CKD

SM－12946－A

INSTRUCTION MANUAL

HYCOOL

HYW2012C・HYW2023C・HYW2045C

- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

Nov-05 5th Edition
CKD Corporation

Discontinue

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.

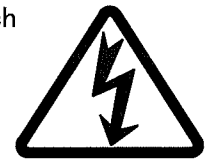
CAUTION This denotes hazards which COULD result in minor personal injury and/or product or property damage, if not avoided.

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.

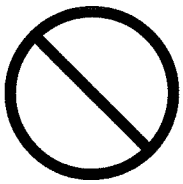


CAUTION : Hot surface

★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 your purchasing of "HYCOOL".

This manual describes the basic instructions necessary for operation of the HYCOOL to operate it at its maximum performance level. Prior to operation of the machine, read this manual carefully to fully understand its contents.

Keep this manual together with the guarantee card in a safe place.

The machine specifications and contents of the operation manual are subject to change without prior notice.

Discontinue

Table of Contents

1. CAUTION

1-1.Using fluid

HYCOOL is designed for cooling the city water, not to use another liguid.

1-2.Carriage

(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 HYCCOL base.

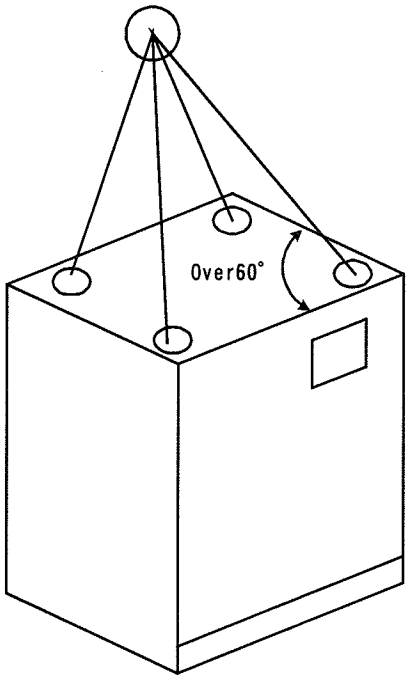
When hoisting

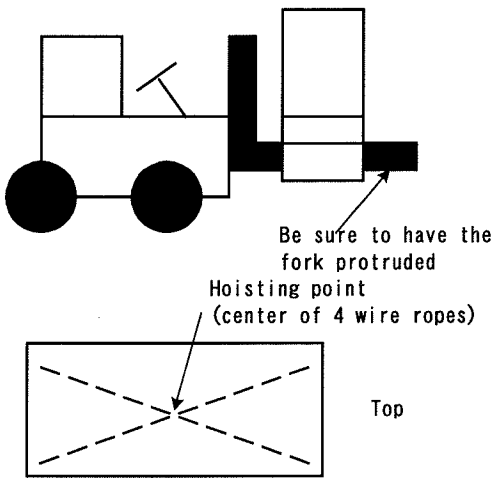
Use wire ropes with a sufficient strength.

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

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

(Hooks are optional parts.)





(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) Do not install the HYCOOL in a place where corrosion gas exists.
(3) Install a place free from direct sun rays, waste heat from other equipment, and the influence of fire and heat.
(4) Range of ambient temperature is 5～40℃.

1-4.Using

⚠ 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.
- Never try to touch electric components or wiring upon removing a panel while power is still kept ON.
  Never alter internal wiring of HYCOOL.

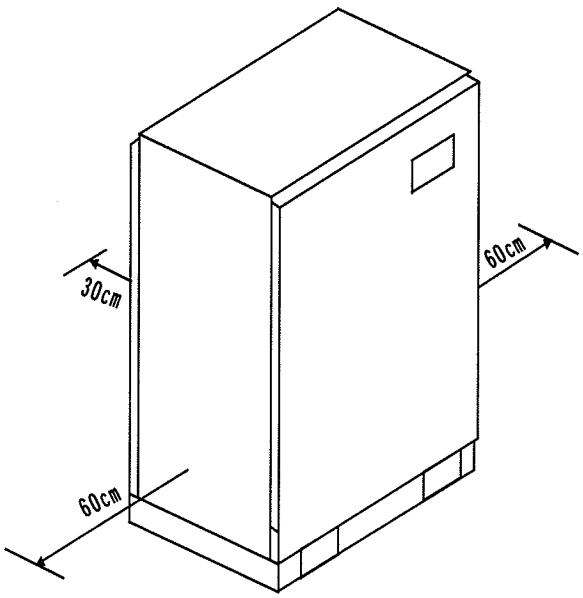
⚠ CAUTION

- While in running, not to open the panel. There are rotating equipment and high temperature pipes.
- Do not restart frequently.(Control circuit protect the restart in 3 minutes.)
- Do not dry running for pump.
- Check the air-tightness of the piping to prevent air bubbles from entering the water circuit.
- In particular, do not operate the refrigerating unit until the circuit is filled with the water by utilizing the individual operation of the pump during trial-run.
- If any air bubbles enter the water circuit, this may cause the heat exchanger to break.

2. INSTALLATION

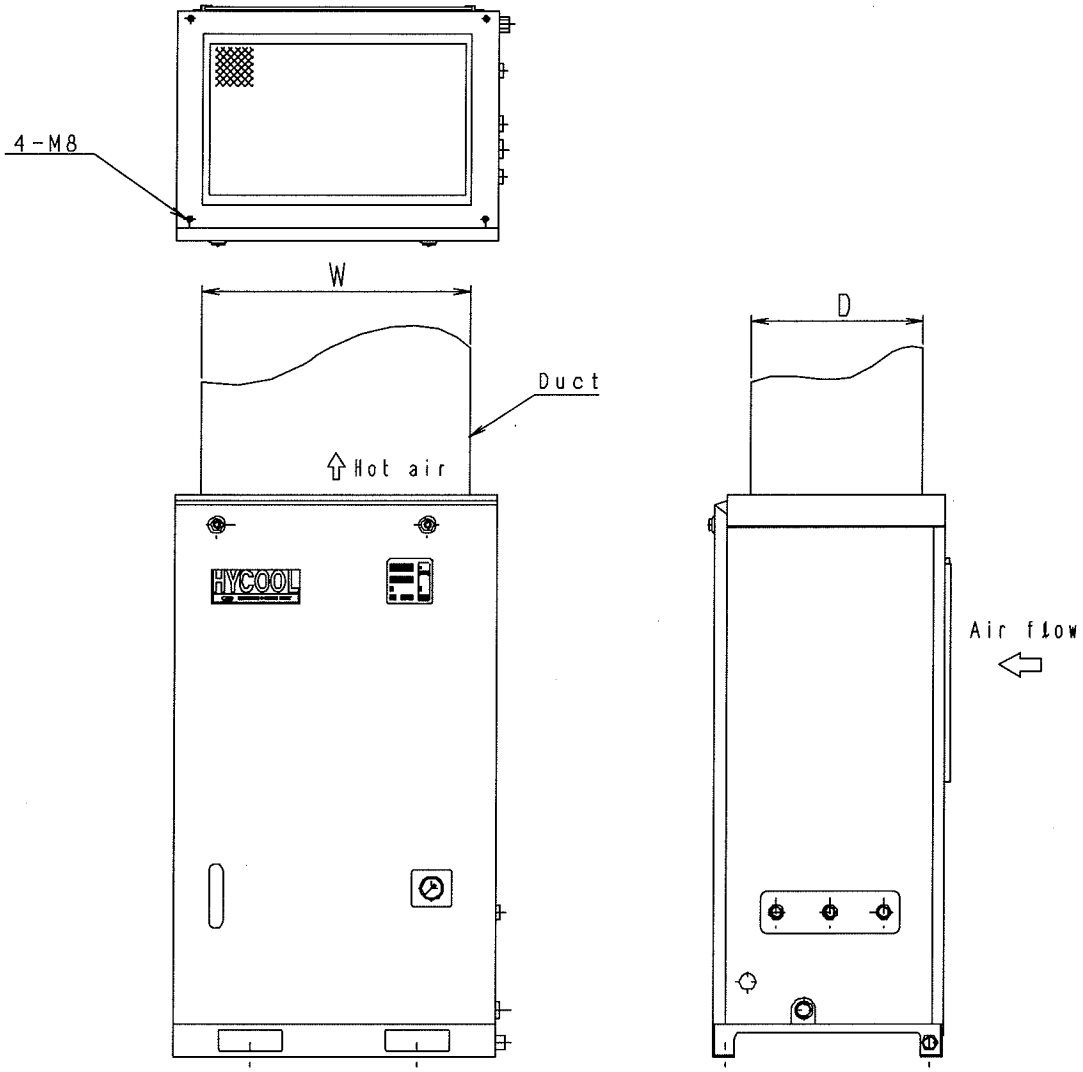
2-1.Installation

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



(7) The operation ambient temperature range for operation is 5 to 40℃. 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.

Installation procedure for duct



	HYW2012C	HYW2023C	HYW2045C
duct size W (mm)	450	500	550
duct size D (mm)	300	320	350
Exhaust heat quantity (kW)	2.2/2.7	3.9/4.4	6.4/7.5
Exhaust gas volume (m^3/min)	13.0/16.5	25.0/30.0	38.0/42.0

1. Top area of duct is over exhaust area. (Refer to above table)
2. Its maximum length is under 3m.
3. Do not restrict the duct section area on the way of it.
4. Bend of duct is minimum.
5. Use ducts of metal.
6. Use 4-M8 for installed on HYCOOL.
7. Make sure rain and wind is not sucked.

2-2.Wiring

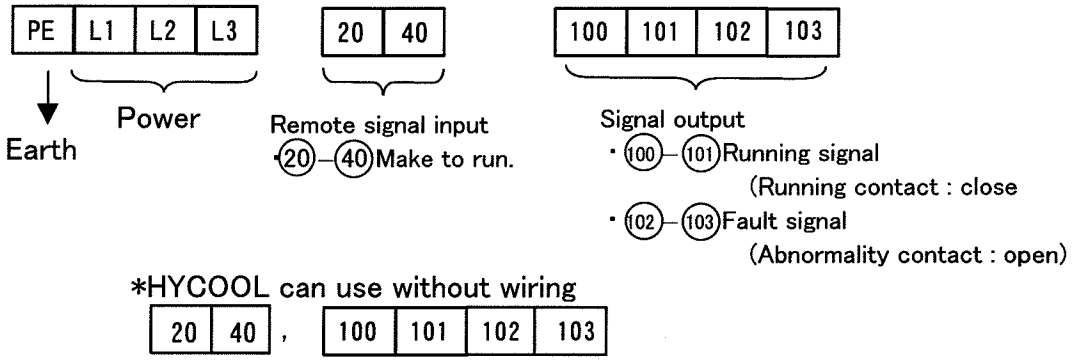
(1) Be sure to provide an earth leakage breaker(sensitivity:100mA or less) and an over current device to the main power source.

(2) Be sure to wiring the earth.

