

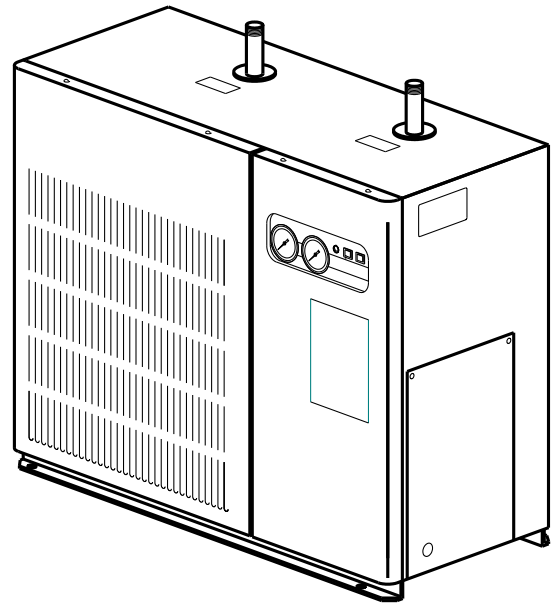
Operating Manual

Refrigerated Compressed-Air Dryer

Air Dryer



FR005AP(Ⅱ) FR005A(Ⅱ)
FR010AP(Ⅱ) FR010A(Ⅱ)
FR020AP(Ⅱ) FR020A(Ⅱ)
FR030AP(Ⅱ) FR030A(Ⅱ)
FR050AP(Ⅱ) FR050A(Ⅱ)
FR075AP(Ⅱ) FR075A(Ⅱ)
FR100AP(Ⅱ) FR100A(Ⅱ)
FR150A(Ⅱ)



- This Air Dryer is designed for industrial use. Handle with care.
- Please read this manual carefully and operate this equipment accordingly.
- Retain this manual for future Reference.

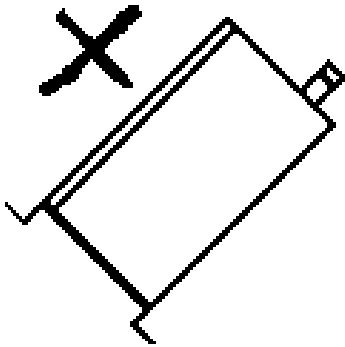
Thank you for purchasing this Fu Sheng Co., Ltd product.
To ensure safe and efficient use, please install and operate this equipment in accordance with the instructions provided in this manual.
Product specifications are subject to change without notice. Please be aware that recent changes to product specifications may not be reflected in the content of this manual.

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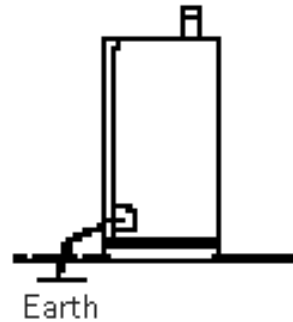
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Important Notes.

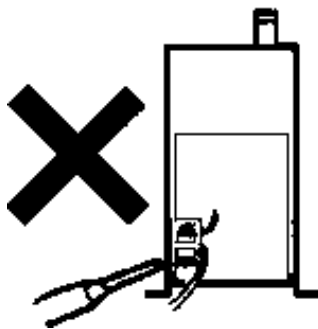
1. Do not carry the dryer turned aslant or upside down ·



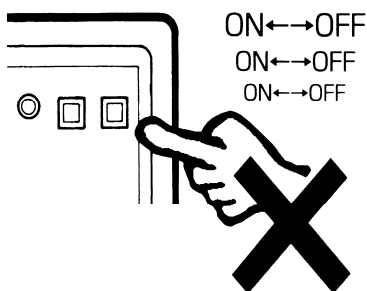
2. Be sure to ground the unit to prevent electric shock.



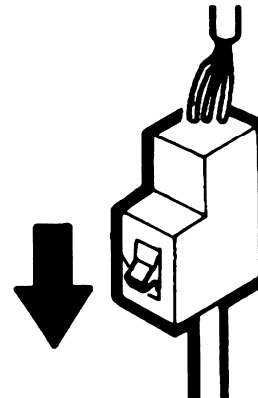
3. Do not modify the wiring in the switchboard ·
• Do not modify the wiring except at the primary-side power terminals.



- 5 · Never turn the operation switch on and off frequently.



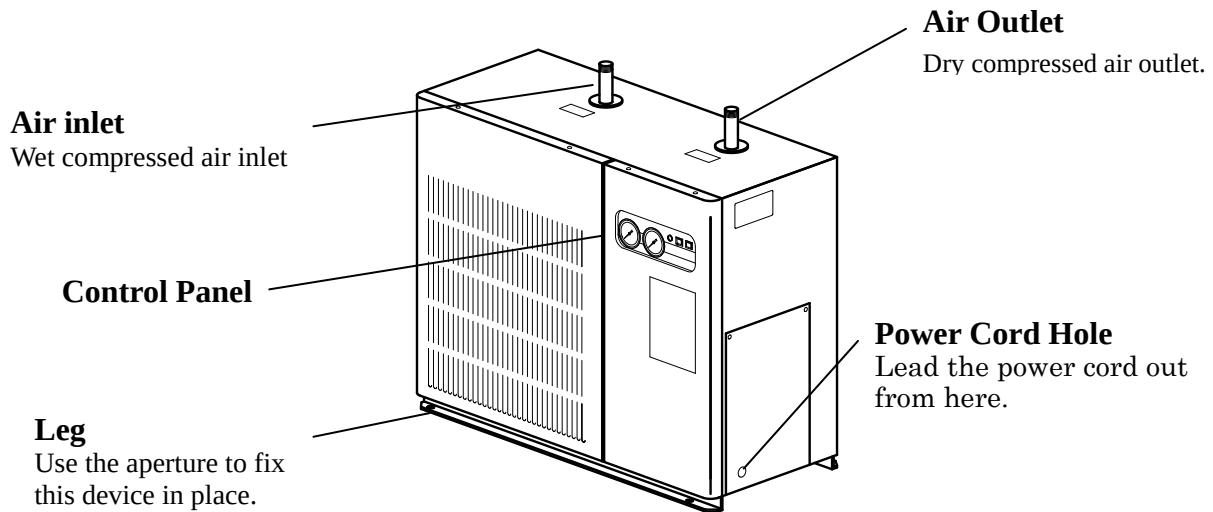
- 4 · Before inspection, be sure to stop the air compressor and turn off power to the air dryer.
Make sure that pressure is relieved in the air dryer.



Names of Parts and Functions

Illustrations used are those of FR020A(Ⅱ)

1. Appearance



2. Control Panel

■ FR005A、FR005AP、FR010A、FR010AP



FR005A、FR005AP

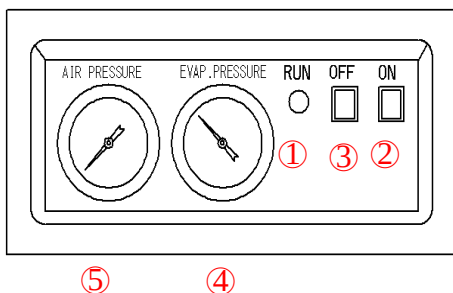
EVAP. Pressure Gauge
Indicates the EVAP. Pressure of the



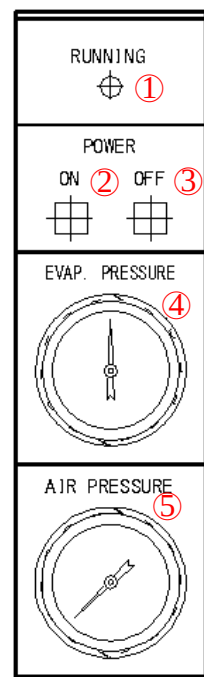
FR010A、FR010AP

Operation Switch (with lamp)
Press ON, and the lamp lights up, the dryer starts operating. Press OFF, and the lamp goes out, the dryer stops

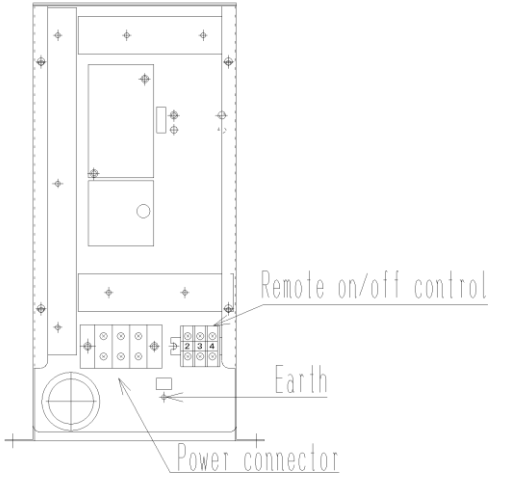
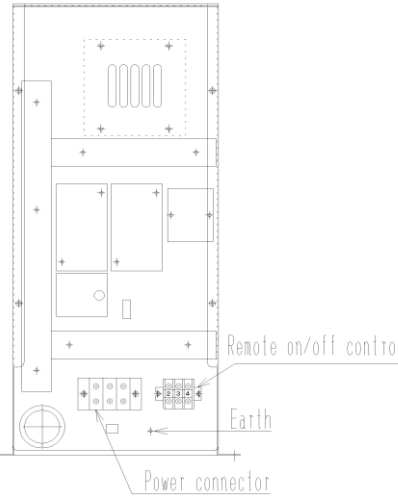
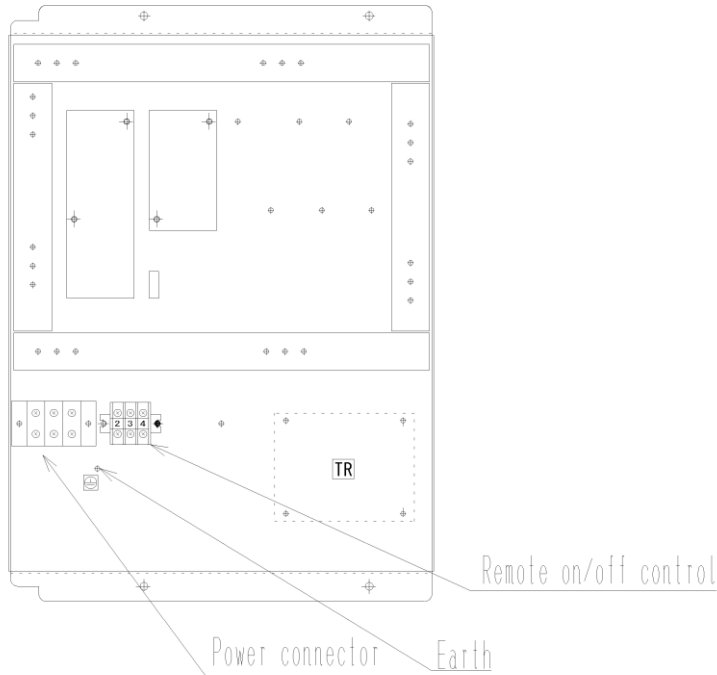
■ FR020A~075A、FR075AP~100AP



- ① RUNNING LAMP
- ② RUNNING SWITCH(WHITE)
- ③ STOP SWITCH (RED)
- ④ EVAP. PRESSURE GAUGE
- ⑤ AIR PRESSURE GAUGE



3.Switchboard

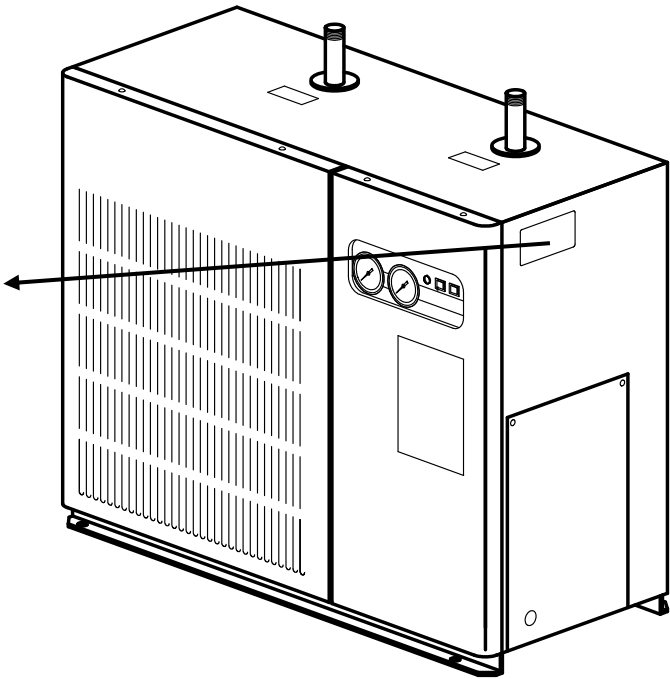
FR020A(Ⅱ)020AP(Ⅱ) 030A(Ⅱ)	FR050A(Ⅱ) 030AP(Ⅱ) 075A(Ⅱ) 050AP(Ⅱ) 100A(Ⅱ) 075AP(Ⅱ)
 Remote on/off control Earth Power connector	 Remote on/off control Earth Power connector
FR150A(Ⅱ) 100AP(Ⅱ)	
 Remote on/off control Power connector Earth	

Installation Notes

1. Checking Model

After unpacking the dryer, check the Specifications Plate to make sure that you have received the system that you ordered..

AIR DRYER			
MODEL		SERIAL No.	
AIR CAP.	m ³ /min	SOURCE	
WEIGHT	kg	FREQ	
REFRIG. R-22,	kg	INPUT	kW
		CURRENT	A
 FU SHENG INDUSTRIAL CO., LTD.			



■ Accessories

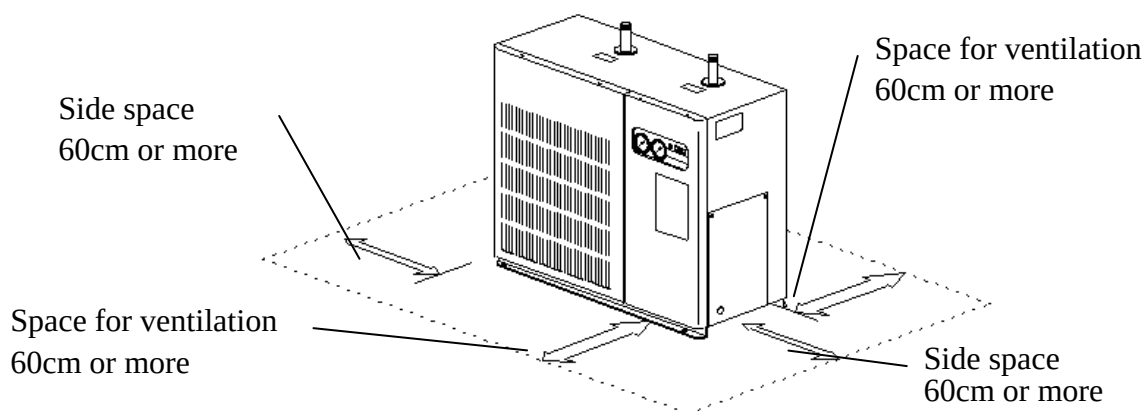
	Auto drain trap	Ball valve
FR005AP(II) 010AP(II) 020AP(II) 30AP(II)050AP(II) FR005A (II)010A(II) 020A (II)030A (II)050A (II)075A(II)	Float type 1pc	1/2B 1pc
FR075AP (II)100AP(II) FR100A (II)150A(II)	Discus type 1pc	1/2B 1pc

Also confirm that the unit has not suffered any shipping-relating damage. In the event of a problem, please contact your dealer

2. Space for Installation

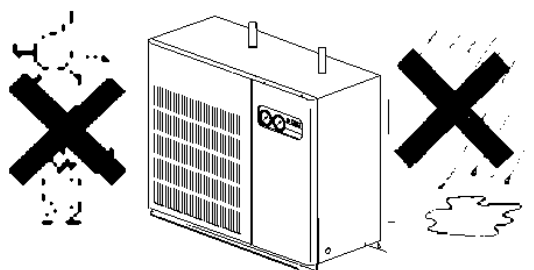
Locate the dryer with enough free space around.

To ensure a sufficient ventilation and accessibility, keep adequate distances between the dryer and objects in its surrounding

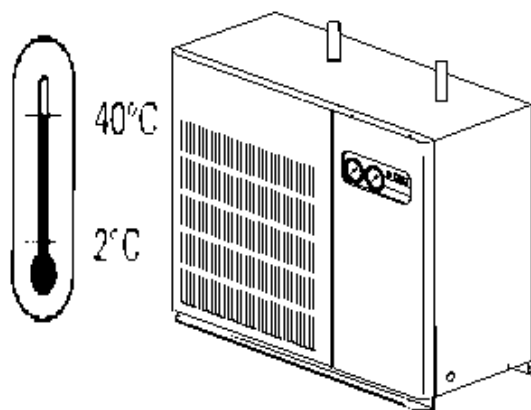


3. Forbidden places

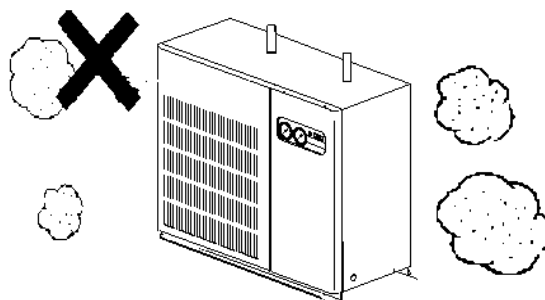
- Do not install in the place where unit will be exposed to direct sunlight, rain, or external heat. Such exposure may reduce the ability of the condenser to release heat, resulting in poor performance.



