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CKD

HYCOOL

HYW6010・HYW6017・HYW6023

INSTRUCTION MANUAL

● Be sure to read this manual before installing and operating your HYCOOL.

● Keep this manual within the reach of an operator all the time.

CKD Corporation

05-12 17th EDITION SM-11498-A

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Safety instructions

This manual is intended for personnel who are familiar with basic knowledge about electricity, compressed air, fluid, piping, and refrigerant. CKD shall not be held responsible for troubles or accidents that result from installation, operation or repairs made by personnel who are not qualified or trained for the above subjects.
Improper handling may cause the machine not to be operated at its maximum performance level or lead to accidents or personal injury.
Always confirm the machine specification and operate the machine in the correct manner designated by CKD.
This machine is equipped with various safety and other protective devices.
However, improper handling of the machine may cause personal injury and/or damage to the machine.
Read this operation manual carefully and fully comprehend its contents before operation.
Read the contents of the following warning labels, as well as cautions stated in the operation manual, and follow the instructions contented therein.
Keep this operation manual near the machine where all concerned personnel have easy access to it.

Safety precautions

Safety precautions are classified into the following groups, WARNING and CAUTION.

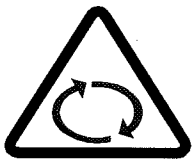
WARNING CAUTION

WARNING This denotes hazards which COULD result in severe personal injury or death, if not avoided.

CAUTION This denotes hazards which COULD result in minor personal injury and/or product or property damage, if not avoided.

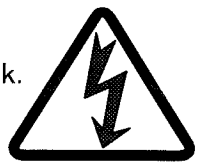
WARNING : Rotating device

★Fan may suddenly start rotating, causing personal injury.
Do not put your hand or foreign object in this part.
●Always shut-down the power before starting inspection.



WARNING : Electric shock hazard

★Power terminal block and switches are electrically live.
Do not touch any part. Doing so may cause an electric shock.
●Always shut-down the power before starting inspection.
Do not inspect the machine with wet hand.

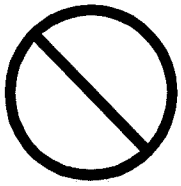


CAUTION : Hot surface

★Surface is hot during operation or immediately after the machine operation is stopped.
●Always shut-down the power and confirm that the surface is cooled before starting inspection.

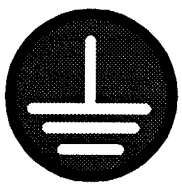
CAUTION : Falling hazard

★Do not step on the panel. Doing so may fall.
●Never step on the panel.



Ground connection

★To prevent any electric shock hazard, firmly connect the ground cable.



This machine is designed for industrial use. Always carefully handle the machine in the correct manner.

FORWARD

Thank you for purchasing our quality product, "HYCOOL".
For proper application of it, please read this manual well prior to start operating it.

Beware of causing unexpected trouble sometimes, otherwise, not only may fail to attain the capacity to its full extent.

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Table of Contents

1 Caution

1-1.Using fluid

HYCOOL is designed for Cooling the city water and anti freezing fluid, not to use another liqid.

1-2.Carreige

(1) As HYCOOL is heavy, be very careful not to be wounded during carriage.

(2) For carriage, use a forklift or hoist hooks.

When carrying a forklift

Pass the fork through the fork holes provided in the base of HYCOOL.

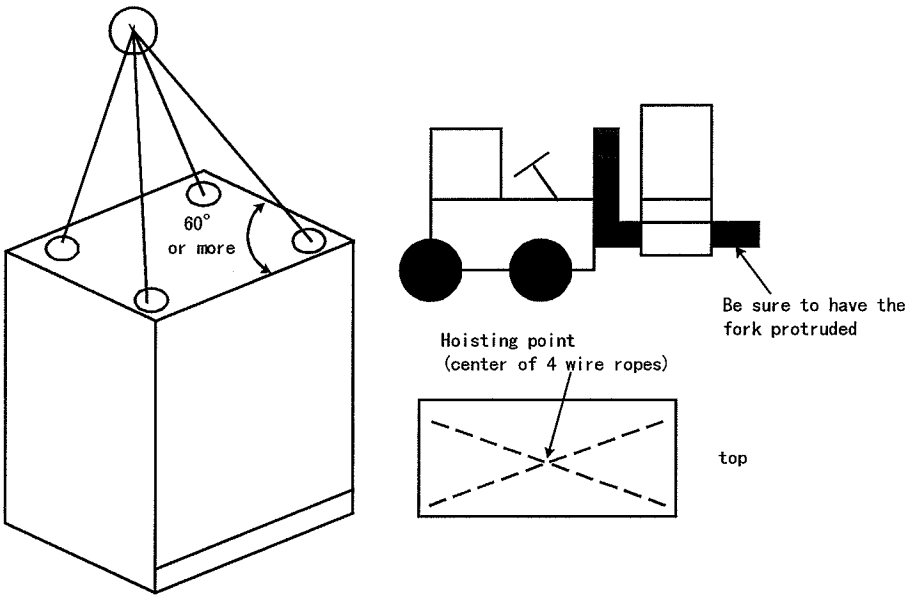
Be sure to have the fork ends protruded from the HYCOOL base.

When hoisting

Use wire ropes with a sufficient strength.

Be sure to hook wire ropes on four points, and set the hoist point to the center of these 4 hooks points.

Secure a hoisting angle of 60° or more as to all the 4 hooks points.



(3) Do not topple down HYCOOL or tilt HYCOOL over 30°. Never use HYCOOL in the toppled or tilted (over 30°) position.

(4) Before carriage, disconnect the wiring and piping from HYCOOL and drain out the water from the water tank.

(5) Do not step on HYCOOL or put anything on HYCOOL.

1-3.Installation

(1) Install the HYCOOL for good ventilation place.

(2) Install a place free from direct sun rays, waste heat from other equipment, and the influence of fire and heat.

(3) Range of ambient temperature is −5～43℃.

1-4.Cautions on operation

⚠ WARNING

- Make sure to wiring for earth.
  Do not touch equipment inside the enclosure, while power source is on.
  It is very dangerous for electrical shock.

⚠ CAUTION

- While in running, not to open the panel. There is rotating equipment and high temperature pipes.
- Do not restart frequently. (Control circuit protect the restart in 3 minutes.)
- Do not dry running for pump.
- Do not change set point of all equipment.
- Please check the airtightness of piping so that air bubbles do not mix in a water circuit. Especially, at the time of a test run, using pump independent operation, please do not operate a freezer until a circuit is full of water. Mixing of air bubbles may damage a heat exchanger.

2. Installation

2-1.Installation

(1) Install the machine in a place with good ventilation.

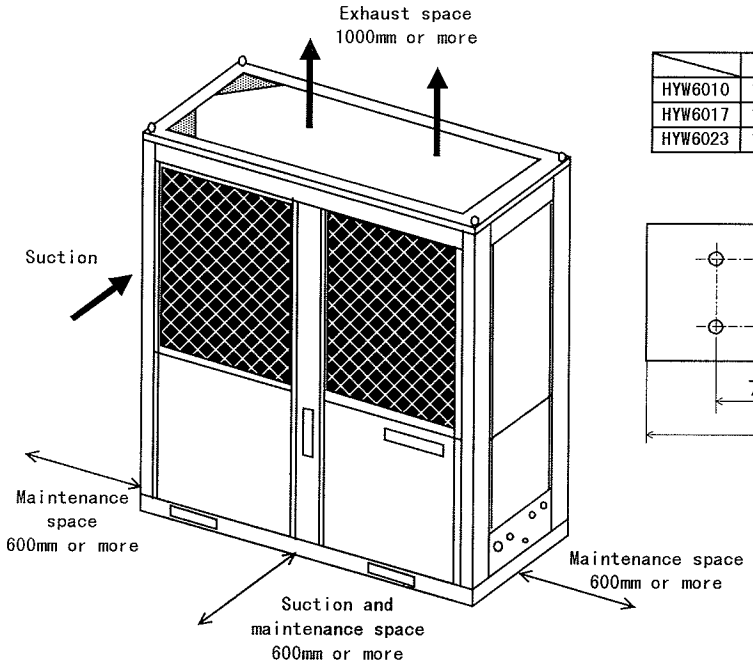
(2) Do not install the machine in a place where it is likely to by exposed to direct sunlight and where heat is likely to be generated.

(3) Do not use the machine in a place where corrosion gas exist.

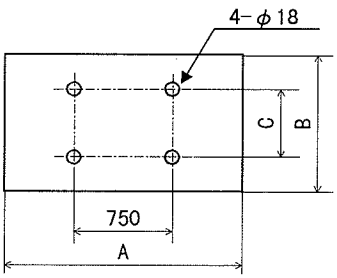
(4) Install the machine in a clean and dust free area.

(5) Select a solid and horizontal floor with least amount of vibration.
Solidify the groundwork of the installation place.
(Suitable installation level : FL + more than 100mm)
Fix the machine using anchor bolts to prevent its fall.

