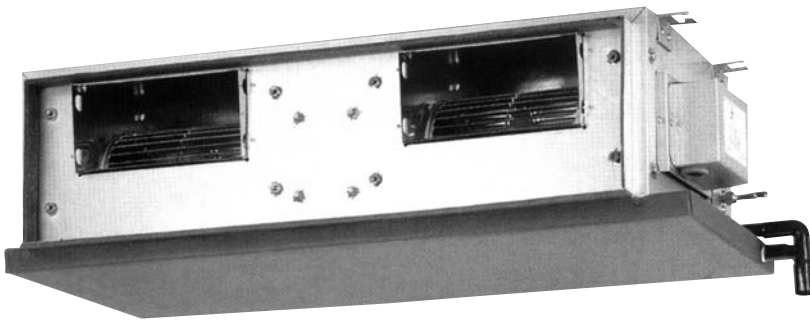


DAIKIN

INSTALLATION MANUAL

R22 Split Series



Models

FDYM30CV1M

FDYM40CV1M

FDYM60CV1M

FDYM71CV1M

FDYM80CV1M

FDYM90CV1M

FDYM90CV1M

FDYM100CV1M

FDYM125CV1M

FDYM125CV1M

FDYM140CV1M

FDYM160CV1M

FDYB30CV1M

FDYB40CV1M

FDYB60CV1M

FDYB71CV1M

FDYB90CV1M

FDYB90CV1M

FDYB125CV1M

FDYB125CV1M

FDYB140CV1M

FDYB160CV1M

RY30CV1M

RY40CV1M

RY60CV1M

RY71CV1M

RY80CV1M

RY90CV1M

RY90CY1M

RY100CV1M

RY125CV1M

RY125CY1M

RY140CY1M

RY160CY1M

Installation Manual
R22 Split series

English

Manuel d'installation
Série split R22

Français

Руководство По Установке
Серия R22 с раздельной установкой

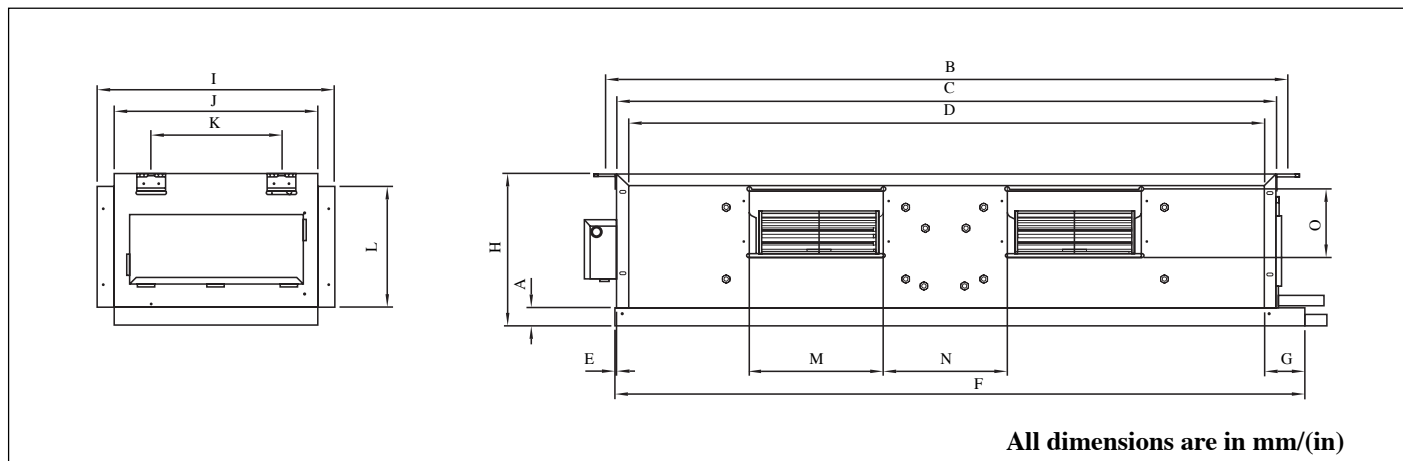
Русский

Kurulum Kılavuzu
R22 Split serisi

Türkçe

OUTLINE AND DIMENSIONS

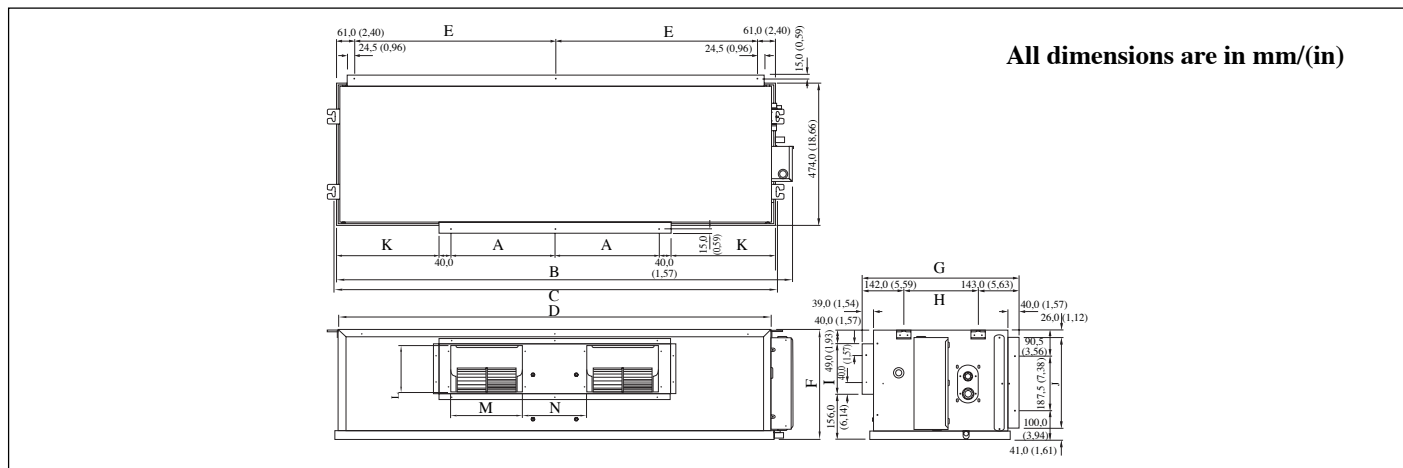
Indoor Unit



All dimensions are in mm/(in)

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
FDYM30CV1M FDYB30CV1M	31 (1,2)	741 (29,2)	702 (27,6)	662 (26,1)	10 (0,4)	765 (30,1)	72 (2,8)	261 (10,3)	411 (16,2)	351 (13,8)	225 (8,9)	211 (8,3)	232 (9,1)	212,8 (8,4)	114 (4,5)
FDYM40CV1M FDYB40CV1M	31 (1,2)	881 (34,7)	842 (33,1)	802 (31,6)	10 (0,4)	905 (35,6)	72 (2,8)	261 (10,3)	411 (16,2)	351 (13,8)	225 (8,9)	211 (8,3)	232 (9,1)	212,8 (8,4)	114 (4,5)
FDYM60CV1M FDYB60CV1M	31 (1,2)	1041 (41,0)	1002 (39,4)	962 (37,9)	10 (0,4)	1065 (41,9)	72 (2,8)	261 (10,3)	411 (16,2)	351 (13,8)	225 (8,9)	211 (8,3)	232 (9,1)	212,8 (8,4)	114 (4,5)
FDYM71CV1M FDYB71CV1M	31 (1,2)	1176 (46,3)	1137 (44,8)	1097 (43,2)	10 (0,4)	1200 (47,2)	72 (2,8)	261 (10,3)	411 (16,2)	351 (13,8)	225 (8,9)	211 (8,3)	232 (9,1)	212,8 (8,4)	114 (4,5)

