⃠ Do not disassemble or modify the unit.

● Do not reconfigure the unit. Fire or electrical shock may be caused.

⚠ CAUTION

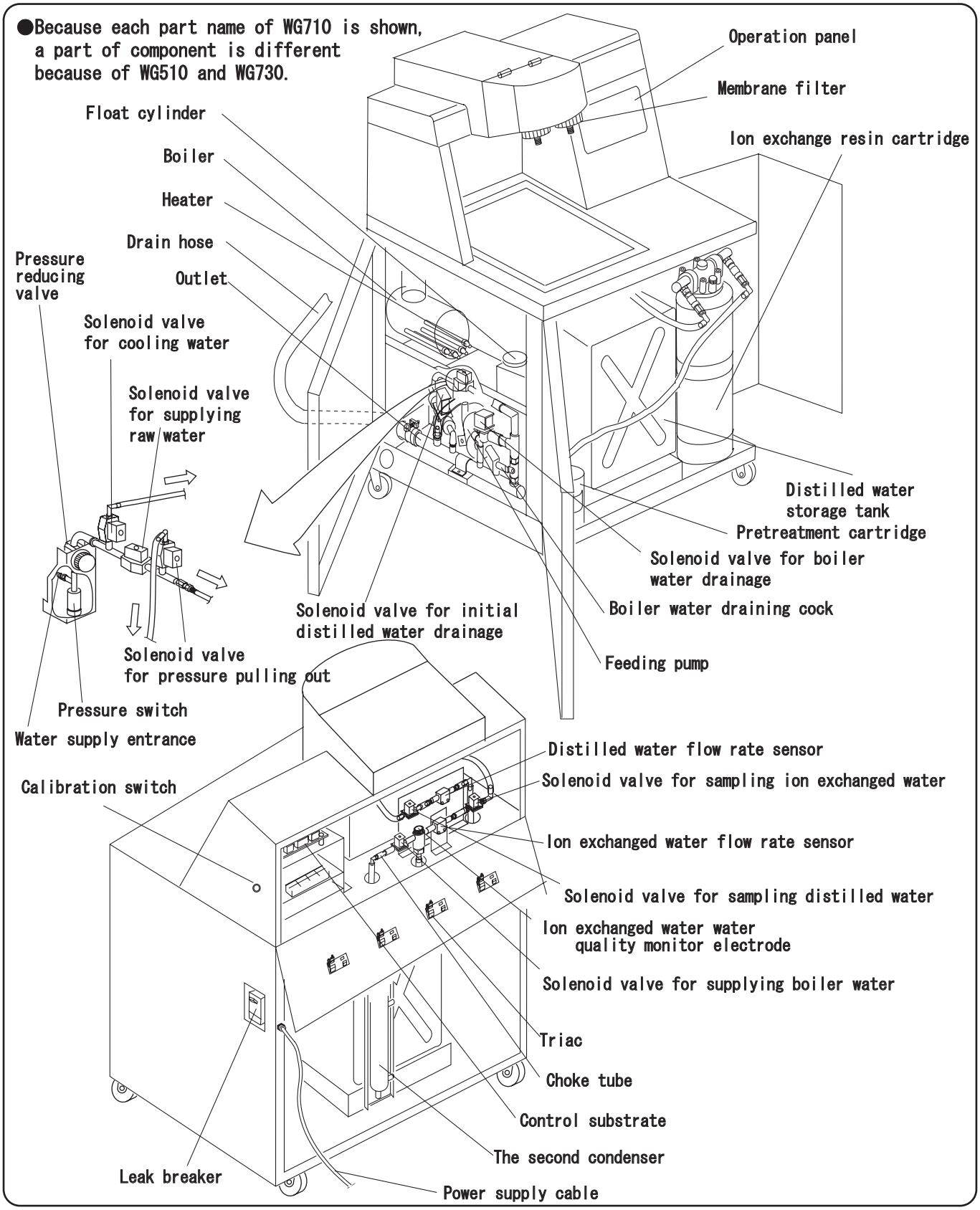
❗ During a thunder storm . . .

● During a thunder storm, turn off the power key immediately, then turn off the circuit breaker and the main power.If this procedure is not followed, fire or electrical shock may be caused.

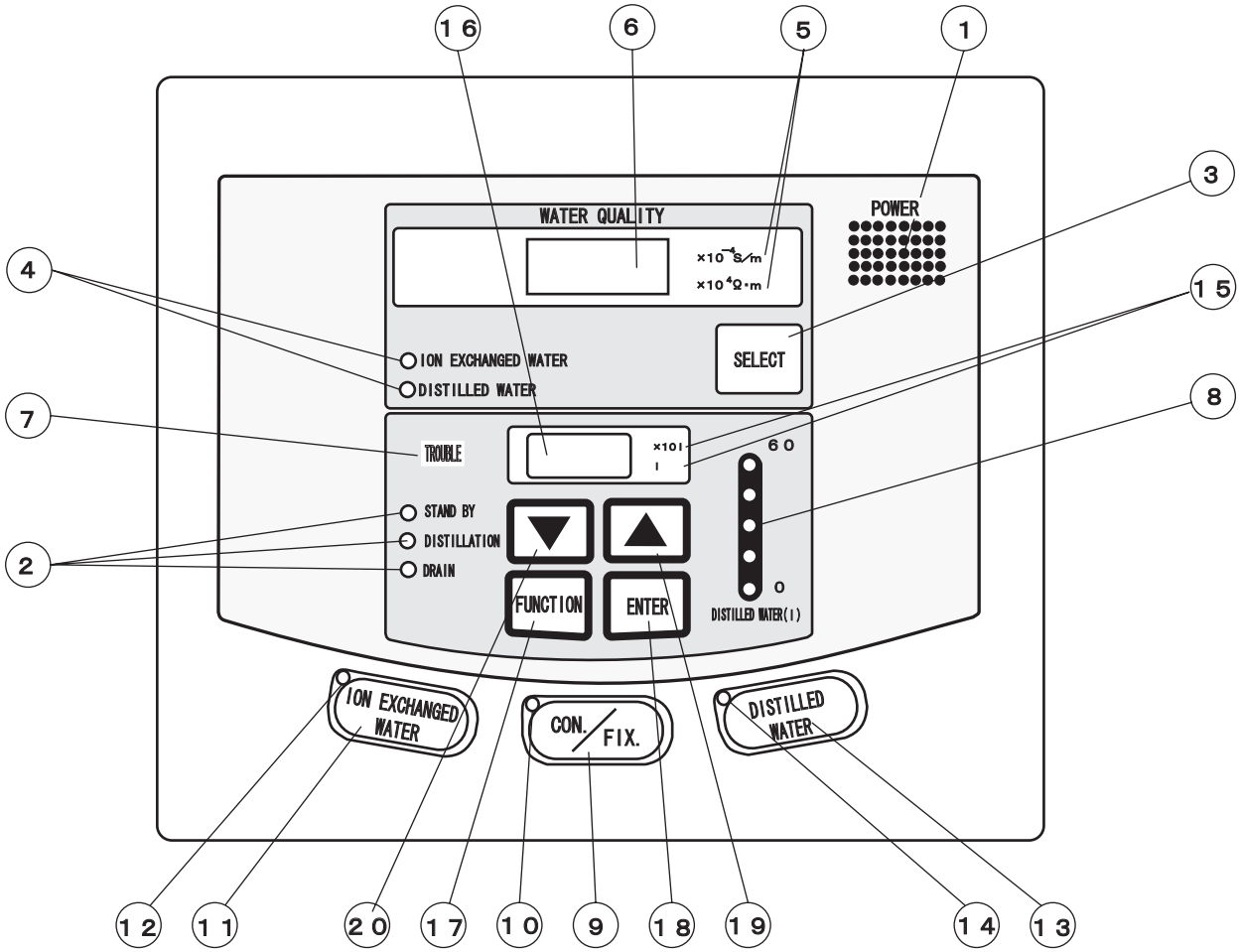
Description and function of each part

Main unit (Model WG710)

●Because each part name of WG710 is shown, a part of component is different because of WG510 and WG730.



Operation panel



1. Power switch
2. Indicator for operating condition
3. Select switch for ionexchanged water or distilled water
4. Indicator for select switch ③
5. Unit for water quality display
6. Indicator (1)
7. Indicator for trouble
8. Indicator for reserved distilled water
9. Select switch for continuous or fixed flow rate
10. Indicator for select switch ⑨
11. Switch for ion exchanged water
12. Indicator for switch ⑪
13. Switch for distilled water
14. Indicator for switch ⑬
15. Unit for produced water
16. Indicator (2)
17. Function key
18. Enter key
19. Up key
20. Down key

Operation panel

POWER

① Power switch ····
This switch makes the operator enable/disable to access the unit. the unit changes its state from STAND BY state to OPERATING state and vice versa by pushing the switch.

○ STAND BY
○ DISTILLATION
○ DRAIN

A yellow lamp blinks2 Indicator for operating condition ····
standby: (1) A yellow lamp lights when the power supplies to the unit and the unit is in the "STAND BY" state.
(2) A yellow lamp blinkswhen the raw water pressure decreases or the water supply is suspended. [cut] is also displayed in the indicator(1).
Distillation: A green lamp lights when distilling.
Drain: A green lamp lights when draining boiler water automatically.

SELECT

③ Select switch for ion exchanged water or distilled water ····
It is switch for selecting the sensor for mesuring the water quality.The sensor is switched from ion exchanged water to distilled water each time the switch is pushed.
The indicator(1)displays the conductivity or the resistivity corresponding to the selected sensor.

④ Indicator for select switch③····
○ ION EXCHANGED WATER
○ DISTILLED WATER
The lamp of the selected sensor by the select switch lights.
Ion exchanged water: Water quality at ion exchange resin cylinder exit
Distilled water: Distilled water water quality at condenser exit

×10⁻⁴S/m
×10⁴Ω·m

⑤ Unit for to water quality ····
The unit of the value of the water quality displayed in the indicator(1)is indicated..
$\times 10^{-4}$S/m : Electric conductivity is shown. (=μS/cm)
$\times 10^{4}$Ω・m : The resistivity is shown. (MΩ・cm)
(However, the resistivity becomes an integer display within the range of 18-1).

WATER QUALITY

⑥ indicator(1) ····
The value of the water quality is displayed with 25℃ conversion. The water quality checks by 2 sensors are always done concurrently and when either of water quality decreases below a constant value,the sensor number is displayed in the indicator repeatedly.
Moreover,when abnormality occurs in the unit or hydraulic pressure of the raw water pressure decreases or the water supply is suspended,the error code is displayed.
< regulated value of judgment of water quality decrease >
Ion exchange water: 10×10^{-4}S/m or more(1×10^{4}Ω・m or less)
Distilled water: 10×10^{-4}S/m or more(1×10^{4}Ω・m or less)
<example of displaying water quality decrease>
Distilled water is selected with the key of the selection:
Distilled water: 10×10^{-4}S/m
Ion exchanged water: 10×10^{-4}S/m or more (The water quality decreases)

[1.75] ➡ [C 1] ➡ [1.75] ➡ [C 1]

Electric conductivity of electrode C3 (distilled water) selected for

Ion exchanged water electrode number to which water quality decreases (C1)

< When raw water pressure and hydraulic pressure decrease >

[cut] light and the "STAND BY" of the operation mode indicator blinks.

< When trouble circumstances >
The generated abnormal content is displayed. Please refer to the treatment in emergency(Page 2) because of details.

Operation panel

⑭ Indicatior for switch ⑬ ····
A green lamp lights while the distilled water is gathered.

×10ℓ
ℓ

⑮ Unit for produced water ····
When the collection capacity is displayed in indicator(2), "(ℓ)" is lit.
When the amount of the totaling pass is displayed in indicator(2) "×10(ℓ)" is lit.

⑯ Indicator(2) ····
displays as follows:
1)During CONTINUOUS collection···· [--] is displayed.
2)During Fixed Quantity collection ····
The set collection quantity is displayed. The initial value after the unit reset is 0.1(ℓ) . During collection,the value decreases reflecting the rest of the amount of water and returns to the initial value when collection is completed.
3)The Function in use ····
The designation of the selected function is displayed.
a) [ion] : Accumulated amount of collected water display function
b) [unt] : Unit of the water quality switching function
4) Accumulated amount of collected water display····
The accumulated amount of the water that passes through the ion exchange resin is displayed.(The accumulated amount of the water which passes through the ion exchange resin is equal to the total quantity of the collected distilled and ion exchanged water.)

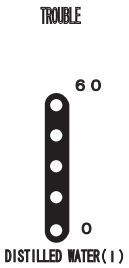
FUNCTION ⑰ Function key ····
The key enables the operator to call the functions that the unit supports.
The designation of the selected function is displayed in indicator(2).

ENTER ⑱ Enter key ····
Pushing this key makes the selected function effective. It is necessary to push this key to come off the state of the function selection.

▲ ⑲ Up key ···· The following setting is done by pushing the key.
1) The Fixed Quantity collection ····
The set value of indicator(2) increases one by one everytime the operator pushes the key. The value increases continuously by keeping the key pushed.
2) The function selection ····
a) Under the condition that Indicator(2) displays [ion],pushing the key makes Indicator(2) display the accumulated amount of the ion exchanged water.
b) Under the condition that Indicator(2) displays [unt],pushing the key makes the representation of the water quality.(conductivity and resitivity)

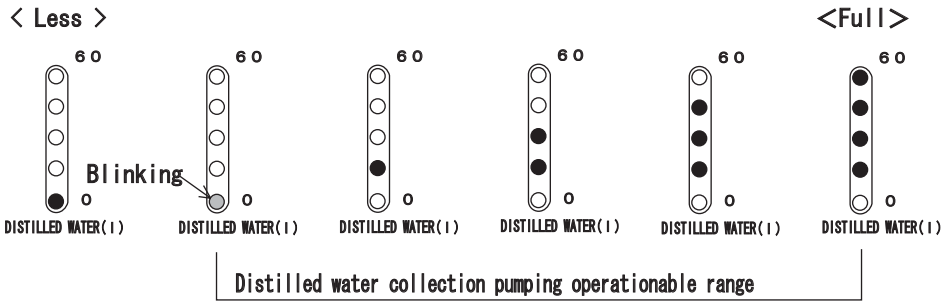
▼ ⑳ Down key ···· The following setting is done by pushing the key.
1) The Fixed Quantity collection ····
The set value of indicator(2) decreases one by one everytime the operator pushes the key. The value decreases continuously by keeping the key pushed.
2) When the function is selected ····
a) Under the condition that Indicator(2) displays [ion],pushing the key makes Indicator(2) display the accumulated amount of the ion exchanged water.
b) Under the condition that Indicator(2) displays [unt],pushing the key makes the representation of the water quality.(conductivity and resitivity)

Operation panel



(7) Indicator for trouble ····
Blank in nomal operation."TROUBLE" lamp lights up when the equipment is in the abnomal condition. The error code corresponding to the abnomality is displayed in indicator(1).

(8) Indicator for stored water ····
The amount of water stored in the distilled water tank is displayed by lighting the lamp by five steps. When the amount of stored water is below 8 liters a yellow lamp lights and the distilled water cannot be gathered because this causes damage to the distilled water collection pump.



(9) Select switch for CONTINUOUS collection or FIXED QUANTITY collection
The switch changes the water collection mode from CONTINUOUS collection to FIXED QUANTITY collection and vice versa.

(10) Indicator for select switch (9) ····
When a continuous collection is selected,the indicator lights. When the fixed quantity collection is selected,the indicator turns off.

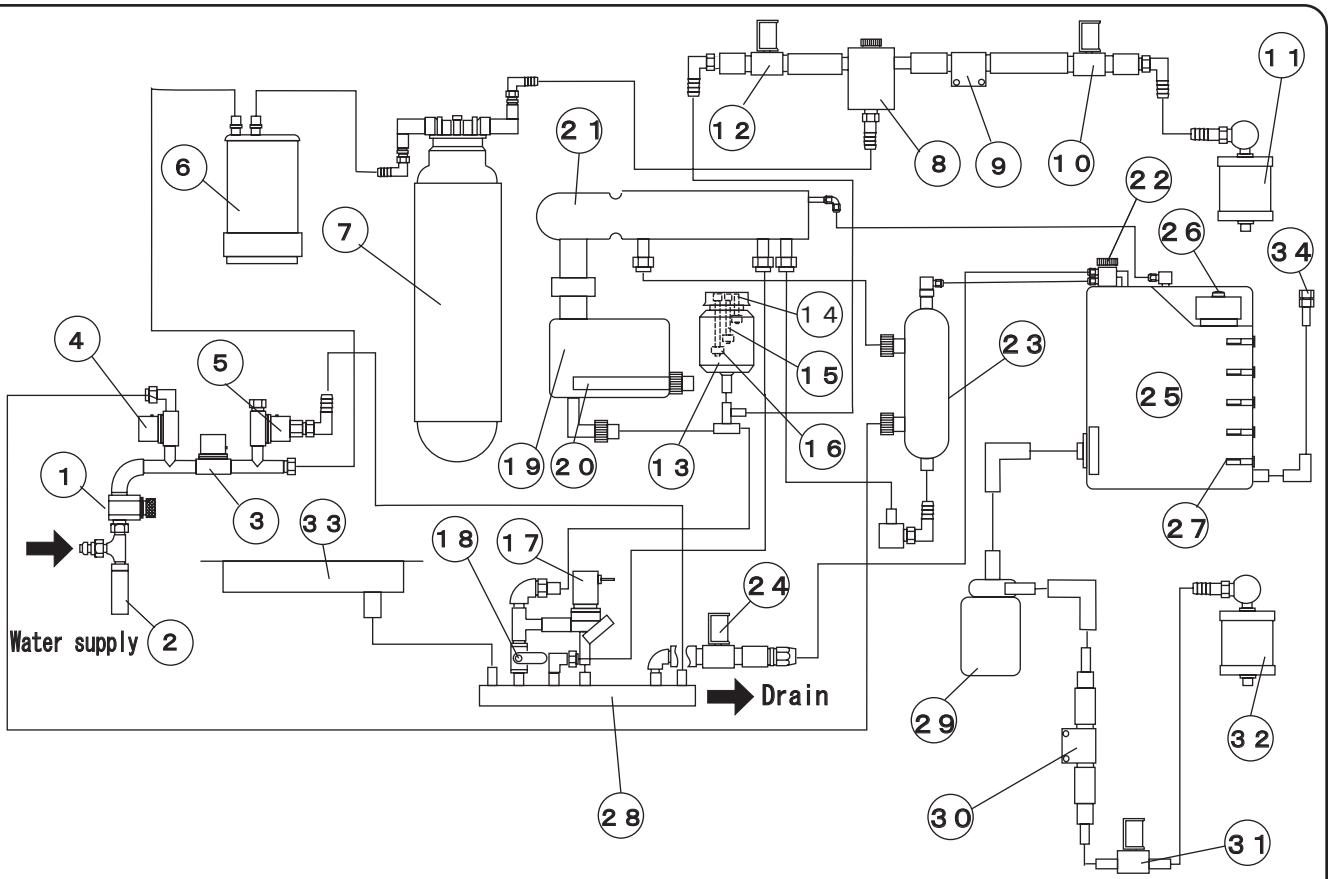
(11) Switch for ion exchanged water ····
1)Continuous collection
By pushing the button, the ion exchanged water comes out from the faucet. Next time the button is pushed down, the ion exchanged water stops.

