



INSTALLATION MANUAL OPERATION MANUAL

CEILING CONCEALED SPLIT TYPE AIR-CONDITIONER

**FDMR36ERV16
FDR65FRV16
FDR100FRV16
FDR130FRV16
FDR130FRV162
FDR200FRY16
FD65DSV16
FD100DSV16
FD130DSV16
FD200DSY16
FD60GRV16
FD90GRV16
FD120GRV16
FD180GRY16**

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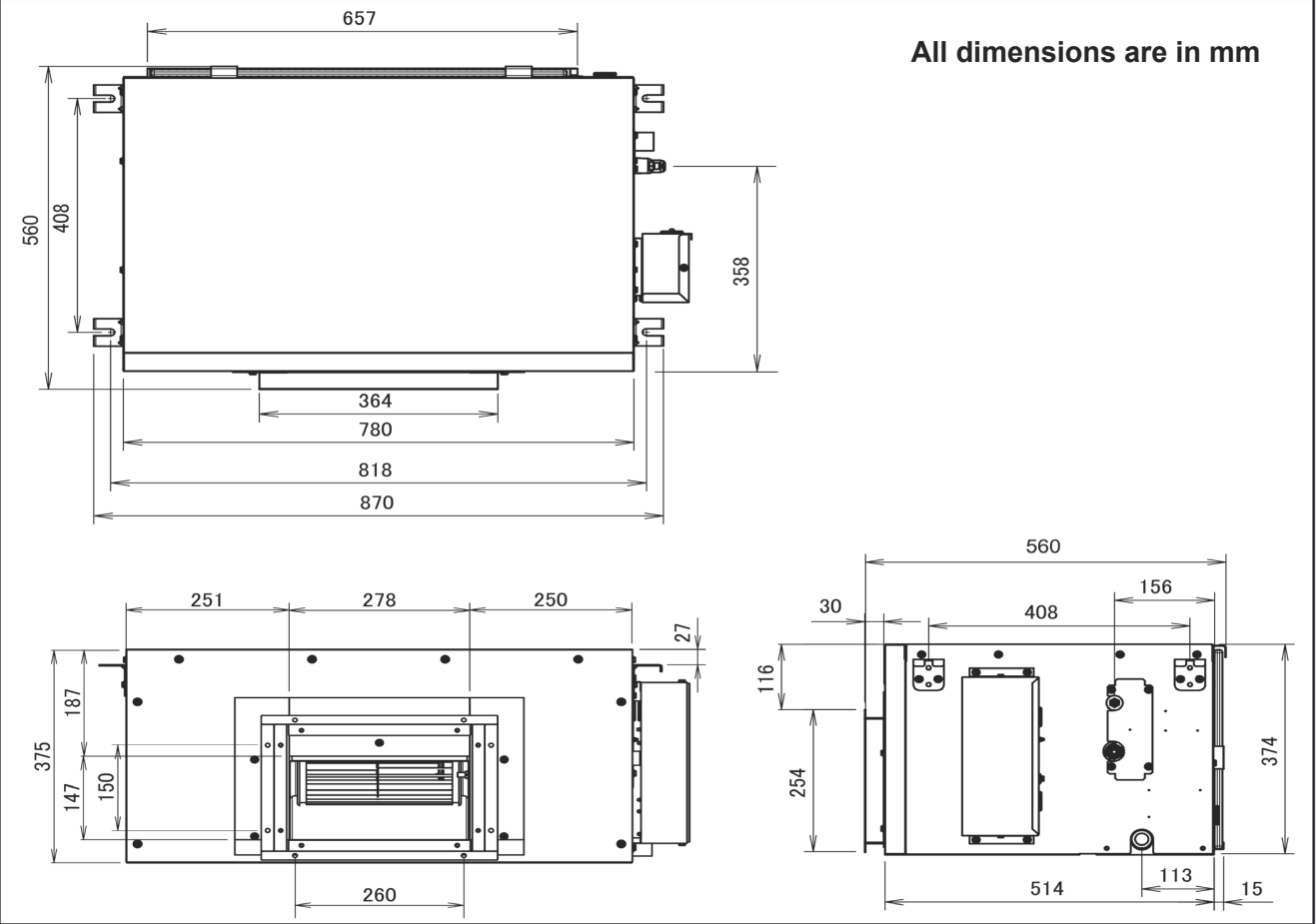
**Ceiling Concealed
Split Type Air Conditioner
Installation Manual & Operation Manual**

CONTENTS

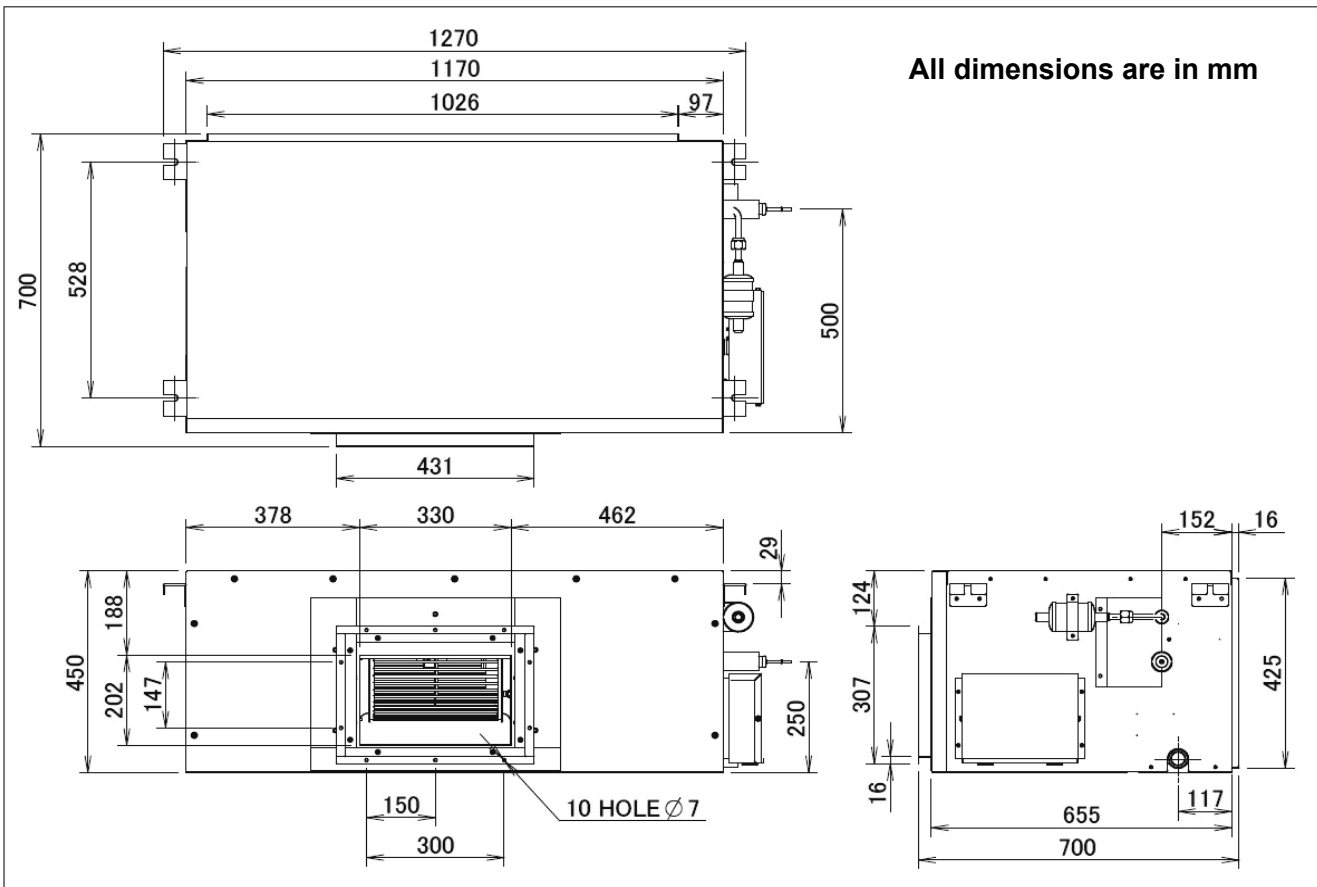
1.	Outline and Dimensions	02-08
2.	Safety Precautions.....	09
3.	Installation of the Indoor Unit.....	10
4.	Installation of the Outdoor Unit.....	11-12
5.	Optional Accessories.....	13
6.	Refrigerant Piping.....	14-15
7.	Electrical Connection.....	16
8.	Overall Checking	17
9.	Vacuuming and Charging	18
10.	Additional Charge and Oil Refill Charge Guidelines	19
11.	Special Precautions when charging Unit with Scroll Compressor.....	20
12.	Standard Operating Conditions.....	21
13.	Troubleshooting.....	22
14.	Phase Protector	23
15.	SLM Controller Indication.....	24
16.	Operating Instruction.....	25-26
17.	E-Waste Guidelines	27