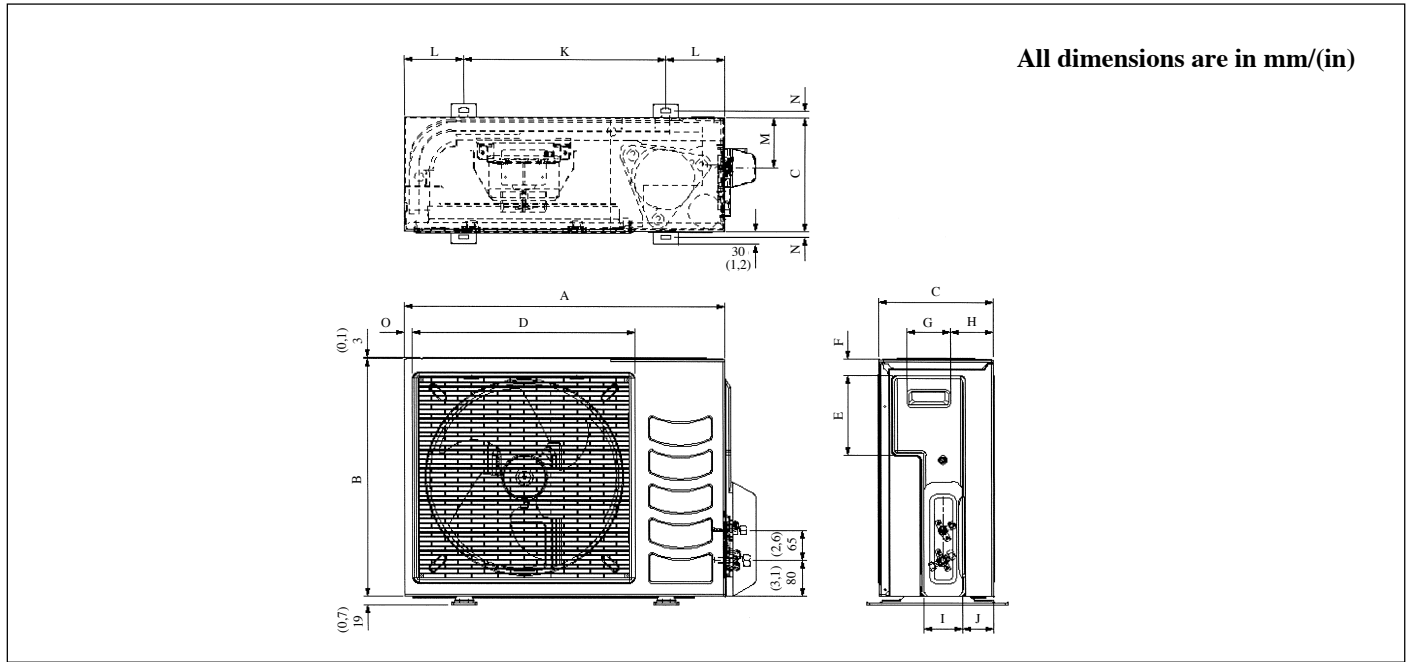
Indoor Unit



All dimensions are in mm/(in)

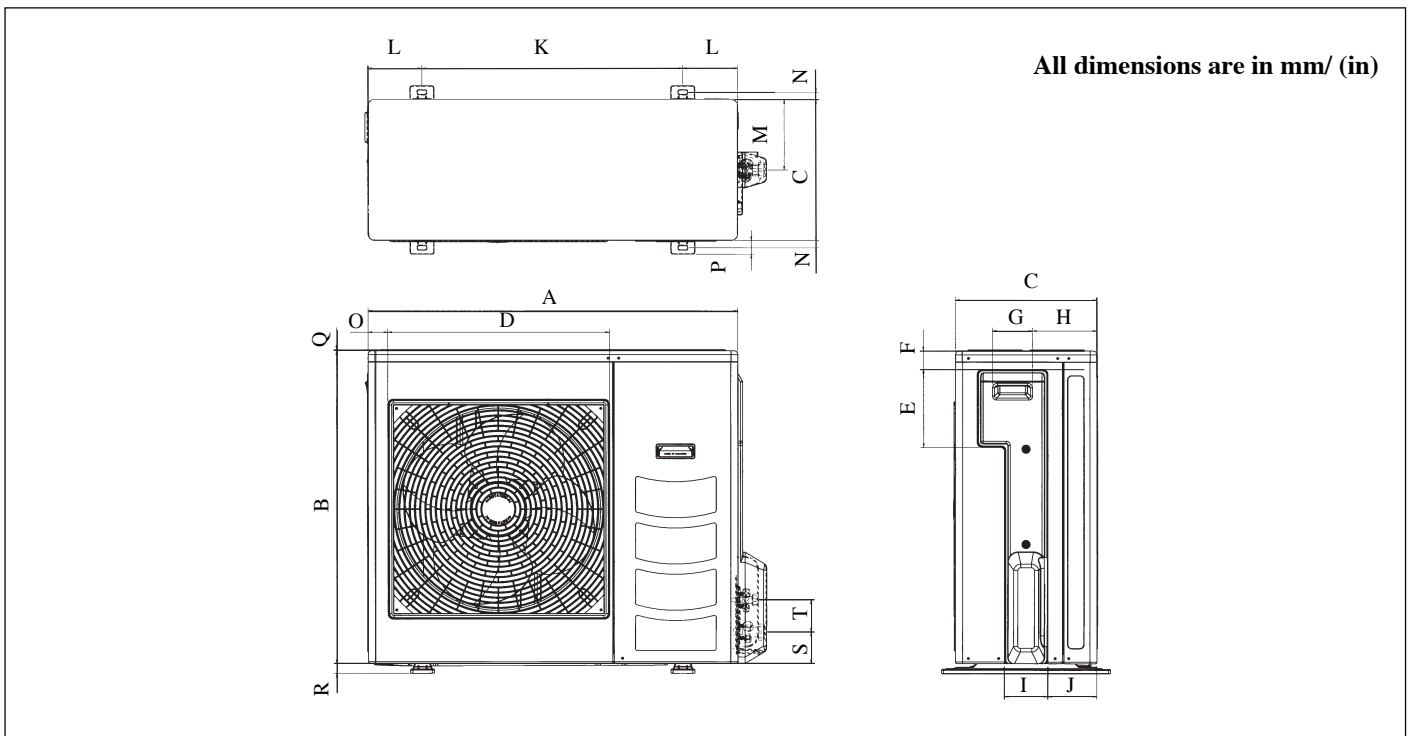
Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N
FDYM80CV1M	371,7 (14,6)	1007 (39,6)	959 (37,8)	920 (36,2)	410,0 (16,1)	295 (11,6)	600 (23,6)	339 (13,3)	121 (4,8)	213 (8,4)	64,0 (2,5)	100,0 (3,9)	239 (9,4)	214,0 (8,4)
FDYM90CV1M FDYB90CV1M	359 (14,1)	999 (39,3)	956 (37,6)	917 (36,1)	408,5 (16,1)	378 (14,9)	541 (21,3)	256 (10,1)	173 (6,8)	306 (12,0)	70,5 (2,8)	160,5 (6,3)	248 (9,8)	220,0 (8,7)
FDYM100CV1M	371,2 (14,6)	1312 (51,7)	1264 (49,8)	1225 (48,2)	562,5 (22,1)	315 (12,4)	638 (25,1)	401 (15,8)	183 (7,2)	233 (9,2)	217,0 (8,5)	169,2 (6,7)	251 (9,9)	237,8 (9,4)
FDYM125CV1M FDYB125CV1M	359 (14,1)	1115 (43,9)	1072 (42,2)	1033 (40,7)	466,5 (18,4)	378 (14,9)	541 (21,3)	256 (10,1)	173 (6,8)	306 (12,0)	128,5 (5,1)	160,5 (6,3)	248 (9,8)	220,0 (8,7)
FDYM140CV1M FDYB140CV1M	359 (14,1)	1369 (53,9)	1326 (52,2)	1287 (50,7)	593,5 (23,4)	378 (14,9)	541 (21,3)	256 (10,1)	173 (6,8)	306 (12,0)	255,5 (10,1)	160,5 (6,3)	248 (9,8)	220,0 (8,7)
FDYM160CV1M FDYB160CV1M	359 (14,1)	1569 (60,1)	1526 (58,5)	1487 (58,5)	693,5 (27,3)	378 (14,9)	541 (21,3)	256 (10,1)	173 (6,8)	306 (12,0)	355,5 (14,0)	160,5 (6,3)	248 (9,8)	220,0 (8,7)

Outdoor Unit



Dimension	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
RY30CV1M	700	521	250	485	175	36	95	93	86	68	441	130	111	15	18
RY40CV1M	(27,5)	(20,5)	(9,8)	(19,1)	(6,8)	(1,4)	(3,7)	(3,6)	(3,3)	(2,6)	(17,3)	(5,1)	(4,3)	(0,5)	(0,7)