(6) Ensure that there is sufficient place around the machine for ease of maintenance and inspection.



	A	B	C
HYW6010	1500	700	660
HYW6017	1500	700	660
HYW6023	1800	900	850



(7) The operation ambient temperature range is −5 to 43°C. When the machine Install in indoor, waste heat and air discharged from the machine may raise the ambient temperature. Accordingly, if necessary, provide an intake dust (inlet) an exhaust dust (or ventilating fan) to discharge waste heat to the outdoor.
Make sure that these ventilators will not lower the capacity of the ventilating fan of the machine.

(8) Although the machine is useful in outdoor, do not install the machine in a place where it is likely to be exposed to rain, in order to use for a long period of time. Ensure that exhaust hot air from the machine is not sucked from cooling air suction again.

2-2.Wiring

(1) Be sure to provide an earth leakage breaker (Sensitivity : 100mA or less) and an over current device to the main power source.

(2) Be sure to wiring the earth.

(3) Power source : 3 phase 200V AC±10% 50/60Hz±1%.

(4) In connection to the power source, check the phase sequence and make sure of correct connection from right side wiring hole.

(5) In remote control, refer to the appended electric circuit diagram and make sure of correct connection.

2-3.Piping

(1) For piping, use pipes of stainless steel, copper, vinyl chloride or the like which are free from rust.

(2) Each piping shall withstand the working pressure. Each connection port shall be so treated as to prevent water leakage. If the length of the piping to the load is long(over 10m)or that part of piping includes many elbows, enlarge the pipe size.

- MAX. pressure at water inlet/outlet piping : 0.63 MPa

(3) Draw water from a city water service pipe, and set the pressure for water supply to approx. 0.1~0.2 MPa

(4) In order to prevent rusty water, it is advisable to supply water through a filter.

(5) For the over flow, drain and drain pan drain ports, do not use risers in the piping. Also arrange for the prevention on back pressure on the piping.

(6) Provide a stop valve which can withstand the maximum working pressure to each pipe.

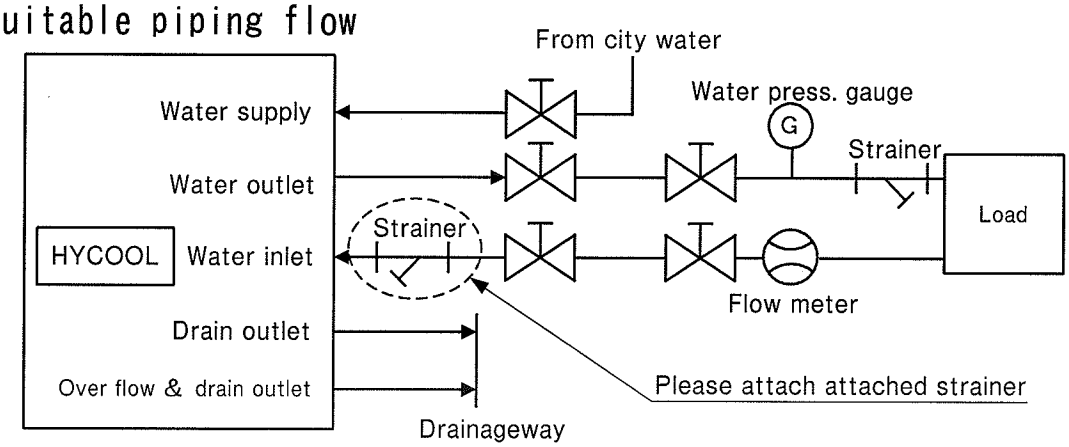
(7) The surface of the water inlet/outlet piping may have condensation depending on the ambient temperature and humidity condition. In order to prevent the falling of water drops due to condensation, keep the piping warm with an insulating material, if necessary.

(8) In order to avoid mixing of the garbage into piping etc., please install attached strainer in a water inlet.

⚠ CAUTION

If garbage mixes in HYCOOL, there is a possibility that apparatus, such as a heat exchanger, may be damaged.

Suitable piping flow



(9) Piping size

	HYW6010 HYW6017	HYW6023
Water inlet and outlet	Rc 1	Rc $1^{1}/_{4}$
Over flow, Drain	Rc $^{3}/_{4}$	
Water supply	Rc $^{1}/_{2}$	
Drain outlet	Rc $^{1}/_{2}$	

3. Operation

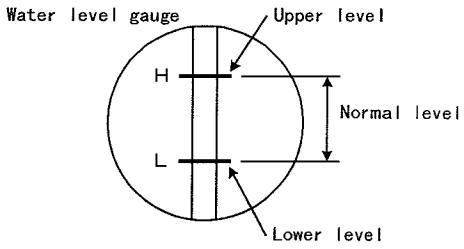
3-1.Water supply

(1)Water supply for water tank

〔In case of water supply from water supply port.〕

① Fully open the city water stop valve of the water supply port. Supply water to the water tank begins. The water is automatically supplied until the water level reaches the normal water level range.

② Check with the water level gauge to make sure that the water level is within the normal water level range.



〔In case of water supply directly.〕

① Remove a upper front panel from HYCOOL.

② Take the cover from water tank.

③ Supply water to the tank directly, until its level reaches the normal range.

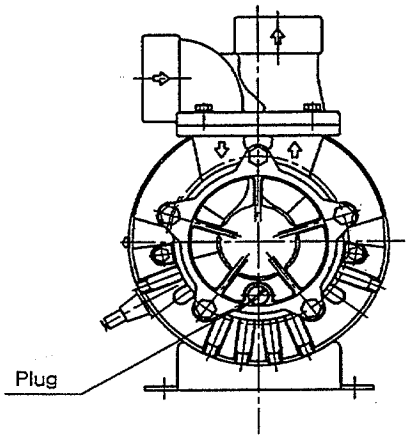
④ Put the cover on it.

⑤ Attach a upper front panel again.

【Caution】

Always bleed the sir using the following procedures after water has been supplied.

- Open the air bleeding cock on the suction side of the pump to bleed the air
- It water oozes from air bleeding cock, close it to complete the air bleeding work.



(2)Water supply to the machine

①Fully open all the stop valves disposed between HYCOOL and the load. Also check the water circuit at the load to make sure of the state ready for water supply.

②Remove the right-under front panel and right-under side panel.

③Turn ON the MAIN POWER switch.

【warning】 Never touch the charging part within the enclosure(otherwise you may get an electric shock).

④ Set the PUMP toggle switch to the ON side(it is located in side of control panel.) If the power source is in the negative phase, the water pressure will not rise. Check the water level gauge. If the power source is in the negative phase, turn off the MAIN POWER SWITCH, and exchange 2 power wires out of the 3 power wires.

⑤ Press. feed pump run and it begins to supply water.

1) If pipeline capacity for the load is too big, press. feed pump run and water level down often. Then, alarm lamp may be ON and machine stop.

2) At this case, turn off the toggle switch. Supply water again until its level reaches the normal level.
(Refer to (1) water supply for water tank.)

3) After confirming the normal water level, push stop button (it service as a reset switch) to remove alarm. Set the PUMP toggle switch to the ON side again.

4) Retry this item again (It may happen for many times caused by pipeline capacity.

⑥ Water supply to the load is complete.
Turn off toggle switch

WATER TANK CAPACITY	HYW6010、6017	70 ℓ
	HYW6023	85 ℓ

(3)Adjustment of flow rate

① Turn on pump toggle switch.

② As shown in suitable piping flow, adjust the flow rate and press. if flow meter is connected.

3-2.Test run

(1) Check the water level gauge, and if it is lower level, supply water.

(2) Turn on the power source and check the power lamp is ON.

3-3.Thermo-controller

1)Setting of thermo-controller

(Delivery setting)

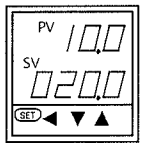
Setting value(SV)	20℃
Upper temperature limit	38℃
Lower temperature limit	2℃

(Setting of thermo-controller)

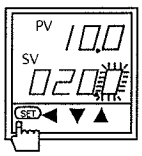
- Never change the parameters except for the setting value(SV), or otherwise trouble may be caused.
- Set the setting value(SV) within a range of 15-30℃.

(Setting procedure)

When changing the setting value(SV) from 20℃ to 25℃, provided that the actually measured value(PV) before setting is 10℃ initial state.

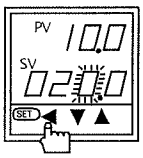


(1)Selection of setting value(SV) mode



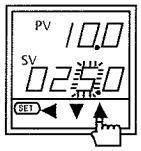
Press the [SET] mark of the set key to select the setting value(SV) mode. Upon the setting value(SV) mode is selected, the lowest digit lamp (right end) lights up. The setting of the digit for which the lamp is ON is ready for changed.