(3) Power source : Three phase 200V AC±10%, 50/60Hz±1%.
Three phase 220V AC±10%, 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.



(6) Suitable wires and breaking current are as follows.

	HYW2012C	HYW2023C	HYW2045C
Power source	Three phase 200V AC,50/60Hz Three phase 220V AC, 60Hz		
Power cord [mm^2]	Over 1.25		Over 2.0
Breaking current [A]	10		20

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 : 0.45 MPa

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

(4) For the overflow, drain and drain pan drain ports, do not use risers. Also arrange for the prevention of back pressure on the piping.

(5) Provide a stop valve which can withstand the maximum working pressure to each pipe. Also provide a pressure gauge to the water supply and inlet/outlet pipes.

(6) Also arrange the same piping at the load side, directing care not to make an error in water inlet/outlet directions.

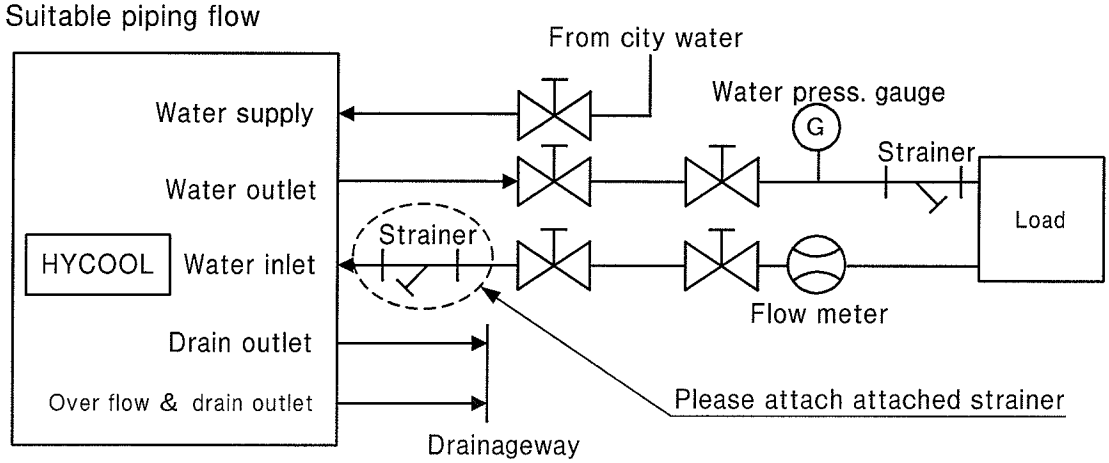
(7) The surface of the water inlet/outlet piping may have condensation depending on the ambient temperature and humidity condition. In order to prevent the falling of water drops due to condensation, keep the piping warm with an insulating material, if necessary.

(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



	HYW2012C	HYW2023C	HYW2045C
Water inlet	Rc $^{1}/_{2}$		Rc $^{3}/_{4}$
Water outlet	Rc $^{1}/_{2}$		Rc $^{3}/_{4}$
water supply	Rc $^{1}/_{2}$		
Over flow	Rc $^{3}/_{4}$		
Drain outlet	Rc $^{1}/_{2}$		

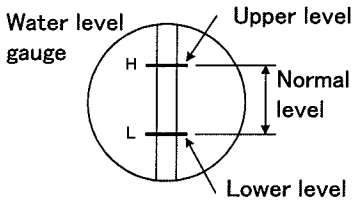
3. OPERATION

3-1.Water supply

(1)Water supply for water tank

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.

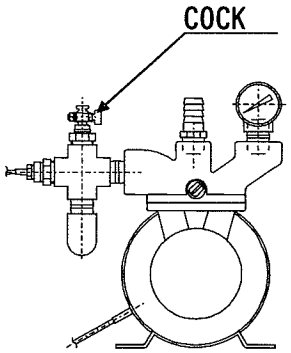
② Check with the water level gauge to make sure that the water level is within the normal water level range.



【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 close all the stop valves disposed between HYCOOL and the machine.

②Remove the front panel.

③Turn ON the MAIN POWER switch.

【WARNING】

Never touch the changing part within the enclosure.
(Otherwise you may get an electric shock.)

④ If the alarm lamp is ON while the water level is within the normal water level range, diagnose the trouble by referring to 『5.TROUBLESHOOTING FOR OTHER TROUBLES』.

⑤ Turn ON the PUMP INDIVIDUAL OPERATION switch (toggle switch on the left side panel of the electric box).

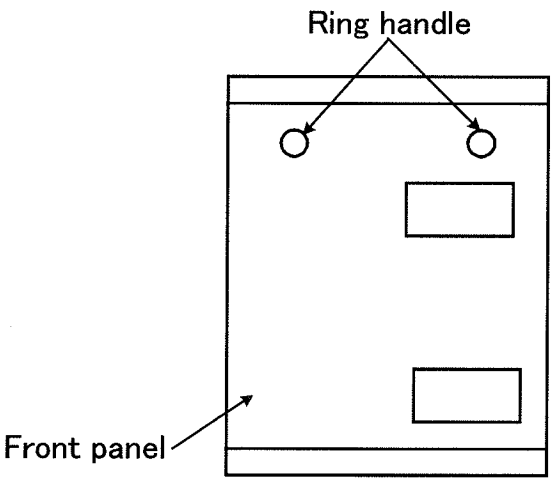
⑥ The operation of the press feed pump is then started to supply the water to the load side.

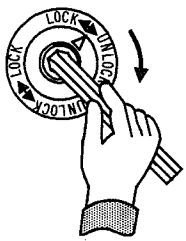
1) If the capacity of the pipe on the load side is large, the water in the water tank decreases and alarm code A18 may be shown due to water level drop. This may cause the operation of the press feed pump to stop.
2) If the pump operation is stopped due to water level drop, turn OFF the PUMP INDIVIDUAL OPERATION switch and supply the water until the water level reaches the correct level.
(Refer to previous section (1), Supplying water to water tank.)
3) After checking that the water level becomes correct, press the RESET switch to reset the alarm. After that, turn ON the PUMP INDIVIDUAL OPERATION switch.
4) Alarm code A18 may disappear. If this alarm code appears again, repeat above steps 1) to 3) to supply the water to the correct level.

⑦ When the water level reaches the correct level and the water supply is completed, turn OFF the PUMP INDIVIDUAL OPERATION switch.
⑧ Mount the front panel.
Actual capacity of water tank: HYW2012C 10 ℓ
HYW2023C 10 ℓ
HYW2045C 20 ℓ

3-2.Test run

(1)Remove the front panel.
(2)Check with the water level gauge to make sure that the water level is within normal water level range. Supply water to the tank directly, until its level reaches the normal range.
(3)Turn on the power source and circuit breaker.
After turning on the power, make sure that lamps of thermo-controller is lit.
(4)Check of flow rate.
①Turn on feed pump running switch.
②As shown in suitable piping flow, if flow meter is established to pipe line, check flow rate and pressure. Do not over pressure 0.45MPa. The feed pump may be defective.
③If there is not flow meter in pipe line, check the flow rate by water flow head chart.





In order to open the front panel, insert nominated size 5 or 3/16 hexagonal bar spanner into hexagonal hole in the center, and turn the spanner clockwise until triangle mark moved to 「UNLOCK」 from 「LOCK」.
When closing it, turn the spanner reversely to 「LOCK」 position.

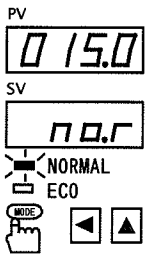
3-3.Setting procedure

How to change running mode

《Setting procedure》

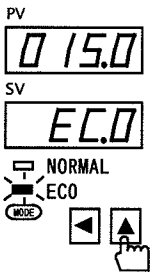
When changing from "Normal mode" to "ECO mode".
(ECO means Conservation of energy.)

①Change status to "mode selecting"



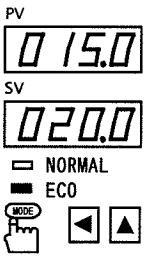
Push MODE key for over 2 seconds, become "mode changing" status.
SV display "nor" (means Normal mode) and NORMAL lamp start flashing.

②Change running mode



Push ▲ key, then change running mode.
SV display ECO (means ECO mode) and ECO lamp start flashing.
("nor" and "ECO" displays alternative, when push the ◀ key.)

③Fix running mode



Fix running mode, after selecting running mode.
Running mode is fixed by pushing MODE key.
Flashing lamp change to lighting.
Display returns to "PV/SV display mode".
【Caution】No-operation continued for over 1 minutes, become automatically PV/SV display mode. Then setting value is not updated.

Setting procedure

●Turn on power source

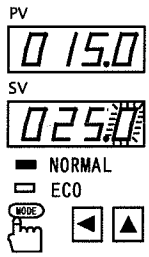
●Set temp. Adjuster

(Set value from factory) set value (SV)　15℃

〈Setting procedure〉 Constant temp. control

When changing the setting value(SV) from 25℃ to 20℃.

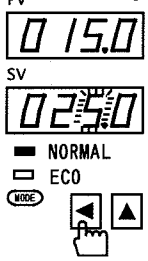
①Call for setting mode



Press MODE mark for one second, then into The setting mode. Set value (SV) on display lights with its lowest digit (on the right end) flicker. Flicking digit is changeable.

②Change value

(Make other digits flicking)



Press ◀ mark so that the first digit may be flicking.

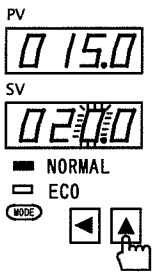
Press ▲ mark to get "5" on the flicking digit.

(▲ mark increase digit 1 by press once.

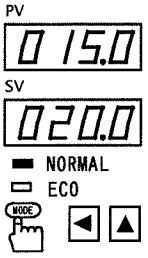
Pressing ▲ mark, when digit display "9",

Make to "0".)

③Change value(Change numbers)



④Input the set value into memory



After setting value, press MODE mark, then set value into memory.

Set value (SV) are back in the normal display mode.

NOTE : Without key operation for 1 minute, set Value are not into memory. And displays are back in the normal display mode, automatically.

3-4.Starting

(1) Close all panels.
(2) Turn the power ON.
(3) Press RUN mark or turn the operation signal input switch ON.
(4) Running lamp lit and HYCOOL run.
- Feed pump start to run.
- When the setting value (SV) of the 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 through ref. condensing temperature.

(5) Check to make sure that the actually measured value (PV) is stable near the setting value (SV) (with a deflection of approx.±1℃.)

【CAUTION】 Never open the front panel during operation

3-5.Stopping

(1)Press STOP mark or turn the operation signal input switch OFF.
(2)Turn the power OFF.

【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.
(3) Never open the front panel during operation.
(4) HYCOOL is designed for cooling the city water, not to use another liguid.
(5) Use the pump under Max. working pressure.
(6) Pressure fan sometimes repeats “Run and Stop” but this is normal.
(7) Install HYCOOL in a place with good ventilation.
Do not place an object on the vent or close the vent.