- Ambient temperature should be between 2 °C and 40 °C. Ambient temperatures above 40 °C. can impede heat release from the condenser, resulting in safety-device activation and equipment shutdown. If you need to install the unit in an area where ambient temperature may exceed 40 , set up ductwork as necessary to supply outside air directly to the air intake area on the cabinet, or construct an outdoor exhaust port to discharge the inside exhaust air (warm air). Be sure that the design does not result in a drop in the fan airflow.



- Do not install in a dusty location. Dust accumulation on the condenser may reduce the unit's performance



Preparation for Operation

1. Piping

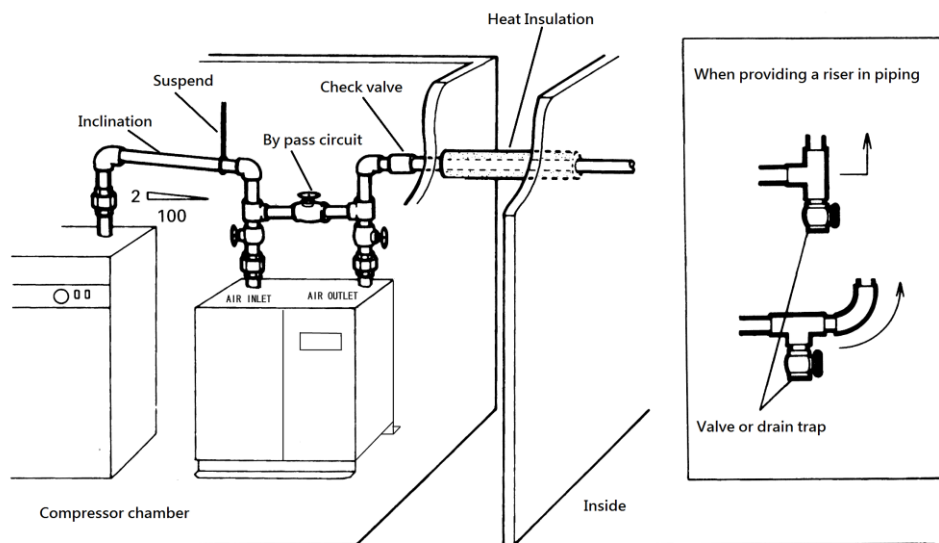
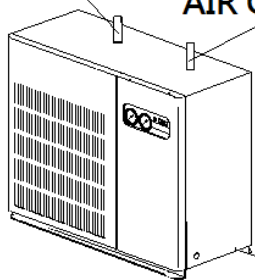
■ Air inlet/outlet connection dimension

Model	FR005AP(Ⅱ)	FR010AP(Ⅱ)	FR015AP(Ⅱ) FR020AP(Ⅱ)	FR030AP(Ⅱ) FR050AP(Ⅱ)	FR075AP (Ⅱ)	FR100AP (Ⅱ)
Model	FR005A(Ⅱ)	FR010A(Ⅱ)	FR020A(Ⅱ) FR030A(Ⅱ)	FR050A FR075A	FR100A (Ⅱ)	FR150A (Ⅱ)
Pipe size	1/2B	3/4B	1B	1-1/2B	2B	2 1/2B

■ Piping notes

AIR INLET

AIR OUTLET



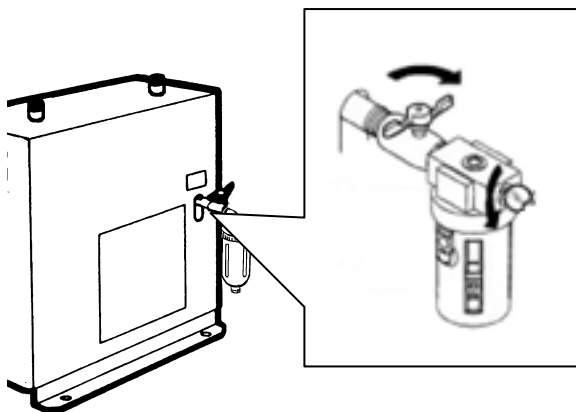
- 1) Do not confuse the inlet and outlet of the air dryer.
- 2) Do not use any riser in the piping from air compressor to air dryer .
However, if it is inevitable, install a valve or a drain trap so that water can be purged .
- 3) Provide a by-pass circuit between the inlet and the outlet of the air dryer .
- 4) Do not allow the piping weight to bear on the air dryer .
- 5) In a cold place, cover the outdoor piping, if any, with heat insulator .
Even indoors, use heat insulator if the air dryer outlet piping develops condensation.
- 6) In piping, prevent dust and other foreign materials from entering the air circuit .

2. Installation of Accessories

- 1) FR005AP(Ⅱ) 、 010AP(Ⅱ) 、 020AP(Ⅱ) 、 030A(Ⅱ) 、 050AP(Ⅱ)
FR005A(Ⅱ) 、 010A(Ⅱ) 、 020A(Ⅱ) 、 030A(Ⅱ) 、 050A(Ⅱ) 、 075A(Ⅱ)

■ Accessories

Auto drain trap	Float type	1pc
Ball valve	1/2B	1pc
Auto drain trap	Float type	1pc



- 1) As shown, install the ball valve and auto drain trap on the drain pipe with the marking **DRAIN**.
- 2) After the installation, open the ball valve.
- 3) Install the auto drain trap so that the drain outlet is positioned below.
- 4) Use the following vinyl hose when the drainage is to be led out of the auto drain trap.
Hose inside diam.:16 mm
- 5) When connecting a pipe, screw it on the threaded part of the drain trap outlet.
Drain trap outlet thread diam: Rc 1/4

● Important

To remove the drain trap (when you need to replace it), proceed as follows:

- (1) Close the ball valve;
- (2) Release the pressurized air from the trap;
- (3) Hold on to the ball valve so that it cannot turn, and rotate (unscrew) the trap to remove.

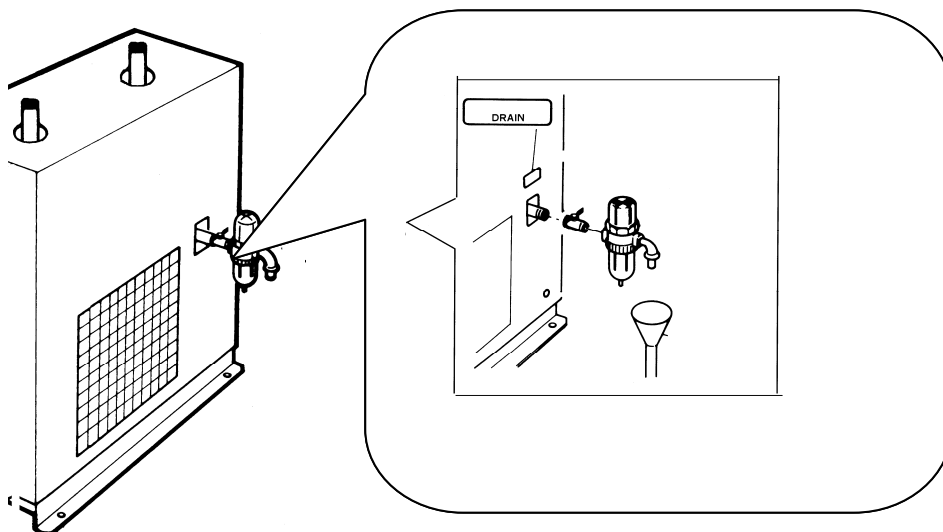
● Important

If attaching a pipe to the drain outlet, note that the pipe should not be too long and should not move upward. Reverse pressure caused by excessive pipe length or upward flow may prevent draining.

2) FR075AP(Ⅱ)、100AP(Ⅱ)
FR075A(Ⅱ)、100A(Ⅱ)、150A(Ⅱ)

■ Accessories

Auto drain trap	Discus type	1 pc
Ball valve	1/2B	1 pc



● Important

To remove the drain trap (when you need to replace it), proceed as follows:

- 1) Close the ball valve;
- 2) Release the pressurized air from the trap;
- 3) Hold on to the ball valve so that it cannot turn, and rotate (unscrew) the trap to remove.

● Important

If attaching a pipe to the drain outlet, note that the pipe should not be too long and should not move upward. Reverse pressure caused by excessive pipe length or upward flow may prevent draining.

3. Electrical Wiring

1) Power-cord capacities are as follows.

Model	FR005AP(Ⅱ) FR010AP(Ⅱ)	FR020AP(Ⅱ)	FR030AP(Ⅱ) FR050AP(Ⅱ)	FR075AP(Ⅱ) FR100AP(Ⅱ)
	FR005A(Ⅱ) FR010A(Ⅱ) FR020A(Ⅱ)	FR030A(Ⅱ)	FR050A(Ⅱ) FR075A(Ⅱ)	FR100A(Ⅱ) FR150A(Ⅱ)
Power source (standard type)	Single phase 240V 50Hz			3 phase 415V 50Hz
Power cord (mm2)	1.25 or more		2.0 or more	2.0 or more
Breaker capacity (A)	5A	10A	15A	10A
Ground line (mm2)	1.25 or more		2.0 or more	2.0 or more

2) Install an overload leakage breaker (overload-protect function plus current leakage function).

The breaker must be dedicated to the air dryer. (Use high-speed type with 30mA current sensitivity.)

3) Connect up the power cord.

For single-phase models, connect the wires to terminals 1 and 2.

For three-phase models, connect to terminals R,S and T

4) Connect the ground.

Ground (earth) connection must be set up by a qualified electrician. The ground line must be connected to the earth terminal. The line diameter must be at least 2mm².

5) Power voltage should remain within 5% of the rated value while the dryer is operating.

Operation

* Before starting operation, make certain that the power breaker is ON .

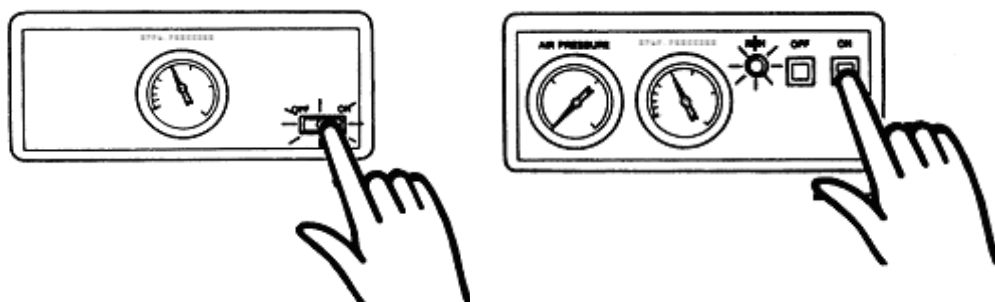
1 . How to start

① Press the operation switch **ON**

The operation lamp lights up and operation starts .

FR005AP(Ⅱ)

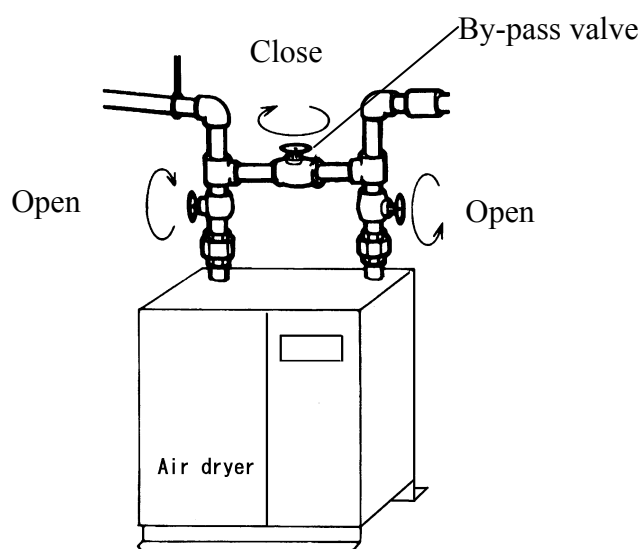
FR005A(Ⅱ) 010A(Ⅱ) 010AP(Ⅱ) FR020A(Ⅱ) Above



② 3 minutes later, start supplying compressed air .

About three minutes after the start of the dryer, supply compressed air by operating the air compressor .

o



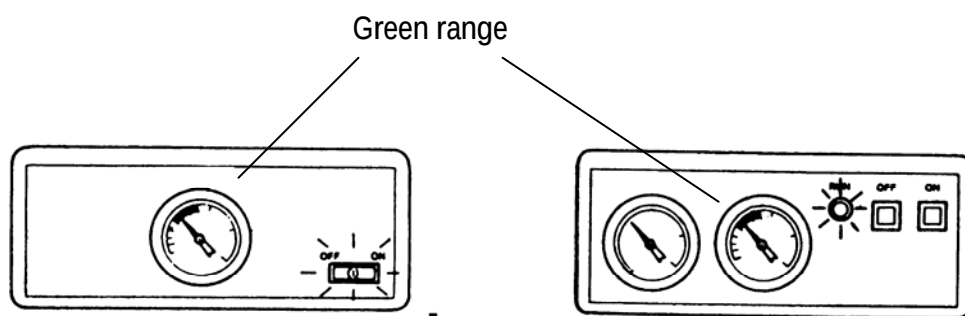
Caution At this time, be sure to close the by-pass valve in the piping.

③ Check the indications on the gauges.

Soon after the flow of compressed air, EVAP. pressure gauge will normally start indicating within the green-colored range .

● EVAP. pressure gauge :

The air dryer may not easily develop trouble even when it is operated with the EVAP. pressure gauge indicating a little beyond the green range. Yet, take care to use it within the green range so that the dryer can perform at its maximum efficiency .



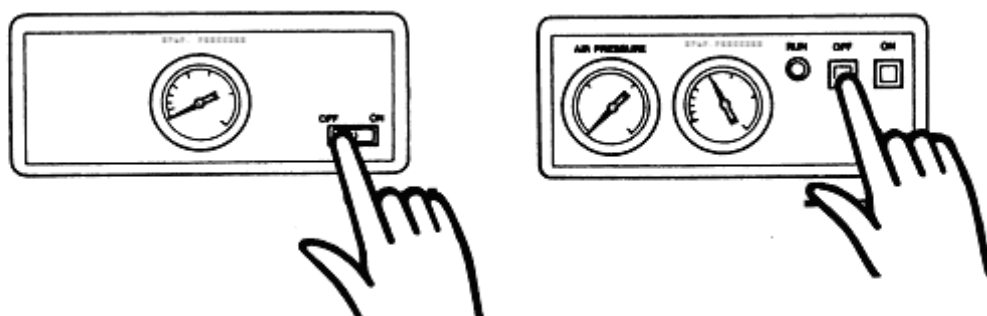
【Note】 When the ambient temperature drops, the fan may repeat stop and run operation . This is to prevent the freezing inside the heat exchanger .

2 · How to Stop

① Stop the air compressor .

② Press the stop switch **OFF** .

The operation lamp goes out and operation stops .



Safety Devices

※The dryer is provided with safety devices to ensure operational safety for you

The air dryer will stop automatically at the operation of any safety device ·

■ Refrigerant circuit safety device ⇨ High-pressure switch

The high-pressure switch operates when the condensation pressure reaches:

$3.0 \pm 0.1 \text{ MPa}$ ($30 \pm 1 \text{ kgf/cm}^2 \text{G}$) (R407C Refrigerant)

$2.0 \pm 0.1 \text{ MPa}$ ($20 \pm 1 \text{ kgf/cm}^2 \text{G}$) (R134a Refrigerant)

$4.15 \pm 0.15 \text{ MPa}$ ($42 \pm 1.5 \text{ kgf/cm}^2 \text{G}$) (R410A Refrigerant)

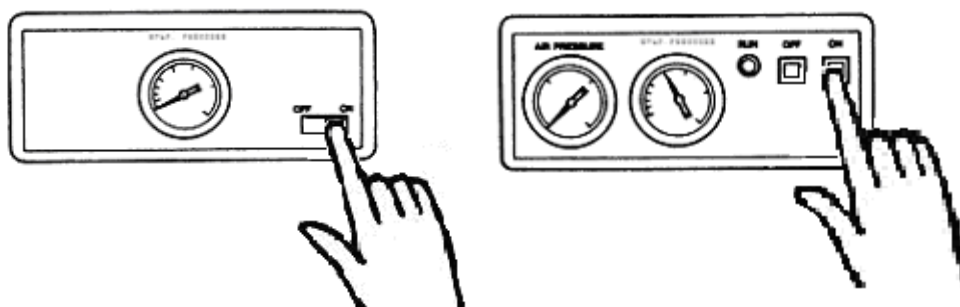
and stops the dryer ·

■ Electric circuit ⇨ Motor protector

The motor protector will operate to stop the air dryer if the temperature of the compressor gets high or an over current flows in the circuit.

How to reset

- 1 · Remove the cause of stoppage. (See Troubleshooting ·)
- 2 · Press the operation switch **ON** on the control panel.



Daily Maintenance and Checks

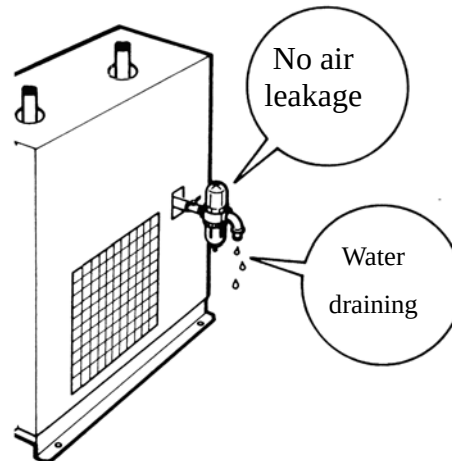
1. Daily Checks

Checking of auto drain trap

Check the auto drain trap everyday.

