



United Technologies
turn to the experts

Tropical



220-240V ~ 50Hz 1Ph
380-420V ~ 50Hz 3Ph

Miraco
MISR REFRIGERATION & AIR CONDITIONING MFG. CO.

ClassiCOOL

*Ceiling Concealed Ducted Split Systems
High Efficiency - Green
Cool Only*

53KDMT12N-718
53KDMT18N-718
53KDMT24N-718
53KDMT30N-718
53KDMT36N-718T

53KDHT42N-518T
53KDHT48N-518T
53KDHT60N-518T

53KDHT72N-518T



INSTALLATION MANUAL

Carrier is committed for continuous improvement of Carrier products according to national and international standards to ensure the highest quality and reliability standards, and to meet market regulations and requirements.

All specifications subject to change without prior notice according to Carrier policy of continuous development.

03504574



Rev. (0) - 2016



Features of Ducted Split Systems - Medium Static Pressure Sizes 12K - 18K - 24K - 30K - 36K

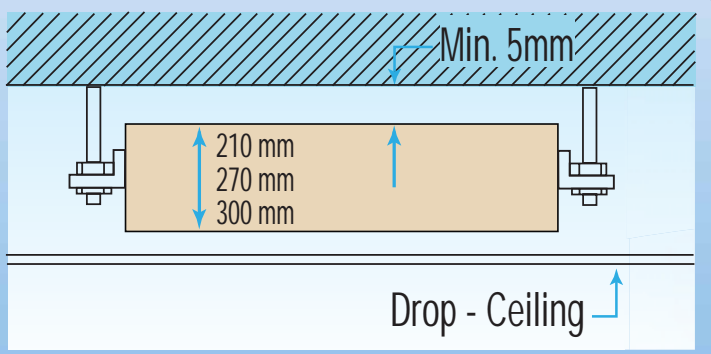
Easy and Flexible Installation

Due to compact dimensions, low height and low weight, the installation of ducted indoor unit - medium static pressure on the ceiling is faster and extremely easy.

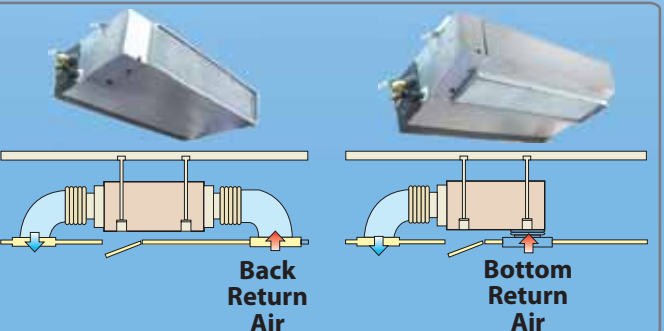


Low Height Compact Dimensions & Light Weight

Size	Dimensions (mm)			Net Weight Kg
	W	H	D	
12K	920	210	635	23
18K - 24K	920	270	635	28
30K - 36K	1200	300	865	44.5



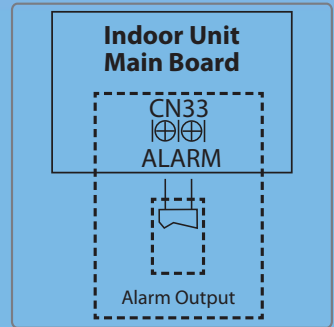
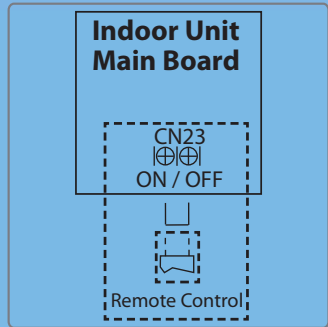
Flexible two directions of air return :
Back air return (factory standard)
Bottom air return (can be done at field).



Remote ON / OFF function provides more easy central ON / OFF control of ducted split system.



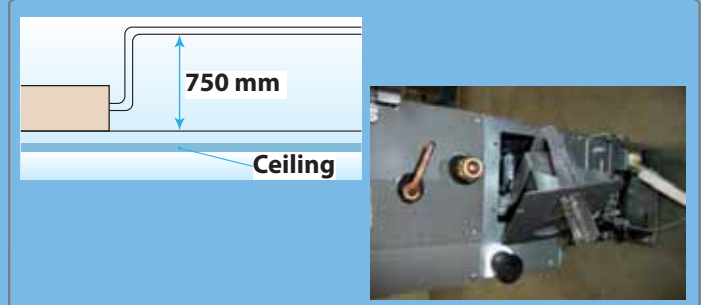
Remote system alarm function which required for some applications such as computer rooms for fast and easy service and maintenance.



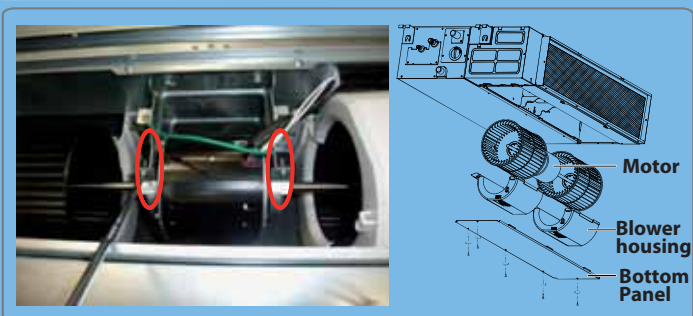
Pre-Punched Fresh intake air built in the indoor unit from both sides to make air quality more healthy and more comfortable.



Optional drain pump which can lift the condensate water up to 750 mm upmost. Optimal drain pump is factory installed upon request.



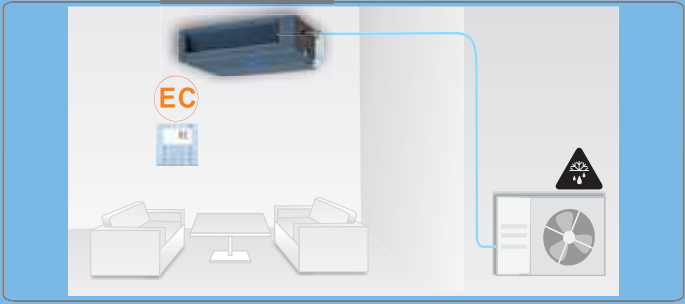
Easy accessibility for motors and fans on indoor unit for easy fast service and maintenance.



Smart Refrigerant leak detection by sensitive sensor mounted on indoor coil for easy fast service and maintenance.



Easy removal of washable air filters for cleaning.



Features of Ducted Split Systems - High Static Pressure Sizes 42K - 48K - 60K - 72K

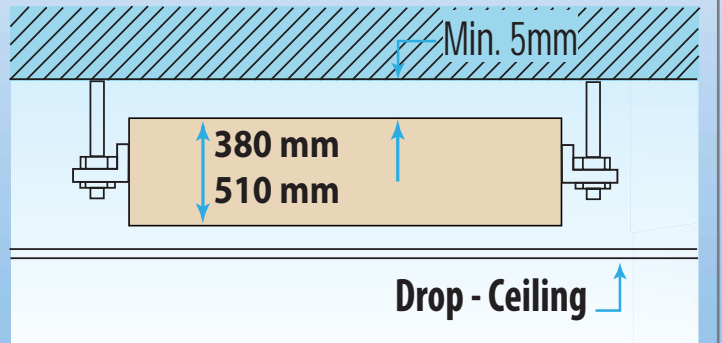
Easy and Flexible Installation

Due to compact dimensions, low height and low weight, the installation of ducted indoor unit - High static pressure on the ceiling is faster and extremely easy.



Low Height Compact Dimensions & Light Weight

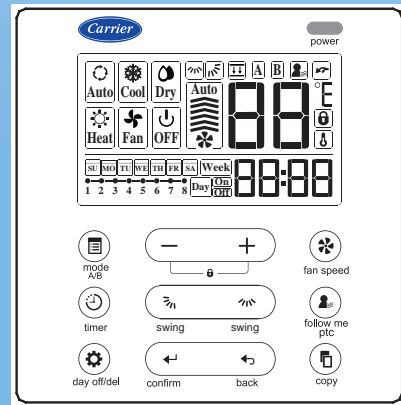
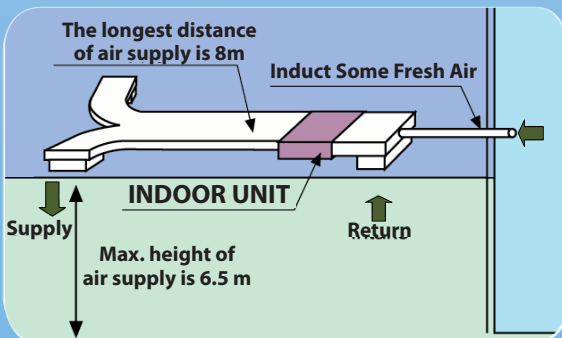
Size	Dimensions (mm)			Net Weight Kg
	W	H	D	
42K				
48K	1200	380	608	56
60K				
72K	1470	510	795	83



High external static pressure design for long distance of supply air duct.

160 Pa

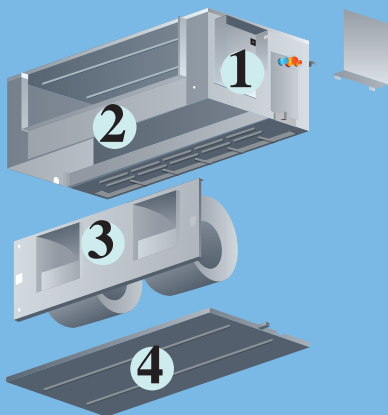
Standard Smart Wired Controller with complete control functions built in the control system.



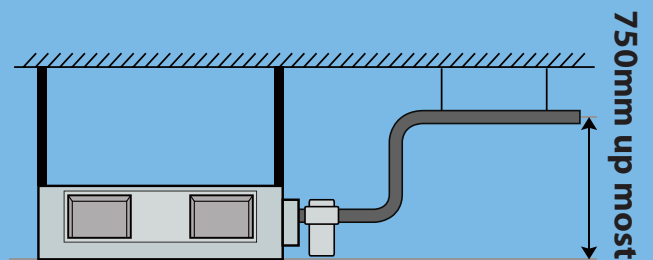
Easy accessibility for motors and fans on indoor unit for easy fast service and maintenance.



Optional drain pump which can lift the condensate water up to 750 mm up most. Optimal drain pump is factory installed upon request.



1. Control box
2. Fan casing
3. Motor
4. Bottom panel



Easy removal of washable aluminium air filters for cleaning.



Smart Refrigerant leak detection by sensitive sensor mounted on indoor coil for easy fast service and maintenance.

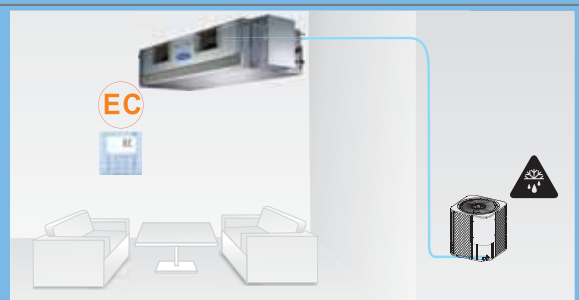
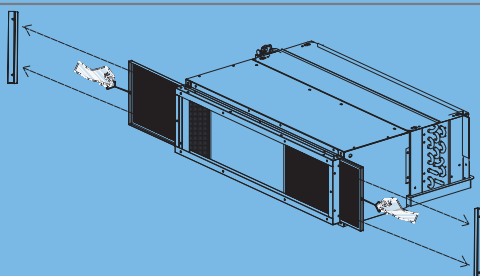


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1. GENERAL NOTES TO INSTALLER

Ducted split air conditioner has been carefully designed and manufactured under strict Quality Control conditions.

Therefore you are completely responsible for proper installation completion and operation of the air conditioner.

Carefully read the manual carefully before proceeding with the installation to ensure correct installation. This manual describes installation instructions to help ensure trouble free operation and extended life of the air conditioner.

Make sure all accessory parts are with the system before beginning installation.

□ **You will need the following tools for installation:**

- | | |
|------------------------------------|--|
| 1. Standard screwdriver | 10. Flaring tool set |
| 2. Phillips head screw driver | 11. Pipe bender |
| 3. Electric drill, Hole core drill | 12. Hexagonal wrench (4mm) |
| 4. Measure tape | 13. Torque wrench |
| 5. Water level gauge | 14. Vacuum pump matched with Air conditioner R410A |
| 6. Pipe clamp | 15. Gas leak detector for refrigerant R410A |
| 7. Pipe cutter | 16. Gauge manifold R410A |
| 8. Spanner (half union) | 17. Thermometer |
| 9. Reamer | 18. Electrical multimeter |

□ **Important**

- During the system installation make first refrigerant piping connections and then electrical connections.
- If the system is uninstalled first disconnect electrical cables and then refrigerant piping connections.

□ **After completion of installation, perform a run test and give the customer full instructions on the correct operation of the air conditioner including:**

- | | |
|-----------------------------------|---|
| • Turning the unit on and off. | • Removal and cleaning of the air filters. |
| • Functions of the wired control. | • Re-installation of air filters after cleaning |

Leave the owner manual with the customer so that it can to be used during operation of the air conditioner.

Leave the installation manual with the customer so that it can be used for any service and maintenance operations.

□ **Advise the customer to the tips of energy saving while operating the air conditioner as mentioned in the owner's manual.**

□ **Warning**

Disconnect the mains power supply switch before servicing the system or handling any internal parts of the system.

2. PRECAUTIONS BEFORE INSTALLATION

SAFETY PRECAUTIONS

- Installation and maintenance of air conditioning equipment can be hazardous due to system pressures, electrical components and rotating parts.
- The installation and maintenance of the air conditioner must be carried out by trained and qualified technicians from Carrier or one of Carrier authorized dealers.
- After unpacking, Please check carefully for possible damage the indoor and outdoor units of the air conditioner.
- Before undertaking any work on the indoor and outdoor units of the air conditioner, make sure to disconnect the power supply.



WARNING

- This installation manual describes the installation procedures of split room air conditioner consisting of an outdoor unit and an indoor unit manufactured by Carrier.
- The installation of air conditioner must be according to applicable national installation standards.
- During installation, Proceed first with refrigerant connections between indoor and outdoor units, and only then make the electrical connections.
Similarly, when disassembling, disconnect the electrical wiring first and only then open refrigerant connections.

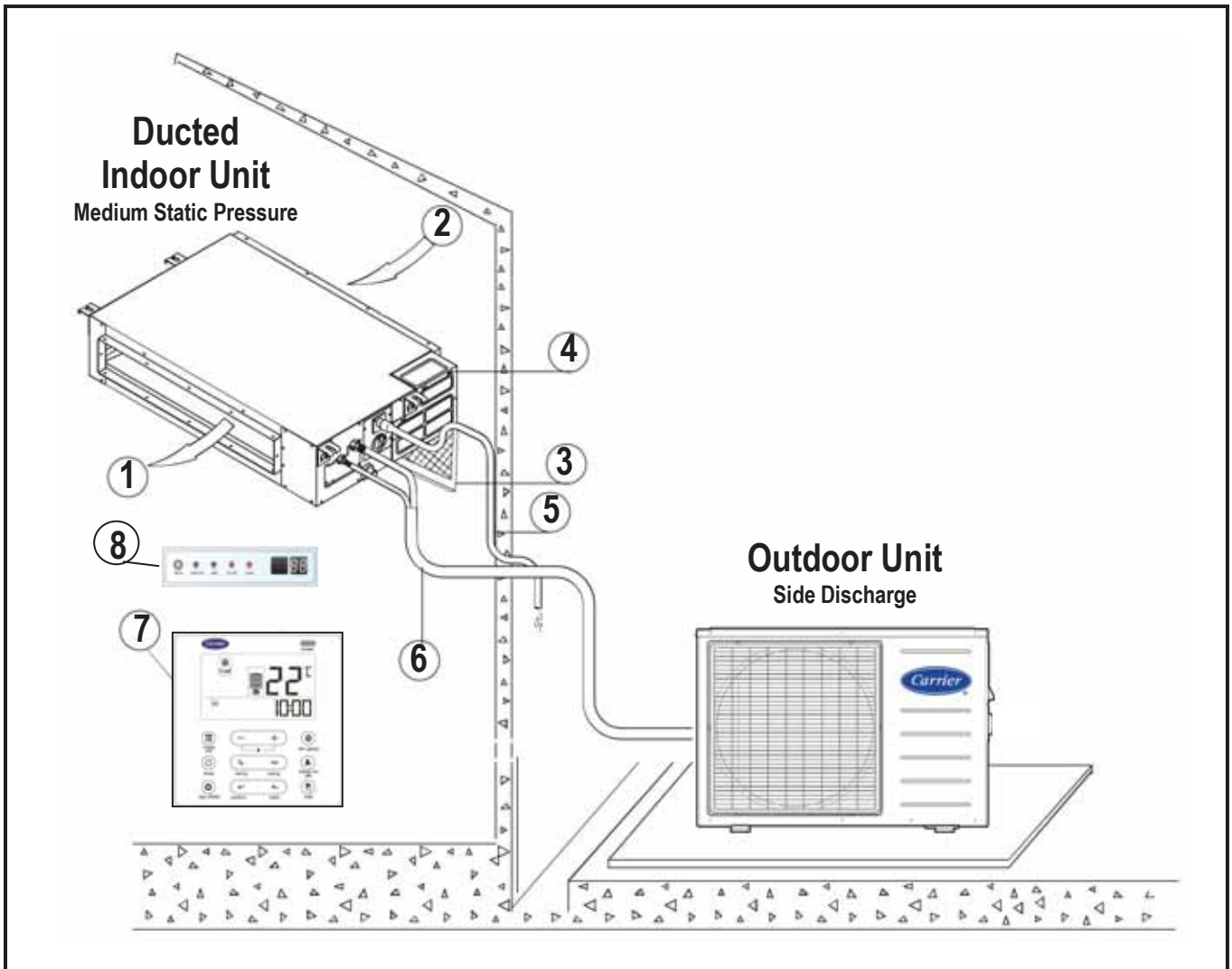
What is not covered in our warranty?

- 1- Failure due to wrong electrical connections between the electrical power supply and circuit breaker of air conditioner leading to fire due to short-circuiting. As these electrical connections are owner's responsibility.
- 2- Failure due to Misuse, Abusing, overloading, negligence of air filters cleaning and negligence of instructions included in the owner's manual.
- 3- Failure due to Accident / Weather Natural catastrophe, accident due to bad weather (Hail Storm, Sand Storm, lightning, Flooding, Acid Rain and Air Borne fallout, etc).
- 4- Failure due to damages during transport done through the owner.
- 5- Failure due to any modifications in the product done through the owner.
- 6- Failure due to Installation or Service and Maintenance or repair works done through the owner.
- 7- Product normal sound (refrigerant – moving parts – plastic parts)
- 8- Inconvenience or commercial loss is not covered.

The decision of Carrier in ascertaining the same will be final. Any such repairs will be carried out at the expense of the owner (purchaser).