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

① Abnormal stop

If the safety devise of HYCOOL is activated and HYCOOL makes an abnormal stop, the ALARM lamp will light up to alarm the trouble.

② How to reset the alarm

When the trouble is located, the cause of the trouble is removed and it is reset, the ALARM lamp goes off.

Refer to the countermeasures to malfunction on page 14 for resetting the stop status and removing cause of the stop.

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.

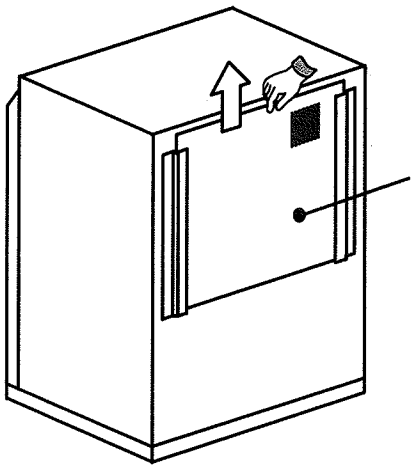
When watertemp. is 10℃, then pump stops and heater is turned off.

4. INSPECTION AND MAINTENANCE ITEMS

4-1.Inspection items

Inspection point	Inspection item	Inspection frequency				Remarks
		Daily	Weekly	Monthly	Quarterly~ halfly year	
Water level gauge	Water level between L and H	○				
Water pressure gauge	Water feed pressure is 0.45MPa or less.	○				In case of press. rise or feed 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.
Dust filter	Adherence of dust and dirt		○	○		If necessary, increase the inspection frequency according to the ambient atmosphere or the degree of adherence.
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 dust filter



- Move up the dust filter mounted on the rear of the product to remove it.
- To keep clean the dust filter, check soiled condition of dust filters and blow the soil out with air gun or with long hair brush (Metallic is not available.)
- Wash dust filters with neutral detergent, when oil soil is attached to them.
- Cooling capacity of the HYCOOL may decrease due to poor ventilation.
  When dust is attached.(OVER LOAD lamp is lit)
  In the worst case, an emergency stop may be occurred by actuated safety devices.

4-3.Exchange of water in water tank

(1) Turn OFF the main power and earth leakage circuit breaker.
(2) Remove the front panel.
(3) Close the stop valve of water supply.
(3) Open the drain valve.
(4) Discharge the water from the inside of the water tank.
(5) After the water has been discharged completely, close the drain valve and supply the water.

4-4.Cleaning the water tank

(1)cleaning the water tank (Cleaning with water)

If the water tank becomes dirty, wash the interior and replace the water.
Cleaning should be carried out once three months.

《Cleaning method》

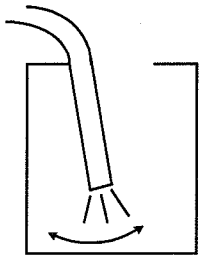
①Turn the operating switch to the OFF position and then disconnect the power source and the short circuit breaker.

②Remove the front panel.

③Open the waste water valve and let the water run out.

④Remove the lid from the water tank.

⑤Rinse the inside of the tank with water from a hose.



【note】

- Use only clean water.
- Be careful not to get the outside of the tank wet.
- Leave the drain valve open while you rinse out the tank.
- While cleaning, wear rubber gloves to protect your hands.
- Be careful no to put your hand accidentally into the tank.

⑥When the waste water has become clean, shut off the hose and close the waste water valve.

⑦Water supply to tank

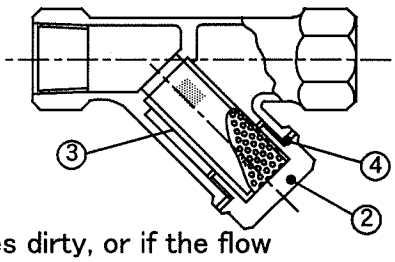
Connect the breaker and the power source.
Begin operating the water supply according to the instruction manual 『3-4.Operation』.

【note】 Be sure to attach the front panel after reconnecting the water supply.

⑧If a Y-strainer is attached, take the Y-strainer apart and clean it.

《Cleaning methods》

Disassembling & A assembling procedures.
Remove the strainer ③ by loosening the cap ②.
Clean the strainer with water and remove foreign matter, dust, etc. attached to the strainer.
Mount the strainer with the packing ④ being fitted in and tighten them.



⑨Then cleaning for water tank is finished

- If after cleaning the water tank the water still becomes dirty, or if the flow of the water seems blocked or insufficient, it probably means the pipes are dirty, so please use a cleanser.
- Cleaning the pipes with a cleanser should be done by someone with sufficient knowledge of cleansers.

(2)Cleaning the water tank pipes (Cleaning with cleansers)

・If after cleaning the water tank the water still becomes dirty, or if the flow of the water seems blocked or insufficient, it probably means the pipe are dirty, so please use a cleanser.

・Pipes should be cleaned once a year.
(Cleaning the pipes with a cleanser should be done by someone with sufficient knowledge of cleanser)

《Cleaning method》

① Turn off START/STOP switch to stop the operation machine.

② Remove the front panel. Then add the cleaning agent in water tank. When water flowing out from the tank, drain a small quantity of water from drain valve.
The amount of cleaning agent (standard) 1～2 ℓ

③ Put the cover on water tank and attach the front panel. Then operate the machine for approx. 30 minutes.

④ After drained the whole quantity of water, wash the strainer.

⑤ Repeat the operations as mentioned ②,③,④, two to three times. The cleaning is finished, when no foreign substances exist in the strainer.

⑥ Supply only water to the water tank. Then operate the machine for 5 minutes. (Washing with water)

⑦ After drained the whole quantity of water, wash the strainer.

⑧ Repeat the operations as mentioned ⑥,⑦ three to four times.

Cleaning agent

1) MITSUBISHI GAS CHEMICAL COMPANY INC.	Slime eliminate 「DESLIME」
2) KURITA WATER INDUSTRY LTD.	Slime eliminate 「KURICHEMICAL-A」

○ Remark

① Before operating the machine, be sure that all panels is attached to it. Furthermore, do not remove the all panels while in operation.

②Hand the cleaning agent in accordance with instruction manual published by cleaning agent manufacturers.

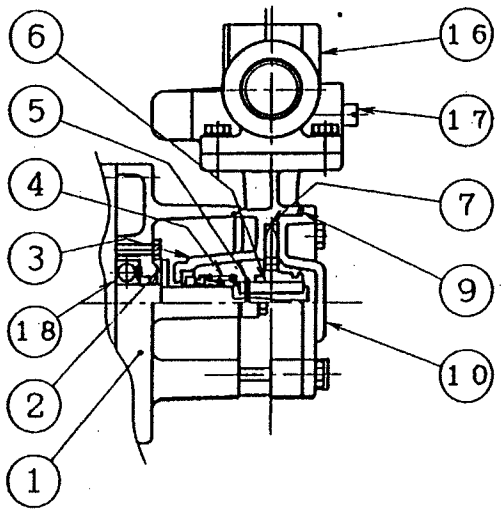
4-5.Exchange parts of press. feed pump

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	Locking pin	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.

4-6. 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※
Dust filter	1	Every week	When it damages and – dirt does not come off
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
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)
Compressor	M1	1	B	20,000 hours (6 years)
Pressure feed pump	M2	1	A	20,000 hours (6 years) (Consumables are excluded.)
Pressure fan	M3	1	A	20,000 hours (6 years)
Electromagnetic switch (For pumps)	KM2+FR2	1	A	20,000 hours (6 years)
Electromagnetic switch (For compressors)	KM1(+FR1) *1	1	A	20,000 hours (6 years)
DC power supply	GS1	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 In case of HYW2012C — There is only KM1. Exchange KM1 only.
In case of HYW2023C・HYW2045C — There is KM1 and FR1. Exchange 1set of KM1+FR1.

5. Troubleshooting

5-1.Locating of faulty part and corrective actions

The following summarizes typical troubles and corrective actions to be taken.
Since some troubles can be solved by the customer, take appropriate actions while referring to the table below.

This product shows relevant alarm code on the SV display of the operation unit.
After the cause of the trouble has been removed while referring to the following table, reset the alarm.

Alarm code	Trouble	Cause	Corrective action
A 0 1	RT1 : Water temperature measuring sensor error	·Wiring is faulty. ·Sensor is faulty.	·Check the wiring. ·Replace the sensor. ·Contact CKD.
A 0 3	RT3: Refrigerant condensing temperature measuring sensor error		
A 0 4	RT4: Refrigerant suction temperature measuring sensor error		
A 0 5	Compressor over-current error	·Ambient temperature is high.	·Operate the product within its specifications.
		·Dust filter is clogged.	·Clean the dust filter.
		·Over-load occurs.	·Reduce the load.
		·Air ventilation is poor.	·Improve the air ventilation.
		·Compressor malfunctions.	·Contact CKD.
		·Solenoid valve malfunctions	
A 0 7	Refrigerant high-pressure error	·Ambient temperature is high.	·Operate the product within its specifications.
		·Dust filter is clogged.	·Clean the dust filter.
		·Over-load occurs.	·Reduce the load.
		·Air ventilation is poor.	·Improve the air ventilation.
		·Solenoid valve malfunctions	·Contact CKD.
A 0 8	Compressor high-temperature error	·Ambient temperature is high.	· Operate the product within its specifications.
		·Dust filter is clogged.	·Clean the dust filter.
		·Over-load occurs.	·Reduce the load.
		·Compressor malfunctions.	·Contact CKD.
		·Solenoid valve malfunctions	
A 0 9	High water temperature error	·Water temperature setting (SV) is high.	·Set the water temperature within its specifications.
		·Ambient temperature is high.	· Operate the product within its specifications.
		·Over-load occurs.	·Reduce the load.
		·Refrigerant gas leaks.	·Contact CKD.
		·Solenoid valve malfunctions	
A 1 1	High refrigerant temperature error	·Ambient temperature is high.	· Operate the product within its specifications.
		·Over-load occurs.	·Reduce the load.
		·Dust filter is clogged.	·Clean the dust filter.

Alarm code	Trouble	Cause	Corrective action
A 1 3	Low refrigerant temperature error	·Pump water feed is faulty.	·Check the water flow.
		·Cooler is damaged.	·Contact CKD.
		·Solenoid valve malfunctions	
A 1 5	power source reverse phase error	3 phase power source connected reverse direction	·Exchange 2 power wires out of the 3 power wires.
A 1 7	Press feed pump over-current error	·Water feed pressure is too high.	·Reduce the resistance of the feed path on the load side.
		·Foreign matter enters the press feed pump.	·Remove the foreign matter.
		·Press feed pump malfunctions.	·Contact CKD.
A 1 8	Water level error (water level drop)	·Water volume is insufficient.	·Supply the water.
		·Water leaks.	·Correct the leak part and supply the water.
		·Level switch malfunctions.	·Contact CKD.