Check items

- Air leakage
- Normal operation
(water draining)

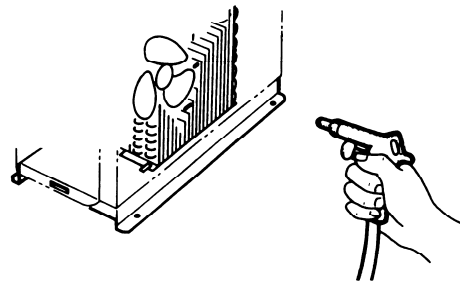


2. Maintenance

1) Cleaning of condenser

Clean the condenser periodically, using a brush or air gun ·

Dust or dirt accumulated on the condenser will reduce the heat exchange efficiency ·
At the worst , the dryer may stop with the safety device operating ·

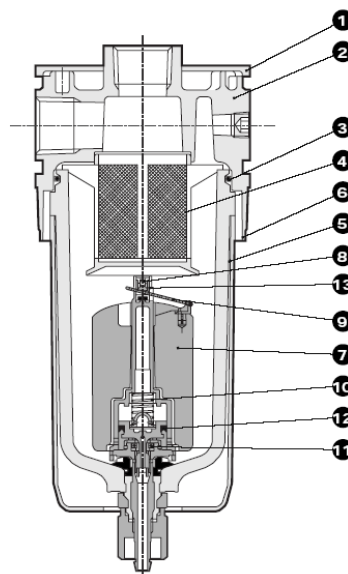


Caution In cleaning, exercise care so as not to deform the condenser fins ·

2) Cleaning of auto drain trap (Float type)

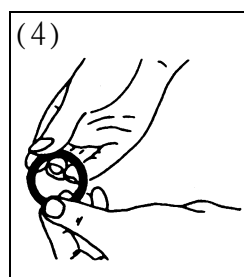
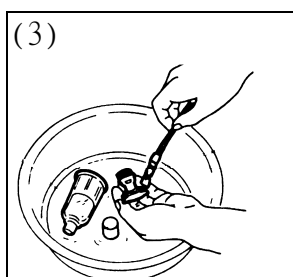
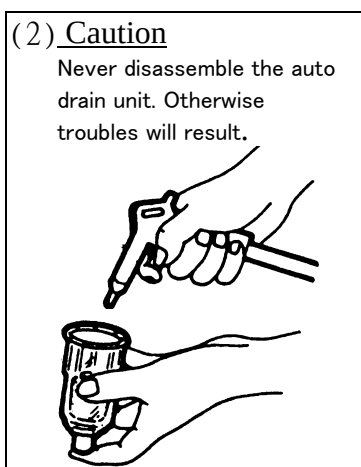
- Overhaul the auto drain trap periodically (every week) so that it can always operate normally.

NO.	PARTS NAME
1	Plat cover
2	Body
3	O-ring
4	Filter
5	Bowl
6	Bowl guard
7	Float
8	Orifice
9	Float level arm
10	Spring
11	Packing
12	Valve
13	Orifice spring



■ How to clean

- (1) Close the ball valve.
- (2) Remove the dirt and dust from the filter element, which is fit in the lower part of the auto drain unit, using an air gun or like means.
- (3) Wash the separated parts with a neutral detergent.
- (4) Check for damaged parts. Make a particularly careful check of O-ring.

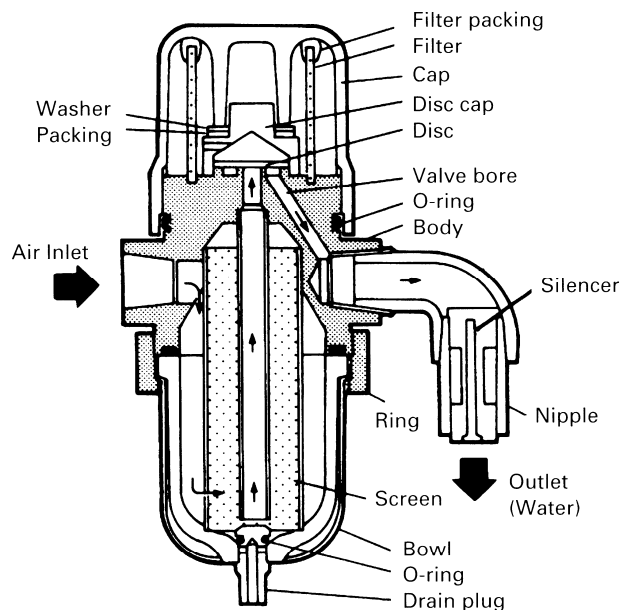


- The drain should not be exposed to direct sunlight, as such exposure may damage the drain bowl.
 - The following substances can damage the drain bowl. These substances should never be present within the drain or in the atmosphere around the drain.
 - Oils based on phosphoric acid esters.
 - Organic solvents (aromatic, chloride, and hydrocarbon compounds)
 - Benzene, toluene, phenol, trichloroethylene, gasoline, paint thinner, etc.
 - Sulfurous acid gas, chlorine gas, CFC gas.
- Acids: hydrochloric acid, sulfuric acid, acetic acid, etc.

3) Cleaning of auto drain trap (Discus type)

Overhaul the auto drain trap periodically (every week) so that it can always operate normally.

■ Parts name



■ Draining

Discharge the drainage once a week by turning the drain plug clockwise · During a cold season, perform the drainage after every operation to prevent freezing ·

■ Draining before a long suspension of operation ·

Be sure to discharge the water from the bowl by turning "clockwise" the drain plug at the bottom of the drain trap ·

■ Adjustment of drainage discharge

The operating interval of this drain trap varies with the load, pressure , etc ·
Turning the needle valve in the " + "direction will shorten the interval and increase the drainage discharge · Adjust the interval in such a way that water will not accumulate in the bowl ·

■ Disassembly

If some abnormality, such as excessive dirt on the screen or longer interval, is found, overhaul the drain trap as follows :

- Turn the cap counterclockwise and remove it ·
- Blow the dust off from the filter, using compressed air ·
- Clean the disc cap and disc ·
- Turn the ring counterclockwise and remove it.
- Remove the screen ·
- Blow the dust off the screen ·
- Wash the bowl with a neutral detergent. Never use any organic solvent ·
- Check all the parts for damage. Never fail to check the O-rings, packings and washer

Troubleshooting

■ Should any trouble arise during operation of the dryer, correct it using the troubleshooting chart below

Problem	Possible Cause	Solution
Dryer does not operate with operation switch ON pressed · (RUN lamp does not light up.)	• Lamp disconnected • Switch faulty • Low power supply voltage • Magnetic contactor faulty • Protector faulty • High pressure switch faulty	• Replace. • Replace. • Use specified voltage. • Replace · • Replace · • Replace.
Dryer does not operate with operation switch ON pressed (RUN lamp lights up.)	• Magnetic contactor faulty • Protector fault	• Replace · • Replace
Dew point is normal but water or oil drops occur ·	• Drainage hindered by foreign material in auto drain trap • Drainage in auto drain trap frozen	• Disassemble and clean auto drain trap · • Take proper measures to prevent freezing ·
Dew point is high and water or oil drops occur ·	• Too high air processing rate • Lowered cooling capacity • Condenser clogged up • Too high ambient temperature • Fan motor faulty	• Correct air processing rate · • Check for gas leak · • Clean · • Lower ambient temperature.(below 40 °C) • Replace ·
Machine stops suddenly during operation ·	• Magnetic contactor faulty • Too high air processing rate • Condenser clogged up • Too high ambient temperature • Abnormal voltage • Fan control pressure switch faulty	• Replace · • Correct air processing rate · • Clean • Lower ambient temperature. (below 40 °C) • Use rated voltage · • Replace ·

After-Sale Service

■ Should any trouble arise, correct it according to the troubleshooting chart · If you can not correct it, contact your dealer and ask for the repair. When you request an after-sale service on the dryer, give information on the following particulars :

● Application for repair

- (1) Model and Serial No · of the air dryer
- (2) Defective part and trouble
- (3) Date of purchase
- (4) Sketch map of your location

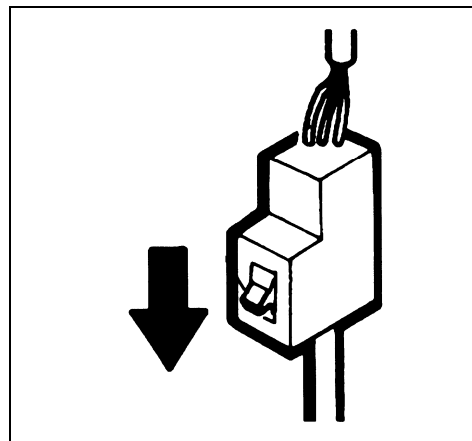
● Application for parts

- (1) Model and Serial No · of the dryer
- (2) Number, name and quantity of part(s)

Before Long Disuse

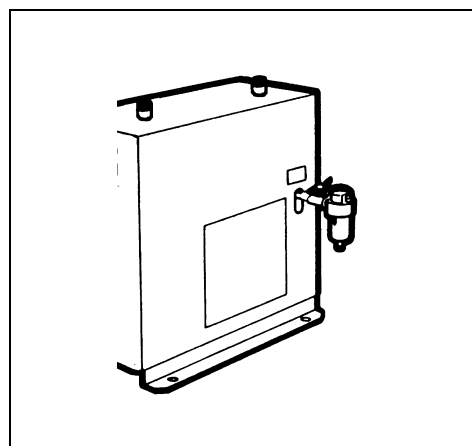
1. Turn off the power

Turn off the main power supply (power supply breaker) ·



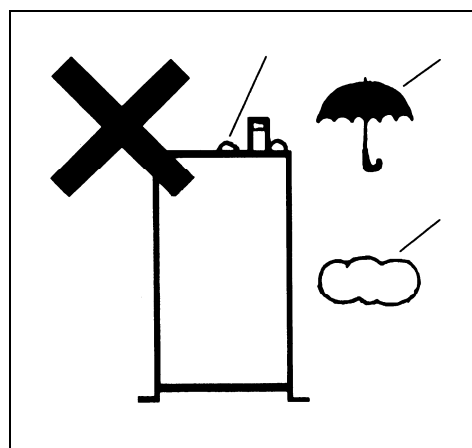
2. Purge drainage out

Discharge the drainage inside the air dryer completely through the auto drain trap.



3. Store

Store the air dryer in a place free from dirt, dust, rain, water, snow, etc ·



■ For operation after a long disuse

Perform checks of the parts of the air dryer. Then resume operation according to the instructions on preparation and operation in this manual ·

Table of Specifications

Model	FR	005A (Ⅱ)	010A (Ⅱ)	020A (Ⅱ)	030A (Ⅱ)	050A (Ⅱ)	075A (Ⅱ)	100A (Ⅱ)	150A (Ⅱ)
Measurement conditions on air processing									
Air processing capacity	m ³ / min	0.6	1.2	2.4	4.4	7.0	11.0	14.0	23.5
Inlet air pressure	MPa	0.69							
Inlet air temperature	℃	35							
Dew point of outlet air	℃	10 at pressure							
Ambient temperature	℃	32							
Allowable conditions									
Maximum inlet air temperature	℃	10 ~ 50							
Ambient temperature	℃	2 ~ 40							
Maximum air pressure	MPa	0.98							
External dimensions									
Height	mm	478	543	705	705	984	988	1220	1260
Depth	mm	490	423	423	440	490	490	984	1022
Width	mm	377	722	797	797	944	944	670	792
Net weight	kg	18	28	35	37	73	82	113	180
Air pipe connection		R 1/2	R 3/4	R 1		R 1-1/2		R 2	R 2-1/2
Electric rating									
Power source		1ø240V 50Hz						3ø415V 50Hz	
Power consumption	kW	0.3	0.4	0.6	0.8	1.6	1.6	2.3	3.4
Electric current	A	1.3	2.0	2.7	4.2	8.0	8.0	4.7	7.0
Equipment details									
Evaporator		Cross - wave fin type (Shell : SUS304)							
Condenser		Fin and tube, forced air cooling							
Fan motor for condenser	φ	120	172	225	300	350	400	450	
Refrigerant controller		Capillary tube system							
Capacity controller		Capacity control valve							
Refrigerant		R134a		R407C		R410A		R407C	
Auto drain trap		Float type						Discus type	
Protecting devices									
Compressor		—			Over current relay				
		—						phase relay	
		Motor protector							Thermostat
Refrigerant circuit		—		High pressure switch					
		Cooling fan control switch							

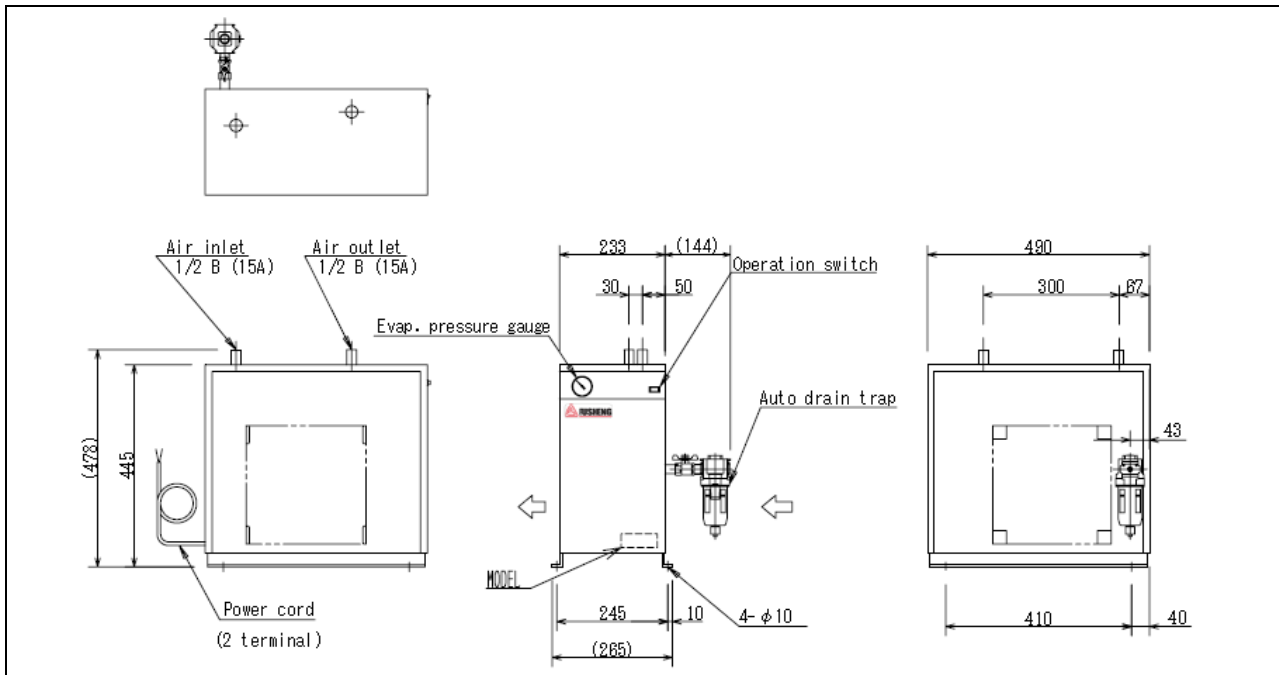
Table of Specifications

Model		FR	005AP (Ⅱ)	010AP (Ⅱ)	020AP (Ⅱ)	030AP (Ⅱ)	050AP (Ⅱ)	075AP (Ⅱ)	100AP (Ⅱ)
Measurement conditions on air processing									
	Air processing capacity	m ³ / min	0.6	1.2	2.4	4.4	7.0	11.0	14.0
	Inlet air pressure	MPa	0.69						
	Inlet air temperature	℃	55						
	Dew point of outlet air	℃	10 at pressure						
	Ambient temperature	℃	32						
Allowable conditions									
	Maximum inlet air temperature	℃	10 ~ 80						
	Ambient temperature	℃	2 ~ 40						
	Maximum air pressure	MPa	0.2 ~ 0.98						
External dimensions									
	Height	mm	478	543	705	984	988	1220	1260
	Depth	mm	490	423	440	490	490	973	1022
	Width	mm	377	722	797	944	944	670	792
Net weight		kg	20	35	37	73	82	113	180
Air pipe connection			R1/2	R3/4	R1	R1-1/2		R2	R2-1/2
Electric rating									
	Power source		1 phase 240V 50Hz					3phase415V 50Hz	
	Power consumption	kW	0.4	0.4	0.8	1.6	1.6	3.4	3.4
	Electric current	A	2.0	2.0	4.1	8.0	8.0	7	7
Equipment details									
	Evaporator		Cross - wave fin type (Shell : SUS304)						
	Condenser		Fin and tube, forced air cooling						
	Fan motor for condenser	φ	172	225	300	350	400	450	
	Refrigerant controller		Capillary tube system						
	Capacity controller		Capacity control valve						
	Refrigerant		R134a		R407C	R410A		R407C	
	Auto drain trap		Float type					Discus type	
Protecting devices									
Compressor					Over current relay				
			—					Opposite phase relay	
			Motor protector					Thermostat	
	Refrigerant circuit		—	High pressure switch					
			Cooling fan control switch						