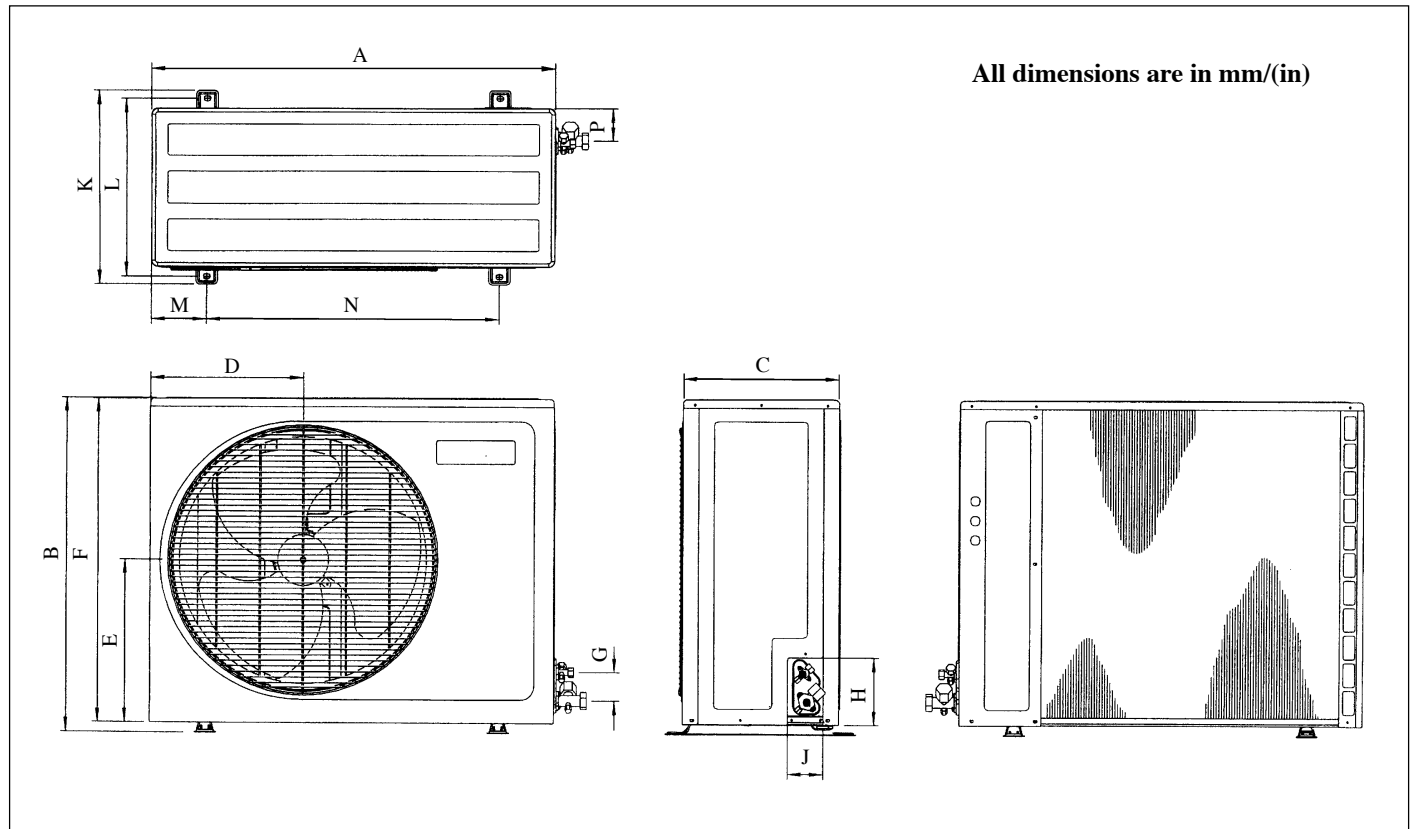
Outdoor Unit



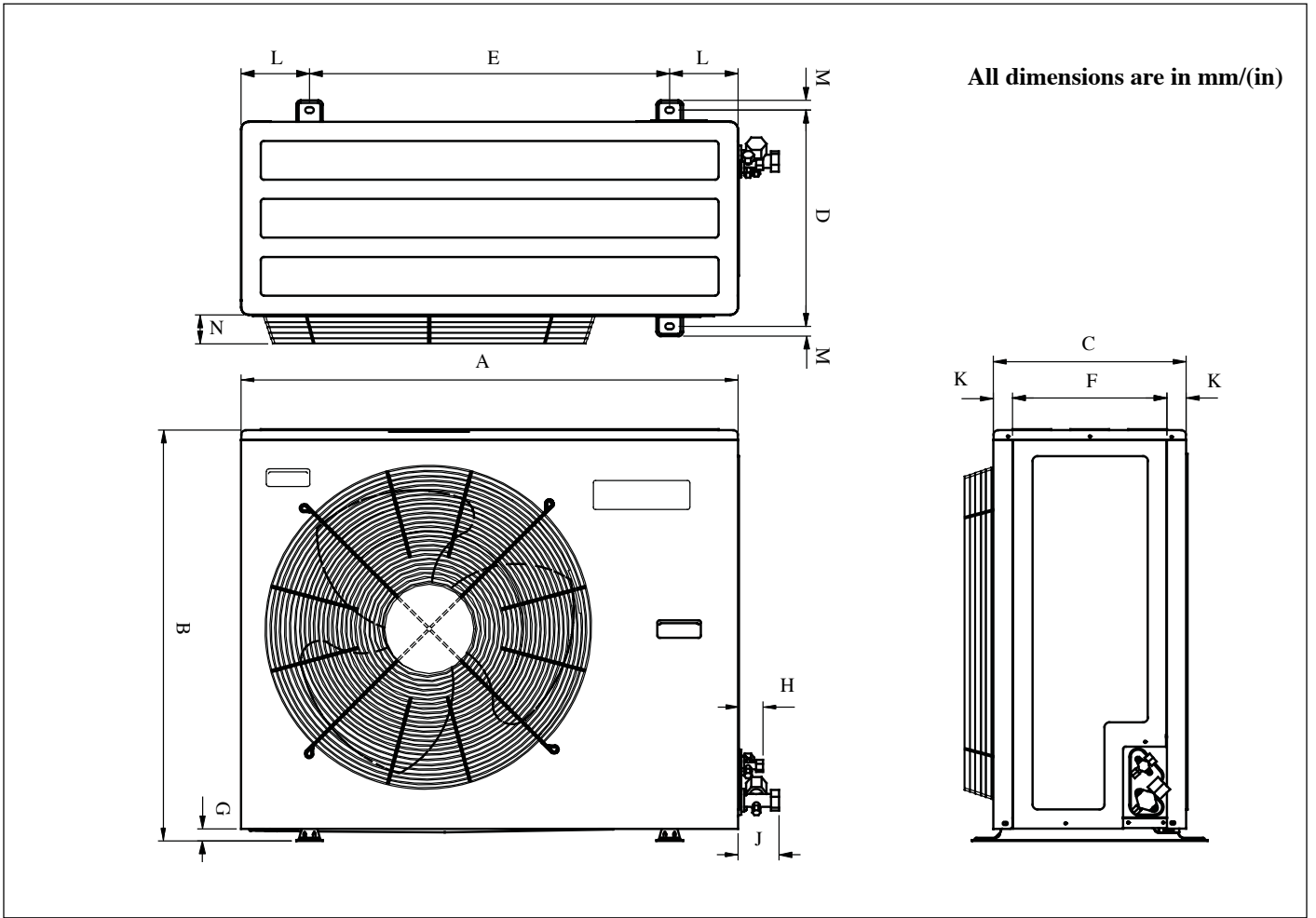
Dimension	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
RY60CV1M	855	628	328	513	182	44	93	149	101	113	603	126	164	17	49
RY71CV1M	855	730	328	513	182	44	93	149	101	113	603	126	164	17	47
RY80CV1M	(33,7)	(28,7)	(12,9)	(20,2)	(7,2)	(1,7)	(3,7)	(5,9)	(4,0)	(4,4)	(23,7)	(5,0)	(6,4)	(0,7)	(1,9)

Dimension	P	Q	R	S	T
RY60CV1M	32	3	23	73	75
RY71CV1M	(1,3)	(0,1)	(0,9)	(2,9)	(3,0)
RY80CV1M	32	3	23	73	75
	(1,3)	(0,1)	(0,9)	(2,9)	(3,0)

Outdoor Unit



Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P
RY90CV1M/ RY90CY1M/ RY100CV1M/ RY125CV1M/ RY125CY1M/ RY140CY1M	1030 (40,6)	850 (33,5)	400 (15,7)	390 (15,4)	414 (16,3)	827 (32,6)	72 (2,8)	196 (7,7)	91 (3,6)	488 (19,2)	448 (17,6)	141,5 (5,6)	746,5 (29,4)	82 (3,2)



Model	A	B	C	D	E	F	G	H	J	K	L	M	N
RY160CY1M	1030 (40,6)	850 (33,5)	400 (15,7)	448 (17,6)	746,5 (29,4)	320 (12,6)	25 (1,0)	50 (2,0)	85 (3,3)	40 (1,6)	141.5 (5,6)	20 (0,8)	60 (2,4)

INSTALLATION MANUAL

This manual provides the procedures of installation to ensure a safe and good standard of operation for the air conditioner unit.

Special adjustment may be necessary to suit local requirements.

Before using your air conditioner, please read this instruction manual carefully and keep it for future reference.





SAFETY PRECAUTIONS

WARNING

- Installation and maintenance should be performed by qualified persons who are familiar with local code and regulation, and experienced with this type of appliance.
- All field wiring must be installed in accordance with the national wiring regulation.
- Ensure that the rated voltage of the unit corresponds to that of the name plate before commencing wiring work according to the wiring diagram.
- The unit must be GROUNDED to prevent possible hazard due to insulation failure.
- All electrical wiring must not touch the refrigerant piping or any moving parts of the fan motors.
- Confirm that the unit has been switched OFF before installing or servicing the unit.
- Disconnect from the main power supply before servicing the air conditioner unit.
- DO NOT pull out the power cord when the power is ON. This may cause serious electrical shocks which may result in the fire hazards.
- Keep the indoor and outdoor units, power cable and transmission wiring, at least 1m from TVs and radios, to prevent distorted pictures and static. {Depending on the type and source of the electrical waves, static may be heard even when more than 1m away}.

CAUTION

Please take note of the following important points when installing.

- **Do not install the unit where leakage of flammable gas may occur.**
 -  If gas leaks and accumulates around the unit, it may cause fire ignition.
- **Ensure that the drainage piping is connected properly.**
 -  If the drainage piping is not connected properly, it may cause water leakage which will dampen the furniture.
- **Do not overcharge the unit.**
 -  This unit is factory pre-charged, Overcharge will cause over-current or damage to the compressor.
- **Ensure that the unit's panel is closed after service or installation.**
 -  Unsecured panels will cause the unit to operate noisily.
- **Sharp edges and coil surfaces are potential locations which may cause injury hazards. Avoid from being in contact with these places.**
- **Before turning off the power supply set the remote controller's ON/OFF switch to the "OFF" position to prevent the nuisance tripping of the unit.** If this is not done, the unit's fans will start turning automatically when power resumes, posing a hazard to service personnel or the user.
- **Do not operate any heating apparatus too close to the air conditioner unit.** This may cause the plastic panel to melt or deform as a result of the excessive heat.
- **Ensure the color of wires of the outdoor unit and the terminal markings are same to the indoors respectively.**
- **IMPORTANT : DO NOT INSTALL OR USE THE AIR CONDITIONER UNIT IN A LAUNDRY ROOM.**

Disposal requirements

Dismantling of the unit, treatment of the refrigerant, oil and other parts shall be done in accordance with local and national regulation.