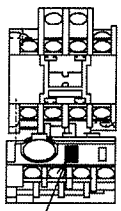
5-2 Troubleshooting

Trouble	Cause	Corrective action
Controller is not lit.	・Main power is turned OFF.	・Turn ON the main power.
	・Power supply voltage is faulty.	・Adjust the voltage to the specified level.
	・Fuse is blown up.	・Remove the cause and replace the fuse.
Overload lamp is lit.	・Ambient temperature is high.	・Operate the product within its specifications.
	・Dust filter is clogged.	・Clean the dust filter.
	・Over-load occurs.	・Reduce the load.
	・Air ventilation is poor.	・Improve the air ventilation.

●How to reset the alarm

Keep the RESET/STOP button pressed for 2 sec. or longer. The alarm will be reset.

●How to reset the over-current relay



RESET button

As shown in the Fig. on the left, the over-current relay is connected to the electromagnetic contactor.

If the over-current error occurs, press the white RESET button to reset the FR.

⚠ WARNING

Before starting the maintenance work, turn OFF the main power and lock it to prevent any electric shock.

● The refrigerant is R-407C

For recycling of R-407C, follow the laws and regulations of a country where HYCOOL is installed.

Discontinue

6. OTHER DOCUMENT

6-1. Specifications

Item \ Product name			HYCOOL		
			HYW2012C	HYW2023C	HYW2045C
Specifications	Installation place		Indoor place		
	Fluid used		Fresh water		
Performance	Cooling capacity (50/60 Hz) (Note 1, 2)		1.1/1.2 kW	2.0/2.3 kW	4.2/4.5 kW
	Working ambient temperature range		5～43℃		
	Working fluid temperature range		5～30℃		
	Accuracy of outlet temperature		±1℃ (NORMAL mode) ／±3℃ (ECO mode)		
Electric specifications	Power supply		AC200V±10%, 50/60Hz±1% AC220V±10%, 60Hz±1%		
	Power consumption (50/60Hz) (Note 2)		1.0/1.3 kW	1.5/1.9 kW	2.0/2.5 kW
	Current (50/60 Hz) (Note 2)		3.0/3.5 A	5.5/6.0 A	7.0/8.0 A
	External signal	Input	Non-voltage contact input (operation)		
		Output	Non-voltage contact output (error)		
Units	Condenser		Aluminium parallel flow type		Multi－passange fins and tube
	Cooler		Stainless plate type heat exchanger		
	Press feed pump (50/60 Hz)(Note 3)	Flow rate	29/36 ℓ/min		35/44 ℓ/min
	Water tank	Actual capacity	10 ℓ		20 ℓ
	Refrigerant control method		Capillary tube		
	Refrigerant		R-407C		
	Thermo-regulator		Digital electronics thermo-regulator (with alarm monitor)		
Protective devices	Compressor		Over load protector		Over-current relay
	Press feed pump		Over-current relay		
	Refrigerant circuit		High-pressure pressure switch		
Pipe port size	Water inlet/outlet		Rc 1/2		Rc 3/4
	Water supply port		Rc 1/2		
	Over flow		Rc 3/4		
	Drain outlet		Rc 1/2		
Others	Outside dimensions	Width	550 mm	600 mm	680 mm
		Depth	400 mm	430 mm	450 mm
		Height	900 mm	1050 mm	1200 mm
	Product weight (with empty water tank)		80 kg	95 kg	125 kg
	Exhaust heat quantity (50/60 Hz)		2.2/2.7 kW	3.9/4.4 kW	6.4/7.5 kW
	Exhaust air quantity (50/60 Hz)		13.0/16.5 m³/min	25.0/30.0 m³/min	38.0/42.0 m³/min
	Operation noise (50/60 Hz) (Note 4)		52/54 dB (A)	54/57 dB (A)	54/57 dB (A)

Note 1. The cooling capacity is 95% or more of the value stated in the above table.

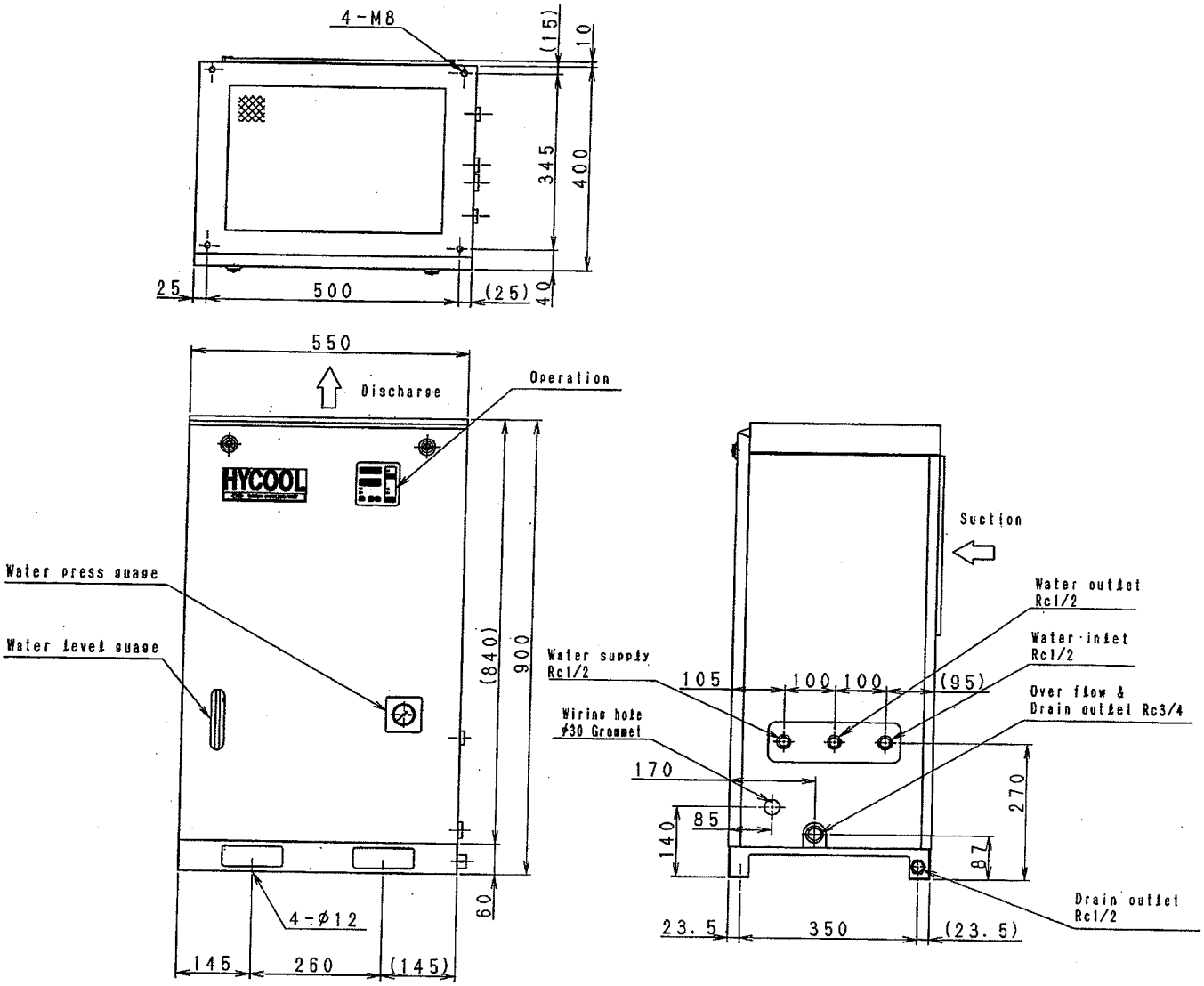
Note 2. This value is obtained when the ambient temperature is 32°C and the fluid temperature is 20°C

Note 3. This value is obtained when the head is 12 m long. For details about the head and flow rate of the press feed pump, refer to the feed water characteristic curve.

Note 4. The operation noise is measured at a position having the product height where is 1.5 m away from the front of the product.

Discontinue

6-2. OUTLINE DRAWING HYW2012C



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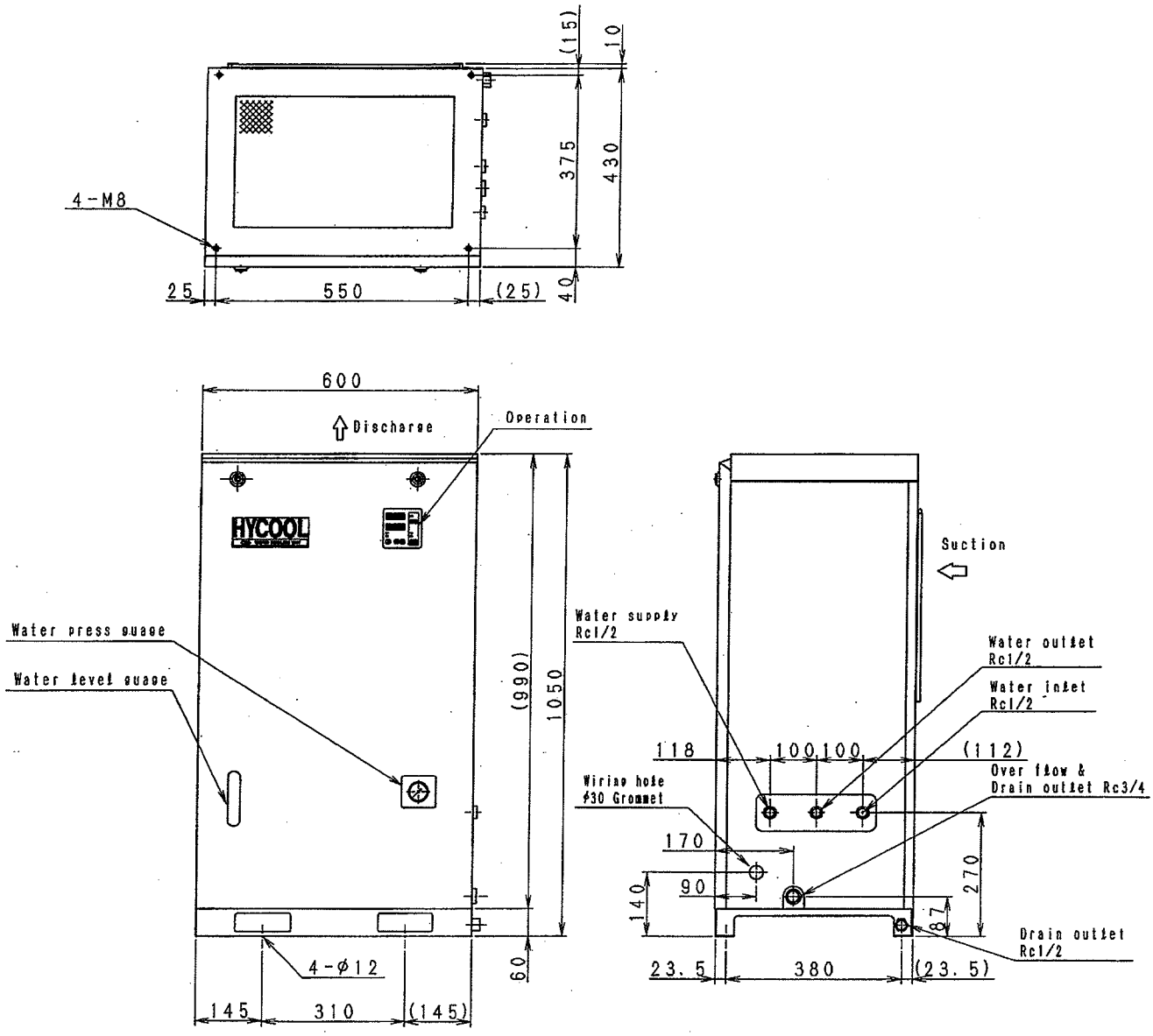
6-2. OUTLINE DRAWING HYW2023C