2)Fixed quantity collection
By pushing the button the preset amount of the ion exchanged water comes out from the faucet.

(12) Indicatior for switch (11) ····
A green lamp lights while the ion exchanged water is gathered.

(13) Switch for distilled water ····
1)Continuousness collection
By pushing the button, the distilled water comes out from the faucet. Next time the button is pushed down, the distilled water stops..
2)Fixed quantity collection
By pushing the button the preset amount of the distilled water comes out from the faucet.

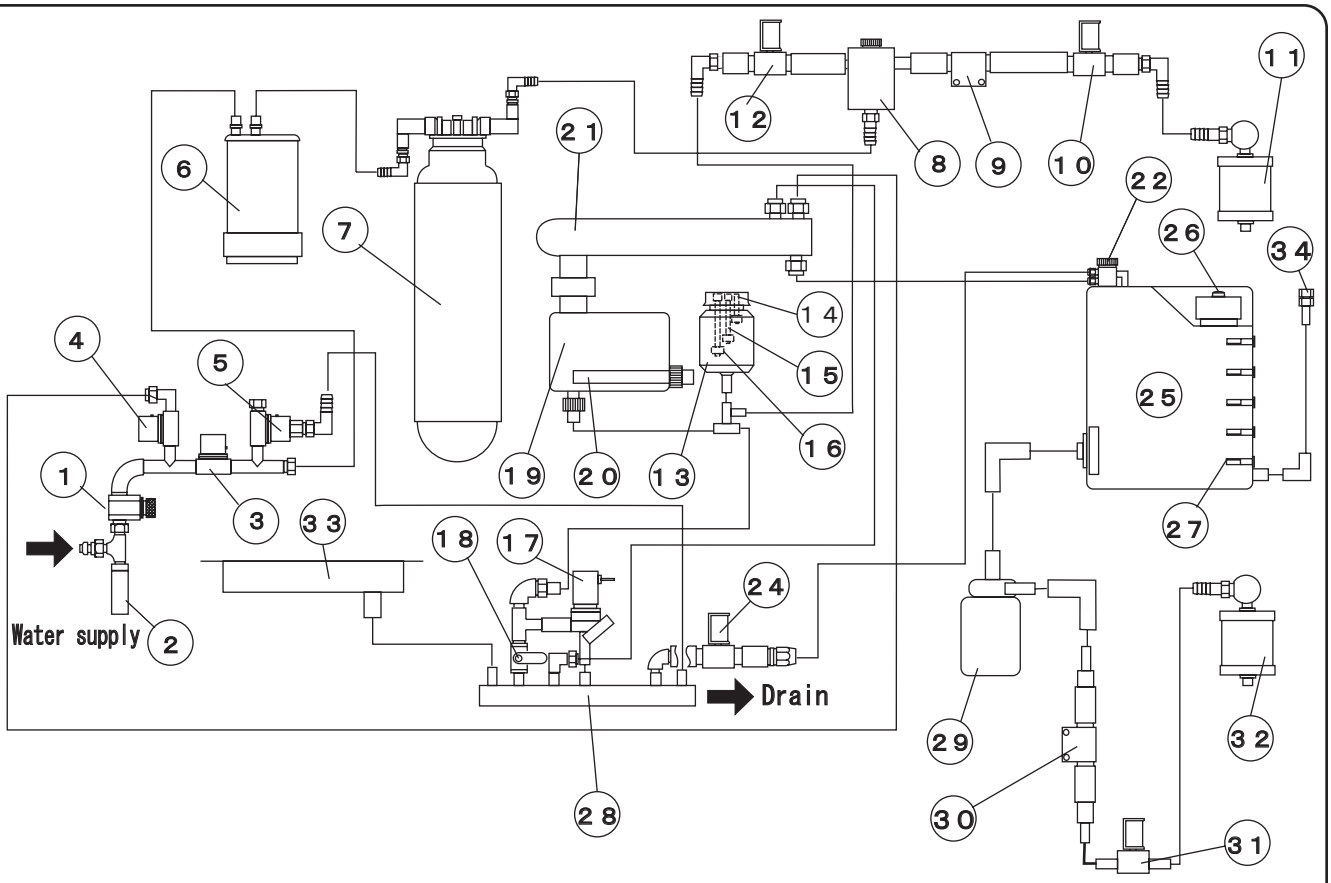
Piping system(WG710/730)



① Pressure reducing valve
② Pressure switch
③ Solenoid valve for supplying raw water
④ Solenoid valve for cooling water
⑤ Solenoid valve for pressure pulling out
⑥ Pretreatment cartridge
⑦ Ion exchange resin cartridge
⑧ Ion exchanged water quality monitor electrode
⑨ Ion exchanged water flow rate sensor
⑩ Solenoid valve for sampling ion exchanged water
⑪ Membrane filter
⑫ Solenoid valve for supplying boiler water
⑬ Float cylinder
⑭ Float switch for over-heat prevention
⑮ Float switch for boiler water level control
⑯ Float switch for heater control
⑰ Solenoid valve for boiler water drainage
⑱ Boiler water draining cock
⑲ Boiler
⑳ Heater
㉑ Condenser
㉒ Distilled water quality monitor electrode
㉓ Second condenser
㉔ Solenoid valve for the initial distilled water drainage
㉕ Distilled water storage tank
㉖ Air filter
㉗ Float switch for water level
㉘ Drain
㉙ Feeding pump
㉚ Distilled water flow rate sensor
㉛ Solenoid valve for sampling distilled water
㉜ Membrane filter
㉝ Sink
㉞ Glasses of distilled water tank outlet

Description and function of each part

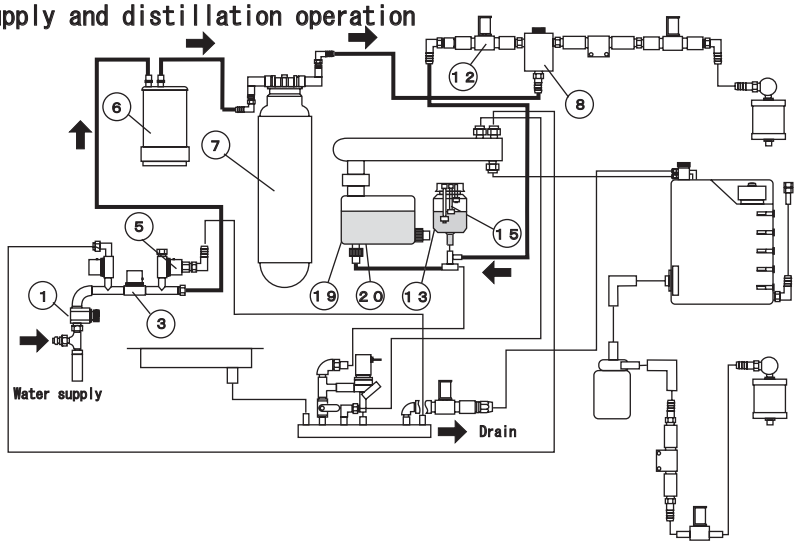
Piping system(WG510)



① Pressure reducing valve
② Pressure switch
③ Solenoid valve for supplying raw water
④ Solenoid valve for cooling water
⑤ Solenoid valve for pressure pulling out
⑥ Pretreatment cartridge
⑦ Ion exchange resin cartridge
⑧ Ion exchanged water quality monitor electrode
⑨ Ion exchanged water flow rate sensor
⑩ Solenoid valve for sampling ion exchanged water
⑪ Membrane filter
⑫ Solenoid valve for supplying boiler water
⑬ Float cylinder
⑭ Float switch for over-heat prevention
⑮ Float switch for boiler water level control
⑯ Float switch for heater control
⑰ Solenoid valve for boiler water drainage
⑱ Boiler water drain cock
⑲ Boiler
⑳ Heater
㉑ Condenser
㉒ Distilled water quality monitor electrode
㉔ Solenoid valve for the initial distilled water drainage
㉕ Distilled water storage tank
㉖ Air filter
㉗ Float switch for water level
㉘ Drain
㉙ Feeding pump
㉚ Distilled water flow rate sensor
㉛ Solenoid valve for sampling distilled water
㉜ Membrane filter
㉝ Sink
㉞ Glasses of distilled water tank outlet

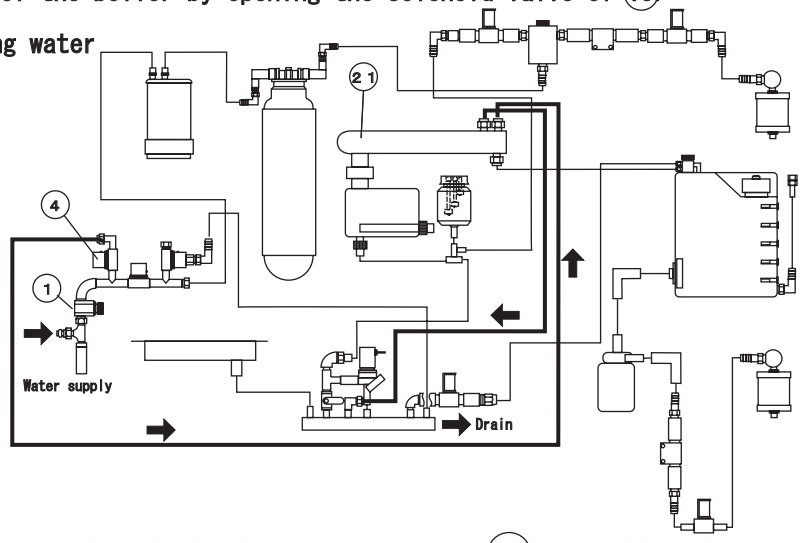
Operation principle

(1) Boiler water supply and distillation operation



● The water supplies to the boiler through the water supply entrance, pressure reducing valve①, solenoid valve for supplying raw water③, pretreatment cartridge⑥, ion exchanger⑦, ion exchangeed water quality meter electrode 8 , solenoid valve for supplying boiler water ⑫, and float cylinder ⑬, and boiler ⑲. Power is supplied to the heater ⑳ when the float switch ⑮ that senses the water level of the boiler detects the enough water to begin the distillation at the initial water supply.
The water supply to the boiler is controlled by means of opening and shutting solenoid valve for supplying raw water③ and solenoid valve for supplying boiler water 12 with float switch for the control of the water level of the boiler ⑮. Solenoid valve for the pressure pulling out 5 does a reverse-operation against the above-mentioned solenoid valve and pull out the pressure in pretreatment cartridge⑥ and ion exchanger⑦ during suspention of the water supply . The water in the boiler is automatically wasted every 5 hours to prevent scales from adhering on the surface of the boiler by opening the solenoid valve of ⑮.

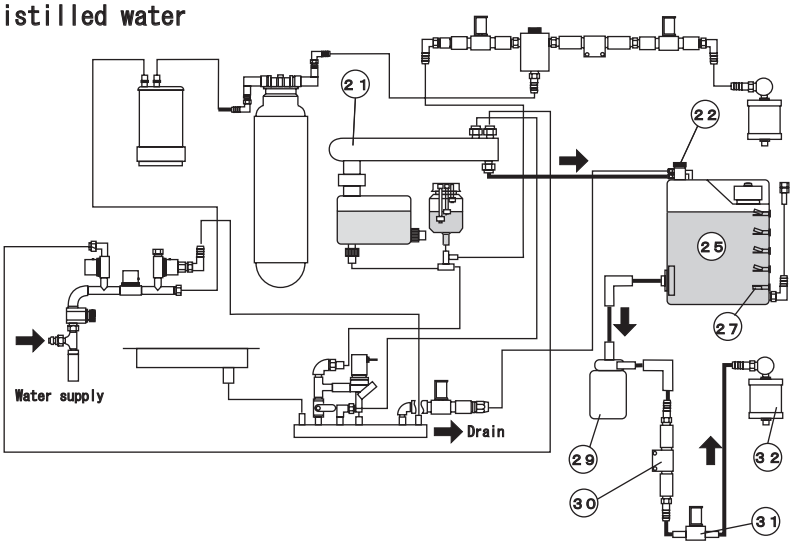
(2) Flow of cooling water



●Cooling water goes through the decompression valve①, solenoide valve for cooling water ④ and the second condensation machine 23(Please refer to the piping system chart of WG710/730), condensation machine㉑ in this order. In case of suspention of distillation, supply of cooling water is automatically suspended.(Cooling water is adjusted by decompression valve①)

Operation principle

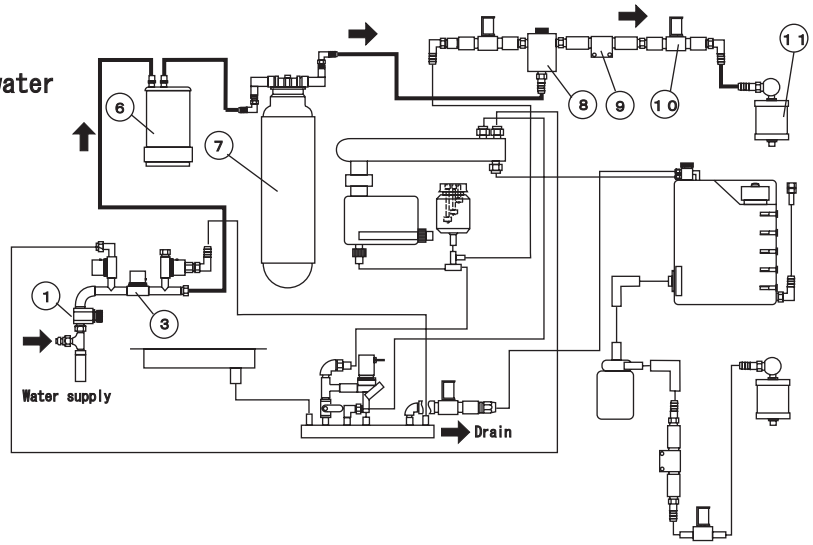
(3) Collection of distilled water



●The distilled water condensed by condenser (21) is cooled by second condenser (23) (Refer to the piping system chart of WG710/730), passes through the distilled water quality electrode (22) and is stored to distilled water tank (25). When the tank fills with the distilled water and the float switch goes active, the unit stops producing the distilled water. When consuming some amount of the distilled water, the unit begins producing again automatically.

The stored distilled water is gathered by distilled water collection pump (29). When the amount of the distilled water stored in the tank goes below 8(ι) and the float switch located at the bottom of the tank goes active, the pump stops to prevent itsself from the empty drive.

(4) Collection of ion exchanged water



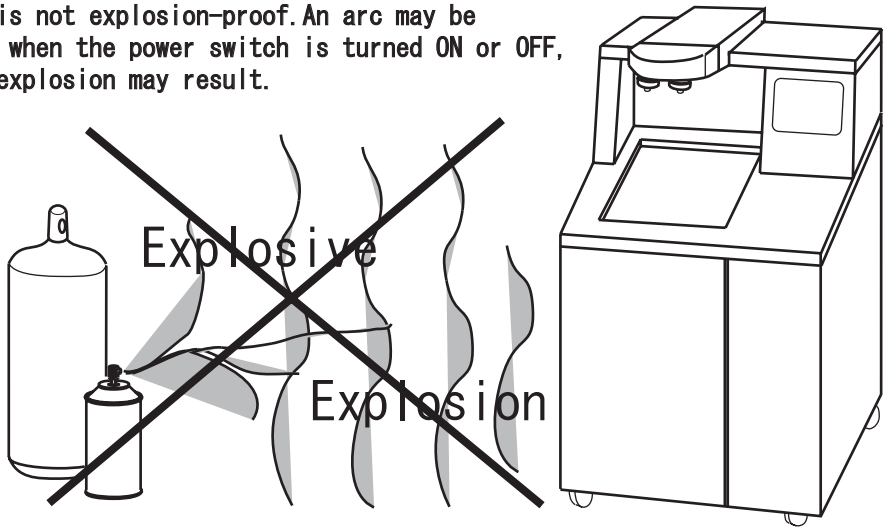
● The ion exchanged water is gathered through solenoid decompression valve (1), valve (3), preprocessing cartridge (6), ion exchange machine (7), ion exchange water water quality meter electrode (8), ion exchanged water current amount sensor (9) for the water supply, solenoid valve (10) for the ion exchanged water collection, and membrane filter (11). The distillation and cooling water stop automatically while gathering the ion exchange water.

