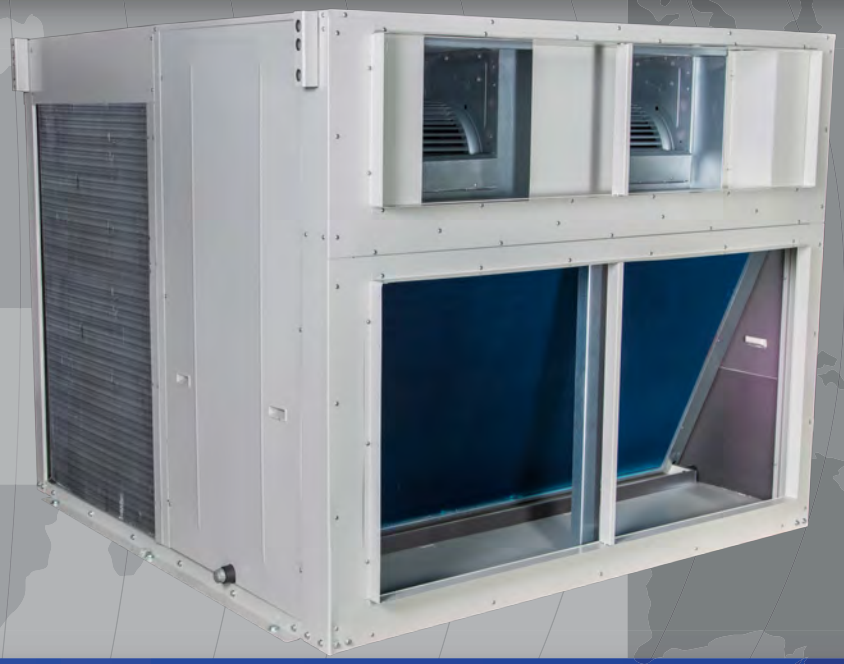
AIR-COOLED ROOFTOP PACKAGE

Models: FACP 8-32 A

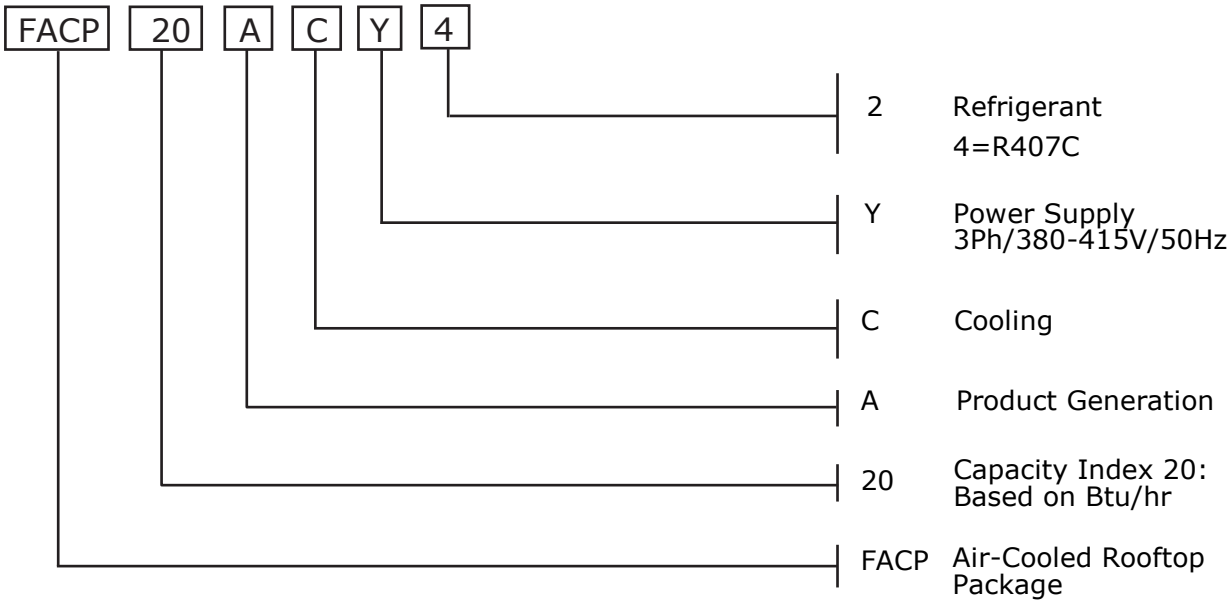


Direct Expansion System
FDXA04-2024/25A

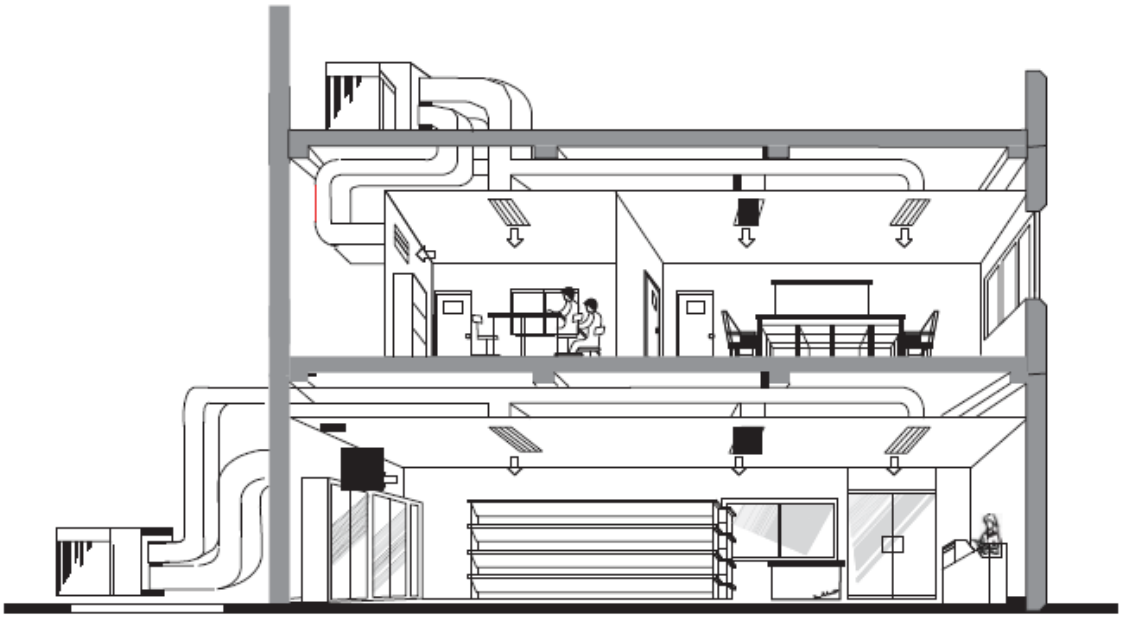
Content

Product Nomenclature

Air-Cooled Rooftop Air Conditioner



Typical Installation Example



Features

Compact Construction Design

Compact and rigid single unit construction design provides convenient installation with no additional piping work as both indoor and outdoor sides are pre-connected. The unit casing is made of external painted sheet metal that is suitable for outdoor application. The unique feature of unit's flat top design allows unit to be stacked up and provides maximum usage of warehouse and container space.

Single Capacity Control

Unit is equipped with Scroll Compressor that is more reliable with higher efficiency. The compressor is mounted on rubber vibration isolators for minimal noise level and vibration transmissions.

Indoor Fan Motor

Direct-drive, forward curved, centrifugal-type fans are used to deliver an accurate air flow at low noise level. The standard unit fan motor is △ connection. Unit can be operated at lower air flow by changing to 人 connection.

High Sensible Cooling Capacity

The sensible cooling capacity has been significantly improved through balanced optimized heat exchanger design.

Control

Mechanical control allows the air conditioner to operate as standalone system

Engineering Specifications

General Data - Cooling Only

Model name	FACP-ACY4		8	10	12	15	20	24	32
Power supply			3Ph~380-415V 50Hz						
Total cooling capacity	Outdoor 35°CDB	kW	24.0	30.0	35.0	48.0	64.0	70.0	100.0
		Btu/h	81,900	102,400	119,500	163,800	218,400	238,900	341,200
	Outdoor 46°CDB	kW	21.9	28.8	33.0	43.7	61.5	66.0	94.0
		Btu/h	74,800	98,300	112,600	149,200	209,900	225,200	320,800
Sensible cooling capacity	Outdoor 35°CDB	kW	19.2	24.0	28.0	38.4	51.2	56.0	80.0
		Btu/h	65,600	81,900	95,600	131,100	174,700	191,100	273,000
Capacity step		%	0-100			0-50-100			0-66-100
Refrigerant			R407C						
Refrigerant charge		kg	4.5	5.9	5.7	2x4.8	2x5.9	2x5.7	3x3.5
Refrigerant control			Capillary Tube						
External finish			Acrylic Resin Coating						
Color			MUNSELL 5Y8/1						
Dimension	Height	mm	1,000			1,200			1,650
	Width	mm	1,300			1,990			2,100
	Length	mm	1,530			1,670			2,100
Net weight		kg	360	390	395	655	755	765	1,100
Compressor			Hermetic Line Start (Scroll Comperssor)						
No. x Motor output		kW	1x5.5	1x7.5	1x8.0	2x5.5	2x7.5	2x8.0	3x8.0
Evaporator			Cross Fin Coil						
Evaporator fan			Centrifugal - Direct-Drive						
Evaporator fan motor			Three - Phase Squirrel Cage Induction Motor(人 Δconnection)						
No. x Motor output		kW	1x0.7	1x1.25	1x1.25	1x1.7	1x2.5	1x2.5	1x4.5
Evaporator fan airflow		CMH	5,400	6,000	6,000	9,000	12,000	12,000	17,100
		CFM	3,179	3,532	3,532	5,300	7,064	7,064	10,066
External static pressure		mmAq	10			20			25
		Pa	100			200			250
Condenser			Cross Fin Coil						
Condenser fan			Propeller - Direct Drive						
Condenser fan motor			Three Phase Cage Induction Motor						
Condenser fan air flow		CMH	9,600		10,800	19,200		21,600	28,800
		CFM	5,651		6,354	11,302		12,708	16,954
Drain connection		mm	25.4						
Sound pressure level		dB(A)	66		69	70		73	76
Protection devices			High Pressure Switch, Fuse, Low Pressure Switch (Only FACP 32), Over Current Relay (Compressor), Internal Thermostat (Compressor, Outdoor & Indoor Fan Motor)						

Note :

1. Cooling capacity is based on the following conditions. Indoor;27°CDB,19°CWB, Outdoor;35°CDB
2. Refrigerant charge volumes are factory charged.
3. Capacity is gross capacity which do not include a deduction for evaporator fan motor heat.
4. The measuring point of the Sound pressure level is 1m from the unit surface.
5. The range of working voltage is within ±10% voltage of power supply.
6. Specification subject to change without notice.
7. Full refrigerant charge of FACP 32 is 3x6.3kg