3. DUCTED SPLIT SYSTEM DESCRIPTION

3.1 Ducted Split System – Medium Static Pressure 12K – 18K – 24K – 30K



1: Supply Air From Indoor Unit

2: Return Air To Indoor Unit

3: Air Filter (s)

4: Electrical Box

5: Condensate Drain Hose

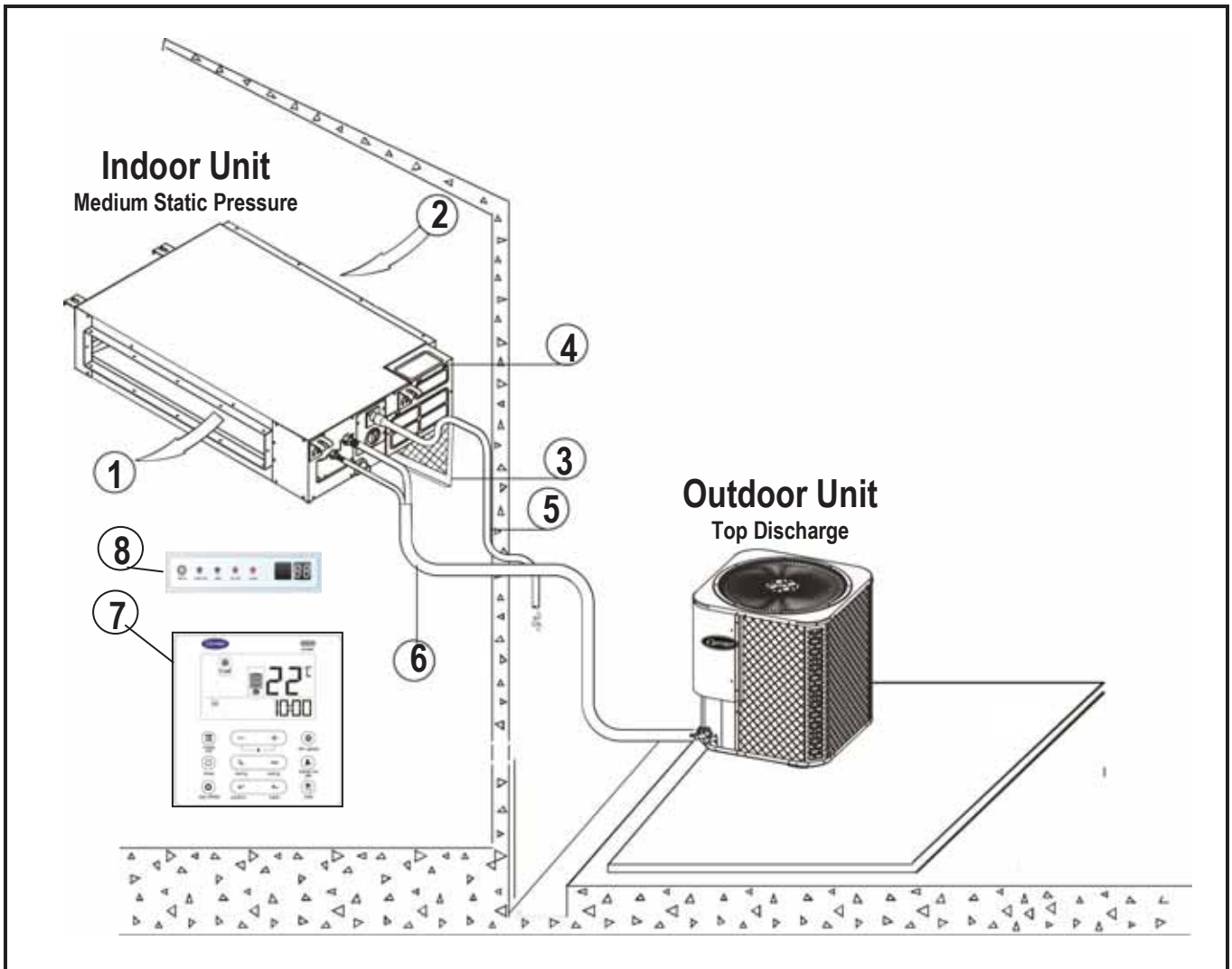
6: Inter-connecting refrigerant piping lines and electrical cables between outdoor and indoor units.

7: Wired Room Controller (Standard)

8: Display & Receiver Panel for optional wireless remote control

DUCTED SPLIT SYSTEM DESCRIPTION

3.2 Ducted Split System – Medium Static Pressure 36K



1: Supply Air From Indoor Unit

2: Return Air To Indoor Unit

3: Air Filter (s)

4: Electrical Box

5: Condensate Drain Hose

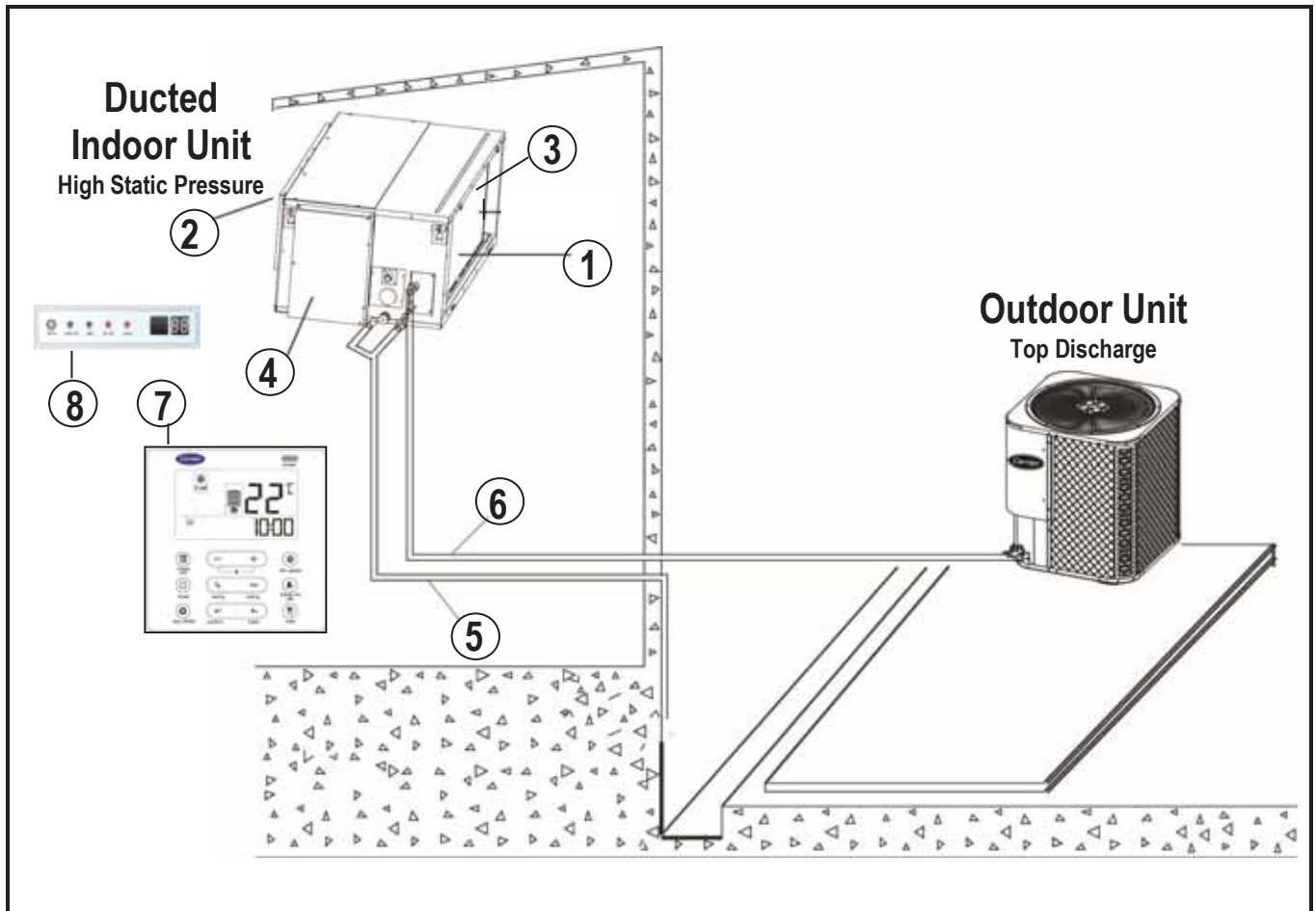
6: Inter-connecting refrigerant piping lines and electrical cables between outdoor and indoor units.

7: Wired Room Controller (Standard)

8: Display & Receiver Panel for optional wireless remote control

DUCTED SPLIT SYSTEM DESCRIPTION

3.3 Ducted Split System – High Static Pressure 42K – 48K – 60K



1 : Supply Air To Indoor Unit

2 : Return Air From Indoor Unit

3 : Air filter (s)

4 : Electrical Box

5 : Condensate Drain Hose

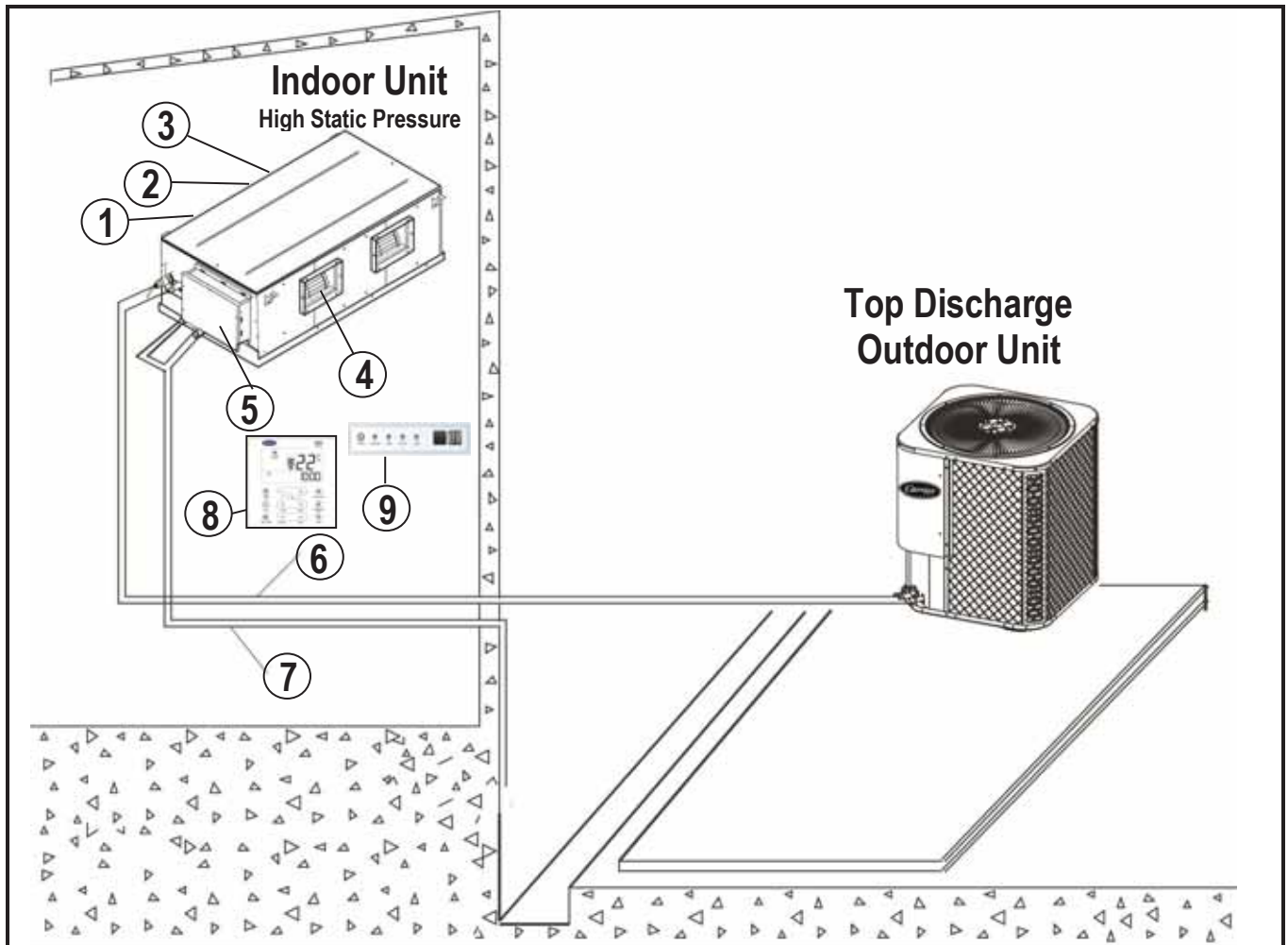
6 : Inter-connecting refrigerant piping lines and electrical cables between outdoor and indoor units.

7 : Wired Room Controller (Standard)

8 : Display & Receiver Panel for optional wireless remote control

DUCTED SPLIT SYSTEM DESCRIPTION

3.4 Ducted Split System – High Static Pressure 72K



1 : Air filter (s)

2 : Indoor Coil

3 : Return Air To Indoor Unit

4 : Supply Air From Indoor Unit

5 : Electrical Box

6 : Inter-connecting refrigerant piping lines and electrical cables between outdoor and indoor units.

7 : Condensate Drain hose

8 : Wired control (Standard)

9 : Display & Receiver Panel for optional wireless remote control

4. UNIT MODELS & IDENTIFICATION

Unit Models

System Model	Indoor Unit Model	Outdoor Unit Model
53KDMT12N-718	42KDMT12N-718	38KDMT12N-718
53KDMT18N-718	42KDMT18N-718	38KDMT18N-718
53KDMT24N-718	42KDMT24N-718	38KDMT24N-718
53KDMT30N-718	42KDMT30N-718	38KDMT30N-718
53KDMT36N-718T	42KDMT36N-718T	38KDMT36N-718T
53KDHT42N-518T	42KDHT42N-718T	38KDHT42N-518T
53KDHT48N-518T	42KDHT48N-718T	38KDHT48N-518T
53KDHT60N-518T	42KDHT60N-718T	38KDHT60N-518T
53KDHT72N-518T	42KDHT72N-718T	38KDHT72N-518T

Identification :

53	= Split System
42	= Indoor Unit
38	= Outdoor Unit
K	= Cool Only
D	= Ducted
M	= Medium Static Pressure
H	= High Static Pressure
T	= Tropical High Ambient
18	= System Size
N	= R410A Green Refrigerant
7	= Power Supply 220-240V/1Ph/50Hz
5	= Power Supply 380-420V/3Ph/50Hz
1	= Wired Room Controller
8	= Manufactured by Miraco – Carrier
T	= Outdoor Unit – Top Discharge

5. OPERATING LIMITS *

COOLING

Difference	Dry Bulb Temp. C°	Wet Bulb Temp. C°
Indoor temperature		
Maximum	32	23
Minimum	21	15
Outdoor temperature		
Maximum	52	-
Minimum	21	-

MAIN POWER SUPPLY

System Model	Nominal Power Supply V / PH / HZ	Minimum Voltage	Maximum Voltage
53KDMT12N-718	220-240 / 1 / 50	198	254
53KDMT18N-718			
53KDMT24N-718			
53KDMT30N-718			
53KDMT36N-718T			
53KDHT42N-518T	380-415 / 3 / 50	342	462
53KDHT48N-518T			
53KDHT60N-518T			
53KDHT72N-518T			

NOTE:

* When the ducted split systems is operated above or below these limits for a long time, system diagnostics may detect a malfunction and the system will not operate properly.

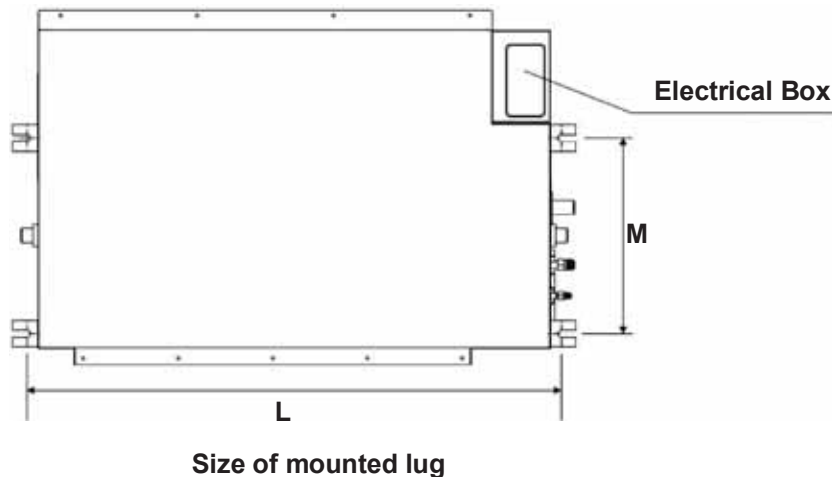
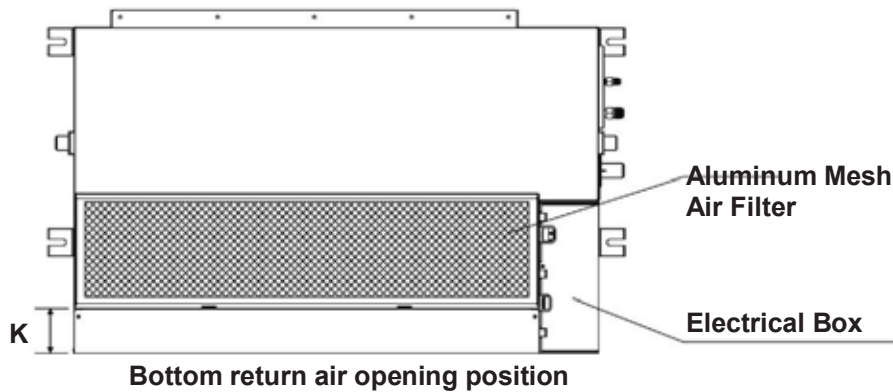
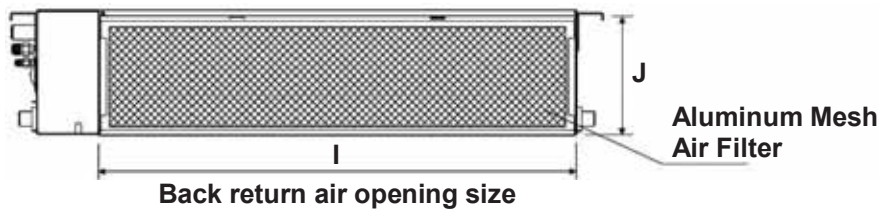
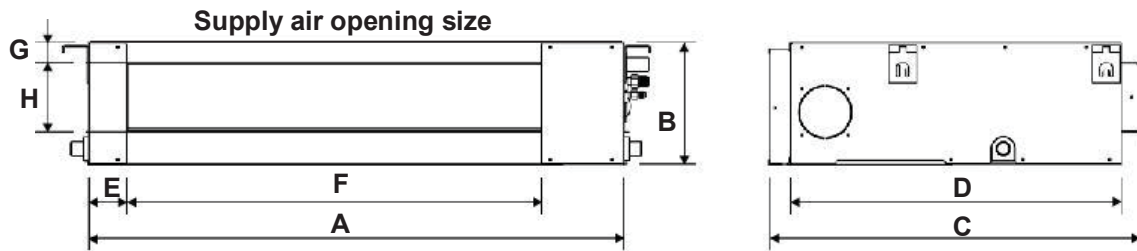
6. DIMENSIONS AND WEIGHTS OF DUCTED INDOOR UNITS

6.1 Ducted Indoor Units - Medium Static Pressure Sizes 12K, 18K, 24K, 30K, 36K

- The refrigerant piping connections and control box are located on the right hand side of the indoor unit when facing supply air side of the unit.
- The indoor unit should be installed for horizontal supply air flow.
- The indoor unit should be suspended horizontally using the factory provided holes located at the topside flanges of the indoor unit.