Attention on the horizontal safety

⚠Warning

Do not use unit in area where there is flammable or explosive gas.

●Never use the unit in an area where there is flammable or explosive gas. The unit is not explosion-proof. An arc may be generated when the power switch is turned ON or OFF, and fire/explosion may result.



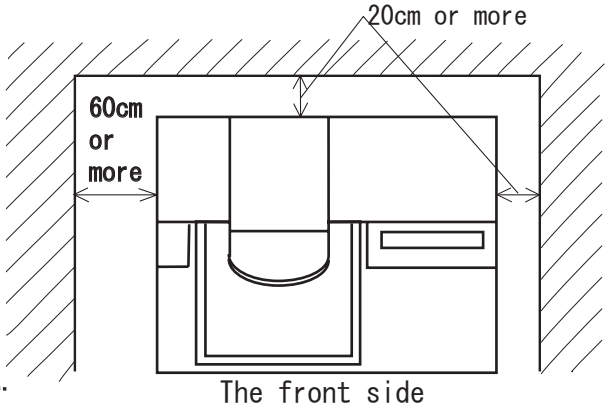
⚠Warning

Please note the installation place.

●Please do not set up in ,especially the following places.

- Flammable gas or corrosive gas generated.
- Ambient temperature exceeds 35℃.
- Ambient temperature loweres 0℃(freeze).
- Ambient temperature fluctuates violently.
- There is excessive humidity and dust.
- There is direct sunlight.
- There is constant vibrations.

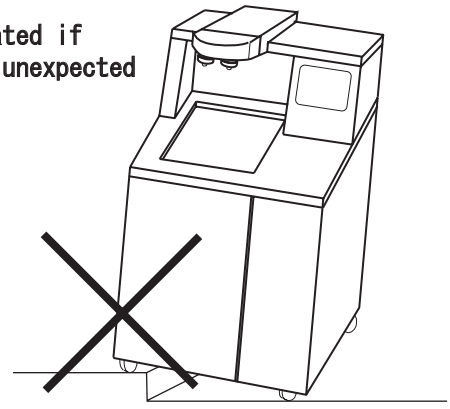
●Keep the following clearance around the unit.



⚠Warning

Please avoid an unstable place.

●A basic performance not only is demonstrated if does not set up horizontally but also an unexpected trouble and the breakdown can be caused.



Attention on the safety

⚠Warning

Please connect the water supply hose surely.

● Water supplying hose and connected entrance come off if does not connect with certain and water leak causes as spouting etc.

1. Please take out the main body of connected entrance and water supplying hose of attached goods of the unit. Please set up the unit in the horizontal and steady place near the faucet and sink.

.

● Please connect the water supply hose surely according to the procedure of the following.

2. Connection of faucet side

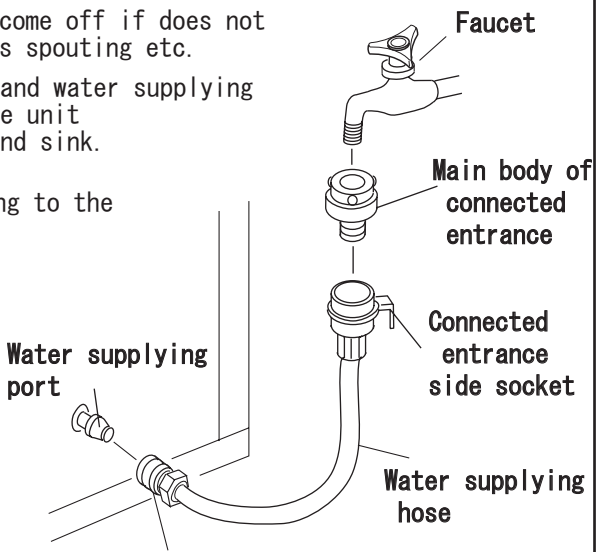
(1) Please separate the main body of the connected entrance from the water supplying hose by sliding the sleeve of the connected entrance in the direction of the arrow.

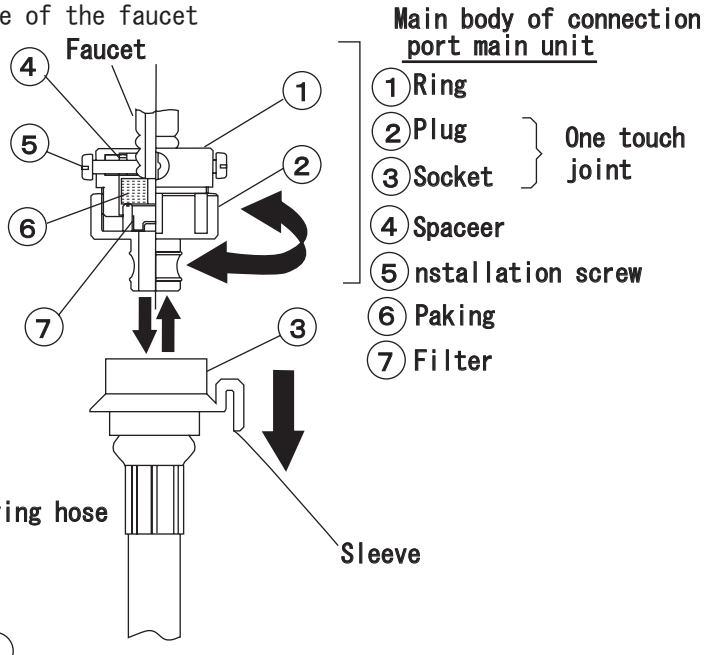
(2) Please loosen plug ② from ring ① once.

(3) Please tighten four installation screws ⑤ uniformly with evenly pressing ring ① lightly so that packing ⑥ may flatly hit the faucet. Please adjust the position of the connected entrance as shown in figure so that the installation screw may locate at the lowest hollow of the nipple of the faucet in case of chemical faucet.

(4) Please turn plug ② clockwise and tighten surely. As a result, the faucet and the connected entrance are sealed by packing ⑥ .

(5) Please insert the socket ③ into the plug ② surely with the sliding the sleeve in the direction of the arrow. If the sleeve returns to the original position by releasing the sleeve, the connection is completed.

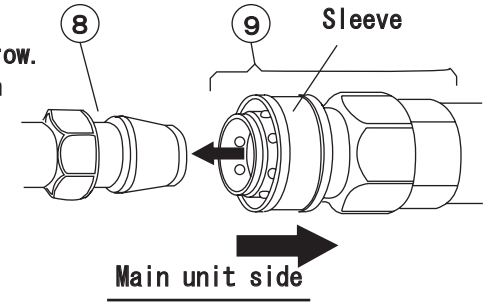




3. Connection with the main body of the unit

(1) Please detach the rubber cap from plug ⑧

(2) Please insert the sleeve ⑨ into the plug ⑧ of the the main body of the unit surely with sliding the sleeve in the direction of the arrow. If the sleeve returns to the original position by releasing the sleeve, the connection is completed. **The valve is built into in the socket and opens only if the conection of sleeve with the plug is perfect.**

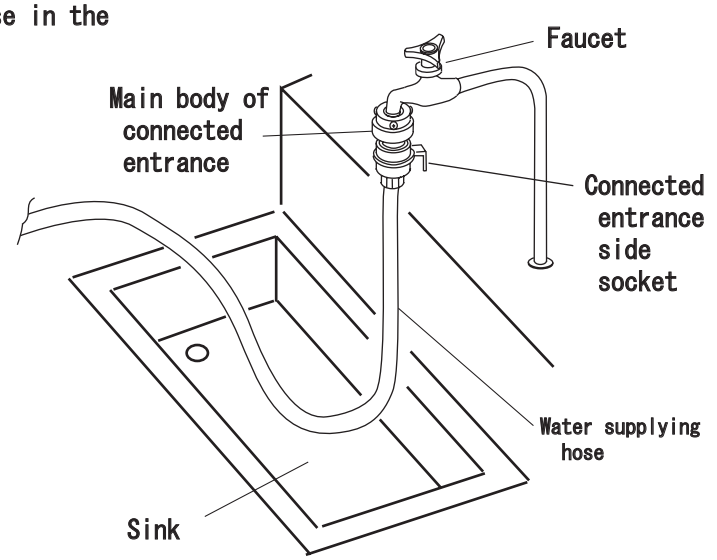


Attention on the horizontal safety

⚠Warning

Please install the water supplying hose in the faucet with the sink equipment.

- Please install in the faucet with the sink equipment must because there is dread of damage by a flood when the water supplying hose comes off or is damaged if the water supplying hose is installed in the faucet without the sink equipment.

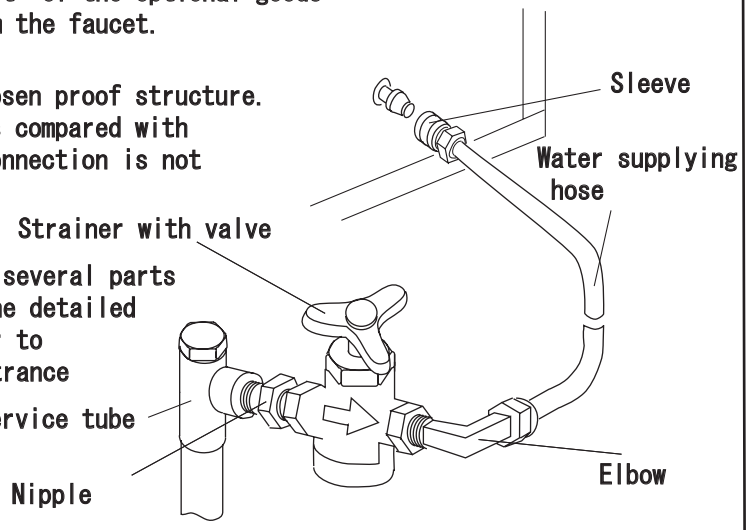


⚠Warning

Please use "Water supply entrance unit" of the optional goods when the sink equipment is away from the faucet.

●In "Water supply entrance unit"has the loosen proof structure. Even if the water service pressure changes compared with a standard water supplying hose set,the connection is not easily broken.

The water supply entrance unit consists of several parts as shown in the right figure. Concerning the detailed information such as the installation, refer to the instruction manual of "Water supply entrance unit"..



⚠Warning

The hydraulic pressure of the field of water service must be the specified range of pressure.

- ●Please include at nighttime and use the water service pressure within the range of 1～5×100kPa(1～5kgf/cm^2).
- ●The same range of he hydraulic pressure of the field is applied in case of using "Water supply entrance unit" of the optional goods

Attention on the safety

⚠Warning

Please connect the drain hose surely.

●If you do not connect the drain hose certainly,the hose comes off and water leak or the breakdown of the machine may occur.

●Please connect the drain hose according to the following procedure.

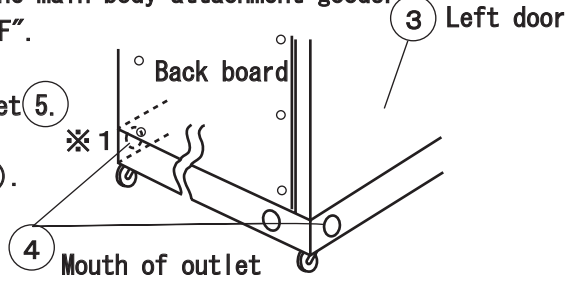
(1) Please take out drain hose (1) and hose strap (2) of the main body attachment goods.

(2) Please leak breaker of this machine confirm it is "OFF".

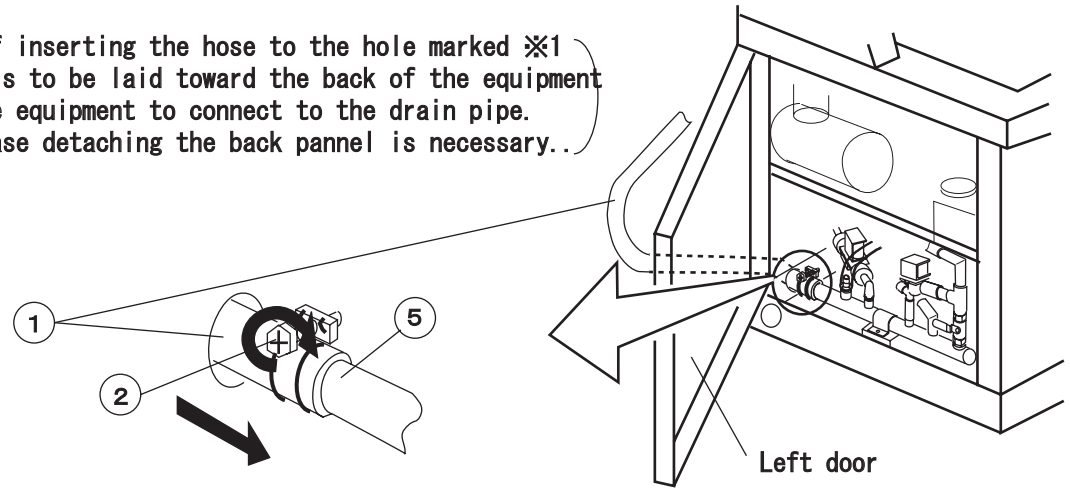
(3) Please open left door (3) of this machine.

(4) Please detach the rubber stopping at the exit of outlet (5).

(5) Insert the hose to one of the 3 holes (4) good for the hose arrangement (the hose should not easily bend). Connect the hose with the hoseband to the drain pipe of the equipment and fasten the connection.



In case of inserting the hose to the hole marked ※1 the hose is to be laid toward the back of the equipment inside the equipment to connect to the drain pipe. In this case detaching the back pannel is necessary..



⚠Warning

Pay attention to laying the drain hose.

●Please do not bend absolutely and do not make the convex part in the drain hose.

●The drain hose must lower more than outlets of this machine.

●Please put the edge of the drain hose to the sink equipment. WG510 drains water by 2(ℓ/min) and WG710 by 3(ℓ/min) while distilling. Moreover, they drain more water while proceding boiler water exchange. Therefore the drain equipment with enough capavility is strongly recommended.

⚠Warning

Temperature of drained cooling water might occasionally exceeds 60℃

●Please drain to a place away from the work environment because the temperature of cooling water might occasionally exceeds 60℃ in summer and the operator get heat injury when touching the drained water.

●Drain the cooling water to the point of the sink far from the drain pipe in case of using the chloridization vinyl tube as the drain pipe in order to avoid the deterioration of the drain pipe.
Use the drain trap (option) when the drained cooling water does not become below 60℃ even if VP pipe (JIS K6741) is used as drain pipes and DV-RR fittings and insertion sockets (JIS K6739) are used. Although the drained cooling water is below 60℃ use the drain trap under the condition that neither VP pipes nor DV-RR fittings/ insertion sockets are used.

Attention on safety

⚠Warning

Please connect the power supply cable with the power supply equipment that has enough room for the power requirement of this machine.

●The necessary power supply capacity is shown in the right table.

Please connect with the power supply equipment that has enough room for the power requirement. The amount of the distilled water is insufficient and the normal control cannot be done due to the decrease of the power supply voltage if the power supply capacity is insufficient.

Type	Power supply	Necessary power supply capacity
WG510	AC200V single phase	20A or more
WG730	AC200V 3 phases	18A or more
WG710	AC200V single phase	40A or more

⚠Warning

Pay attention to the color of each wick wire when the power supply cable is connected.

●Turn off the breaker on the power supply equipment side when connecting the power supply code to the power supply.

●This machine doesn't have the power supply plug. Please select the plug and the terminal which is proper to the power supply facility.

For the single phase

Line core color	The indoor wiring
Brack	Voltage side
White	Earth side
Green	Earth pole (earth)

For three phases

Line core color	The indoor wiring
Red	R aspect
White	S aspect
Brack	T aspect
Green	Earth pole (earth)

⚠Warning

Please connect the earth.

●Please connect the earth line with the earth line or the earth terminal on the power supply equipment. The green wick line of the power supply code is an earth line. Please ground based on the electric equipment standard Article 18 (below the third kind earth construction 100Ω) after consulting the nearest electrical work shop if there is no earth equipment.

●Do not connect with the gas tube or the water service tube, etc.

●Leak breaker does not operate in case of leaking electricity if the equipment is not grounded. This causes the electric shock accident.

⚠Warning

About the handling of the power supply cable

●Turn off the leak breaker of this machine and the breaker on the power supply facility as soon as possible when the power supply cable hurts (exposure and disconnection, etc. of the wick line). A fire and the electric shock may happen when leaving just as it is.

●Do not bend, do not twist, and do not pull the power supply cable unreasonably. A fire and the electric shock are caused.

●Do not damage by placing the power supply cable between the thing. A fire and the electric shock are caused.

●Do not bring the power supply cable close to the heat apparatus etc. A fire and the electric shock are caused.

Attention on Safety

⚠ Warning

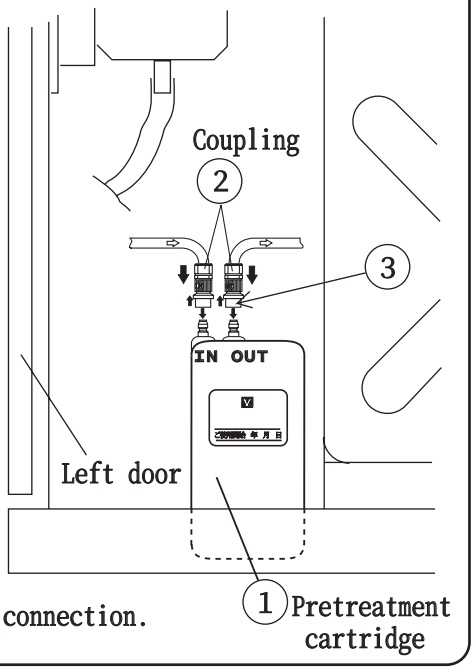
Please connect the pretreatment cartridge surely.