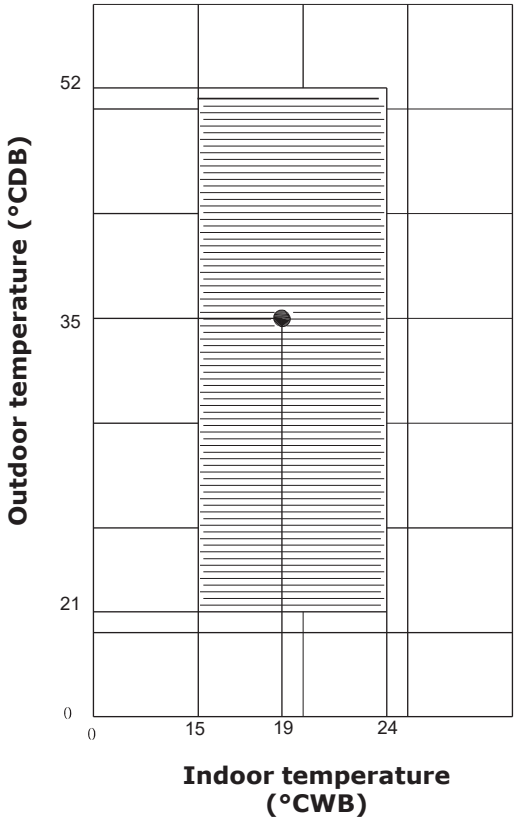
Electrical Data

VOLT	ITEM		FACP8A Cooling	FACP10A Cooling	FACP12A Cooling	FACP15A Cooling
415V	TOTAL INPUT	kW	8.1	10.5	12.5	18.1
	RATED LOAD AMP(RLA)	A	13.4	16.9	20.2	31.5
	MAXIMUM RUNNING AMP(MRA)	A	20.3	25.8	29.5	45.5
	POWER FACTOR	%	84%	86%	86%	80%
	START CURRENT	A	91.3	119.3	119.6	129.1
	COMPRESSOR INPUT	kW	6.4	8.1	9.3	14.4
	RUN CURRENT	A	9.1	12.1	14.6	22.6
	OUTDOOR FAN INPUT	kW	0.5	0.5	1.3	1
	RUN CURRENT	A	1.5	1.3	2.1	2.8
	INDOOR FAN INPUT	kW	1.2	1.9	1.9	2.7
	RUN CURRENT	A	2.8	3.5	3.5	6.1
400V	TOTAL INPUT	kW	8.1	10.5	12.5	18.1
	RATED LOAD AMP(RLA)	A	13.9	17.6	21	32.7
	MAXIMUM RUNNING AMP(MRA)	A	22.2	28.2	32.2	49.7
	POWER FACTOR	%	84%	86%	86%	80%
	START CURRENT	A	94.8	123.7	114.8	133.9
	COMPRESSOR INPUT	kW	6.4	8.1	9.3	14.4
	RUN CURRENT	A	9.4	12.7	15.2	23.5
	OUTDOOR FAN INPUT	kW	0.5	0.5	1.3	1
	RUN CURRENT	A	1.6	1.3	2.2	2.9
	INDOOR FAN INPUT	kW	1.2	1.9	1.9	2.7
	RUN CURRENT	A	2.9	3.6	3.6	6.3
380V	TOTAL INPUT	kW	8.1	10.5	12.5	18.1
	RATED LOAD AMP(RLA)	A	14.6	18.5	22.1	34.4
	MAXIMUM RUNNING AMP(MRA)	A	24.6	31.3	35.8	55.2
	POWER FACTOR	%	84%	86%	86%	80%
	START CURRENT	A	99.6	130.2	110.1	140.9
	COMPRESSOR INPUT	kW	6.4	8.1	9.3	14.4
	RUN CURRENT	A	10	13.3	16	24.7
	OUTDOOR FAN INPUT	kW	0.5	0.5	1.3	1
	RUN CURRENT	A	1.6	1.4	2.3	3.1
	INDOOR FAN INPUT	kW	1.2	1.9	1.9	2.7
	RUN CURRENT	A	3	3.8	3.8	6.6

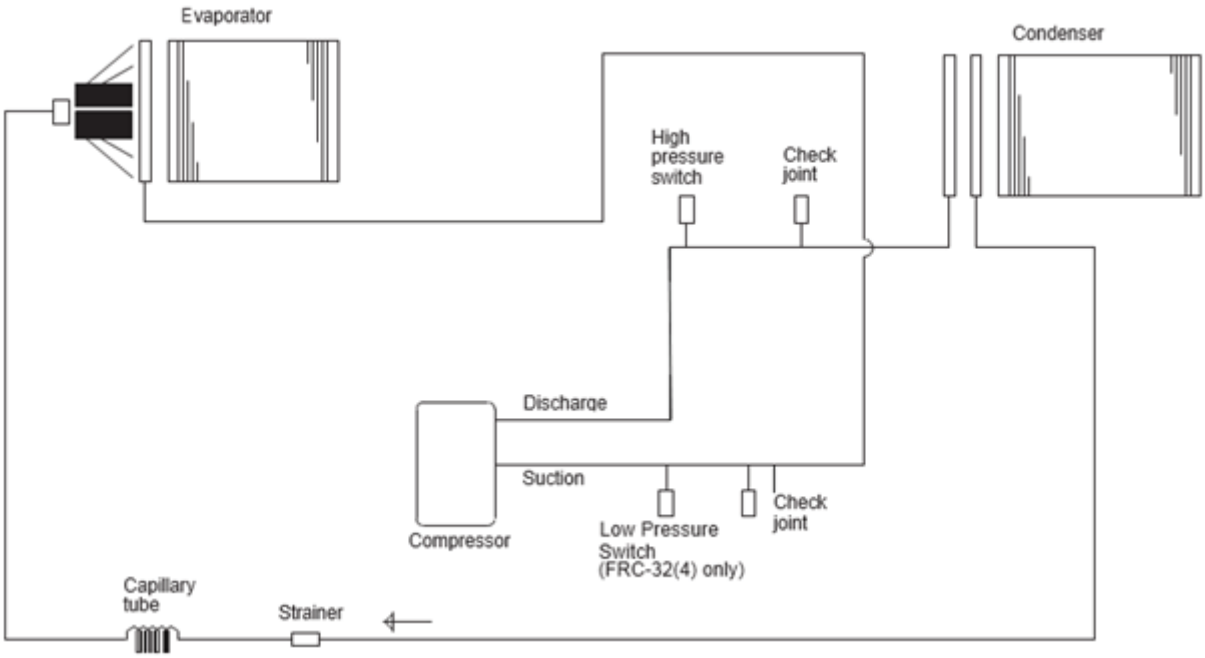
Electrical Data

VOLT	ITEM		FACP20A Cooling	FACP24A Cooling	FACP32A Cooling
415V	TOTAL INPUT	kW	20.8	25.5	39.8
	RATED LOAD AMP(RLA)	A	34.8	42.7	66.7
	MAXIMUM RUNNING AMP(MRA)	A	62.1	68.6	110.6
	POWER FACTOR	%	83%	83%	83%
	START CURRENT	A	136.5	140.8	164.2
	COMPRESSOR INPUT	kW	16.2	19.3	32.5
	RUN CURRENT	A	25.5	31.8	49.5
	OUTDOOR FAN INPUT	kW	1	2.6	2.7
	RUN CURRENT	A	2.6	4.2	5.6
	INDOOR FAN INPUT	kW	3.6	3.6	4.6
	RUN CURRENT	A	6.7	6.7	11.6
400V	TOTAL INPUT	kW	20.8	25.5	39.8
	RATED LOAD AMP(RLA)	A	36.1	44.3	69.2
	MAXIMUM RUNNING AMP(MRA)	A	67.8	74.9	120.8
	POWER FACTOR	%	83%	83%	83%
	START CURRENT	A	141.7	136.9	161.1
	COMPRESSOR INPUT	kW	16.2	19.3	32.5
	RUN CURRENT	A	26.4	32.9	51.4
	OUTDOOR FAN INPUT	kW	1	2.6	2.7
	RUN CURRENT	A	2.7	4.4	5.8
	INDOOR FAN INPUT	kW	3.6	3.6	4.6
	RUN CURRENT	A	7	7	12
380V	TOTAL INPUT	kW	20.8	25.5	39.8
	RATED LOAD AMP(RLA)	A	38	46.7	72.8
	MAXIMUM RUNNING AMP(MRA)	A	75.3	83.2	134.3
	POWER FACTOR	%	83%	83%	83%
	START CURRENT	A	149.1	133.4	158.8
	COMPRESSOR INPUT	kW	16.2	19.3	32.5
	RUN CURRENT	A	27.8	34.7	54
	OUTDOOR FAN INPUT	kW	1	2.6	2.7
	RUN CURRENT	A	2.8	4.6	6.1
	INDOOR FAN INPUT	kW	3.6	3.6	4.6
	RUN CURRENT	A	7.4	7.4	12.7

Operating Range



System Schematic Diagram



Sound Pressure Level

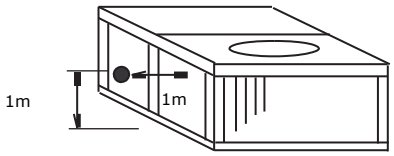
50Hz

Sound Pressure Levels (SPL) Condition: Cooling

Model	SPL dB(A)	63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz
FACP8A	66	64.5	67.5	64.5	64	62	54	48.5	39
FACP10A	66	64.5	68.5	67	64	59.5	56	51	41.5
FACP12A	69	72.5	71	68	66.5	65	60	53.5	44.5

(dB)

Note. The measuring point is 1m from the comp.service panel.



measuring place: open field

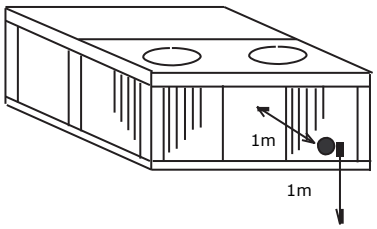
50Hz

Sound Pressure Levels (SPL) Condition: Cooling

Model	SPL dB(A)	63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz
FACP15A	70	72	74	68	68	66.5	59.5	52.5	43.5
FACP20A	70	71.5	73.5	68	66.5	66	59.5	52	42.5
FACP24A	73	67	70	70.5	69	69	65	58	49
FACP32A	76	70.5	77	78	74	71.5	65.5	59.5	53

(dB)

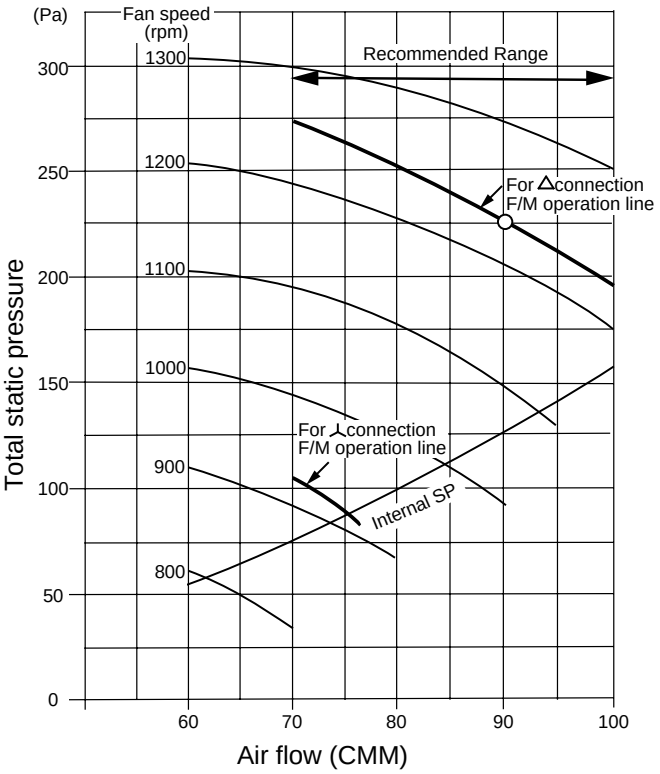
Note. The measuring point is 1m from the comp.service panel.