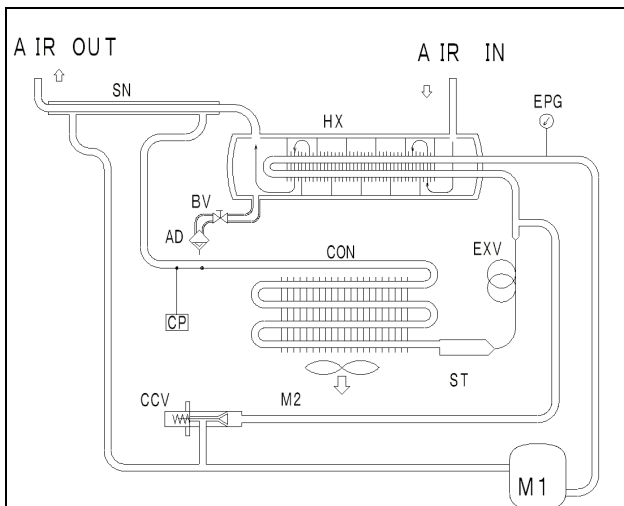
Specification

【FR005A(Ⅱ) FR005AP(Ⅱ)】

Overall Dimensions(unit : mm)

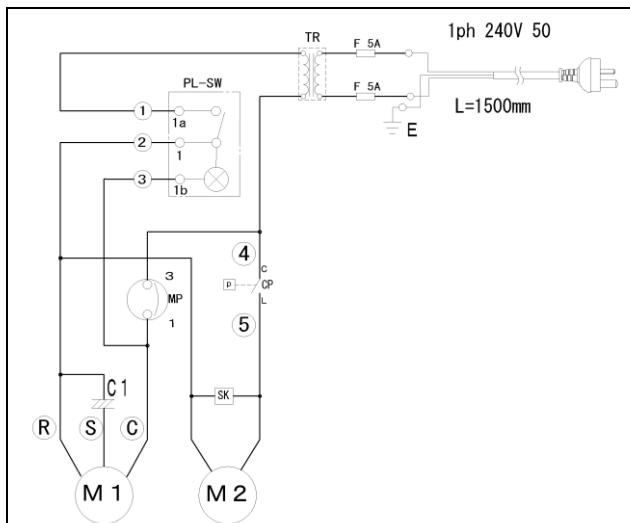


Circuit Diagram



SIGN	NAME OF PARTS
HX	Chiller
M1	Compressor motor
M2	Fan motor
CON	Condenser
ST	Strainer
EXV	Capillary tube
CCV	Capacity control valve
AD	Auto drain trap
CP	Fan cotrolling pressure switch
EPG	Evap. pressure gauge
BV	Ball valve

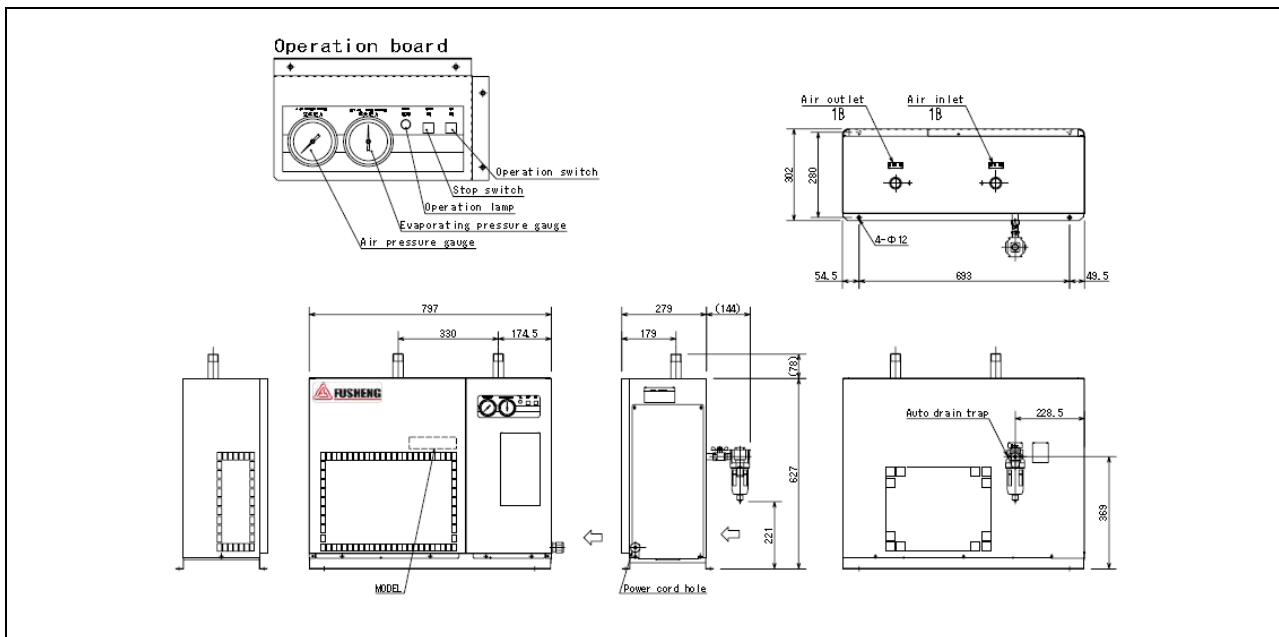
Wiring Diagram



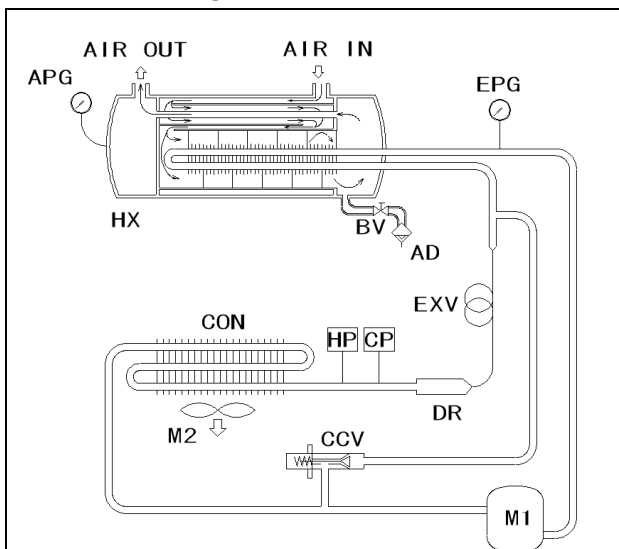
SIGN	Name of Parts
M1	Motor (Compressor motor)
M2	Motor (Fan motor)
MP	Motor protector
CP	Fan control pressure switch
C1	Running capacitor
PL-SW	Operation switch with lamp
SK	Spark killer
TR	Transformer
F	Fuse (5A 32mm)

【FR020A(Ⅱ)】

Overall Dimensions(unit : mm)

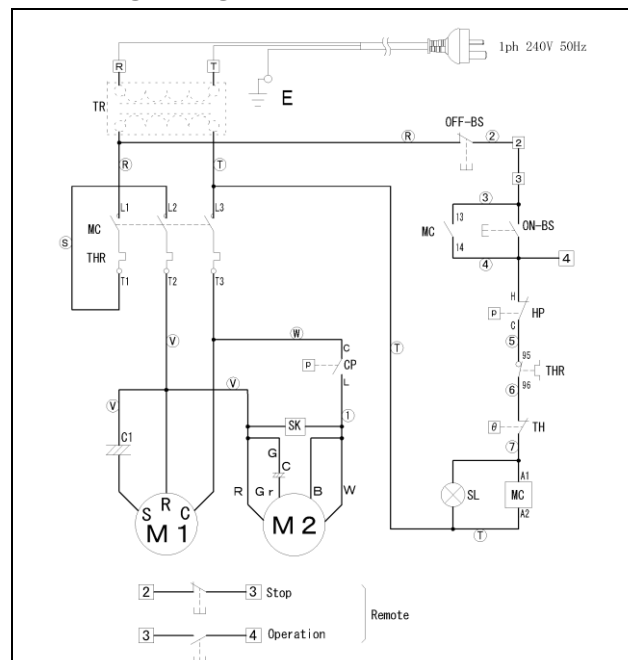


Circuit Diagram



SIGN	NAME OF PARTS
HX	Chiller
M1	Compressor motor
M2	Fan motor
CON	Condenser
DR	Dryer
EXV	Capillary tube
CCV	Capacity control valve
CP	Fan cotrolling pressure switch
HP	High pressure switch
APG	Air pressure gauge
EPG	Evap. pressure gauge
BV	Ball valve
AD	Auto drain trap

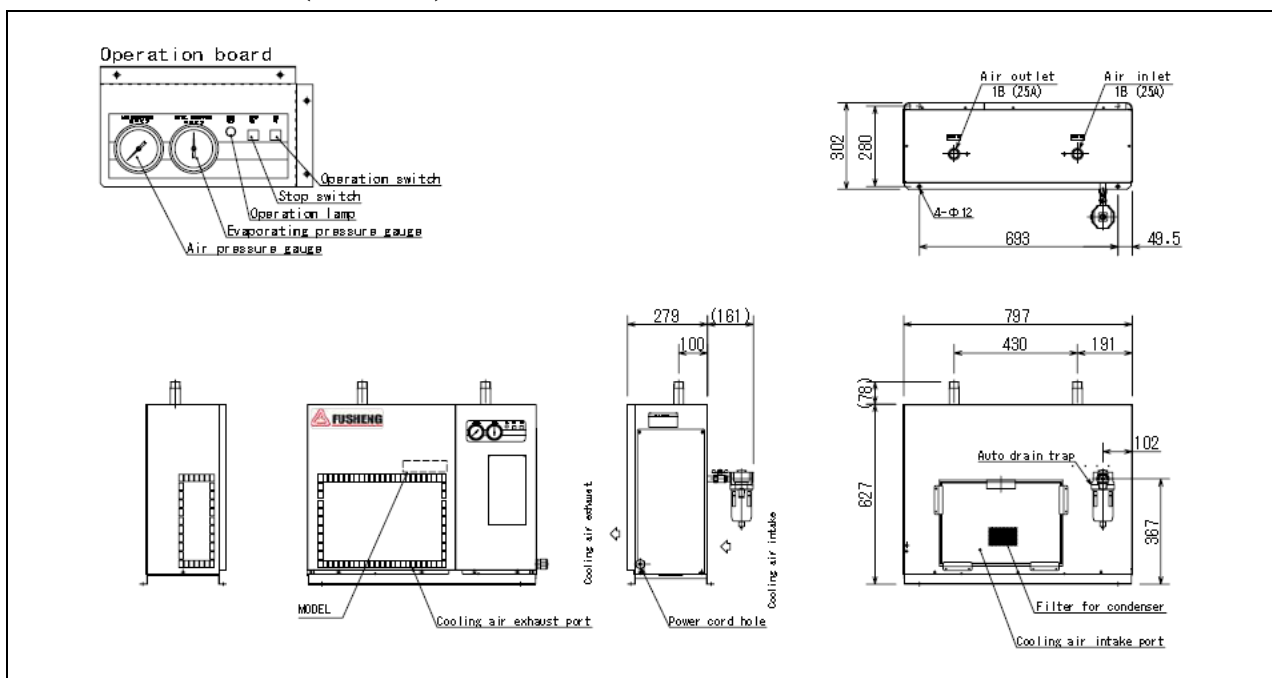
Wiring Diagram



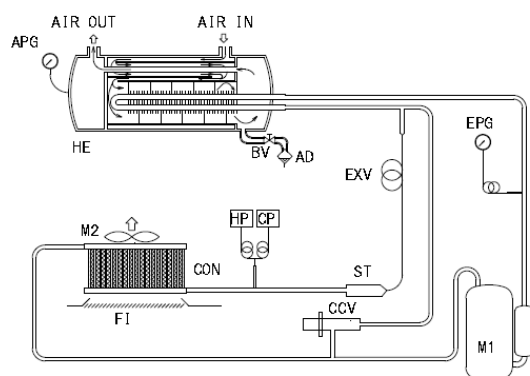
SIGN	Name of parts
M1	Motor (Compressor motor)
M2	Motor (Fan motor)
MC	Electromagnetic contactor
THR	Over current relay
C1	Starting condenser (M1)
TH	Thermostat(Compressor motor)
OFF-PB	Stop switch
ON-PB	Operation switch
C	Operation condenser (M2)
CP	Fan control pressure switch
HP	High pressure switch
SL	Operation lamp (Green)
SK	Spark Killer
TR	Transformer

【FR020AP(Ⅱ) FR030A(Ⅱ)】

Overall Dimensions(unit : mm)

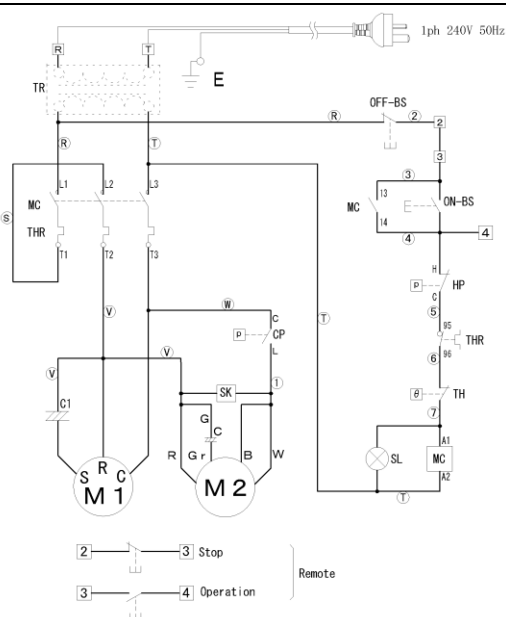


Circuit Diagram



SIGN	Name of parts
HE	Chiller
M1	Compressor motor
M2	Fan motor
CON	Condenser
ST	Strainer
EXV	Capillary tube
CCV	Capacity control valve
HP	High pressure switch
CP	Fan control pressure switch
EPG	Evaporating pressure gauge
APG	Air pressure gauge
BV	Ball valve
AD	Auto drain trap
F1	Filter for condenser

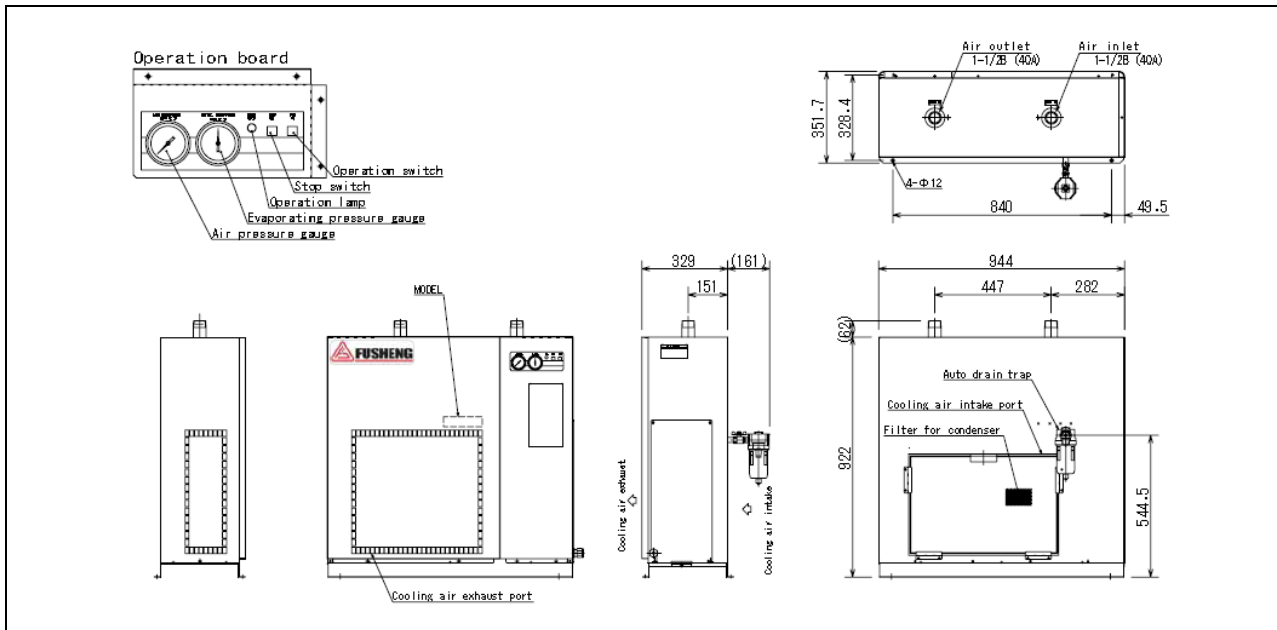
Wiring Diagram



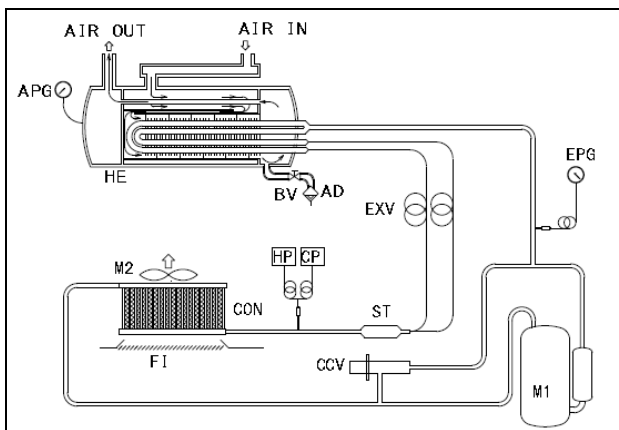
SIGN	Name of parts
M1	Motor (Compressor motor)
M2	Motor (Fan motor)
MC	Electromagnetic contactor
THR	Over current relay
C1	Running Capacitor (M1)
TH	Thermostat (Compressor motor)
OFF-PB	Stop switch
ON-PB	Operation switch
C	Operation capacitor (M2)
CP	Fan control pressure switch
HP	High pressure switch
SL	Operation lamp (Green)
SK	Spark Killer
TR	Transformer