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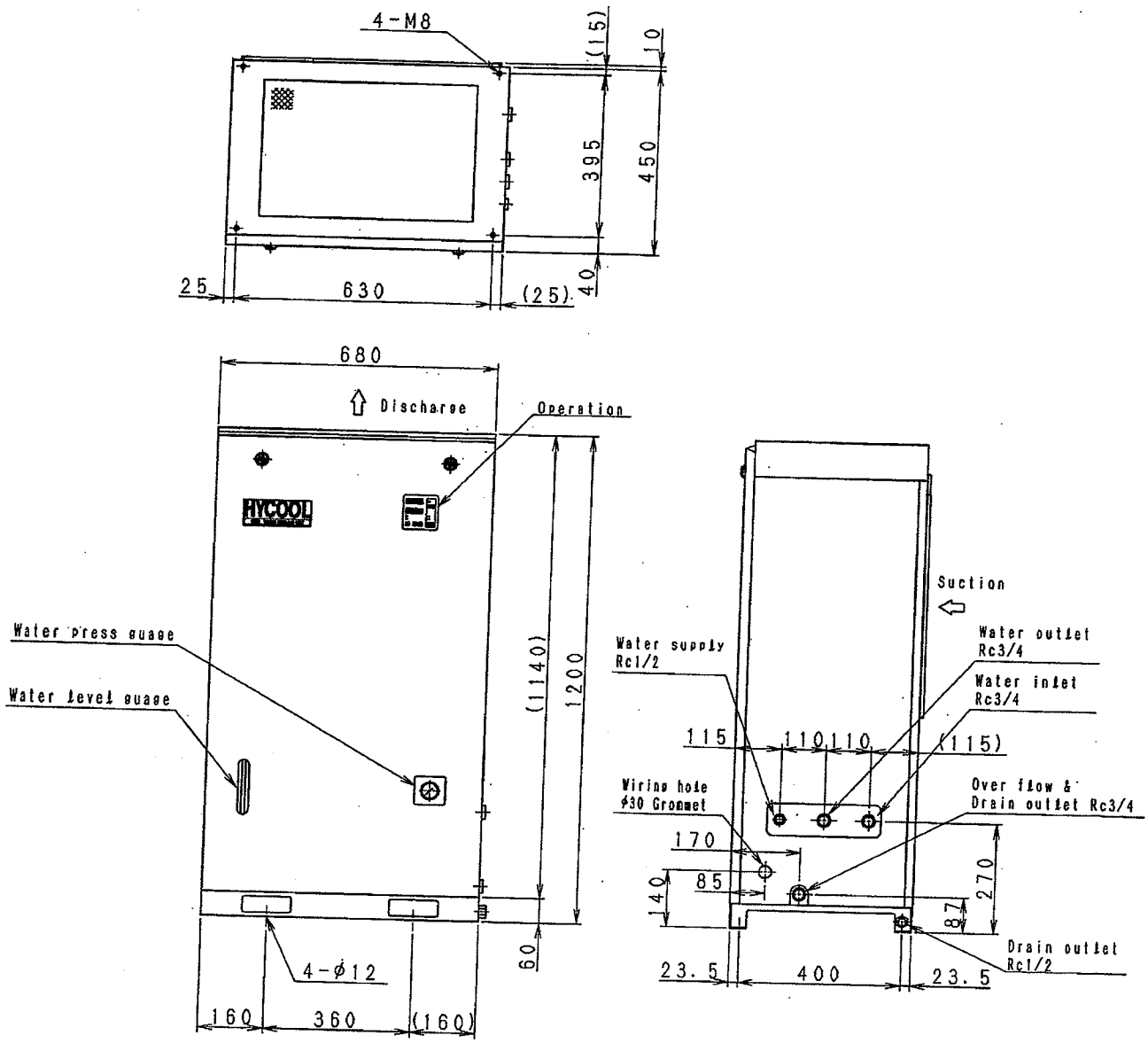
6-2. OUTLINE DRAWING HYW2045C



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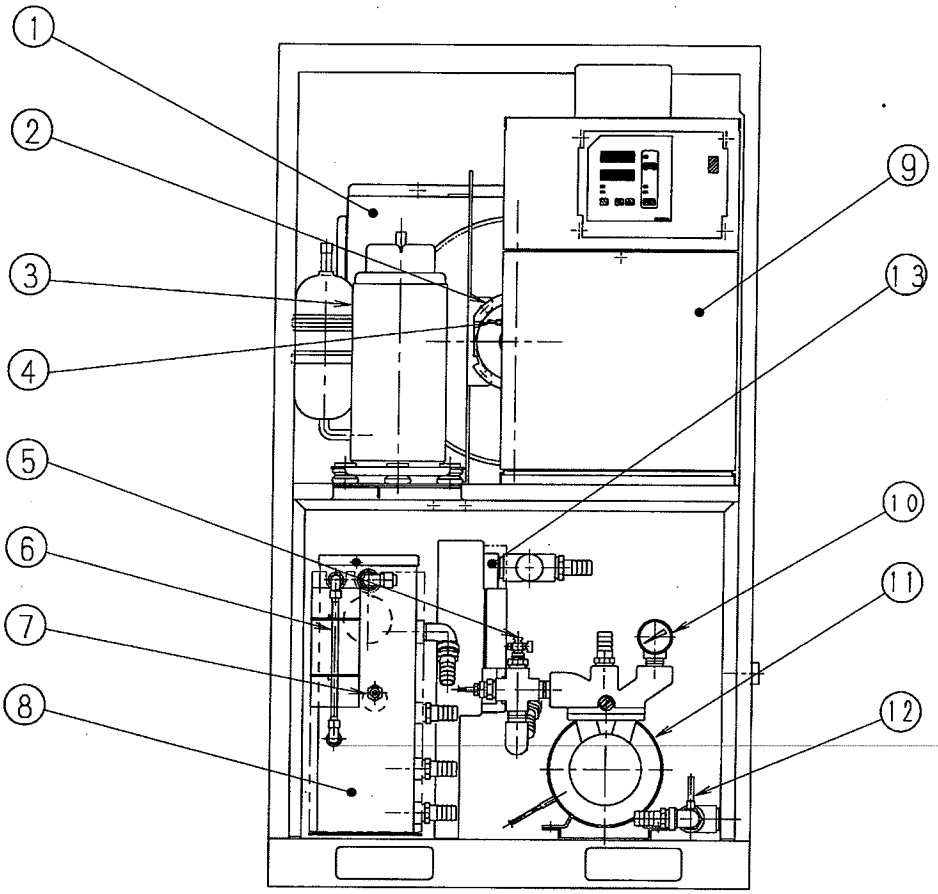
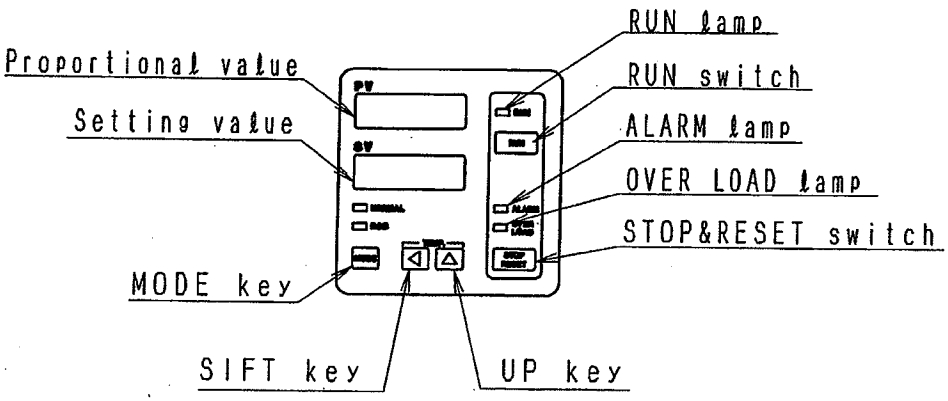
6-3. INSIDE STRUCTURE DRAWING



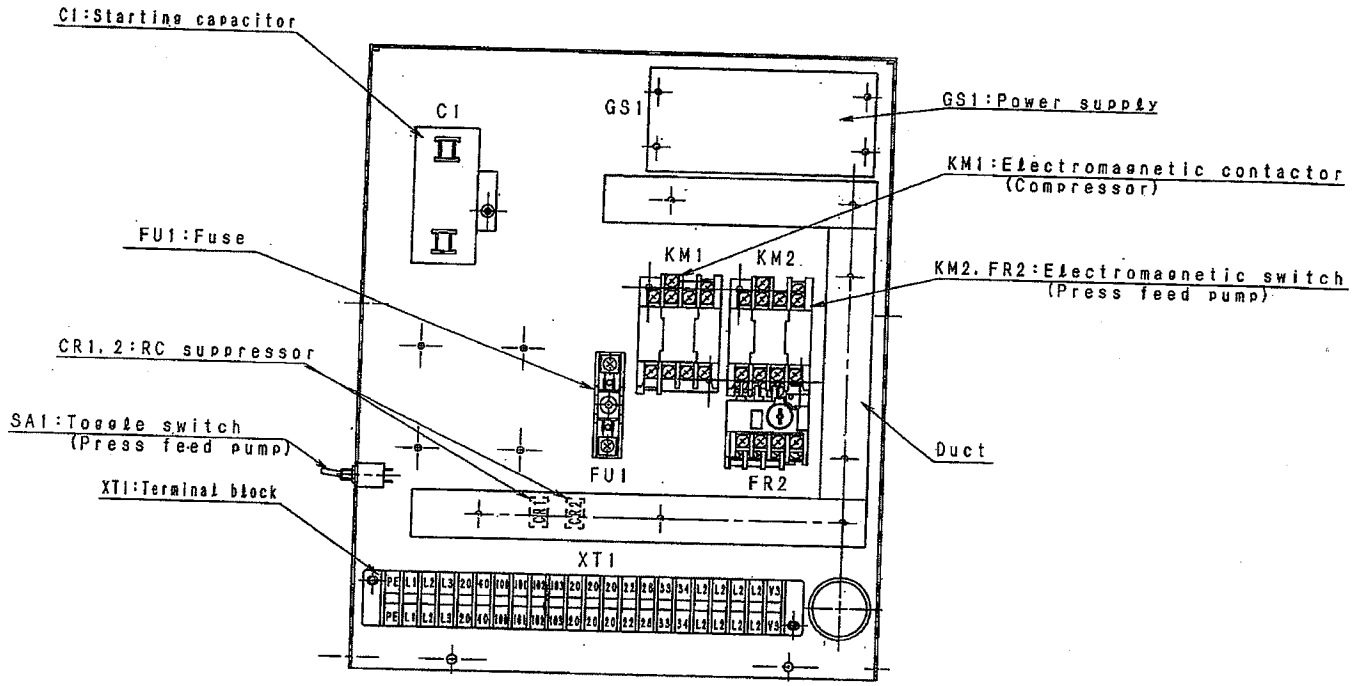
品番 NO	部品名 PART	数量 Q'TY
13	Evaporator	1
12	Stop valve	1
11	Press feed pump	1
10	Water pressure gauge	1
9	Control box	1
8	Water tank	1
7	Water level switch	1
6	Water level gauge	1
5	Air bleeder cock	1
4	Toggle switch	1
3	Compressor	1
2	Fan motor	1
1	Condenser	1