measuring place: open field

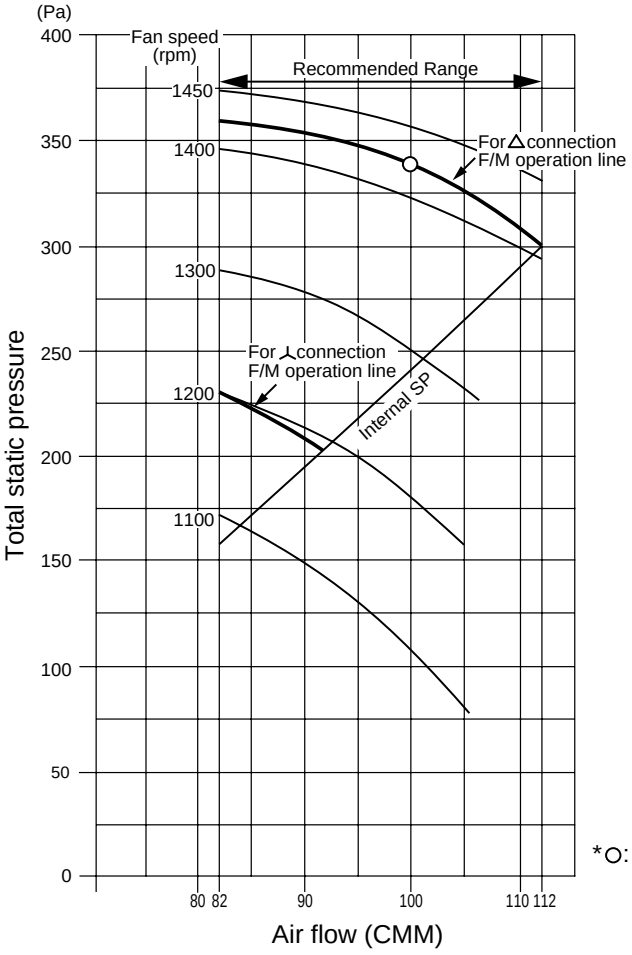
Fan Performance Curve

FACP8A



*○: Standard point

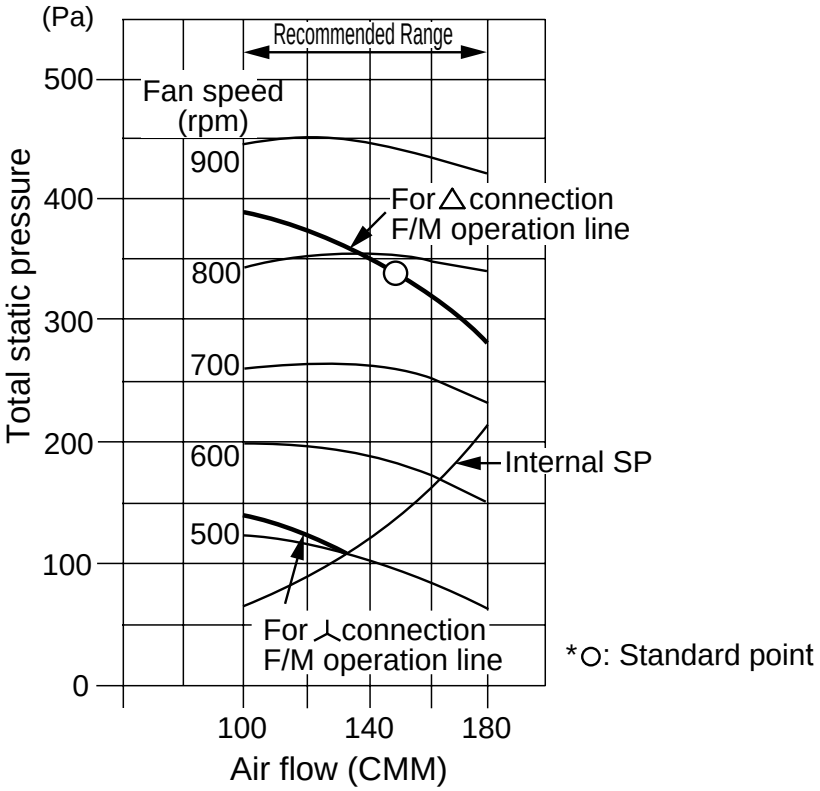
FACP10A,12A



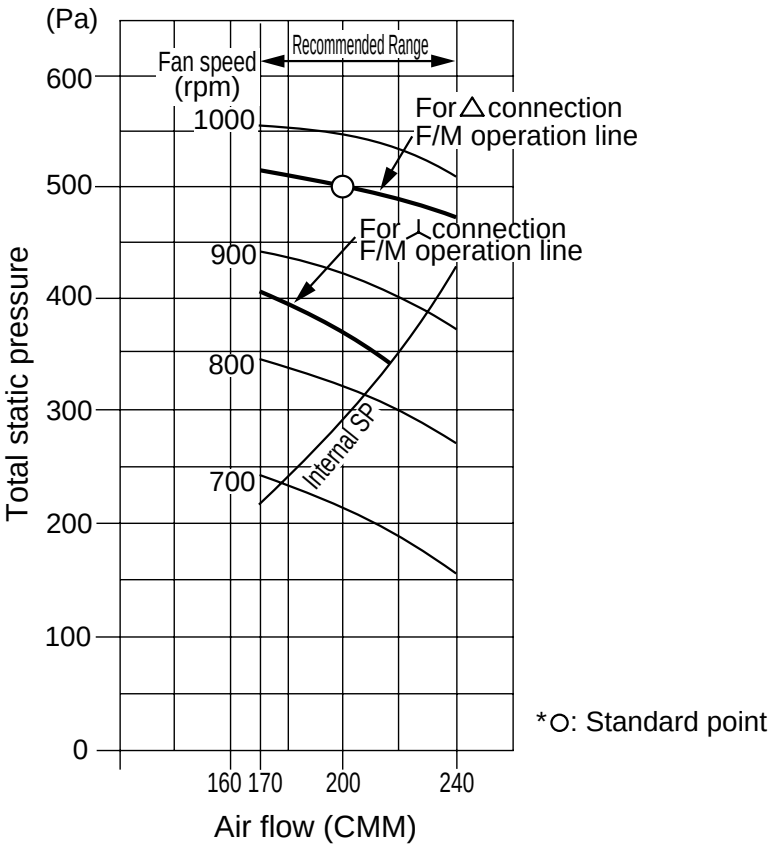
*○: Standard point

Fan Performance Curve

FACP15A

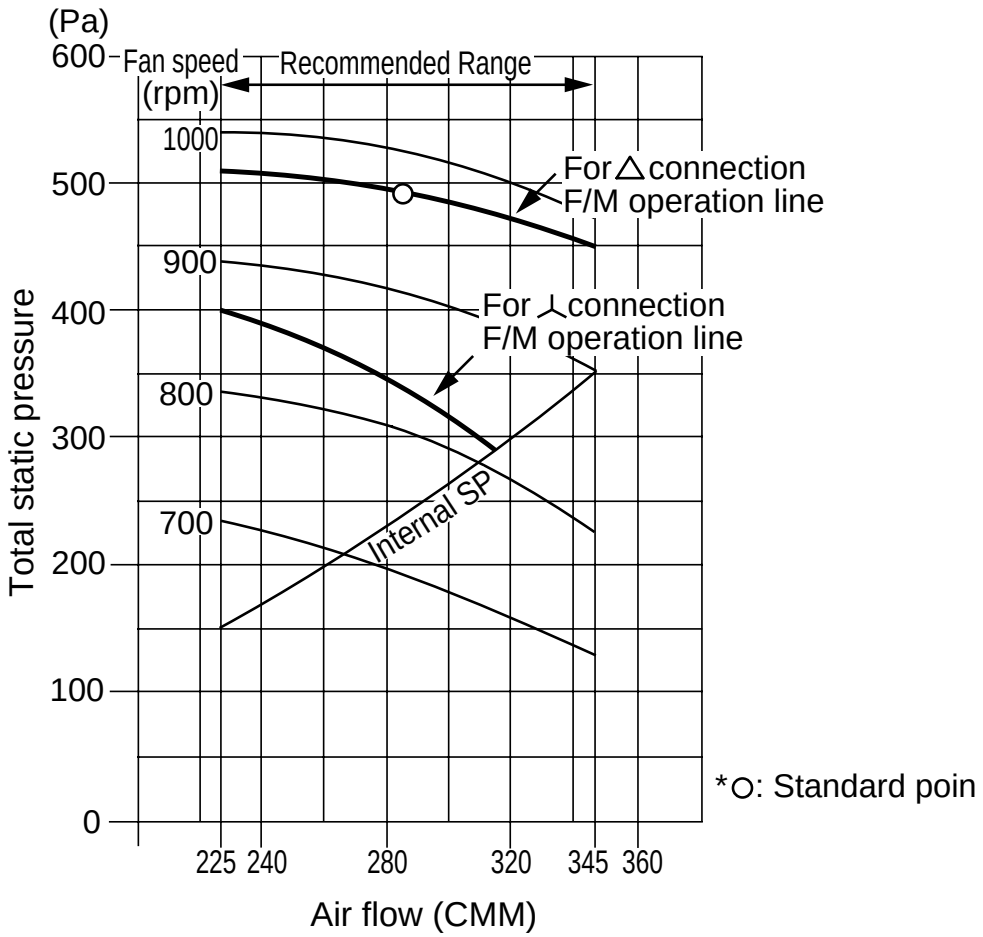


FACP20A,24A



Fan Performance Curve

FACP32A

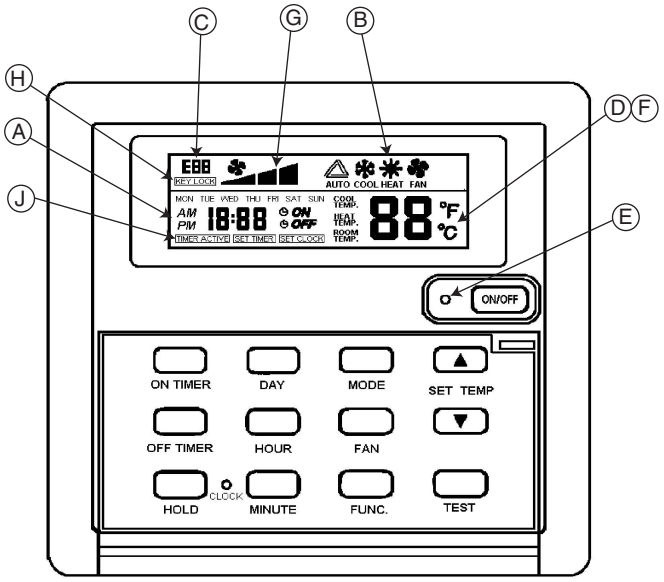


Controller Features And Algorithm (Optional)

How to operate : In case of using LCD remote controller.

If you use the LCD remote controller, you can operate below method.
Please consult operate method with dealer, if you use field supply control parts.

Display section



For purposes of explanation, all the displays on this page are shown in their lit condition.
This configuration does not occur in the actual unit.

Before starting operation

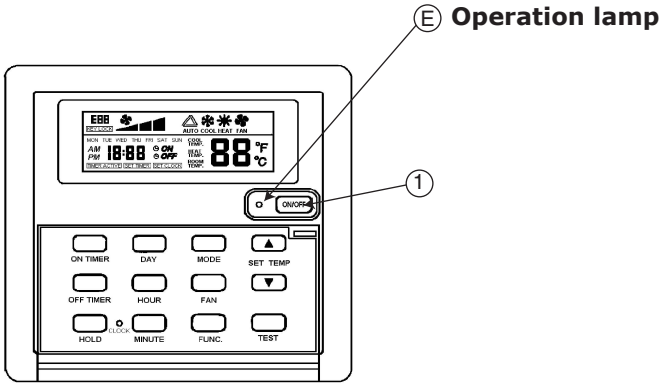
* Make sure that the power supply is turned ON before use.
  (Keep the power supply turned ON at all times when the air conditioner is in use.Use of the unit without power can result in compressor failure.)

⚠ Warning:

Check and confirm the power circuit before use. For the contents, refer to the previously described chapter [Crucial points to be observed for safety].

Display	Indicator	Remarks
[Current/start/ending time]	A	
Operation Mode	B	The status of operation
[Checking]	C	This display indication when some abnormally in the unit
[Set temperature]	D	Display the set temperature
[Operation] Lamp	E	Lights up during operation, goes off during stop
[Room Temperature]	F	Display the temperature of the air sucked in during operation
[Fan]	G	This display indication fan operation
[Key Lock]	H	This display indication during key lock function active
[Timer Hold/Resume setting]	J	

ON / OFF



Start operation

Press the [ON/OFF] button ①
Operation lamp lights up and operation starts.

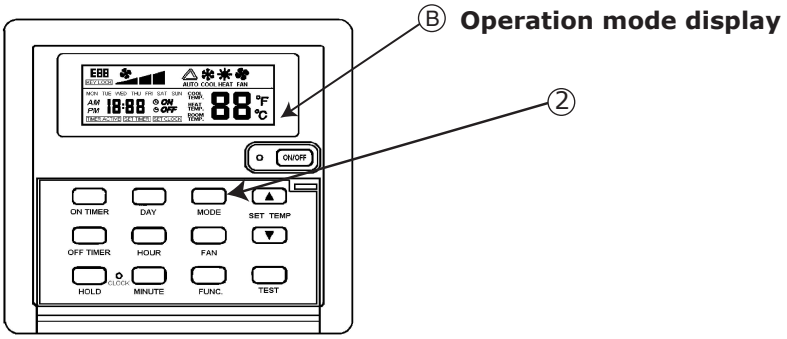
Stop operation

Press the [ON/OFF] button ① again
Operation lamp goes off and operation stops.