【FR030AP(Ⅱ) FR050A(Ⅱ)】

Overall Dimensions(unit : mm)

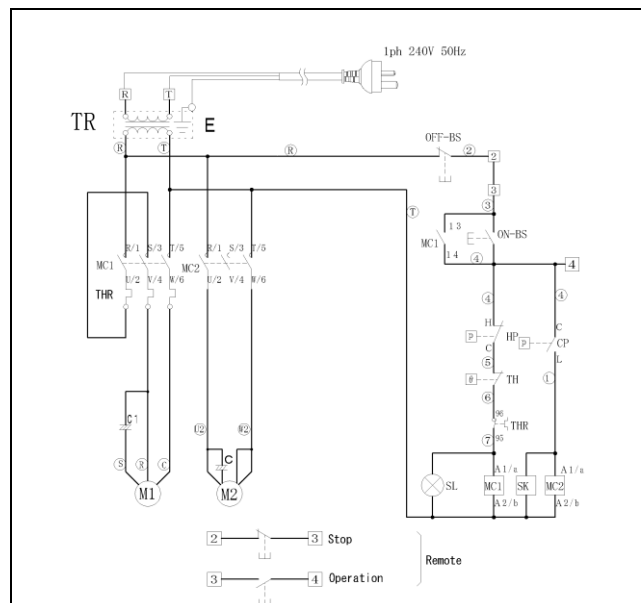


Circuit Diagram



SIGN	Name of parts
HE	Chiller
M1	Compressor motor
M2	Fan motor
CON	Condenser
ST	Strainer
EXV	Capillary tube
CCV	Capacity control valve
HP	High pressure switch
CP	Fan control pressure switch
EPG	Evaporating pressure gauge
APG	Air pressure gauge
BV	Ball valve
AD	Auto drain trap
FI	Filter for condenser

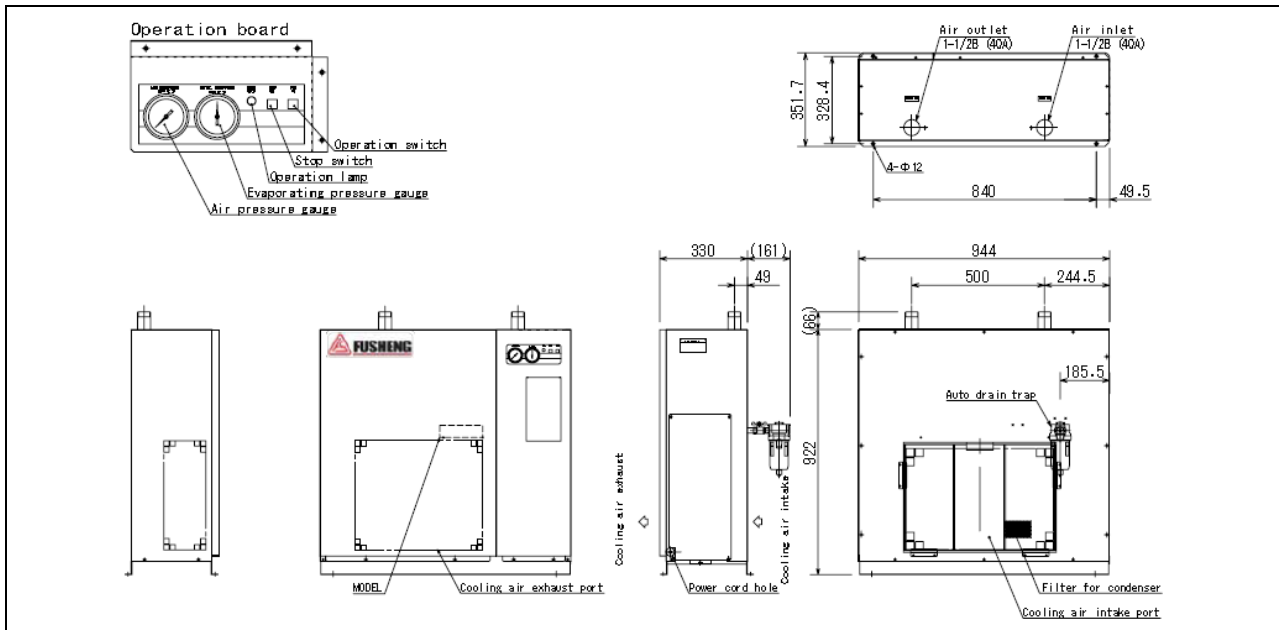
Wiring Diagram



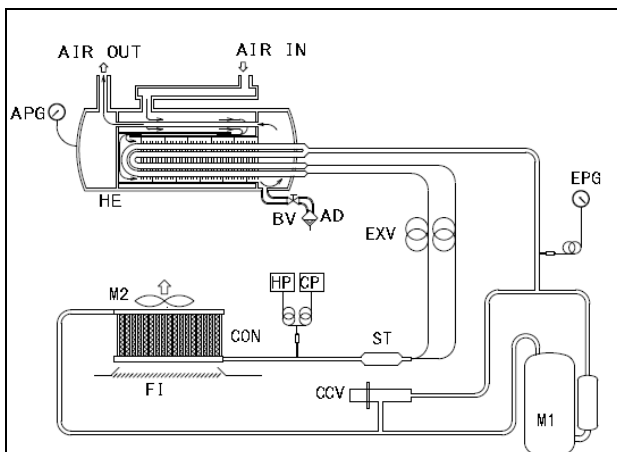
SIGN	Name of parts
M1	Motor (Compressor motor)
M2	Motor (Fan motor)
MC1	Electromagnetic contactor (M1)
THR	Over current relay
MC2	Electromagnetic contactor (M2)
TR	Transformer
TH	Thermostat (Compressor motor)
OFF-BS	Stop switch
ON-BS	Operation switch
CP	Fan control pressure switch
HP	High pressure switch
SL	Operation lamp (Green)
SK	Spark Killer
C1	Running Capacitor for M1
C	Running Capacitor for M2

【FR050AP(Ⅱ) FR075A(Ⅱ)】

Overall Dimensions(unit : mm)

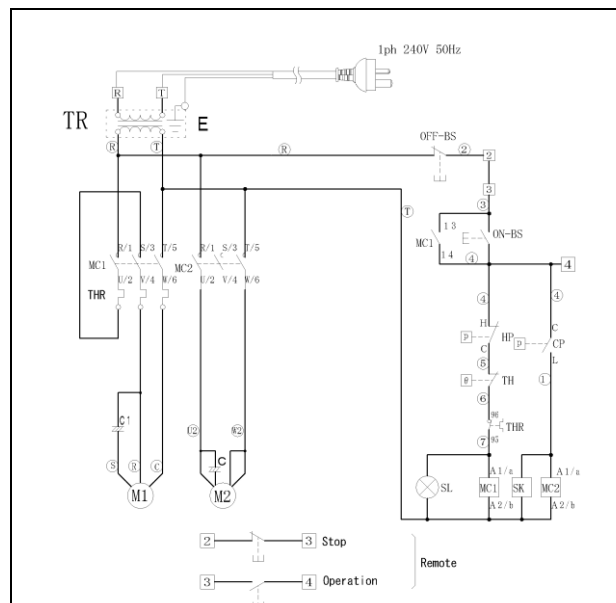


Circuit Diagram



SIGN	Name of parts
HE	Chiller
M1	Compressor motor
M2	Fan motor
CON	Condenser
ST	Strainer
EXV	Capillary tube
CCV	Capacity control valve
HP	High pressure switch
CP	Fan control pressure switch
EPG	Evaporating pressure gauge
APG	Air pressure gauge
BV	Ball valve
AD	Auto drain trap
FI	Filter for condenser

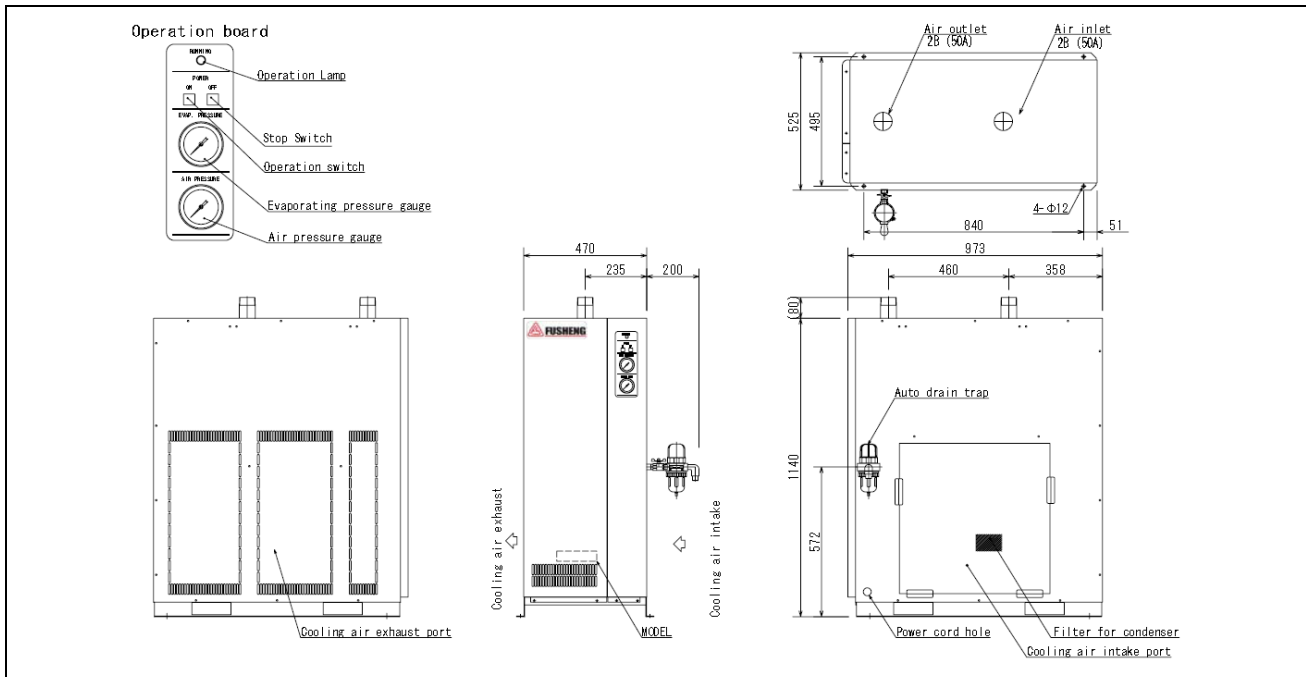
Wiring Diagram



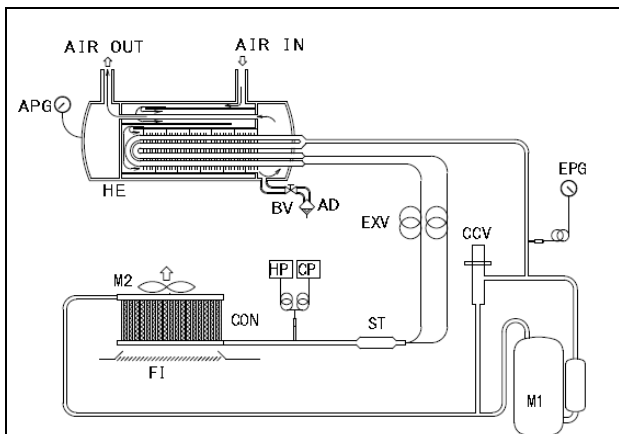
SIGN	Name of parts
M1	Motor (Compressor motor)
M2	Motor (Fan motor)
MC1	Electromagnetic contactor (M1)
THR	Over current relay
MC2	Electromagnetic contactor (M2)
TR	Transformer
TH	Thermostat (Compressor motor)
OFF-BS	Stop switch
ON-BS	Operation switch
CP	Fan control pressure switch
HP	High pressure switch
SL	Operation lamp (Green)
SK	Spark Killer
C1	Running Capacitor for M1
C	Running Capacitor for M2

【FR100A(Ⅱ) FR075AP(Ⅱ)(60Hz)】

Overall Dimensions(unit : mm)

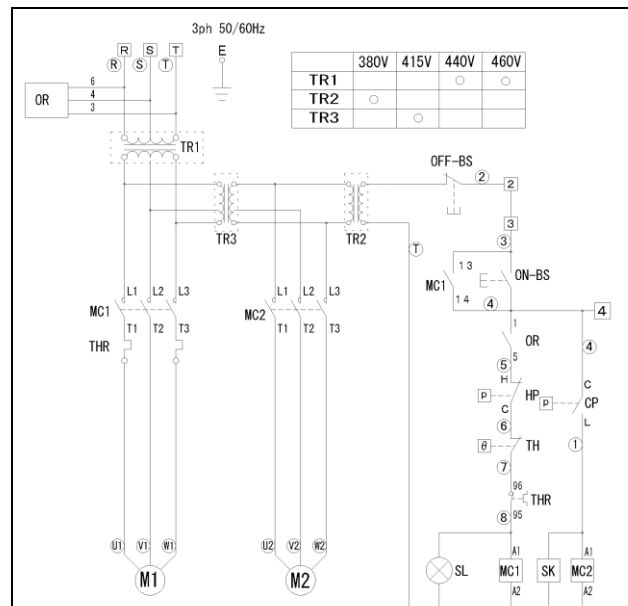


Circuit Diagram



SIGN	Name of parts
HE	Chiller
M1	Compressor motor
M2	Fan motor
CON	Condenser
ST	Strainer
EXV	Capillary tube
CCV	Capacity control valve
HP	High pressure switch
CP	Fan control pressure switch
EPG	Evaporating pressure gauge
APG	Air pressure gauge
BV	Ball valve
AD	Auto drain trap
FI	Filter for condenser

Wiring Diagram

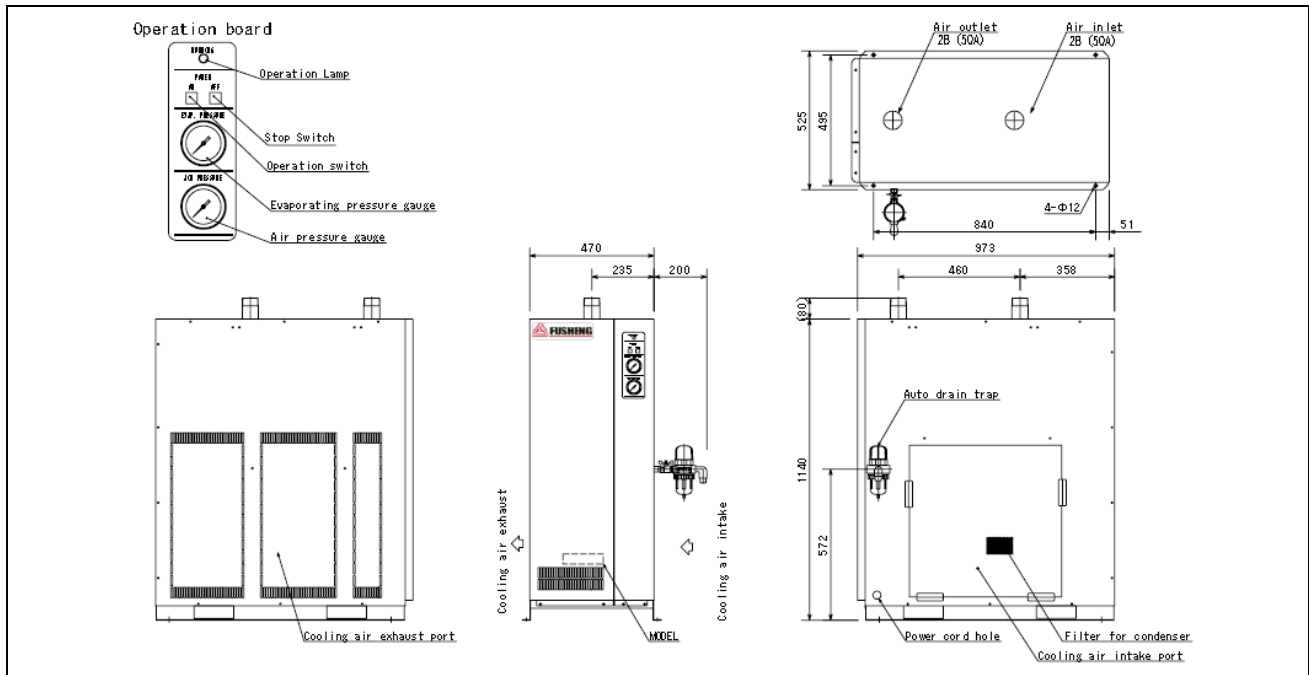


SIGN	Name of parts
M1	Motor (Compressor motor)
M2	Motor (Fan motor)
MC1	Electromagnetic contactor (M1)
THR	Over current relay
MC2	Electromagnetic contactor (M2)
OR	Opposite phase relay
TH	Thermostat (Compressor motor)
OFF-PB	Stop switch
ON-PB	Operation switch
CP	Fan control pressure switch
HP	High pressure switch
SL	Operation lamp (Green)
SK	Spark Killer
TR1, 2, 3	Transformer

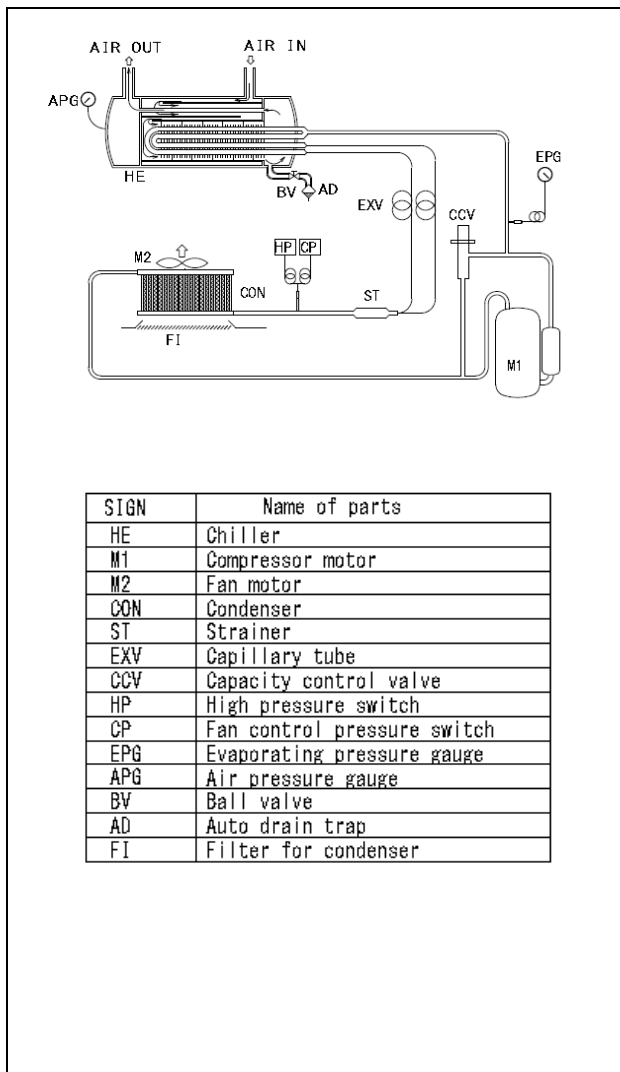
※ □ represents terminal block number.
○ represents wire number.