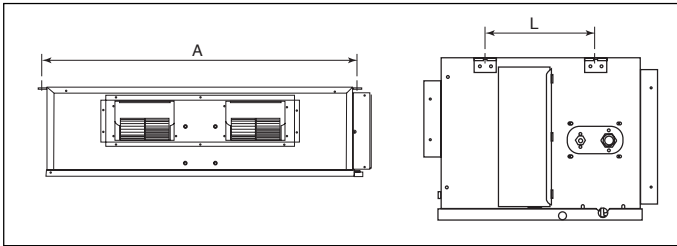
INSTALLATION OF THE INDOOR UNIT

The indoor unit must be installed such that there is no short circuit of the cool discharge. Respect the installation clearance. Do not put the indoor unit where there is direct sunlight on unit. The location is suitable for piping and drainage and it must be have a large distance between a door and unit.

Ceiling Concealed Mounting

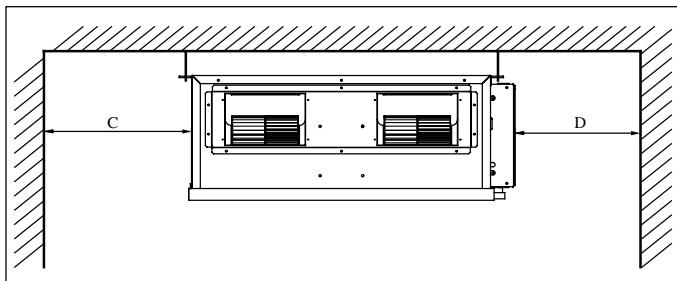
- Use the hanger supplied with the unit.
- Make sure that the wall is sufficiently strong to withstand the weight.

Center distance of axle (see drawing below)



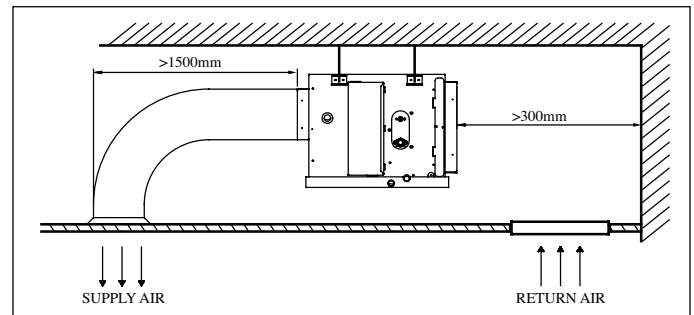
	A mm (inch)	L mm (inch)
FDYM30CV1M	741	225
FDYB30CV1M	(29.2)	(8.9)
FDYM40CV1M	881	225
FDYB40CV1M	(34.7)	(8.9)
FDYM60CV1M	1041	225
FDYB60CV1M	(41.0)	(8.9)
FDYM71CV1M	1176	225
FDYB71CV1M	(46.3)	(8.9)
FDYM80CV1M	959	339
	(37.8)	(13.3)
FDYM90CV1M	956	266
FDYB90CV1M	(37.6)	(10.5)
FDYM100CV1M	1264	401
	(49.8)	(15.8)
FDYM125CV1M	1076	266
FDYB125CV1M	(42.4)	(10.5)
FDYM140CV1M	1326	266
FDYB140CV1M	(52.2)	(10.5)
FDYM160CV1M	1526	266
FDYB160CV1M	(60.1)	(10.5)

During installation, provide clearance for servicing ease as shown in diagram and table below:



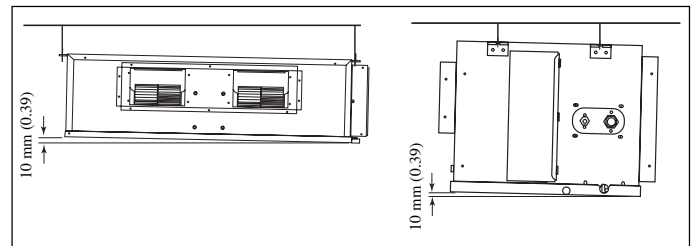
	C mm (inch)	D mm (inch)
FDYM30CV1M		
FDYB30CV1M		
FDYM40CV1M		
FDYB40CV1M	200	500
FDYM60CV1M	(7.9)	(19.7)
FDYB60CV1M		
FDYM71CV1M		
FDYB71CV1M		
FDYM80CV1M	460	500
	(18.1)	(19.7)
FDYM90CV1M	450	500
FDYB90CV1M	(17.7)	(19.7)
FDYM100CV1M	610	540
	(24.0)	(21.3)
FDYM125CV1M	510	500
FDYB125CV1M	(20.1)	(19.7)
FDYM140CV1M	640	570
FDYB140CV1M	(25.2)	(22.4)
FDYM160CV1M	740	670
FDYB160CV1M	(29.1)	(26.4)

For unit installed with return duct and grille with built in air filter, service space for A & B could be 200mm and 500mm respectively.



When installing the
 * unit without ducting
 * or with short ducting (horizontal length <1.5m)
 * or without grill,
 install the unit at a height more than 2.5m so that the fan blades can not be touched.

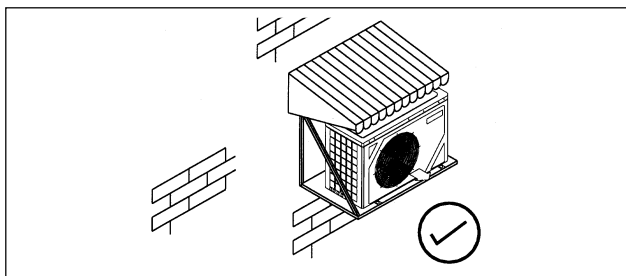
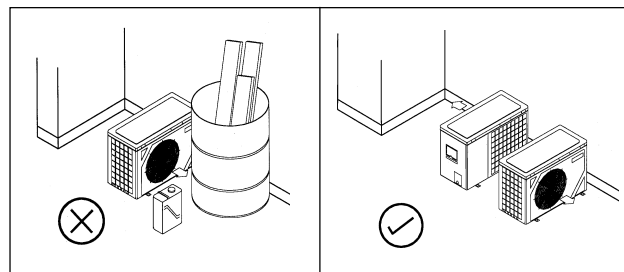
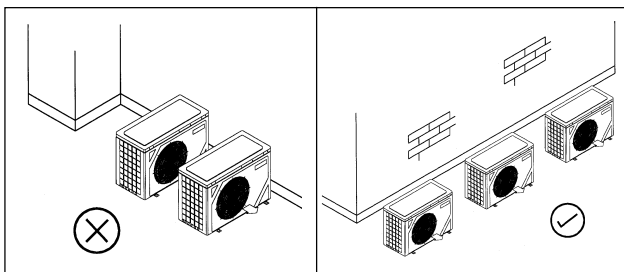
Ensure the slope of the drainage piping as shown in diagram below:



INSTALLATION OF THE OUTDOOR UNIT

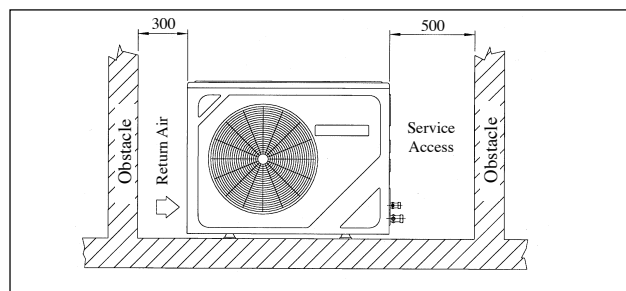
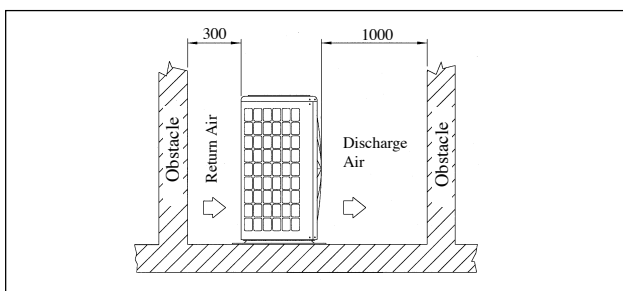
The outdoor unit must be installed such that there is no short circuit of the discharge air or obstruction to smooth air flow. Respect the installation clearance. Select the coolest possible place where intake air should not be higher than the outside temperature (maximum 45°C).

Ensure that there are no obstruction of air flow into or out of the unit. Remove obstacles which block air intake or discharge.



The location must be well-ventilated, so that the unit can draw in and distribute plenty of air thus lowering the temperature. A place capable of bearing the weight of the outdoor unit as well as isolating noise and vibration. A place protected from the direct sunlight. Use an awning for protection if necessary. The installation location must not be susceptible to highly concentrated dust, oil, salt or sulfide gas.

Outdoor Unit SL Series Clearance (in mm)



Note: If the obstacle is higher than 2 m or if there is any obstruction at the upper part of the unit allow more space than indicated in the table above.