Indoor Unit Model	Weight Kg	Outline dimensions				Supply air opening size				Return air opening size			Size of Mounted lug	
		A	B	C	D	E	F	G	H	I	J	K	L	M
42KDMT 12	23	920	210	635	570	65	713	35	119	815	200	80	960	350
42KDMT 18 - 24	28	920	270	635	570	65	713	35	179	815	260	20	960	350
42KDMT 30 - 36	44.5	1200	300	865	800	80	968	40	204	1094	288	45	1240	500

Outline dimensions (mm)



DIMENSIONS AND WEIGHTS OF DUCTED INDOOR UNITS

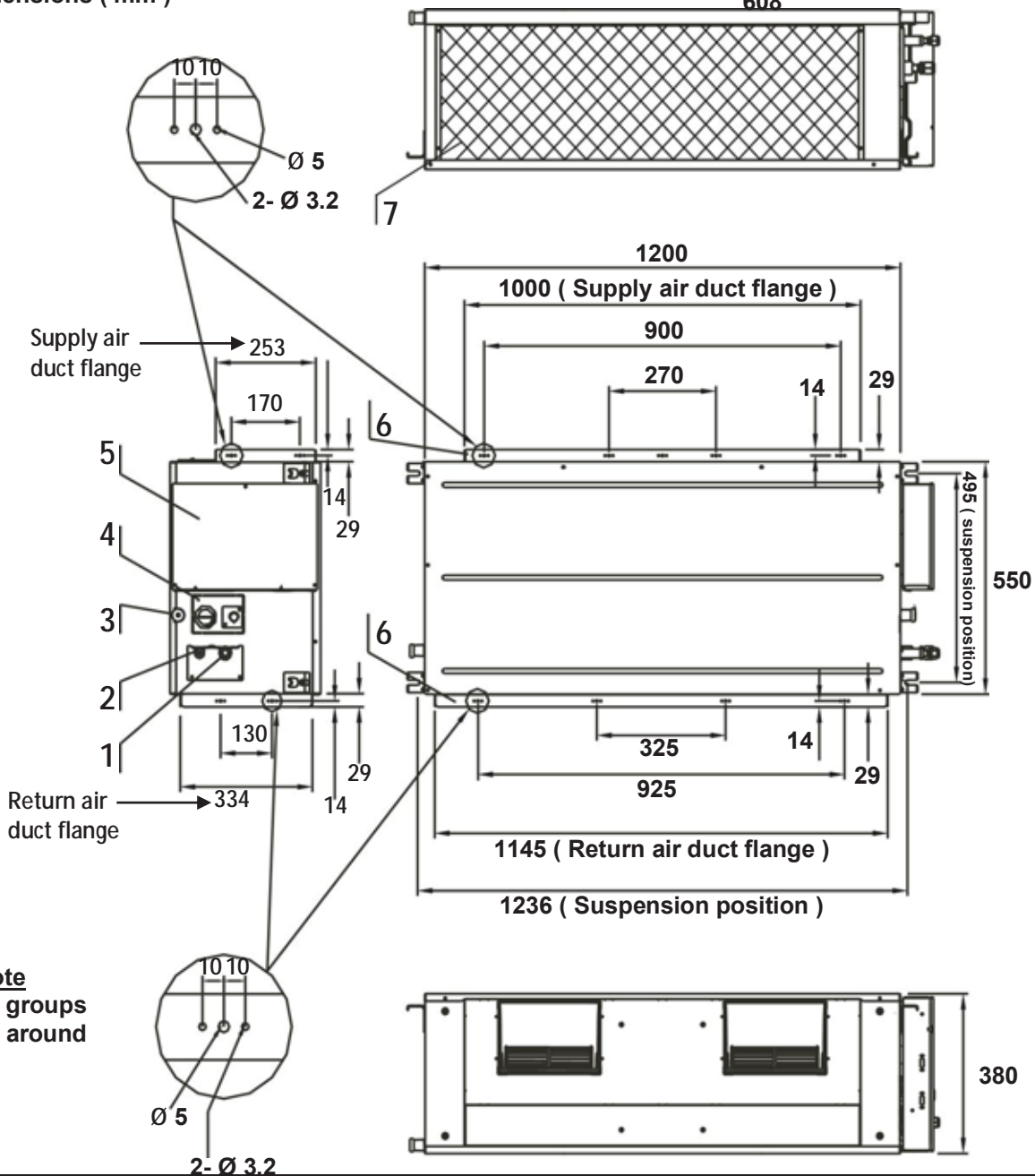
6.2 Ducted Indoor Units - High Static Pressure Sizes 42K, 48K, 60K

- The refrigerant piping connections and control box are located on the right hand side of the indoor unit when facing supply air side of the unit.
- The indoor unit should be installed for horizontal supply air flow.
- The indoor unit should be suspended horizontally using the factory provided holes located at the topside flanges of the indoor unit.

Weight Kg	
Model	Kg
42KDHT42N-718T	56
42KDHT48N-718T	56
42KDHT60N-718T	56



Dimensions (mm)




Number	Name	Description
1	Suction pipe connection	---
2	Liquid pipe connection	---
3	Drain pipe connection	OD Ø 25 ID Ø 20
4	Drain pipe connection	Using drain pump (optional)
5	Power supply connection	---
6	Supply air flange	---
7	Aluminium mesh air filter	10 mm thick

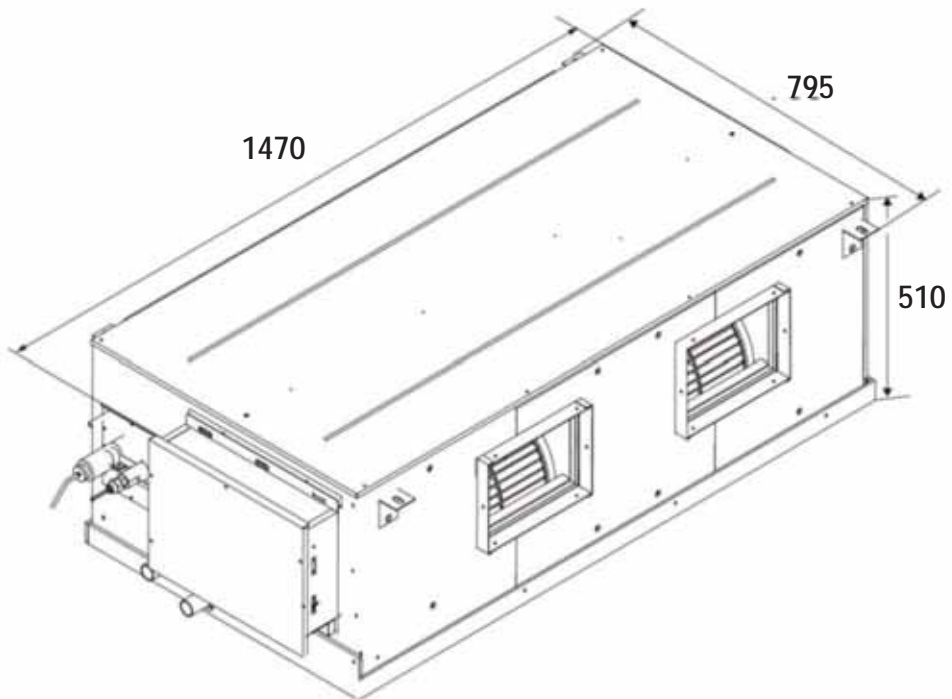
DIMENSIONS AND WEIGHTS OF DUCTED INDOOR UNITS

6.3 Ducted Indoor Unit - High Static Pressure Size 72K

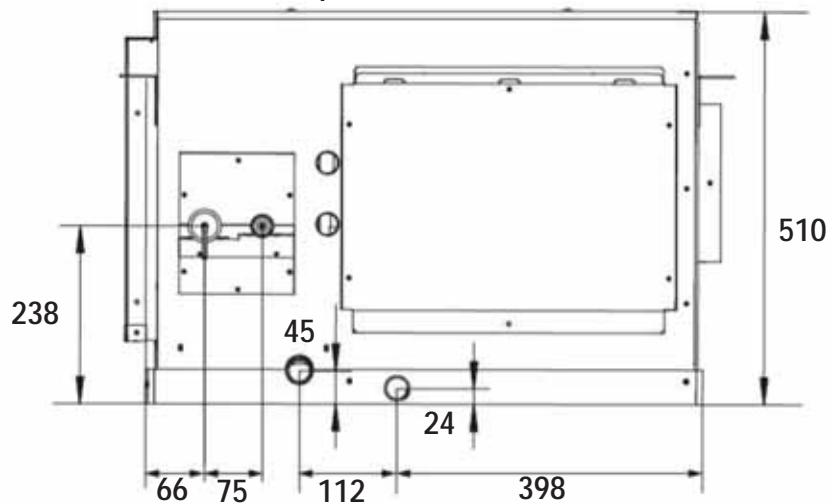
- The refrigerant piping connections and electrical control box are located on the left hand side of indoor unit when facing supply air flow of indoor unit.
- The indoor unit should be installed horizontally for horizontal discharge only.
Using the factory-provided holes located at the topside flanges of the indoor unit.

Weight 	
Model	Kg
42KDHT72N-718T	83

Dimensions (mm)



Pipe side view



7. DIMENSIONS AND WEIGHTS OF OUTDOOR UNIT

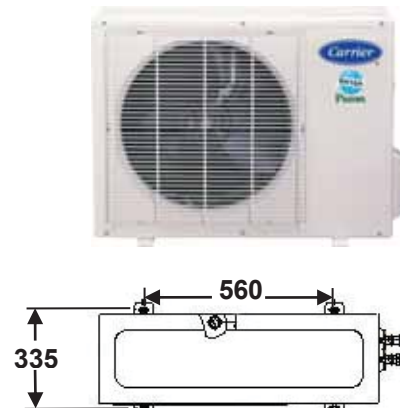
7.1 Side Discharge Outdoor Units Sizes 12K, 18K, 24K, 30K

Model	Unit Dimensions (mm)			Weight Kg
	Width	Height	Depth	
38KDMT12N-718	770	555	300	37



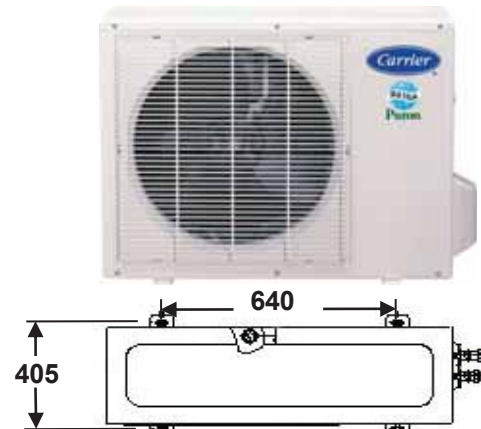
Mounting Dimensions

Model	Unit Dimensions (mm)			Weight Kg
	Width	Height	Depth	
38KDMT18N-718	845	700	320	48.5



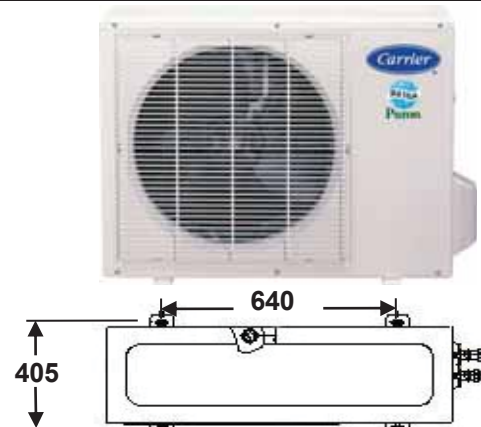
Mounting Dimensions

Model	Unit Dimensions (mm)			Weight Kg
	Width	Height	Depth	
38KDMT24N-718	945	810	395	60



Mounting Dimensions

Model	Unit Dimensions (mm)			Weight Kg
	Width	Height	Depth	
38KDMT30N-718	945	810	395	70.5

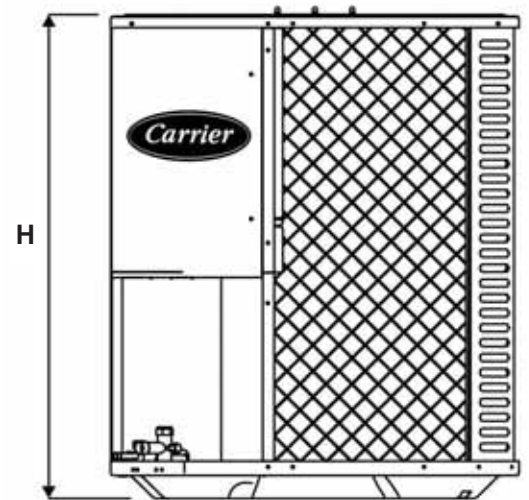
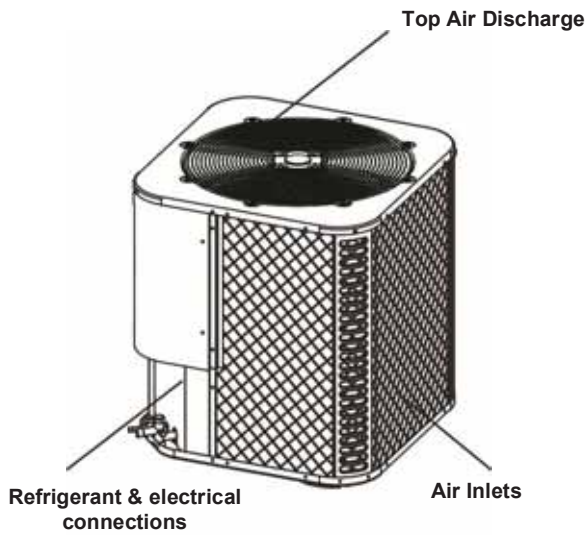
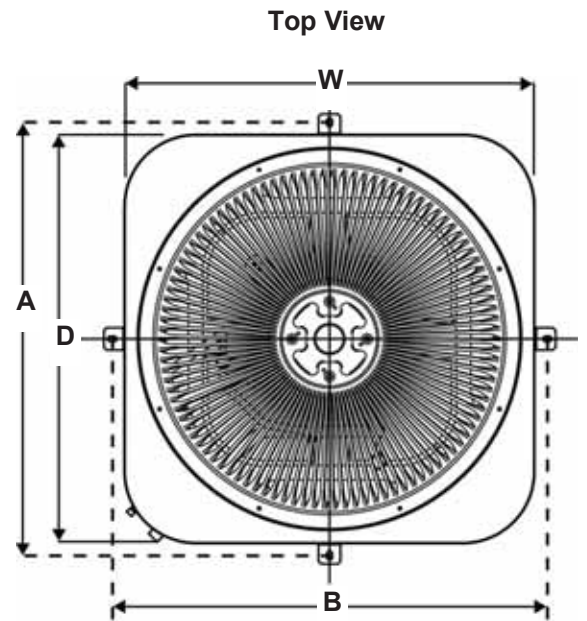


Mounting Dimensions

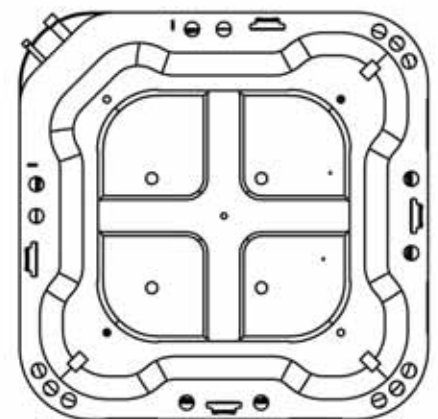
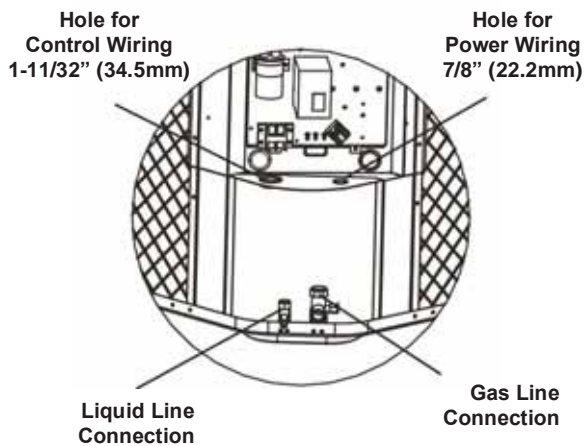
DIMENSIONS AND WEIGHTS OF OUTDOOR UNIT

7.2 Top Discharge Outdoor units Sizes 36K & 42K & 48K & 60K & 72K

Model	Mounting Dimensions (mm)		Unit Dimensions (mm)			Weight Kg
	A	B	W	H	D	
38KDMT36N-718T	754	753	710	843	710	84.5
38KDHT42N-518T						80
38KDHT48N-518T						80
38KDHT60N-518T	785	784	740	843	740	102
38KDHT72N-518T						



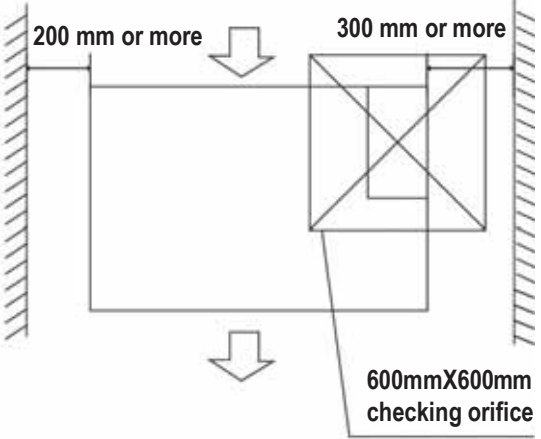
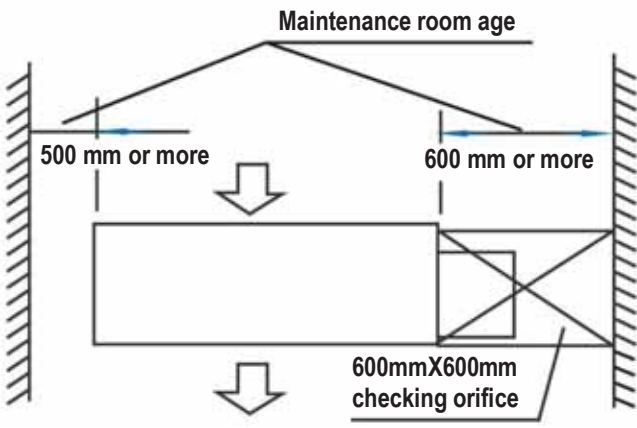
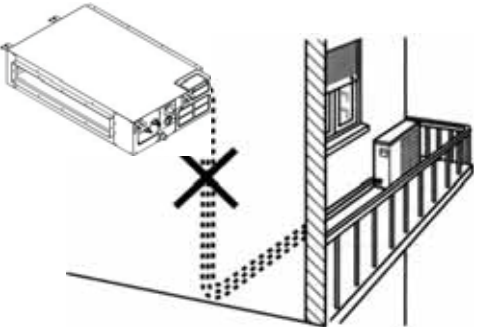
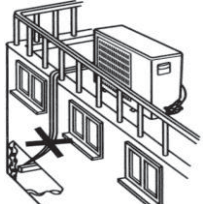
Front View