【FR075AP(Ⅱ)(50Hz)】

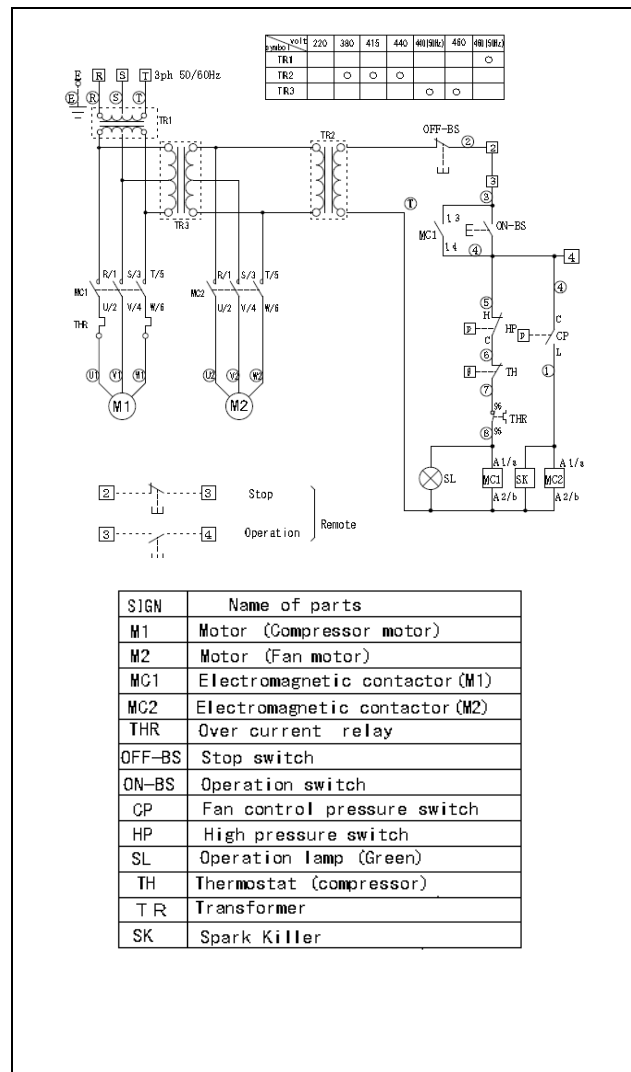
Overall Dimensions(unit : mm)



Circuit Diagram

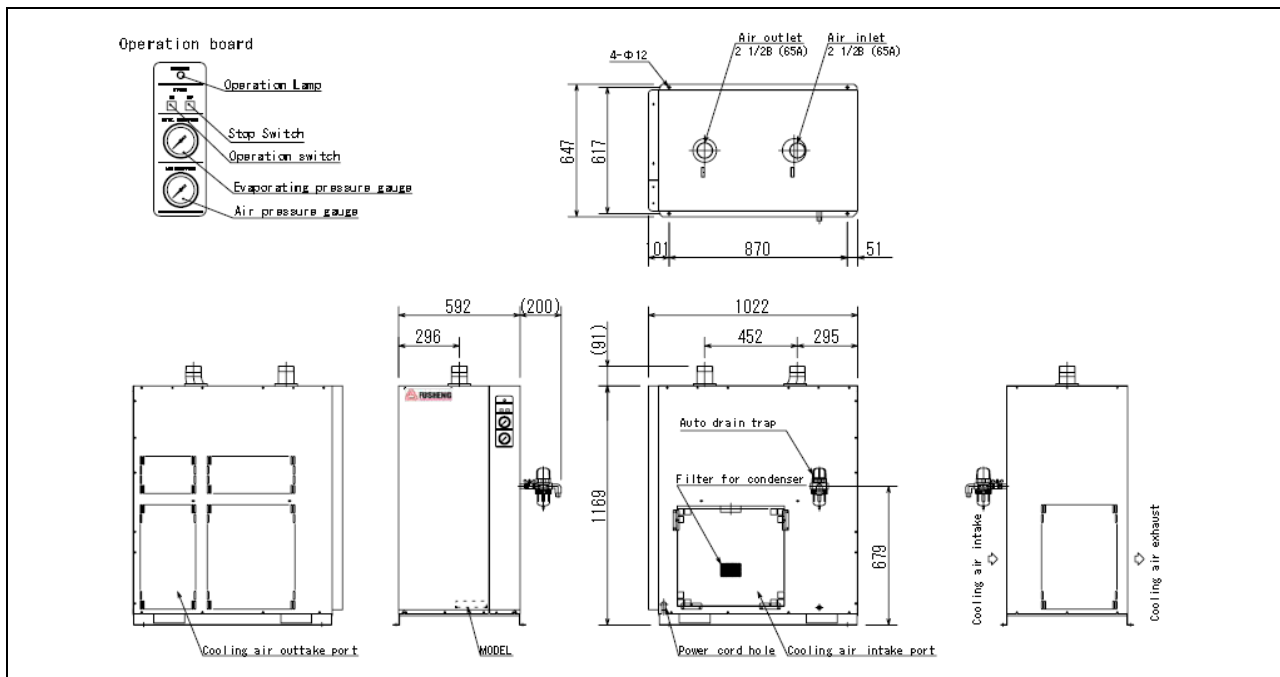


Wiring Diagram

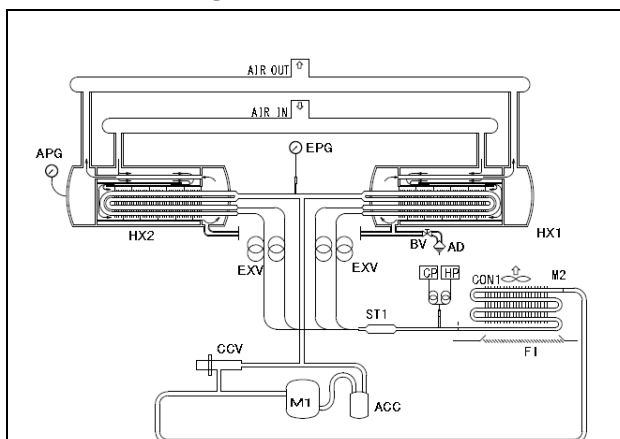


【FR100AP(Ⅱ) FR150A(Ⅱ)】

Overall Dimensions(unit : mm)

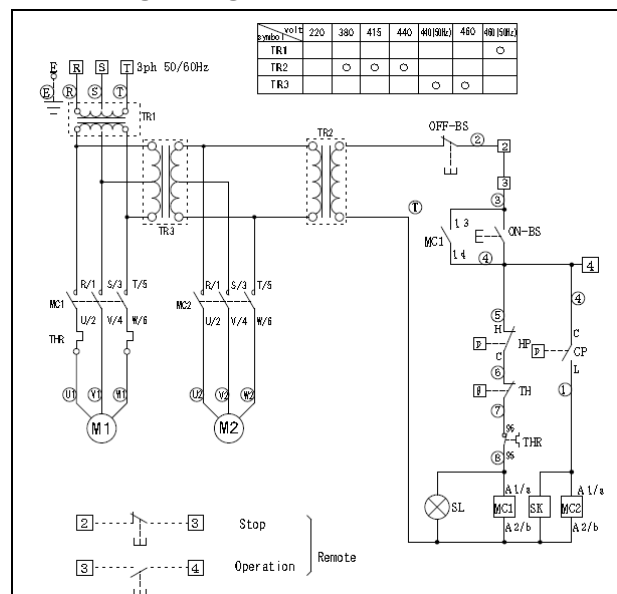


Circuit Diagram



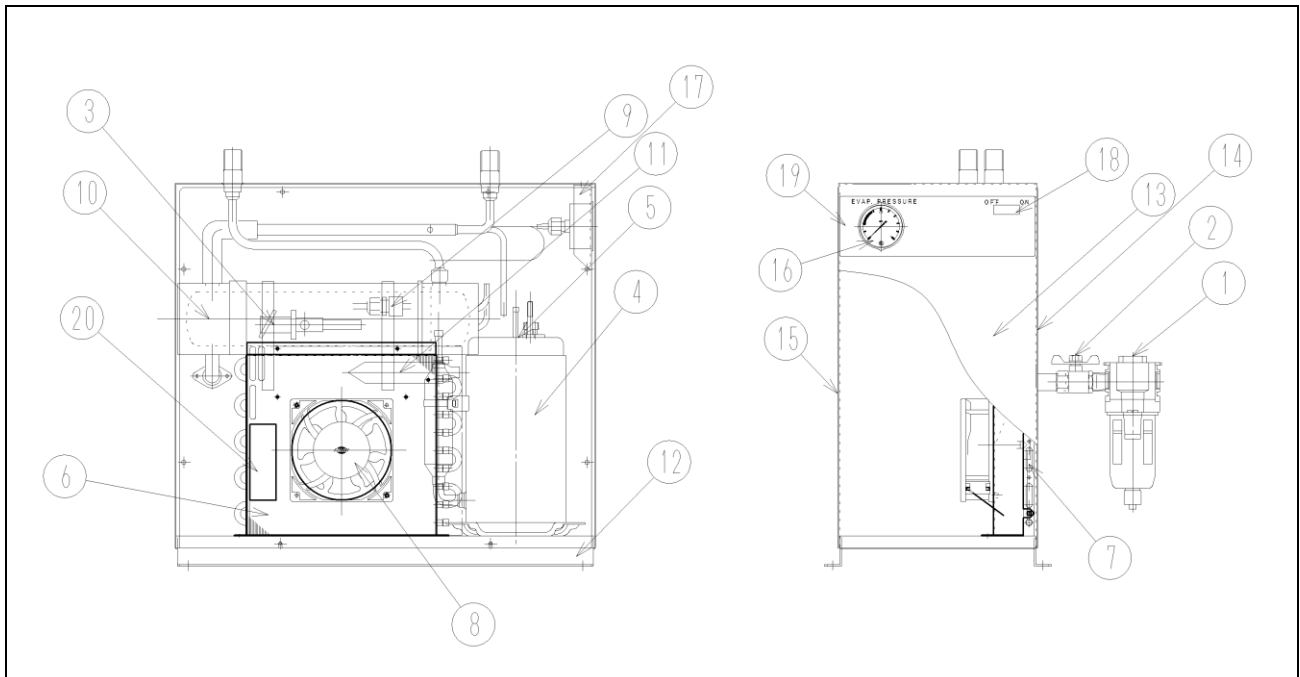
SIGN	Name of parts
HE1.2	Chiller
M1	Compressor motor
M2	Fan motor
CON1	Condenser
ST1	Strainer
EXV	Capillary tube
CCV	Capacity control valve
HP	High pressure switch
CP	Fan control pressure switch
EPG	Evaporating pressure gauge
APG	Air pressure gauge
BV	Ball valve
AD	Auto drain trap
F1	Filter for condenser
ACC	Accumulator

Wiring Diagram



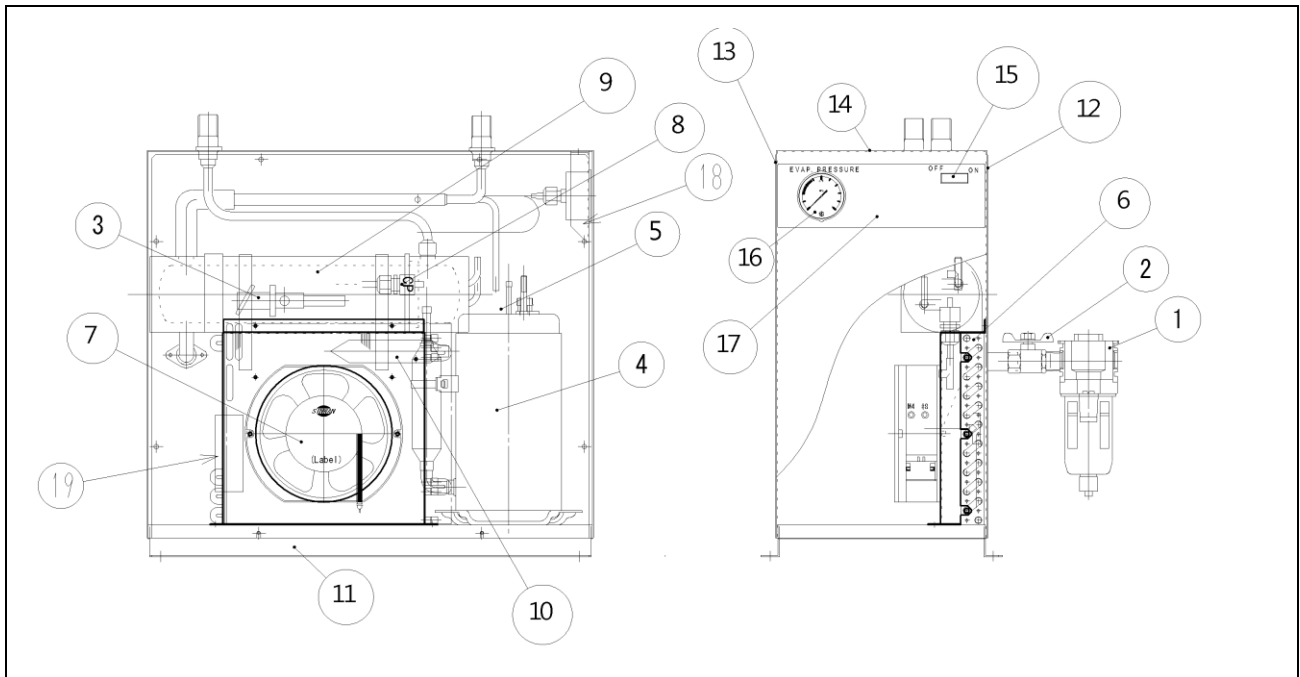
SIGN	Name of parts
M1	Motor (Compressor motor)
M2	Motor (Fan motor)
MC1	Electromagnetic contactor (M1)
MC2	Electromagnetic contactor (M2)
THR	Over current relay
OFF-BS	Stop switch
ON-BS	Operation switch
CP	Fan control pressure switch
HP	High pressure switch
SL	Operation lamp (Green)
TH	Thermostat (compressor)
TR	Transformer
SK	Spark Killer

PARTS LIST FR005A(Ⅱ)