OUTLINE AND DIMENSIONS

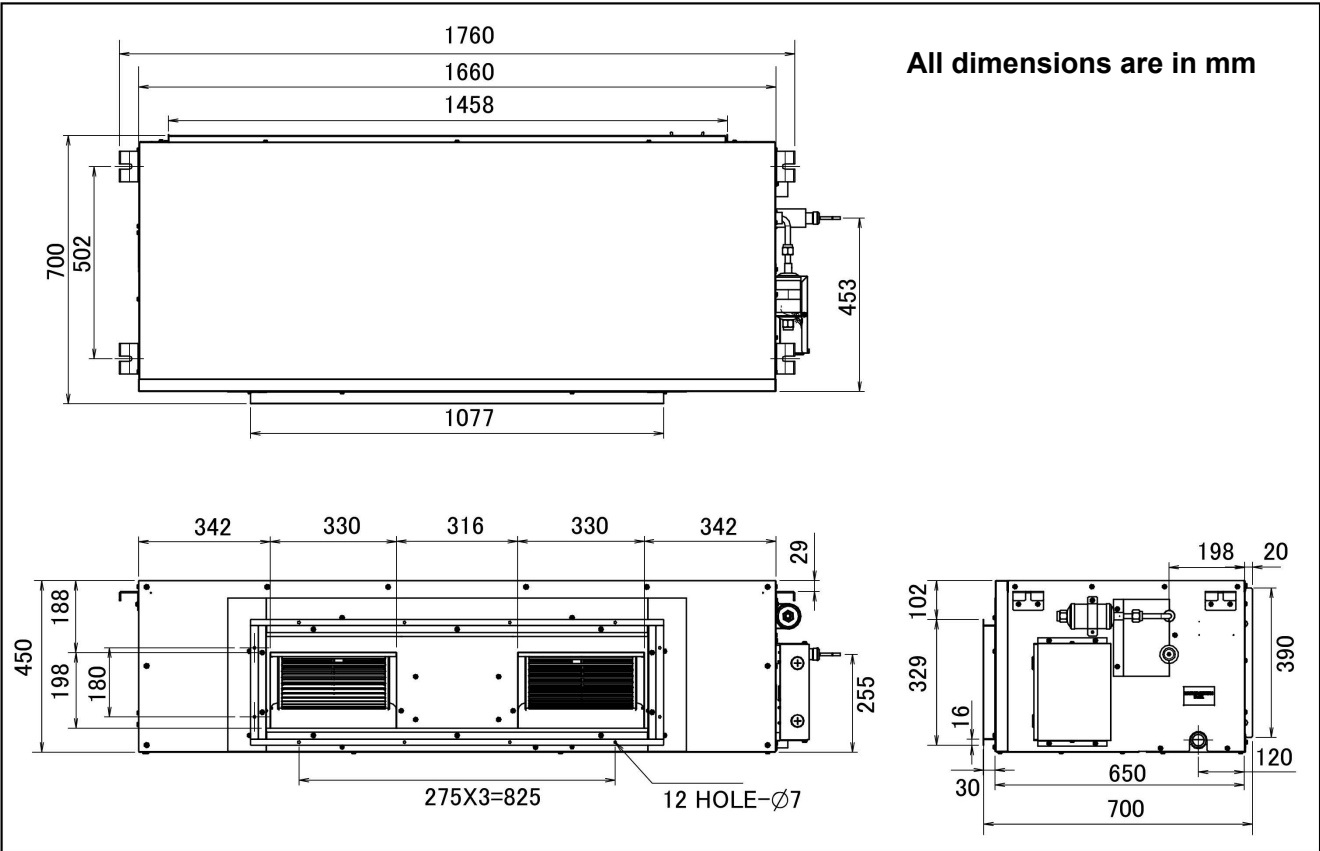
Indoor Unit FDMR36ERV16



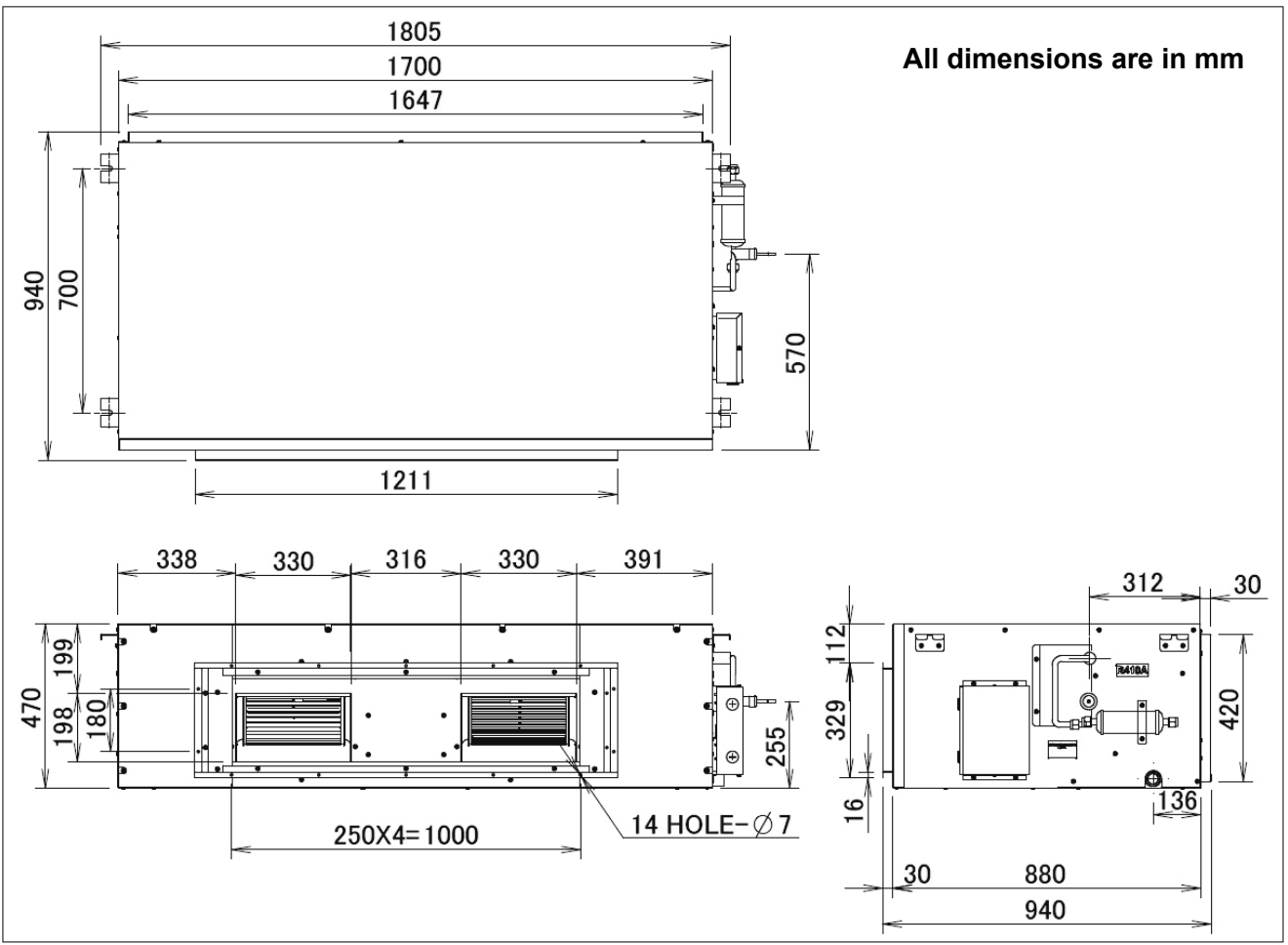
Indoor Unit FDR65FRV16



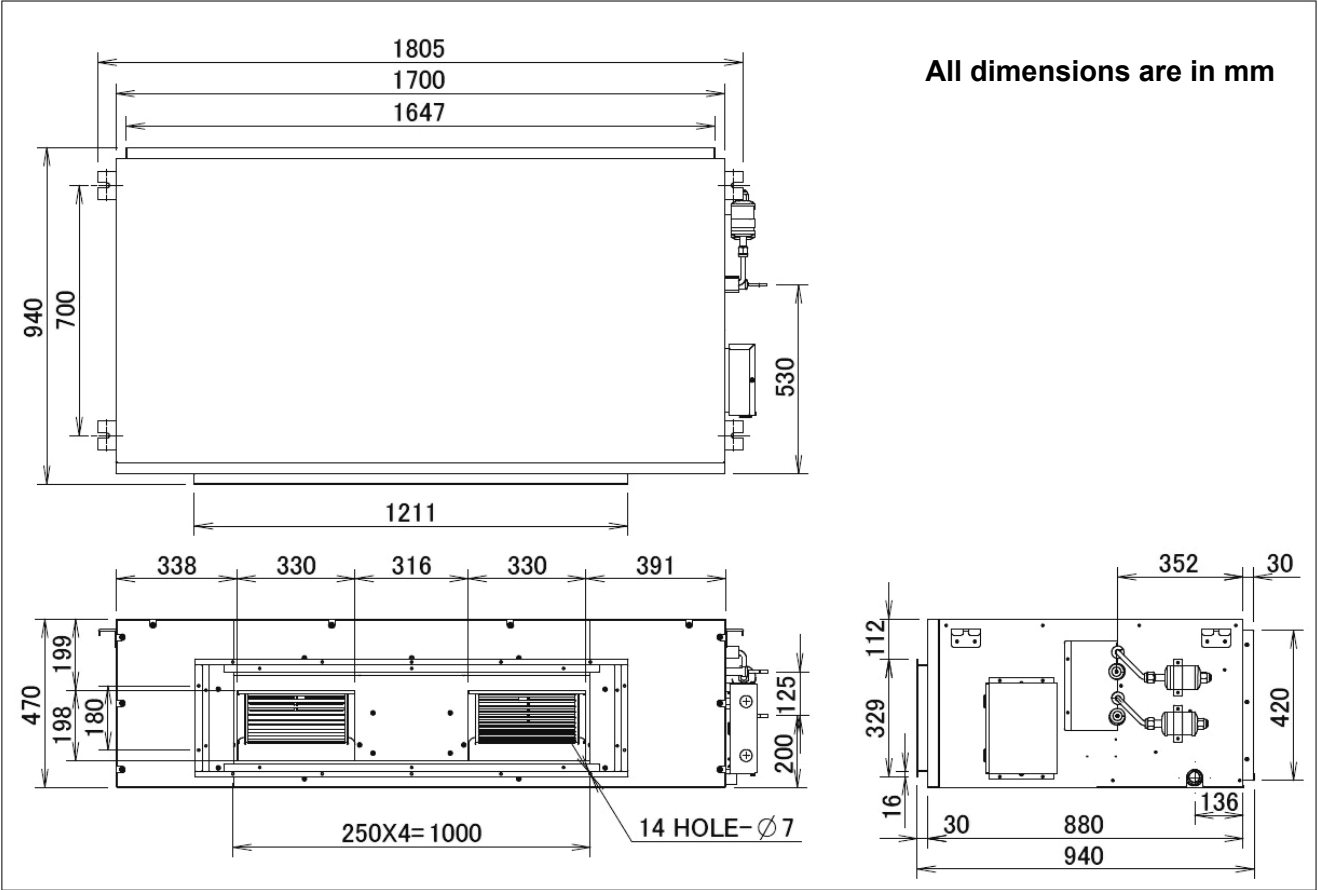
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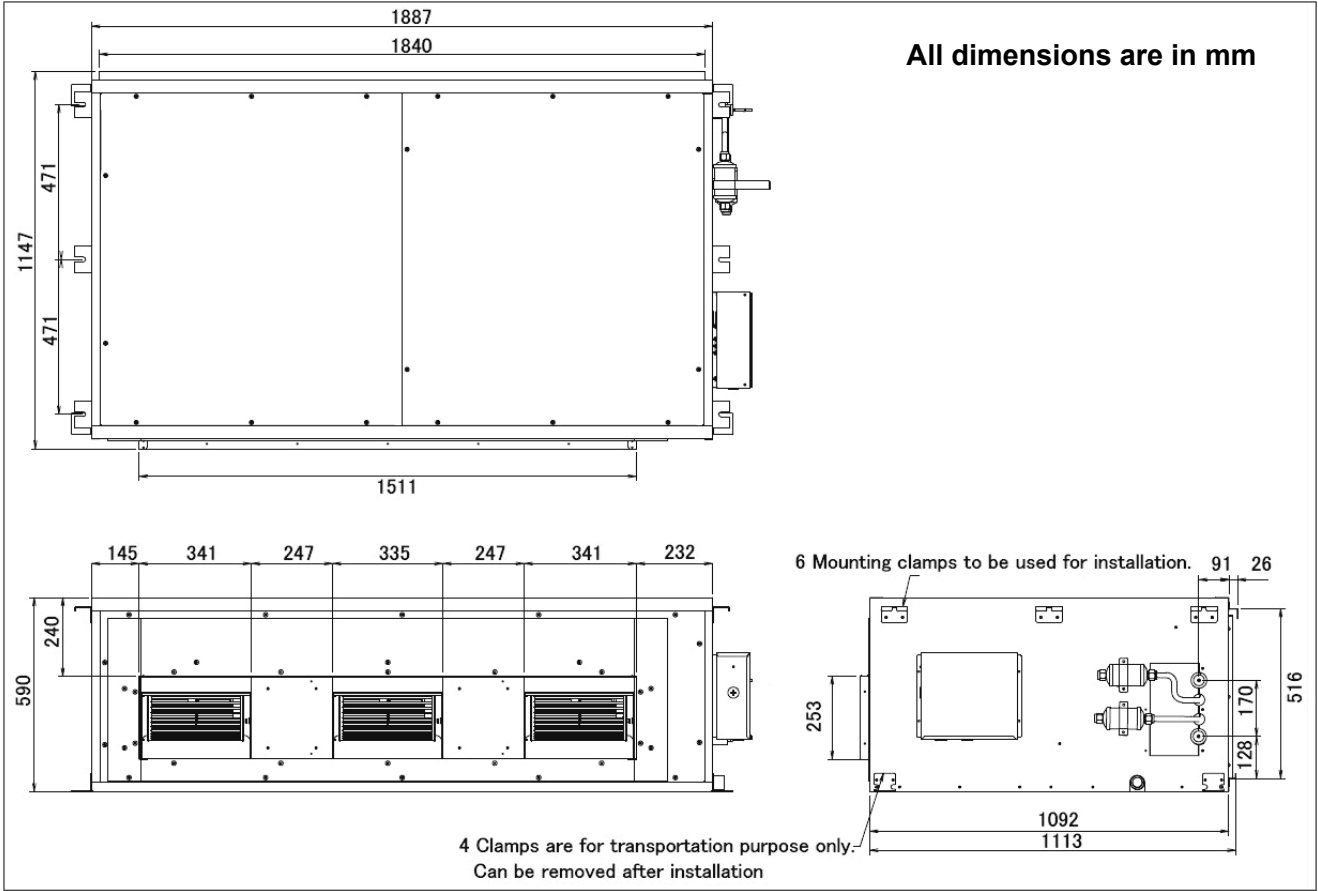
Indoor Unit FDR130FRV16