(2)Changing(shifting of lighted digit)



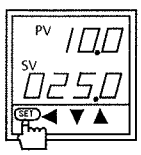
Press the [◀] mark of the setting digit shift key to shift the lighted digit to the first digit.

(3)Changing(increment/decrement of the setting value)



Press the [▲] mark of the setting value increment key to change the first digit to 5.

(4)Registration of setting value



When setting has been completed, press the [SET] mark of the set key. Then, all the digits of the setting value (SV) light up, and the mode returns to the setting value(SV) mode or the actually measured value(PV) display mode.

3-4.Starting

(1)Turn on circuit breaker in the enclosure.
(2)Close all panels expect front panel (right).
(3)Turn on source power.
(4)Push start switch on control panel. Turn on remote operation signal.
(5)Running lamp lit and HYCOOL run.
◆Press feed pump start to run.
◆When the setting value (SV) of the thermo-controller is smaller than the actually measured value (PV)(SV<PV), compressor starts immediately. When SV is larger than PV (SV>PV), however, compressor dose not start until SV<PV is achieved. When compressor starts, the fan motors may repeat start/stop.
◆Exhaust fun is turned on or off by means of the refrigerant pressure of the discharge side.
(6)Check to make sure that the actually measured value (PV) is stable near the setting value (SV)

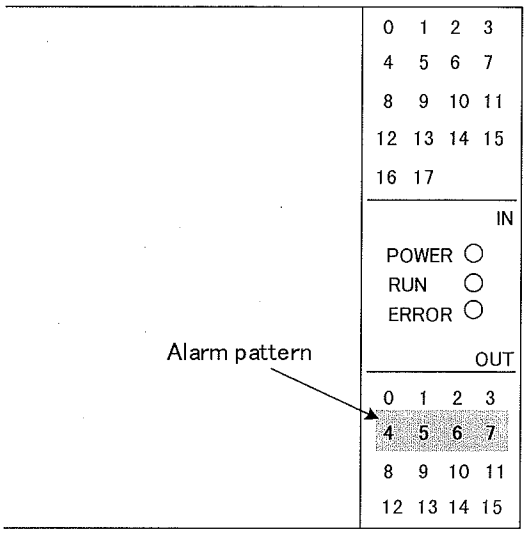
3-5.Stopping

Press the STOP switch.
HYCOOL dose not stop immediately. While the RUN lamp is flickering, the refrigerant circuit makes a pump down operation. Then, after about 30 seconds, HYCOOL comes to completely stop.
【CAUTION】 Do not turn OFF the MAIN POWER switch until HYCOOL stops completely

3-6.Cautions on operation

(1) Use HYCOOL within working range.
(2) Hold frequency of starting/shutting off within 6 times/hour, keep it running for at least 5 minutes before shutting it off and hold restarting it 3 minutes or large.
As HYCOOL is build in the forced shutting off circuit, it dose not restart for 3 minutes after stopping. However, press feed pump can be operated at this time.
(3) Never open the front panel.
(4) HYCOOL is designed for cooling the city water, not to use another liquid.
(5) Use the pump under Max. working pressure.
(6) Pressure fan sometimes repeats “Run and Stop” but this is normal.
(7) Do not touch the relief valve disposed for water pipe. But can be adjusted, when changing water pressure to load.
(8) Install HYCOOL in a place with good ventilation.
Do not place an object on the vent or close the vent.
(9) Turn on source power 6 hours before operation. Then turn on circuit breaker in the enclosure.

3-7.If the ALARM lamp lights up and HYCOOL makes an abnormal stop



◆If the safety devise of HYCOOL is activated and HYCOOL makes an abnormal stop, the ALARM lamp (red) will light up to alarm the trouble. As the PC(programmable controller)lamp within the enclosure tells the location of the trouble, remove the front panel and check the PC lamp (by referring to enclosure layout plan).

◆Troubleshooting table for cases where the ALARM lamp light up and HYCOOL makes an abnormal stop is given in the following pages. (The same table is pasted to the inside of the right front panel.)

How to reset the alarm : when the trouble is located, the cause of the trouble is removed and the trouble is reset, the ALARM lamp goes off.

The alarm can be reset by continuously pressing the STOP-RESET switch for at least 2 seconds.

Restarting after resetting the alarm :

◆When HYCOOL is operated by using the pendant switch, press the START switch again after the ALARM lamp goes off.

◆When HYCOOL is operated by remote control, input the START signal again after the ALARM lamp goes off the ERROR signal disappears.(Even if the REMOTE CONTROL signal is continuously inputted, if an error is caused, the START signal is reset once on the PC program.)

3-8.Anti freezing run

Do not cut of main power line. Keep the machine electrified. In the case of a drop of the water temp. The machine do the operation for preventing the drop of water.

When water temp. is 2℃, press. feed pump runs and heater is turned on.

When water temp. is 10℃, then pump stops and heater is turned off.

Discontinue

4. Inspection and maintenance items

4-1.Inspection items

Inspection point	Inspection item	Inspection frequency				Remarks
		Daily	Weekly	Monthly	Quarterly	
Water level gauge	Water level between L and H	○				If water level lowers suddenly, check for water leakage.
Water pressure gauge	Water pressure is less than 0.63MPa	○				In case of pressure rise or flow rate fall, check piping, strainer, etc. for clogging. If the strainer is clogged, clean the strainer. If the piping system is clogged, clean the water circuit.
Press. feed pump	Water leakage		○			Exchange sealing parts
	Abnormal noise				○	Exchange bearing
Condenser	Adherence of dust and dirt			○		If necessary, increase the inspection frequency according to the ambient atmosphere or the degree of adherence.
Fan	Adherence of dust			○		Clean the fan
	Abnormal noise				○	Exchange fan
Water in Water tank	Contamination and scale			○		If contamination is excessive, change water. If necessary, increase the inspection frequency according to the water quality.

4-2. Cleaning of condenser

Remove upper front panel.

Brush up long fur brush of blow by compressed air carefully

Clean the condenser regularly and keep cleaned condition.

Use neutral detergent for greasy dusts.

4-3.Exchange of water in water tank

(1) Cut off the source power.
(2) Remove the front panel (upper) and side panel (right-under).
(3) Open the drain valve.
(4) After all drain is flow out, clean the water tank carefully.
(5) Close drain valve and attach the panels.

4-4.Exchange parts of press. feed pump.

IWAYA ELECTRIC MFG. CO.,LTD.

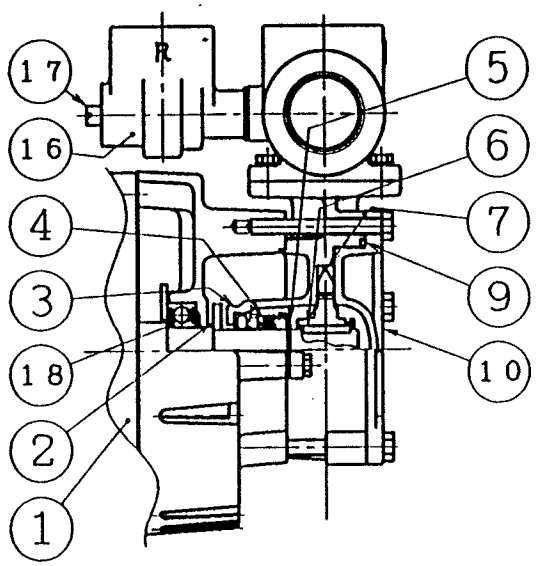
MAINTENANCE

Parts replacement of Pressure feed pump

NOTE: Always turn off the earth leakage breaker and the power source before inspection.

Structure

Sectional view



Parts number	Description	Quantity
1	Electric motor	1
2	Deflector	1
3	Casing	1
4	Mechanical seal	1
5	C-type shaft retaining ring	1
6	Key	1
7	Impeller	1
9	O ring	1
10	Casing cover	1
16	Relief valve	1
17	Pressure screw	1
18	Ball Bearing	2

Consumable items: Consumable items are products which are consumed or worn out with use from lubricating oils, packing, mechanical seals, etc.

(1) Replace the consumable items according to the following table.

Consumable goods	Mechanical seal	Ball bearing
Recommended replacement timing	When water leakage is detected	When noise level is high, or abnormal noise is detected. When grease leakage is detected.
Replacement cycle	Every year	Every second or third year

(2) When ordering spare parts, check the pump nameplate to specify the correct pump model and manufacturing number (No.) .

Please refer to the parts list to make sure the parts number and description of the necessary spare parts.