Down View

8. SELECTING INSTALLATION LOCATION OF INDOOR UNIT

8.1 CONSIDERATIONS OF SELECTING INSTALLATION LOCATION

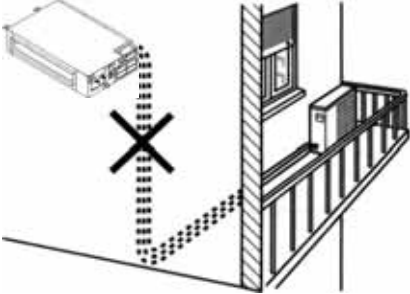
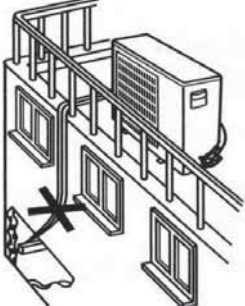
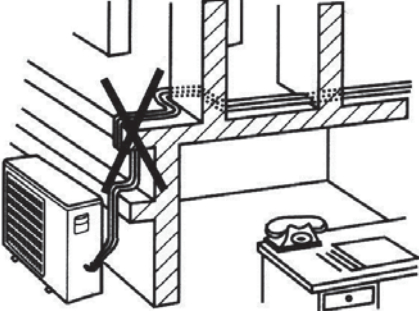

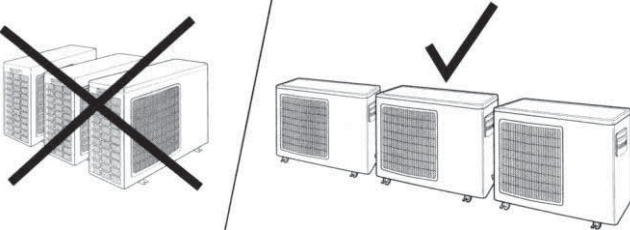
 <p>200 mm or more</p> <p>300 mm or more</p> <p>600mmX600mm checking orifice</p> <p>For Ducted Indoor Unit - Medium Static Pressure</p>	<p>Select installation location which allows minimum clearances for free air circulation and easy accessibility for easy service and maintenance.</p>
 <p>Maintenance room age</p> <p>500 mm or more</p> <p>600 mm or more</p> <p>600mmX600mm checking orifice</p> <p>For Ducted Indoor Unit - High Static Pressure</p>	
	<p>Avoid installation location which can lead to excessive length of refrigerant piping lines between outdoor and indoor units</p>
	<p>Avoid installation location which can lead to excessive height difference between outdoor and indoor units</p>
<p>Select Installation location which should be able to support indoor unit operating weight. The ceiling should be horizontal</p>	
<p>Select Installation location which should permit easy connection of refrigerant piping lines, electrical cables and condensate drain line.</p>	

9. SELECTING INSTALLATION LOCATION OF SIDE DISCHARGE - OUTDOOR UNIT

9.1 INSTALLATION LOCATIONS

The side discharge outdoor unit can be installed in any outside location, on a wall, on a roof or on a ground level.

9.2 CONSIDERATIONS FOR SELECTING INSTALLATION LOCATIONS

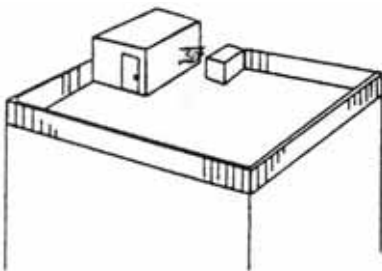
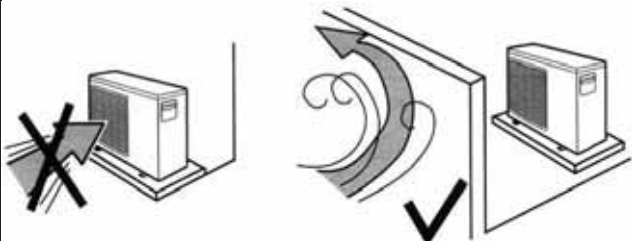
	<p>Avoid installation location which can lead to excessive distance between outdoor and indoor units to avoid alteration on system cooling performance.</p>
	<p>Avoid installation location which can lead to excessive height difference between outdoor and indoor units to avoid alteration on system cooling performance.</p>
	<p>Avoid installation location which can lead to unnecessary turns and bends in the refrigerant piping lines connecting outdoor unit with indoor unit.</p>
	<p>Avoid installation location where there are obstacles near the air outlet or air inlet that may affect air flow and performance of the unit</p>
	<p>Avoid multiple unit installation with units facing each other and blowing discharged air into each other.</p>

SELECTING INSTALLATION LOCATION OF SIDE DISCHARGE - OUTDOOR UNIT

CONSIDERATIONS FOR SELECTING INSTALLATION LOCATION

Select installation location which is close to the indoor unit.
Select the installation location of outdoor unit which is able to support operating weight of outdoor unit, and not cause vibration.
Select the installation location of outdoor unit which is far away from the direct sunlight.
Select the installation location of outdoor unit which is far away from heat sources, steam or flammable gas.
Select the installation location of outdoor unit which is free of dust or any material, which can cause clogging of condenser coil. When installing unit on the ground, select a location not subjected to flooding.
Avoid installation location which is full of oil vapors which may result in malfunction.
Avoid installation location which is full of sulfuric gas which may result in malfunction.
Select installation location where the operation noise and discharged air are not disruptive to your neighbors.

When the installation is made on the rooftop or other places subject to strong wind :

<p>When the outdoor unit is to be installed on the rooftop or at the places where there are no other buildings around. it is required to avoid the strong wind from blowing directly into the air outlet of the outdoor unit so as to prevent the negative impacts on cooling performances due to insufficient airflow of the outdoor unit heat exchanger and to prevent from faulty performances.</p>	
<p>When there are walls in the vicinity, the air outlet should face the wall and keep a space of 500mm from the wall.</p> 	<p>When the air outlet is affected by the strong wind, the installation position should be changed so as to make the air outlet at a straight angle from the wind direction.</p> 

SELECTING INSTALLATION LOCATION OF SIDE DISCHARGE - OUTDOOR UNIT

9.3 Minimum Clearances When Selecting Installation Location for Single Outdoor Unit Installation Minimum Clearances When Selecting Installation Location for Serial Installation of More Than One Outdoor Unit

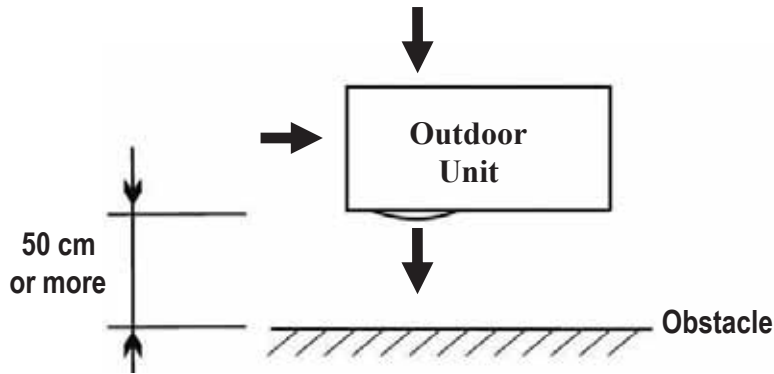
Select installation location which allows the minimum clearances shown in the figures for free air circulation and easy accessibility for service and maintenance :

- The front of outdoor unit (air outlet)
should be away from any obstacle by 500 mm or more to ensure free air circulation.**
- The back of outdoor unit (air inlet)
should be away from any obstacle by 160 mm or more. This distance is built in the design of wall support
to ensure free air circulation.**
- The left side of outdoor unit
should be away from any obstacle by 400 mm or more to ensure easy access to refrigerant and electrical
connections.**
- The right side of outdoor unit (air inlet)
should be away from any obstacle by 250 mm or more to ensure free air circulation.**
- The top side of outdoor unit
should be away from any obstacle by 400 mm or more to ensure easy access to the electrical
components, motor and fan.**

SELECTING INSTALLATION LOCATION OF SIDE DISCHARGE - OUTDOOR UNIT

Minimum Clearances When Selecting Installation Location for Single Outdoor Unit Installation

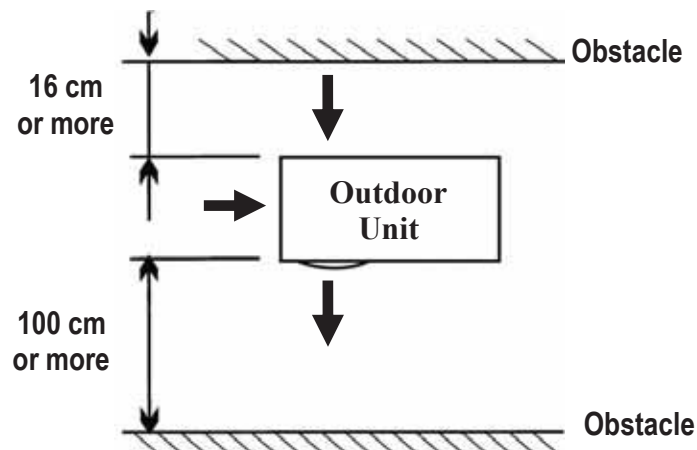
Obstacle at unit front (air outlet)



No obstacle at back or top or right or left

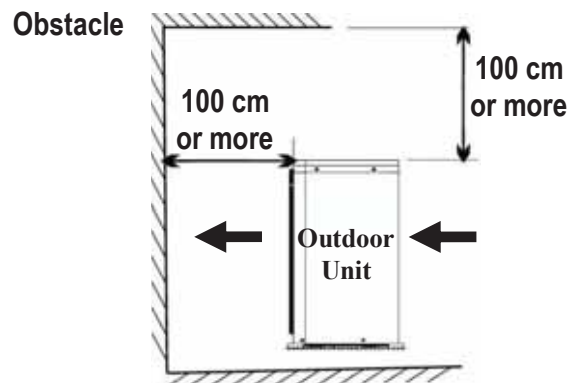
Obstacle at unit front (air outlet) & Obstacle at unit back (air inlet)

Note: The height of Obstacle should be less than the height of outdoor unit



No obstacle at top or right or left

Obstacle at unit front (air outlet) & Obstacle at unit top

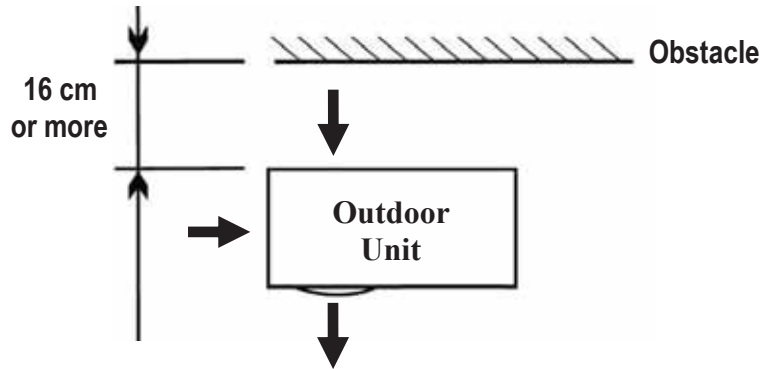


No obstacle at back or right or left

SELECTING INSTALLATION LOCATION OF SIDE DISCHARGE - OUTDOOR UNIT

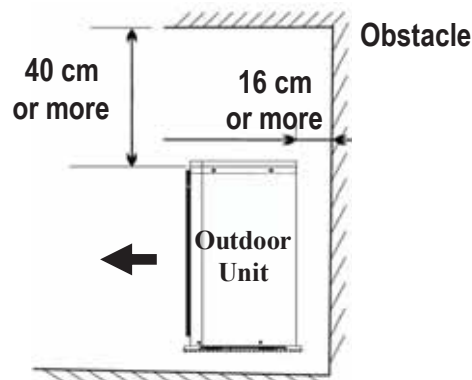
Minimum Clearances When Selecting Installation Location for Single Outdoor Unit Installation

Obstacle at unit back (air inlet)



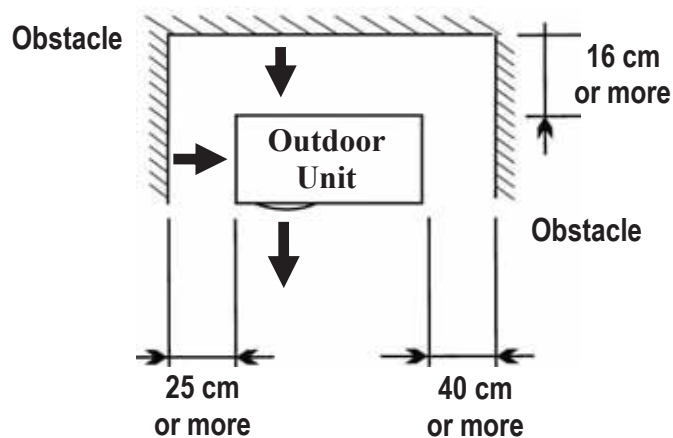
No obstacle at front or top or right or left

Obstacle at unit back (air inlet) & Obstacle at unit top



No obstacle at front or right or left

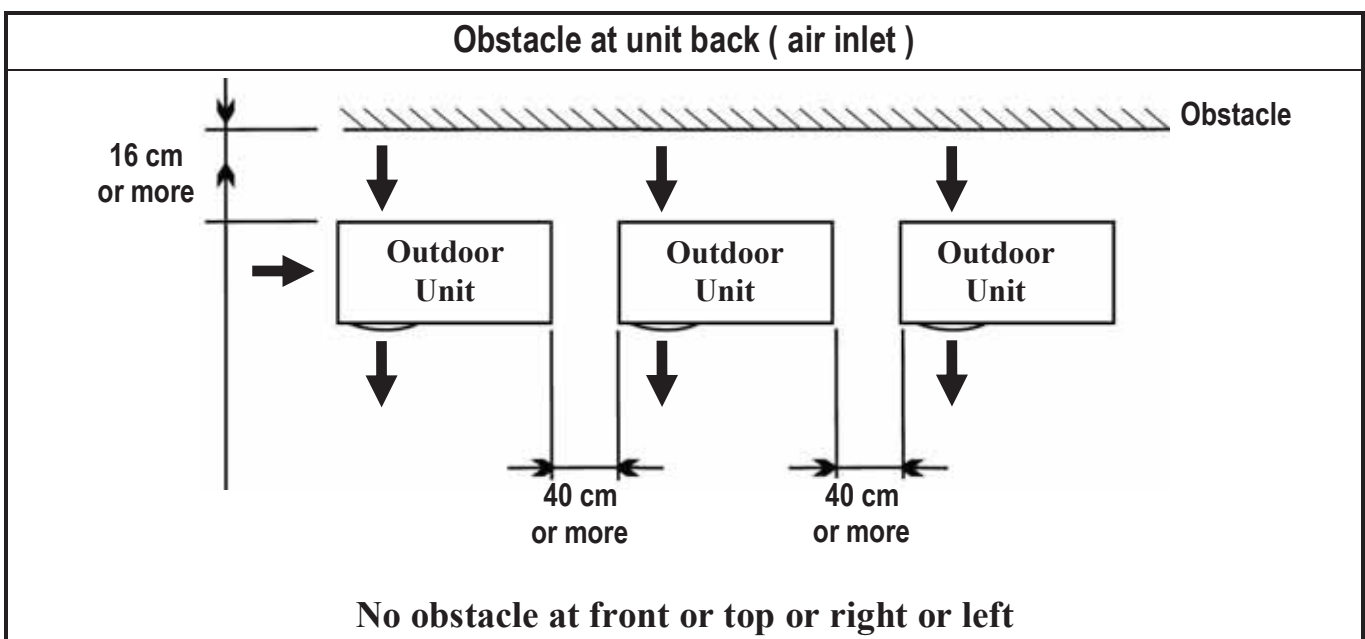
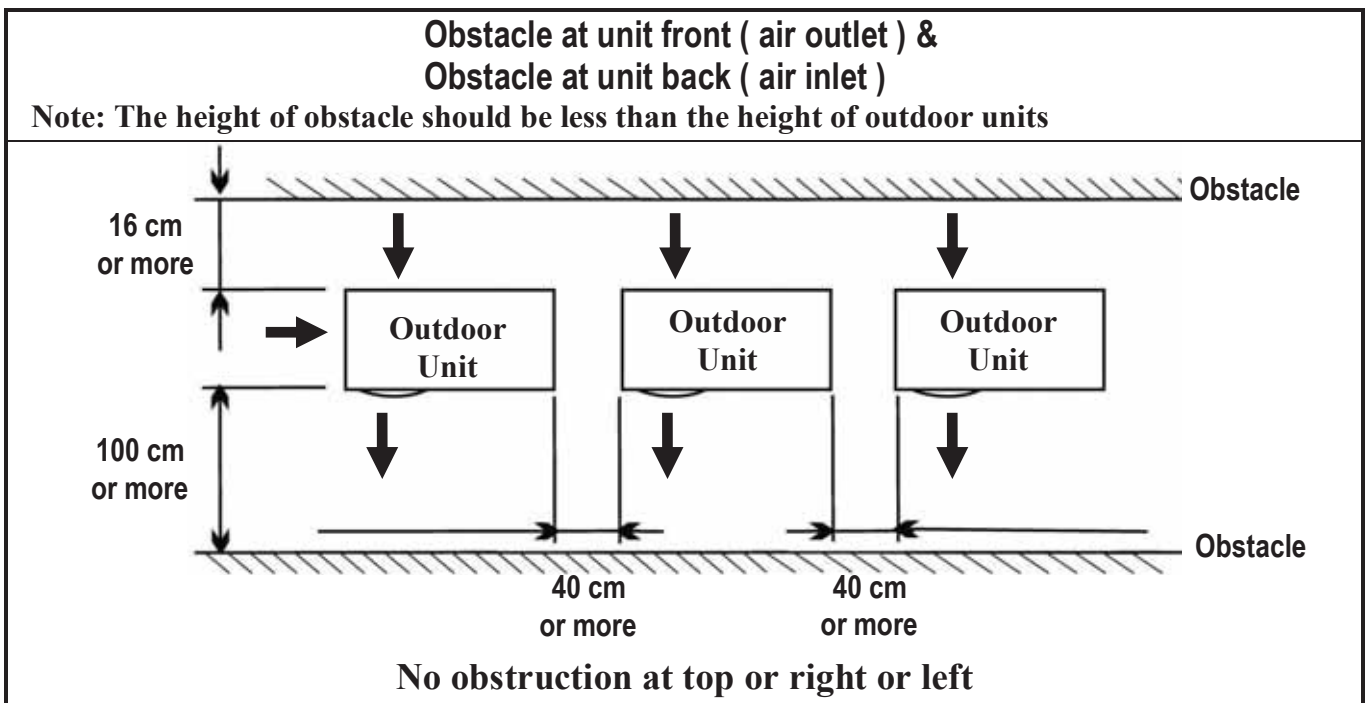
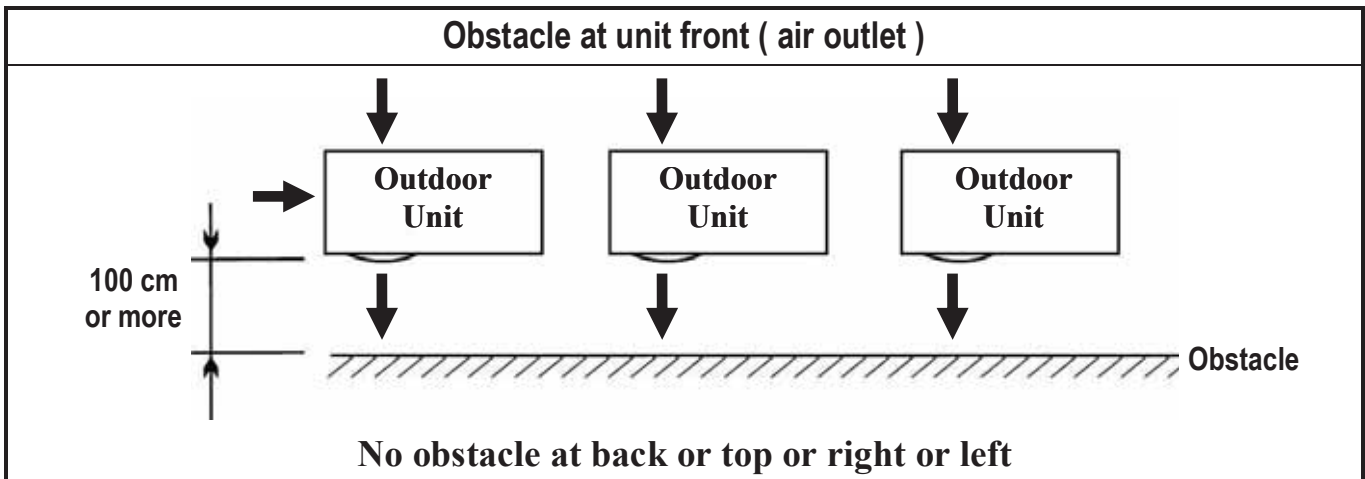
Obstacle at unit back (air inlet) & Obstacle at unit right and left sides