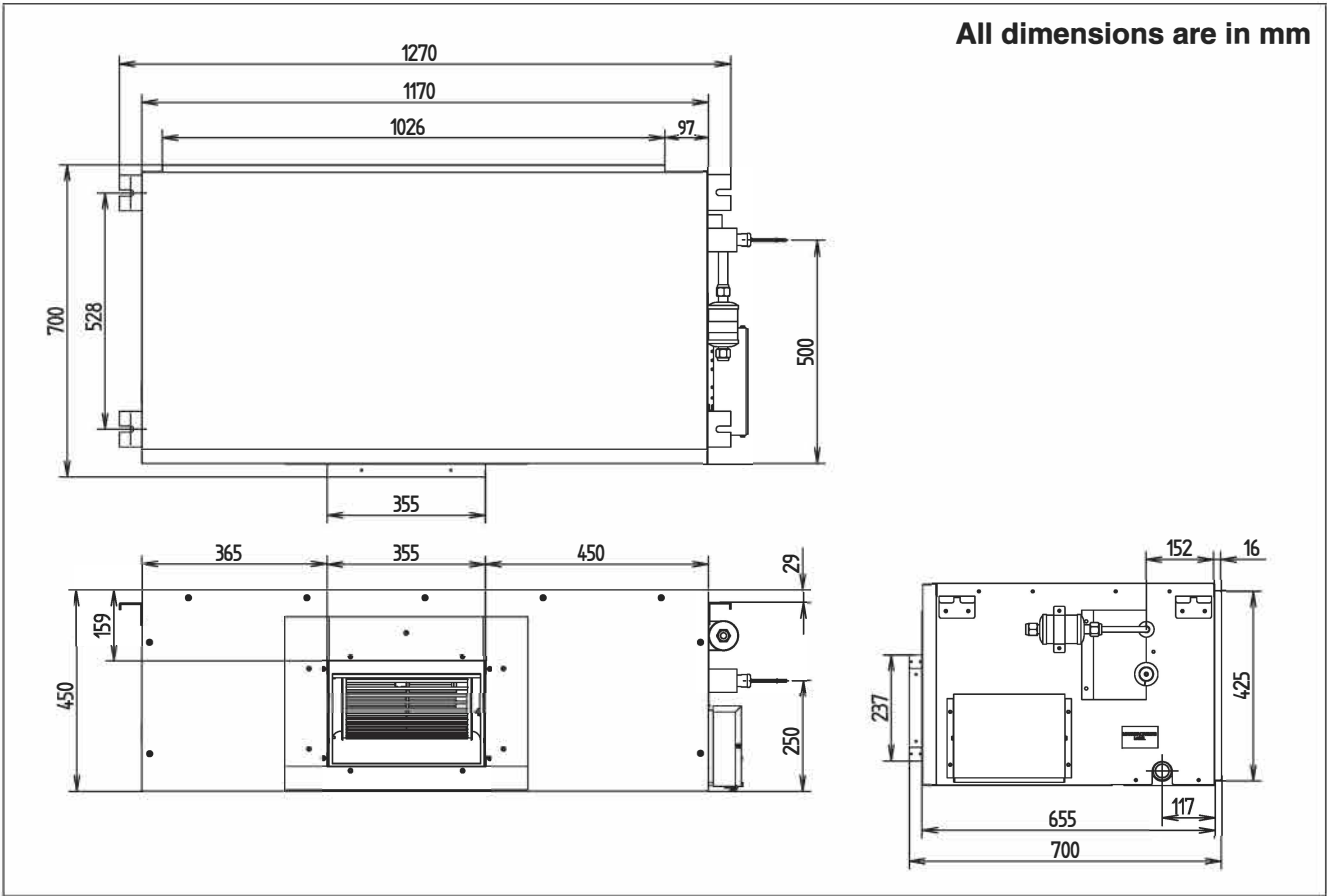
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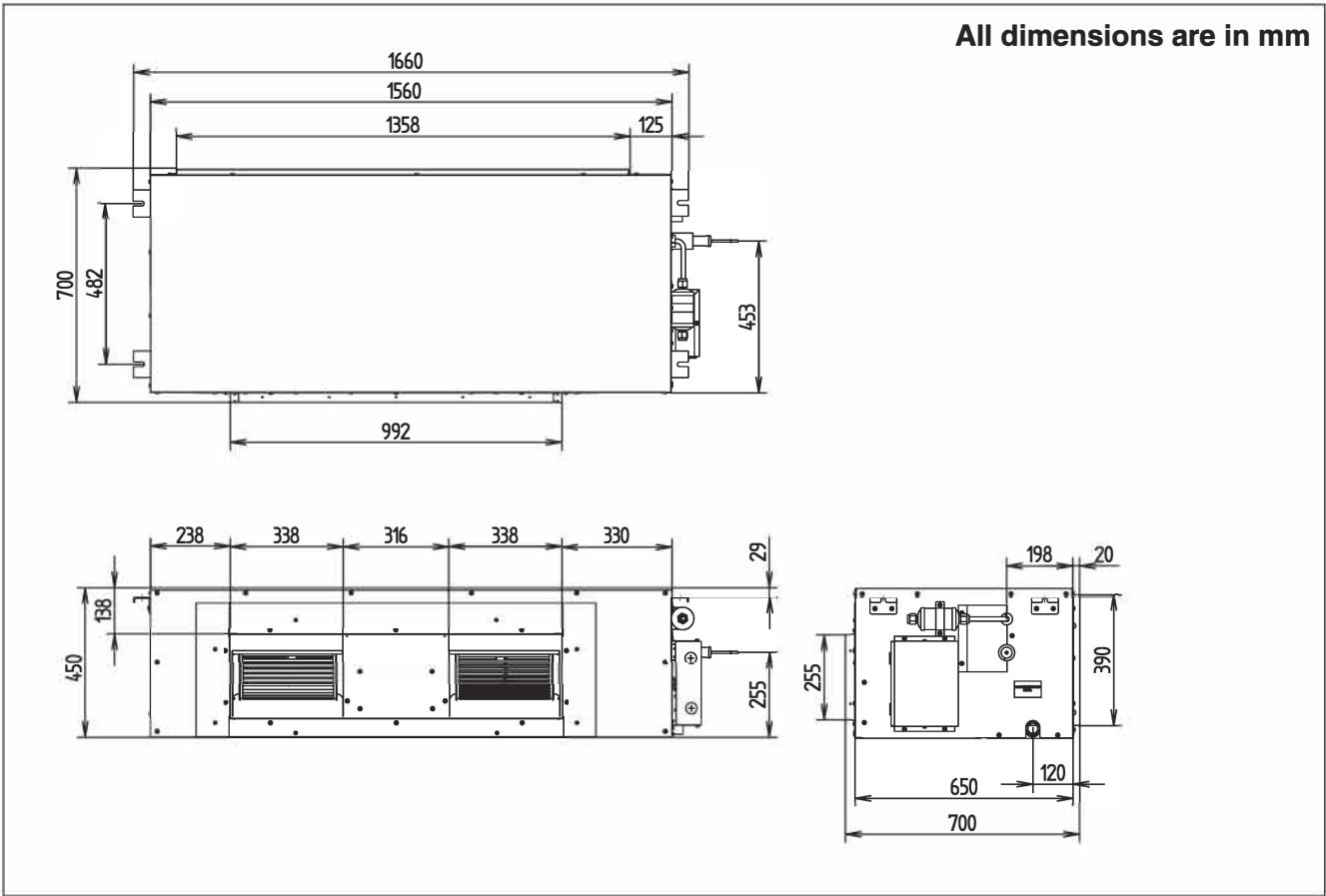
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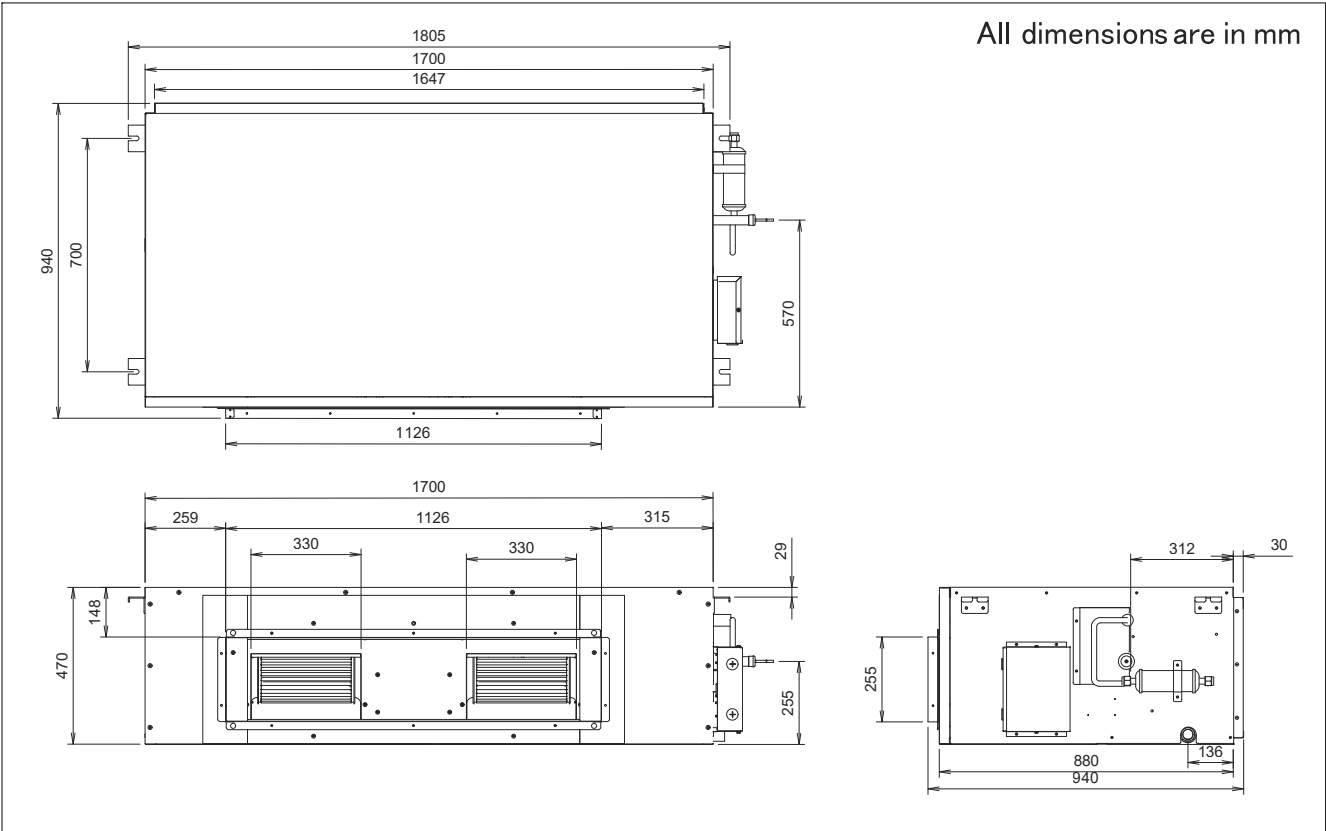
Indoor Unit FD65DSV16 / FD60GRV16