* Once the buttons have been set, pressing of the [ON/OFF] button only can repeat the same operation thereafter.
* During operation, the operation lamp above the [ON/OFF] button lights up.

⚠ **Caution:**
Even if the operation button is pressed immediately after the operation is once stopped, operation is not restarted for about 3 minutes.
This function protects the machine. It automatically starts operation after the lapse of approximately 3 minutes.

Selecting operation



When selecting operation

Press the [MODE] button ②
Consecutive press of the [MODE] button switches the operation over to "FAN"and "COOL".
For the contents of operation, check the display.

For fan

Press the [MODE] button ② and bring up the "FAN" display.
* The fan operation functions to circulate the air in the room.
* The temperature of the room cannot be set by fan operation.

⚠ Caution:

Never expose your body directly to cool air for a long time. Excessive exposure to cool air is bad for your health, and should therefore be avoided.

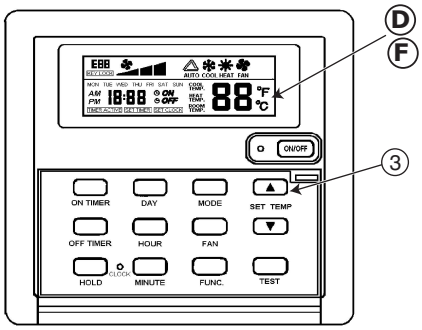
For cooling

Press the [MODE] button ② and bring up the "COOL" display.

⚠ Caution:

* When the air conditioner is used together with burners, thoroughly ventilate the area. Insufficient ventilation can result in accidents due to oxygen deficiency.
* Never place a burner at a place where it is exposed to the airflow from the air conditioner. Doing so can result in imperfect combustion of the burner.

Room temperature adjustment



Ⓓ **Set temperature display**
Ⓕ **Room temperature display**

To change room temperature

Press the [SET TEMP] button ③ and set the room temperature of your choice.

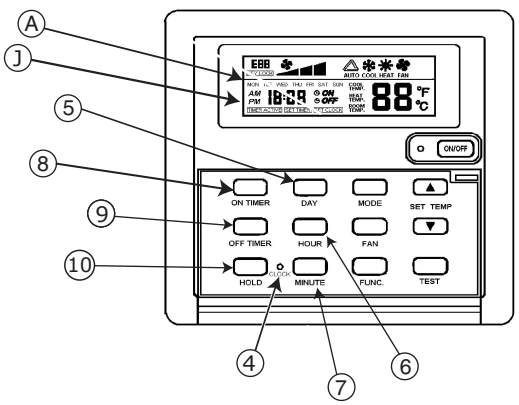
Press △ or ▽ button once changes the setting by 1°C.

If the pressing is continued, the setting continues to change by 1°C.

* Indoor temperature can be set within the following range.
  CoolingCooling 19 ~ 30°C
* It is impossible to set the room temperature by the air-blow operation.

Press △ and ▽ button together, the unit of temperature change "°C " (degree-centigrade) and "°F ". (degree-Fahrenheit)

Time setting



Ⓐ Current time display
Ⓙ Timer Hold/Resume display

Clock setting

Press the [CLOCK] key ④ one time will activate set clock mode.

Press the [CLOCK] key ④ again will disable set clock mode.

Under set clock mode, the real time clock and present day setting can be changed by pressing [DAY] button ⑤ , [HOUR] button ⑥ or [MINUTE] button ⑦ .

⚠ **Caution:**

[CLOCK] key ④ is not allowed to be pushed with the thing of sharp tip.

7-Days timer setting

There are two buttons for timer. One is [ON TIMER] ⑧, another is [OFF TIMER] ⑨.

Press the button one time will activate set timer mode.
Press the same button again will disable set timer mode. Under set timer mode, the 7-days timer setting can be changed by pressing [DAY] button ⑤, [HOUR] button ⑥ or [MINUTE] button ⑦.

Day setting

During set clock mode or set timer mode, press the [DAY] button ⑤ will change the day setting.

Hour setting

During set clock mode or set timer mode, press the [HOUR] button ⑥ will change the hour setting.

Minute setting

During set clock mode or set timer mode, press the [MINUTE] button ⑦ will change the minute setting.

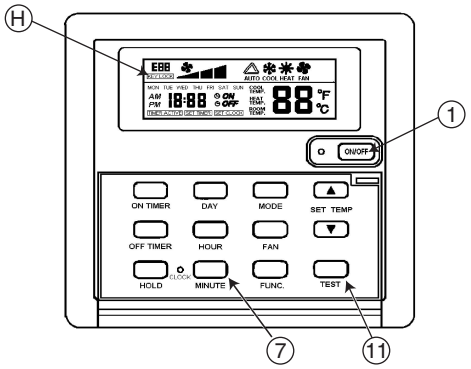
Timer Hold / Resume setting

If 7-days timer is set, then the word "Timer Active" is displayed (J).

To clear all the timers setting, press and hold the [HOLD] button (10) until the word "Timer Active" is not displayed.

To resume the timer setting after timers have been held, press and hold the [HOLD] button (10) until the word " Timer Active" is displayed.

Other function



Key lock

Press the [MINUTE] button ⑦ three times consecutively, the word "KEY LOCK" will displayed (H) .

At this time, only [ON-OFF] button (1) is valid.

This function purpose is protect from mischief of child etc.

To cancel the key lock function, Please press [MINUTE] button ⑦ three times consecutively again.

Test run

Press the [TEST] button (11) two times consecutively.

The unit will run and finished automatically after two hours.

Troubleshooting

Before you ask for repair service, check the following points:

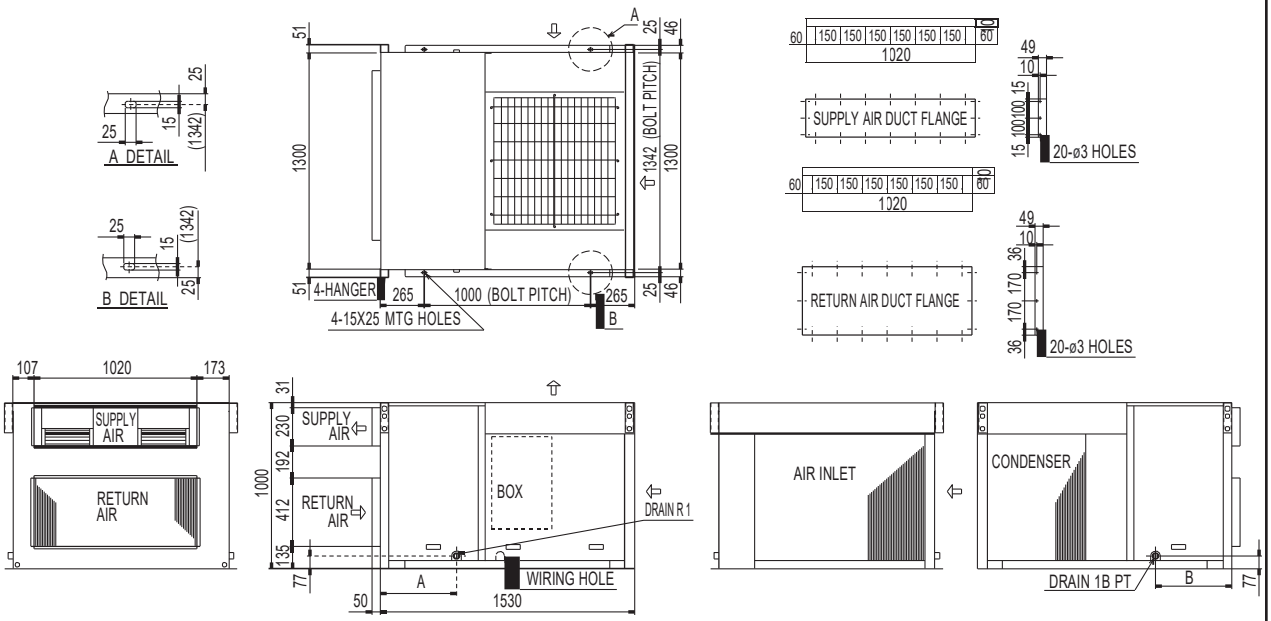
State of Machine	LCD remote Controller	Cause	Troubleshooting
It does not run	"ON-OFF" display is not lit up. No display appears even when the [ON/OFF] button is pressed	Power failure	Press the [ON/OFF] button after power restoration.
		The power supply is turned OFF	Turn the power supply ON
		The fuse in the power supply is gone	Replace fuse
		The earth leakage breaker is gone	Put in the earth leakage breaker
		The wiring phase of power supply is mistaken. (FACP-8, 10, 15, 20 only)	Modify the wiring phase of power supply
Air flows out but it does not cool enough.	The liquid crystal display shows that it is in the state of operation.	Improper temperature adjustment.	After checking the set temperature and inlet temperature on the liquid crystal display, refer to [To change room temperature] on page 6, and operate the adjustment button.
		The filter is filled with dust and dirt.	Clean up the filter.
		There are some obstacles at the air inlet or outlet of the units.	Remove.
		Windows or doors are open.	Close.
Cool air does not come out.	The liquid crystal display shows that it is in operation.	The restart-preventing circuit is in operation for 3 minutes.	Wait for a while. (To protect the compressor, a 3-minute restartpreventing circuit is built into the unit. Therefore, there are occasions sometimes when the compressor does not start running immediately. There are cases when it does not run for as long as 3 minutes.)
Fan runs but compressor do not run.		The set temperature of thermostat is excessively high for cooling.	For temperature control, decrease the set temperature at cooling.
		The room temperature is excessively low for cooling.	Can not be operated as it is out of temperature control range.
Compressor runs but stops immediately.		Air outlet or inlet are blocked.	Remove blocking matter.
Water or steam is discharged from the unit.		At cooling, water which places to cooling piping and piping connection part drops.	It is not a breakdown. Please contact and consult your dealer.
		The drain pipe is clogged due to dust, therefore the drain water overflow.	

LCD remote controller error display

Indicate	Cause	Troubleshooting
E01	Room temperature sensor open.	Automatically reset to restoration error.
E02	Room temperature sensor short.	Automatically reset to restoration error.
E03	Error input from Indoor unit or Outdoor unit.	Push the On-Off switch. (OFF to ON)