Disassembly/Assembly

1. Remove casing cover mounting bolt(s).
2. Extract the impeller from the main shaft.
3. Remove the key and locking pin from the main shaft.
4. Extract the rotary ring from the mechanical seal.
5. Remove main unit mounting bolt(s), and remove the casing from the motor. The mechanical seal fixing ring can be removed along with the main unit. Be sure not to damage the mechanical seal.
6. Re-assembly is the reverse of disassembly. Please follow the instructions below.
   (1) Clean the sliding surface of the mechanical seal with a dry cloth to prevent damage.
   (2) Turn the main shaft by hand to see if it moves smoothly and lightly.
   (3) Use a new O ring.
   (4) Replace the worn or damaged parts with new parts.
   (5) Tighten bolts gradually and symmetrically. The tighteness should be equal on both sides.
   (6) Insert a screwdriver into a vent hole of the motor bracket on the opposite side of the pump to check that the fan rotates lightly.
   (If the fan rotates abnormally, inspection must be carried out again.)
   Now, the assembly is complete.

4-5. Consumables and maintenance parts (Note: pcs/set is use quantity per 1 set of these devices.)

●Consumables

(The parts which will be exchanged if the state exhausting was checked periodically and it has exhausted.)

Inspect the following parts periodically, and exchange it based on Exchange judgment standard.

Parts name	pcs/set	Inspection frequency	Exchange judgment standard※
Mechanical seal (For pumps)	1	Every week	When there is a leak or 8,000 hours (2 years)
O ring (For pumps)	1	—	At the time of mechanical seal exchange
Fan control switch	1	—	8,000 hours (2 years)
Fuse	1	Each time	When it goes out
The element for Y type strainer	1	Every week	Water pressure is checked, and when high, it cleans at the time of a flux fall.. It exchanges, when it damages and - dirt does not come off.

※Be careful that it is not a guarantee value since the operation time (years) indicated changes with operating conditions (ambient temperature, installation environment, etc.). Years are a standard at the time of considering as 12 hours/day (Japan Electrical Manufacturer's Association (JEMA)) x 300 days of operating ratios.

※Those who have the knowledge and experience of piping, electricity, etc. need to perform exchange of parts.

(When there are not these knowledge and experiences, please ask our company or a special contractor.)

●Periodic maintenance parts (The main parts for which exchange is needed with a use situation)

Check the following parts periodically and exchange them based on standard exchange time.

Parts name		pcs/set	How to exchange	Standard exchange time※
Solenoid valve	YV1	1	B	15,000 hours (4 years)
Solenoid valve	YV2	1	B	15,000 hours (4 years)
Solenoid valve	YV3 *1	1 *1	B	15,000 hours (4 years)
Compressor	M1	1	B	20,000 hours (6 years)
Pressure feed pump	M4	1	A	20,000 hours (6 years) (Consumables are excluded.)
Pressure fan	M2, M3	2	A	20,000 hours (6 years)
Electromagnetic switch (For pumps)	KM3+F3 *2	1	A	20,000 hours (6 years)
Electromagnetic contactor (For compressors)	KM1+F1 *2	1	A	20,000 hours (6 years)
Electromagnetic contactor (For fan)	KM2+F2 *2	1	A	20,000 hours (6 years)
Programmable controller	PC	1	A	20,000 hours (6 years)
Temperature controller	ST1	1	A	20,000 hours (6 years)

※ Keep in mind that it is not a guarantee value since the operation time (years) indicated above changes with operating conditions (ambient temperature, installation environment, etc.). Years are a standard at the time of considering as 12 hours/day (Japan Electrical Manufacturers' Association (JEMA)) x 300 days of operating ratios. Moreover, since time for the rate of failure in the case where you use it above this time to increase is shown, although it is not necessary to necessarily exchange, this exchange time is exchanged when the case where there are abnormalities at the time of check, and preventive maintenance are performed

・How to exchange

A : Those who have the knowledge and experience of piping, electricity, etc. Need to perform exchange of parts.

(When there are not these knowledge and experiences, ask our company or a special contractor.)

B : Before part exchange, refrigerant recovery is required. Moreover, since technical knowledge is needed for exchange work, ask our company or a special contractor.

NOTE

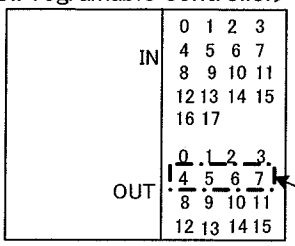
*1 HYW6010・・・It is two of valves YV1 and YV2.

*2 An electromagnetic switch is exchanged by the set, respectively.

Discontinue

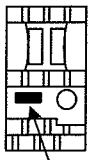
5. Trouble shooting and remedies

<PC:Programable controller>



These 4 lamp patterns tell the location of the trouble.

〈Electromagnetic switch〉



Reset swicth

No	Lighting pattern (●:ON, ○:OFF)	Contents of error	Remedy
①	4 5 6 7 ○ ○ ○ ●	Abnormal water level (too low water level)	☐ Supply water, and then press the START/STOP switch, and the error will be removed.
②	4 5 6 7 ○ ○ ● ○	Over current through press feed pump	☐ Press the RESET button of the thermal relay of the electromagnetic switch MC1, then press. the STOP-RESET switch, and the error will be removed. ○ Before restarting, check the following : ◆ Check the pump for locking or foreign substance. ◆ Check the pump for excessively high water feed pressure
③	4 5 6 7 ○ ● ○ ○	Too high water temperature	◆ Reduce load, and lower the ambient temperature. ◆ Adjust the water temperature setting value to a range of 15～30℃. ☐ After taking the above remedies, press. the STOP-RESET switch, and the error will be removed.
④	4 5 6 7 ● ○ ○ ○	Over current through compressor	☐ Press the RESET button of the thermal relay of the electromagnetic switch, then press the STOP-RESET switch, and the error will be removed. ○ Before restarting, check the following : ◆ Reduce load, and lower the ambient temperature.
⑤	4 5 6 7 ○ ○ ● ●	Too high compressor Temperature	
⑥	4 5 6 7 ○ ● ○ ●	Too high refrigerant pressure	◆ Reduce load, and lower the ambient temperature. ☐ After taking the above remedies, press. the START/STOP switch, and the error will be removed.
⑦	4 5 6 7 ● ○ ○ ●	Frozen cooling water in evaporator	☐ Press the STOP-RESET switch, and the error will be removed. Then, check the following . ◆ Check to make sure that the cooling water is being fed.
⑧	4 5 6 7 ○ ● ● ○	Over current through fan motor	☐ Press the RESET button of the thermal relay of the electromagnetic switch MC3, then press. the STOP-RESET switch, and the error will be removed. ◆ Check the fan for locking or an object which hits the fan impeding the fan rotation.
⑨	4 5 6 7 ● ○ ● ○	Water pressure is abnormal	☐ Press the STOP-RESET switch, and the error will be removed. Then, check the following. ◆ Check the external piping of HYCOOL for clogging. If valve, etc. Are closed, open then.
⑩	4 5 6 7 ● ● ○ ○	Too low water temperature	◆ Adjust the water temperature range 15～30℃. ☐ After taking the above remedies, press the STOP-RESET switch, and the error will be removed. If the error can not be released, drain and then replenish the tank. (When water in tank is drained, the "abnormal water level" error is caused. After supplying the specified volume of water, press the STOP/RESET switch to release the error.)
⑪	4 5 6 7 ● ● ○ ●	Ref. pump down error	☐ After taking the above remedies, press the STOP-RESET switch, and the error will be removed.
⑫	4 5 6 7 ● ● ● ○	Abnormal PC	☐ After taking the above remedies, press the STOP-RESET switch, and the error will be removed.

※1.In case of abnormal stop, wait at least 3 minutes, and the restart HYCOOL

※2.press the STOP-RESET switch continuously for at least 2 seconds.

Discontinue

Sympton		Cause	Remedy
POWER lamp dose not light up		·No power supply	·Turn ON MAIN POWER switch
		·Abnormal power voltage	·Adjust to the specified voltage
		·Blowing out of fuse	·Replace the fuse
		·Defect of lamp	·Replace the lamp
After turning START SWITCH on, HYCOOL dose not operate	RUN lamp dose not light up.	·Too short time from stop to restart	·Wait least 3 minutes after stop
		·Defect of start switch	·Replace the lamp
		·Defect of lamp	·Replace START switch
	ALARM lamp is lit	·Protective devises in function	·Refer to page 17. Remove the causes. Then push START SWITCH (Served as RESET SWITCH) in 2 sec. Or over.
Outlet water temperature is too high		·Too high setting value of thermo-controller	·Adjust the setting value
		·Overload ·Too high ambient temperature ·Too high outlet water temperature, and too high water feed rate	·Adjust to the specified range
		·Poor ventilation	·Improve the ventilation
		·Leakage of refrigerating gas	·Repair to prevent the leakage. Change gas.
Too low outlet water temperature		·Too low setting value of thermo-controller	·Adjust the setting value
HYCOOL stopped during operation, and all the lamps went off		·Failure of main power supply	·Turn ON the MAIN POWER switch. Wait for the resumption of power supply after power failure
		·Abnormal power voltage	·Adjust to the specified voltage
		·Blowing out of fuse	·Replace the fuse