●Connect the hose fast otherwise the hose comes off and water leak accident causes.

●Please connect the hose in the main body surely according to the following procedure.

(1) Turn off the leak breaker of this machine "OFF" and tighten the faucet.
(2) Take out pretreatment cartridge (1) of attached goods of the main body.
(3) Detach the cap adhering to the entrance and the exit of pretreatment cartridge (1).
(4) Connects in front of this machine together with the character of IN and OUT of pretreatment cartridge (1) because there is a hose for the connection displayed in coupling (2) as IN and OUT when the door is opened.
(5) Please release part three light blue after pushing the match of the mouth of coupling and the cartridge doing the slide in the place where a light blue hose side of three of the part of coupling the connection.
(6) Place the pretreatment cartridge as shown in the right figure paying attention to not bendign the hose after completing the connection.

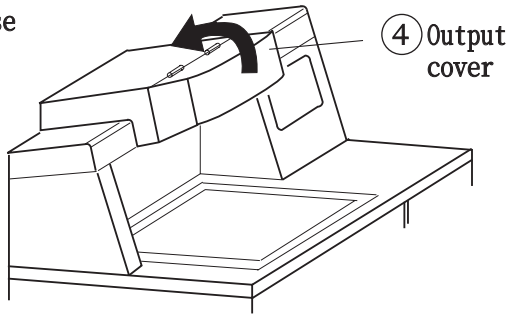
Where front door was opened



⚠ Warning

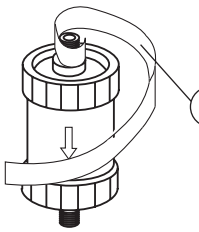
Connect the membrene filter surely.

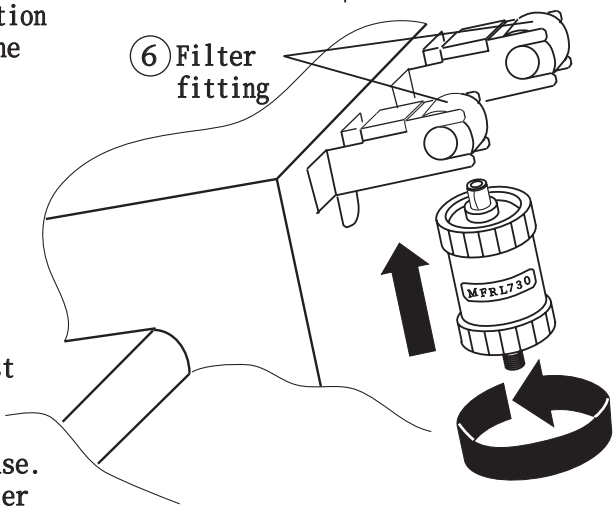
●Please connect the membrene filter surely otherwise the water leaks from the connection point and the collected water may become polluted.



●Install membrane filter according to the following procedure.

(1) Take out two membrane filter and the seal tape of attached goods of the main body.
(2) Open output cover (4).
(3) Wrap the seal tape clockwise by 2 to 3 turns with some tention added to the tape paying attention to the direction of the arrow as shown in the figure below. Waste the rest of the tape.





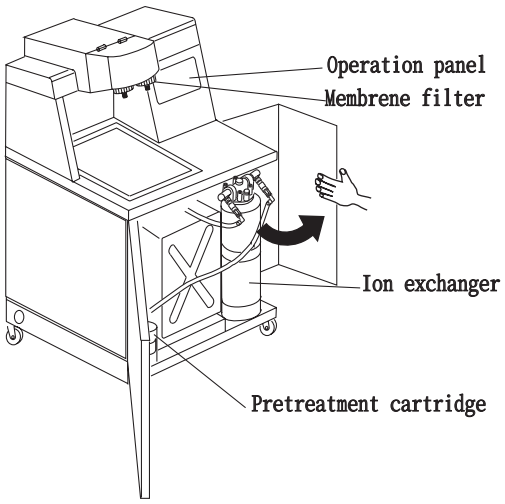
(4) The side where the seal tape was wrapped must screw into the filter fitting (6) by about three turns so as not to crush the screw hread. Please check the water leak when in use. If the water leak is detected screw the filter some more turns.

●Loosen the faucet.

●Check the water leak at the connected part of water supplying hose.
●Open the front door of the main body.

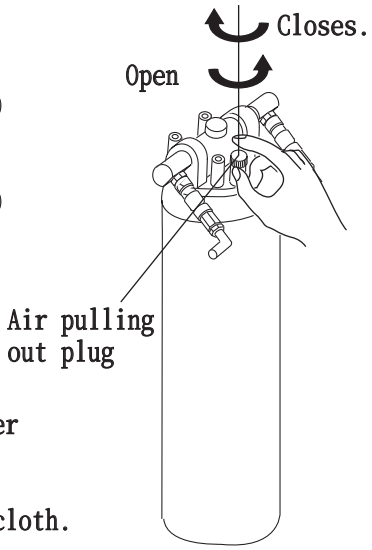
(1) Please push the (PUSH) part on a front door.
The left side of a front door opens.

(2) Open the right side of the front door where the ion exchanger is located inside.
●Turn on the leak breaker on the right side of the body.



●Pull out the air in the ion exchanger according to the following procedure. Air is contained in the pretreatment cartridge and the ion exchanger at the initial operation. The performance degrades if the air pulling out is not completely done.

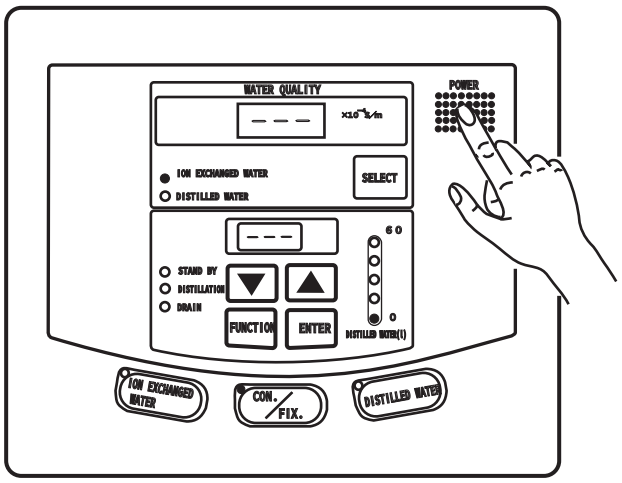
(1) Please confirm the boiler water drain cock shuts.
(the 33 page)
(2) Please push the power switch after confirming "STAND BY" lamp of the operation panel lights.
(the 20 page)
(3) The control begins about 15 seconds later.
Open the air pulling out plug① by 1/3 rotations.
The water begins to pass through the ion exchanger immediately after the power switch is turned on at the initial use because the boiler is empty.



(4)Close the air pulling out plug surely immediately after the air pulling out ends in 1-2 minutes and the water comes out.
(5) Please wipe up the water which flows out with a dry cloth.

Drive usually

1.Please operate with the installation person according to the preparation before using.



(① It is "Insertion" as for leak breaker.)

② Please push the power key (power supply).

➡ Operation panel for about 15 seconds until the distillation begins after pushing the power key.

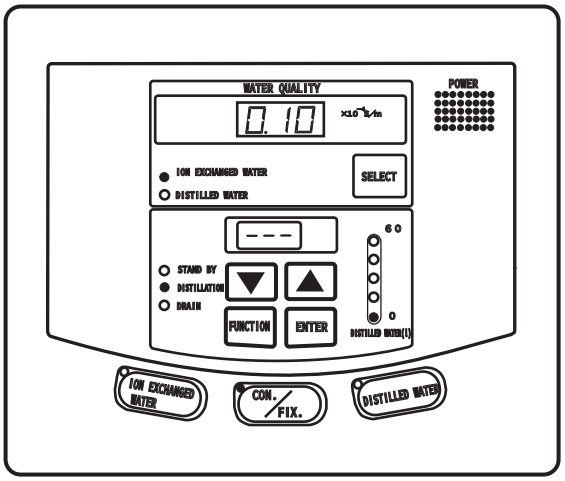
●Indicator(1) does the blinking display of [---]

●Operation state display lamp "STAND BY" is turned off.

(However, leak breaker appears and the [---] display does not appear from indicator(1) when the power key is pushed after time passes after "ON")

⬇

2. When 15 seconds or more have passed since the power key was pushed.

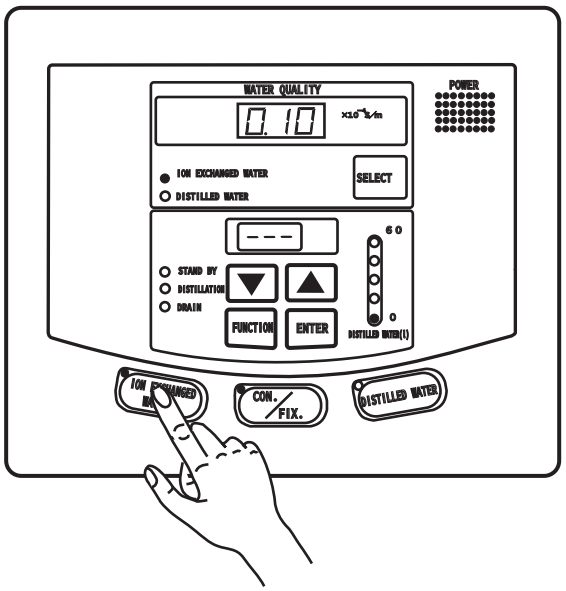


➡ Operation panel displayed

●Indicator(1) displays electric conductivity of the ion exchanged water (ex [0.10])
●ION EXCHANGED WATER of indicator for select switch is light.
●Yellow lamp of initial water shortage of indicator for reserved distilled water is light.
●The indicator operating condition lights when water is supplied up to a fixed water level in the boiler and an initial water supply is completed a green lamp of the distillation and begins distilling.

Continuous collection of pure water

Continuous collection of ion exchanged water



Switch for ion exchanged water is pushed once when "CON." of indicator for select switch for ion exchanged water.

➡ Operation panel displayed

- ●Indicatior for switch for ion exchanged water is lights.
- ●"DISTILLATION" of indicator for operating condistion is turns off.
- ●Does not depend in the state of the lamp lighting of indicator for reserved distilled water and the ion exchanged water can be gathered.

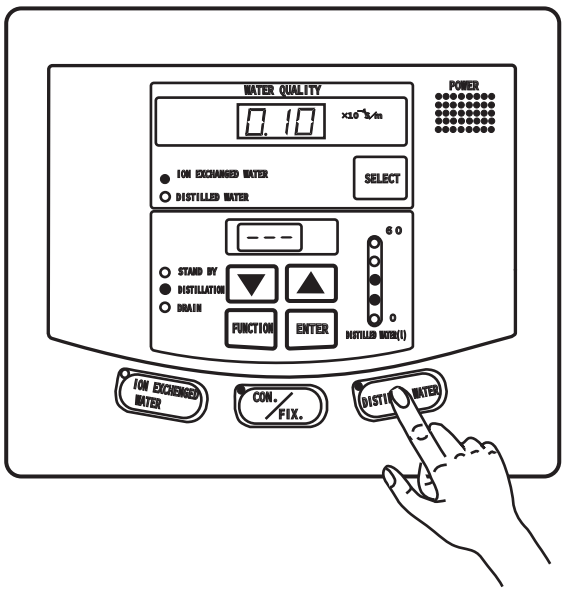
Push switch for ion exchange water again.

➡ Operation panel displayed

- ●Indicatior for switch for ion exchanged water is turns off.
- ●"DISTILLATION" of indicator for operating condistion is lights.

(The distillation enters the state of the stop because cannot supply water in the boiler while gathering the ion exchange water)

Continuous collection of distilled water



Switch for distilled water is pushed once when "CON." of indicator for select switch for distilled water lights with a yellow lamp of indicator for reserved distilled water does not light.

➡ Operation panel displayed

- ●Indicatior for switch for distilled water is lights.

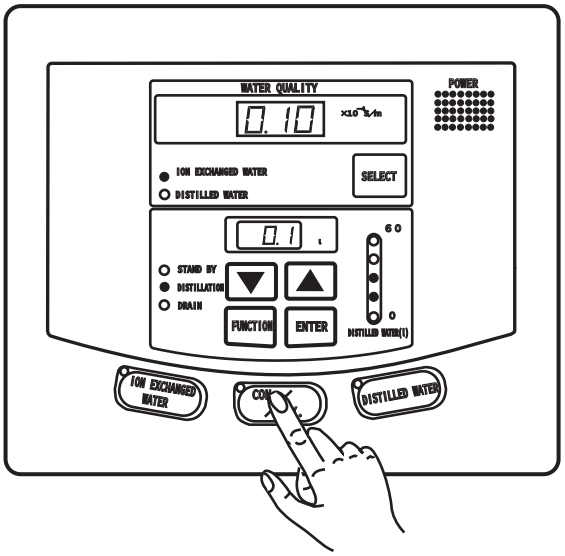
Push the switch for distilled water again.

➡ Operation panel displayed

- ●Indicatior for switch for distilled water is turns off.

(When the collection stops automatically at that time when yellow lamp "Less" of indicator for reserved distilled water lights and distilled water is gathered, the display lamp is turned off while gathering.)

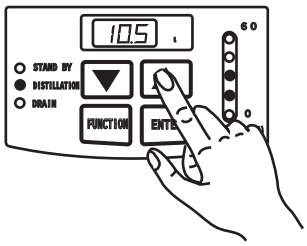
Fixed quantity collection of ion exchanged water



Push the select switch for continuous or fixed flow rate once

➡ Operation panel displayed

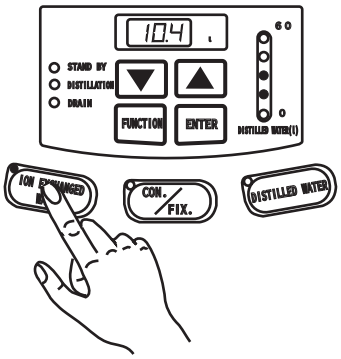
- "CON." in indicator for select switch is turned off.
- Indicator(2) displays 0.1 first stages and "ι" in unit of water quality display lights.



Please set in the capacity which wants to be gathered pushing the up ▲ and the down ▼ key.

➡ Operation panel displayed

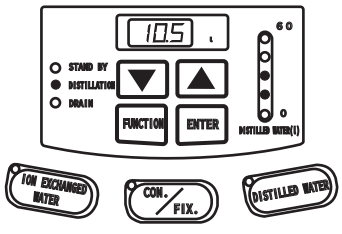
- The numerical value of indicator(2) increases and decreases to the key operation. (99.9 until can set.)



Please push switch for ion exchange water switch.
Ion exchanged water goes out of membrene filter.

➡ Operation panel displayed

- Indicatior for switch for ion exchanged water is lights.
- The numerical value of indicator(2) begins the subtraction count.

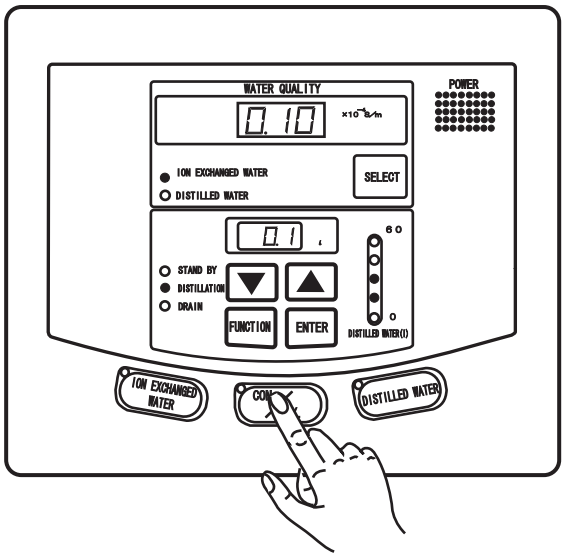


indicator(2) begins the subtraction count until 0.1 ,remainder pass of 0.1 ι is completed.

➡ Operation panel displayed

- Indicatior for switch for ion exchanged water is turns off.
- Indicator(2) returns to a set value.

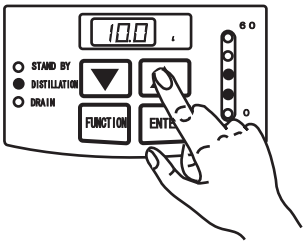
Fixed quantity collection of distilled water



Push the select switch for continuous or fixed flow rate once

➡ Operation panel displayed

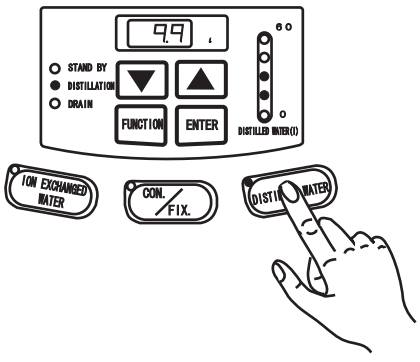
- "CON." in indicator for select switch is turned off.
- Indicator(2) displays 0.1 first stages and "ℓ" in unit of water quality display lights.



Please set in the capacity which wants to be gathered pushing the up ▲ and the down ▼ key.

➡ Operation panel displayed

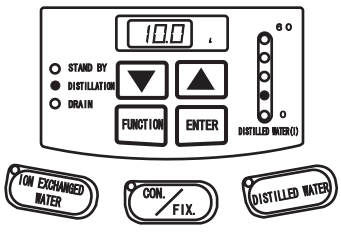
- The numerical value of indicator(2) increases and decreases to the key operation. (99.9 until can set.)



Please push switch for distilled water. Distilled water goes out of membrene filter.

➡ Operation panel displayed

- Indicatior for switch for distilled water is lights
- The numerical value of indicator(2) begins the subtraction count.