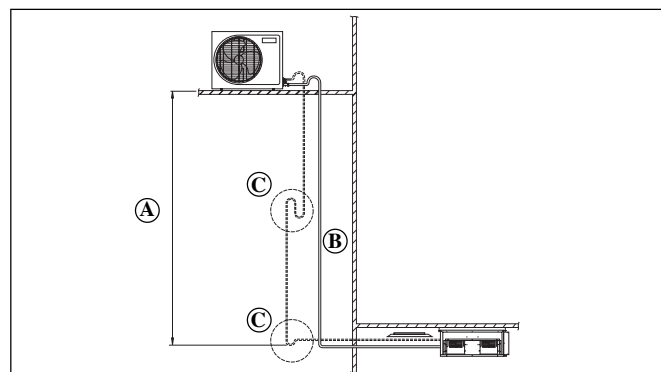
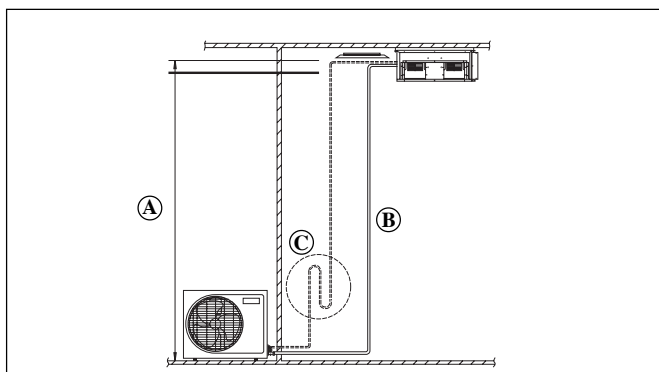
REFRIGERANT PIPING

Maximum Pipe Length And Maximum Number Of Bends

When the pipe length becomes too long, both the capacity and reliability drop. As the number of bends increases, system piping resistance to the refrigerant flow increases, thus lowering the cooling capacity. As a result, compressor reliability will be affected. Always choose the shortest path and follow the recommendation as tabulated below:

Data \ Model	FDYM30CV1M FDYB30CV1M	FDYM40CV1M FDYB40CV1M	FDYM60CV1M FDYB60CV1M	FDYM71CV1M FDYB71CV1M	FDYM80CV1M
Maximum Length, A m (ft)	12 (39.4)	12 (39.4)	15 (49.2)	15 (49.2)	15 (49.2)
Maximum Elevation, B m (ft)	5 (16.4)	5 (16.4)	8 (26.2)	8 (26.2)	8 (26.2)
Maximum No. of Bends, C	10	10	10	10	10

Data \ Model	FDYM90CV1M FDYB90CV1M	FDYM100CV1M	FDYM125CV1M FDYB125CV1M	FDYM140CV1M FDYB140CV1M	FDYM160CV1M FDYB160CV1M
Maximum Length, A m (ft)	45 (147.6)	45 (147.6)	45 (147.6)	45 (147.6)	35 (114.8)
Maximum Elevation, B m (ft)	25 (82.0)	25 (82.0)	25 (82.0)	25 (82.0)	15 (49.2)
Maximum No. of Bends, C	10	10	10	10	10



Piping Works And Flaring Technique

Do not use contaminated or damaged copper tubing. If any piping, evaporator or condenser had been exposed or had been opened for 15 seconds or more, vacuum the system. Generally, do not remove plastic, rubber plugs and brass nuts from the valves, fittings, tubings and coils until it is ready for connection.

If any brazing work is required, ensure that the nitrogen gas is passed through piping and joints while the brazing work is being done. This will eliminate soot formation on the inside walls of the copper tubings.

Cut the pipe stage by stage, advancing the blade of pipe cutter slowly. Extra force and deep cut will cause more distortion of pipe and therefore extra burr.

Remove burrs from cut edges of pipes with a remover as shown in Fig. R. This will avoid unevenness on the flare faces which will cause gas leak. Hold the pipe on top position and burr remover at lower position to prevent metal chips from entering the pipe.

Insert the flare nuts mounted on the connection parts of both indoor and outdoor unit, into the copper pipes. The exact length of pipe protruding from the face of the flare die is determined by the flaring tool.

Fix the pipe firmly on the flare die. Match the centers of both the flare die and the flaring punch, and tighten flaring punch fully.

Piping Connection To The Units

Align the center of the piping and sufficiently tighten the flare nut with fingers.

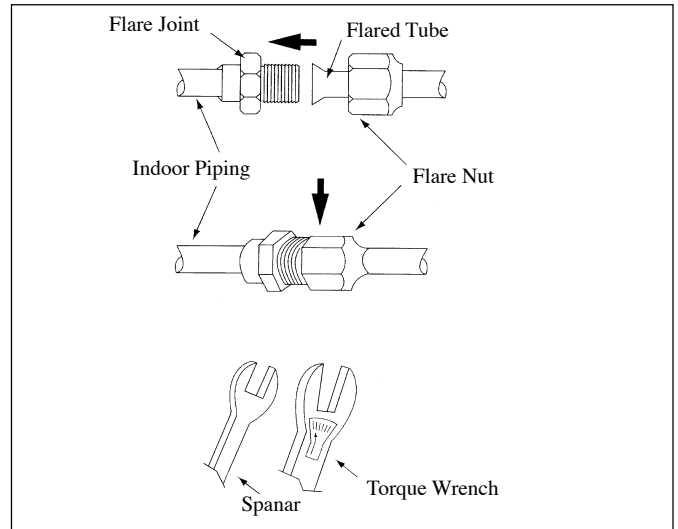
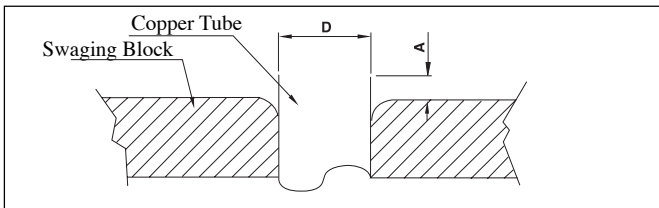
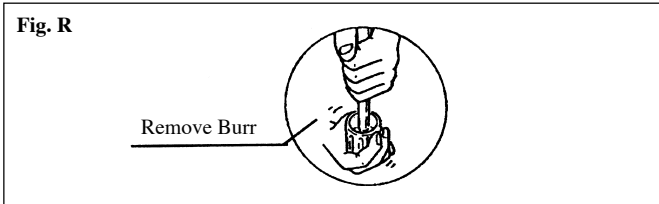
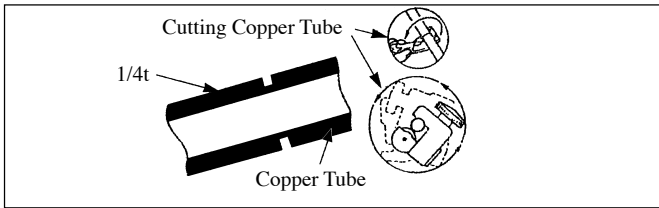
Finally, tighten the flare nut with torque wrench until the wrench clicks.

When tightening the flare nut with the torque wrench, ensure that the direction for tightening follows the arrow on the wrench.

The refrigerant pipe connection are insulated by polyurethane (ARMAFLEX type or similar).

Ø Tube, D		A (mm)	
Inch	mm	Imperial	Rigid
1/4"	6.35	1.3	0.7
3/8"	9.52	1.6	1.0
1/2"	12.70	1.9	1.3
5/8"	15.88	2.2	1.7
3/4"	19.05	2.5	2.0

Pipe Size, mm (in)	Torque (Nm)
6.35 (1/4)	18
9.53 (3/8)	42
12.7 (1/2)	55
15.88 (5/8)	65
19.05 (3/4)	78

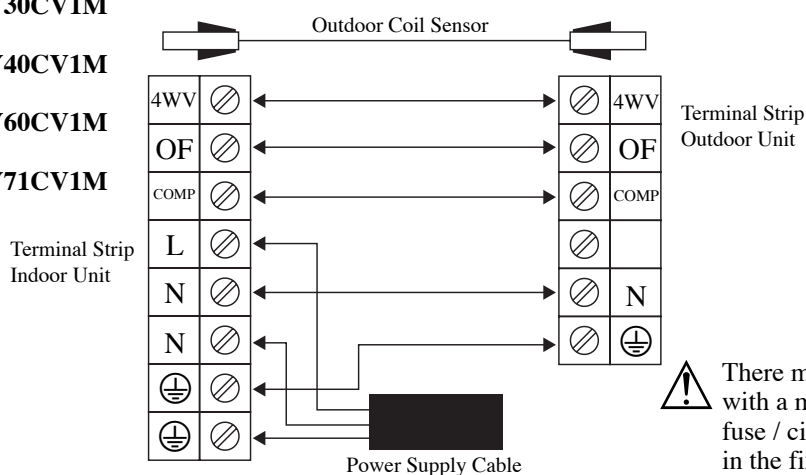


ELECTRICAL CONNECTION

Heat Pump Units

Indoor unit	FDYM30CV1M FDYB30CV1M	FDYM40CV1M FDYB40CV1M	FDYM60CV1M FDYB60CV1M	FDYM71CV1M FDYB71CV1M
Outdoor unit	RY30CV1M	RY40CV1M	RY60CV1M	RY71CV1M
Voltage range	220V-240V /1Ph /50Hz + ⊕			
Recommended fuse* A	10	10	16	20
Power supply cable size* mm ²	1.5	1.5	2.5	2.5
Number of conductors	3	3	3	3
Interconnection cable size* mm ²	1.5	1.5	2.5	2.5
Number of conductors	5	5	5	5