No obstacle at front or top

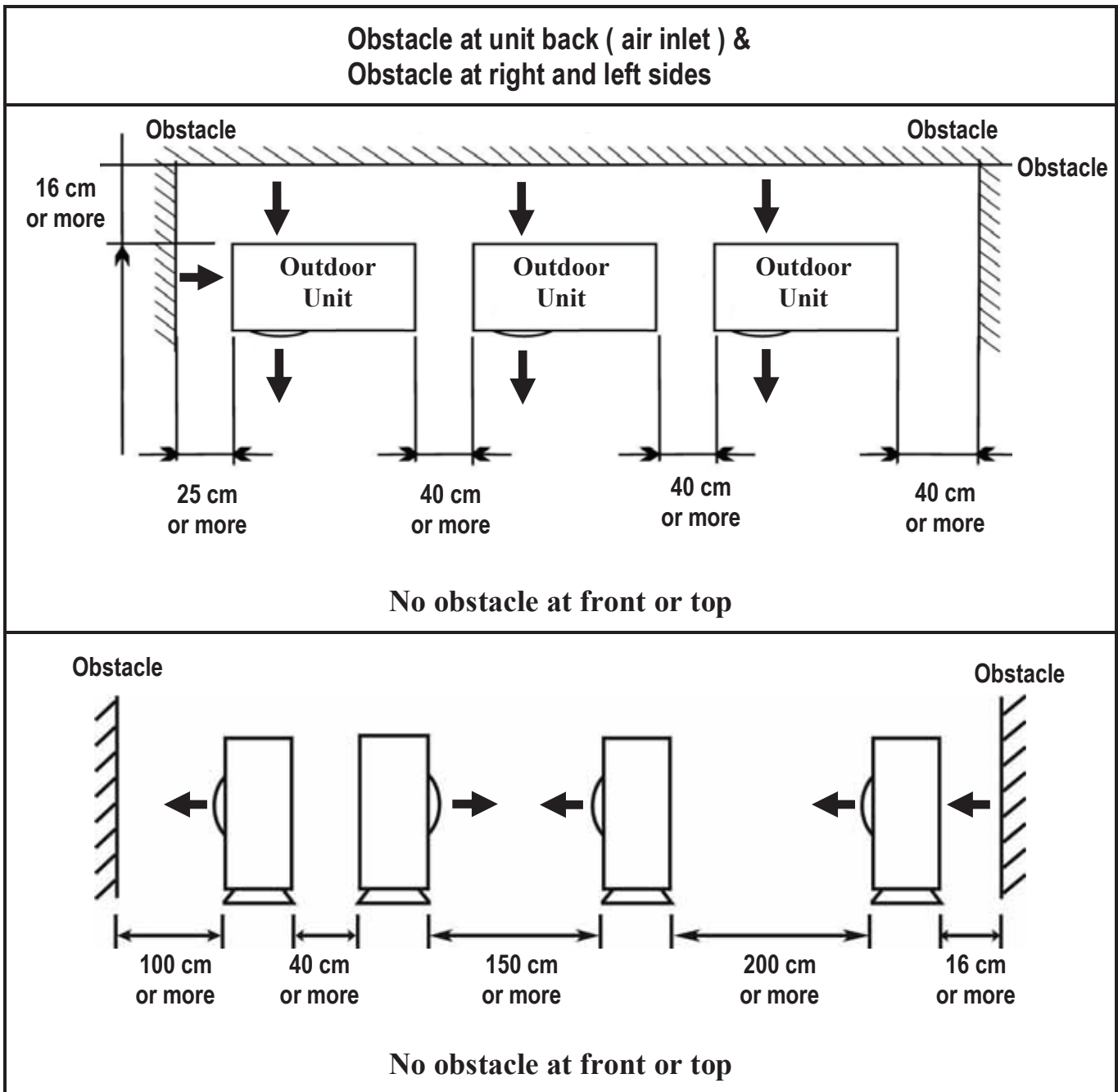
SELECTING INSTALLATION LOCATION OF SIDE DISCHARGE - OUTDOOR UNIT

Minimum Clearances When Selecting Installation Location for Serial Installation of More Than One Outdoor Unit



SELECTING INSTALLATION LOCATION OF SIDE DISCHARGE - OUTDOOR UNIT

Minimum Clearances When Selecting Installation Location for Serial Installation of More Than One Outdoor Unit



10. SELECTING INSTALLATION LOCATION OF TOP DISCHARGE - OUTDOOR UNIT

10.1 INSTALLATION LOCATIONS

The outdoor unit can be installed in any outside location on a ground level or on a roof.

10.2 CONSIDERATIONS FOR SELECTING INSTALLATION LOCATION

Select installation location which is close to the indoor unit.
Select installation location which is close to the electrical power supply.
Avoid installation location which can lead to excessive distance between outdoor and indoor units to avoid alteration on system cooling performance.
Avoid installation location which can lead to excessive height difference between indoor and outdoor units to avoid alteration on system cooling performance.
Avoid installation location which can lead to unnecessary turns and bends in the refrigerant piping lines connecting outdoor unit with indoor unit.
Avoid installation location where there are obstacles near the air outlet or air inlet that may affect air flow and system cooling performance.
Avoid multiple outdoor unit installation with units facing each other and blowing discharged air into each other. For multiple outdoor units installation, the outdoor units must be spaced a minimum of 50cm (coil face to coil face).
Select the installation location of outdoor unit which is able to support operating weight of outdoor unit, and not cause vibration.
Select the installation location of outdoor unit which is far away from the direct sunlight.
Select the installation location of outdoor unit which is far away from heat sources, steam or flammable gases.
Select the installation location of outdoor unit which is free of dust or any material, which can cause clogging of outdoor coil. When installing unit on the ground, select a location not subjected to flooding.
Avoid installation location which is full of oil vapors which may result in malfunction.
Avoid installation location which is full of sulfuric gas which may result in malfunction.
Select installation location where the operation noise and discharged air are not disruptive to your neighbors.

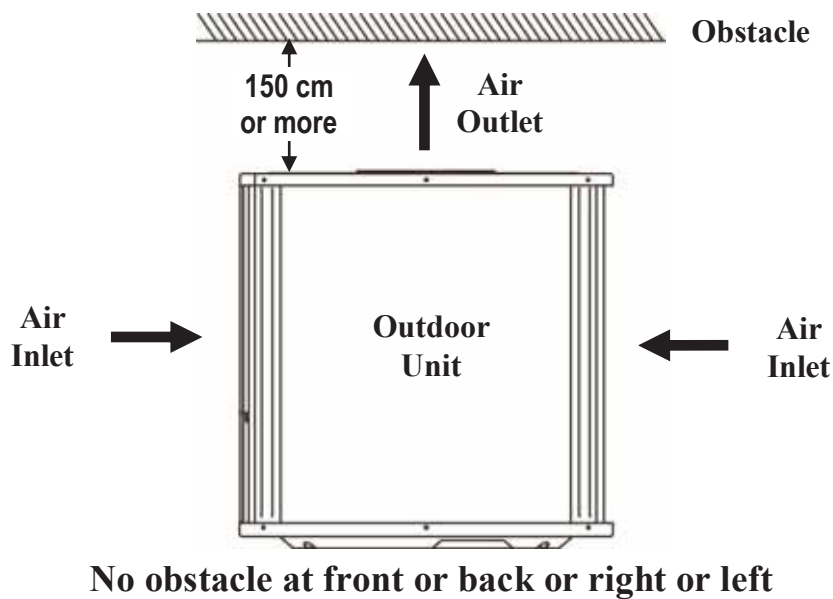
SELECTING INSTALLATION LOCATION OF TOP DISCHARGE - OUTDOOR UNIT

CONSIDERATIONS FOR SELECTING INSTALLATION LOCATION

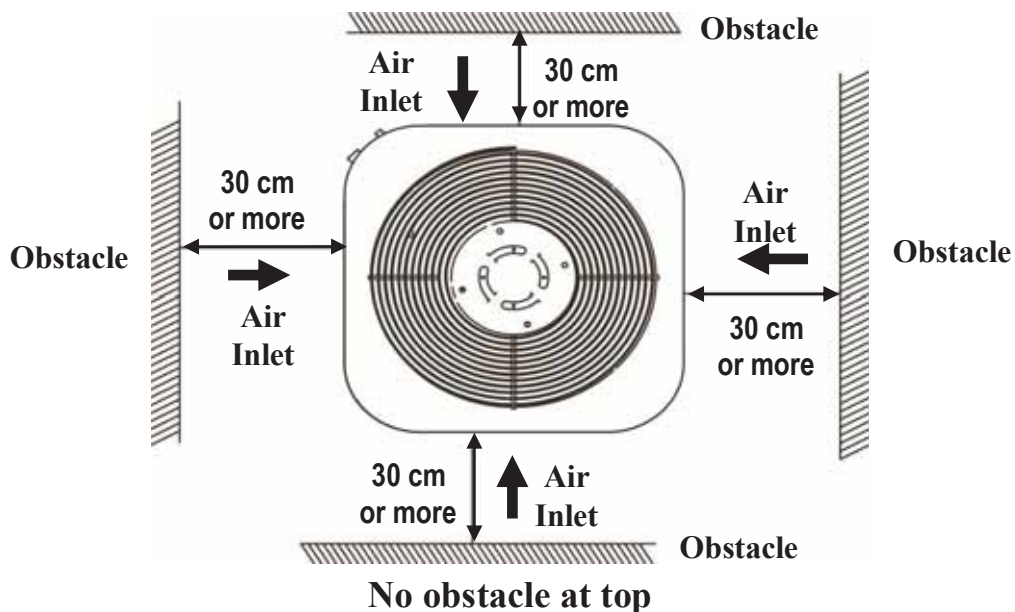
Select installation location which allows the minimum clearances shown in the figures for free air circulation and easy accessibility for service and maintenance :

- The top of outdoor unit (air outlet) should be away from any obstacle by 150 cm or more to ensure free air circulation.
- The front, back, right and left of outdoor unit (air inlet) should be away from any obstacle by 30 cm or more to ensure free air circulation and easy access to refrigerant and electrical connections.

Obstacles at outdoor unit top (air outlet)



Obstacles at outdoor unit front & back & right and left sides (air inlets)








11. INSTALLATION LOCATION CHECK LIST

(A) INDOOR UNIT	
- The installation location is close to the outdoor unit	<input type="checkbox"/>
- The wall hole (required to pass refrigerant piping, electrical cables and drain line) is on the unit right back	<input type="checkbox"/>
- The installation location permit the unit to deliver air to all of the space to be air-conditioned	<input type="checkbox"/>
- The installation location avoid obstructions, which affect motion of supply and/or return air to the unit	<input type="checkbox"/>
- The installation location permit free service space around the unit right, left, front back and top	<input type="checkbox"/>
(B) OUTDOOR UNIT	
- The electrical power supply is close to the outdoor unit	<input type="checkbox"/>
- The installation location is close to the indoor unit	<input type="checkbox"/>
- The installation location is able to support operating weight of outdoor unit	<input type="checkbox"/>
- The installation location is far away from any sunlight	<input type="checkbox"/>
- The installation location is free of dust or any material, which can cause clogging of outdoor coil	<input type="checkbox"/>
- The installation location allow sufficient space for air circulation around the unit	<input type="checkbox"/>
- The installation location allow sufficient space for service and maintenance around the unit	<input type="checkbox"/>
- The installation location is selected so that the operation noise and discharge air do not disturb the neighbors	<input type="checkbox"/>
(C) REFRIGERANT PIPING LINES BETWEEN INDOOR AND OUTDOOR UNITS	
- The excessive length of refrigerant piping lines is avoided	<input type="checkbox"/>
- The excessive height between outdoor and indoor units is avoided	<input type="checkbox"/>
- The excessive number of turns and bends in the refrigerant piping lines is avoided	<input type="checkbox"/>



12. INSTALLATION ACCESSORIES

12.1 STANDARD INSTALLATION ACCESSORIES SUPPLIED FROM THE FACTORY

Wired Room Controller With Accessories		1	To operate the air conditioner used with indoor unit sizes 12K – 18K – 24K – 30K – 36K – 42K – 48K – 60K
Wired Room Controller With Accessories		1	To operate the air conditioner used with indoor unit size 72K
Display & Receiver Panel For Optional Wireless Remote Control		1	To display operation and error codes
Owner manual		1	To illustrate control functions of operation
Installation Manual		1	To illustrate installation instructions.
Support angle for outdoor unit Top discharge		4	To fix outdoor unit top discharge

12.2 OTHER INSTALLATION ACCESSORIES

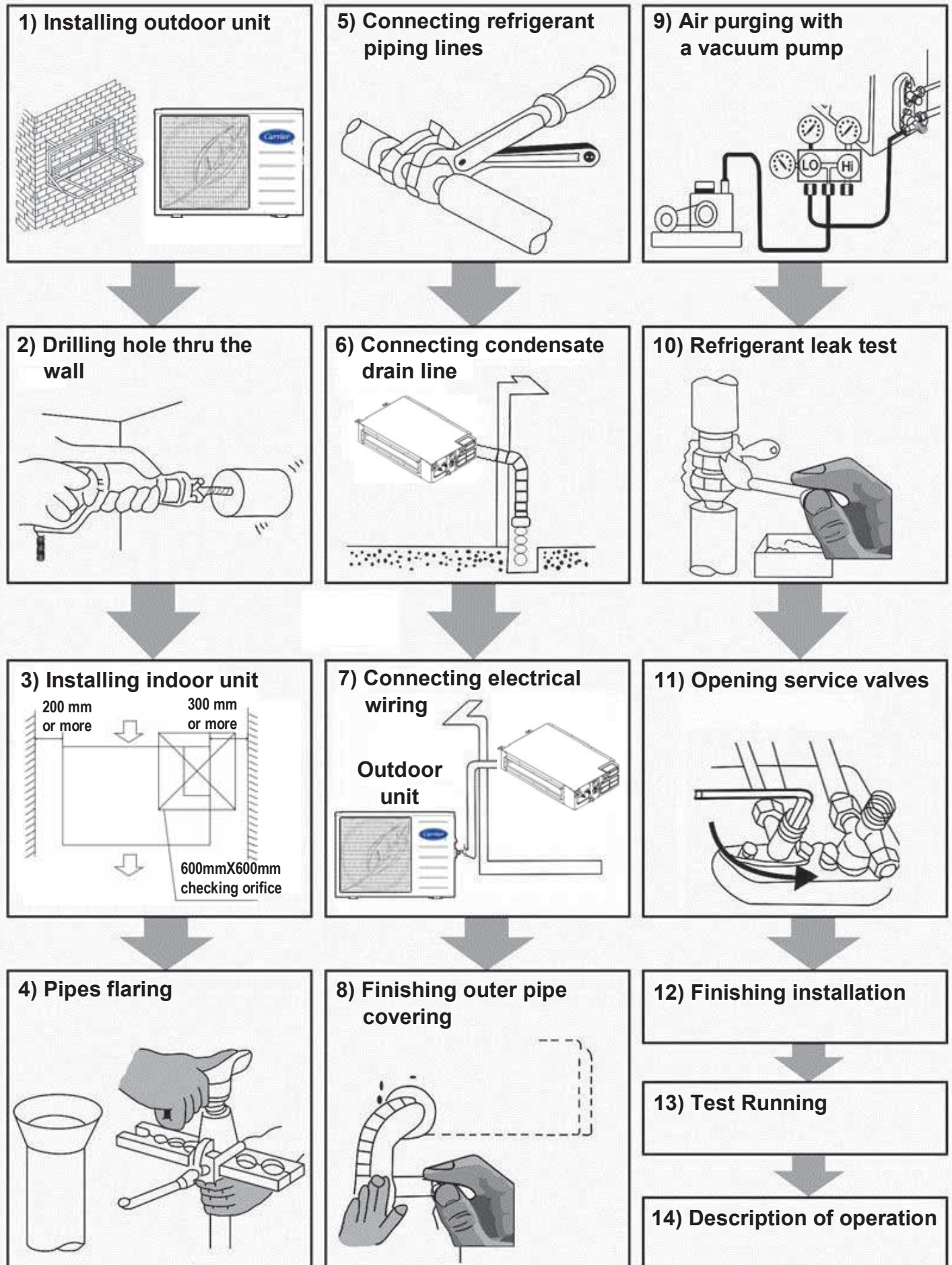
Not supplied from the factory but must be used in the installation field to complete installation.