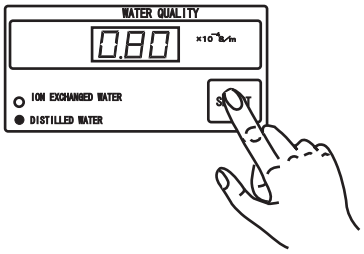
indicator(2) begins the subtraction count until 0.1, remainder pass of 0.1ℓ is completed.

➡ Operation panel displayed

- Indicatior for switch for distilled water is turns off.
- Indicator(2) returns to a set value.

Display of water quality

Change Ion exchange water or distilled water of electrode



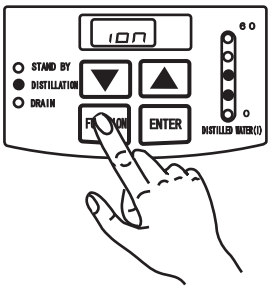
Whenever push the select switch once

➡ Operation panel displayed
●Indicator for select switch is Ion exchange water ⟷ Distilled water alternately lights.

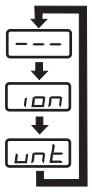
(Always display in each electricity conductivity ×10-4S/m at the power switch "ON")

↓

Switch at each water quality display



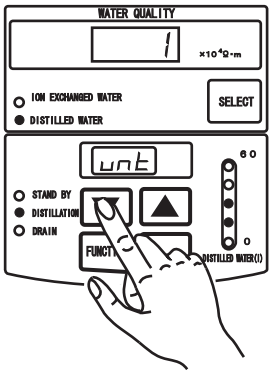
Whenever you push the FUNCTION key once
The display of the operation panel
● Indicator(2) displayed



Continuous collection
Multiplication pass amount display mode
Switch mode at each water quality display

Be sure please to display unt because changes.

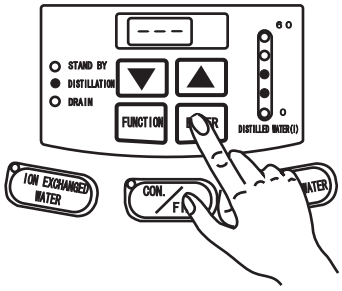
↓



Please push either of up key ▲ to the down key ▼ once.

Operation panel displayed
●Unit of water quality display and changes into the unit display of ratio resistance ($\times 10^4 \Omega \cdot m$).
●indicator(1) display ratio resistance value, range of 18.2 to 1.0($\times 10^4 \Omega \cdot m$) is displayed by 18 to 1 and the integer.

↓



Please push the execution key. The unit fixes and releases from the state of the function.

➡Operation panel displayed
●Indicator(2) display [---]

(The unit of the water quality display returns to electric conductivity by turning off and turning on the power key)

Display of water quality

About electric conductivity

●Electric conductivity is a numerical value by which easiness is shown like electricity.Because electricity comes to pass easily for water by there are the dissolving electrolysis material, that is, a lot of impurities, the numerical value becomes small large and few the electrolysis material as for the numerical value of conductivity.

●The smaller the numerical value of electric conductivity is, the better the purity of pure water is.However, because the content of non-electrolysis material (organism and colloid materials, dissolve gases, and microorganisms,etc.) value indicated in electric conductivity is not shown only by the electrolysis material, it is one index which shows the purity of pure water to the last and not one to show all of purity.

●There is ratio resistance in the one to show the same content as electric conductivity.Because the ratio resistance becomes the relation between electric conductivity and the reciprocal, the larger the numerical value is, better purity is.

●The ratio resistance if you assume R and electric conductivity to be ρ when you request the ratio resistance from electric conductivity

$$R\ [\Omega \cdot m] = \frac{1}{\rho\ [S/m]} \quad \text{or} \quad R\ [\times 10^{4}\ \Omega \cdot m] = \frac{1}{\rho\ [\times 10^{-4}\ S/m]}$$

becomes and the value of theory pure water is the following street.

R＝１８．３×１０^{4}Ω・ｍ（１８．３ＭΩ・ｃｍ）at　２５℃

(However, please note that the range of １８～１×１０^{4}Ω・ｍ does not display the decimal point by the integer display about the ratio resistance display of this machine)

ρ＝０．０５５×１０$^{-4}$Ｓ／ｍ（０．０５５μＳ／ｃｍ）at ２５℃

About the water quality of the ion exchange water and distilled water

●The ion exchanged water and distilled water have the following characteristic respectively.Please use properly if necessary.

Please drain the water of the distilled water tank if not using at the long period because using at once after gathering is an ideal in pure water.Please use after newly laying aside underground in the distilled water tank after draining once when laying aside underground in the distilled water tank for a long term.

(1) Ion exchange water

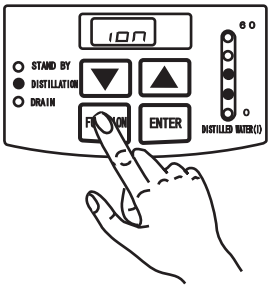
Most of the electrolysis material in water is removed and the water of the lowest electric conductivity is obtained.However, non-electrolysis material cannot be removed.Moreover, when passes after the device stops while the resin is new again, the decrease in purity is somewhat seen.

(2) Distilled water

It is possible to remove on average with electrolysis and non-electrolysis material excluding the low boiling point stuff such as ammonia.However, 1-2 <worse than the ion exchange water>. electric conductivity to generate the carbonic acid absorb carbon dioxide on an atmospheric inside by the manufacturing process (condense and store)１～２．５×１０$^{-4}$Ｓ／ｍ（１～２．５μＳ／ｃｍ） about 25℃ show acidity (pH5-6).

Method of displaying amount of multiplication pass and reset method

Please confirm the amount of the multiplication pass as a standard at the exchange time of the ion exchange resin.

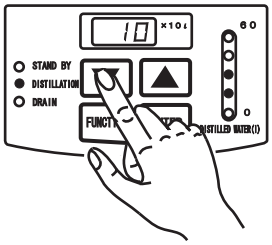


Please push the function key.

Operation panel displayed
●Indicator(2) displayed

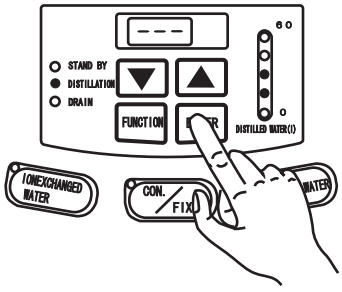
Continuous collection
Multiplication pass amount display mode
Switch mode at each water quality display

Be sure please to display ion because changes.



Please push the up ▲ or down ▼ either of key to the down key once.

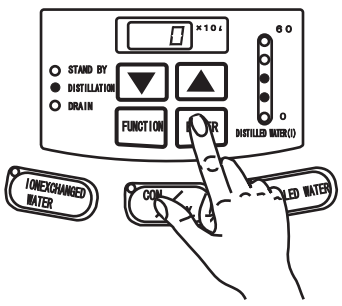
Operation panel displayed
●Indicator(2) displays the amount of the multiplication pass



When the ENTER key is pushed, releases from the state of the function.

Operation panel displayed
●Indicator(2) displays ---

Reset method



Please display the amount of the multiplication pass in indicator(2) and push the select switch for continuous or fixed flow rate CON./FIX. and the ENTER key at the same time.

➡Operation panel displayed
●Indicator(2) displays 0

Method of processing breakdown

Breakdown display and content of error code

Safety device	Display part	Display	Cause	Phenomenon when operating	Processing method
Electronic circuit abnormality detection	Indicator (1)	E.15 Lighting	Breakdown on electronic circuit	All the controls such as a heater and electromagnetic valves become "OFF".	Please receive the service of the shop or our company.
Water leak detection		E.31 Lighting	Water leak	All the controls such as a heater and electromagnetic valves become "OFF".	Please check the piping parts after making breaker "OFF". (29 page ※1 reference)
Heater overheating detection		E.32 Lighting	Heater overheats or damage	All the controls such as a heater and electromagnetic valves become "OFF".	Please check the piping parts after making breaker "OFF". (29 page ※2 reference)
Float switch abnormality detection		E.34 Lighting	Float switch of the distilled water tank trouble	All the controls such as a heater and electromagnetic valves become "OFF".	Please receive the service of the shop or our company.
Water level abnormality detection		E.35 Lighting	Water level of float cylinder trouble	All the controls such as a heater and electromagnetic valves become "OFF".	Please receive the service of the shop or our company.
Float switch abnormality detection		E.36 Lighting	Float switch of float cylinder trouble	All the controls such as a heater and electromagnetic valves become "OFF".	Please receive the service of the shop or our company.

● A display trouble lamp does the blinking display in another and trouble circumstances when the error code is lighting displayed in indicator(1) when breaking down.

Method of processing breakdown

Breakdown display and content other than error code

Safety device	Display part	Display	Cause	Phenomenon when operating	Processing method
Water quality trouble detection	Indicator (1)	C 1	The water quality of the ion exchanged water decreases below a regulated value. (When becoming 10 × 10^{-4}S/m or more)	Another from whom the display of the C 1 warning is repeated operates as usual.	It is not a breakdown of the device because of the longevity of the ion exchange resin. Please exchange for the new article. ➡ ※1
		C 3	The water quality of the distilled water decreases below a regulated value. (When becoming 10 × 10^{-4}S/m or more)	Another from whom the display of the C 3 warning is repeated operates as usual.	Please receive the service of the shop or our company.
		. . .	Decreases below the range that the water quality can be measured.	Another who displays the following when the electrode is selected usually operates.	C 1 and C 3 are displayed at the same time. Please follow each treatment.
Sensor trouble detection		– – –	Waterless in the measurement electrode Disconnection of electrode	Another who displays the following when the electrode is selected usually operates.	Please receive service if not canceling for a long term when passes though it is likely to be generated in the device operation.
		cut "STAND BY" Lamp lighting	Suspension of the water supply or decrease of hydraulic pressure of field (When the hydraulic pressure of the field is 100kPa	The distillation operation and the ion exchanged water collection operation temporarily stop.	Please confirm hydraulic pressure and the water service stopping of the field water open. When the hydraulic pressure of the field returns within one minute even if entering the state of cut while gathering the ion exchanged water, the collection is restarted.
	Measurement electrode display lamp	Blinking	Disconnection of sahmisuta for the temperature amends of the measurement electrode when bearing as follows.	When the electrode is selected, the value without the temperature amends is displayed.	Please receive service ahead of time.

➡ ※1 Please exchange for a new at once resin when the ion exchange resin reaches longevity. The scale adhesion of the boiler and the heater increases remarkably when using as it is and the performance of the equipment not only is demonstrated but also becomes a breakdown occasionally.

⚠ Warning

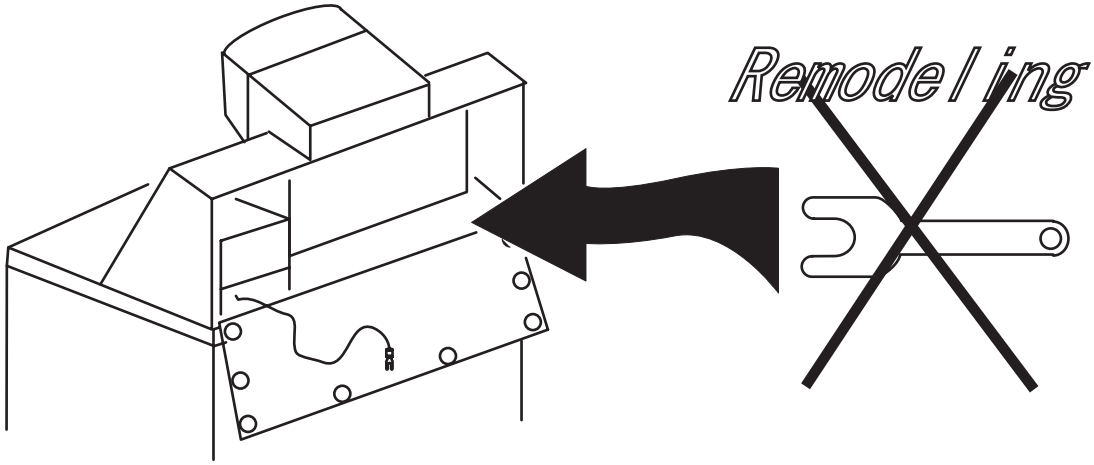
About the use prohibition/the treatment in abnormal circumstances

●Shut down the leak breaker of this machine at once, shut down the breaker on the power supply equipment, and request the check to the shop or the Yamato science office when smoke rises or it smells strange. A fire and the electric shock accident may cause when leaving just as it is.Moreover, please never repair by the customer.

Please do not decompose this machine.

●Never decompose.
The electric shock is caused because there is a part where the voltage is high in the inside.Please request the adjustment and the repair of internal to the shop or the Yamato science office.Please go according to the procedure described to the owner guide even at daily maintenance and the check.

●Do not remodel this machine.



When thunder begins to become

● Please cut leak breaker when the thunder begins. The control circuit of this machine breaks down and a fire and the electric shock are caused by lightning when leaving just as it is.

When annulling

● Do not leave in the place where the child plays when annulling.

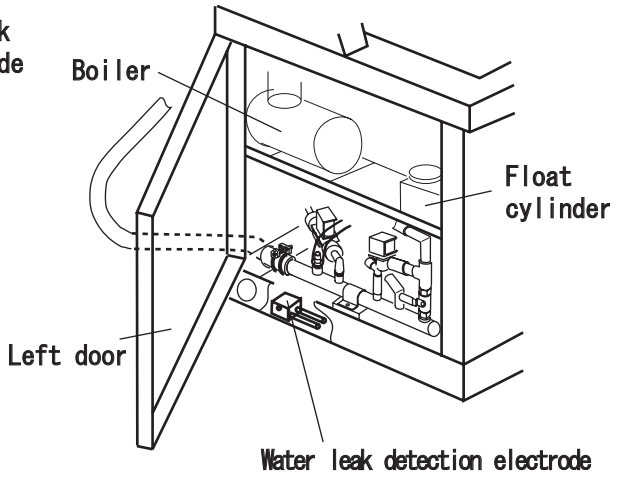
Method of processing breakdown

※1 Water leak detection (E. ３１)

① Please dry the device bottom and the water leak detection electrode enough and set the electrode as before when is driven again after treatment 1 defect part of 31 point light) is repaired.

② Please close a left door.

③ Please make leak breaker "ON". A normal drive will begin because a defective part is treated.



※２ Heater overheating detection (E. ３２)

As for the cause where overheating of the treatment heater is generated, the following two points are thought.

(1) Please report to the shop of purchase or the our company office and the service section because it is forecast that parts for the water level control are out of order when the error occurs though scale does not adhere to the heater when the water level in the boiler decreases and the heater enters the state of boiling without water and parts on the cooling water side are out of order.

(2) Please wash by scale's (evaporating residual thing) using scale remover of the attachment for the surface of the heater according to method of maintenance and "Maintenance check" when the temperature of the heater rises by the heat exchange's more than a constant amount adhering and having worsened. Still, please report to the shop of purchase or the our company office and the service section when the heater overheats.

⚠ Warning

Pay attention to handling of the cleaning solution

- Please keep in the container which can be sealed up and avoid the high temperature and high humidity in the handling of the cleaning solution.
- The principal ingredient of scale remover of the cleaning solution is a sulfamine acid (PH of solution is acidity of about 1).
- Please use the protection tool (gloves, mask, and glasses) at the handling of this cleaning solution.
- Please flush enough fresh water when it is time when the beating touches human body.
- Please neutralize the liquid after washing with the neutralizing medicine (hydroxide sodium etc.).
- Please confirm neutralizing with the pH examination paper etc.
- Please do not use an empty container for the beverage.
- Please do not throw the cleaning solution to the agricultural rainwater road and the field, etc. because the rice plant is caused to die.

When you install the cap in the ion exchange resin cylinder

Please confirm the grain of the ion exchange resin does not adhere to the screw when you install the cap in the preliminary ion exchange resin cylinder.

Please wipe off the grain of the resin with a clean cloth etc. The seal becomes imperfect and degrades the seal material and the water leak may occur when the ion exchange resin adheres to the screw of the cartridge for the reproduction and the screw of the cap.

- Do not fall the grain of the resin on the floor.

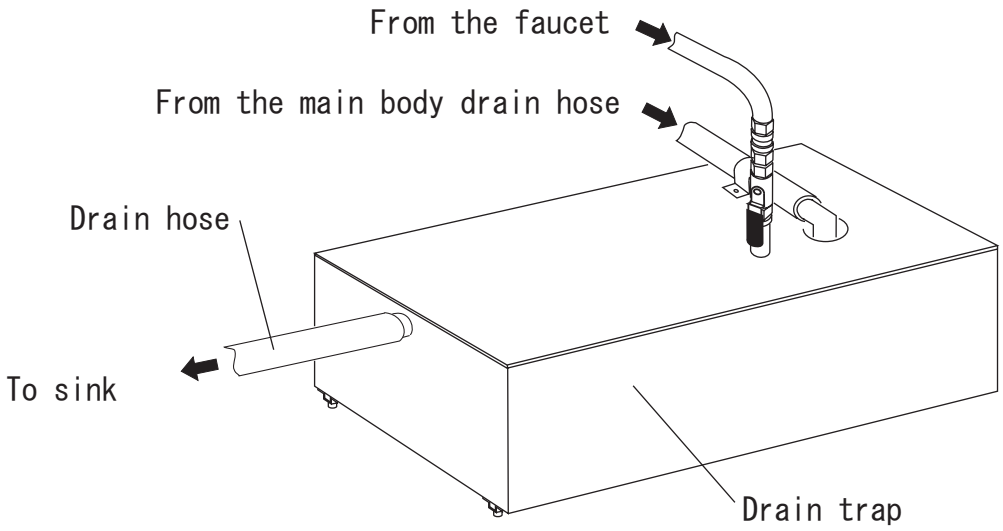
Please wipe all off when crashing to the floor side because it is very slippery and is dangerous because the grain of the ion exchange resin has the shape of the ball when grain drops to the floor side.