FDYM30CV1M/
FDYB30CV1M - RY30CV1M
FDYM40CV1M/
FDYB40CV1M - RY40CV1M
FDYM60CV1M/
FDYB60CV1M - RY60CV1M
FDYM71CV1M/
FDYB71CV1M - RY71CV1M



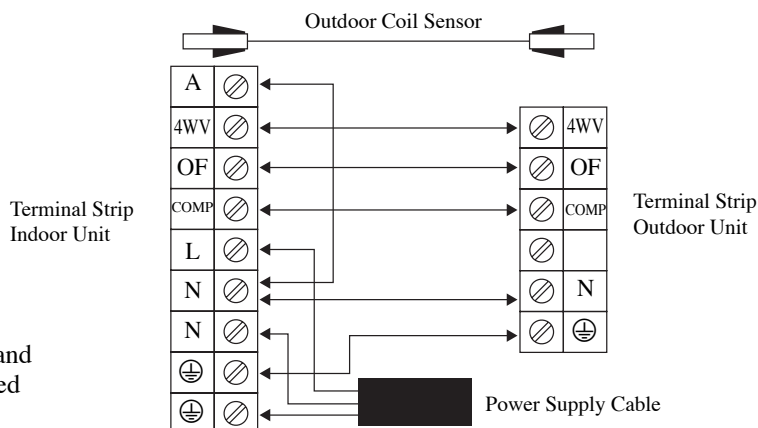
⚠ There must be a all pole switch with a minimum 3 mm contact gap and fuse / circuit breaker as recommended in the fixed installation circuits.

Heat Pump Units

Indoor unit	FDYM80CV1M	FDYM90CV1M FDYB90CV1M	FDYM100CV1M	FDYM125CV1M FDYB125CV1M
Outdoor unit	RY80CV1M	RY90CV1M	RY100CV1M	RY125CV1M
Voltage range	220V-240V /1Ph /50Hz + ⊕			
Recommended fuse* A	25	30	35	35
Power supply cable size* mm ²	4.0	4.0	4.0	4.0
Number of conductors	3	3	3	3
Interconnection cable size* mm ²	2.5	1.5	1.5	1.5
Number of conductors	5	6	6	6

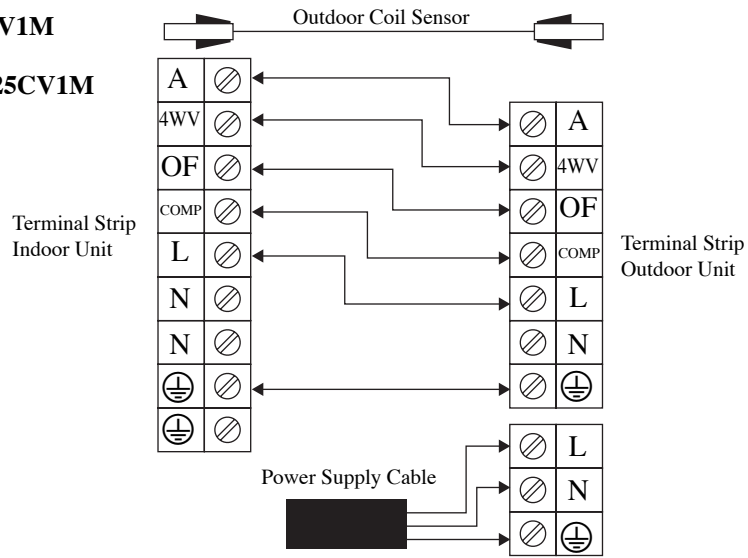
IMPORTANT: * These values are for information only, they should be checked and selected to comply with the local and/or national codes and regulations. They are also subjected to the type of installation and size of conductors.

FDYM80CV1M - RY80CV1M



⚠ There must be a all pole switch with a minimum 3 mm contact gap and fuse / circuit breaker as recommended in the fixed installation circuits.

FDYM90CV1M/FDYB90CV1M - RY90CV1M
FDYM100CV1M - RY100CV1M
FDYM125CV1M/FDYB125CV1M - RY125CV1M

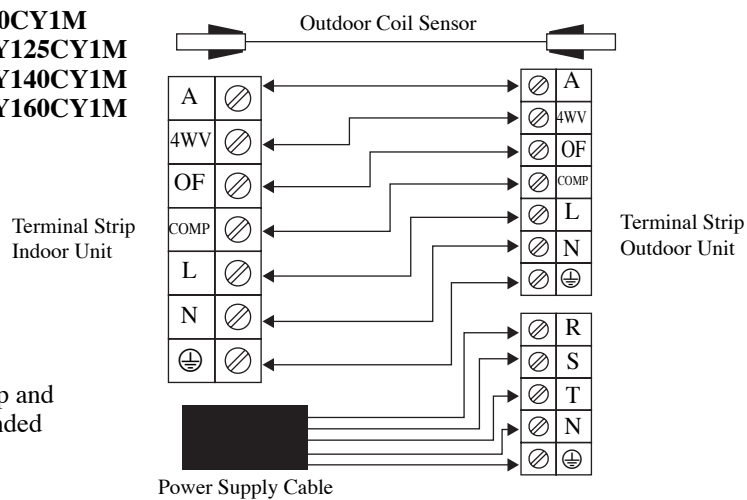


⚠ There must be a all pole switch with a minimum 3 mm contact gap and fuse / circuit breaker as recommended in the fixed installation circuits.

Heat Pump Units

Indoor unit	FDYM90CV1M FDYB90CV1M	FDYM125CV1M FDYB125CV1M	FDYM140CV1M FDYB140CV1M	FDYM160CV1M FDYB160CV1M
Outdoor unit	RY90CY1M	RY125CY1M	RY140CY1M	RY160CY1M
Voltage range	380V-415V /3Ph /50Hz + N + ⊕			
Recommended fuse* A	10	10	16	16
Power supply cable size* mm²	1.5	1.5	2.5	2.5
Number of conductors	5	5	5	5
Interconnection cable size* mm²	1.5	1.5	1.5	1.5
Number of conductors	7	7	7	7

FDYM90CV1M/FDYB90CV1M - RY90CY1M
FDYM125CV1M/FDYB125CV1M - RY125CY1M
FDYM140CV1M/FDYB140CV1M - RY140CY1M
FDYM160CV1M/FDYB160CV1M - RY160CY1M



⚠ There must be a all pole switch with a minimum 3 mm contact gap and fuse / circuit breaker as recommended in the fixed installation circuits.

IMPORTANT: * These values are for information only, they should be checked and selected to comply with the local and/or national codes and regulations. They are also subjected to the type of installation and size of conductors.

PURGING THE REFRIGERANT PIPING

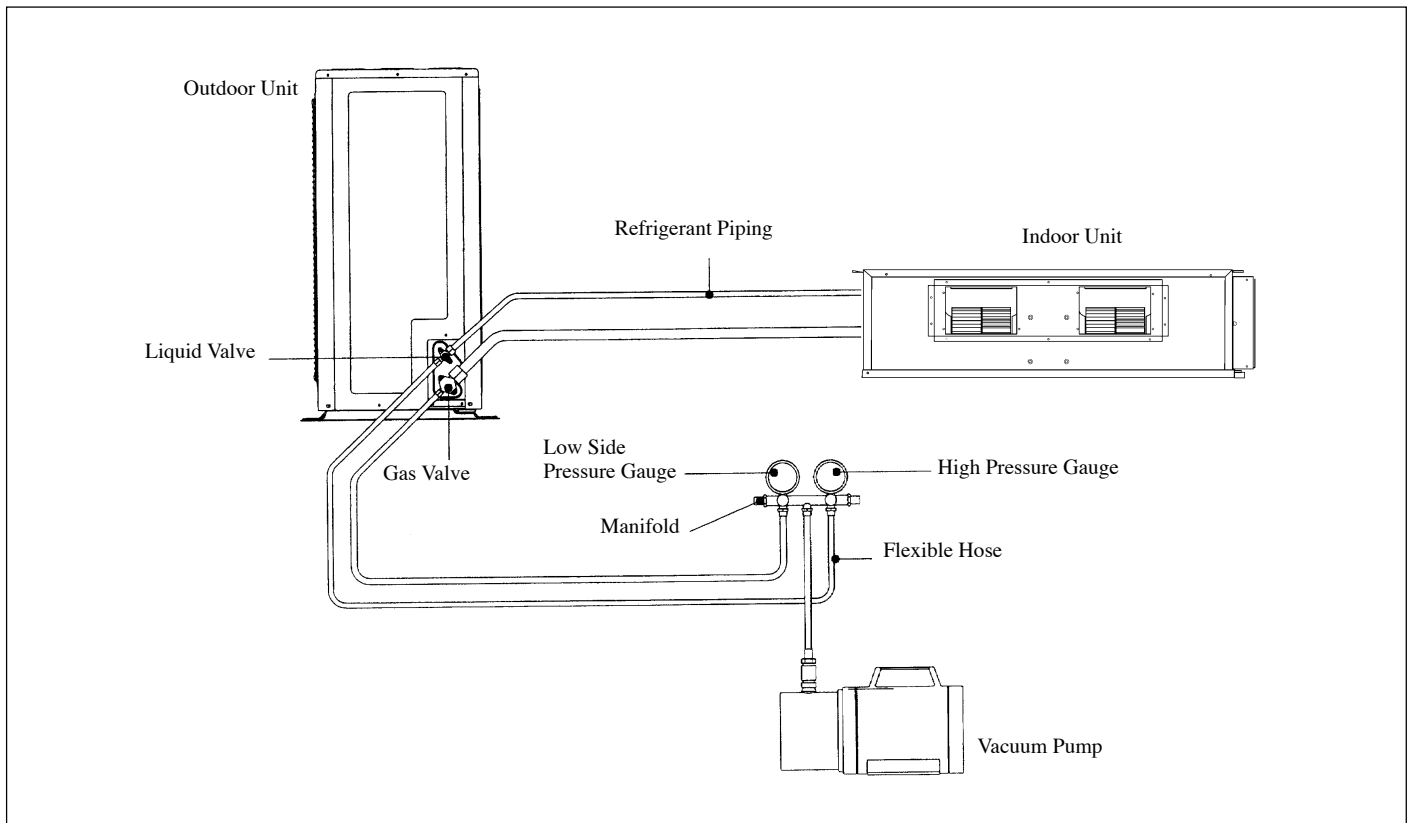
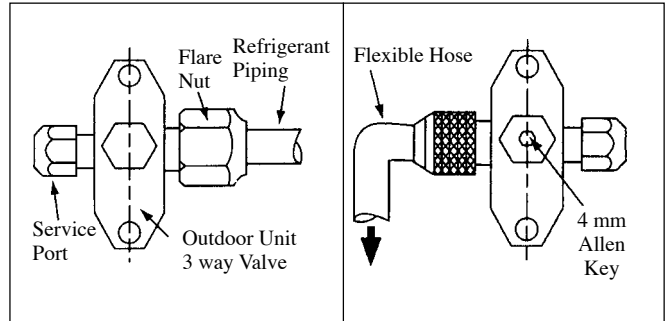
Purging The Piping And The Indoor Unit