Discontinue

Sympton	Cause	Remedy
Abnormal water level (Too low)	·Water leakage	·Repair to prevent water leakage
	·Closing of water supply valve	·Open the water supply valve
	·shortage of water supply pressure	·Adjust to the specified pressure
	·Cutoff of water supply	·Wait for the resumption of water supply
	·Defect of level switch	·Repair the level switch
Over current through press feed pump	·Over load Too high water feed pressure	·Adjust to the specified voltage
	·Abnormal power voltage	
	·Defect of press feed pump	·Repair the press feed pump
	·Mixing of foreign substance in press feed pump	·Remove foreign substance in pump
Too high cooling water temperature	·Overload ·Ambient temperature is too high ·Cooling water inlet temperature is too high and water feed rate is to high	·Adjust to the specified range
	·Clogging of dust filter	·Clean the dust filter
	·Poor ventilation	·Improve the ventilation
	·Abnormal power voltage	·Adjust to the specified voltage
	·Defect of solenoid valve	·Repair the solenoid valve
	·Too low setting of thermo-controller	·Adjust the setting value to within the applicable range
Over current through refrigerating compressor	·Overload ·Ambient temperature is too high ·Cooling water inlet temperature is too high and water feed rate is to high	·Adjust to the specified range
	·Clogging of dust filter	·Clean the dust filter
	·Poor ventilation	·Improve the ventilation
	·Abnormal power voltage	·Adjust to the specified voltage
	·Defect of refrigerating compressor	·Repair the refrigerating compressor
	·Defect of solenoid valve	·Repair the solenoid valve
Too high refrigerating compressor temperature	·Overload ·Ambient temperature is too high ·Cooling water inlet temperature is too high and water feed rate is to high	·Adjust to the specified range
	·Clogging of dust filter	·Clean the dust filter
	·Abnormal power voltage	·Adjust to the specified voltage
	·Defect of refrigerating compressor	·Repair the refrigerating compressor
	·Defect of solenoid valve	·Repair the solenoid valve
Too high refrigerant pressure	·Overload ·Ambient temperature is too high ·Cooling water inlet temperature is too high and water feed rate is to high	·Adjust to the specified range
	·Clogging of dust filter	·Clean the dust filter
	·Abnormal power voltage	·Adjust to the specified voltage
Too low evaporator temperature	·Defect of solenoid valve	·Replace the solenoid valve. If water is frozen, wait for defrosting
Over current through fan motor	·Abnormal power voltage	·Adjust to the specified voltage
	·Defect of motor fan	·Repair the motor fan
	·Foreign substance caught by fan motor rotation part	·Remove the foreign substance
Too low cooling water temperature	Too low setting of thermo-controller	·Adjust the setting value to within the applicable range
	Defect of solenoid valve	·Repair the solenoid valve

Discontinue

6. Other document

6-1.Specifications

Name of product			HYCOOL		
Items			HYW6010	HYW6017	HYW6023
Service range	Installation placed		Indoor		
	Range of ambient temp.		-5～43℃(Freezing not allowed)		
	Range of ambient humidity		40～80% RH		
	Electric power		3 phase 200V AC, 50/60Hz		
	Service media		Water		
	Max. Working Pressure		0.63 MPa		
	Range of outlet temp. control		15～30℃		
Capacity	Cooling capacity (*1)		9.7/10.1 kW	18.7/19.4 kW	25/25.6 kW
	Outlet water temp. Control		±1℃		
	Water flow rate (*2)		60/82 ℓ/min		82/108ℓ/min
Electric specific-ations	Electric consumption		6/8 kW	10/12 kW	13/15 kW
	Running current		21/23 A	31/37 A	43/47 A
	Control circuit		24VDC /200V AC		
	Remote control signal		Dry contact		
	Alarm signal		Dry contact		
	Protective devise	Electric power circuit	Fuse		
		Compressor	Over current relay		
		Feed pump	Over current relay		
		Feed pump	Over current relay		
		Refrigerant circuit	High pressure switch		
	display	Electric power	Orange		
		Running	Green		
		Alarm	Red		
Connecting ports	Water inlet		Rc 1		Rc $1^{1}/_{4}$
	Water outlet		Rc 1		Rc $1^{1}/_{4}$
	Water supply		Rc $^{1}/_{2}$		
	Over flow & Drain outlet		Rc $^{3}/_{4}$		
	Drain pan		Rc $^{1}/_{2}$		
Others	External dimensions	Width(mm)	1500		1800
		Depth(mm)	700		900
		Height(mm)	1990		1990
	Painting color (Munsell No.)		5GY 7.5/0.5		
	Mass of product		450 kg	500 kg	600 kg
	Water tank		70 ℓ		85 ℓ
	Refrigerant		R-22		

(*1) Cooling capacity is based on water outlet temperature at 20℃ and ambient temperature at 40 ℃

(*2) Water flow rate at water outlet pressure 0.4MPa

(*3) Use anti-freezing fluid, if water may freeze.

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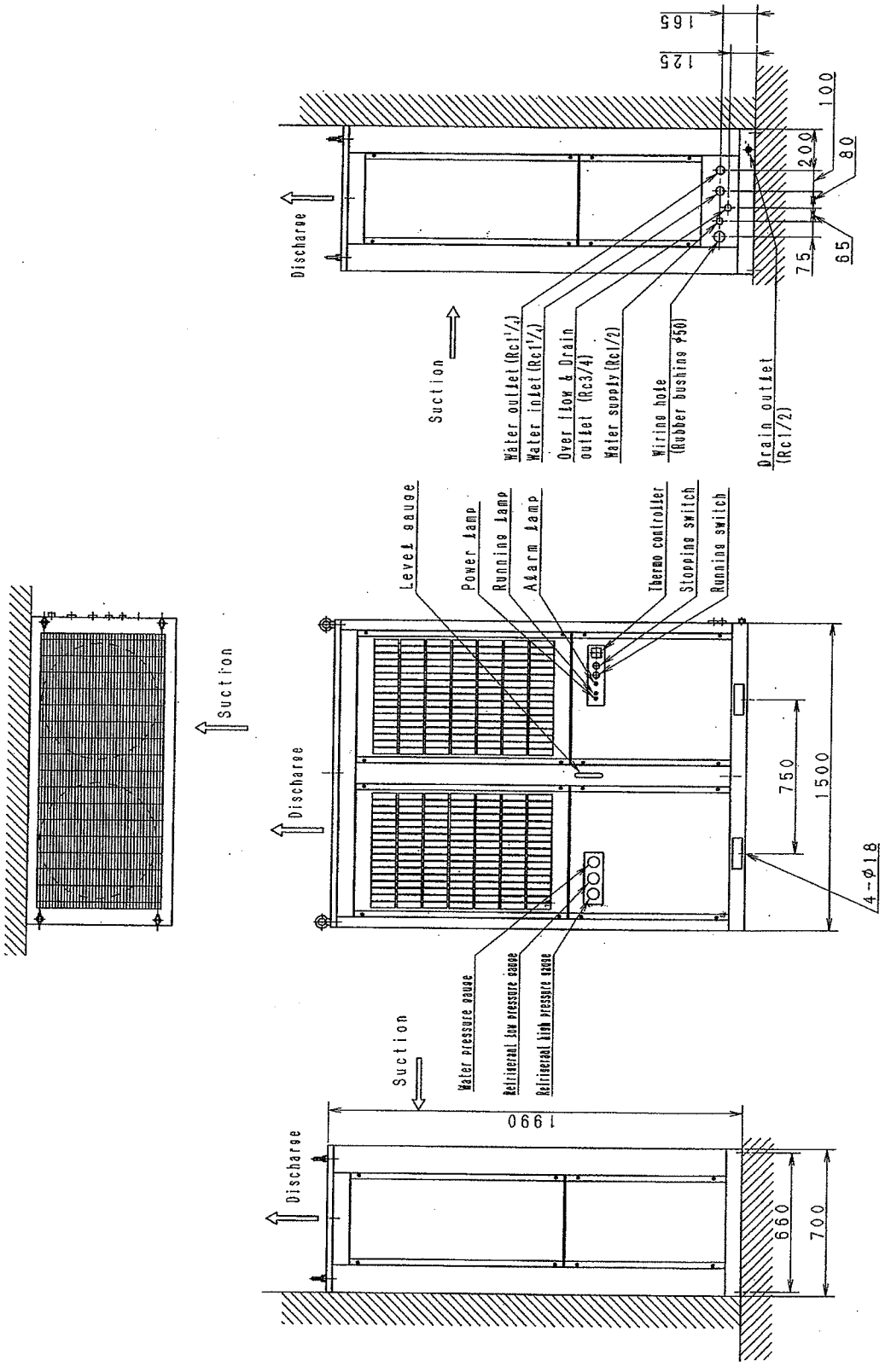
6-2.Outline drawing　HYW6010,　HYW6017