⚠ Warning

If the temperature of the drain tube of the sink equipment does not become 60℃ or less

● Please connect the drain trap of attached outside standard goods.

The drain trap decreases the temperature by temporarily accumulating the drain after cooling and decreases the temperature in addition by supplying the service water.



⚠ Attention

If not using for a long term

● Please cut leak breaker of this machine without fail for safety if not using at the long period and close the water service stopping.Please drain according to the following procedure because the water quality deteriorates as for water in the boiler and the distilled water tank when it is a state laid aside underground as it is.

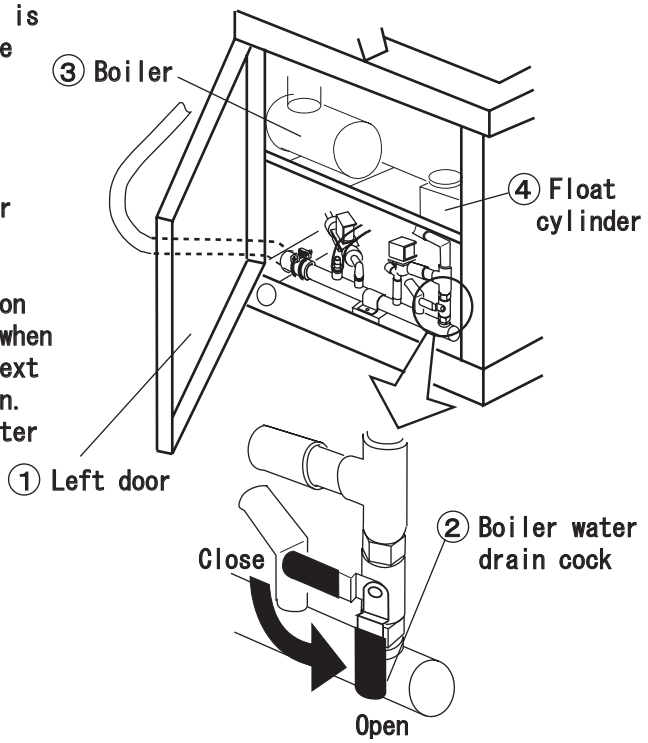
1.Boiler water drain

(1)Please open left door① to boiler water drain after waiting for 30 minutes or more after it is confirmed to cut leak bureaker of this machine and to have closed the water faucet.

(2) Please open boiler water drain cock②.

(3) Please confirm it was finished that all water in boiler③and float cylinder④came off.

(4) Please shut boiler water drain cock 2 .The ion exchanged water does not pass in the boiler when the boiler water drain cock opens when the next being use and the distillation does not begin. Moreover, all are drained from the boiler water drain cock and the longevity of the ion exchange resin is shortened.



2.Drain of the distilled water tank

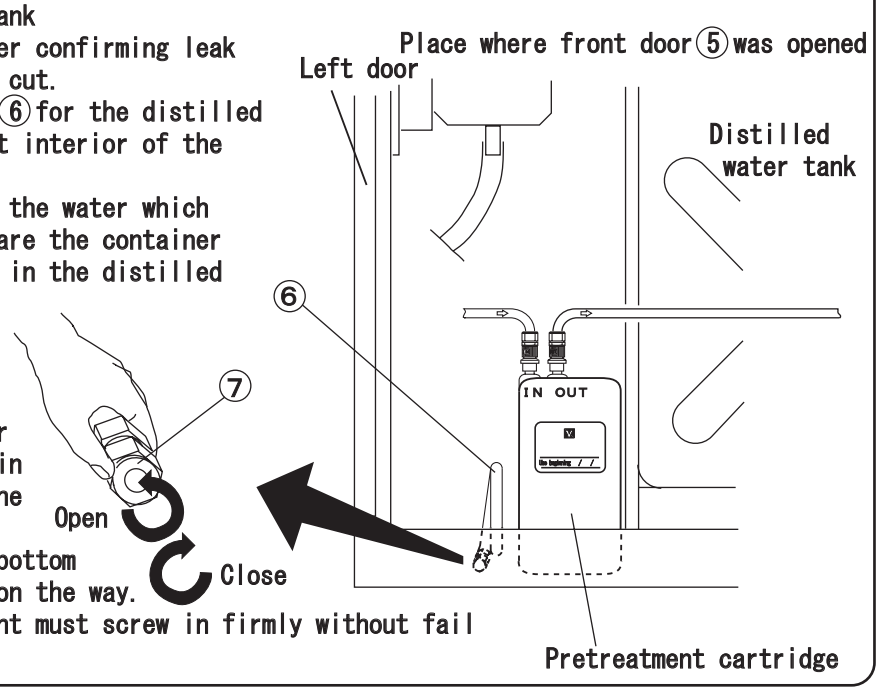
(1) Please open front door⑤after confirming leak bureaker of this machine was cut.

(2) Please draw out because hose⑥for the distilled water tank drain is in a left interior of the pretreatment cartridge.

(3) Please confirm the amount of the water which remains in the tank and prepare the container for drain etc. because water in the distilled water tank flows when stopping⑦in the point is turned counterclockwise and is detached and goes out.

(4) Please note that the hose for the distilled water tank drain does not finish water's in the tank coming off when raises more than the height of the bottom in the distilled water tank on the way.

(5) Please stopping⑦in the point must screw in firmly without fail and close when drain ends.



Maintenance check

The execution time of the maintenance check (Please check usually to have the stability of the product use).

Maintenance and check item	Standard at execution time	Note
Replace of pretreatment cartridge	2-3 months	Processing performance:Please execute ahead of time when the water quality of about 5000ι field water is bad in the city water of Tokyo.
Replace of ion exchange resin cylinder	C 1 displayed in indicator(1)	Processing performance:It is field water of 200×10-4S/m and about 1500ι.
Replace of membrene filter	Three months	Processing performance:The exchange time comes when about 3000ι collection flowing quantity decreases extremely by the pure water pass.
Washing of distillation machine	Three months	Please execute ahead of time when the water quality of the field water is bad.
Washing of water supply hose filter	Six months	
Replace of hose	Two years	Please check connected part once a month.

Replace of pretreatment cartridge
Please refer to "Please connect the pretreatment cartridge surely" for the replace method before using.Please do the air pulling out with the air pulling out plug of the ion exchange resin because the ion exchange resin is replaced when you exchange the cartridge.

When you replace the pretreatment cartridge once ➡ Please make the replacce of the ion exchange resin three times a standard.

Maintenance check

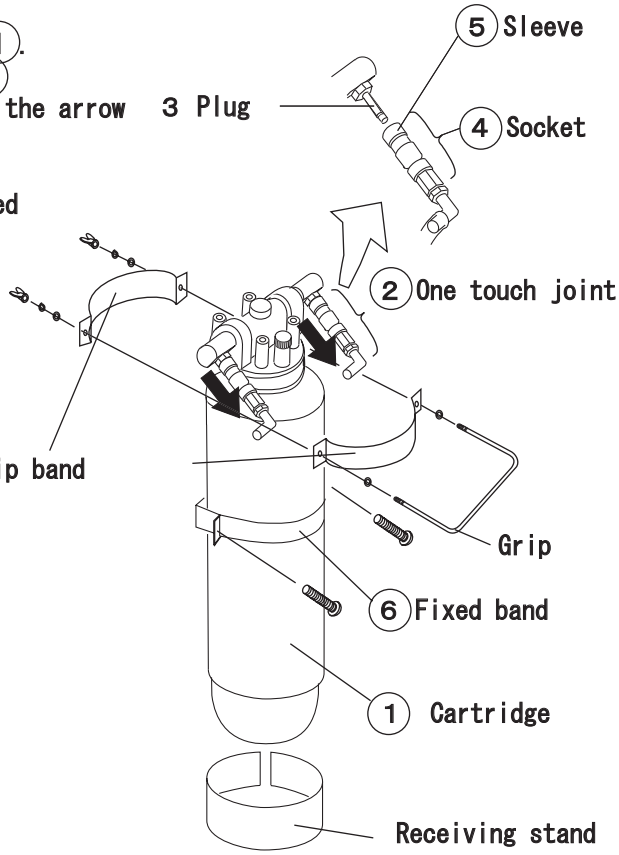
Replace of ion exchange resin cylinder

●Detaching of ion exchange resin cylinder

1. Please detach one touch joint (2) from cartridge (1). one touch joint detaches sleeve (5) and socket (4) is detached from plug (3) in direction (↘) of the arrow with the slide done.

2. Please loosen the screw to the main body of fixed band (6) and detach the strap.

3. Please draw out from the main body. Please note one's feet enough because there is weight of about 18kg.



Ion exchange resin cylinder

●Water pulling out of ion exchange resin cylinder for reproduction

1. Please blow down the cartridge from the water pulling out hose to dripping the water pulling out hose of the attachment to the place where another inserting edge can be drained and coming out of water to the plug on pure water exit side.

2. Please lean the cartridge because water comes off according to an internal siphon phenomenon even if causes when you start draining from the water pulling out hose. It takes the time of about 10 minutes for drain.

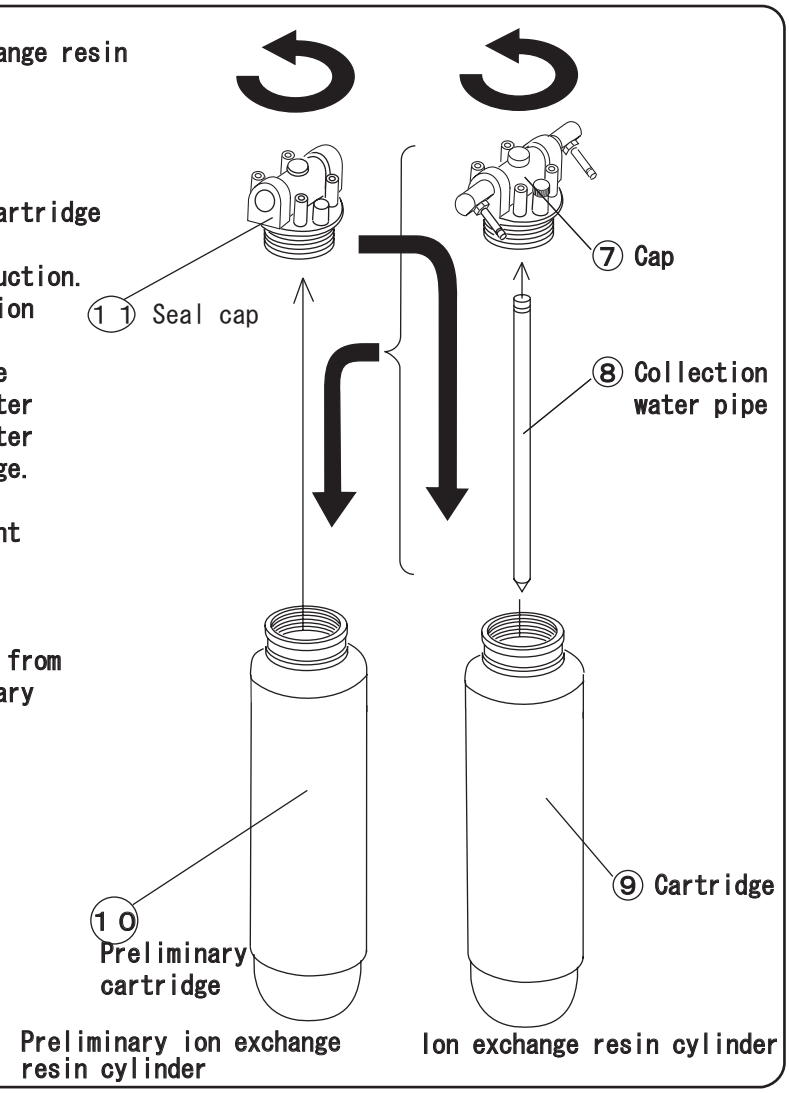
3. Please detach the hose when ending.

Maintenance check

Replace of ion exchange resin cylinder

● Part replace of preliminary ion exchange resin cylinder

1. Please detach cap⑦and collection water pipe⑧from cartridge⑨of the ion exchange resin cylinder, detach seal cap ⑪ from preliminary cartridge ⑩ to preliminary cartridge⑩ ,and install in cartridge⑨for the reproduction.
2. The installation of cap⑦and collection water pipe⑧firmly inserts first the collection water pipe in a center hole of the cap, inserts the collection water pipe next, and is inserted in the center of the resin of a preliminary cartridge.
3. Please tighten the cap.Please tighten after confirming because the seal might ecome insufficient when the grain of the ion exchange resin adheres to the screw of the cap and the cartridge.
4. Please install the grip band and grip from the cartridge in a detaching preliminary cartridge.
(Please refer to former page)



●Installation on main body of preliminary cartridge

1. In entrance (IN) of the field water, please install pure water exit(OUT) in piping and the other of the preprocessing cartridge respectively.Please insert the socket of the hose in the plug surely.
2. Please do without forgetting the air pulling out in the cartridge.

Maintenance check

Washing of distillation unit

● Detaching of distillation machine

1. Please leak breaker make "OFF".

2. Please close the faucet.

3. Please have waiting after" for about 30 minutes and open a left door of this machine and leak breaker "OFF" open the boiler water drain cock.

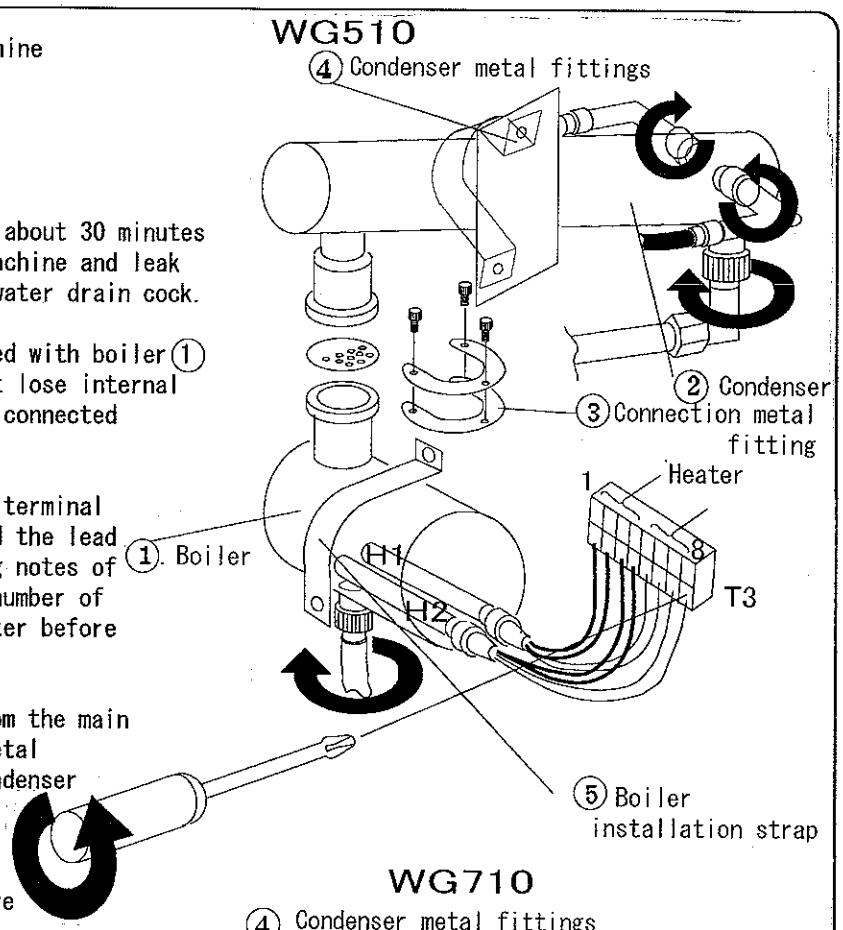
4. Please remove the hose connected with boiler ① and condenser ② . Please do not lose internal packing when detaching because connected entrance uses the bag nut.

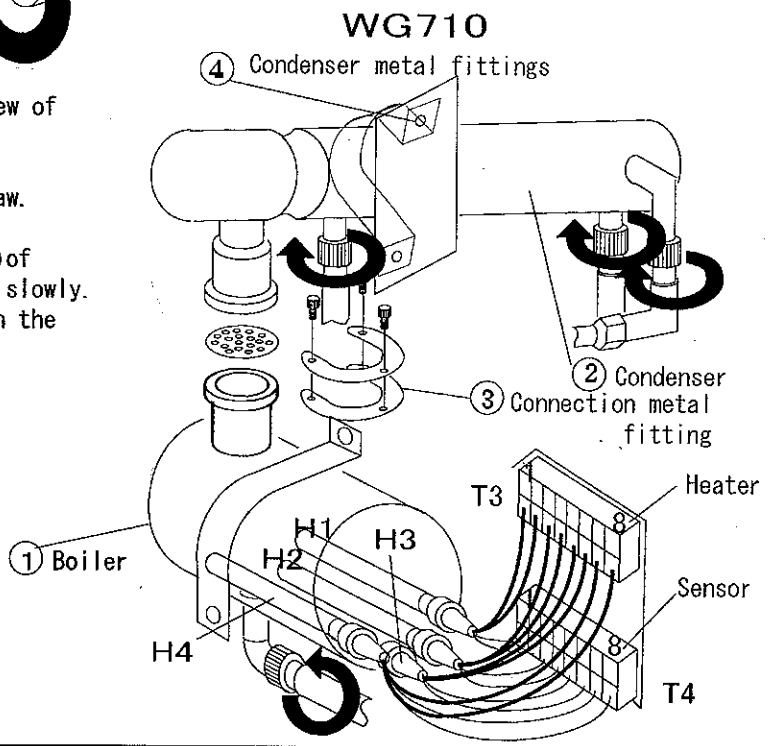
5. Please remove the cover of the terminal stand and detach the heater and the lead line of the sensor after taking notes of the position where the entire number of the terminal stand and the heater before removing are installed.