Except the outdoor unit which is pre-charged with refrigerant, the indoor unit and the refrigerant connection pipes must be air purged because the air that contain moisture remaining in the refrigerant cycle may cause malfunction to the compressor.

The outdoor unit is equipped by two 3 ways refrigerating connecting valves. The suction valve is the larger one while the small one is the liquid valve. Both valves are supplied with service port valve for connection to a manometer.

- Remove the caps from the valve and the service port.
- Connect the center manifold gauge with the vacuum pump.
- Connect the manifold gauge to the service port of the 3 ways valve.
- Start the vacuum pump. Check the low pressure manifold gauge until it indicate 0.9 bar. The evacuation time varies with each vacuum pump capacity but generally in half an hour.

- Close the manifold valve and stop the vacuum pump.
- On the outdoor unit, open the suction and liquid valve (anti clockwise) with 4 mm key for hexagon sacked screw.
- The air conditioner unit is ready for start.
- If the reading is close to 0, the refrigerant circuit must be evacuated (by vacuum pump) and charged again.



ADDITIONAL CHARGE

The refrigerant is pre-charged in the outdoor unit. If the piping length is less than 5 m, additional charge after vacuuming is not necessary. When the piping length is more than 5 m, use the table below.

Additional Charge Operation

This operation must be done by using gas cylinder and a precise weighing machine obligatorily. The additional charge is top up into the outdoor unit by suction valve via service port.

- Remove the service valve plug.
- Connect the low pressure manifold to the suction service port, center manifold to the cylinder tank and close the high pressure manifold (see figure below).
Purge all the flexible hose with refrigerant gas.
- Start the air conditioner unit.
- Open the gas cylinder and low pressure manifold valve.
- When the required refrigerant quantity is pumped in the unit, close the low pressure manifold and the gas cylinder valve.
- Disconnect the manometer and the gas cylinder. Place back the service port cap.

Additional Charge

Heat Pump Unit

Indoor	FDYM30CV1M FDYB30CV1M	FDYM40CV1M FDYB40CV1M	FDYM60CV1M FDYB60CV1M	FDYM71CV1M FDYB71CV1M	FDYM80CV1M
Outdoor	RY30CV1M	RY40CV1M	RY60CV1M	RY71CV1M	RY80CV1M
Additional Charge (g/m)	23	23	22	56	56

Indoor	FDYM90CV1M FDYB90CV1M	FDYM100CV1M	FDYM1250CV1M FDYB1250CV1M	FDYM140CV1M FDYB140CV1M	FDYM160CV1M FDYB160CV1M
Outdoor	RY90CV1M RY90CY1M	RY100CV1M	RY125CV1M RY125CY1M	RY140CY1M	RY160CY1M
Additional Charge (g/m)	55	57	56	56	106

E.g.

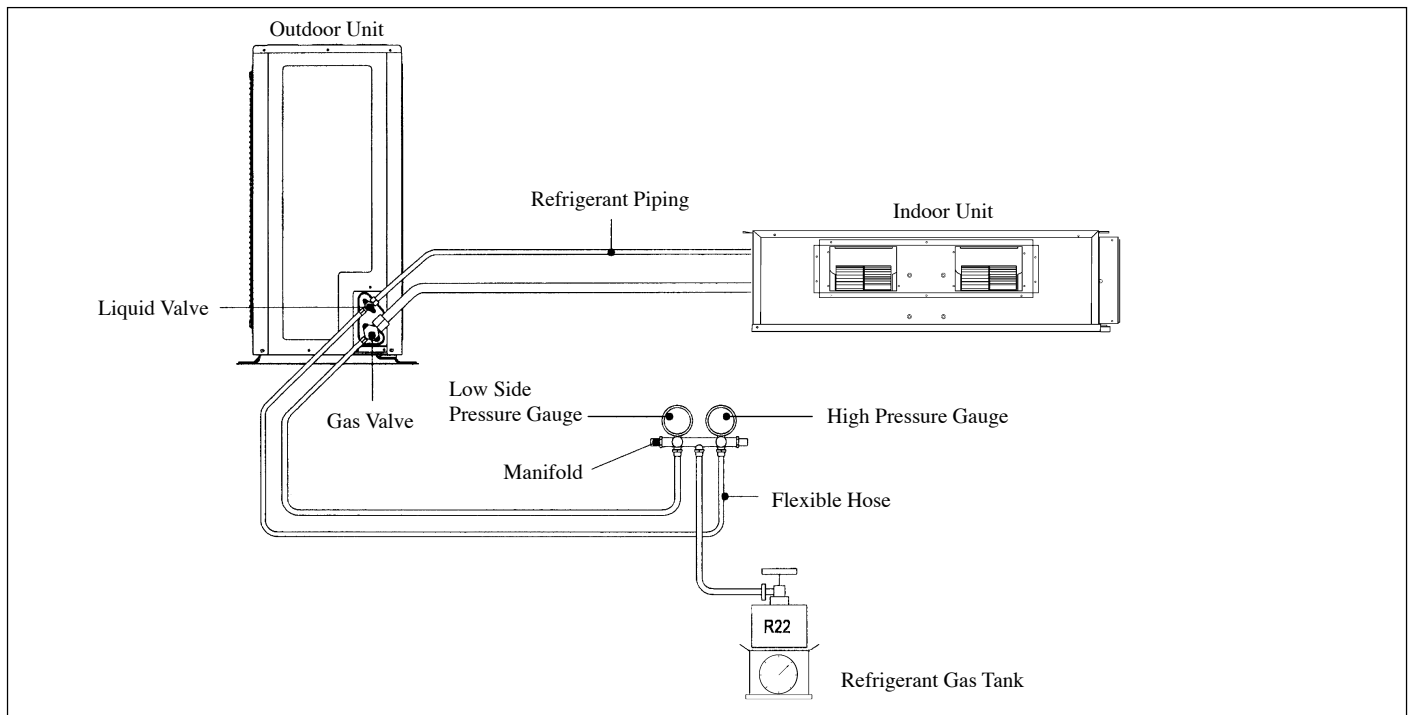
FDYM30CV1M & RY30CV1M with 12m piping length, additional piping length is 4.4m. Thus,

$$\begin{aligned} \text{Additional charge} &= 4.4[\text{m}] \times 23[\text{g/m}] \\ &= 101.2 [\text{g}] \end{aligned}$$

Check Refrigerant Leak

Check with refrigerant detector whether there is a leak on the flare type connection of the indoor unit and outdoor unit.

Hints: After operation for sometime, check if there is oil traces, there is a leak.



SPECIAL PRECAUTIONS WHEN CHARGING UNIT WITH SCROLL COMPRESSORS

These precautions are intended for use with Scroll compressors only with R22, R407C, R134A, R404A, R507 and R410A refrigerants but are not applied to other compressors.

Scroll compressors have a very high volumetric efficiency and quickly pump a deep vacuum if there is insufficient refrigerant in the system or if refrigerant is added too slowly. Operation with low suction pressure will quickly lead to very high discharge temperatures. While this process is happening, the scrolls are not being well lubricated – scrolls depend on the oil mist in the refrigerant for lubrication. A lack of lubrication leads to high friction between the scroll flanks and tips and generates additional heat. The combination of heat of compression and heat from increased friction is concentrated in a small localized discharge area where temperatures can quickly rise to more than 300°C. These extreme temperatures damage the Scroll spirals and the orbiting Scroll bearing. This damage can occur in less than one minute especially on larger compressors. Failure may occur in the first few hours or the damage done during field charging may show up some time later.