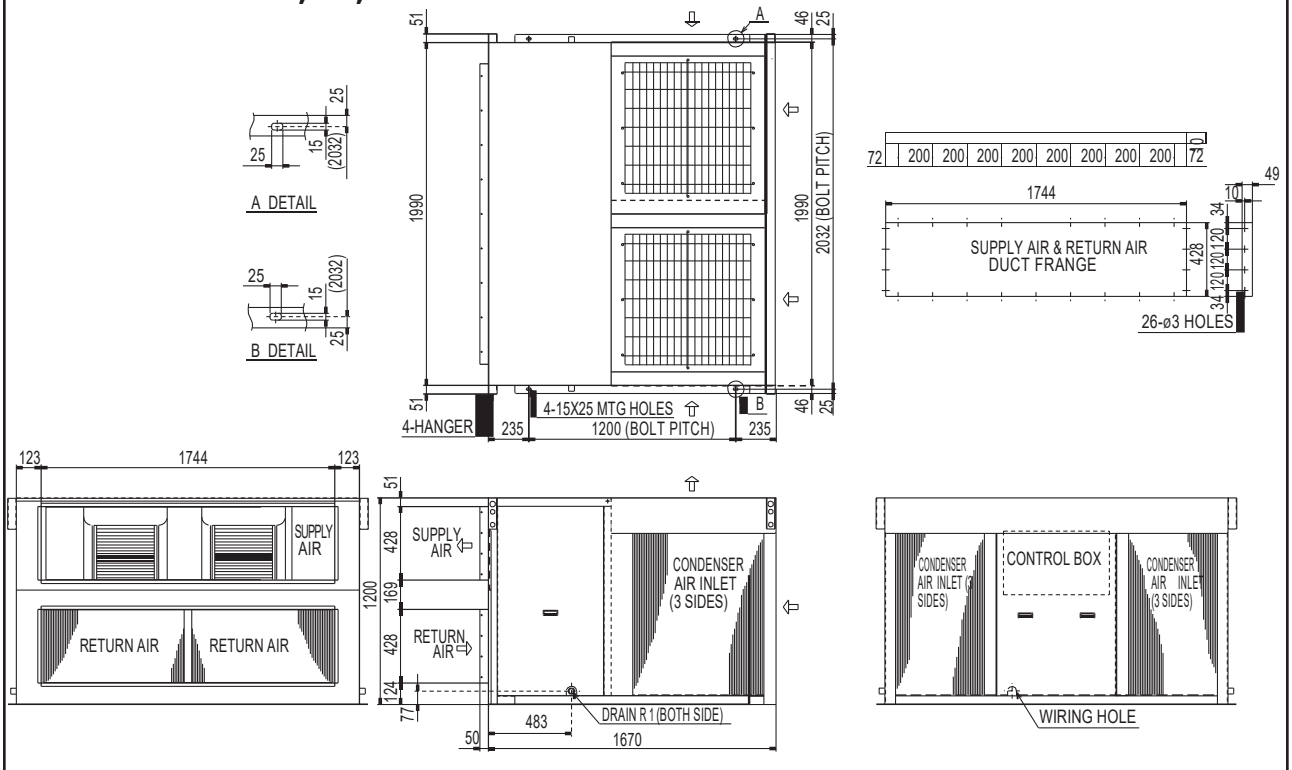
Dimensions

Model: FACP 8,10,12A

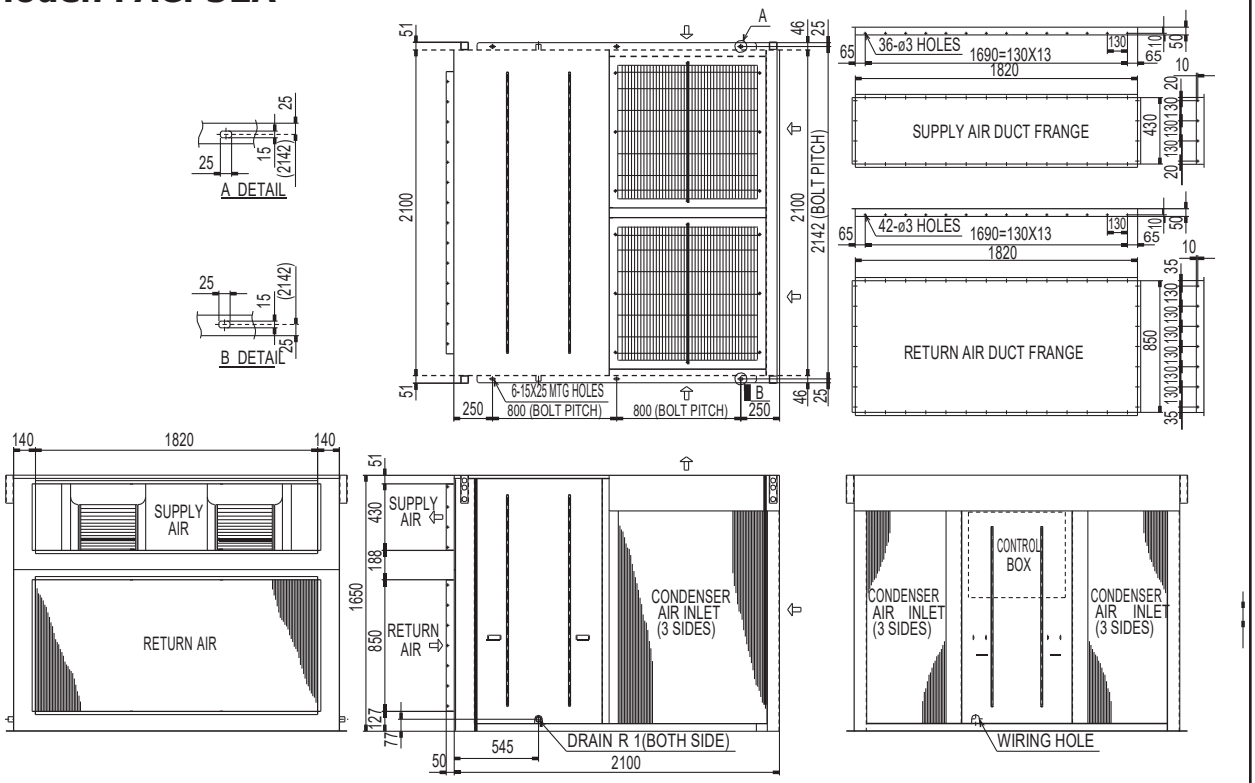


	A	B
FACP8,10A	437	437
FACP12A	458	458

Model: FACP 15,20,24A



Model: FACP32A



Wiring Diagram

Model: FACP8,10,12A

Symbol	Name	Symbol	Name	Symbol	Name
MC	Compressor Motor	Tr	Transformer	49F1	Internal Protector (Fan I/D)
MF1	Fan Motor (Indoor)	51C	Over Current Relay(Compressor)	49F2	Internal Protector (Fan O/D)
MF2	Fan Motor (Outdoor)	63H	High-Pressure Switch	<SW>	Switch (On)
52C	Contactor (Compressor)	63L	Low Pressure Switch	<23WA>	Thermostat (Room Temp.)
52F	Contactor (Fan I/D)	FZ	Auxiliary Relay (Fan)	C01~C04 C11,12,14	Connector
TB1,2	Terminal Block	CZ	Auxiliary Relay (Compressor)		
F1,F2	Fuse (3.15A)	30CZ,30FZ	Auxiliary Relay (Check)		

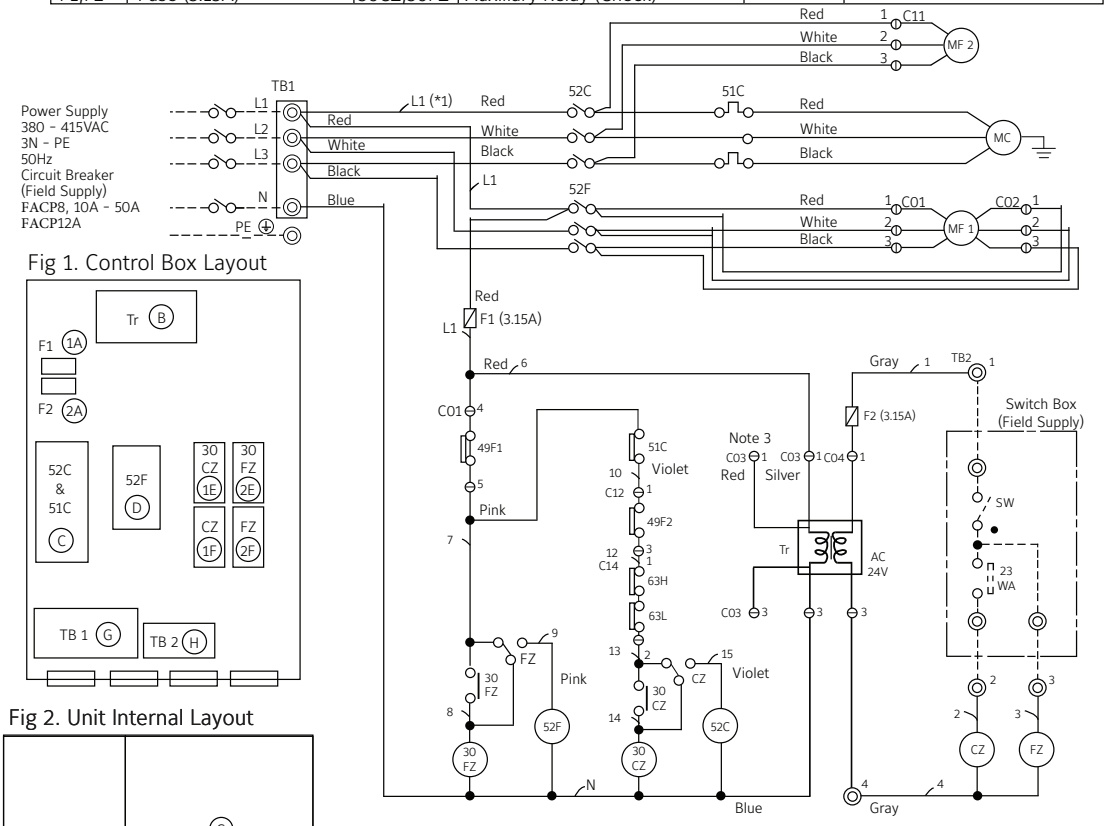
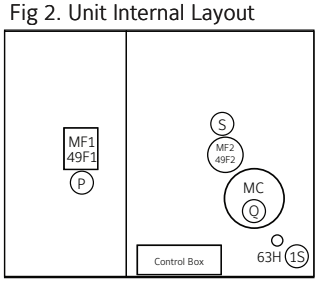


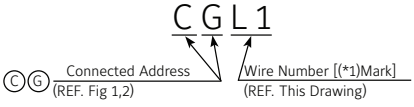
Fig 1. Control Box Layout

Fig 2. Unit Internal Layout



Note :

1. The dotted lines show field wiring.
2. The figure in the parenthesis show field supply parts.
3. In case of power supply 380VAC model
   (FACP8, 10, 12ACY4M)Tr wiring.
   Change the connector connection Tr, if 380VAC model is used for 400,415VAC and 400,415VAC model is used for 380VAC.
4. Refer below example about wiring mark.



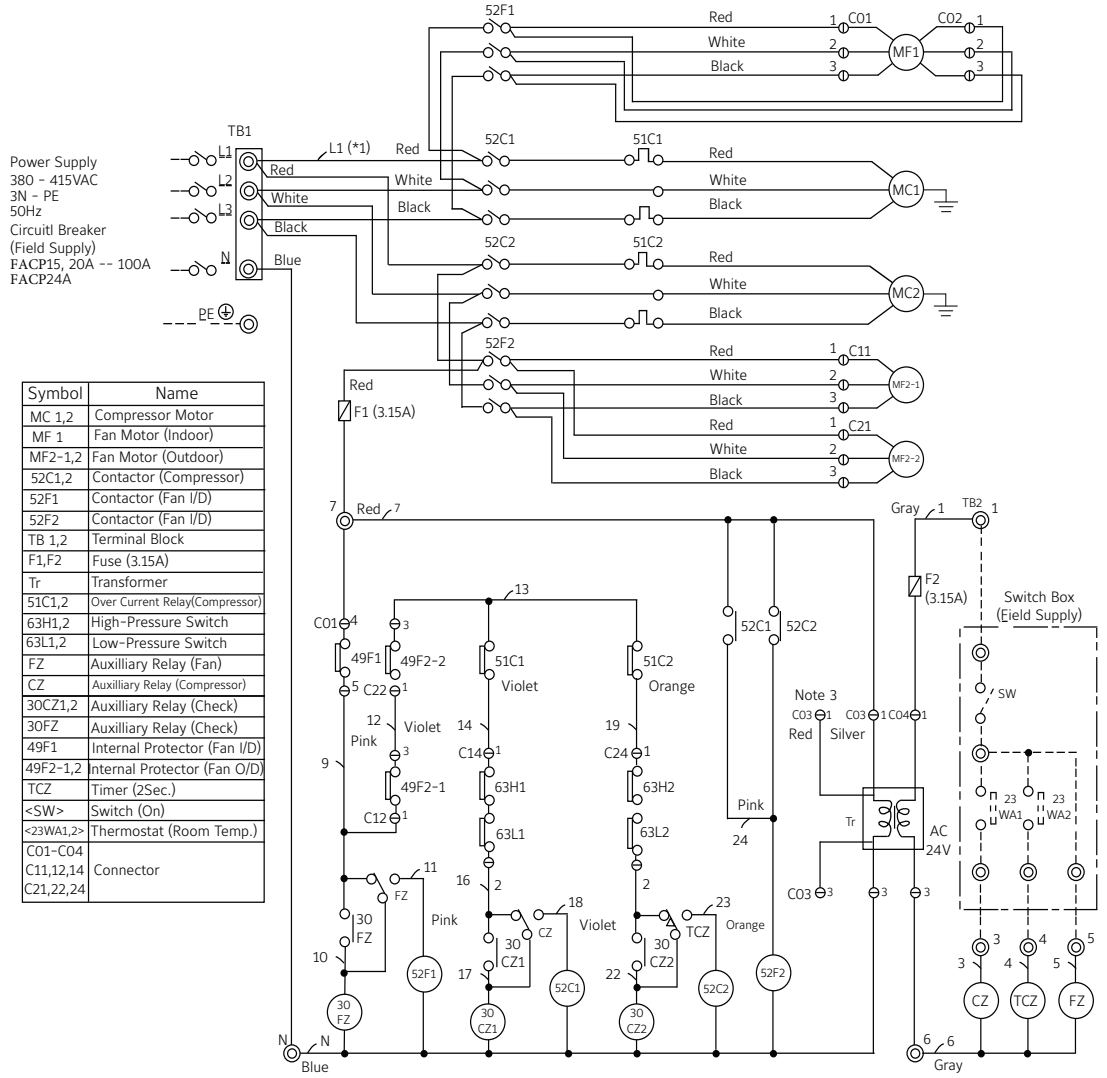
Caution :

1. To protect compressor from abnormal current, over current relay <51C> is installed. Therefore, do not change factory set value of over current relay.