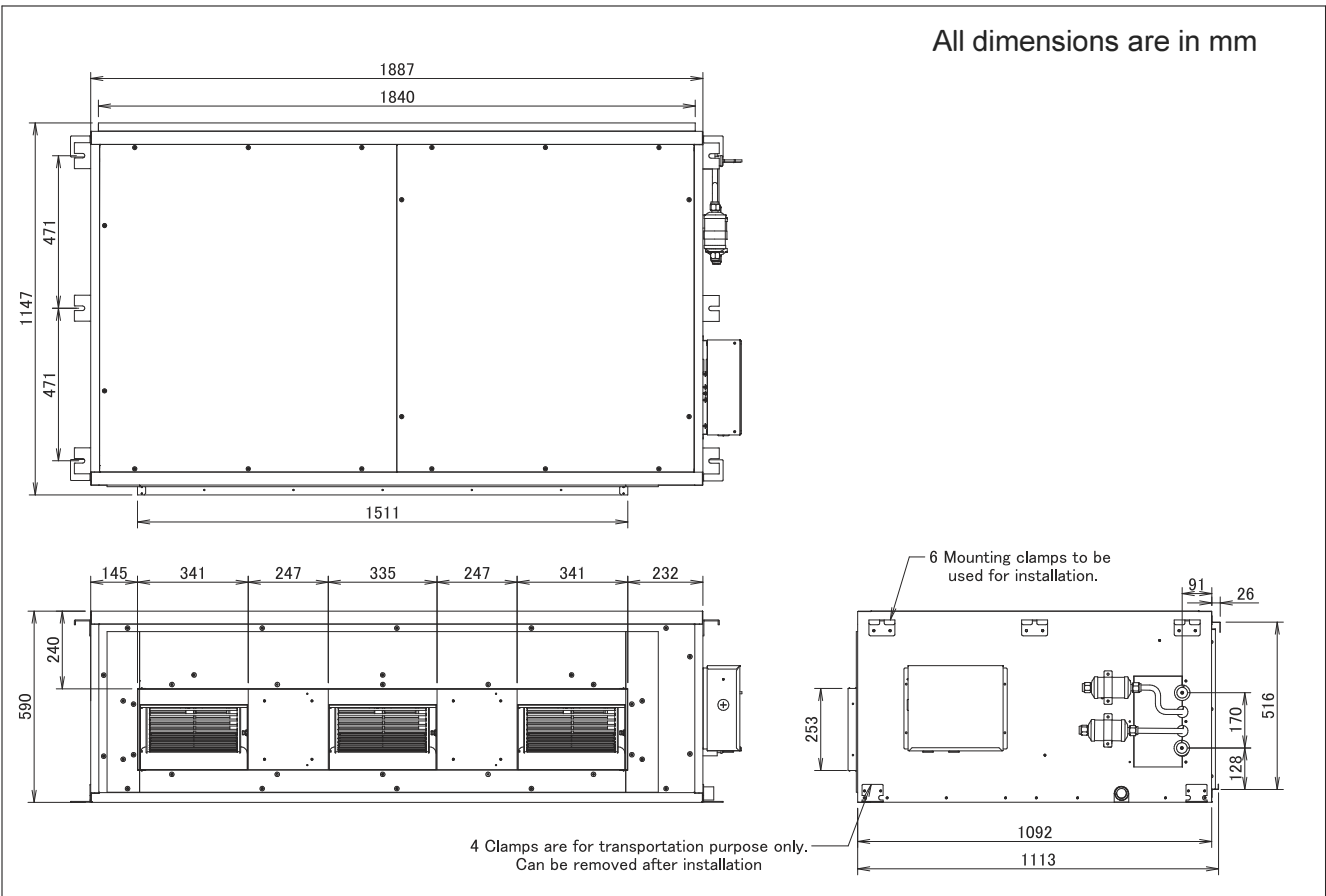
Indoor Unit FD100DSV16 / FD90GRV16



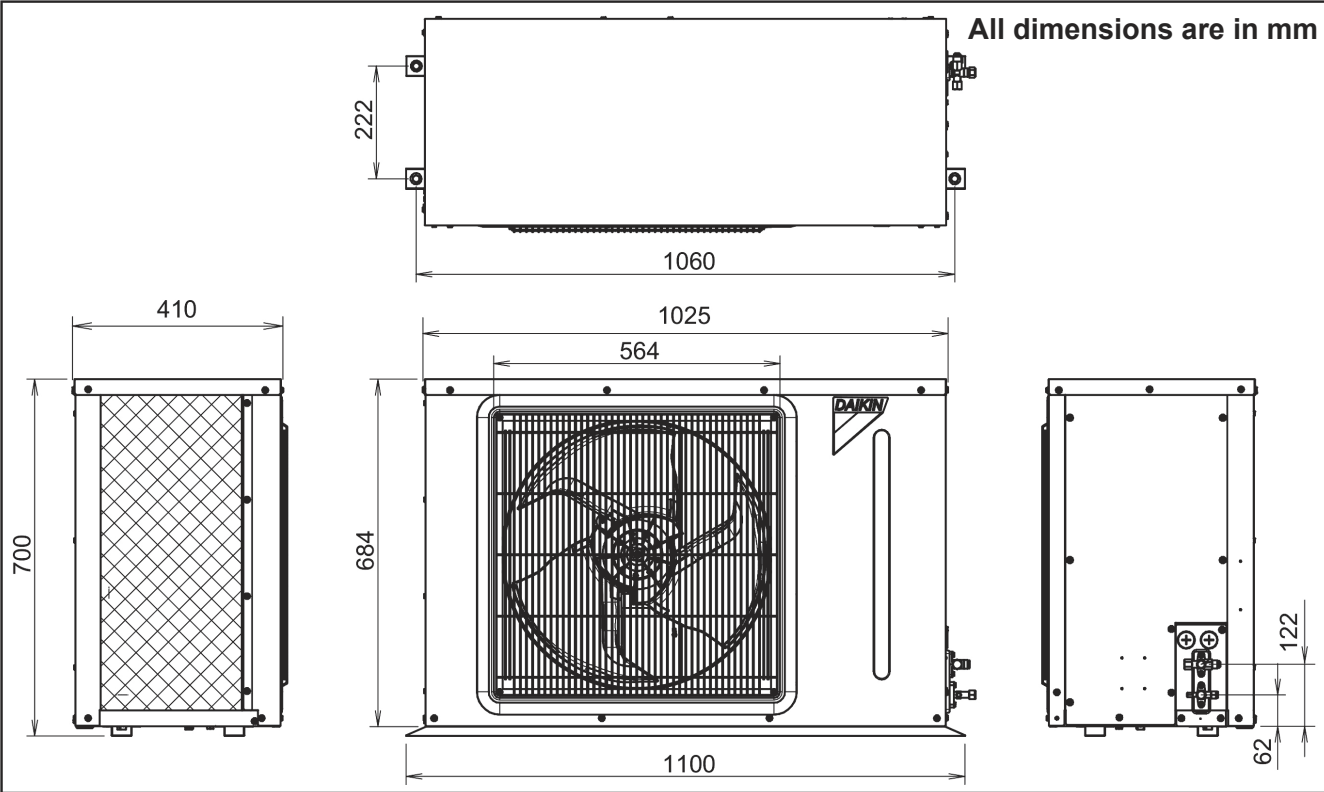
Indoor Unit FD130DSV16 / FD120GRV16



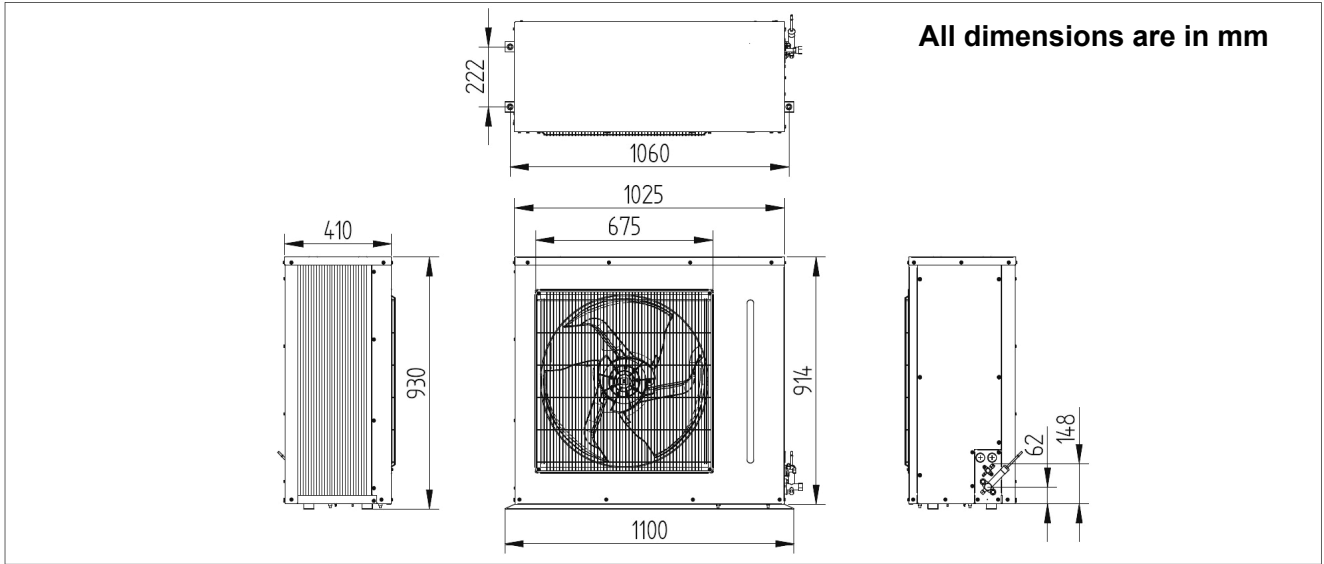
Indoor Unit FD200DSY16 / FD180GRY16



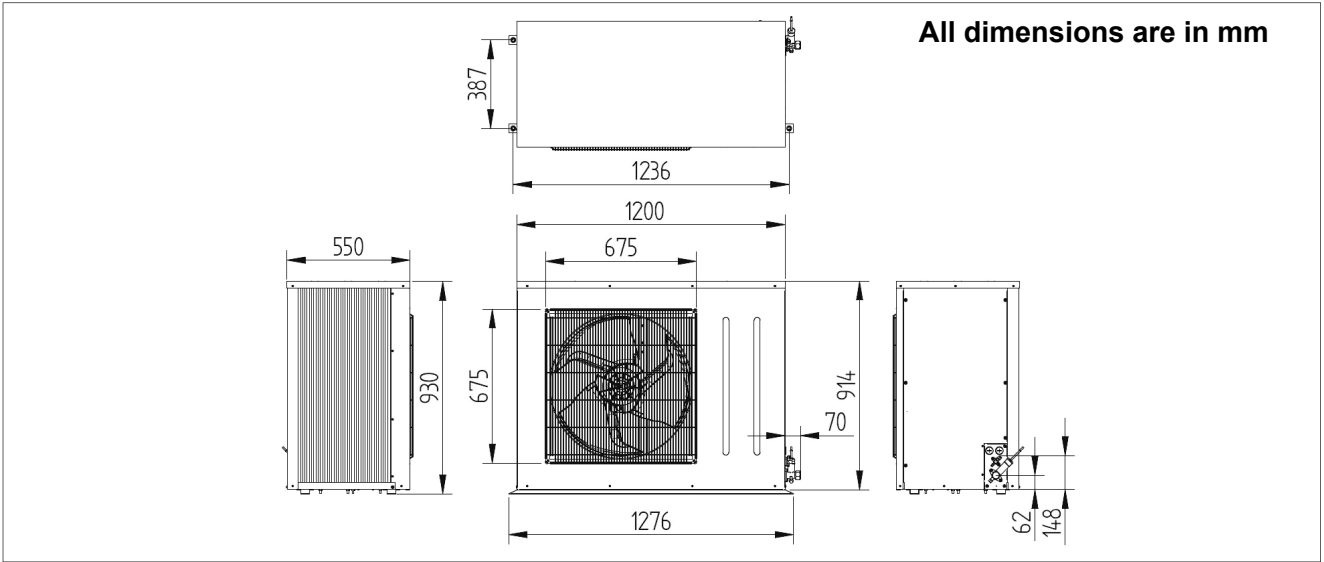
Outdoor Unit RR36ERY16 Horizontal Air Discharge



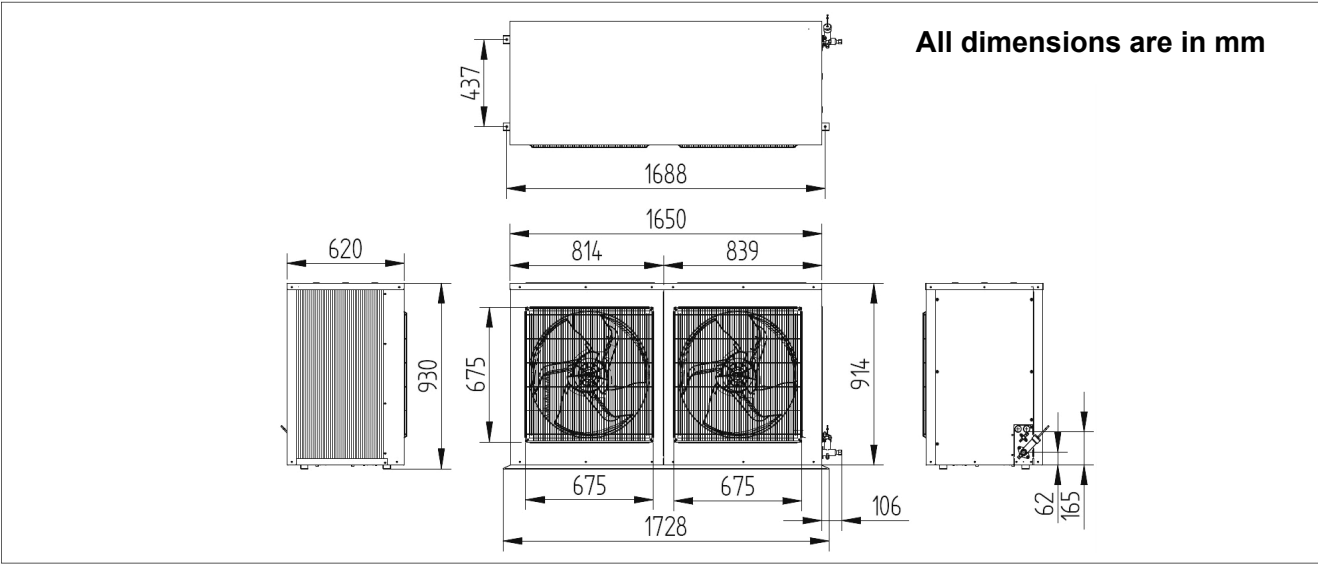
Outdoor Unit RR65FRY16/R65DSY16/R60GRY16 Horizontal Air Discharge



Outdoor Unit RR100FRY16/R100DSY16/R90GRY16 Horizontal Air Discharge



Outdoor Unit RR130FRY16/R130DSY16/R120GRY16 Horizontal Air Discharge



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.

This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.

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.

• **Be sure to install an earth leakage breaker. Failure to install an earth leakage breaker may result in electric shocks or fire.**

- 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 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).

Special notice of product

[REFRIGERANT]

The system uses R410A/R22 refrigerant.

The refrigerant requires that strict precautions be observed for keeping the system clean, dry and tightly sealed. The following procedures must be followed correctly,

A. Clean and dry

Strict measures must be taken to keep impurities (including SUNISO oil and other mineral oils as well as moisture) out of the system.


B. Tight sealed

Take care to keep the system tight when installing. Refrigerant contains no chlorine, does not destroy the ozone layer and so does not reduce the earth's protection against harmful ultraviolet radiations. It will contribute only slightly to the greenhouse effect if released to the atmosphere.


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 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.**

 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 install the units at or near doorway.**

- **Do not operate any heating apparatus too close to the air conditioner unit or use in room where mineral oil, oil vapour or oil steam exist, this may cause plastic part to melt or deform as a result of excessive heat or chemical reaction.**

- **When the unit is used in kitchen, keep flour away from going into suction of the unit.**

- **This unit is not suitable for factory used where cutting oil mist or iron powder exist or voltage fluctuates greatly.**

- **Do not install the units at area like hot spring or oil refinery plant where sulphide gas exists.**

- **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.**

- **Don't use joined and twisted wires for incoming power supply.**

NOTE:

[DESIGN PRESSURE] The design pressure of the system is 4.17MPa.

R410A is a mixed refrigerant, the required additional refrigerant must be charged in its liquid state. (if the system is charged with refrigerant in its gaseous state, due to compositions change, the system will not function normally).

INSTALLATION OF THE INDOOR UNIT

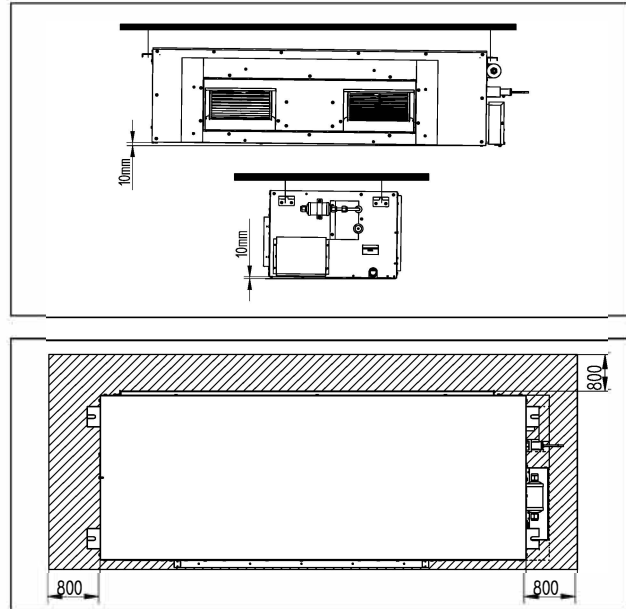
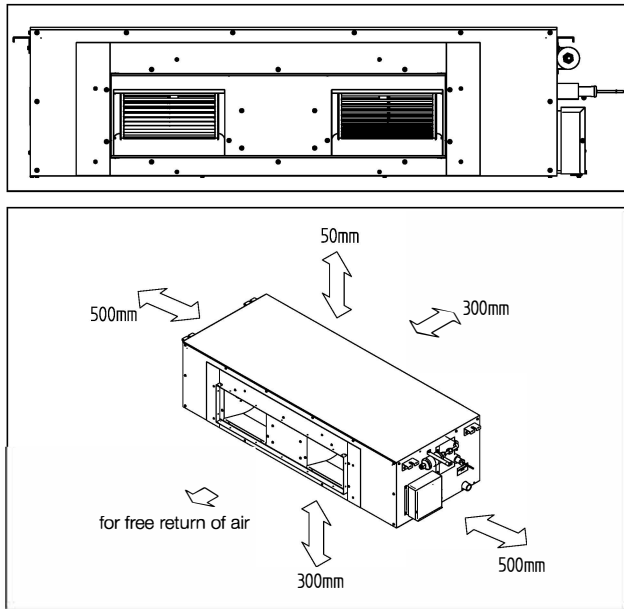
Mounting

Ensure that the overhead supports are strong enough to hold the unit's weight. Position hanger rods and check for alignment with the unit. Check that hangers are secure and that the base of fan-coil unit is level in the two horizontal directions, taking into account the gradient recommended for drainage flow as shown. Check the gradient recommended for drainage flow as follow.