Other typical field charging problems include undercharging, overcharging, moisture or air in the system etc. In time each one of these problems can cause compressor failure.

Minimal equipment is required for field charging. The minimum equipment required to do a satisfactory job is:-

Set of service gauges	Vacuum gauge
Hoses	Scales
Vacuum pump	Thermometer

The proper refrigerant charge should follow the volume as recommended by manufacturer and recommendation should be followed by the installer.

1. Charging procedures – Single phase compressors

Evacuate the system to 500 microns Hg. (67Pa). To reduce evacuation time, use short, large diameter hoses and connect to unrestricted service ports on the system. Quality of vacuum cannot be determined by time – a reliable vacuum gauge must be used. (etc. electronic vacuum gauge)

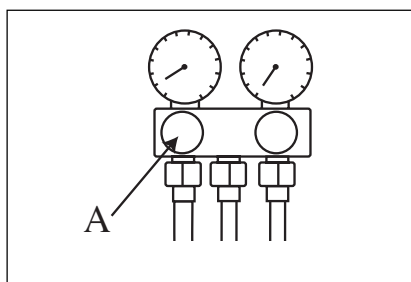
Turn the refrigerant cylinder upside down, purge the charging hose and charge liquid through the liquid line charging port until refrigerant no longer flows or until the correct charge has been weighed in. If additional charge is required start the system and slowly bleed liquid into the suction side until the system is full.

Scroll compressor manufacturer recommends charging liquid in a CONTROLLED manner into the suction side until the system is full. This recommendation does not hold true for other compressors where liquid charging into the suction side could cause severe damage.

Carefully monitor the suction and discharge pressures – ensure that the suction pressure does not fall below 25 psig (1.7 bar) at any time during the charging process.

⚠ CAUTION

- Manifold Gauge will show cylinder pressure rather than suction pressure if the cylinder valve and Manifold valve “A” are both open.



There are many ways of charging liquid in a “controlled manner” into the suction side:-

1. Use valve A on the manifold gauge set
2. Use the valve on the refrigerant cylinder
3. Charge through a Shredder valve
4. Use a hose with a Shredder valve depressor
5. Charge into the suction side at some distance from the compressor
6. All of the above

2. Charging procedures – Three phase compressors

The fundamental procedure is the same as for single phase models but the compressor can run in the wrong direction on starting. If this happens reverse any two phases and start again. Short term reverse rotation will not damage the compressor.

Outdoor	Compressor Type
RY30-80	Rotary
RY100-160	Scroll

OVERALL CHECKING

Ensure the following, in particular:-

1. The unit is mounted solidly and rigid in position.
2. Piping and connections are leak proof after charging.
3. Proper wiring has been done.

Drainage check:- Pour some water into left side of drain pan (drainage are in right side of unit).

• Test run:

1. Conduct a test run after water drainage test and gas leakage test.

2. Watch out for the following:-

- a) Is the electric plug firmly inserted into the socket?
- b) Is there any abnormal sound from unit?
- c) Is there smooth drainage of water?

• Check that:

1. Condenser fan is running, with warm air blowing off the condensing unit.
2. Evaporator blower is running and discharge cool air.
3. The remote controller incorporates a 3 minute delay in the circuit. Thus, it requires about 3 minutes before the outdoor condensing unit can start up.

STANDARD OPERATING CONDITION

Cooling Mode

Temperature	Ts °C / °F	Th °C / °F
Minimum indoor temperature	19.4 / 66.9	13.9 / 57.0
Maximum indoor temperature	26.7 / 80.1	19.4 / 66.9
Minimum outdoor temperature	19.4 / 66.9	13.9 / 57.0
Maximum outdoor temperature	46 / 114.8	24 / 75.2

Heating Mode

Temperature	Ts °C / °F	Th °C / °F
Minimum indoor temperature	10 / 50	-
Maximum indoor temperature	26.7 / 80.1	-
Minimum outdoor temperature	-8 / 17.6	-9 / 15.8
Maximum outdoor temperature	24 / 75.2	18 / 64.4

Ts: Dry bulb temperature. Th: Wet bulb temperature.

AUTO RANDOM RE-START FUNCTION

If there is a power cut when the unit is operating, it will automatically resume the same operating mode when the power is restored. (Applicable only to units with this feature).

SERVICE AND MAINTENANCE

Service Parts	Maintenance Procedures	Period
Indoor Air Filter	<ol style="list-style-type: none"> 1. Remove any dust adhered on the filter by using a vacuum cleaner or wash in lukewarm water (below 40°C) with neutral cleaning detergent. 2. Rinse well and dry the filter before placing it back onto the unit. 3. Do not use gasoline, volatile substances or chemical to clean the filter. 	<p>At least once every 2 week.</p> <p>More frequently if necessary.</p>
Indoor Unit	<ol style="list-style-type: none"> 1. Clean any dirt or dust on the grille or panel by wiping it using soft cloth soaked in lukewarm water (below 40°C) with neutral detergent solution. 2. Do not use gasoline, volatile substances or chemical to clean the indoor unit. 	<p>At least once every 2 weeks.</p> <p>More frequently if necessary.</p>
Condense Drain Pan & Pipe	<ol style="list-style-type: none"> 1. Check its cleanliness and clean it if necessary. 	Every 3 months.
Indoor Fan	<ol style="list-style-type: none"> 1. Check for any abnormal noise. 	When necessary.
Indoor/Outdoor Coil	<ol style="list-style-type: none"> 1. Check and remove any dirt clogged between the fins. 2. Check and remove any obstacles that hinder air flowing into and out of the indoor/outdoor unit. 	<p>Every month.</p> <p>Every month.</p>
Power Supply	<ol style="list-style-type: none"> 1. Check the voltage and current of the indoor and outdoor unit. 2. Check the electrical wiring for any faulty contacts caused by loose connections, foreign matters, etc. Tighten the wires onto the terminal block if necessary. 	<p>Every 2 months.</p> <p>Every 2 months.</p>
Compressor	<ol style="list-style-type: none"> 1. No maintenance needed if the refrigerant circuit remain sealed. However, check for any refrigerant leaks at all joints and fitting. 	Every 6 months.
Compressor Oil	<ol style="list-style-type: none"> 1. The compressor oil is factory-precharged. It is not necessary to add any oil if the circuit remains sealed. 	No maintenance required.
Fan Motor Oil	<ol style="list-style-type: none"> 1. All motor pre-lubricated and sealed at factory. 	No maintenance required.

TROUBLESHOOTING

When any malfunction of the air conditioner unit is noted, immediately switch off the power supply to the unit. Check the following fault conditions and causes for some simple troubleshooting tips.

Fault	Causes
1. The compressor does not start operate after 3 minutes from starting the air conditioner unit.	- Protection against frequent starting. Wait for 3 to 4 minutes for the compressor to start operate.
2. The air conditioner unit does not operate.	- Power failure, or the fuse need to be replaced. - The power plug is disconnected. - It is possible that your delay timer has been set incorrectly. - If the fault persist after all these verifications, please contact the air conditioner unit installer.
3. The air flow is too low.	- The air filter is dirty. - The doors or windows are open. - The air suction and discharge are clogged. - The regulated temperature is not high enough.
4. The remote control display is dim.	- Battery flat. - The batteries are placed incorrectly.
5. Discharge air flow has bad odor.	- Odors may be caused by cigarettes, smoke particles, perfume etc. which might have adhered onto the coil.
6. Condensation on the front air grille of the indoor unit.	- This is caused by air humidity after an extended long period of operation. - The set temperature is too low, increase the temperature setting and operate the unit at high fan speed.
7. Water flowing out from the air conditioner unit.	- Check the condensate evacuation.
8. Hissing air flow sound from the air conditioner unit during operation.	- Refrigerant fluid flowing into the evaporator coil.

If the fault persists, please call your local dealer / serviceman.

PHASE SEQUENCER (OPTIONAL)

The unit with Scroll Compressor can only rotate in one direction. For this reason, a protective device (phase sequencer) is fitted to prevent incorrect wiring of the electrical phases. When the three phases are not connected correctly, the phase sequencer operates, and the unit will not start. This device is located in the control box of the outdoor unit.

The following table shows the LED indicator light for phase sequencer under normal operation and fault conditions.

Description \ LED	PW (Red)	P_R (Yellow)	P_S (Yellow)	P_T (Yellow)	Actions
Normal operation	○	●	●	●	-
Reverse phase	◐	◐	◐	◐	Switch off the unit. Check the 3 phase wiring.
T phase missing	◐	●	●	◐	Switch off the unit. Check the 3 phase wiring.
S phase missing	◐	●	◐	●	Switch off the unit. Check the 3 phase wiring.
R phase missing	●	●	●	●	Switch off the unit. Check the 3 phase wiring.
S & T phase missing ⁺	◐	●	◐	◐	Switch off the unit. Check the 3 phase wiring.
Overload ⁺	◐	●	●	●	High discharge temperature. Check the refrigerant system.
Sensor missing ⁺	◐	○	○	○	Switch off the unit. Plug in sensor.

○ ON

● OFF

◐ Fast Blink

Notes : 1. “+” indicates additional functions for PP01 phase sequencer.

2. When R phase missing, no LED or buzzer will indicate the error, but relay 71 and relay 81 will cut off.

⚠ **WARNING**

• Troubleshooting must be performed by qualified personnel.