Controller Connection

Symbol	No.	Function	PAC-204RC (Option) Terminal No.
TB2	1	Power (Active)	24VAC(L)
	2	Cooling Operation	COMP1
	3	Fan Operation	FAN HI
	4	Power (Neutral)	24VAC(N)

Model: FACP15, 20, 24A



Symbol	Name
MC 1,2	Compressor Motor
MF 1	Fan Motor (Indoor)
MF2-1,2	Fan Motor (Outdoor)
52C1,2	Contactor (Compressor)
52F1	Contactor (Fan I/D)
52F2	Contactor (Fan I/D)
TB 1,2	Terminal Block
F1,F2	Fuse (3.15A)
Tr	Transformer
51C1,2	Over Current Relay(Compressor)
63H1,2	High-Pressure Switch
63L1,2	Low-Pressure Switch
FZ	Auxilliary Relay (Fan)
CZ	Auxilliary Relay (Compressor)
30CZ1,2	Auxilliary Relay (Check)
30FZ	Auxilliary Relay (Check)
49F1	Internal Protector (Fan I/D)
49F2-1,2	Internal Protector (Fan O/D)
TCZ	Timer (2Sec.)
<SW>	Switch (On)
<23WA1,2>	Thermostat (Room Temp.)
C01~C04 C11,12,14 C21,22,24	Connector

Fig 1. Control Box Layout

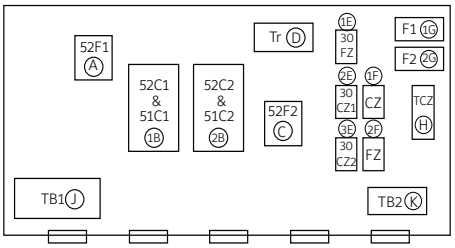
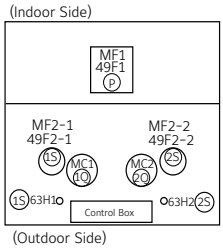
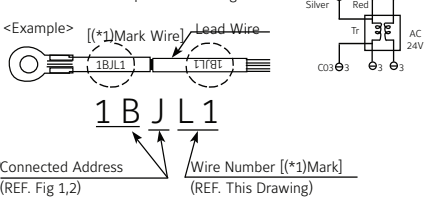


Fig 2. Unit Internal Layout



Note :

1. The dotted lines show field wiring.
2. The figure in the parenthesis show field supply parts.
3. In case of power supply 380VAC model (FACP15, 20, 24ACY4M)Tr wiring. Change the connector connection of Tr, if 380VAC model is used for 400,415VAC and 400,415VAC model is used for 380VAC.
4. Refer below example about wiring mark.



Controller Connection

Symbol	No.	Function	PAC-204RC (Option) Terminal No.
TB2	1	Power (Active)	24VAC(L)
	3,4	Cooling Operation	COMP1,2
	5	Fan Operation	FAN HI
	6	Power (Neutral)	24VAC(N)

Caution :

1. To protect compressor from abnormal current, over current relays <51C1,2> are installed. Therefore, do not change factory set value of over current relays.
2. This timer <TCZ> installed because the power supply breaker may operate if two compressors start at the same time.
3. Do not change factory set value of timer.

Model: FACP32A

Symbol	Name
MC 1~3	Compressor Motor
MF1	Fan Motor (Indoor)
MF2-1,2	Fan Motor (Outdoor)
52C1~3	Contactor (Compressor)
52F1	Contactor (Fan I/D)
52F2	Contactor (Fan O/D)
TB1,2	Terminal Block
F1,F2	Fuse (3.15A)
Tr	Transformer
51C1~3	Over Current Relay(Compressor)
63H1~3	High-Pressure Switch
63L1~3	Low-Pressure Switch
FZ	Auxilliary Relay (Fan)
CZ	Auxilliary Relay (Compressor)
30CZ1~3	Auxilliary Relay (Check)
30FZ	Auxilliary Relay (Check)
49F1	Internal Protector (Fan I/D)
49F2~1,2	Internal Protector (Fan O/D)
TCZ1	Timer (2Sec.)
TCZ2	Timer (4Sec.)
<SW>	Switch (on)
<23WA1>	Thermostat (Low Room Temp.)
<23WA2>	Thermostat (High Room Temp.)
C01~C04 C11~14 C21~24 C34	Connector

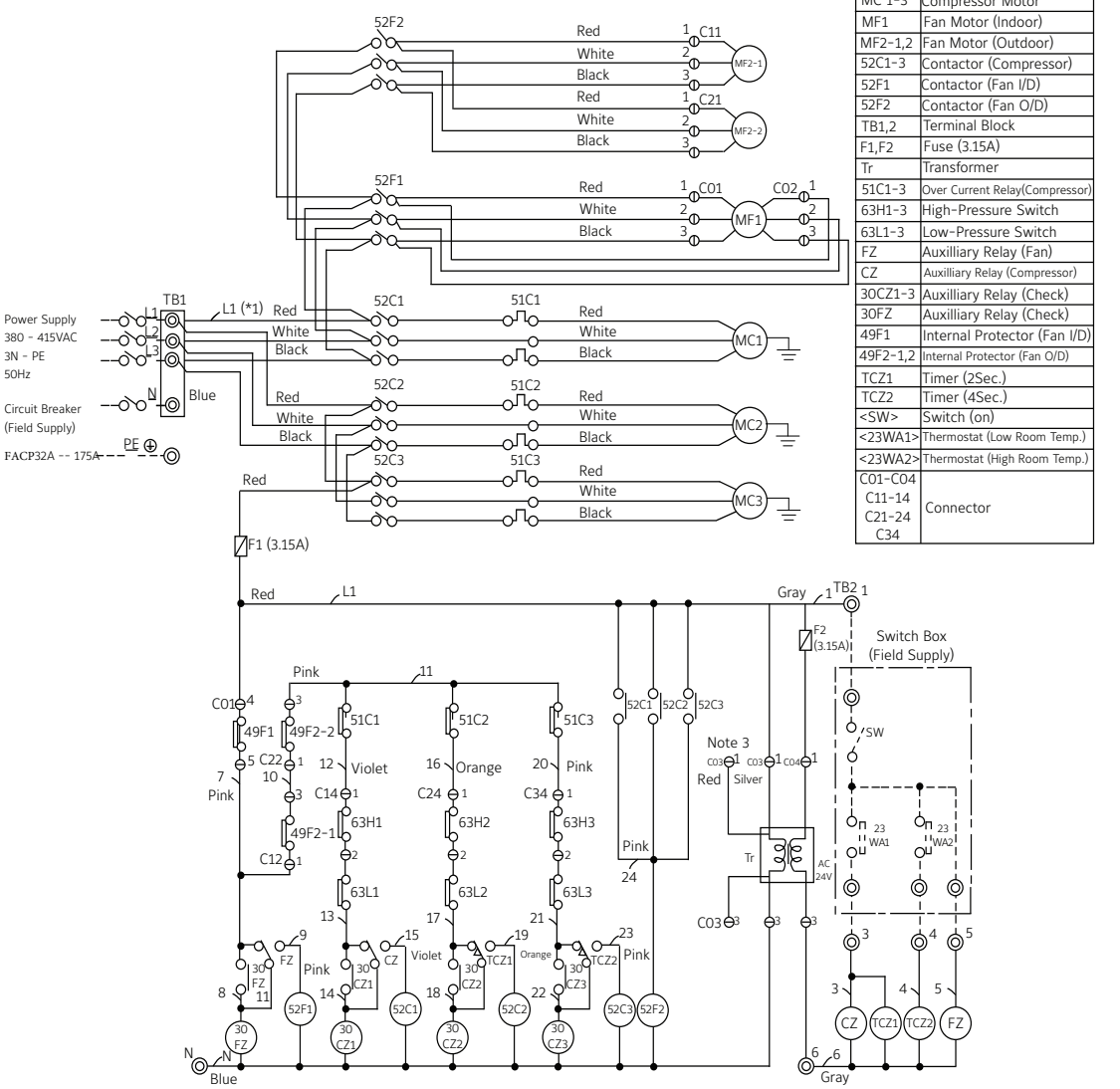


Fig 1. Control Box Layout

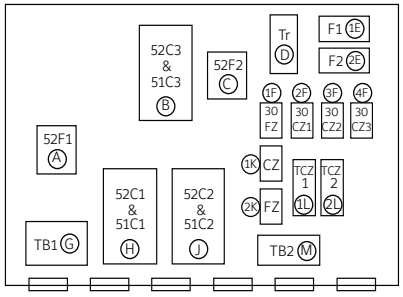
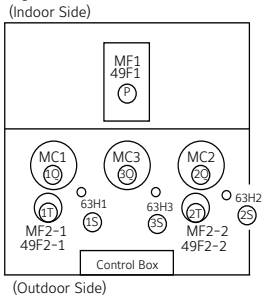
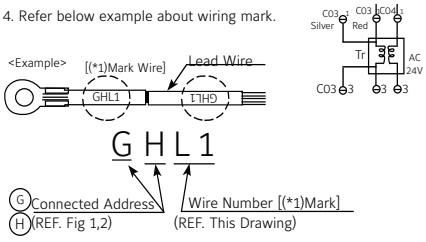


Fig 2. Unit Internal Layout



Note :

1. The dotted lines show field wiring.
2. The figure in the parenthesis show field supply parts.
3. In case of power supply 380VAC model (FACP32ACY4M) Tr wiring.
   Change the connector connection of Tr, if 380VAC model is used for 400,415VAC and 400,415VAC model is used for 380VAC.
4. Refer below example about wiring mark.



Controller Connection

Symbol	No.	Function	PAC-204RC (Option) Terminal No.
TB2	1	Power (Active)	24VAC(L)
	3,4	Cooling Operation	COMP1,2
	5	Fan Operation	FAN HI
	6	Power (Neutral)	24VAC(N)

Caution :

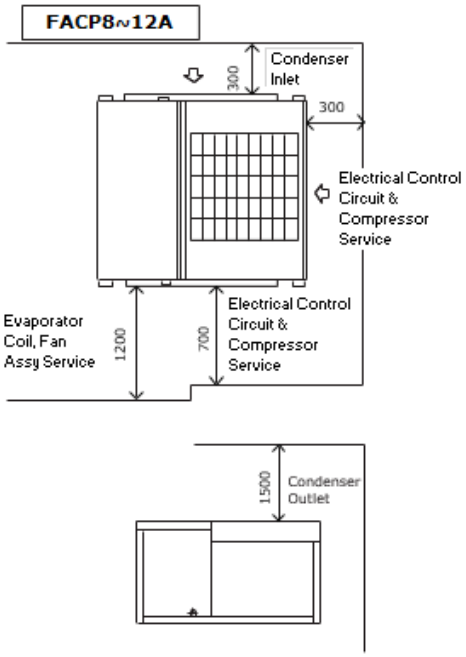
1. To protect compressor from abnormal current, over current relays <51C1,2,3> are installed. Therefore, do not change factory set value of over current relays.
2. This timer <TCZ1,2> installed because the power supply breaker may operate if three compressors start at the same time.
3. Do not change factory set value of timer.