6. Detaches from the condenser from the main body. Please remove connected metal fittings ③ and separate the condenser and the boiler.

7. Detaches from the condenser from the main body. Please remove supporting the condenser by one hand, loosening the machine screw of condenser metal fittings ④ at the center of the condenser with + screwdriver, and noting straw.

8. Please remove installation strap ⑤ of the boiler and take out the boiler slowly. The heater is put into the state in the state of installing in the boiler.





Maintenance check

Washing of distillation unit

● Adjustment of cleaning solution

1. Please prepare the warm water of 60-70℃.

2. Please add scale washing medicine scale remover of the attachment to the warm water and mix thoroughly.

Warm water and amount of scale remover

Type	Warm water(ℓ)	Amount of scale remover(g)
WG５１０	4	３３０
WG７１０	6	５００
WG７３０	6	５００

● Washing method

1. Please stop the rubber hose connection entrance under boiler stopping etc.

2. Please fall and stabilize even if you pour the scale washing medicine in the boiler.

3. Please pour the washing medicine from connected entrance with the condensation machine with the heater installed.
   The washing medicine does not depend on the lead line of the heater and notes enough.

4. Please extend time by the situation in the boiler though scale can be almost taken in about 4-5 hours. However, please drain the cleaning solution because it is shown that the washing ability came to the limit when the color of the washing medicine changes from blue purple into yellow. Please add the cleaning solution newly when you cannot remove scale and repeat washing.

5. Please drain the cleaning solution in the boiler when you can remove scale. The heater is detached from the boiler and washes in the water service water. Please water must fill a large beaker etc. Without fail so that the heater may wet neither a lead line nor connected entrance to water and do in that.

6. Please do the following and do solid scale which was not able to finish being taken with the cleaning solution.
   Boiler ···· Please remove with brush etc.
   Heater ···· Please be and remove the chip and plastic, etc. rubbing with the thing.

7. Washing the condenser can take most furs by sealing to the hose connection entrance to pour the above-mentioned cleaning solution during the tube of cooling the condenser it, for the cleaning solution to flow, and so as not to go out and putting for about 2-3 hours. Afterwards, please flush enough in the condenser in the service water.

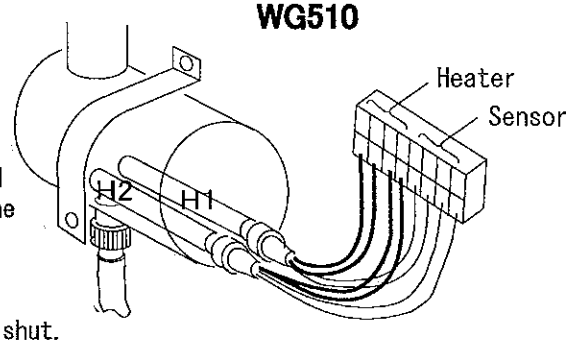
Maintenance check

Washing of distillation unit

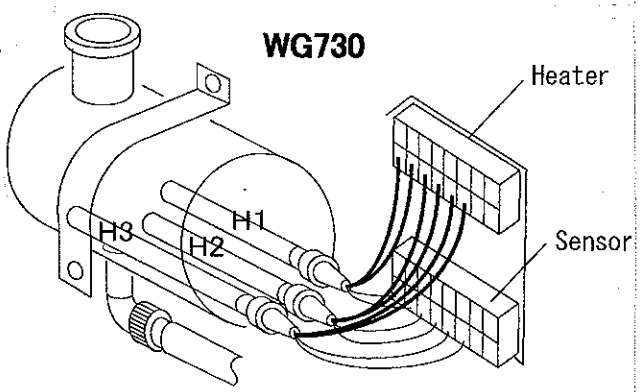
● Installation of distillation unit

1. Give the distillation unit and the condenser in installation. does in the reverse order of detaching. Please confirm connected position and connect each hose and each lead line firmly.
2. Heater number and which is sure to come to build in heater boiler up character of "YK-W-4" on surface of heater and is taken notes. Please install after confirming the applying position.
3. Please refer to a right picture for the installation of each heater. Two is a sensor line for the temperature detection in the lead line of the heater and other two is a lead line for the heater. The lead line for the heater uses a fat line. Please connect surely with + screwdriver.
4. Please confirm the boiler water drain cock is shut.
5. Please open the water service stopping.
6. Please make leak breaker of this machine "ON".
7. Please confirm "STAND BY" lamp of the operation panel lights.
8. Please do calibration by the following procedure when you lose the memo paper at the heater number and the installation position of detaching the heater by any chance though it is the above, washing the distillation unit is completion (Replace by any chance by the heater damage for a new heater).
9. Please push calibration switch at the right of the operation panel.

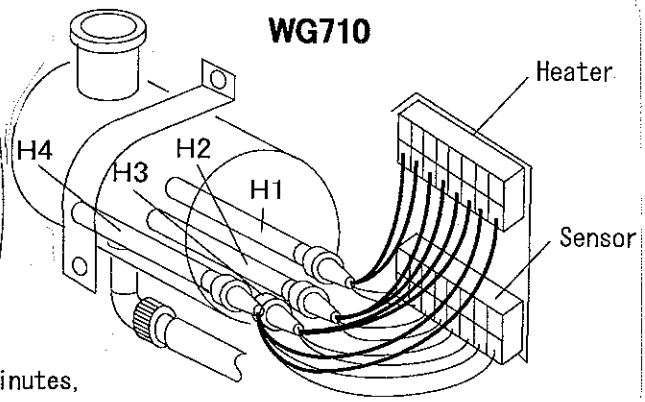
WG510



WG730



WG710



Calibration switch is a switch of the sensor buried under the heater respectively to usually memorize a standard temperature in the state of the drive in the internal control machine. When rising, abnormality is detected from a standard temperature by some causes at +20℃ or more while driving usually. The character of CAL does the blinking display to indicator (1) of the operation panel while driving Calibration.

10. After calibration is driven for about five minutes, usually automatically becomes a drive.

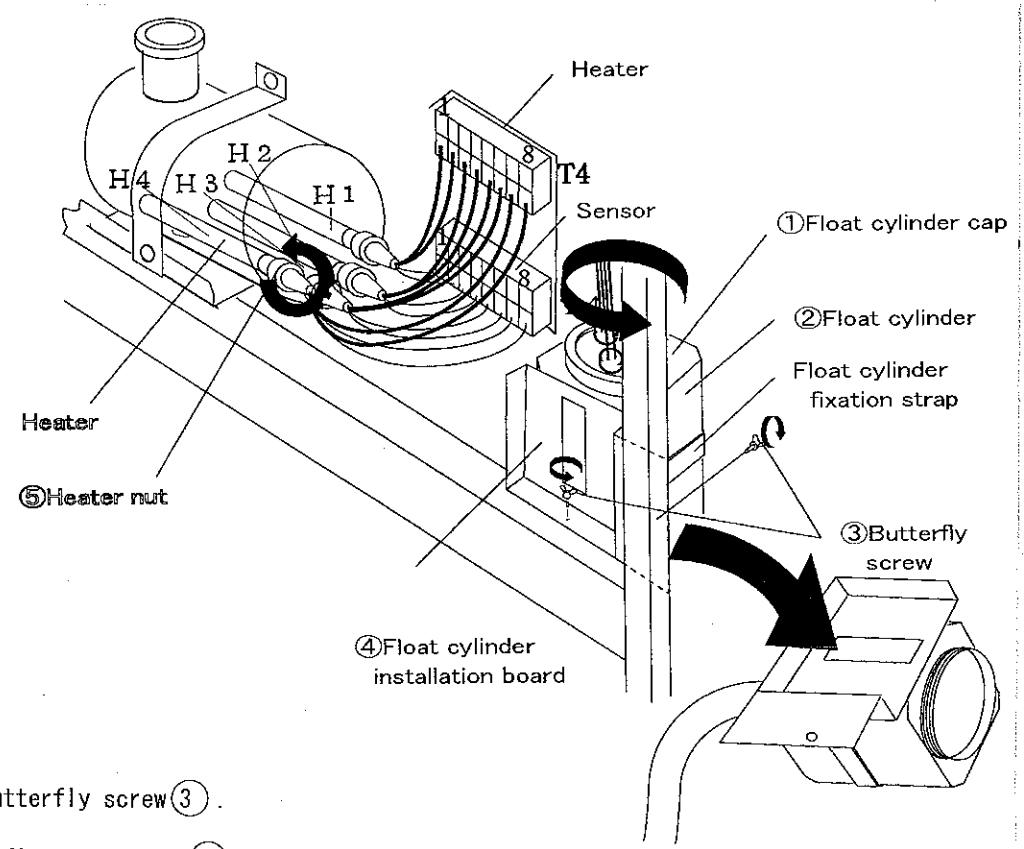
Maintenance check

Method of replace heater

●When scale adheres to the heater or the heater is disconnected, it is E.32 in indicator(1) lights and all the controls such as a heater and solenoid valves stop as for the device. Please cut leak breaker of this machine for safety and close the water faucet.

1. Please drain the boiler water.
   Please refer attention "Do not use for a long term" (P33).

2. Please remove float cylinder cap 1 from float cylinder(2). Please detach noting that the lead line is not hurt because the lead line of the float switch pounds to the float cylinder cap.



3. Please detach butterfly screw(3).

4. Please draw out float cylinder (2) to float cylinder installation board (4) forward in the state of installation.

5. Please remove the heater lead line and the sensor lead line of the heater terminal stand.

6. Please loosen heater nut (5).

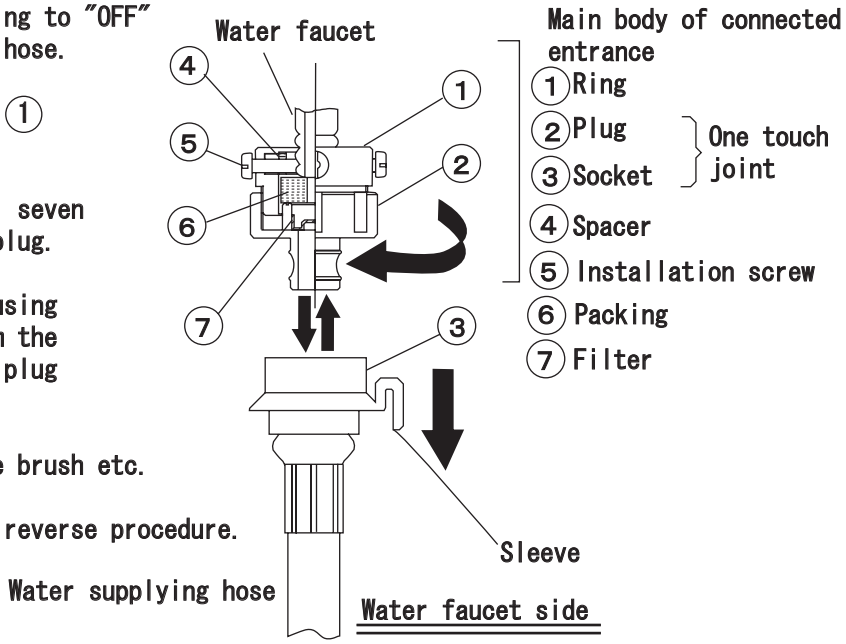
7. Please pull out the heater forward straight. Please remove very carefully because the glass is occasionally damaged when impossible even a little power joins the nut installation mouth on the boiler side.

8. Please install a washed heater or a new heater in 7-1 according to a reverse procedure.

Maintenance check

Washing of water supplying hose filter

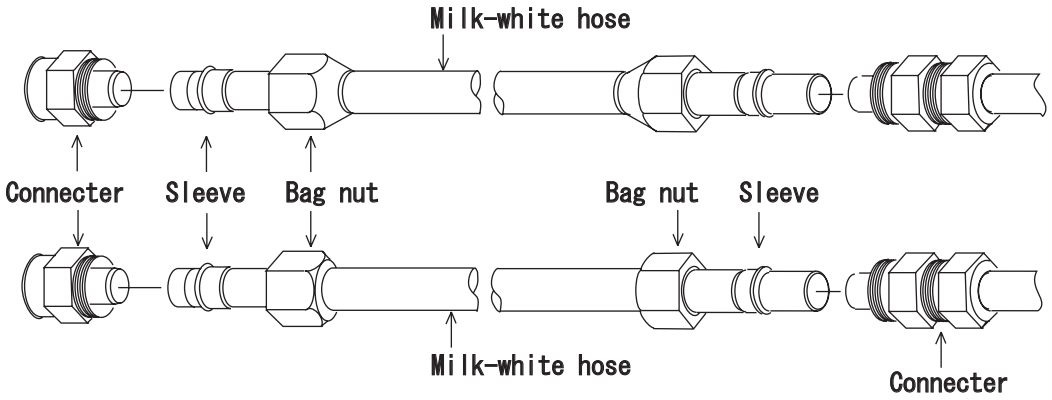
1. Please detach leak breaker of this machine and close the faucet after making to "OFF" and detach the water supplying hose.
2. Please turn plug ② from ring ① and remove.
3. Please wash with the filter ⑦ seven service water inserted in the plug.
4. Please push the filter out by using flat respect of the pencil from the hole on the sleeve side of the plug when stopped up is violent.
5. Please wash the filter with the brush etc.
6. Please assemble according to a reverse procedure.



Replace of hose

- The hose for the replace must use the one of the our company specification.
- Please replace the resisting pressure hose (milk-white) used in the device by the following procedure.

1. Please remove the bag nut and pull out the hose from the connecter.
2. Please cut a new hose so that the edge side may squarely become.
3. Please put up the sleeve and the bag nut to a new hose.
4. Please insert the hose up to the interior of the connecter and tighten the bag nut by the sleeve surely.



When the repair is requested

Please discontinue record and the drive, cut leak breaker of this machine, close the water faucet,and report the error display etc. to the shop of purchase or the our company office if abnormality occurs by any chance.

(content to want to have report)

- ●Model name of product
- ●Product number
- ●Date of purchase

Please see the signature version put on the guarantee book or this machine.

- ●Content of breakdown (It is detailed).

Please present the guarantee book in the fold for which service man looked.

The guarantee book (Append separately).

- ●Please keep filling in such as "Shop name and purchase day" and keep the confirmation guarantee book well importantly after reading because the guarantee book is passed from the shop of purchase or the office in our company.
- ●It is from "Purchase day" to 1 year at guaranteed term. I will repair free according to the content of the description of the guarantee book.
- ●Please consult the shop of purchase or the our company office about the repair after the guaranteed term passes.When the function can be maintained by the repair, I will repair by charge by the demand of the customer.

The lowest possession periods of repair performance parts

After discontinuance of manufacturing, the lowest possession periods of the performance parts for the repair of the WG series are seven years.
Parts for the repair are parts necessary to maintain the performance of the product.

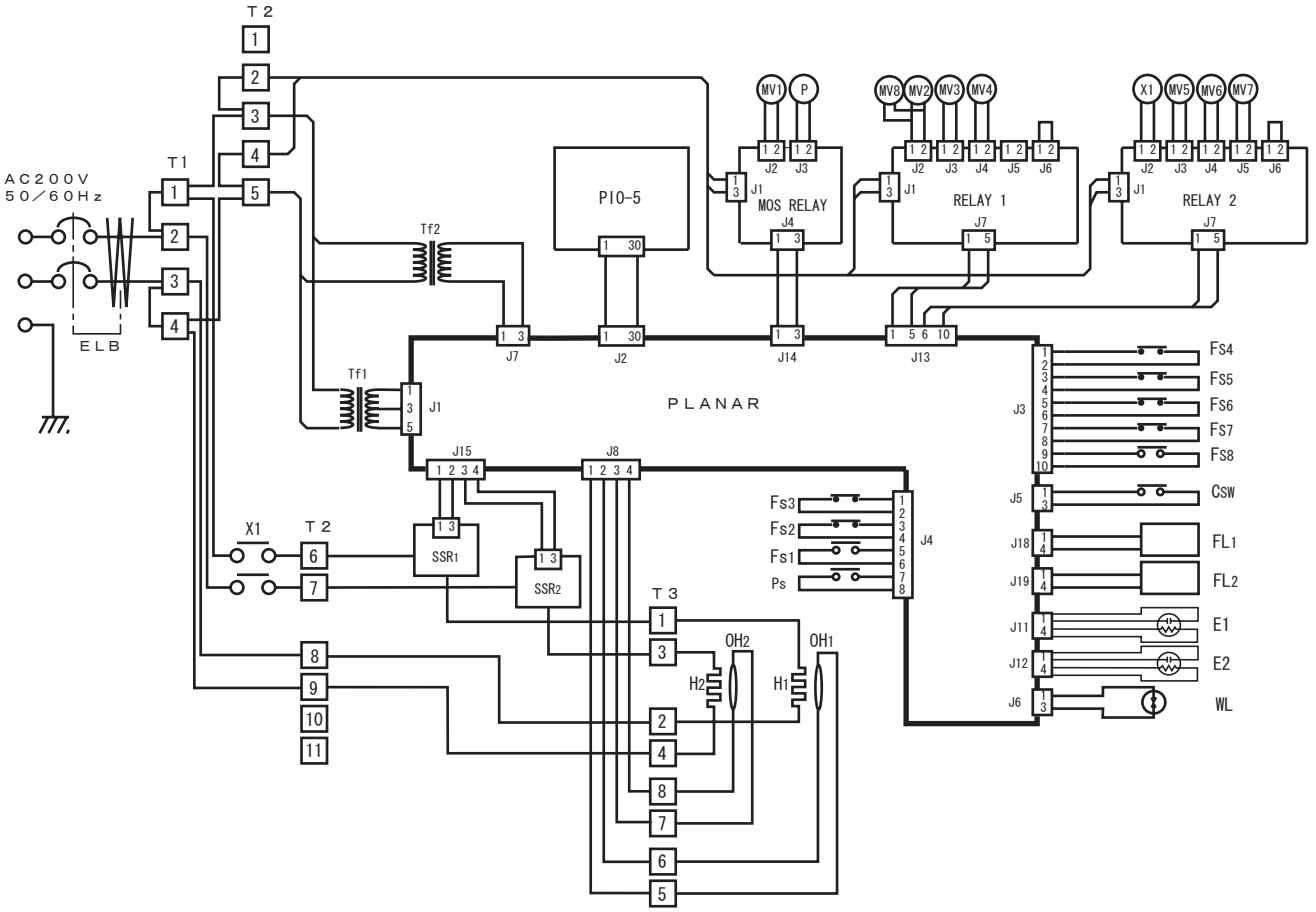
When thinking breakdown ?