Provide clearance for servicing and optimal air flow as shown in the diagram.

The indoor unit must be installed such that there is no short circuit of cool discharge with air discharge. Respect the installation clearance.

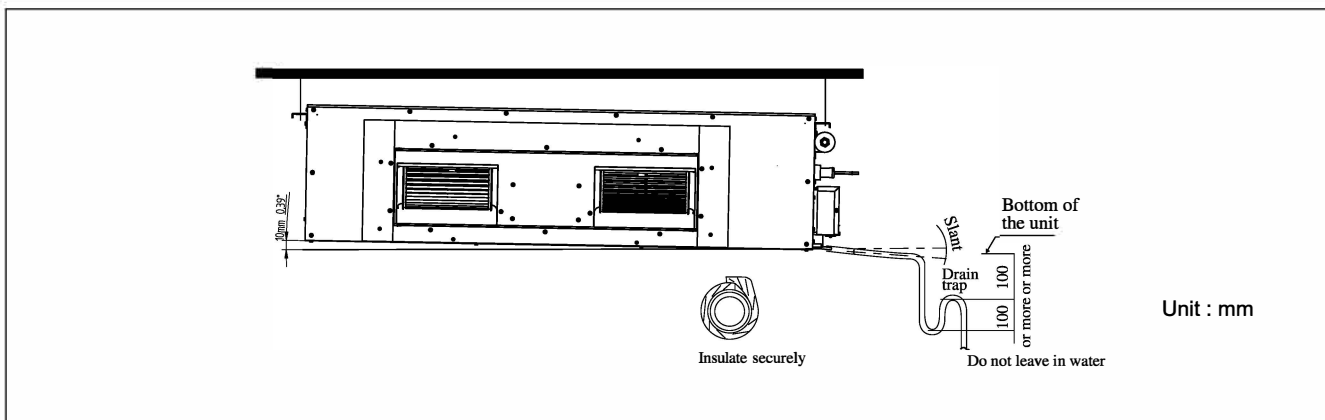
Do not put the indoor unit where there is direct sunlight on unit. The location is suitable for piping and drainage and it must be have a large distance between a door and unit.



All dimensions in mm.

- Important:**
1. While Brazing the Liquid and Gas pipe for indoor unit use wet cloth to prevent the burning of insulation. Insulation must be provided on Liquid and Gas pipe for indoor unit after brazing.
 2. Use M10/M12 Rods for installation of Indoor units total Number of installation Rods should be in accordance with number of hanger metal Provided for installation.

Ceiling Concealed Drain Piping Work



- The drain pipe must be installed as shown in the diagram (see diagram above) to avoid damage caused by leaks and condensation.
- For the best result, keep the piping as short as possible. Slant the piping at an angle to improve the flow.
- Unit installation should be tilted . In range of 10 to 15mm
- The drain pipe slope shall be kept at least 1:100.
- Ensure the drain pipe is securely insulated.
- It is necessary to provide a drain trap in the drain outlet to relieve pressure that exists within the unit compared to the outside atmospheric pressure when the unit is operating. The drain trap is to avoid possibility of splashes or an odour.
- Keep pipes as straight as possible for easy cleaning and to prevent the accumulation of dirt and debris.
- Conduct a water drainage test after the installation is completed. Make sure that the drainage flow is smooth.
- In humid environments, use an extra drain pan to cover the entire area of indoor unit.

INSTALLATION OF THE OUTDOOR UNIT

Location For Installation

Install the outdoor unit in such way that air distributed by the outdoor unit cannot be drawn in again (as in the case of short circuit of discharge air). Allow sufficient space for maintenance around the unit.

Select the coolest possible place where intake air should not be higher than the outside temperature (maximum 48°C).

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

When two or more outdoor units are installed in a location, they must be positioned such that one unit will not be taking the discharge air from another.

This also applies when two or more units are installed one above the other. The all units must face the same direction, or opposite direction (back to back), such that air short circuit does not occur.

The location must be well ventilated, so that the unit can draw and distribute plenty of air.

A place capable of bearing the weight of the outdoor unit and isolating noise and vibration.

A place protected from direct sunlight. Otherwise use an awning for protection, if necessary.

A place where smooth drainage of rain water and water formed by defrosting is acceptable.

A place where the unit will not be buried in snow.

A place where air outlet port is not exposed to strong wind.

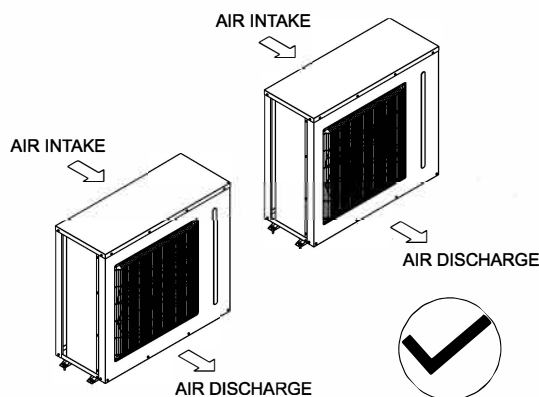
A place where the air discharge and operating sound level will not annoy the neighbours.

The location must not be susceptible to dust or oil mist.

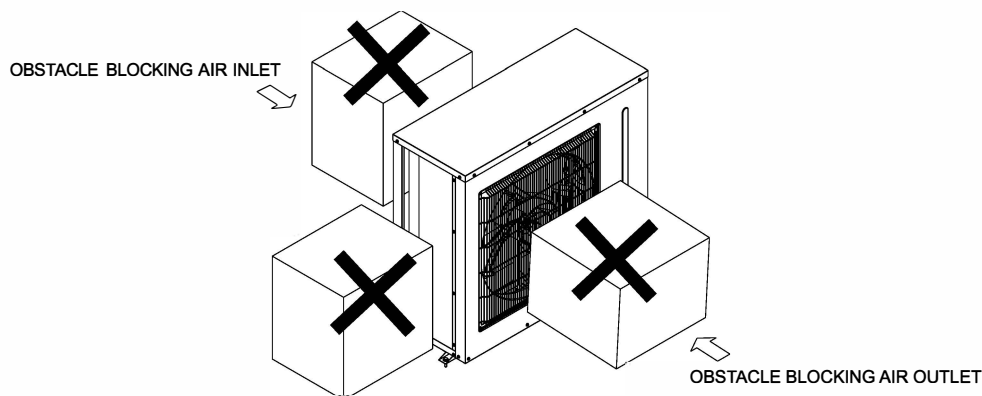
Location For Installation Of The Condensing Units

As condensing temperature rises, evaporating temperature rises and cooling capacity drops. In order to achieve maximum cooling capacity, the location selected should fulfill the following requirements:-

- a) Install the condensing (outdoor) unit in a way such that hot air distributed by the outdoor condensing unit cannot be drawn in again (as in the case of short circuit of hot discharge air). Allow sufficient space for maintenance around the unit.



- b) Ensure that there is no obstruction of air flow into or out of the unit. Remove obstacle which block air intake or discharge



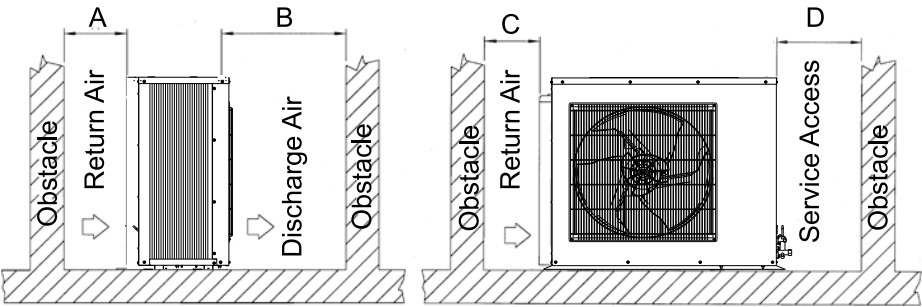
- c) The location must be well ventilated, so that the unit can draw and distribute plenty of air thus lowering the condensing temperature.
- d) A place capable of bearing the weight of the outdoor unit and isolating noise and vibration.
- e) A place protected from direct sunlight. Otherwise use an awning for protection, if necessary.
- f) A place where the hot air discharge and operating sound level will not annoy the neighbours.
- g) The location must not be susceptible to dust or oil mist.

Caution: If the condensing unit is operated in an atmosphere containing oils (including machine oils), salt (coastal area), sulphide gas (near hot spring, oil refinery plant), such substances may lead to failure of the unit.

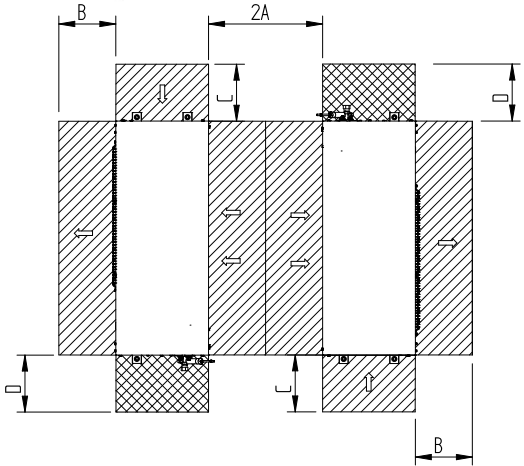
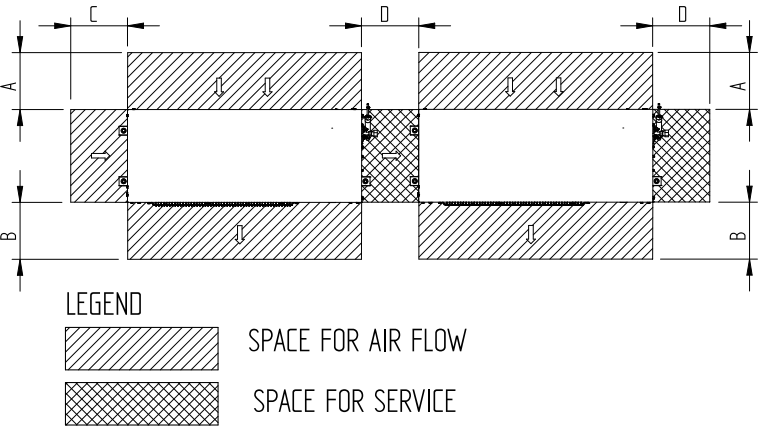
INSTALLATION CLEARANCE

When two or more outdoor units are installed in a location, they must be positioned such that one unit will not be taking the hot discharge air from another to avoid hot air short circuiting. This also applies when two or more units are installed one above the other. Below are the installation clearance guidelines:

Model	RR36ERY16 RR65FRY16 R65DSY16 R60GRY16	RR100FRY16 R100DSY16 R90GRY16	RR130FRY16 R130DSY16 R120GRY16
A (mm)	500	500	700
B (mm)	750	750	1000
C (mm)	1200	1200	1200
D (mm)	1000	1000	1000



Horizontal air discharge



OPTIONAL ACCESSORIES

Please refer the below table for part code of remote compatible with corresponding models :

Model	Wired Remote	Optional Wireless Remote
FDMR36FRV16	4P408280-1	BRC4N151
FDR65FRV16		
FDR100FRV16		
FDR130FRV16		
FDR130FRV162		
FDR200FRY16	4P416386-1	
FD65DSV16	4P408280-1	
FD60GRV16		
FD100DSV16		
FD90GRV16		
FD130DSV16		
FD120GRV16	4P416386-1	
FD200DSY16		
FD180GRY16		

Note: Above wireless remote is optional and can be used with the IR sensor provided in wired remote.
[Wired remote comes as an accessory with indoor units]

REFRIGERANT PIPING

Maximum Pipe Length And Maximum No. Of Bends

When the pipe length becomes too long, both the capacity and reliability will drop and as the no. of bends increases, system piping resistance to the refrigerant flow increases, thus lowering the capacity. As a result the compressor may fail. Always choose the shortest path and follow the recommendations as tabulated below:-

Field piping

To ensure satisfactory operation and performance, the following points should be noted for the field piping arrangements of the complete refrigerant cycle.

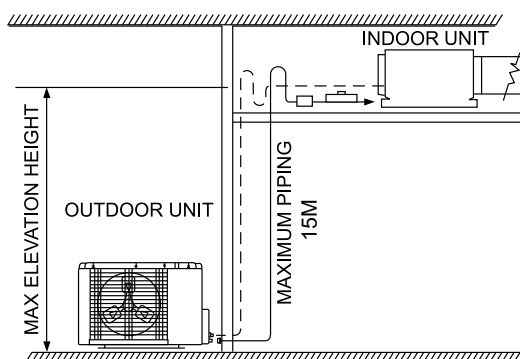
- Liquid loops or oil traps must be provided accordingly to the position of the outdoor and the indoor units (depending on whether the indoor unit is above or below the outdoor unit).
- Field supplied sight glass must be assembled and mounted as shown in the figure.