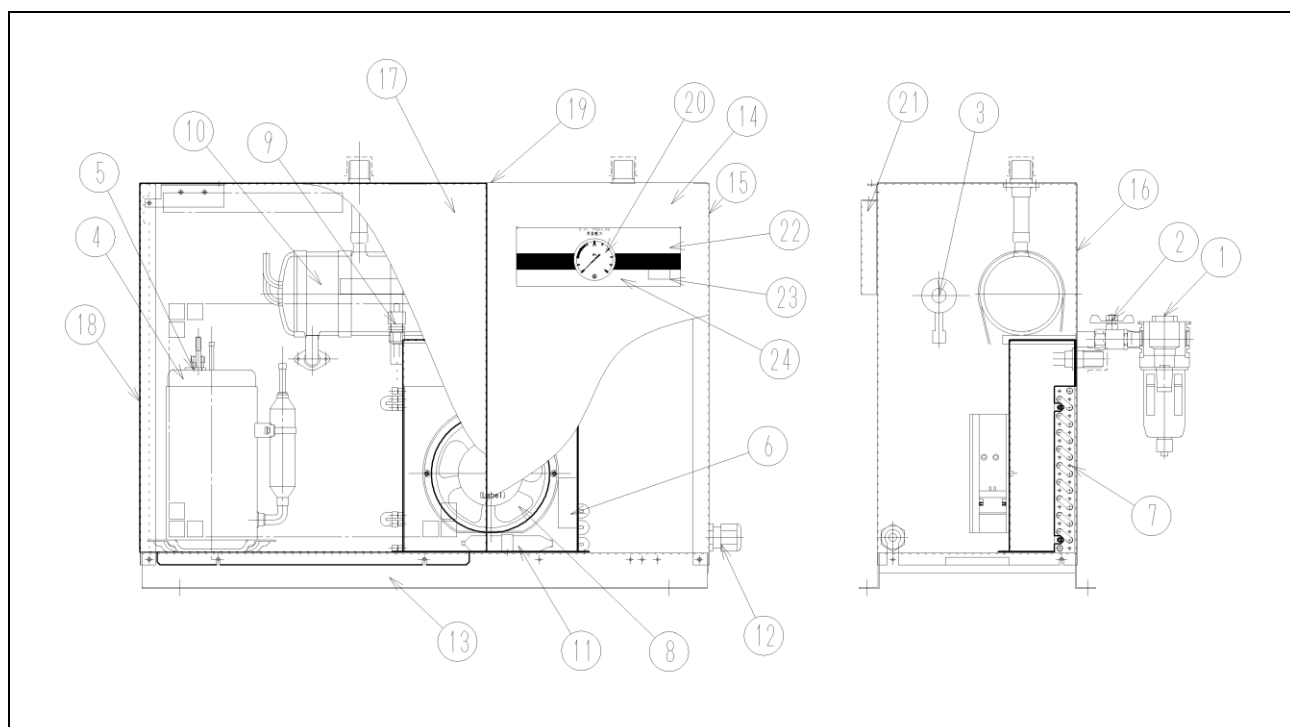
No.	PART NAME	SPECIFICATION	Q'TY
1	AUTO DRAIN TRAP	DT3000	1
2	BALL VALVE	111TP	1
3	CAPACITY CONTROL VALVE	CGX-2315DM	1
4	BARE COMPRESSOR	35D026-B3-AKAA	1
5	MOTOR PROTECTOR	MRA12331-12095	1
6	HOOD	EGC-B	1
7	CONDENSER	1X8X220	1
8	FAN	S109AP-11-1	1
9	FAN CONTROL	ACB-0905	1
10	HEAT EXCHANGER	RAX-3B	1
11	REFRIGERANT STRAINER	9G	1
12	BASE	LGHC	1
13	PANEL	EGC-B	1
14	RIGHT SIDE PANEL	EGC-B	1
15	LEFT SIDE PANEL	EGC-B	1
16	PRESSURE GAUGE 50	6123-0900-00	1
17	GAUGE FITTING	LGHC	1
18	CORRUGATED SWITCH	3035-POT2B01RDBK	1
19	OPERATION PLATE FILM	TETRONIC FILM	1
20	RUNNING CAPACITOR	10μF	1

PARTS LIST FR005AP(Ⅱ)



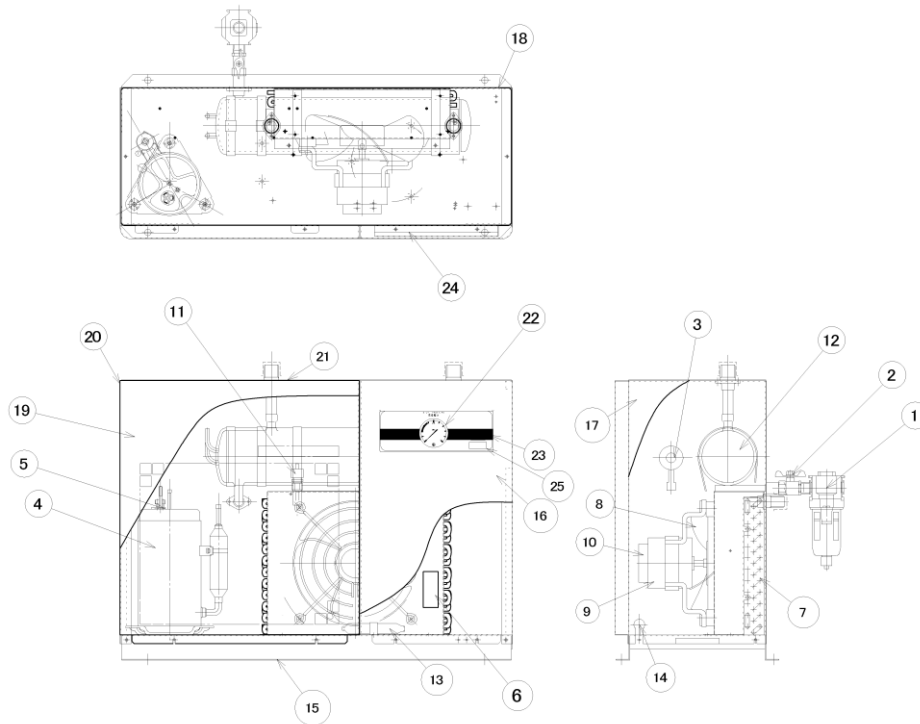
No.	PART NAME	SPECIFICATION	Q'TY
1	AUTO DRAIN TRAP	DT4000	1
2	BALL VALVE	111TP	1
3	CAPACITY CONTROL VALVE	CGX-2315DM	1
4	BARE COMPRESSOR	35D035-B3-AKAA	1
5	MOTOR PROTECTOR	MRA12255-12095	1
6	CONDENSER	C2-10-220	1
7	FAN	S150AP	1
8	FAN CONTROL	ACB-0905	1
9	HEAT EXCHANGER	TRX-5H	1
10	REFRIGERANT STRAINER	9G	1
11	BASE	LGHC	
12	RIGHT SIDE PANEL	EGC-B	1
13	LEFT SIDE PANEL	EGC-B	1
14	UP PANEL	EGC-B	1
15	CORRUGATED SWITCH	3036-POT2801ROBK	1
16	PRESSURE GAUGE 50	6123-0900-00	1
17	OPERATION PLATE FILM	TETRONIC FILM	1
18	GAUGE FITTING	LGHC 2.3T	1
19	RUNNING CAPACITOR	10 μ F 450V	1

FR010A(Ⅱ)



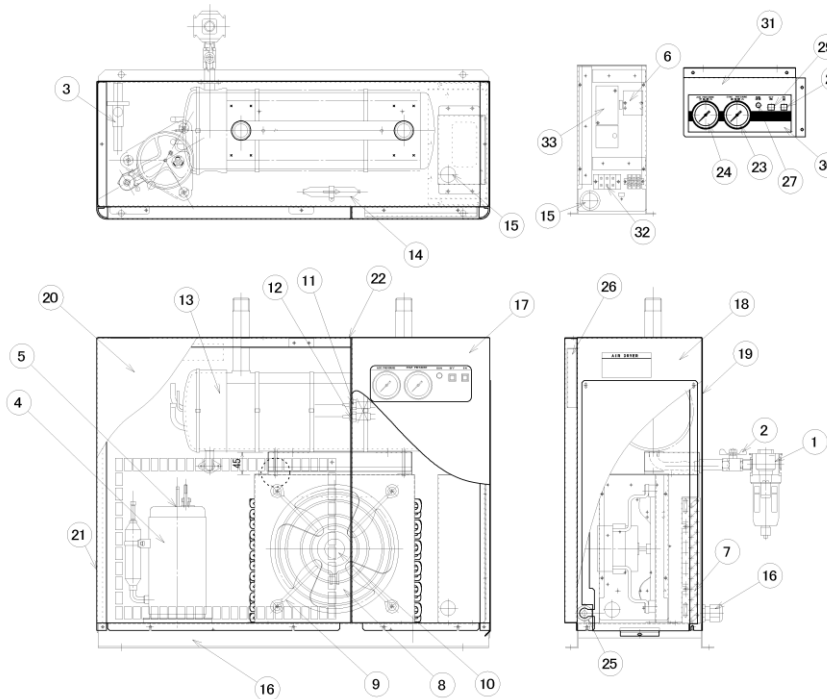
No.	PART NAME	SPECIFICATION	Q'TY
1	AUTO DRAIN TRAP	DT4000	1
2	BALL VALVE	111TP	1
3	CAPACITY CONTROL VALVE	CGX-2315DM	1
4	BARE COMPRESSOR	35D026-B3-AKAA	1
5	MOTOR PROTECTOR	MRA12331-12095	1
6	CAPACITOR	10Mf	1
7	CONDENSER	2-10-245-O	1
8	FAN	S150AP	1
9	FAN CONTROL	ACB0905	1
10	HEAT EXCHANGER	RAX-8B	1
11	REFRIGERANT STRAINER	9G	1
12	CABLE GLEND	φ20	1
13	BASE	LGHC	1
14	RIGHT FRONT PANEL	EGC-B	1
15	RIGHT SIDE PANEL	EGC-B	1
16	REAR PANEL	EGC-B	1
17	LEFT FRONT PANEL	EGC-B	1
18	LEFT SIDE PANEL	EGC-B	1
19	UPPER PANEL	EGC-B	1
20	PRESSURE GAUGE 50	6123-0900-00	1
21	GAUGE FITTING	LGHC 2.3T	1
22	CONTROL PANEL	EGC-B	1
23	CORRUGATED SWITCH	3036-POT2801ROBK	1
24	OPERATION PLATE FILM	TETRONIC FILM	1

FR010AP(Ⅱ)



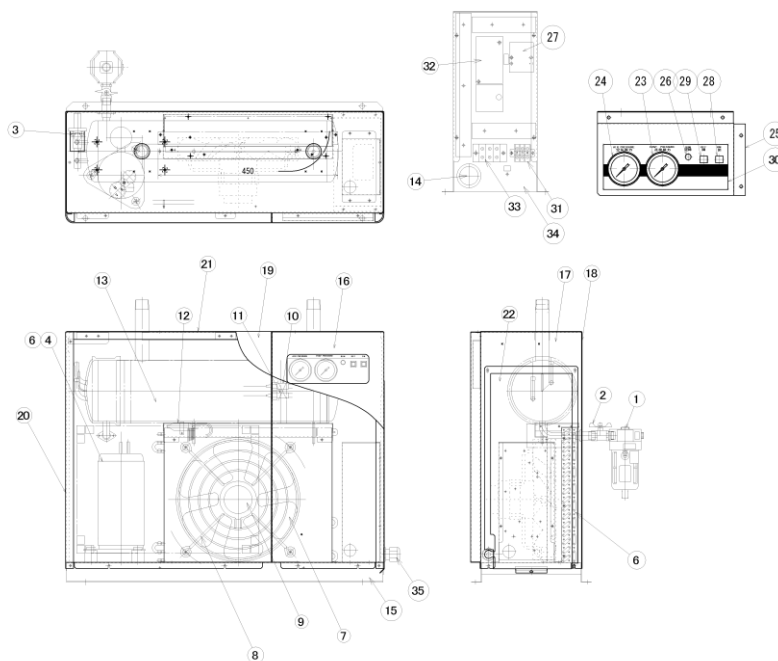
No.	PART NAME	SPECIFICATION	Q'TY
1	AUTO DRAIN TRAP	DT4000	1
2	BALL VALVE	111TP	1
3	CAPACITY CONTROL VALVE	CGX-2315DM	1
4	BARE COMPRESSOR	35D035-B3-ABAA	1
5	MOTOR PROTECTOR	MRA12331-12095	1
6	CAPACITOR	10 μ F 450VAC	1
7	CONDENSER	C3-12-330	1
8	FAN	225	1
9	FAN GUARD	225	1
10	MOTOR	KAF12142 (1 ϕ ,220V 50/60Hz)	1
11	FAN CONTROL	ACB0905	1
12	HEAT EXCHANGER	RAX-8B	1
13	REFRIGERANT STRAINER	9G	1
14	CABLE GLEND	ϕ 20	1
15	BASE	LGHC	1
16	RIGHT FRONT PANEL	EGC-B	1
17	RIGHT SIDE PANEL	EGC-B	1
18	REAR PANEL	EGC-B	1
19	LEFT FRONT PANEL	EGC-B	1
20	LEFT SIDE PANEL	EGC-B	1
21	UPPER PANEL	EGC-B	1
22	PRESSURE GAUGE 50	6123-0900-00	1
23	CONTROL PANEL	EGC-B	1
24	GAUGE FITTING	LGHC 2.3T	
25	CORRUGATED SWITCH	3036-POT2801ROBK	1

FR020A(Ⅱ)



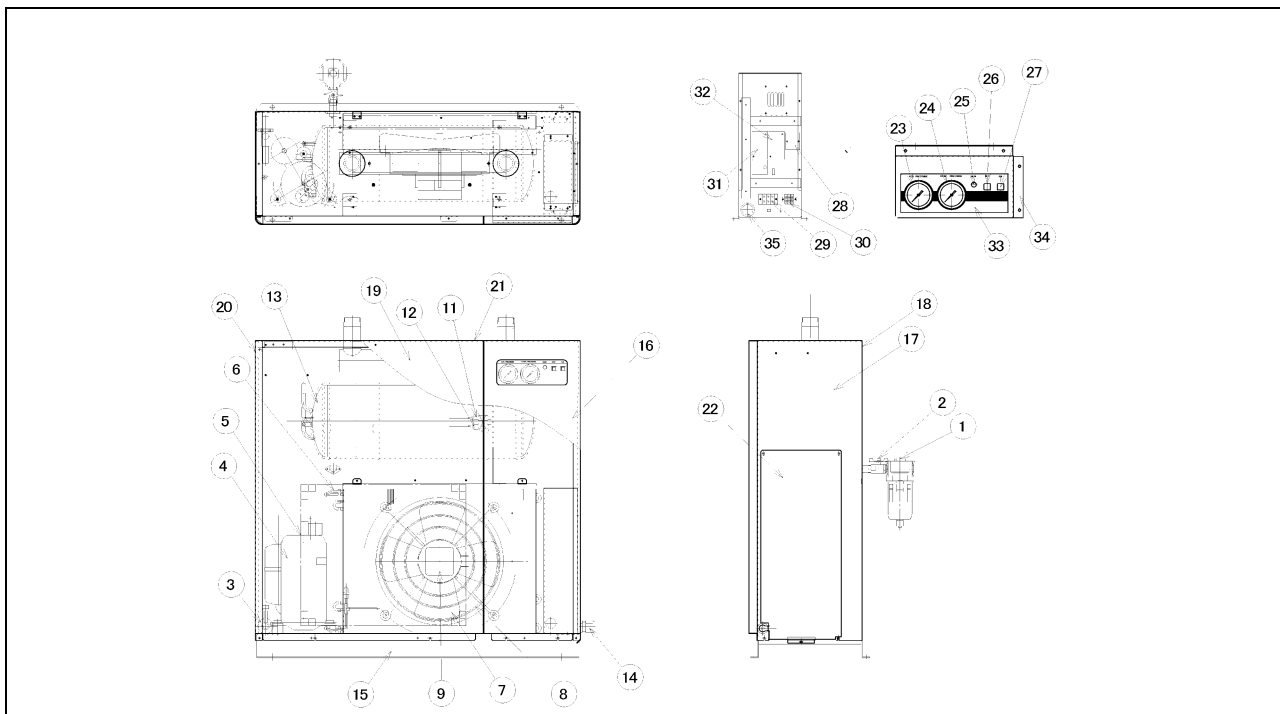
No.	PART NAME	SPECIFICATION	Q'TY
1	AUTO DRAIN TRAP	DT-4000	1
2	BALL VALVE	111TP	1
3	CAPACITY CONTROL VALVE	CGX-2315DH	1
4	BARE COMPRESSOR	KE-C072QZ or 35D042-C3- AJJA	1
5	MOTOR PROTECTOR	MRA9932-9054	1
6	RUNNING CAPACITOR	15 μ F	1
7	CONDENSER	C3-12-320	1
8	FAN	250D (10")	1
9	FAN GUARD	250D (10")	1
10	MOTOR	T12	1
11	FAN CONTROL	ACB2114	1
12	HIGH PRESSURE SWITCH	ACB2330	1
13	HEAT EXCHANGER	20	1
14	REFRIGERANT STRAINER		1
15	BUSH	ϕ 20	1
16	BASE	LGHC	1
17	RIGHT FRONT PANEL	EGC-B	1
18	RIGHT SIDE PANEL	EGC-B	1
19	REAR PANEL	EGC-B	1
20	LEFT FRONT PANEL	EGC-B	1
21	LEFT SIDE PANEL	EGC-B	1
22	UPPER PANEL	EGC-B	1
23	PRESSURE GAUGE 50	6123-0900-00	1
24	PRESSURE GAUGE 50	M500-04-2084	1
25	CABLE GLEND	ϕ 25	1
26	FIXED METAL A	LGHC 2.3T	1
27	PILOT LAMP	NB-281PGF AC220V	1
28	PUSH BUTTON SWITCH	P13-1B(WHITE)	1
29	PUSH BUTTON SWITCH	P13-1C(RED)	1
30	OPERATION PLATE FILM	TETRONIC FILM	1
31	CONTROL PANEL	EGC-B	1
32	TERMINAL BLOCK	TB112F 3P	1
33	MAGNETIC CONTACTOR	LC1D09M7	1

FR020AP(Ⅱ) FR030A(Ⅱ)