6-4. CONTROL PANEL HYW2012C

CONTROL PANEL

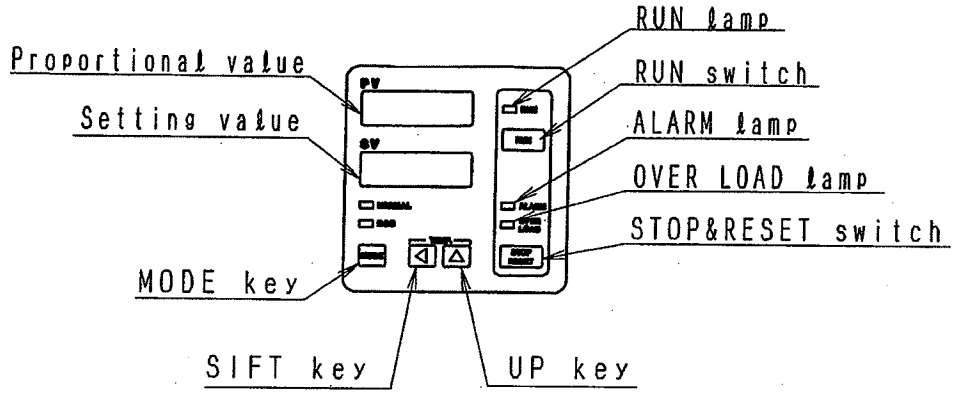


ENCLOSURE



6-4. CONTROL PANEL HYW2023C

CONTROL PANEL



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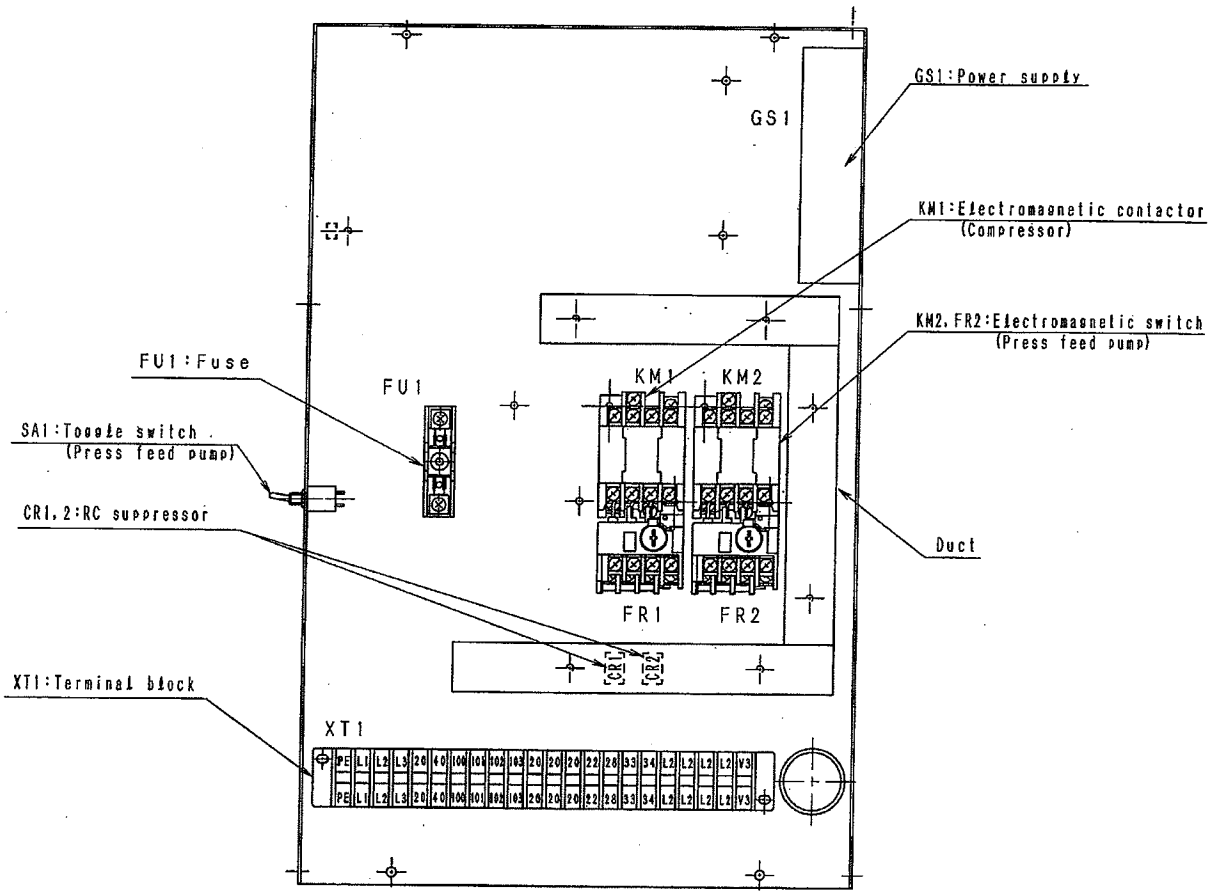
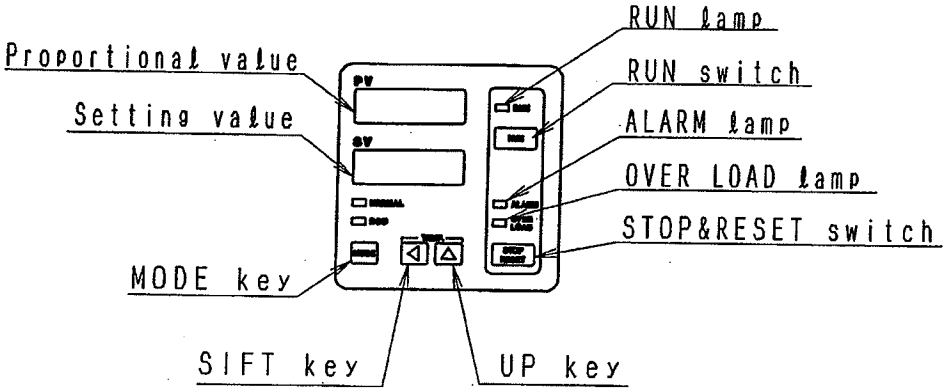


6-4. CONTROL PANEL HYW2045C

CONTROL PANEL



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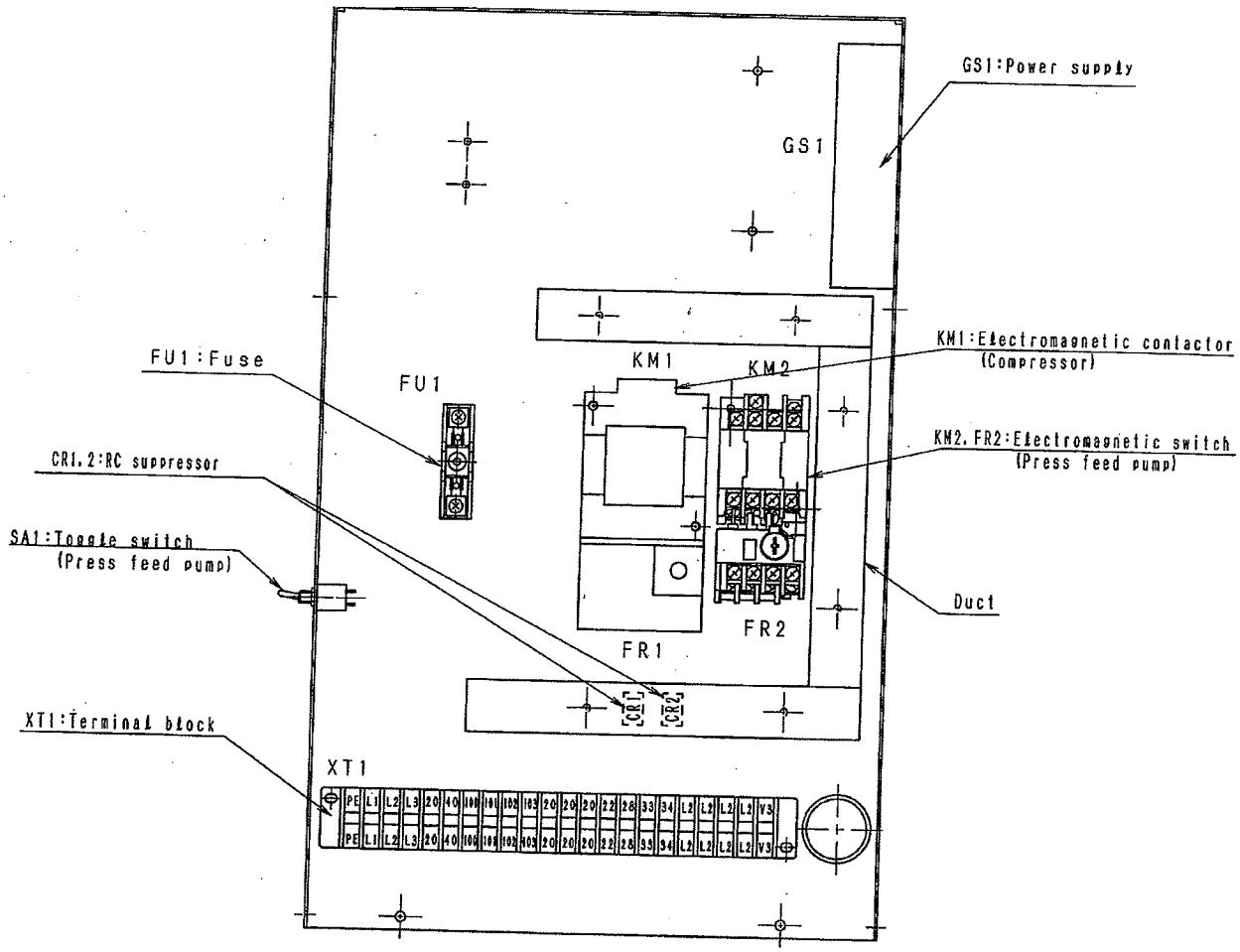