Symptom	Please confirm.
"STAND BY"lamp does not light to the operation panel even if leak breaker is put.	●Is the power supply cable surely connected with the outlet or the switchboard. ● blacked out?
Water is not supplied (ion exchanged water).	●Defect of solenoid valve for raw water supply ●Lack or suspension of the water supply of water service pressure ●Defect of pressure switch ●Stopped up of pretreatment cartridge
The water supply does not stop.	●Defect of float switch. ●Defect of solenoid valve for raw water supply
Water is not supplied to the boiler.	●Defect of solenoid valve for boiler water supply. ●Defect of float switch. ●Defect of solenoid valve for the boiler drain.
The heater is not turned on.	●Defect of float switch ●Heater disconnection
Cooling water does not flow.	●Defect of solenoid valve for cooling water.
Initial distilled water does not drain.	●Defect of solenoid valve for the initial distilled water drain.
The boiler water does not drain.	●Defect of solenoid valve for the boiler water drain.
Distilled water is not atanding.	●Defect of solenoid valve for initial distilled water drain ●Defect of piping.
The distillation does not stop.	●Defect of float switch.
Water collection cannot be done.	●Defect of solenoid valve for sampling ion exchanged water. ●Defect of solenoid valve for the distillation collection. ●Defect of distilled water collection pump.
The amount of the collection is a little.	●Stopped up of memburene filter.

MODEL			WG510	WG710	WG730
Performance	Sampling method		Ion exchanging method ➡	Distilling method ➡	Filtrating method
	Sampled pure water		Ion exchanged water, distilled water		
	Distilled water sampling amount		About 5(l/h)	About 10(l/h)	About 7.5(l/h)
	Capacity output		Ion exchanged water	About 1 to 1.5 (l/min)	
			distilled water	About 1 to 2 (l/min) 50Hz in power supply	
				About 1.5 to 2.5 (l/min) 60Hz in power supply	
Composition	Still	Boiler	Extra hard glass		
		Condencer	Extra hard glass		
		Heater	Ceramic heater 2	Ceramic heater 4	Ceramic heater 3
	Filter on raw water side		Pretrerment cartridge Activated carbon + holiow fiber membrane 0.1(μm)		
	Ion exchanger		Instantly connected type large-scale cartridge		
			Mixed floor type , SP resin amount about 10liters		
	Filter on pure water side		Membrene filter holiow fiber membrane0.1(μm)		
	Distilled water storage tank		Polyethylene, 60liters		
	Water quality monitor		Temperature automatic operation amends and the digital display		
			Display are switch types electric conductivity and the ratio resistance.		
			0.05 - 300×10^{-4} S/m at 25℃(electric conductivity display)		
			18 - 0.1×10^{4} Ω・m at 25℃(ratio resistance display)		
	Feeding pump		Output 20(W)		
	Distilled water tank level display		Five step LED display		
	Range of collection capacity setting		0.1 to 99.9 Little		
Standard	Raw water pressure range		1 to 5×100kPa(1 to 5 kgf/cm^2)		
	Power (50/60Hz)		AC200V		
			Single phase 20A	Single phase 40A	Three phase 18A
	Outer dimensions (width × depth × height)		903×603×1430 mm		
	Weight		Approx.110kg		

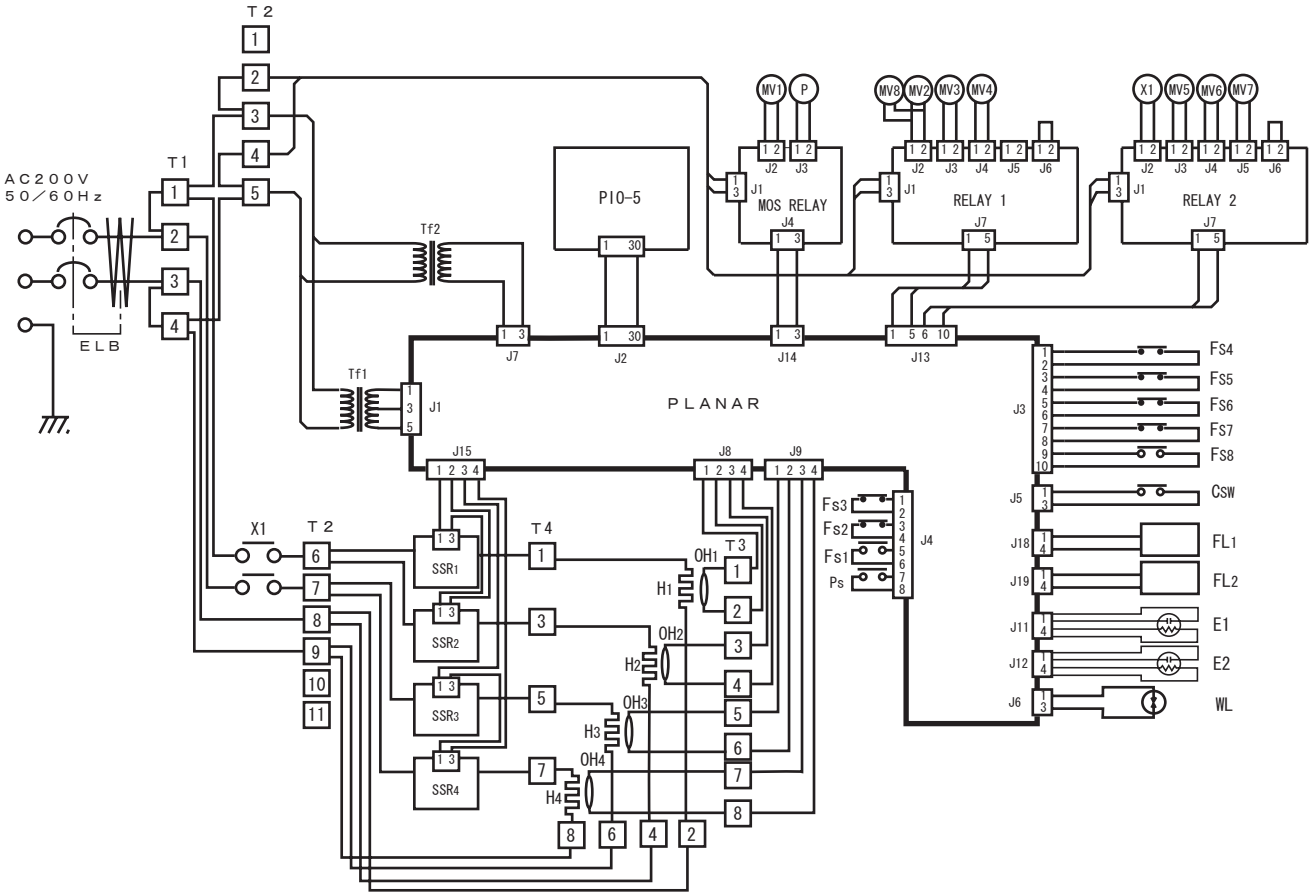
Attached device	Water quality abnormality alarm, Initialdistilled water draining device, Boiler water automatic operation draining device, Cooling water amount automatic control device, Heater no-load operation prevention device, Heater over-heat prevention device, Water leakage detector, Water cutoff detector, Tank overflow prevention device, Distilled water collection pump empty drive prevention, Leak breaker, Ion exchanged water sampling amount setting mechanism, Distilled water sampling amount setting mechanism, Ion exchange water multiplication pass amount display
Accessories	Pretreatment cartridge 1 The ion exchange resin (Filled to the ion exchange resin cylinder of the main body). Membrane filter 2 Water supply hose (with connection unit) 2m 1 Drain hose (with hose band) 3m 1 Vinyl hose (for water pulling out of ion exchange resin cylinder) 1 Scale remover 1kg 1 Seal tape 1
Consumables	Pretreatment cartridge, (ACF0827) Ion exchange resin, (SP resin) Membrene filter, (MFRL730) Scale remover
Optional accessories	Water supply port unit, High quality cartridge (CPC-H type) connection unit, Ion exchange resin preliminary cartridge, Manual valve for direct distilled water collection, Making field water supply two system unit, Distilled water assistance tank (20ι), Collection entrance hose fitting set, Drain trap

WG５１０



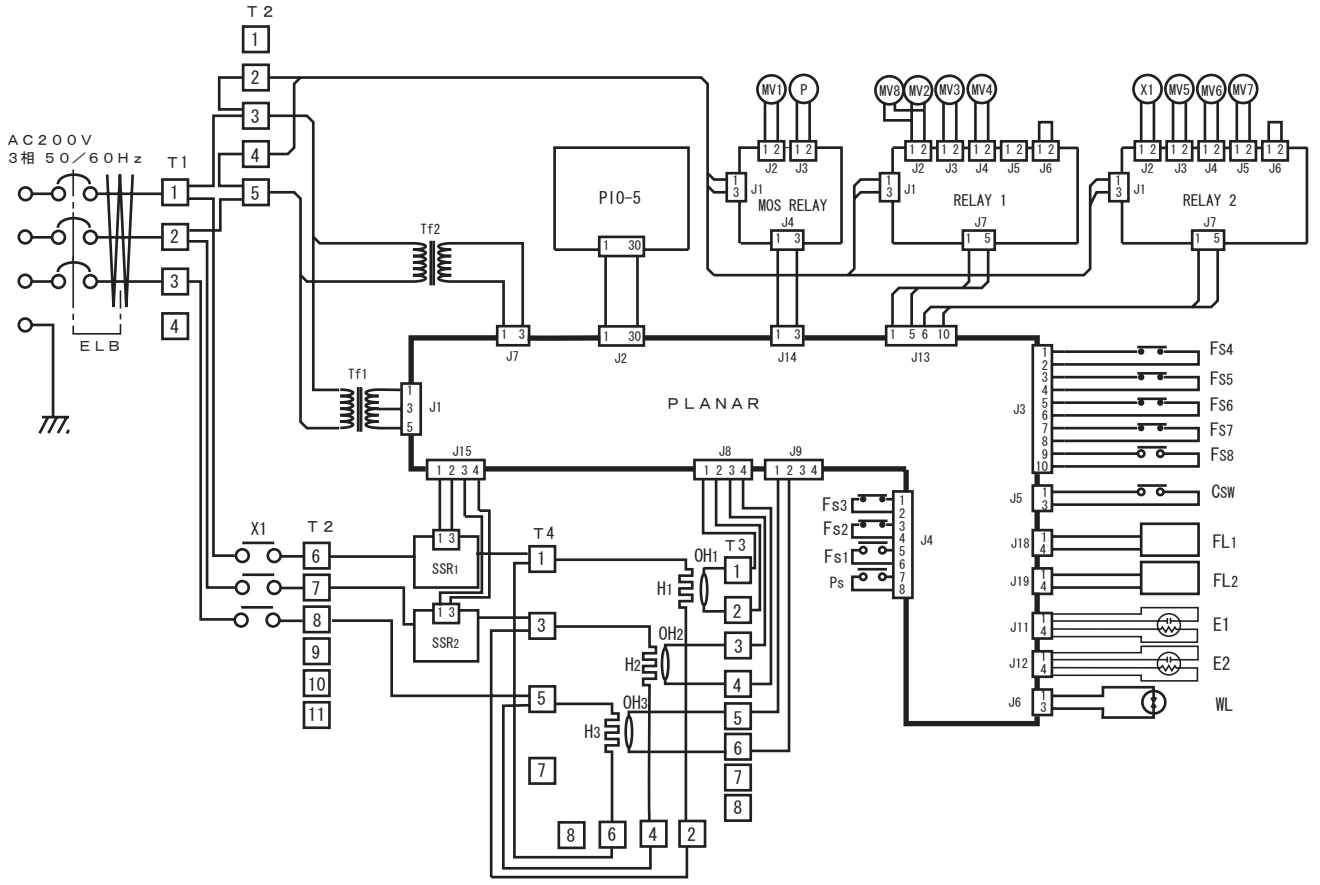
Symbol	Part Name	Symbol	Part Name	Symbol	Part Name
ＣＳＷ	Reset switch	ＭＶ１	Solenoid valve for boiler water supply	ＯＨ１	Sensor of heater
Ｅ１	Ion exchanged water quality monitor electrode	ＭＶ２	Solenoid valve for raw water supply	ＯＨ２	Sensor of heater
Ｅ２	Distilled water quality monitor electrode	ＭＶ３	Solenoid valve for initial distilled water drainage	Ｐ	Pump
ＥＬＢ	Leak breaker	ＭＶ４	Solenoid valve for boiler water drainage	PIO-5	Display board
ＦＬ１	Ion exchanged water flow rate sensor	ＭＶ５	Solenoid valve for ion exchanged water sampling	PLANAR	Planar board
ＦＬ２	Distilled water flow rate sensor	ＭＶ６	Solenoid valve for cooling water	ＰＳ	Pressure switch
ＦＳ１	Float switch for heater control	ＭＶ７	Solenoid valve for distilled water sampling	RELAY1	Relay board
ＦＳ２	Float switch for biler water level control	ＭＶ８	Solenoid valve for pressure pulling out	RELAY2	Relay board
ＦＳ３	Float switch for over-heat control			ＳＳＲ１	Solid-state relay
ＦＳ４	Float switch for tank water level			ＳＳＲ２	Solid-state relay
ＦＳ５	Float switch for tank water level			Ｔ１	Terminal block
ＦＳ６	Float switch for tank water level			Ｔ２	Terminal block
ＦＳ７	Float switch for tank water level			Ｔ３	Terminal block
ＦＳ８	Float switch for tank water level			Ｔｆ１	Transformer
Ｈ１	Heater			Ｔｆ２	Transformer
Ｈ２	Heater			ＷＬ	Water leak detector
MOS RELAY	MOS board			Ｘ１	Relay

WG７１０



Symbol	Part Name	Symbol	Part Name	Symbol	Part Name
ＣＳＷ	Reset switch	ＭＶ１	Solenoid valve for boiler water supply	ＯＨ１～４	Sensor of heater
Ｅ１	Ion exchanged water quality monitor electrode	ＭＶ２	Solenoid valve for raw water supply	Ｐ	Pump
Ｅ２	Distilled water quality monitor electrode	ＭＶ３	Solenoid valve for initial distilled water drainage	PIO-５	Display board
ＥＬＢ	Leak breaker	ＭＶ４	Solenoid valve for boiler water drainage	PLANAR	Planar board
ＦＬ１	Ion exchanged water flow rate sensor	ＭＶ５	Solenoid valve for ion exchanged water sampling	ＰＳ	Pressure switch
ＦＬ２	Distilled water flow rate sensor	ＭＶ６	Solenoid valve for cooling water	RELAY1	Relay board
ＦＳ１	Float switch for heater control	ＭＶ７	Solenoid valve for distilled water sampling	RELAY2	Relay board
ＦＳ２	Float switch for biler water level control	ＭＶ８	Solenoid valve for pressure pulling out	SSR １~４	Solid-state relay
ＦＳ３	Float switch for over-heat control			Ｔ１～４	Terminal block
ＦＳ４	Float switch for tank water level			Ｔｆ１	Transformer
ＦＳ５	Float switch for tank water level			Ｔｆ２	Transformer
ＦＳ６	Float switch for tank water level			ＷＬ	Water leak detector
ＦＳ７	Float switch for tank water level			Ｘ１	Relay
ＦＳ８	Float switch for tank water level				
Ｈ１～４	Heater				
MOS RELAY	MOS board				

WG730



Symbol	Part Name	Symbol	Part Name	Symbol	Part Name
CSW	Reset switch	MV1	Solenoid valve for boiler water supply	OH1~3	Sensor of heater
E1	Ion exchanged water quality monitor electrode	MV2	Solenoid valve for raw water supply	P	Pump
E2	Distilled water quality monitor electrode	MV3	Solenoid valve for initial distilled water drainage	PIO-5	Display board
ELB	Leak breaker	MV4	Solenoid valve for boiler water drainage	PLANAR	Planar board
FL1	Ion exchanged water flow rate sensor	MV5	Solenoid valve for ion exchanged water sampling	PS	Pressure switch
FL2	Distilled water flow rate sensor	MV6	Solenoid valve for cooling water	RELAY1	Relay board
FS1	Float switch for heater control	MV7	Solenoid valve for distilled water sampling	RELAY2	Relay board
FS2	Float switch for biler water level control	MV8	Solenoid valve for pressure pulling out	SSR1	Solid-state relay
FS3	Float switch for over-heat control			SSR2	Solid-state relay
FS4	Float switch for tank water level			T1~4	Terminal block
FS5	Float switch for tank water level			Tf1	Transformer
FS6	Float switch for tank water level			Tf2	Transformer
FS7	Float switch for tank water level			WL	Water leak detector
FS8	Float switch for tank water level			X1	Relay
H1~3	Heater				
MOS RELAY	MOS board				