DESCREPTION	SHAPE	QTY	USE
Screws size 6 x 12 mm		4	For fixing support angles with outdoor unit top discharge 36K – 42K – 48K – 60K – 72K
Cement Screws		4	For fixing support angles of outdoor unit top discharge with ground 36K-42K-48K-60K-72K

DESCREPTION	USAGE
Electrical Connection Cables	To electrically connect the indoor unit, the outdoor unit and circuit breaker
- Wall Sleeve - Wall Cap - Sealer putty	To fill the gap between the wall hole and the lump of refrigerant piping lines, electrical connection cables and condensate drain line.
- Finishing tape PVC film	To tie together the refrigerant piping lines, electrical connection cables and condensate drain line.
- Vinyl tape	To stick pipe insulation.
- Drain hose ID 25 mm	To remove condensate water, from the indoor unit to the outside.
- Refrigerant piping lines	To connect refrigerant R410A between indoor and outdoor units
- Pipe insulation	To insulate suction and liquid refrigerant piping lines
- Refrigerant R410A	To adjust refrigerant charge for long refrigerant piping lines.
- Clamps or saddles	To secure the lump of refrigerant piping lines, electrical cables and condensate drain line

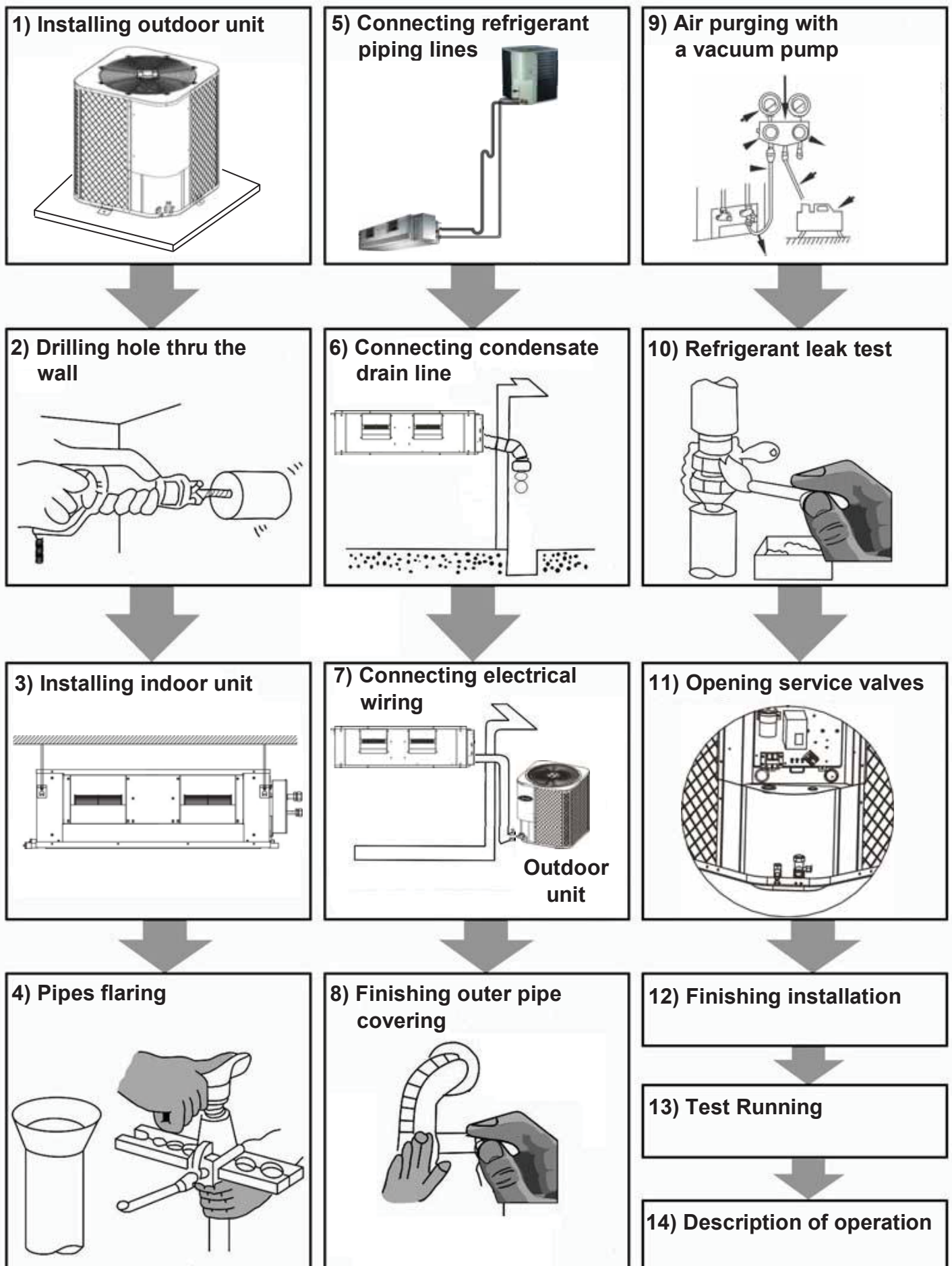
13. INSTALLATION CHART

13.1 Installation chart of Ducted Split System – Medium Static Pressure



INSTALLATION CHART

13.2 Installation chart of Ducted Split System – High Static Pressure

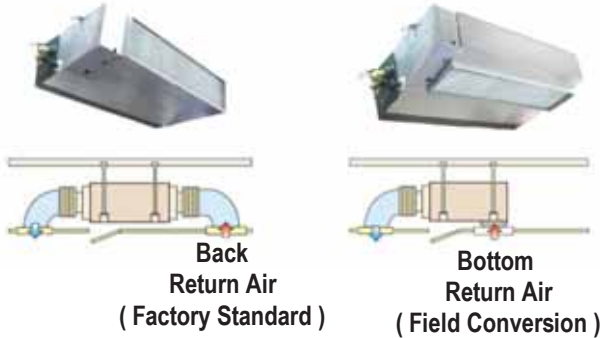
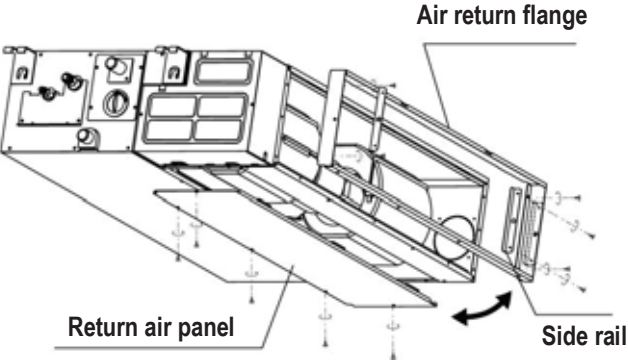
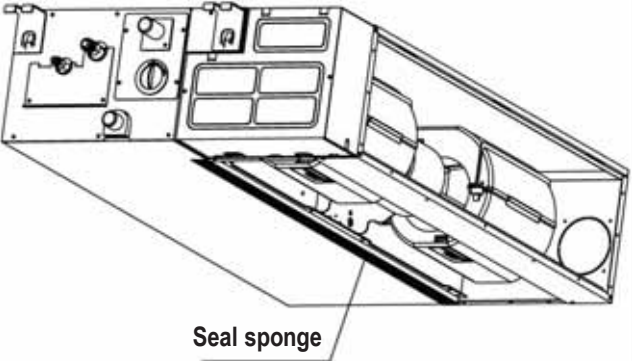
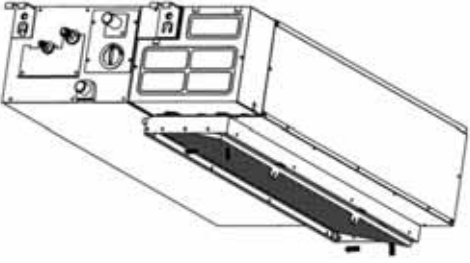
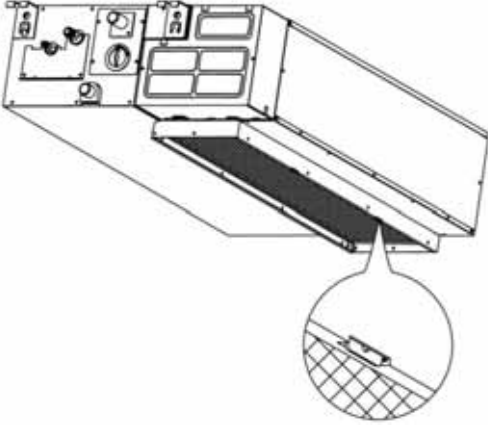


14. INDOOR UNIT INSTALLATION

The indoor unit is factory standard supplied with right hand refrigerant and electrical connections

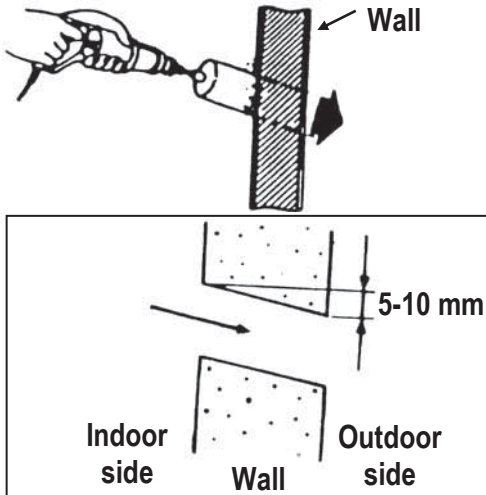
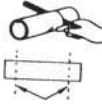
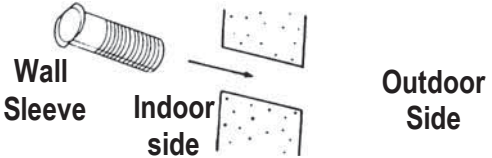
14.1 Flexible Locations of Return Air

- Ducted indoor units – medium static pressure sizes 12K – 18K – 24K – 30K – 36K are supplied from the factory with back return air (Factory Standard)
- Ducted indoor units – medium static pressure sizes 12K – 18K – 24K – 30K – 36K can be field converted from back return air to bottom return air as per installation requirements and as per the below procedure :

<ul style="list-style-type: none"> • Return air from the unit back is standard and return air from the bottom is optional. • The size of the plate from bottom and flange from back is the same, so it is easy for installer to change the return air from back to bottom. 	 <p style="text-align: center;">Back Return Air (Factory Standard) Bottom Return Air (Field Conversion)</p>
<p>1. Take off return air panel and flange, cut off the staples at side rail.</p> 	<p>2. Stick the attached seal sponge as per the indicating place in the following fig, and then change the mounting positions of air return panel and air return flange.</p> 
<p>3. When install the filter mesh, please plug it into flange inclined from air return opening, and then push up.</p> 	<p>4. The installation has finish, upon filter mesh which fixing blocks have been insert to the flange positional holes.</p> 

INDOOR UNIT INSTALLATION

14.2 PREPARATION STEPS

<p>STEP (1): MAKING WALL HOLE</p> <p>PRECAUTIONS</p> <p>Before making a hole, check carefully the following points :</p> <ul style="list-style-type: none">• No studs or pipes are directly run behind the spot to be cut.• No electrical wiring or conduits are located. <p>- Drill a hole of 80 mm to pass the refrigerant lines, drain hose and electrical cables. Decide the piping hole position according to the location of piping direction. Mark the desired drilling point.</p> <p>When making wall hole, make sure to drill outwards at a downward angle, so that the height difference between the entrance and exit of the hole is at least 5-10 mm.</p>	
<p>Step (2): Cutting Sleeve For Wall Hole</p> <ul style="list-style-type: none">• Measure the thickness of the wall from the inside edge to the outside edge and cut PVC pipe at a slight angle 6mm shorter than the thickness of the wall.	 <p>Cut Wall Sleeve</p>
<p>Step (3): Mounting Sleeve Into Wall Hole</p> <ul style="list-style-type: none">• After making hole, a sleeve must be mounted into wall hole and its width to be equal to wall thickness to pass refrigerant lines, drain hose and electrical cables through it.	 <p>Wall Sleeve Indoor side Outdoor Side</p>

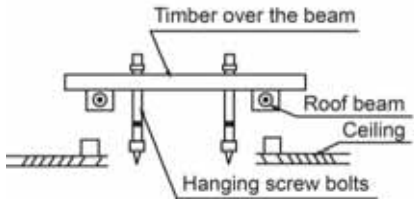

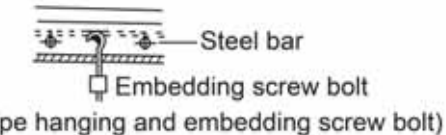
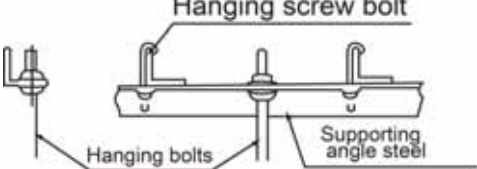
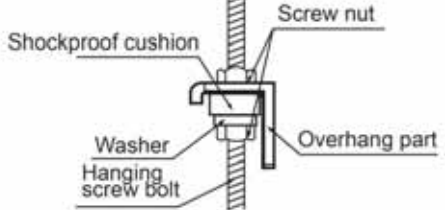
INDOOR UNIT INSTALLATION

Step (4): Installation of Hanging Screw Bolts

Installing Ø10 hanging screw bolts. (4 bolts)

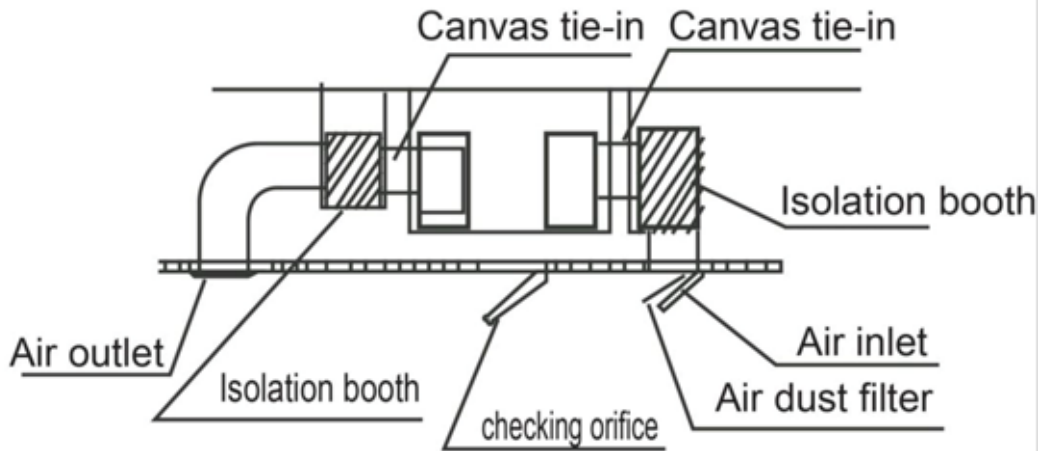
- The handling to the ceiling varies from the constructions, consult the construction personnel's for the specific procedures.
 - The size of the ceiling to be handled ---- Do keep the ceiling flat. Consolidate the roof beam for possible vibration.
- Carry out the pipe and line operation in the ceiling after finishing the installation of the main body.

While choosing where to start the operation, determine the direction of the pipes to be drawn out. Especially in case there is a ceiling, position the refrigerant pipes, drain pipes, indoor & outdoor lines to the connection places before hanging up the machine.
- The installation of hanging screw bolts.
 - Cut off the roof beam.
 - Strengthen the place that has been cut off, and consolidate the roof beam.
- After the selection of installation location, position the refrigerant pipes, drain pipes, indoor & outdoor wires to the connection places before hanging up the machine.
- The installation of hanging screw bolts will be as follows :

<p>(a) Installation of hanging screw bolts in the ceiling of wooden construction</p> <ul style="list-style-type: none"> ▪ Put the square timber traversal over the roof beam, then install the hanging screw bolts. 	
<p>(b) Installation of hanging screw bolts in the ceiling of new concrete bricks</p> <ul style="list-style-type: none"> ▪ Inlaying or embedding the screw bolts. 	
<p>(c) Installation of hanging screw bolts in the ceiling of original concrete bricks</p> <ul style="list-style-type: none"> ▪ Use embedding screw bold, crock and stick harness. 	
<p>(d) Installation of hanging screw bolts in the ceiling of steel roof beam structure</p> <ul style="list-style-type: none"> ▪ Install and use directly the supporting angle steel. 	
<p>Step (5): Overhanging the indoor unit</p> <ol style="list-style-type: none"> (1) Overhang the indoor unit onto the hanging screw bolts with block. (2) Position the indoor unit in a flat level by using the level indicator, unless it may cause leakage. 	

INDOOR UNIT INSTALLATION

Step (6): Diagrammatic sketch for Installing the ducts with indoor unit



Recommended duct connection

- (1) Duct design dimensions to be connected with indoor unit is determined based on the required air flow and static pressure.
- (2) Whatever type of duct is used, it should not be made of materials which are flammable, or which give off toxic gases in the event of a fire. The internal surfaces should be smooth, and not contaminate the air, which passes through.
- (3) Air inlet and air outlet duct should be apart far enough to prevent air outlet entering Air Inlet.
- (4) When connecting duct, use inflammable canvas tie-in to prevent vibrations.
- (5) At the points where the duct joins with the unit, it is advisable to use a flexible connection, which absorbs vibration and prevents the transmission of noise inside the ductwork.
- (6) Bends in duct design should be avoidable, they should be as slight as possible, and internal deflectors should be used when the duct is of large dimensions.
- (7) Do not put the connecting duct weight on the indoor unit.
- (8) When connecting duct, install in place prone to take down for maintenance.
- (9) If installed in place like meeting room where noise is easy to be perceived, design isolation booth and internal duct under layer to muffle the duct system and weaken the air encounter noise in the duct.

15. INSTALLATION OF WIRED ROOM CONTROLLER

15.1 SAFETY PRECAUTION

- Read the safety precautions carefully before installing the wired controller.
- Stated below are important safety issues that must be obeyed.
- Conform there is no abnormal phenomena during test operation after complete.
- Meaning of marks:

WARNING	Means improper handling may lead to personal death or severe injury.
CAUTION	Means improper handling may lead to personal injury or property loss.

WARNING

- Please entrust the distributor or professionals to install the wired controller. Installation by other persons may lead to imperfect installation, electric shock or fire. Improper installation may lead to electric shock or fire.
- Reinstallation must be performed by professionals.
- Improper installation may lead to electric shock or fire.
- A random disassembly may cause abnormal operation, which may result in fire.

CAUTION

- Do not install the wired controller in a place vulnerable to leakage of flammable gases. Once flammable gases are leaked and left around the wire controller, fire may occur.
- The wiring should adapt to the wire controller current. Otherwise, electric leakage may occur and result in fire.
- The specified cables shall be applied in the wiring. No external force may be applied to the terminal.
- Otherwise, wire cut and heating may occur and result in fire.

15.2 OTHER PRECAUTIONS FOR WIRED CONTROLLER

Installation Location : Do not install the wired controller in a place with much oil, steam, sulfide gas. Otherwise, the product may deform and fail.