Always choose the shortest piping path and follow the recommendations as shown below:

Model	Max. Elevation, m (ft.)	Max. Total Length, m (ft.)		Accumulator Liquid holding capacity (kg)	Max. of Bends
		Without Accumulator	With Accumulator		
RR36ERY16	10 (32.8)	20 (65.6)	-----	-----	6
RR65FRY16 R65DSY16 R60GRY16	15 (49.2)	30 (98.5)	35 (114.8)	5	8
RR100FRY16 R100DSY16 R90GRY16			35 (114.8)	6	
RR130FRY16 R130DSY16 R120GRY16			40 (131.2)	9	

Caution:

- Our guarantee on performance of our air-conditioners is strictly revoked if the height, length and/or the number of bends of the refrigerant piping system installed is beyond the limit above.
- Bendings must be carefully made so as not to crush the pipe. Use a pipe bender to bend a pipe as far as possible



Field Connection pipe size detail

Indoor	Liquid Pipe	Gas Pipe	Outdoor	Liquid Pipe	Gas Pipe	Refrigerant Type
FDMR36ERV16	3/8"	8/8"	RR36FRY16	3/8"	5/8"	R410A
FDR65FRV16	1/2"	7/8"	RR65FRY16	1/2"	7/8"	
FDR100FRV16	1/2"	1-1/8"	RR100FRY16	1/2"	1-1/8"	
FDR130FRV16	5/8"	1-1/8"	RR130FRY16	5/8"	1-1/8"	
FDR130FRV162	1/2"	7/8"	2*RR65FRY16	1/2"	7/8"	
FDR200FRY16	1/2"	1-1/8"	2*RR100FRY16	1/2"	1-1/8"	
FD65DSV16	1/2"	7/8"	R65DSY16	1/2"	7/8"	R22
FD100DSV16	1/2"	1-1/8"	R100DSY16	1/2"	1-1/8"	
FD130DSV16	5/8"	1-1/8" *	R130DSY16	5/8"	1-3/8"	
FD200DSY16	1/2"	1-1/8"	2*R100DSY16	1/2"	1-1/8"	
FD60GRV16	1/2"	7/8"	R60GRY16	1/2"	7/8"	R22
FD90GRV16	1/2"	1-1/8"	R90GRY16	1/2"	1-1/8"	
FD120GRV16	5/8"	1-1/8" *	R120GRY16	5/8"	1-3/8"	
FD180GRY16	1/2"	1-1/8"	2*R90GRY16	1/2"	1-1/8"	

Precautions on refrigerant piping

- Do not allow anything other than the designated refrigerant to get mixed into the refrigerant cycle, such as air, nitrogen, etc. If any refrigerant gas leaks while working on the unit, ventilate the room thoroughly right away.
- Add right refrigerant type, refer above table for the details.
- Installation tools:

Make sure to use installation tools that are exclusively used for specific refrigerant type installations to withstand the pressure and to prevent foreign materials (e.g. mineral oils and moisture) from mixing into the system.

*To connect FD130DSV16/FD120GRV16 & R130DSY16/R120GRY16 use reducer at indoor unit end in field installation, gas pipe connection size should be 1-3/8"

Special Precautions When Mounting TXV Bulb

- TXV bulb should be clamped to the suction line near the evaporator outlet, and if possible, on a horizontal run.
- Clean suction line completely before clamping the bulb in place.
- Clamp the bulb to a free draining suction line.
- Insulate the remote bulb from ambient.

Note: After installation is done, the TXV bulb must be fixed at suction line at 8 o'clock or 4 o'clock.

Figure – TXV bulb placement in relation to suction line size



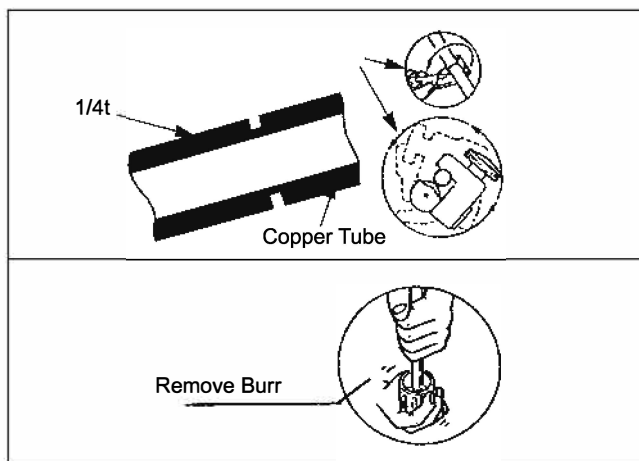
TXV Bulb on small Suction Line



TXV Bulb on large Suction Line

Piping Works & Brazing Technique

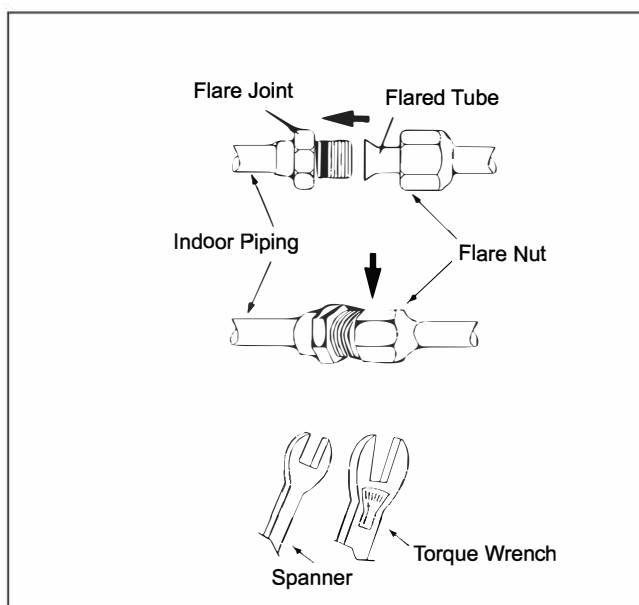
- Do not use contaminated or damaged copper tubing. If any pipings, evaporator or condenser had been exposed or had been opened for 15 seconds or more, then vacuum and purge with field supplied refrigerant. Generally, do not remove plastic, rubber plugs and brass nuts from the valves, fittings, tubings and coils until it is ready to connect suction or liquid line into valves or fittings.
- If any brazing work is required, ensure that the nitrogen gas is passed through coil 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 the pipe cutter slowly. Extra force and deep cut will cause more distortion on the pipe and thus extra burr. See figure.
- Remove burrs from cut edges of the pipes with remover as shown in the figure. Hold the end of the pipe downwards to prevent metal chips from entering the pipe.



Piping Connection To The Units

- Align the center of the piping and tighten the flare nut sufficiently with fingers.
- Finally, tighten the flare nut with the torque wrench until the wrench clicks.
- When tightening the flare nut with the torque wrench, ensure that the tightening direction follows the arrow indicated on the wrench.

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



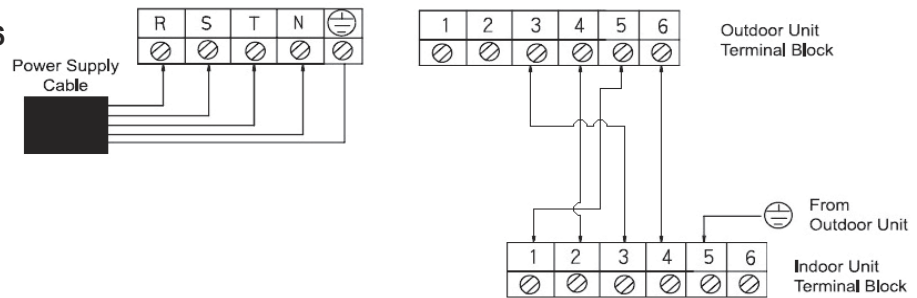
ELECTRICAL CONNECTION

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.

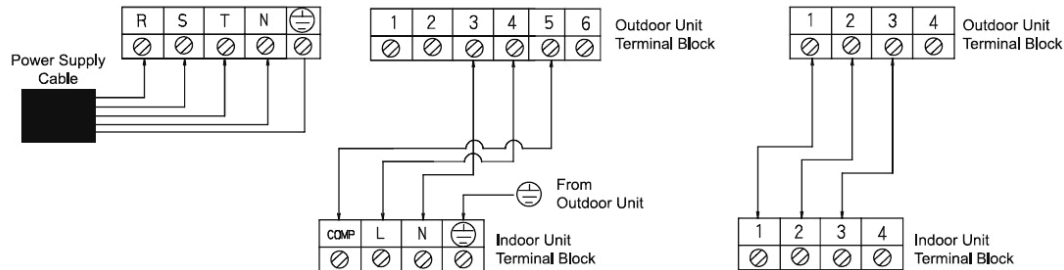
** The appropriate voltage range should be checked with data label on the unit.

Model	Indoor unit	FDMR36ERV16	FDR65FRV16 FD65DSV16 FD60GRV16	FDR100FRV16 FD100DSV16 FD90GRV16	FDR130FRV16 FD130DSV16 FD120GRV16	FDR130FRV162	FDR200FRY16 FD200DSY16 FD180GRY16
	Outdoor unit	RR36ERY16	RR65FRY16 R65DSY16 R60GRY16	RR100FRY16 R100DSY16 R90GRY16	RR130FRY16 R130DSY16 R120GRY16	2*RR65FRY16	2*RR100FRY16 2*R100DSY16 2*R90GRY16
Voltage Range **	Indoor unit Outdoor unit			230V/1Ph/50Hz/⊕ 415V/3Ph/50Hz/⊕			415V/3Ph/50Hz 415V/3Ph/50Hz
Power supply cable size* No. of Conductors mm ²		2.5 5.0	2.5 5.0	4.0 5.0	6.0 5.0	2.5 IDU/ODU Each 5.0 IDU/ODU Each	4.0 IDU/ODU Each 5.0 IDU/ODU Each
Interconnection cable size* No. of Conductors mm ²		1.0 5.0	1.0 7.0	1.0 7.0	1.5 7.0	1.0 Each 7.0 Each	1.0 Each 7.0 Each
Recommended fuse* A		20	20	32	40	20 Each ODU	32 Each ODU

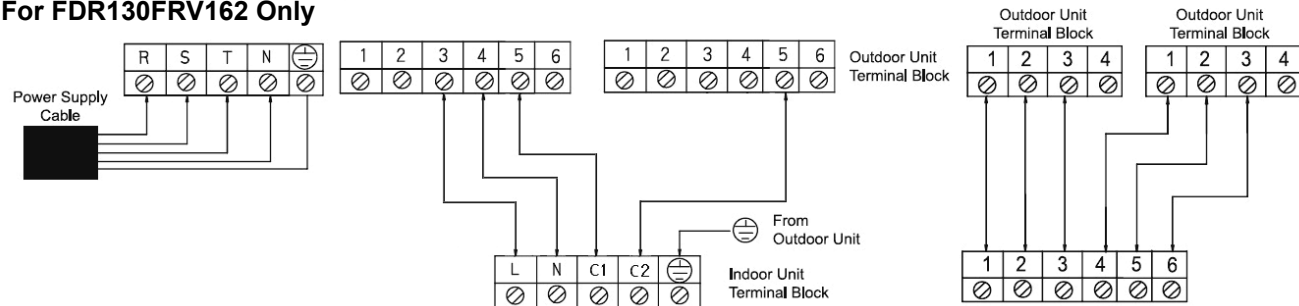
FDMR36ERV16 - RR36ERY16



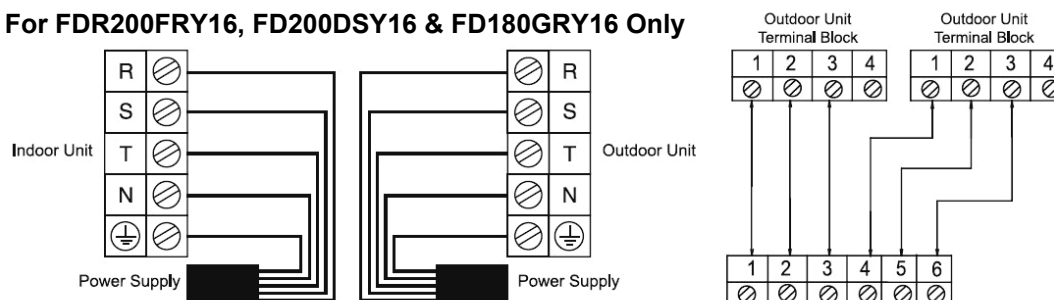
FDR65FRV16 - RR65FRY16, FD65DSV16 - R65DSY16, FD60GRV16 - R60GRY16 FDR100FRV16 - RR100FRY16, FD100DSV16 - R100DSY16, FD90GRV16 - R90GRY16 FDR130FRV16 - RR130FRY16, FD130DSV16 - R130DSY16, FD120GRV16 - R120GRY16



For FDR130FRV162 Only



For FDR200FRY16, FD200DSY16 & FD180GRY16 Only



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 (see fig below).