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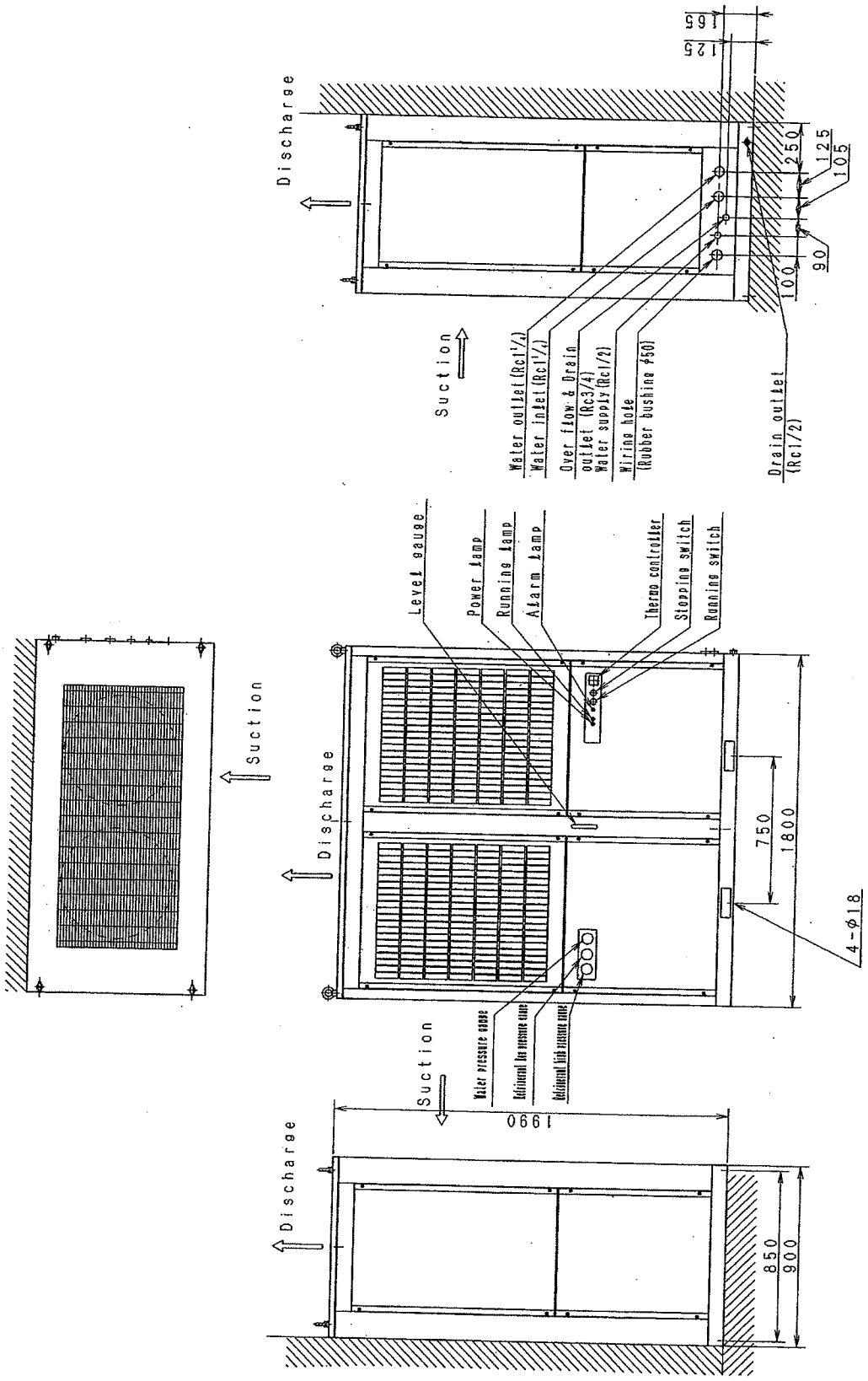
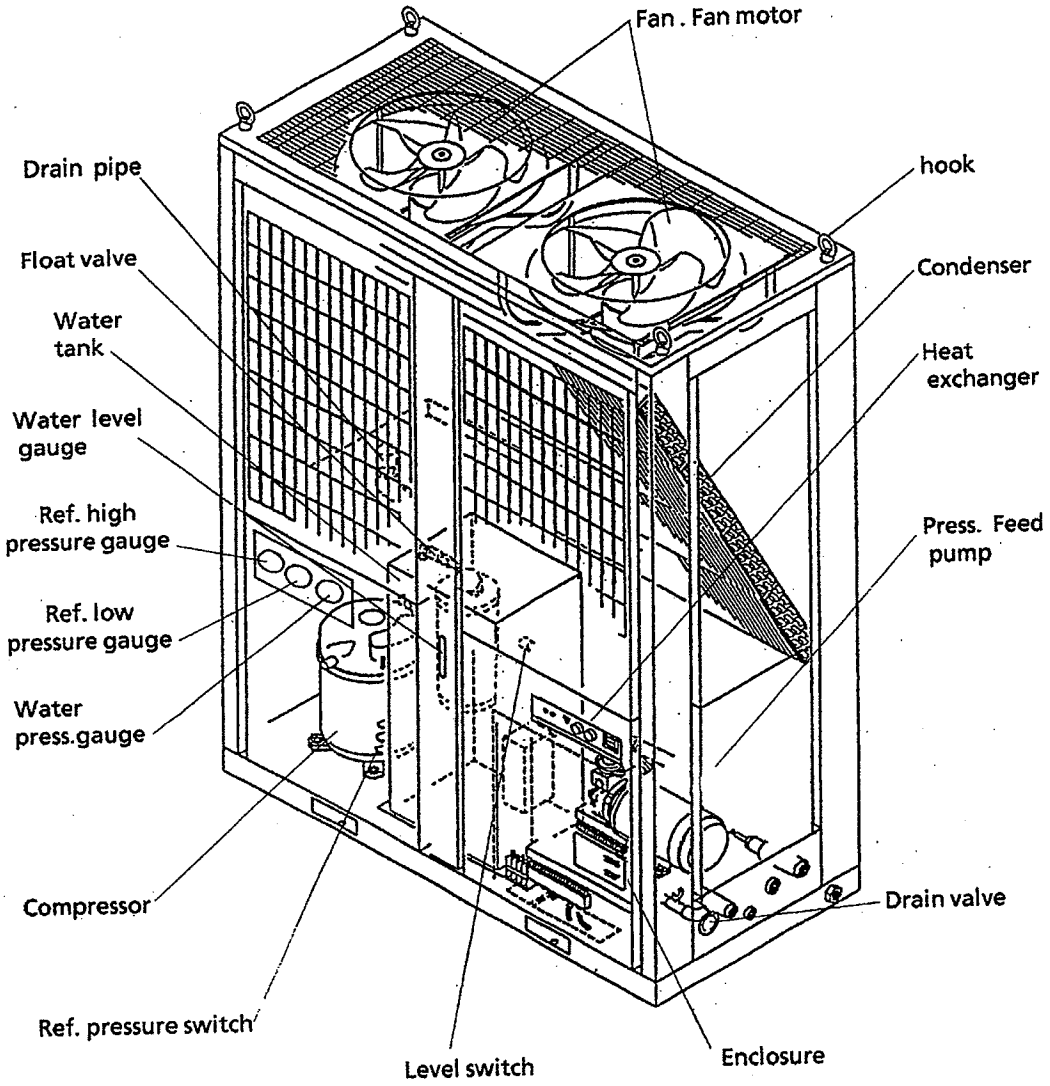
6-2.Outline drawing　HYW6023