Preparation of wired controller before installation :

1. Confirm that all the following parts are supplied.

No.	Name	Qty.	Remarks
1	Wired controller	1	Inside carton box of wired controller
2	Battery	1	Inside carton box of wired controller
3	Cruciform Mounting Screw M4X25	2	This accessory is used when install the wire controller inside the electric cabinet
4	Plastic bolt	2	
5	Connection cable for wired Controller	1	

2. Prepare the following assemblies on the site.

No.	Name	Qty.	Remarks
1	Electric cabinet	1	Universal electric cabinet's specification. Pre-embed it into wall.
2	Wire configured tube (insulated sheath)	1	Pre-embed into wall, the longest length should not exceeding than 15m.
3	Phillips screwdriver	1	For install cruciform slot screw.
4	Slotted head screwdriver	1	For unscrew the bottom cover of wired controller

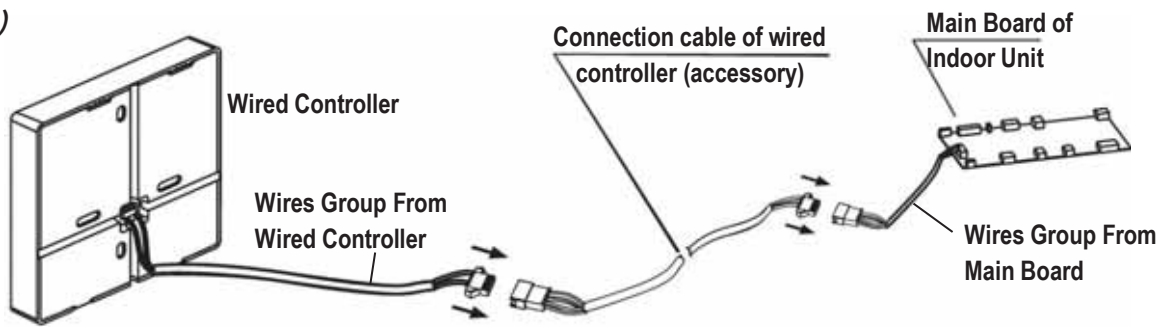
Notes to installation of wired controller :

1. Circuit of Wired Controller is low voltage circuit. Never connect it with a standard 220V/380V circuit or put it into a same Wiring Tube with the circuit.
2. The shield cable must be connected stable to the ground or transmission may fail.
3. Do not attempt to extend the shield cable by cutting, if it is necessary, uses Terminal Connection Block to connect.
4. After finishing connection does not use Muggers to have the insulation check to the signal wire.
5. The connective cable of wired controller should not be longer than 20 meters.

INSTALLATION OF WIRED ROOM CONTROLLER

15.3 Installation Diagram

Fig (1)



1. Connect the female joint of wires group from the main board with the male joint of (See Fig. 1)
2. Connect the other side of connective wires group with the male joint of wires group leads from wired controller. (See Fig. 1)

Only with size indoor unit 72K

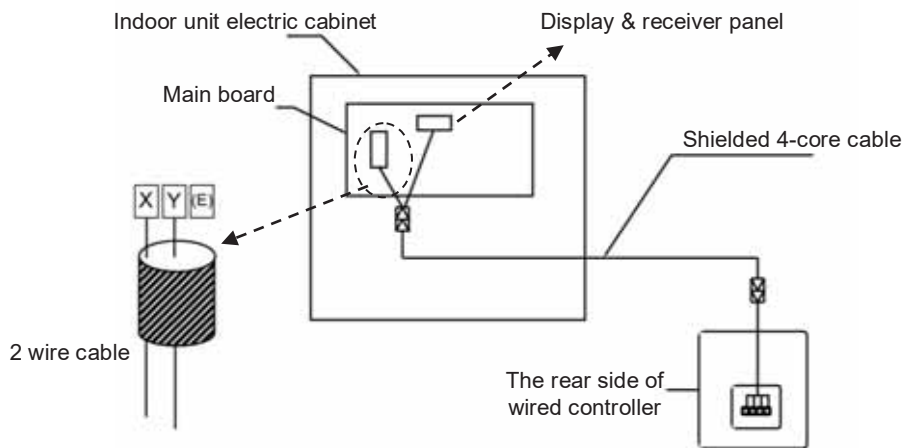
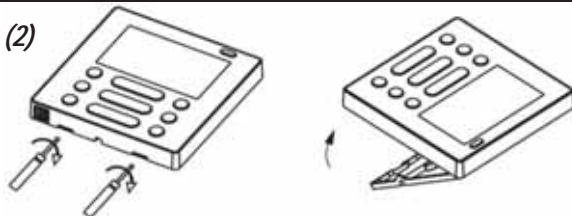


Fig (2)



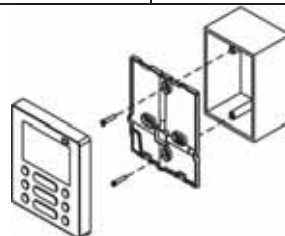
3. Take off the cover of wired controller at the bottom with the screwdriver. (See Fig. 2)

Fig (3)



4. Put the battery into the installation site and make sure the positive side of the battery is in accordance with the positive side of installation site. (See Fig. 3)

Fig (4)



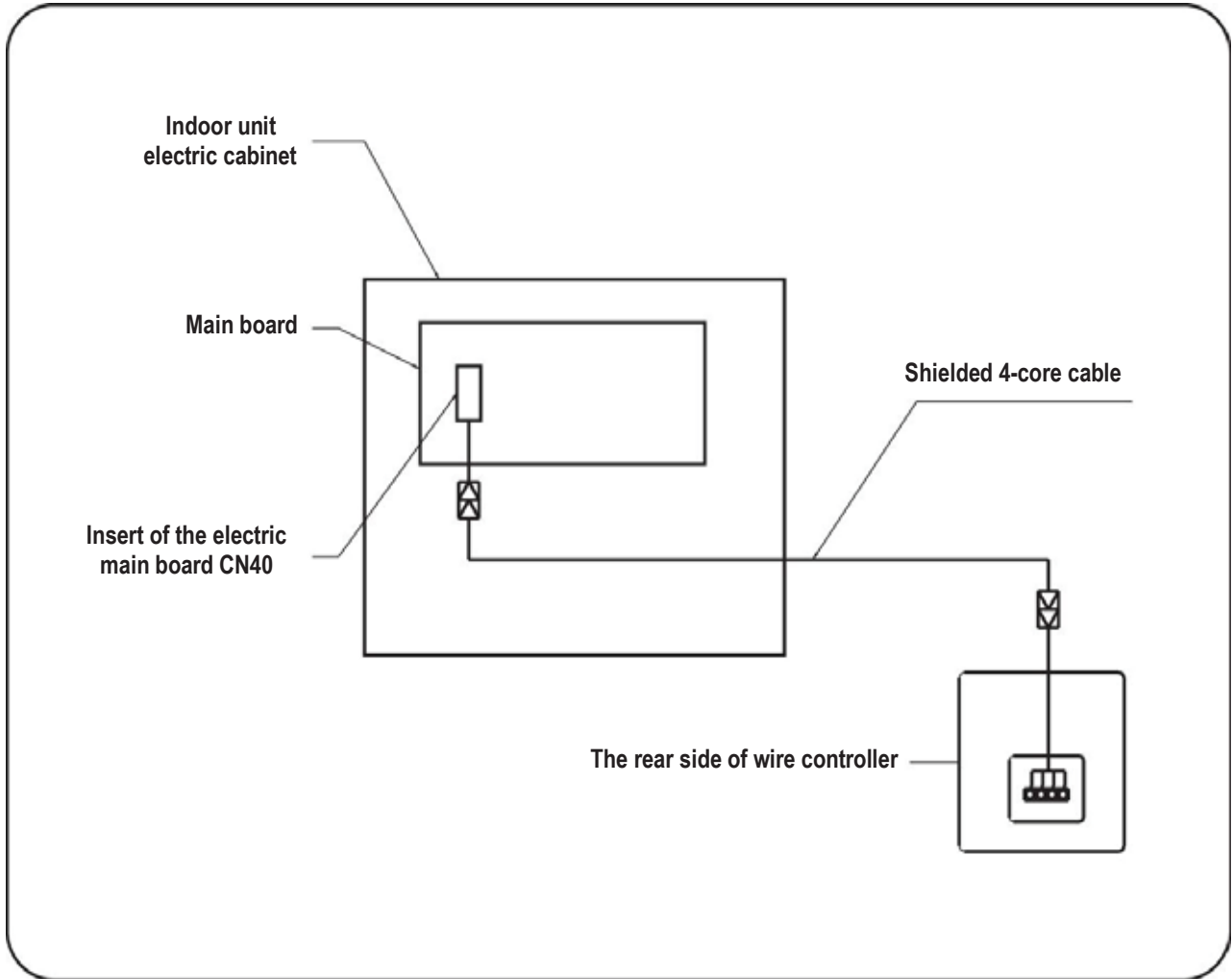
5. Adjust the length of two plastic bolts base on the length of throughout from standard electric cabinet to the wall. Confirm the two bolts fixing in the cabinet are in the same length and vertical to the wall surface.
6. Fix the bottom cover to the electric cabinet by the accessory slotted head screws. Confirm the bottom cover is parallel to wall surface. And then reinstall the bottom cover to wired controller. (See fig. 4)

NOTE
 Over tighten the screw would cause rear cover deformed and LCD damage.
 When installation, please maintain the screws and wired controller at the same height level without deformed.
 When installation, please reserve a certain length of wired controller connective cable for future maintenance to take off the wired controller.

INSTALLATION OF WIRED ROOM CONTROLLER

15.4 WIRING PRINCIPLE SKETCH

Wiring diagram of wire controller connected with indoor unit

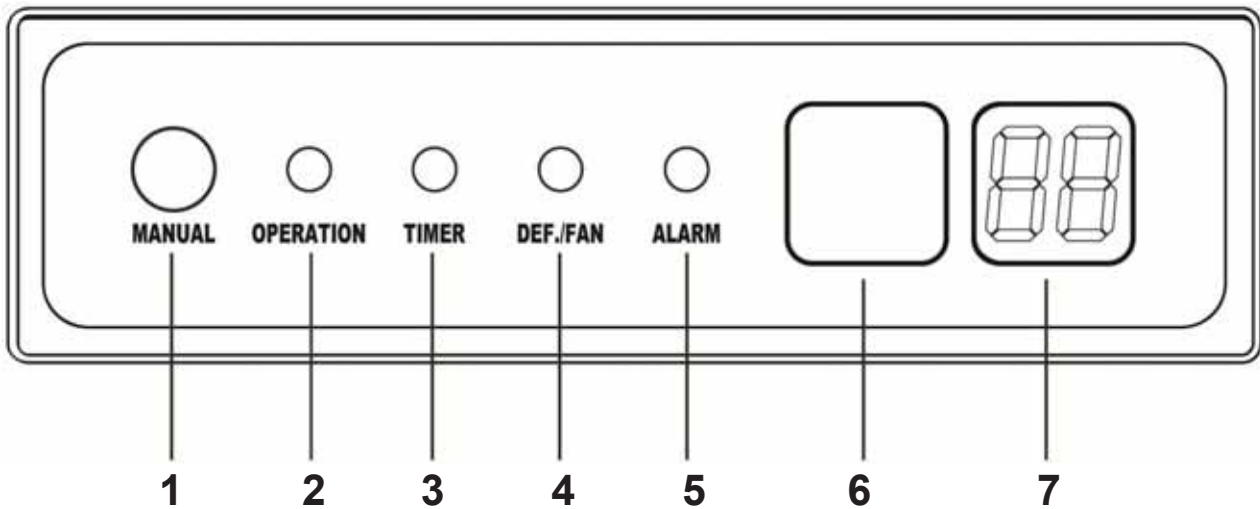


15.5 WIRED CONTROLLER SPECIFICATIONS

Input Voltage	DC 12V
Ambient Temperature	-5 ~ 43 °C (23 ~ 110 °F)
Ambient Relative Humidity	40% ~ 90% RH

16. INSTALLATION OF DISPLAY AND RECEIVER PANEL

16.1 DESCRIPTION OF DISPLAY AND RECEIVER PANEL



1	<p>MANUAL Button</p> <ul style="list-style-type: none"> * This button is used to operate the unit temporarily in case you misplace the remote control or its batteries are exhausted. * Once you push temporary button, the air conditioner will run in such order : Auto, Forced cool, off and back to Auto <p>AUTO The OPERATION lamp is lit, and the air conditioner will run under AUTO mode. The remote controller operation is enabled to operate according to the received signal.</p> <p>FORCED COOL The OPERATION lamp flashes, the air conditioner will turn to AUTO after it is enforced to cool with a wind speed of HIGH for 30 minutes. The remote controller operation is disabled.</p> <p>OFF The OPERATION lamp goes off. The air conditioner is OFF while the remote controller operation is enabled.</p>
2	<p>OPERATION green led</p> <ul style="list-style-type: none"> * OPERATION green led lights on when the air conditioner operates * OPERATION green led lights off when the air conditioner stops
3	<p>TIMER green led</p> <ul style="list-style-type: none"> * TIMER green led lights on when timer function operates * TIMER green led lights off when timer function stops
4	<p>DEF. / FAN red led</p> <ul style="list-style-type: none"> * This led lights on when defrost protection is activated and lights off when defrost protection terminates in heat mode.
5	<p>ALARM red led</p> <p>ALARM red led flashes when there is a malfunction in outdoor unit</p>
6	<p>Infrared Signal Receiver (In case of using remote control)</p>
7	<p>Display Digital Tube</p> <ul style="list-style-type: none"> * This display shows error code in case of a malfunction.

INSTALLATION OF DISPLAY AND RECEIVER PANEL

16.2 INSTALLATION OF DISPLAY AND RECEIVER PANEL

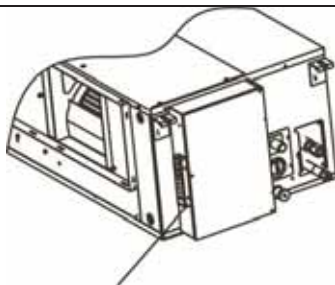
IN CASE OF NOT USING OPTIONAL WIRELESS REMOTE CONTROL

- For Ducted Medium Static Pressure Indoor Units

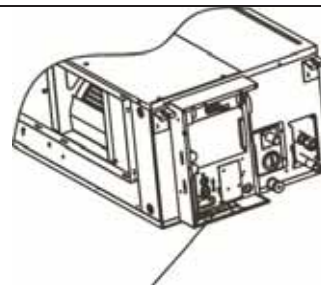


- The display panel mounting on the indoor unit.
- The display panel shows error codes.

- For Ducted High Static Pressure Indoor Units



Put the display board outside of the electrical control box.



Put the display board in the electrical control box

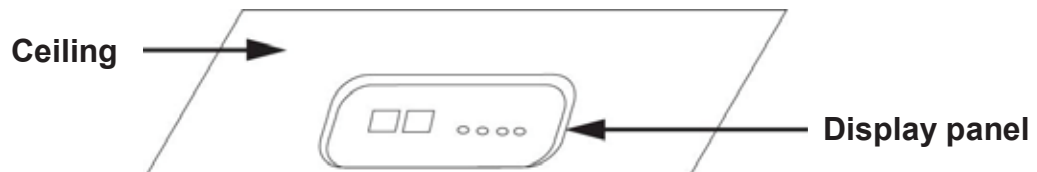


- The display panel mounting on the indoor unit.
- The display panel shows error codes.

INSTALLATION OF DISPLAY AND RECEIVER PANEL

16.3 INSTALLATION OF DISPLAY AND RECEIVER PANEL

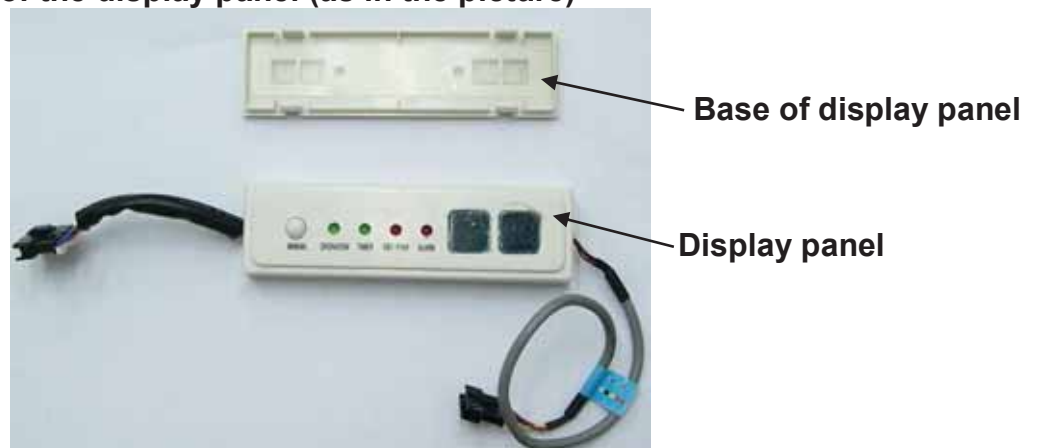
IN CASE OF USING OPTIONAL WIRELESS REMOTE CONTROL



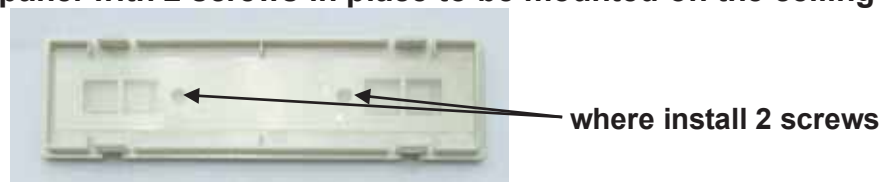
- The display panel receive signal from wireless remote control.
- The display panel shows error codes.

How to install the display in ceiling :-

1. Remove the base of the display panel (as in the picture)



2. Install base of display panel with 2 screws in place to be mounted on the ceiling

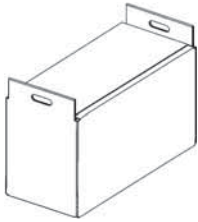
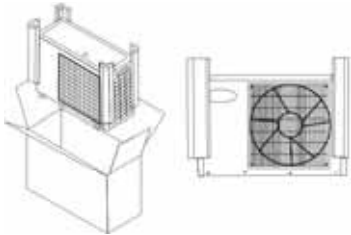
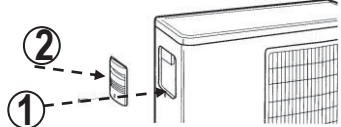


3. Install display panel in the base is heard.

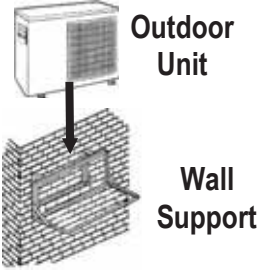
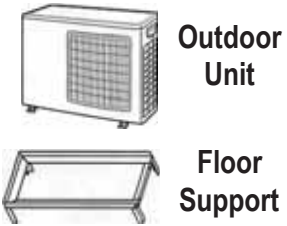
4. Connect the wires of display panel to indoor unit and wired control.