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

• Test run:

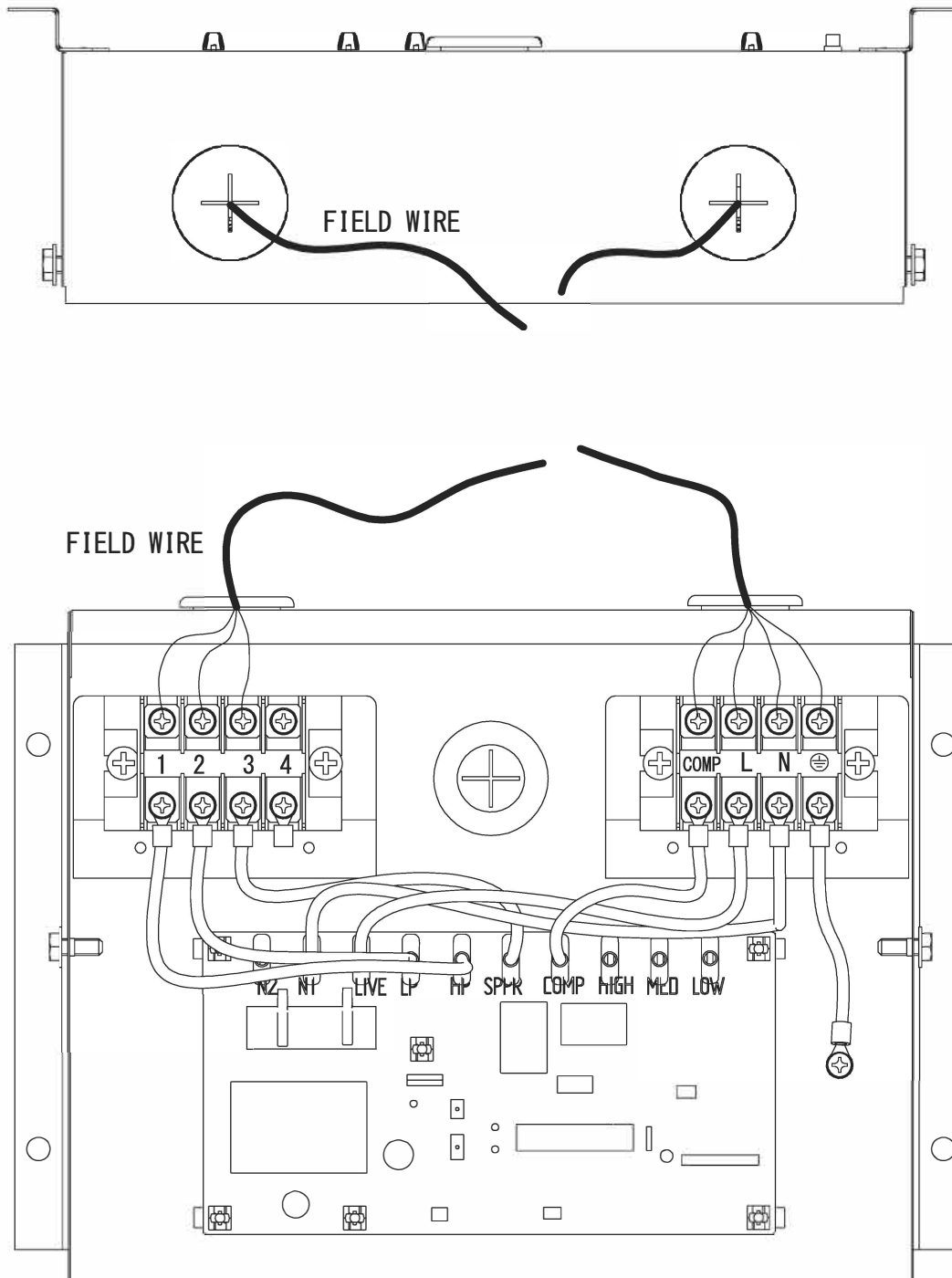
1. Conduct a test run after water drainage test and gas leakage test.

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.

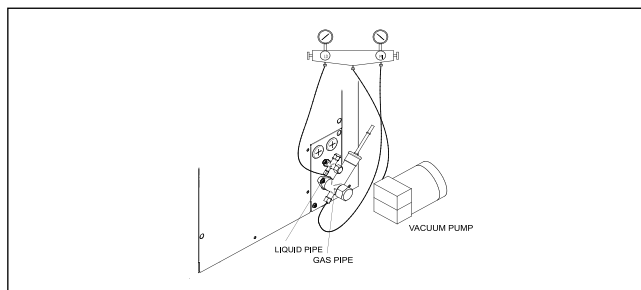


VACUUMING AND CHARGING

Vacuumping is necessary to eliminate all moisture and air from the system. The Outdoor Unit is provided with valve fittings.

Vacuumping

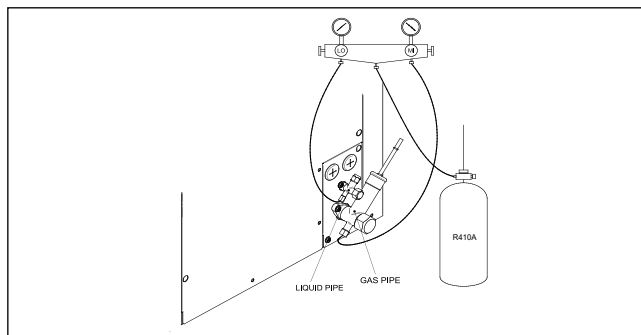
Before vacuumping, perform leak check for refrigeration circuit. After the system piping are properly connected, connect the flexible hoses to the correct charging nipples as shown in the diagram. Ensure that flexible hose from charging nipples are connected to the vacuum pump via standard servicing valves and pressure gauges (gauge manifold). Vacuum the air conditioner system to at least 500 microns Hg. Do not start the unit when the system is engaged in vacuumping.



Charging

Before recharging, the vacuum must be held at 500 microns Hg for at least 15 minutes, then break vacuum by charging right type refrigerant. Operate the unit for 15 minutes and ensure the refrigerant charge is of correct amount as specified below.

After ensuring the system is correctly charged, remove flexible hose from charging nipples and replace caps.



Precautions while charging

- Refrigerant cannot be charged until field work has been completed.
- Refrigerant may only be charged after performing the leak test and vacuum drying.
- When charging a system, care shall be taken that its maximum permissible charge is never exceeded, in view of danger of liquid hammer.
- Charging with an unstable substance may cause explosions and accidents, so always ensure that the appropriate refrigerant type is charged.

SYSTEM REFRIGERANT CHARGE LEVEL GUIDELINES

Cooling only

Indoor	Outdoor	Liquid Pipe	Gas Pipe	Refrigerant Charge (kg/7.5m pipe length)
FDMR36ERV16	RR36ERY16	3/8"	5/8"	2.65
FDR65FRV16	RR65FRY16	1/2"	7/8"	4.4
FDR100FRV16	RR100FRY16	1/2"	1-1/8"	5.3
FDR130FRV16	RR130FRY16	5/8"	1-1/8"	8.4
FDR130FRV162	2*RR65FRY16	1/2"	7/8"	2*4.4
FDR200FRY16	2*RR100FRY16	1/2"	1-1/8"	2*5.9
FD65DSV16	R65DSY16	1/2"	7/8"	3.9
FD100DSV16	R100DSY16	1/2"	1-1/8"	6.0
FD130DSV16	R130DSY16	5/8"	1-3/8"	8.7
FD200DSY16	2*R100DSY16	1/2"	1-1/8"	2*6.0
FD60GRV16	R60GRY16	1/2"	7/8"	4.0
FD90GRV16	R90GRY16	1/2"	1-1/8"	6.0
FD120GRV16	R120GRY16	5/8"	1-3/8"	9.1
FD180GRY16	2*R90GRY16	1/2"	1-1/8"	2*6.7

* FDR200FRY16 comes with 2 Nos. of RR100FRY16, where standard gas charge is 5.3kg/unit. Extra 0.6Kg should be charged for standard pipe length in each unit during installation in field.

* FD180GRY16 comes with 2 Nos. of R90GRY16, where standard gas charge is 6.0kg/unit. Extra 0.7Kg should be charged for standard pipe length in each unit during installation in field.

* Keep minimum 7.5m pipelength during installation.

ADDITIONAL CHARGE

Based on liquid pipe size per meter length:

Liquid Pipe Size, inch	Additional Charge, kg/meter
1/4"	0.02
5/16"	0.04
3/8"	0.05
1/2"	0.10
5/8"	0.17
3/4"	0.26
7/8"	0.37

Note: The additional refrigerant charge amount recommended is a guideline for longer piping application. The actual charge required may be different from the guideline due to different application and variation in site conditions.

OIL REFILL CHARGE GUIDELINES

1. In case of majority Oil spill/Loss by Leakage in field -----

Remove all remaining oil from the compressor. add fresh oil charge in the compressor as per below table.

Indoor	Outdoor	Refill oil charge ltr/30m pipe length
FDMR36ERV16	RR36ERY16	-
FDR65FRV16	RR65FRY16	1.656
FDR100FRV16	RR100FRY16	3.100
FDR130FRV16	RR130FRY16	3.100
FDR130FRV162	2 x RR65FRY16	2 x 1.656
FDR200FRY16	2 x RR100FRY16	2 x 3.100
FD65DSV16	R65DSY16	1.656
FD100DSV16	R100DSY16	3.134
FD130DSV16	R130DSY16	3.134
FD200DSY16	2 x R100DSY16	2 x 3.134
FD60GRV16	R60GRY16	1.656
FD90GRV16	R90GRY16	3.134
FD120GRV16	R120GRY16	3.134
FD180GRY16	2*R90GRY16	2 x 3.134

OIL REMOVE PROCEDURE :

- To remove all remaining oil from the compressor, first remove compressor from the system.
Take it out side & tilt in such a way so that all oil can come outside from suction port.

Note : Check Quality of oil, if Oil color is clear (not black or turbide), use same oil for refilling & top up fresh Oil, to maintain total Refill Quantity as per above table. if Oil color is not clear , do not use this oil , refill with Fresh Oil only.

OIL REFILL PROCEDURE :

- Charge oil through the Suction port of Compressor.

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 reciprocating 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.

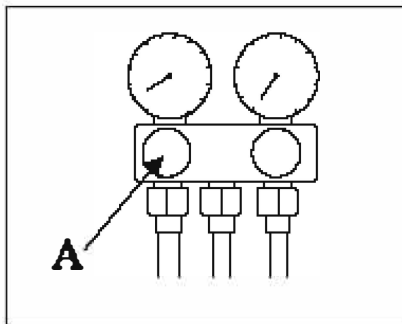
1. Charging procedures – Single phase compressors

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.

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 reciprocating 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.



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.

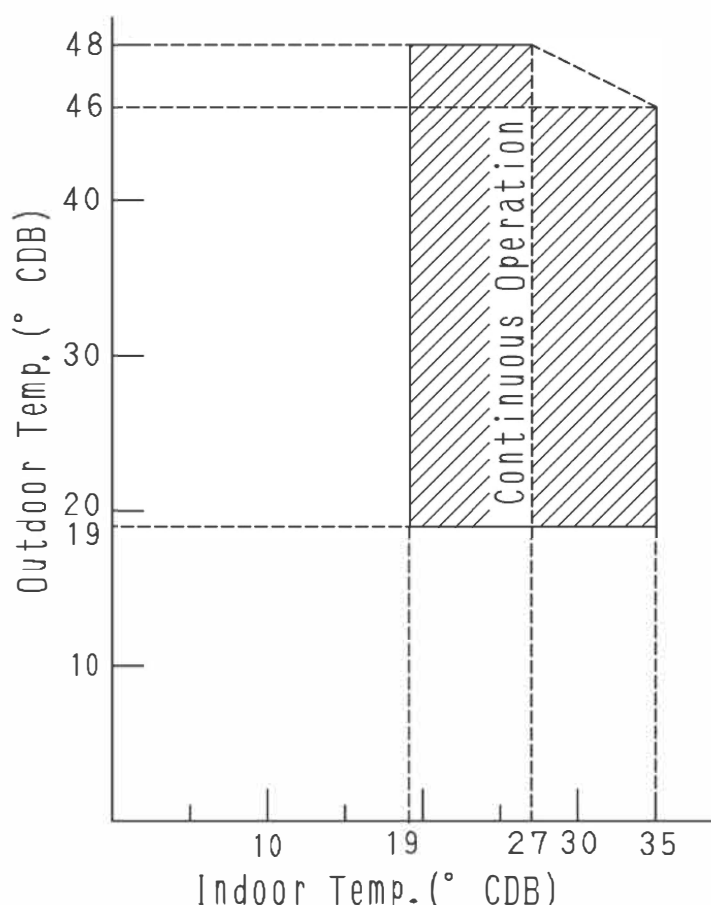
All Scroll Compressors have internal discharge temperature protectors which are very effective in preventing dangerously high discharge temperatures during charging. The protection module will trip and lock the compressor out for 30 minutes. It is not normally necessary to wait 30 minutes for the module to reset. When the compressor has cooled down the module can be reset by breaking the power supply to the control circuit. Very often the serviceman does not understand why the module tripped and uses a jumper wire to bypass it. He continues to charge the system and removes the jumper when charging is complete. The compressor may or may not run with the protector back in the circuit but it is certain that the compressor has been damaged and premature failure is inevitable.

Caution for refrigerant leaks

Care must be taken to ensure that air conditioning facilities are installed in a room which is sufficiently large. This assures that the maximum concentration level of refrigerant gas is not exceeded, in the unlikely event of major leak in the system and this in accordance to the local applicable regulations and standards.

STANDARD OPERATING CONDITIONS

Cooling only



NOTES:

The graph is based on the following conditions:

Equivalent piping length: 7.5m
 Level difference : 0m
 Air Flow Rate : High

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 adhering to the filter by using a vacuum cleaner or wash in lukewarm water (below 40°C) with a neutral cleaning detergent. 2. Rinse the filter well and dry before placing it back onto the unit. 3. Do not use gasoline, volatile substances or chemicals to clean the filter. 	At least once every 2 weeks. More frequently if necessary.
Indoor unit	<ol style="list-style-type: none"> 1. Clean any dirt or dust on the grille or panel by wiping it with a soft cloth soaked in lukewarm water (below 40°C) and a neutral detergent solution. 2. Do not use gasoline, volatile substances or chemicals to clean the indoor unit. 	At least once every 2 weeks. More frequently if necessary.