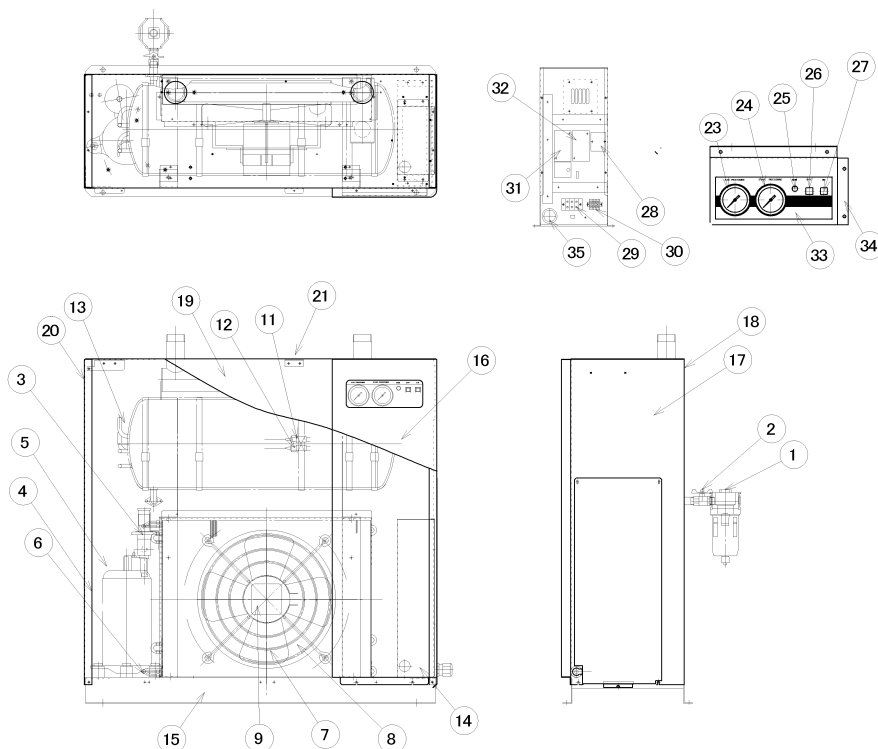
No.	PART NAME	SPECIFICATION	Q'TY
1	AUTO DRAIN TRAP ASSY.	DT-4000	1
2	BALL VALVE	1/2" T201-04BTP	1
3	CAPACITY CONTROL VALVE	SPX-4540DH	1
4	BARE COMPRESSOR	41T086-C3-BMKD	1
5	THERMOSTAT	MRA99255-9079	1
6	CONDENSER	3-16-420	1
7	FAN	12"	1
8	FAN GUARD	12"	1
9	MOTOR	KAF12142 (1 ϕ , 220V 50/60Hz)	1
10	FAN CONTROL	ACB-2114A	1
11	HIGH PRESSURE SWITCH	ACB-2330	1
12	REFRIGERANT STRAINER	1/4"x1/4" ϕ 2.4 (ϕ 18.85x10.7)	1
13	HEAT EXCHANGER	02090149040 RAX22F	1
14	BUSH	ϕ 30	2
15	BASE	LGHC	1
16	RIGHT FRONT PANEL	EGC-B	1
17	RIGHT SIDE PANEL	EGC-B	1
18	REAR PANEL	EGC-B	1
19	LEFT FRONT PANEL	EGC-B	1
20	LEFT SIDE PANEL	EGC-B	1
21	UPPER PANEL	EGC-B	1
22	SWITCH BOARD COVER	EGC-B	1
23	PRESSURE GAUGE 50	0-1.5MPa	1
24	PRESSURE GAUGE 50	6123-0914-00	1
25	CONTROL PANEL	EGC-B	1
26	PILOT LAMP	NB-281PGF AC220V	1
27	RUNNING CAPACITOR	17 μ F400VAC	1
28	ON-PUSH BUTTON SWITCH	P13-1B (WHITE)	1
29	OFF-PUSH BUTTON SWITCH	P13-1C (RED)	1
30	OPERATION PLATE FILM	TETRONIC FILM 0.125T	1
31	TERMINAL BLOCK	TB112F 3P	1
32	MAGNETIC CONTACTOR	S-C12D10G7 (220V)	1
33	TERMINAL BLOCK	TB112F 3P 25A	1
34	SWITCHBOARD BASE	EGC-B	1
35	CABLE GLEND	ϕ 25	1

FR030AP(Ⅱ) FR050A(Ⅱ)



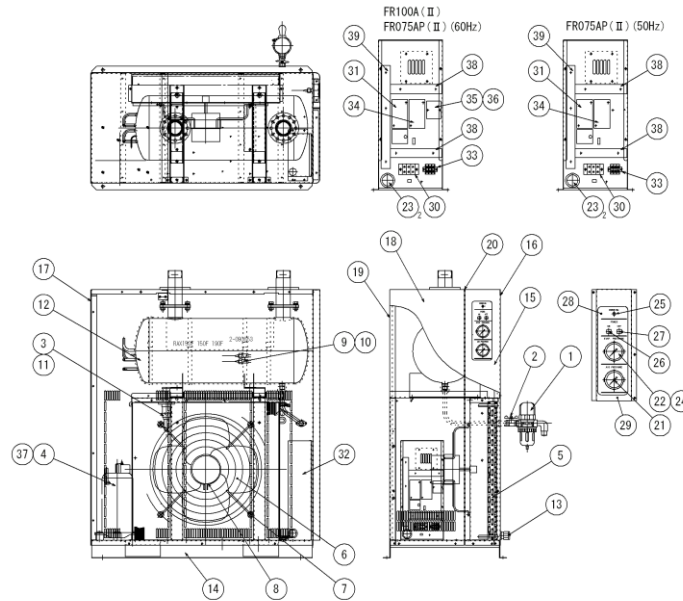
No.	PART NAME	SPECIFICATION	Q'TY
1	AUTO DRAIN TRAP ASSY.	DT4000	1
2	BALL VALVE	1/2" T201-04BTP	1
3	CAPACITY CONTROL VALVE	SPX-4540DVQ47	1
4	BARE COMPRESSOR	50A473V	1
5	THERMOSTAT	Internal	1
6	CONDENSER	C3X20X560	1
7	FAN	350D (14")	1
8	FAN GUARD	350D (14")	1
9	MOTOR	T14	1
10	FAN CONTROL	ACB-2619A	1
11	HIGH PRESSURE SWITCH	ACB-4.15-3.2	1
12	COPPER PIPE STRAINER	FS1033-35(3/8")	1
13	HEAT EXCHANGER	RAX37F	1
14	CABLE CONNECTOR	φ 25	1
15	BASE	LGHC	1
16	RIGHT FRONT PANEL	EGC-B	1
17	RIGHT SIDE PANEL	EGC-B	1
18	REAR PANEL	EGC-B	1
19	LEFT FRONT PANEL	EGC-B	1
20	LEFT SIDE PANEL	EGC-B	1
21	UPPER PANEL	EGC-B	1
22	SWITCH BOARD COVER	EGC-B	1
23	PRESSURE GAUGE 50	0-1.5MPa	1
24	PRESSURE GAUGE 50	6123-0914-00	1
25	PILOT LAMP		1
26	PUSH BUTTON SWITCH	P13-1B(WHITE)	1
27	PUSH BUTTON SWITCH	P13-1C(RED)	1
28	Opposite phase relay	APR-3	0
29	TERMINAL BLOCK	TB112F 3P 25A	1
30	TERMINAL BLOCK	NHC-10-3P	1
31	MAGNETIC SWITCH	LC1D09M7 LR3D-166(9~13A)	1
32	MAGNETIC CONTACTOR		1
33	OPERATION PLATE FILM	TETRONIC FILM	1
34	CONTROL PANEL	EGC-B	1
35	BUSH	φ 30	1

FR050AP(Ⅱ) FR075A(Ⅱ)



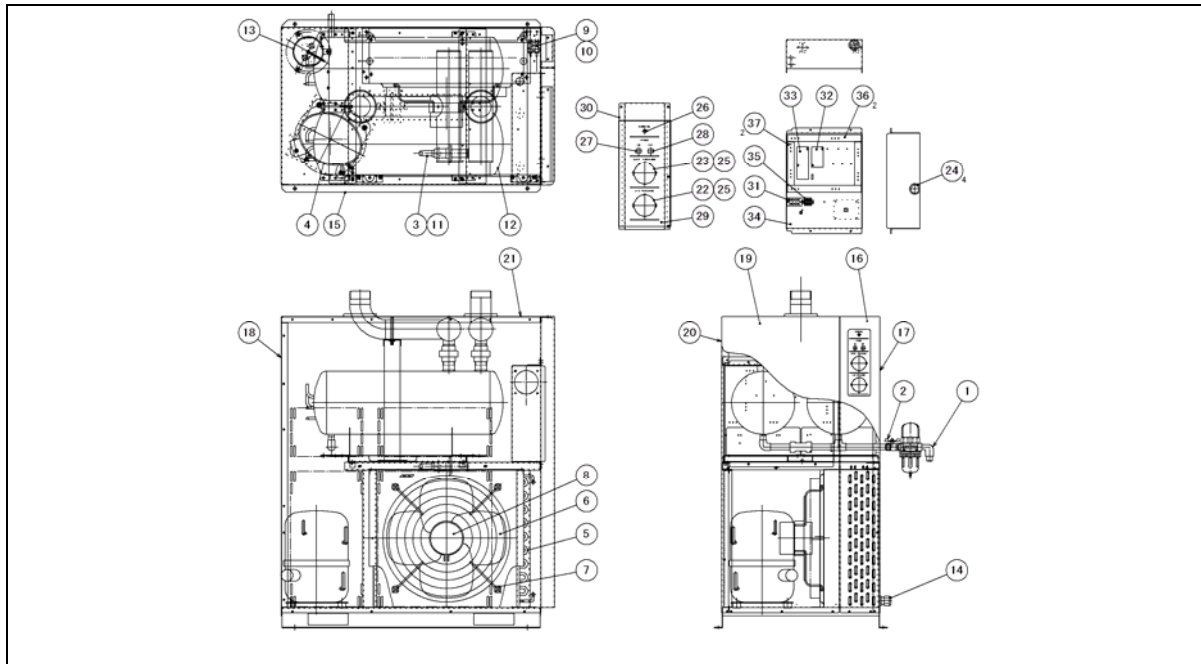
No.	PART NAME	SPECIFICATION	Q'TY
			1phase
1	AUTO DRAIN TRAP ASSY.	DT4000	1
2	BALL VALVE	1/2" T201-04BTP	1
3	CAPACITY CONTROL VALVE	SPX-4540DVQ47	1
4	BARE COMPRESSOR	50A473V	1
5	THERMOSTAT	Internal	1
6	CONDENSER	C3x20x560	1
7	FAN	400D (16")	1
8	FAN GUARD	400D (16")	1
9	MOTOR	T14	1
10	FAN CONTROL	ACB-2619A	1
11	HIGH PRESSURE SWITCH	ACB-41.5-3.2	1
12	COPPER PIPE STRAINER	FS1033-35	1
13	HEAT EXCHANGER	02090348020 RAX55F	1
14	CABLE CONNECTOR	φ 25	1
15	BASE	LGHC	1
16	RIGHT FRONT PANEL	EGC-B	1
17	RIGHT SIDE PANEL	EGC-B	1
18	REAR PANEL	EGC-B	1
19	LEFT FRONT PANEL	EGC-B	1
20	LEFT SIDE PANEL	EGC-B	1
21	UPPER PANEL	EGC-B	1
22	SWITCH BOARD COVER	EGC-B	1
23	PRESSURE GAUGE 50	0-1.5MPa	1
24	PRESSURE GAUGE 50	6123-0914-00	1
25	PILOT LAMP	NB-281PGF AC220V	1
26	PUSH BUTTON SWITCH	P13-1B (WHITE)	1
27	PUSH BUTTON SWITCH	P13-1C (RED)	1
28	OPPOSITE PHASE RELAY	APR-3	0
29	TERMINAL BLOCK	TB-112F 3P	1
30	TERMINAL BLOCK	NHC-10-3P	1
31	MAGNETIC SWITCH	LC1D096M7 LR3D-166(9-13A)	1
32	MAGNETIC CONTACTOR	LC1D096M7	1
33	OPERATION PLATE FILM	TETRONIC FILM	1
34	CONTROL PANEL	EGC-B	1
35	BUSH	φ 25	1

FR100A(Ⅱ)FR075AP(Ⅱ)



No.	PART NAME	SPECIFICATION	Q'TY	
			FR100A(Ⅱ) FR075AP(Ⅱ) (60Hz)	FR075AP(Ⅱ) (50Hz)
1	AUTO DRAIN TRAP ASSY.	AD-5	1	1
2	BALL VALVE	1/2" T201-04BTP	1	1
3	CAPACITY CONTROL VALVE	WPR-1004DH-Q10	1	1
4	BARE COMPRESSOR	TFH-5540	0	1
	BARE COMPRESSOR	KFPC340QZ(3 ̢ 220V)	1	0
		KFPC340BZ(3 ̢ 415V)	1	0
5	CONDENSER	C3-28-620	1	1
6	FAN	18"(Φ450)	1	1
7	FAN GUARD	Φ 450	1	1
8	MOTOR	18" 80W AC220V 50/60Hz	1	1
9	FAN CONTROL	ACB-2114A	1	1
10	HIGH PRESSURE SWITCH	ACB-2330	1	1
11	COPPER PIPE STRAINER	FS1033-35 (3/8")	1	1
12	HEAT EXCHANGER SET	RAX 120F	1	0
		RAX55SE	0	1
13	CABLE CONNECTOR	φ 25	1	1
14	BASE	LGHC	1	1
15	RIGHT FRONT PANEL	EGC-B	1	1
16	RIGHT SIDE PANEL	EGC-B	1	1
17	REAR PANEL	EGC-B	1	1
18	LEFT FRONT PANEL	EGC-B	1	1
19	LEFT SIDE PANEL	EGC-B	1	1
20	UPPER PANEL	EGC-B	1	1
21	PRESSURE GAUGE 50	0-1.5MPa	1	1
22	PRESSURE GAUGE 50	6123-0914-00 1.5MPa	1	1
23	BUSH	φ 30	2	2
24	FIXED METAL A	LGHC	1	1
25	PILOT LAMP	NB-281PGF AC220V	1	1
26	PUSH BUTTON SWITCH	P13-1B (WHITE)	1	1
27	PUSH BUTTON SWITCH	P13-1C (RED)	1	1
28	OPERATION PLATE FILM	TETRONIC FILM	1	1
29	CONTROL PANEL	LGC	1	1
30	TERMINAL BLOCK	TB112F 3P 25A	1	1
31	MAGNET SWITCH	LC1D096M7 LR3D(9-13)	1	1
32	SWITCH BOARD HOOD	LGC	1	1
33	TERMINAL BLOCK	NHC-10-8P	1	1
34	MAGNETIC CONTACTOR	LC1D096M7	1	1
35	OPPOSITE PHASE RELAY	APR-4	1	0
36	RELAY SOCKET	PF085A	1	1
37	THERMO-STATE	KSD301-11.4	1	1
38	ELECTRIC WIRE DUCT	HD-1-L219	2	2
39	ELECTRIC WIRE DUCT	HD-1-L438	1	1

FR100AP(Ⅱ) FR150A(Ⅱ)



No.	PART NAME	SPECIFICATION	Q'TY
1	AUTO DRAIN TRAP ASSY.	AD-5	1
2	BALL VALVE	111TP	1
3	CAPACITY CONTROL VALVE	CTX-12220DPQ105	1
4	BARE COMPRESSOR	3 ϕ 220V TFH5538C	1
5	CONDENSER	520x545-D	1
6	FAN	18"(ϕ 450)	1
7	FAN GUARD	ϕ 450	1
8	MOTOR	18" 80W AC220V 50/60Hz	1
9	FAN CONTROL	ACB-2114A	1
10	HIGH PRESSURE SWITCH	ACB-2330	1
11	COPPER PIPE STRAINER	DML083	1
12	HEAT EXCHANGER	TRX-150	1
13	ACCUMULATOR SET	KF70WLE1D	1
14	CABLE GLEND	ϕ 30	1
15	BASE	LGHC	1
16	RIGHT FRONT PANEL	EGC-B	1
17	RIGHT SIDE PANEL	EGC-B	1
18	REAR PANEL	EGC-B	1
19	LEFT FRONT PANEL	EGC-B	1
20	LEFT SIDE PANEL	EGC-B	1
21	UPPER PANEL	EGC-B	1
22	PRESSURE GAUGE 50	GK25-S27(6113-0005-00)	1
23	PRESSURE GAUGE 50	6123-0914-00 1.5MPa	1
24	BUSH	ϕ 30	4
25	FIXED METAL A	LGHC	2
26	PILOT LAMP	AC220V	1
27	PUSH BUTTON SWITCH	(WHITE)	1
28	PUSH BUTTON SWITCH	(RED)	1
29	OPERATION PLATE FILM	TETRONIC FILM	1
30	CONTROL PANEL	EGC-B	1
31	TERMINAL BLOCK	TB-30 (3P)	1
32	MAGNETIC CONTACTOR	C-12D 1NO1NC 220V	1
33	MAGNET SWITCH	C-18D 1NO1NC 220V GTH-11/3 11A	1
34	SWITCH BOARD BASE	EGC-B	1
35	TERMINAL BLOCK	NHC-10-3P	1
36	ELECTRIC WIRE DUCT	HD-1-L277	2
37	ELECTRIC WIRE DUCT	HD-1-L165	2



SINCE 1953

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