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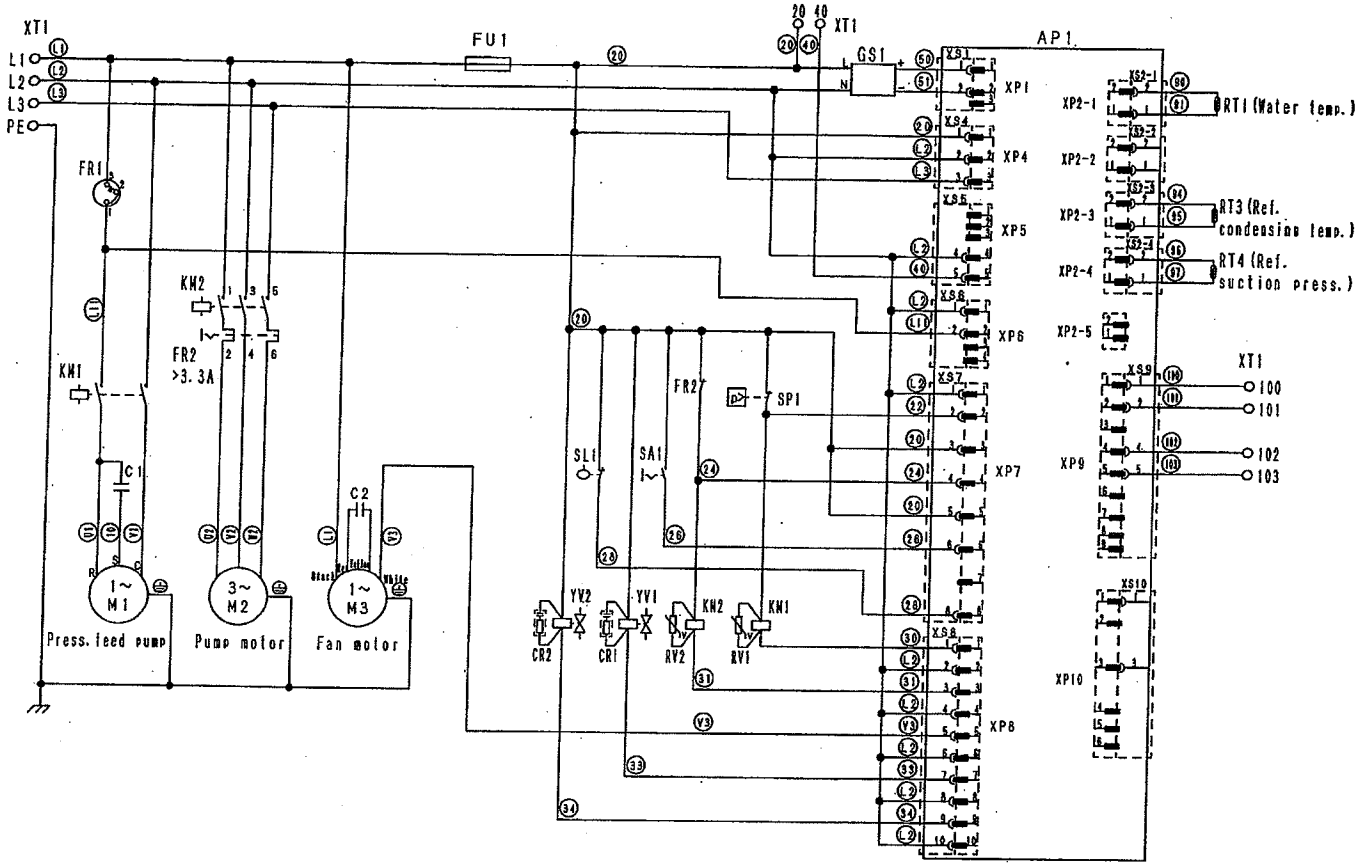
6-5. ELECTRIC CIRCUIT DIAGRAM HYW2012C

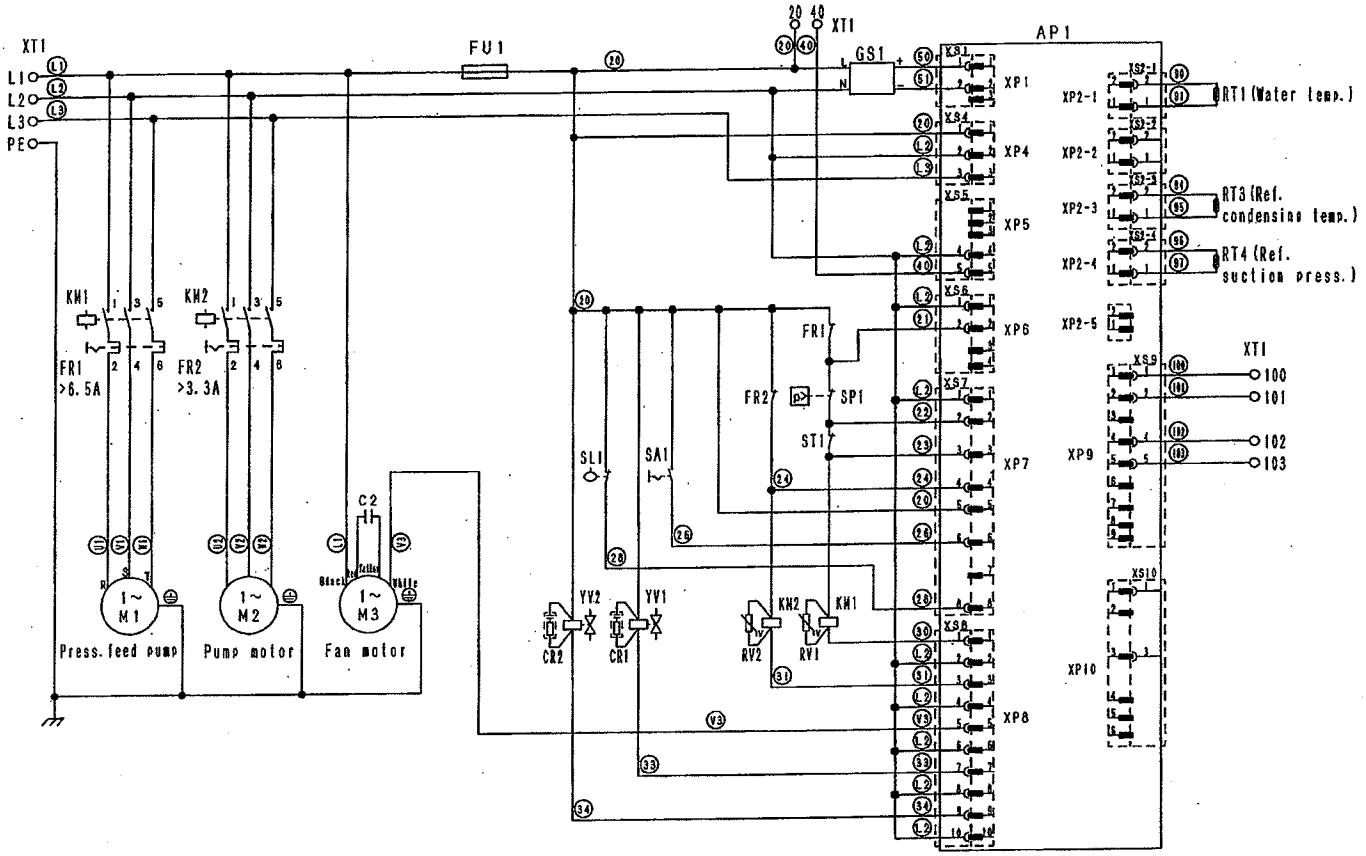


Terminal No.	Description
L1, L2, L3	Power:Three phase AC200V 50/60Hz
PE	Protective earth
20, 40	Remote running signal input Dry contact (Running contact:close)
100, 101	Running signal output Dry contact (Running contact:close)
102, 103	Alarm signal output Dry contact (Alarm contact:open)

No.	Parts name
C2	Condenser
C1	Condenser
XS*	Connector
XT1	Terminal block
CR1~2	RC suppresor
RV1, 2	Varistor
SP1	Pressure switch
SL1	Float switch
SA1	Toggle switch
YV2	Solenoid valve
YV1	solenoid valve
GS1	Power supply
RT4	Thermistor
RT3	Thermistor
RT1	Thermistor
AP1	Controller
FU1	Fuse 3A
FR1	Over load protector
FR2	Over current relay
KM2	Electromagnetic contactor
KM1	Electromagnetic contactor
M3	Fan motor
M2	Pump motor
M1	Compressor motor