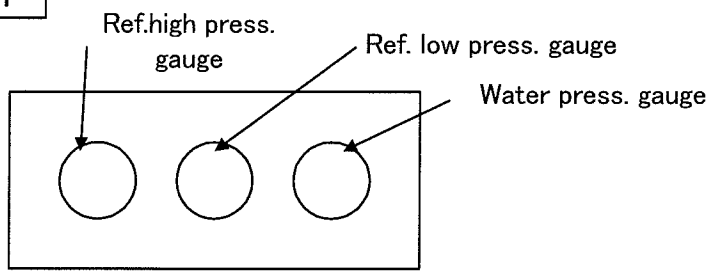


6-3.Inside structure drawing

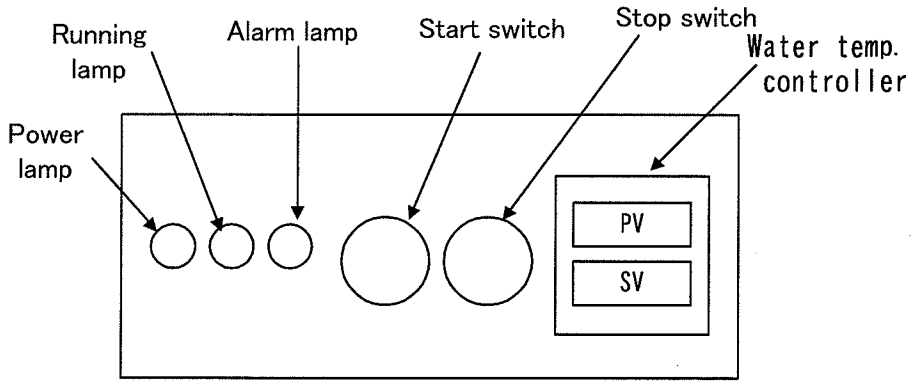


6-4.Control panel

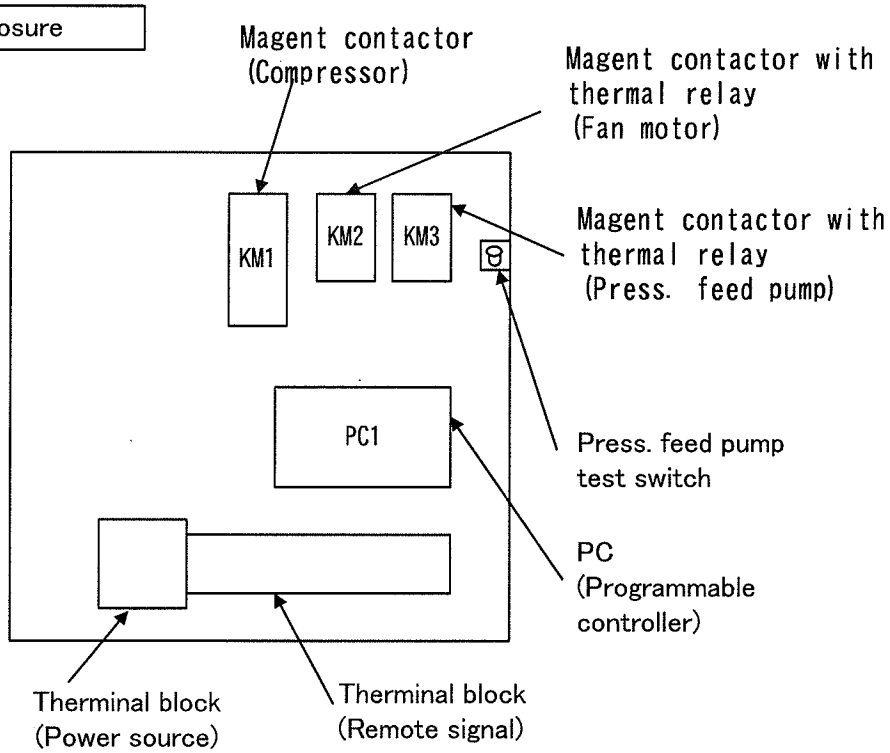
Operation



Control panel



Enclosure



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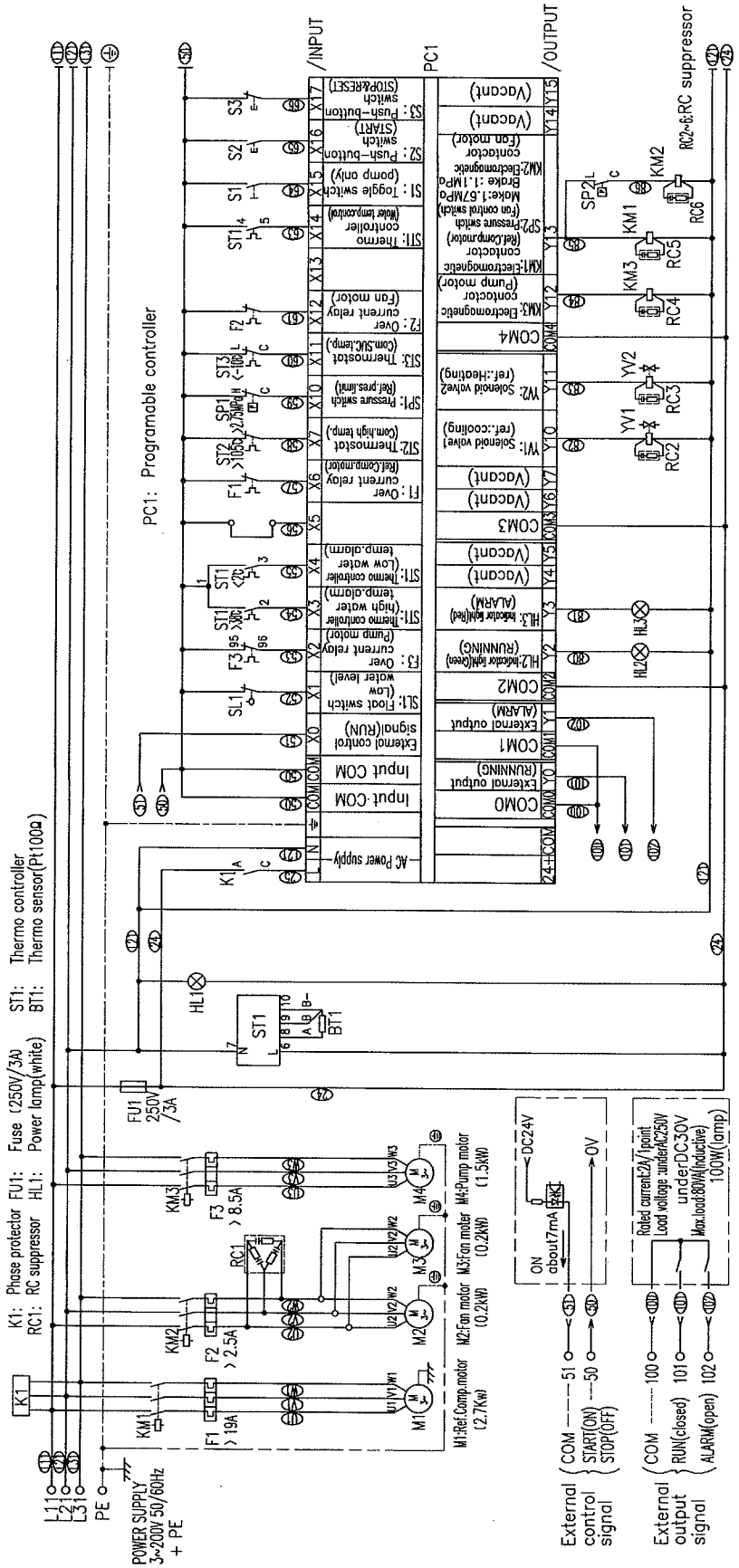
6-5.Electric circuit diagram HYW6010



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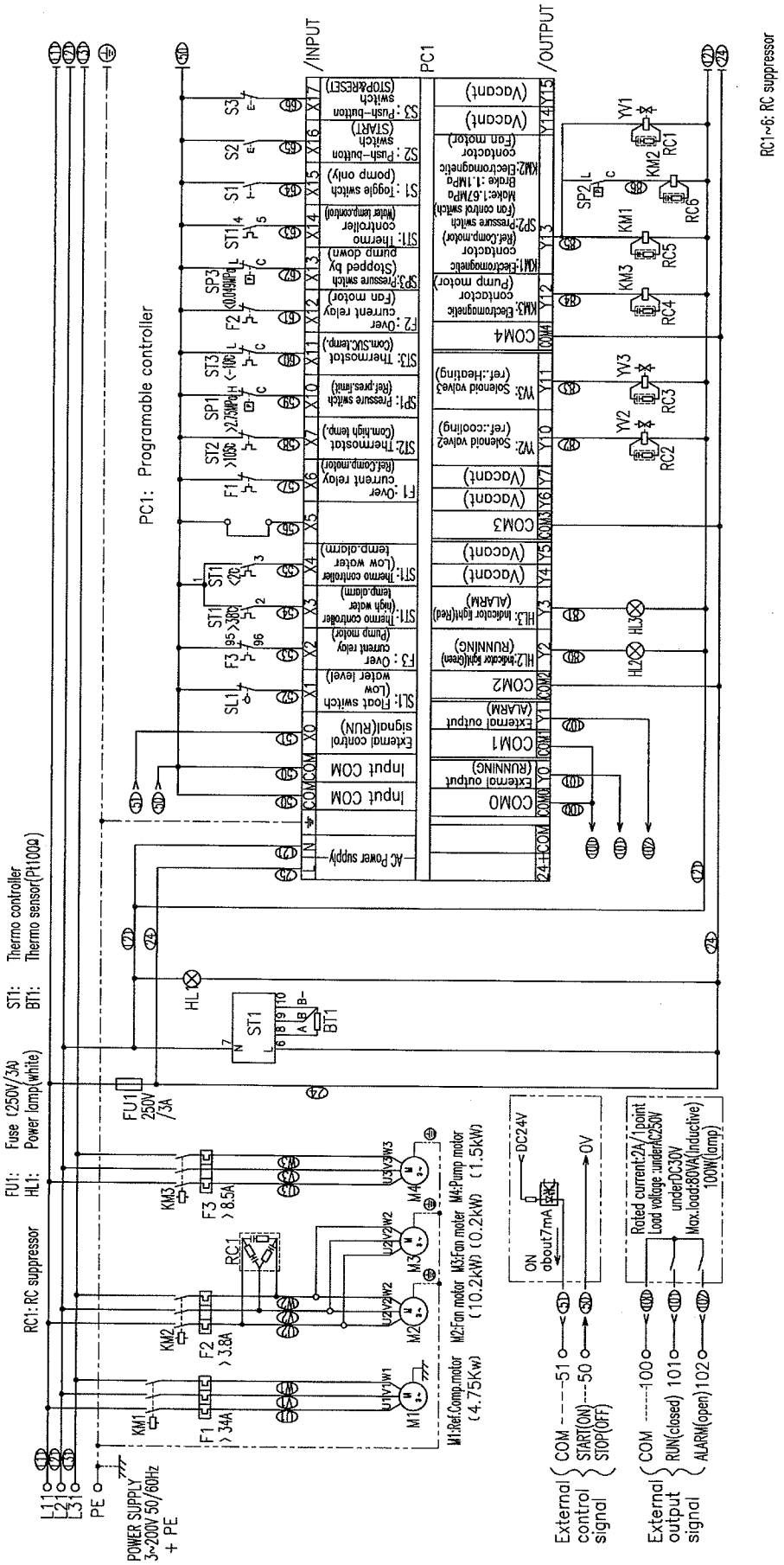
6-5.Electric circuit diagram HYW6017