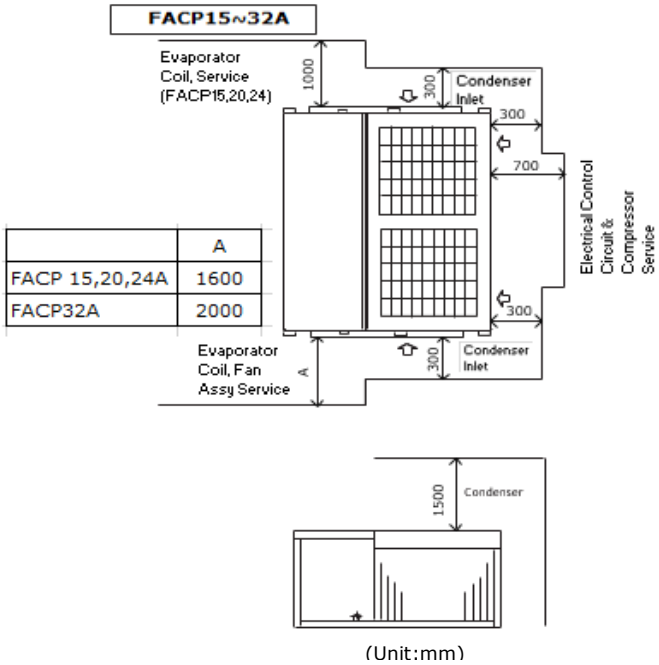
Installation

All series of conditioners are designed for outdoor installations and are to be placed on a slab or rooftop. However, if the air conditioner is to be installed in a plant room, please contact your equipment supplier prior to installation.
Access for both service and installation must be provided to the compressors, control wiring and fans as shown below.

1. Space required around units

- Care must be taken to prevent recirculation of the condenser air. To stabilize compressor, condensing pressures it is recommended that wherever is possible the condenser air inlet side be faced away from prevailing winds.
- For rooftop installation, the type of mounting base depends on the roof construction. A built-up roof may not support the weight of the unit and so it may be necessary to support the unit by adding structural members below it.
- The units are equipped with hoisting plates for rigging and hoisting of the unit. The hoisting plates are located on the top of the unit. When hoisting the unit with a crane, spreader bars must be used to prevent damage to side panels by the supporting cables.



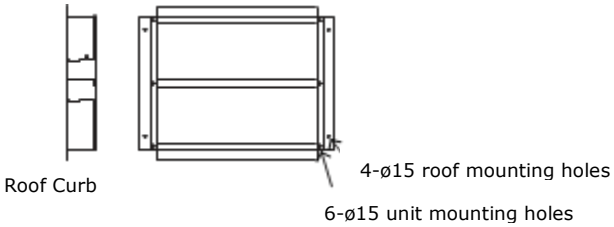


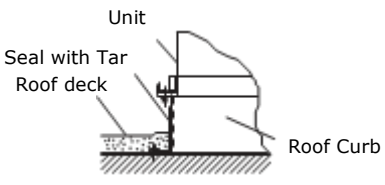
	A
FACP 15,20,24A	1600
FACP32A	2000

(Unit:mm)

2. Installation of The Unit

The figure shows the use of the roof curb available for mounting these units.
The curb should be sealed and fixed to the roof with weather stripping. A suggested means of sealing the unit and roof curb is shown below.

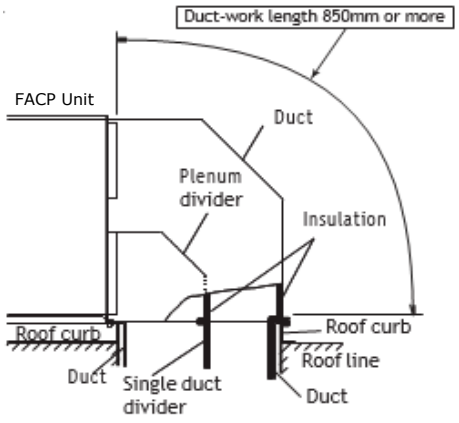




(Unit:mm)

3. Duct Construction

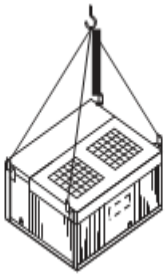
- Series FACP units are equipped with horizontal supply and return air openings. Duct connection to the unit should be made with duct flanges and secured directly to the air openings with flexible duct connectors to avoid abnormal noise transmission.
- For vertical air supply, a field supply plenum should be used. The figure below shows the recommended method for duct connection.
- To prevent air leakage, all duct seams should be taped. Ducts that run-in air spaces that are not air conditioned must be insulated and provided with a vapor barrier. Ducts exposed to the outside must be weather proofed. For quiet operation, we recommend that the insulation on the supply duct to be placed inside, lining the duct.
- Where ducts from the outside enter a building, the duct openings in the building should be sealed with weather stripping to prevent rain, dust, sand, and etc. from entering the building.
- Fans will not accept any external resistance to airflow. Hence, need to determine what provision is available if ductwork is to be fitted with external fans.
- Correctly sized filter must be fitted and there is no provision within the unit. However, the filters may be installed in the return air duct.



Duct connection with a vertical air plenum

4. Lifting Method

When the unit is to be lifted and moved, attach ropes to the suspension plates (4 pcs) provided on the top of the unit. When the unit is lifted, the center of gravity tends to shift the unit to one side and so balance, as shown in the right figure, should be achieved. The angles at which the ropes suspended the unit should be at least 60 at the compressor end and at least 45 at the condenser end. Care should be taken to avoid contact with the main unit while carrying.

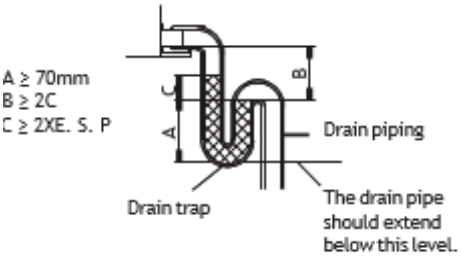


Hook as directly aligned over the center of gravity as possible.

5. Drain Piping

- The condensate drain fitting (R1) is provided. The drain pipe can be let out at the right or left side. Under standard specifications, it is let out at the left side and the right side is covered.
- The drain pipe must have a trap on the outside of the unit and must be installed at an incline for proper drainage, as shown on the right.
- To prevent condensate formation and leakage, provide the drain pipe with insulation to safeguard against sweating.
- Upon completion of the piping work, check that there is no leakage and that the water drains off properly.

The drain piping should have a drain trap.



Note: ESP = External Static Pressure
Drain trap for condensate

6. Refrigerant Charge

An additional charge is unnecessary, except for FACP32. The table below shows the amount of the charge when the unit is shipped.

Refrigerant charge per circuit (kg)	FACP 8	FACP10	FACP12	FACP15	FACP20	FACP24	FACP32
FACP -ACY4 (R407C)	4.5	5.9	5.7	2X4.8	2X5.9	2X5.7	3X3.5*

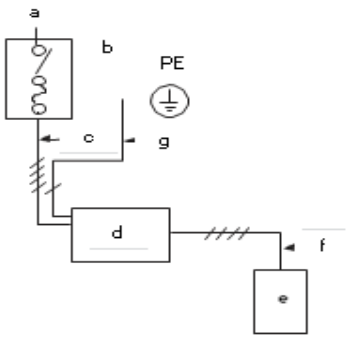
**Full charge of FACP32 is 3 X 6.3*

7. Electrical Wiring

a. Method for connecting electrical wire

Please consult with your power company before doing the wiring in the instructions.

The entire wiring diagram of the unit.



a.	Power Supply
b.	Main Switch/ Fuse (Field Supply)
c.	Power Supply Wiring for Unit
d.	Unit
e.	Remote Controller/ Thermostat (Field Supply)
f.	Connection Wiring for Unit/ Remote Controller
g.	Earth

b. Electrical Wiring

In case of using switch box (field supply), please set up wires as shown above. Remove the panel on the right side (FACP10,12) or the rear side (FACP15,20,24,32) of the unit and connect the units power supply wiring to the proper terminals in the control box. Connect the wires on the basis of following wiring diagram. Mistake in wiring connection may damage the controller.

Caution: This controller can be damaged if wrong connection.

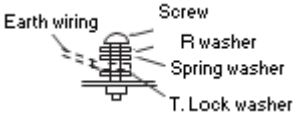
Construct the earth connection.

All electrical work must be carried out by a qualified electrical trades-person and in accordance with local supply authority requirements and associated regulations. The range of working voltage is within ±10% voltage of power supply. The unit is to be wired directly from an electrical distribution board either by a circuit breaker (preferred) of HRC fuse.

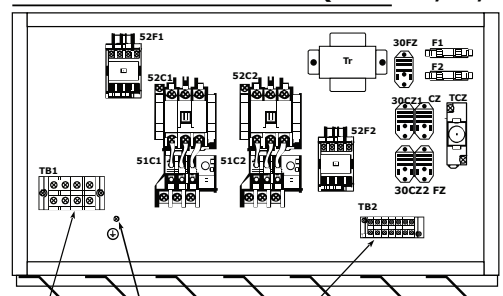
Fix power source wiring to control box by using buffer bushing for sensible force (PG connection or the like).

Connect control wiring to control terminal block through the knockout hole of control box using ordinary bushing.

NOTE: Earth wiring must be connected.

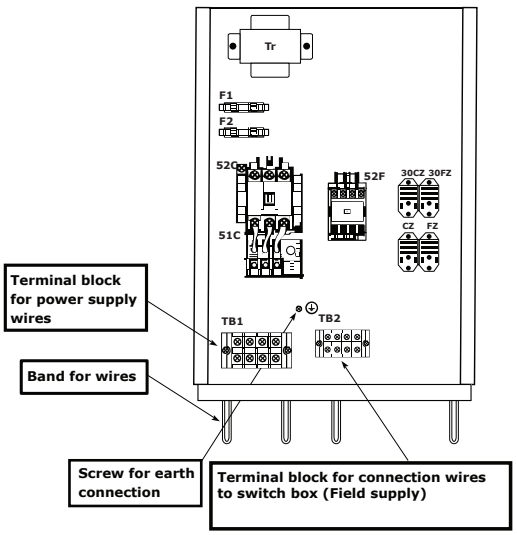


Control module of unit (FACP15,20,24)



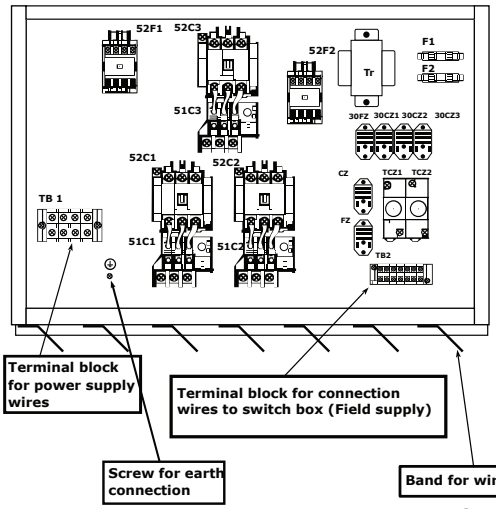
[unit:mm]

Control module of unit (FACP 8,10,12)



[unit:mm]

Control module of unit (FACP32)



[unit:mm]

c. Wiring Example (For metal piping)

	Power cable	Breaker capacity	Over current protection switch	Earth cable
FACP8	14mm²	50A	50A	14mm² over
FACP10	14mm²	50A	50A	14mm² over
FACP12	14mm²	50A	50A	14mm² over
FACP15	22mm²	100A	100A	22mm² over
FACP20	38mm²	100A	100A	22mm² over
FACP24	38mm²	100A	100A	22mm² over
FACP32	60mm²	175A	175A	30mm² over

The grounding wire must be the same diameter as the power able wires. See table above.
The selection of other capacities should be determined in accordance with the relevant standards.

d. Selecting Earth Leakage Breaker (NV)

To select NF or NV instead of a combination of class B fuse switch, use the following.
In the case of class B fuse rated 15A.