Discontinue

6-5. ELECTRIC CIRCUIT DIAGRAM HYW2023C

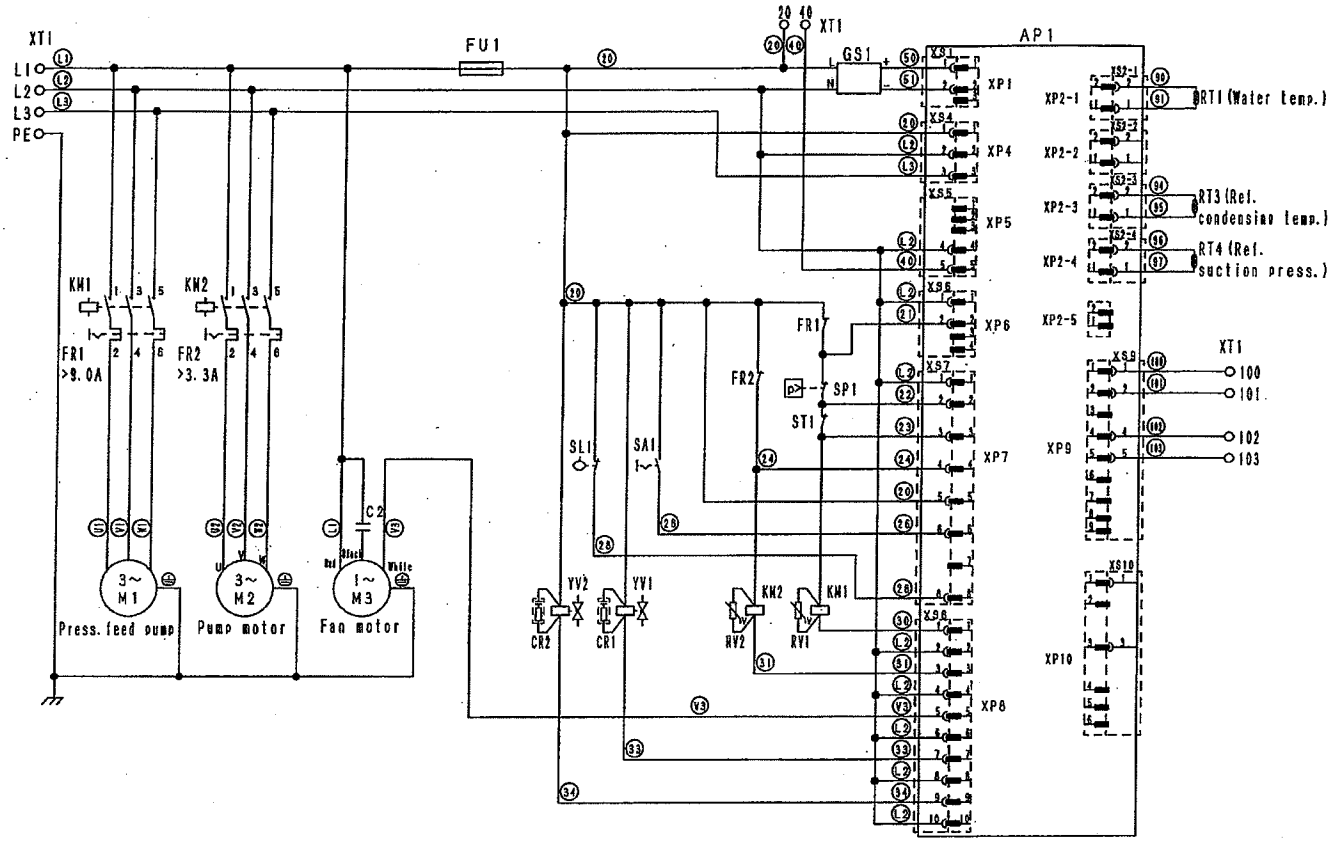


Terminal No.	Description
L1, L2, L3	Power:Three phase AC200V 50/60Hz
PE	Protective earth
20, 40	Remote running signal input Dry contact(Running contact:close)
100, 101	Running signal output Dry contact(Running contact:close)
102, 103	Alarm signal output Dry contact(Alarm contact:open)

No.	Parts name
ST1	Internal thermostat
C2	Condenser
XS*	Connector
XT1	Terminal block
CR1~2	RC suppresor
RV1, 2	Varistor
SP1	Pressure switch
SL1	Float switch
SA1	Toggle switch
YV2	Solenoid valve
YV1	solenoid valve
GS1	Power supply
RT4	Thermistor
RT3	Thermistor
RT1	Thermistor
AP1	Controller
FU1	Fuse 3A
FR1	Over current relay
FR2	Over current relay
KM2	Electromagnetic contactor
KM1	Electromagnetic contactor
M3	Fan motor
M2	Pump motor
M1	Compressor motor

Discontinue

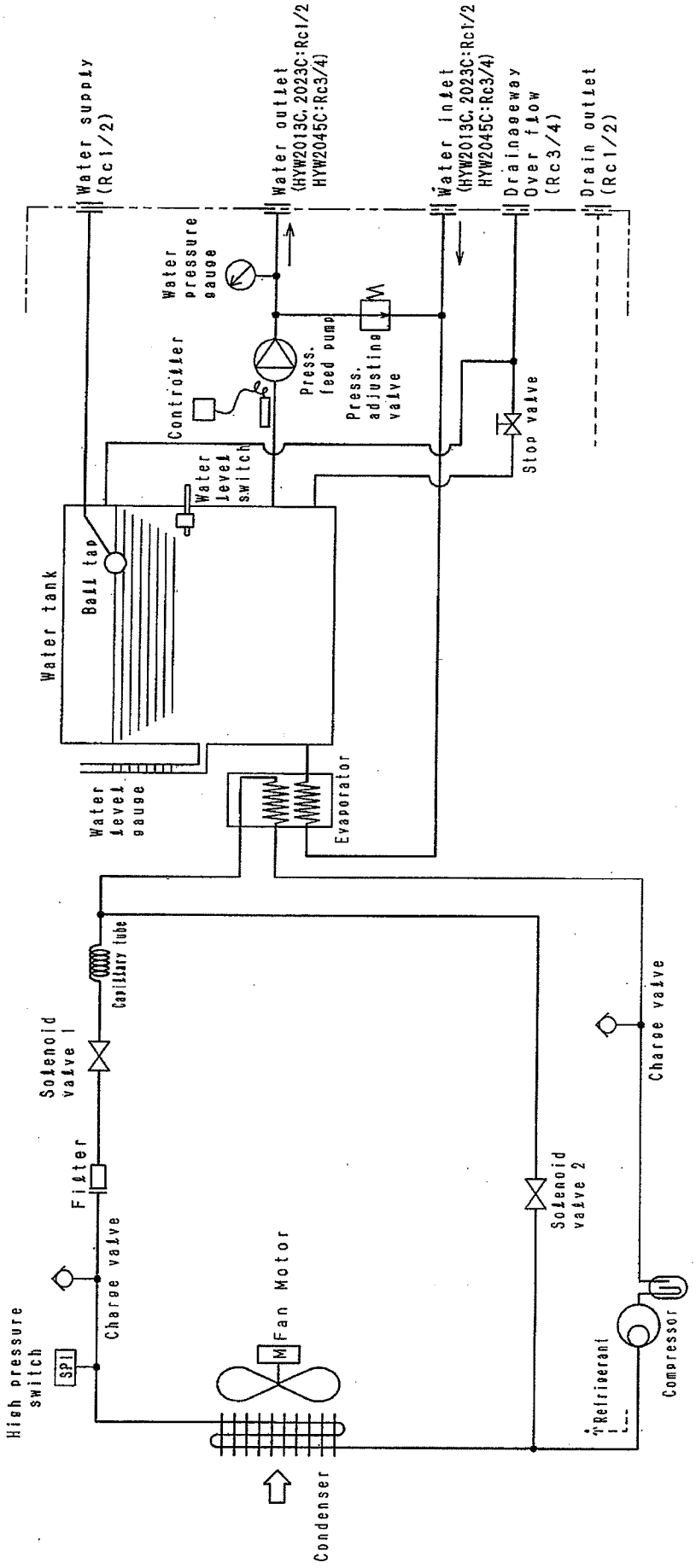
6-5. ELECTRIC CIRCUIT DIAGRAM HYW2045C



Terminal No.	Description
L1, L2, L3	Power:Three phase AC200V 50/60Hz
PE	Protective earth
20, 40	Remote running signal input Dry contact (Running contact:close)
100, 101	Running signal output Dry contact (Running contact:close)
102, 103	Alarm signal output Dry contact (Alarm contact:open)

ST1	Internal thermostat
C2	Condenser
XS*	Connector
XT1	Terminal block
CR1~2	RC suppresor
RV1, 2	Varistor
SP1	Pressure switch
SL1	Float switch
SA1	Toggle switch
YV2	Solenoid valve
YV1	solenoid valve
GS1	Power supply
RT4	Thermistor
RT3	Thermistor
RT1	Thermistor
AP1	Controller
FU1	Fuse 3A
FR1	Over current relay
FR2	Over current relay
KM2	Electromagnetic contactor
KM1	Electromagnetic contactor
M3	Fan motor
M2	Pump motor
M1	Compressor motor
No.	Parts name

6-6. FLOW CHART



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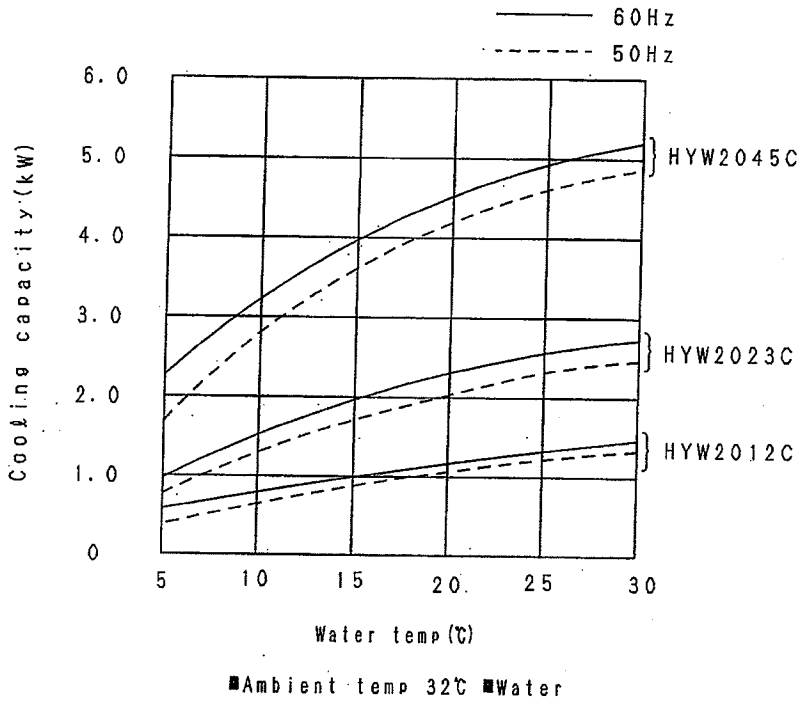
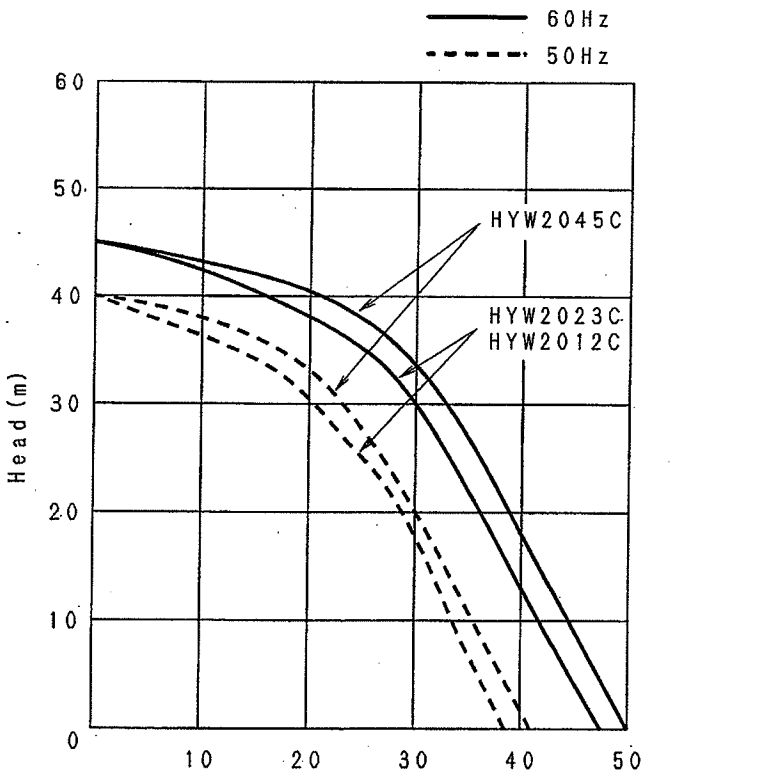
6-7. PERFORMANCE CURVE

COOLING CAPACITY



WATER FLOW RATE



Pump relief pressure 50Hz 0.4MPa Setting