TROUBLESHOOTING

If 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/Action
1. The compressor does not operate 3 minutes after the air conditioner unit is started.	- Protection against frequent starting. Wait for 3 to 4 minutes for the compressor to start operating.
2. The air conditioner unit does not operate.	<ul style="list-style-type: none"> - Power failure, or the fuse needs to be replaced. - The power plug is disconnected. - It is possible that your delay timer has been set Incorrectly. - If the fault persists after all these verifications, please contact the air conditioner unit installer.
3. The air flow is too low.	<ul style="list-style-type: none"> - 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. Discharge air flow has bad odour.	- Odours may be caused by cigarettes, smoke particles, perfume etc. which might have adhered onto the coil.
5. Condensation on the front air grille of the indoor unit.	<ul style="list-style-type: none"> - 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.
6. Water flowing out from the air conditioner unit.	- Switch off unit and call dealer.
7. Hissing air flow sound from the air conditioner unit during operation.	- Refrigerant fluid flowing into the evaporator coil.
8. Room Temperature Sensor Fail display on Remote (r S F).	- If sensor is short / open / not connected, it will be considered as sensor fail. It will automatic be reset when Room sensor is corrected.
9. Indoor Antifreeze sensor Fail display on Remote (CSF1).	- If sensor is short / open / not connected, it will be considered as sensor fail. It will automatic be reset when Indoor Antifreeze sensor is corrected.
10. HP Error display on Remote (HP1).	<ul style="list-style-type: none"> - If discharge pressure is very high or over the limit Then high pressure switch (HP), cut off the Compressor. - This is caused by condenser fan does not work. - Ambient temperature is very high, above the limit. - The Error will be Auto reset ,but in case we get 3 error with in 40 min, system will go in manual reset mode.
11. LP Error display on Remote (LP1).	<ul style="list-style-type: none"> - If Suction pressure is too low or below the limit then low pressure switch (LP), cut off the compressor. - The Error will be Auto reset ,but in case we get 3 error with in 40 min, system will go in manual reset mode.
12. SPPR Error display on Remote (SPPR).	- SPPR failure this is caused by phase absence, phase reverse, unbalance, under/over voltage. This fault is auto reset when SPPR Corrected.
13. Airflow Error display on Remote (AF).	<ul style="list-style-type: none"> - This is caused by the IDU fan faulty (current < 0.5 amp). - The Error will auto reset after 5 min. If get 3 error with in 20 min, system will go on manual reset mode.
14. Communication Failure (C-Er)	<ul style="list-style-type: none"> - This is caused by Communication wire break or faulty - The Error will be Reset after Changing ok Communication wire
15. Indoor Antifreeze Activation on remote (df1)	<ul style="list-style-type: none"> - If indoor coil tube temperature reaches ≤ 1 deg C 1. Check Unit Airflow for any Restriction (Air filter Block) 2. Low gas charge / Refrigerant circuit partial Blockage.

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

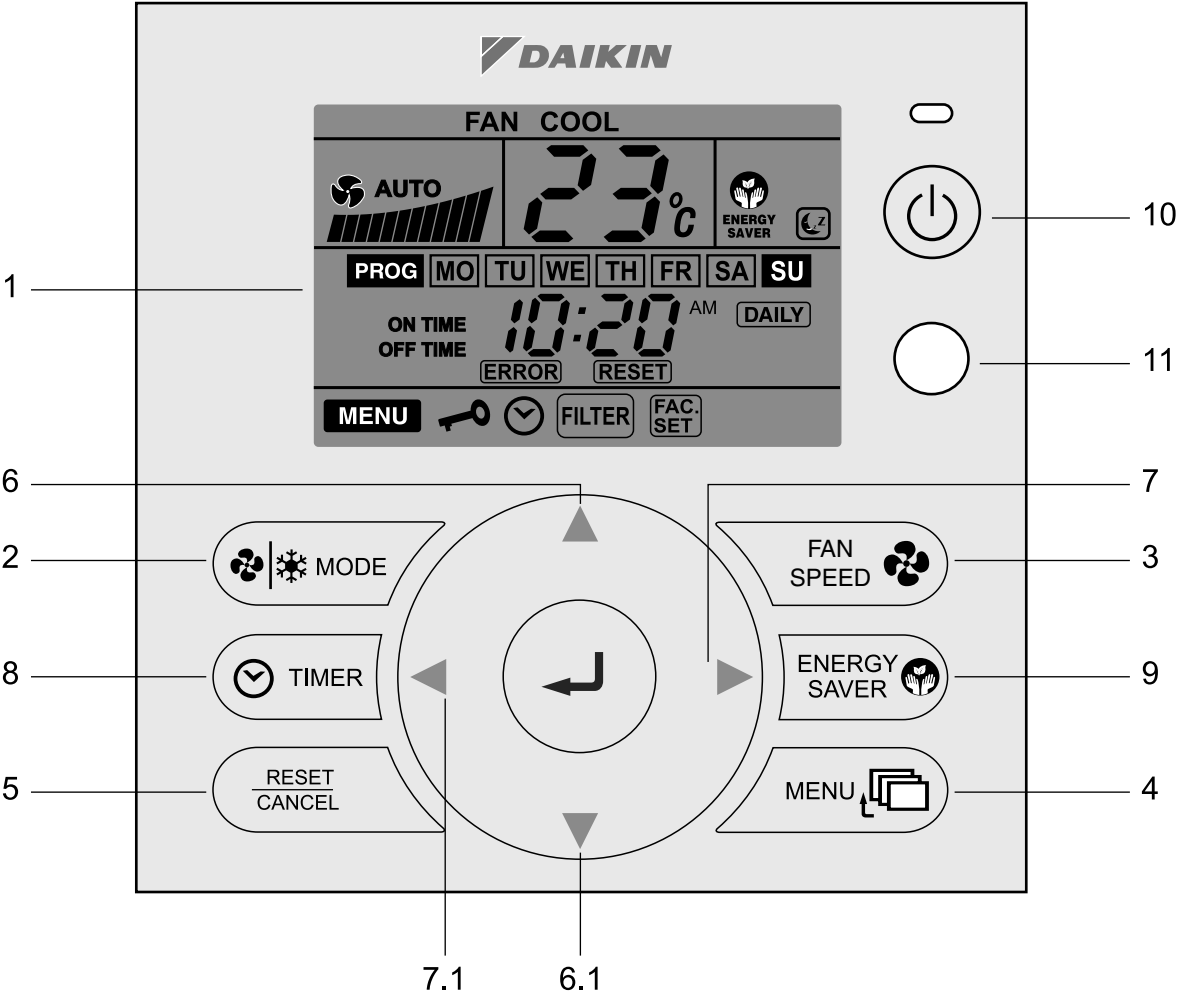
PHASE PROTECTOR

The unit with Scroll Compressor can only rotate in one direction. For this reason, a protective device (phase protector) is fitted to prevent incorrect wiring of the electrical phases. When the three phases are not connected correctly, the phase protector 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 protector under normal operation and fault conditions.

LED Description	RV	UV	OV	AS	Actions
Normal operation	ON	OFF	OFF	OFF	----
Single Phasing	OFF	OFF	OFF	OFF	Switch off the unit. Check the 3 phase wiring.
Phase Reversal	Flashing	----	----	----	Switch off the unit. Check the 3 phase wiring.
Unbalance	ON	----	----	ON	Switch off the unit. Check the Voltage in each phase
Over Voltage	ON	----	ON	----	Switch off the unit. Check the Voltage.
Under Voltage	ON	ON	----	----	Switch off the unit. Check the Voltage.

SLM Controller Indication



OPERATING INSTRUCTION

1. TEMPERATURE (LCD Display)

- To Display the ambient temperature set by the user. press "▲ UP" or "▼ DOWN" Keys to increase or decrease the set temperature. The setting range is between 16°C to 32°C

2. MODE

- To display the selected operating mode: Cool Mode/Fan Mode

3. FAN



- To display the selected ventilation speed: LOW/MED/HIGH. Automatic selection for speed, whereby the speed is automatically adjusted according to the room temperature in only cool mode.

Note- Automatic speed selection is not available in FDR200FRY16, please refer wiring diagram for changing speed setting.

4. MENU MODE

- Press the menu key "MENU" symbol and all option of menu gets "ON"
- MENU can have following option:
 - 1) Key Pad Lock.
 - 2) Clock Setting.
 - 3) Filter reset.
 - 4) Factory Reset




Key Pad Lock.




To lock keypad, press Menu Key, MENU symbol and other symbol will get "ON". Only  this symbol will blink which indicates that user can toggle the lock keypad status. On pressing Enter key  user can lock or unlock keypad.

If lock is activated, "ON/OFF, FAN SPEED, MODE & MENU" key will be active and Menu Mode will have only Options to unlock keypad.

If invalid key is pressed on lock activation,  symbol flashes 3 times to indicate that keypad is locked

Clock Setting:-


To change clock timings and day, press "MENU" Key. In Menu mode, reach to  -CLOCK symbol by left and right key and can enter in clock setting mode by pressing  -Enter key when clock symbol blinks. On enter in clock setting mode, other options of Menu Mode will get cleared from screen and 



&  will start blinking, change day with Left or Right key. Press Enter to set day. On set, Selected day will get "ON" and "HOUR" of clock will start blinking. On press LEFT/RIGHT key and Switch between HOUR & MINUTES. Blinking of hour/minute will show that it can be changed by UP/DOWN Key. When press Enter Key in this mode, clock gets set with set Hour and minute and gets exit from this mode with  clock symbol "ON" with clock time on  this window.

Note: 1) To exit from clock setting mode, press RESET/CANCEL Key at any stage of above
2) AM and PM will change when Hour changes from 12 to 1.




Filter cleaning Reminder:-

In Menu mode, reach to "Filter reset" symbol by left and right key and can reset by enter key.

System shows  symbol in blinking format which indicates a filter clean reminder after 200 Hrs of fan run.

To reset filter clean reminder, reach to  symbol and press  key.

Factory Reset:-

To change clock timings and day, press "MENU" Key. In Menu mode, reach to  -symbol by left and right key and can do Factory Reset by pressing  -Enter key when  symbol blinks. On Factory Reset, below setting gets applied:

Temp- 24°C

Mode-Cool

Fan Speed-High

Filter Timer is reset to Zero.

7 days Programmable timer- All set timers will get cleared and will get "--:" and timer active will also get "OFF". Temperature, mode and fan speed will get display for 2 sec on display.

5. RESET/CANCEL

Press this key in current operation reset or cancel .

6 6.1 TEMPERATURE SETTING

Temperature can be changed by “▲ UP” or “▼ DOWN” Keys .

These keys will be used for changing timers and clock in timer or clock setting mode. These keys will not Change set-temperature in timer or clock setting mode.

7.7.1 RIGHT /LEFT

Press this key to move the cursor left or right and move to other options.

8. TIMER

When presses “TIMER” Key, **PROG** **MO** **TU** **WE** **TH** **FR** **SA** **SU** and **DAILY** will appear for 2 seconds and after that **PROG** **MO** will start flashing which shows enter in MONDAY Timers. For other days move to other days by LEFT/RIGHT Key.

There is 1 On-Timers & 1 Off-Timer for any day of week, with added “Daily” feature.

(a) Press Enter to set day. On set, selected day and **ON TIME** will get “ON” and “HOUR” of Timer will start that it blinking. On press LEFT/RIGHT key switch between HOUR & MINUTES. Blinking of hour/minute can be changed by UP/DOWN Key.

(b) On set/ cancel on-timer, **OFF TIME** symbol will get ON and user can set/cancel off-timer with same way as on-timer.

After setting the Timer's , **PROG** **MO** **TU** **WE** **TH** **FR** **SA** **SU** and **DAILY** will appear for 2 seconds and after that **PROG** **MO** will start flashing which shows user can enter in MONDAY Timers. For other days user can move to other days by LEFT/RIGHT Key.

(c) After Sunday we get option of DAILY .we can set timers of daily in the same way as we did for other days.

Note:

- (1) If “Daily” is selected then only “Daily” Timer will be effective for every Day.
- (2) On set of any timer, time will be shown for 2 sec on screen.
- (3) On cancel of any timer “--:--” will be shown for 2 sec on screen.
- (4) AM and PM will change when Hour changes from 12 to 1.

9. ENERGY SAVER

Energy Saver Mode can be set/ cancel by “ENERGY SAVER” Key.

Energy Saver can be set only in Cool mode. In Cool mode MODE. Set Temp 26 Degree and Fan Speed – MEDIUM, in Energy Saver Mode.

10. ON/OFF SWITCH

Press once,the air conditioner unit start.

Press again,the air conditioner unit stop.

11. IR SENSOR

This feature is applicable with wireless remote.

[For wireless remote fuctions, please refer the operation manual of wireless remote.]

PROTECT THE ENVIRONMENT FROM E-WASTE (GUIDELINES)

Meaning of E-waste under E-Waste (Management) Rules,2022 (E-waste Rules)
-Waste electrical and electronic equipment, whole or in part of reject from their manufacturing and repair process, which are intended to be discarded.
Our product is RoHS compliant.



Don't dump Electrical and Electronic Products in Garbage Bins

DO'S & DONT'S

DO'S	
Run and maintain the air conditioner as per the instructions given in the operation / instruction manual	✓
Ensure that an authorised person repairs your air conditioner	✓
Call our local authorised dealer or our toll free number to dispose your air conditioner	✓
Contact an authorised dealer in case of installation or de-installation	✓
Consult our local authorised dealer or our toll free number on the life span of the air conditioner	✓
DONT'S	
Do not try to repair your air conditioner on your own	✗
Do not sell or dispose your air conditioner or parts to an unauthorised Kabbadi wala / Scrap Dealer / Ragpickers	✗
Do not dismantle your air conditioner on your own	✗
Do not get your air conditioner or any parts repaired by an unauthorised person	✗
Do not dispose off the E-waste in landfills	✗
Do not use the air conditioner as furniture after its use	✗

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