	Fuse (class B)	Earth leakage breaker (with over-load protection)		
FACP8	50A	NV50-CP	50A	30mA 0.1s or less
FACP10	50A	NV50-CP	50A	30mA 0.1s or less
FACP12	50A	NV50-CP	50A	30mA 0.1s or less
FACP15	100A	NV100-CP	100A	100mA 0.1s or less
FACP20	100A	NV100-CP	100A	100mA 0.1s or less
FACP24	100A	NV100-CP	100A	100mA 0.1s or less
FACP32	175A	NV225-CP	175A	100mA 0.1s or less

See table above. The selection of other capacities should be determined in accordance with the relevant standards.

Note.
All electrical wiring must comply with local electrical authority regulations.

8. Before starting the trial run

After having installed the unit, check that:

- The unit fixed securely.
- The unit installed properly
- The drain pipe is provided with a drain trap.
- The electrical wiring has been connected correctly and the terminal screws have been properly tightened.
- The duct work has been performed correctly.
- Before turning the unit on, measure the resistance between the terminals of the electrical parts and ground with a 500v megger and check that the value is at least 1.0M ohm.
  If the measured value is below 1.0M ohm, do not operate the unit.
- Check that the fans are rotating in correct direction.
- Check whether there is refrigerant leakage, and slack power or transmission cable.
- Check the operation of high-pressure switch.
  If the two lead wires of the outdoor unit fan motor are disconnected from the contact and cooling is performed, the high-pressure switch should operate and stop the unit after 5 to 10 minutes.
  Perform trial operation after completing above items.

Service & Maintenance

1. Caution for use

Keep the following points in mind to safeguard against failures and break downs.

- For safety, confirm that the earth terminal has been connected to the earth wire correctly.
- Never block or cover the unit's intakes or outlets. It will reduce the unit's efficiency.
- To start the unit again turns the start switch on after 3 minutes have elapsed.
  Repeatedly stopping and starting within 3 minutes can trip the fuse or power source switch.

2. Maintenance

For superior performance and lasting durability, please do not forget to conduct proper and regular maintenance.

> ⚠ **Caution**
> For safety, turn the power source off before service work.

a. Cleaning of panel

Clean dirt of panel as follows.
Use a household neutral cleanser such as for dishes or vegetables.
Motion a soft cloth with the cleanser, then wipe lightly.
Next, wipe three or four times with another soft cloth moistened with water. Finally, wipe off all the remaining cleanser with a soft cloth.
Moisten a soft cloth with alcohol, the wipe off lightly. Isopropyl alcohol is sold at stores as reagents in small quantities.

Finger-marks → **Neutral cleanser**

Grease → **Neutral cleanser**

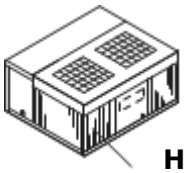
Adhesive → **Isopropyl Alcohol**

Paste → **Isopropyl Alcohol**

Note:
Alcohol is highly combustible. Take extreme care when handling.
Also, do not use paint or adhesive thinner.

b. Cleaning the outdoor heat exchanger

If you use your air conditioner for prolonged periods, the outdoor heat exchanger will become dirty, impairing its function and reducing air conditioner's performance. Consult your equipment supplier or air conditioning contractor on how to clean the heat exchanger.



Heat Exchanger

c. When beginning to use air conditioner again

Please turn on the power supply after the following check is done and no abnormality is found.
It is confirmed that air inlet and outlet are not blocked.
It is confirmed that the earth connection line does not come off.
The earth connection line is installed firmly in the unit.
It is confirmed that there are neither lifting, blocking, nor bending about the drain-hose.

- It is confirm to keep the controller OFF.
- The power supply switch is turned ON.

d. When the air conditioner is not to be used for long time

If the air conditioner is not to be used for a long time due to a seasonal change, etc.,
Please do the following work.

- The power supply is switched OFF.
  If the power supply is kept on, electricity tons will be wasted. Also, the accumulation of dust, etc., can result in fire.
- Filter, eliminator and drain pan are cleaned. Be sure to throw dust properly.
- Run it for 4-5 hours with the air blowing until the inside is completely dry.
- Failing to do so can result in the growth of unhygienic, unhealthy mold in scattered areas throughout the room.

e. In case of failure

- Never remodel the air conditioner. Consult your dealer for any repair service. Improper repair work can result in water leakage, electric shock, fire, etc.
- if the poser breaker is frequently activated, get in touch with your dealer.
  Leaving the unit as it is under such conditions can result in fire or failure.
- If the refrigerant gas blows out or leaks, stop the operation of the air conditioner.
- Thoroughly ventilate the room, and contact your dealer.
  Leaving the unit as it is, can result in accidents due to oxygen deficiency.

3. Transferring Work and Construction

a. Transfer of Installation

- When removing and reinstalling the air conditioner when you enlarge your home, remodel or move, consult with your dealer in advance to calculate the cost of the professional engineering work required for transferring the installation.
- Please do not mix different types of refrigerant when you add the refrigerant during installation and the transferring.
- When moving or reinstalling the air conditioner, consult with your dealer.
  Defective installation can result in electric shock, fire, etc.

b. Place for Installation

Please do not use the unit in following places.

- place where a lot of oil (the machine oil is contained), moistures and dust exist.
- Place where a lot of salinities such as beach district exist.
- Place where Sulphur gas, volatile gas, and corroded gas are filled.
- Place where acid solution is frequently used.
- Place where special spray is frequently used.
- Hot spring zone.
- Near to machine which generates high cycles. (e.g high cycle welding machine etc.)
- Place where ventilation entrance of unit is blocked by snowfall.
- The unit must be installed in stable, level surface.
  The main body might corrode when the unit is used in such a place, the refrigerant leak, the performance of the unit decreases remarkably, causing damage to parts of the unit.

c. Regarding Electric Work

- The electrical work must be undertaken by a person who is qualified as an electric engineer according to the (technical standard respecting electrical installation), (internal wiring rules), the installation and operation manual with the absolute use of exclusive circuits. The range of working voltage is within ±10% voltage of power supply.
- Please install a special power supply in the power supply.
- Please install the earth connection for the electric shock prevention.
- Never connect the grounding wire to a gas pipe, water pipe, arrester, or telephone grounding wires. For details, consult your dealer.
- In some types of installation sites, the installation of an earth leakage breaker is mandatory. For details consult your dealer.
- The breaker and the fuse must use the correct capacity.
  The main body might corrode when the unit is used in such a place, the refrigerant leak, the performance of the unit decreases remarkably, causing damage to parts of the unit.

d. Consideration of the noise.

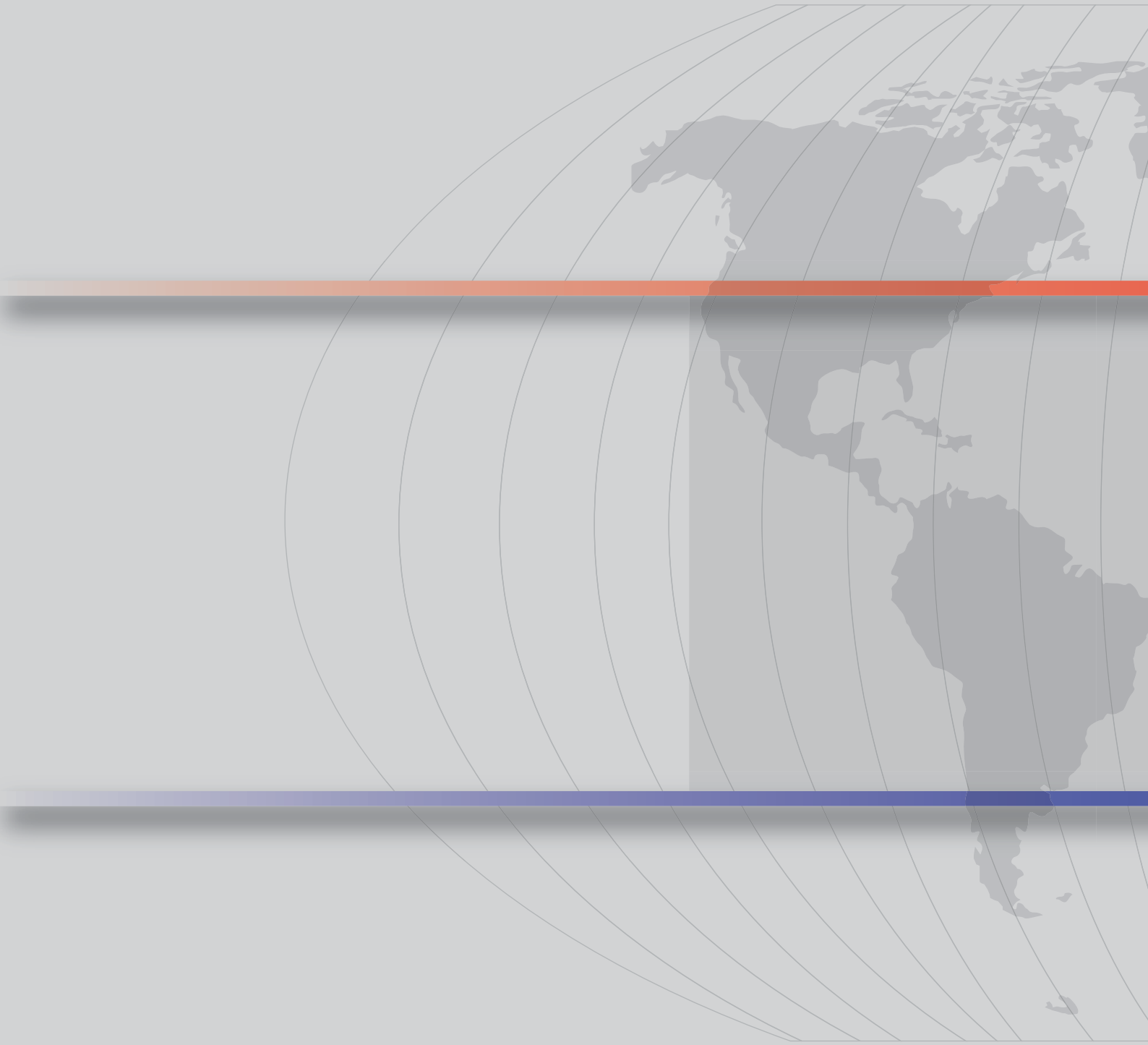
- Take sufficient measures against noise when installing the unit where noise level is critical.
- If any object is placed near the air outlet of the unit, decreased performance and increased noise will result. Avoid any obstacles adjacent to the air outlet.

e. Maintenance and Inspection

- If the unit is used throughout several seasons, the heat exchanger can get dirty, reducing performance.
- Depending upon conditions of usage, foul odors can be generated & drainage can deteriorate due to dust and dirt, etc.

Troubleshooting

Problem	Cause	Troubleshooting
Unit Not Running	Power failure.	Press the [ON/OFF] button after power.
	The power supply is turned OFF.	Turn the power supply ON.
	The fuse in the power supply is burnt.	Replace fuse.
	The earth leakage breaker is gone.	Put in the earth leakage breaker.
	The wiring phase of power supply is mistaken.	Modify the wiring phase of power supply
Unit Running but Not Cool	Improper temperature adjustment.	Check the set temperature and inlet temperature on the liquid crystal display and adjust accordingly.
	The filter is filled with dust and dirt	Clean up the filter
	There are some obstacles at the air inlet or outlet of the units.	Remove.
	Windows or doors are open.	Close.
	Insufficient refrigerant charge.	Contact your installation contractor.
	The restart-preventing circuit is in operation for 3 minutes.	Wait for a while. (To protect the compressor, a 3-minute restart preventing circuit is built into the unit. Therefore, there are occasions when the compressor does not start running immediately. There are cases when it does not run for as long as 3 minutes.)
Fan Runs but Compressor Does Not Run	The set temperature for thermostat is excessively high for cooling.	For temperature control, decrease the set temperature at cooling.
	The room temperature is excessively low for cooling.	Cannot be operated as it is out of temperature control range.
Compressor Runs but Stops Immediately	Air outlet or inlet is blocked.	Remove blocking matter.
Water or Steam Is Discharged From The Unit	Air Flow too high	It is not a breakdown. Please contact and consult your dealer.
	The drain pipe is clogged, therefore the drain water overflows.	Clear the drain pipe.



A member of the FRIMEC International Group