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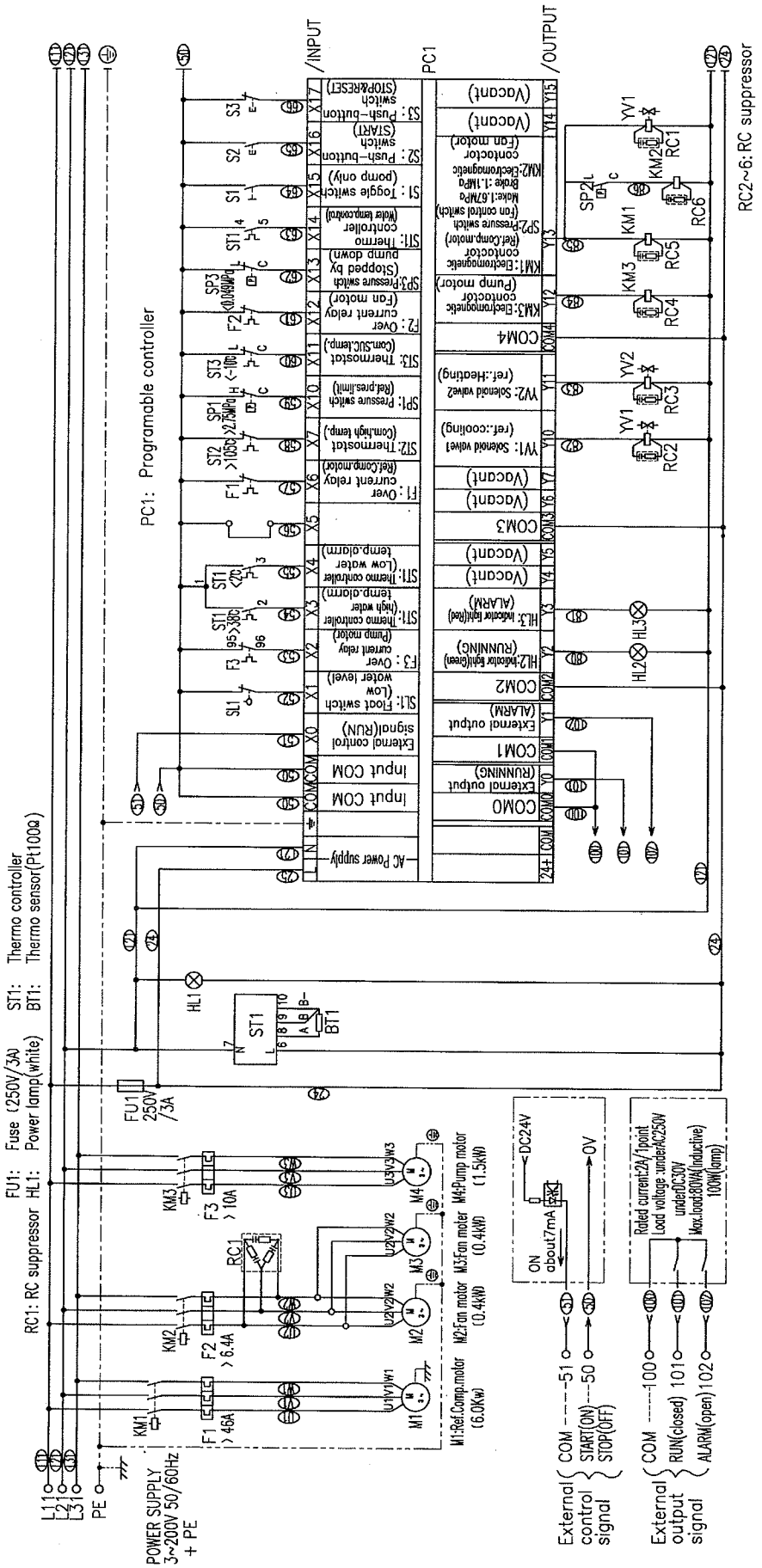
6-5.Electric circuit diagram HYW6023



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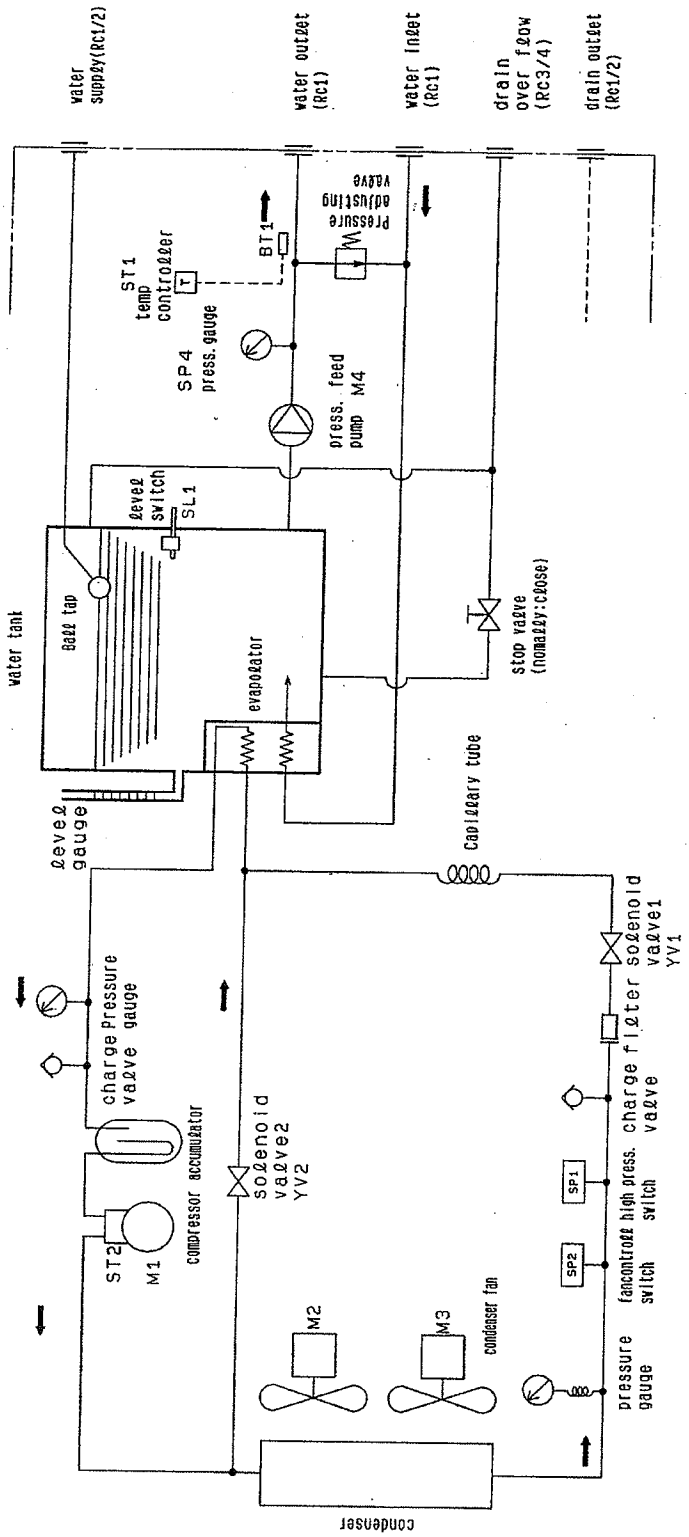
6-6.Flow chart HYW6010



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6-6.Flow chart　　HYW6017·HYW6023