17. OUTDOOR UNIT INSTALLATION

17.1 PREPARATION STEPS BEFORE INSTALLATION

<p>a. Put packed unit as shown.</p> 	<p>b. Lift unit from cardboard.</p> 	<p>c. Remove service door (item 2) by removing one screw (item 1). Detach the cable clamp by removing one screw.</p> 
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17.2 WALL INSTALLATION STEPS FOR SIDE DISCHARGE OUTDOOR UNIT

<p>Fix wall support into the wall Put unit on the wall support.</p> <p>Wall Installation</p>  <p>Outdoor Unit</p> <p>Wall Support</p>	<p>Put outdoor unit on the floor support</p> <p>Floor Installation</p>  <p>Outdoor Unit</p> <p>Floor Support</p>
---	---

OUTDOOR UNIT INSTALLATION

17.3 The outdoor unit top discharge can be installed in any outside location on a ground level or on a roof

17.3.1 GROUND INSTALLATION

- The outdoor unit may be installed at ground level on a solid base that will not shift or settle, causing strain on the refrigerant lines and possible leaks. Maintain the clearances and install the unit in a level position.
- Normal operating sound levels may be objectionable if the outdoor unit is placed directly under windows of certain rooms (bedrooms, study, etc.).
- Top of unit discharge area must be unrestricted for at least 150 cm above the unit.
- If the unit is to be installed on a black-topped ground area, the unit should be raised sufficiently above the roof or ground to avoid taking the accumulated layer of hot air into the outdoor unit. Provide an adequate structural support.

17.3.2 ROOF INSTALLATION

- When installing the outdoor unit on a roof, the structure must be capable of supporting the total weight of the unit, including a padded frame unit, rails, etc., which should be used to minimize the transmission of sound or vibration into the conditioned space.
- If the unit is to be installed on a hot sun exposed roof, the unit should be raised sufficiently above the roof or ground to avoid taking the accumulated layer of hot air into the outdoor unit. Provide an adequate structural support.

17.3.3 UNIT PLACEMENT

1. Provide a base in the pre-determined location.
2. Remove the shipping carton and inspect for possible damage.
3. Compressor tie-down bolts should remain tightened.
4. Position the unit on the base provided.

17.3.4 IMPORTANT NOTE:

These instructions are intended as a method to tie-down system to cement slab as a securing procedure. It is recommended to check Local codes for tie-down methods and protocols.

Step 1: Prior to installing clear pad of debris.

Step 2: Ensure cement pad is level



Then cement pad must be of the proper thickness to accommodate fasteners.

Step 3: Center the outdoor unit onto pad.

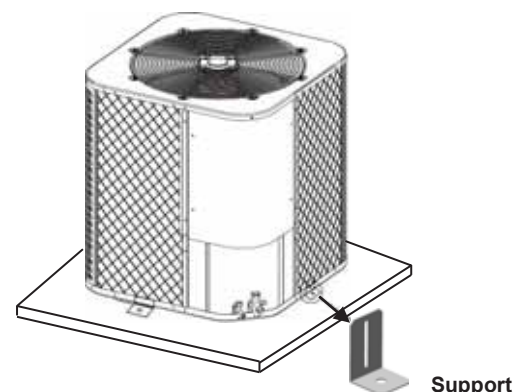
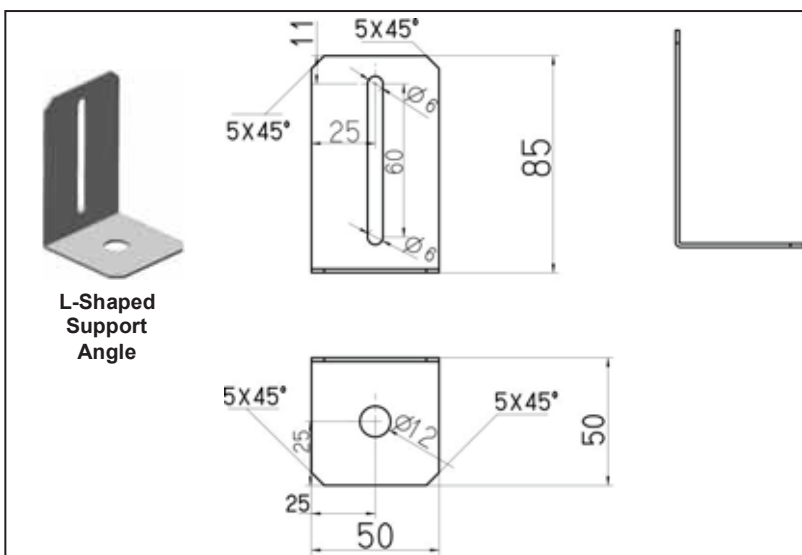
Step 4: Fasten 4 (four) L-shaped support angles onto outdoor unit base using 4 (four) Hex washer head self tapping screws size 6 x 12 mm where indicated in detail below Fig.



Do not use screws longer than indicated and make sure that the L- shaped support angle is attached on center of base where indicated in the figure. Damage will occur.

Step 5: Drill 4 holes into cement base.

Step 6: Fix outdoor unit to cement pad using 4 (four) hex washer head cement screws M8



- Fix support angles with the base of the unit by using 4 (four) hex washer head self tapping screws size 6 x 12 mm
- Fix support angles with ground by using cement screw M8

18. CONNECTING REFRIGERANT PIPING LINES

18-1 R410A – Quick Reference Guide

- (1) R410A refrigerant is a substance that is not depleting the ozone layer.**
- (2) R410A refrigerant operates at 50% - 70% higher pressure than R22.**
- (3) Be sure that installation, service and maintenance equipment are designed to operate with R410A refrigerant.**
- (4) Be sure that replacement components are designed to operate with R410A refrigerant.**
- (5) R410A refrigerant cylinder is Rose color.**
- (6) R410A refrigerant cylinder has a dip tube which allows liquid to flow of cylinder in an upright position.**
- (7) R410A refrigerant is only compatible with oils selected by the compressor manufacturer.**
- (8) Never expose oil to atmosphere because POE oils absorb moisture rapidly.**
- (9) Never open the system to atmosphere while it is under vacuum.
Filter drier is recommended to be used at installation site.**
- (10) Do not vent R410A refrigerant into the atmosphere.
Use only approved recovery equipment for R410A refrigerant.
Do not use recovery equipment for R22 Refrigerant.**
- (11) In case of service and maintenance, R410A system should be charged with refrigerant R410A in liquid phase.
Use a commercial type metering device in the manifold hose in order to vaporize the liquid refrigerant before it enters in the system.**

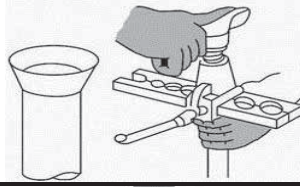
CONNECTING REFRIGERANT PIPING LINES

18-2 REFRIGERANT CONNECTIONS CHART FOR AIR CONDITIONER EQUIPPED WITH

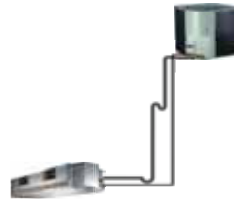
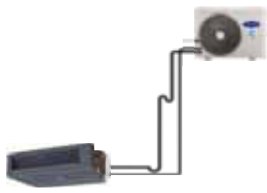
SIDE DISCHARGE OUTDOOR UNITS

TOP DISCHARGE OUTDOOR UNITS

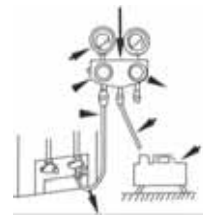
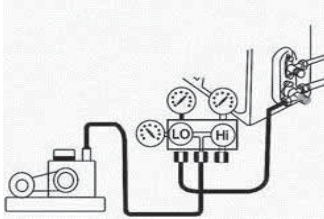
(1) Pipes Flaring



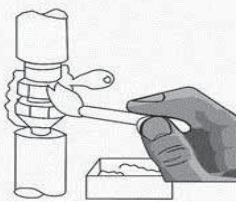
(2) Pipes Connections



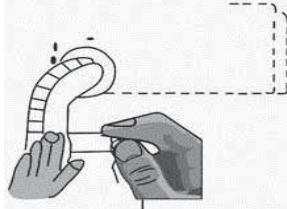
(3) Air Purging



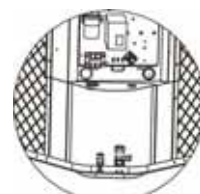
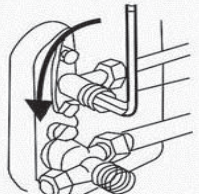
(4) Leak Check



(5) Pipes Insulation

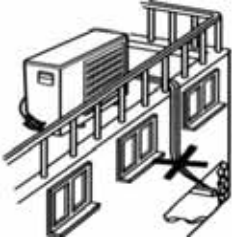
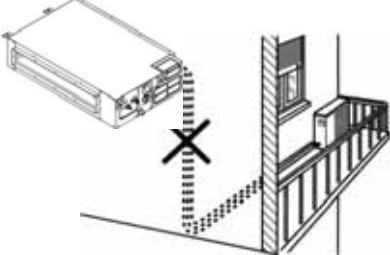
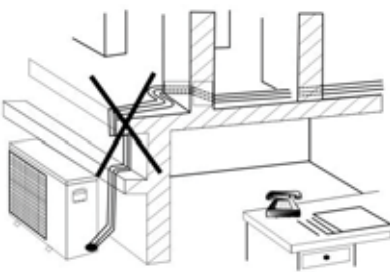
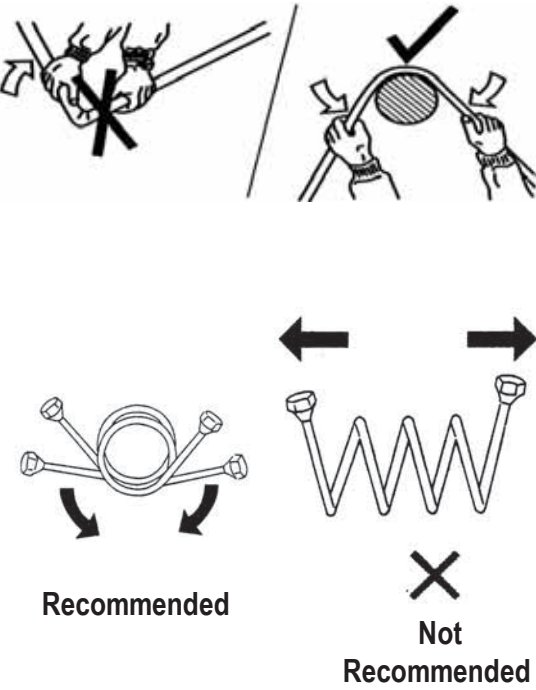


(6) Opening Valves



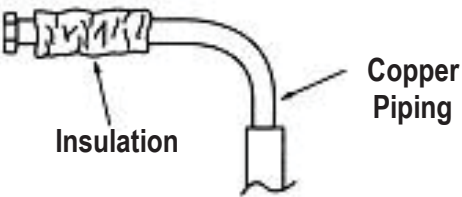
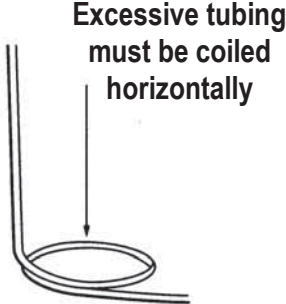
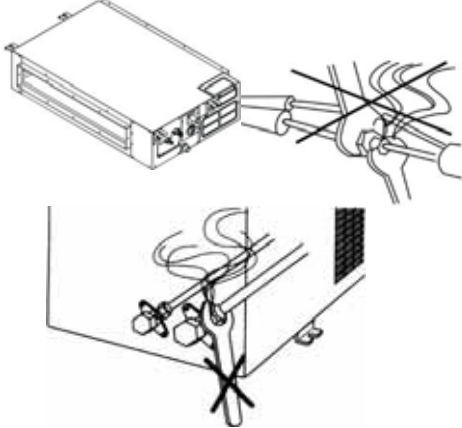
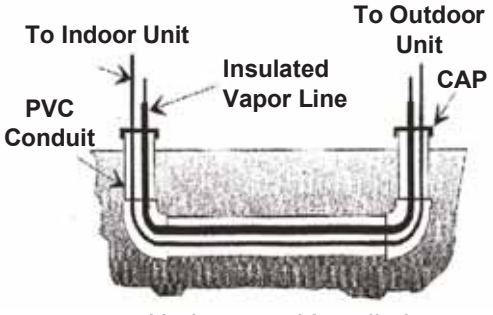
CONNECTING REFRIGERANT PIPING LINES

18-3 INSTRUCTIONS OF CONNECTIING REFRIGERANT PIPING LINES

	<ul style="list-style-type: none"> ❑ Avoid excessive height difference between indoor and outdoor units. ❑ Keep the height difference to a strict minimum to avoid alteration on system cooling performance.
	<ul style="list-style-type: none"> ❑ Avoid excessive length of refrigerant piping lines between outdoor and indoor units. ❑ Keep the height difference to a strict minimum to avoid alteration on system cooling performance.
	<ul style="list-style-type: none"> ❑ Avoid excessive number of turns and bends in refrigerant piping lines during connections with both the indoor and outdoor units. ❑ Keep the number of turns and bends to a strict minimum to avoid alteration on system cooling performance.
	<ul style="list-style-type: none"> ❑ Piping must be performed by qualified installer according to good refrigeration systems practices. ❑ Piping materials and insulation materials must be of refrigerant quality. - Select the pipe diameters to the size of system to be installed. - All bends must be considered when connecting indoor unit with outdoor unit by required length of refrigerant piping lines. - Do not remove the protective caps from the couplings until the refrigerant piping lines are ready for connection with both indoor and outdoor units. This is to keep piping clean. - The installer must carefully unroll the tubing and run it between the indoor and outdoor units. <ul style="list-style-type: none"> ● Do not bend the pipe more than three times at one place. ● When extending the rolled pipe, straighten the pipe by unwinding it. - When forming the pipe. Be careful not to crush it. - Avoid pipes flatterring or kinking. - The minimum radius of bending must not be less than 100 mm to avoid damage of piping.

CONNECTING REFRIGERANT PIPING LINES

INSTRUCTIONS OF CONNECTIING REFRIGERANT PIPING LINES

 <p>Insulation</p> <p>Copper Piping</p>	<p>When making a bend, the installer cuts insulation and slides it away from the bend area. Using a tube bender makes the bend and then the insulation is replaced gluing it together.</p>
 <p>Excessive tubing must be coiled horizontally</p>	<p>When there is excessive tubing, it must be coiled horizontally so that the flow of refrigerant is from the top to bottom of the coil and towards the outdoor unit. The excessive tubing must not be coiled vertically since the vertical coil affects the oil return to the compressor.</p>
	<p>Avoid disconnecting refrigerant piping connections after they have been tightened to avoid refrigerant leaks.</p>
 <p>To Indoor Unit</p> <p>To Outdoor Unit</p> <p>PVC Conduit</p> <p>Insulated Vapor Line</p> <p>CAP</p> <p>Underground Installation</p>	<p>Outdoor Unit Top Discharge</p> <p>Use PVC piping as a conduit for all underground installations. Buried lines should be kept as short as possible to minimize the build-up of liquid refrigerant in the suction line during long periods of shutdown.</p>

CONNECTING REFRIGERANT PIPING LINES - System Model 53KDMT12N-718

USE OF REFRIGERANT PIPING LINES

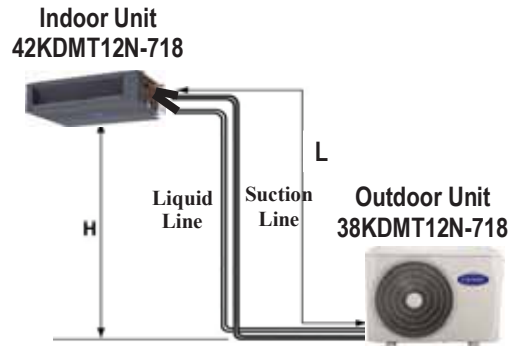
The following data refers to the use of refrigerant piping lines of diameters equivalent to that use in units where :

L = Maximum length of refrigerant piping lines between outdoor and indoor units.
 H = Maximum vertical distance between outdoor and indoor units.

(A) OUTDOOR UNIT BELOW INDOOR UNIT :

Slop tubing towards the outdoor unit with a fall of at least (6mm) to (305mm).

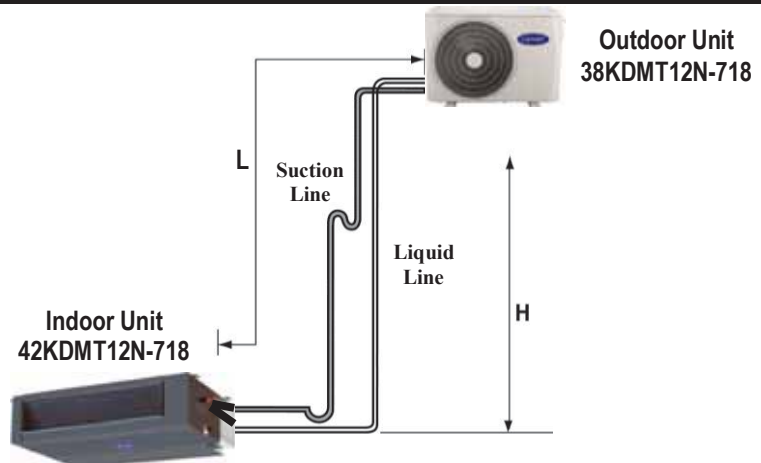
Meters		Suction line diameter	Liquid line diameter
L	H		
10	4	1/2" (12.7 mm)	1/4" (6.35 mm)



(B) OUTDOOR UNIT ABOVE INDOOR UNIT :

- If height is less than or equal 4 meters, one oil trap must be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.
- If height is more than 4 meters, more than one oil trap must exist at the suction line, the first one will be at the suction line near to the indoor unit and the following one will be 4 meters from the first one and so on.

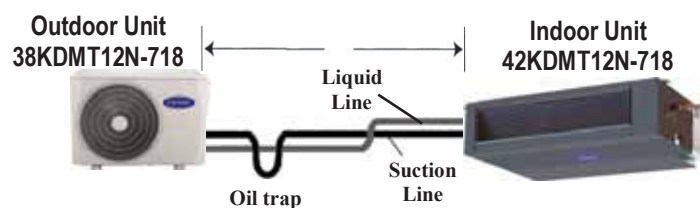
Meters		Suction line diameter	Liquid line diameter
L	H		
10	4	1/2" (12.7 mm)	1/4" (6.35 mm)



(C) OUTDOOR UNIT ON THE SAME LEVEL AS INDOOR UNIT:

An oil trap is preferred to be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.

Meters		Suction line diameter	Liquid line diameter
L			
10		1/2" (12.7 mm)	1/4" (6.35 mm)



CONNECTING REFRIGERANT PIPING LINES - System Model 53KDMT18N-718

USE OF REFRIGERANT PIPING LINES

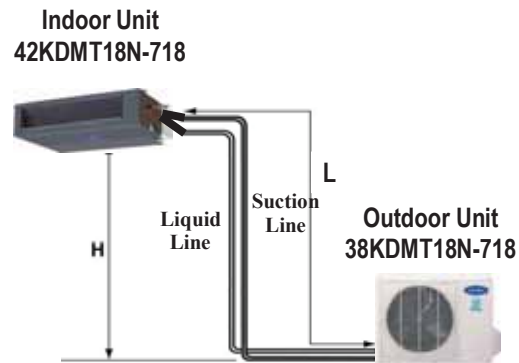
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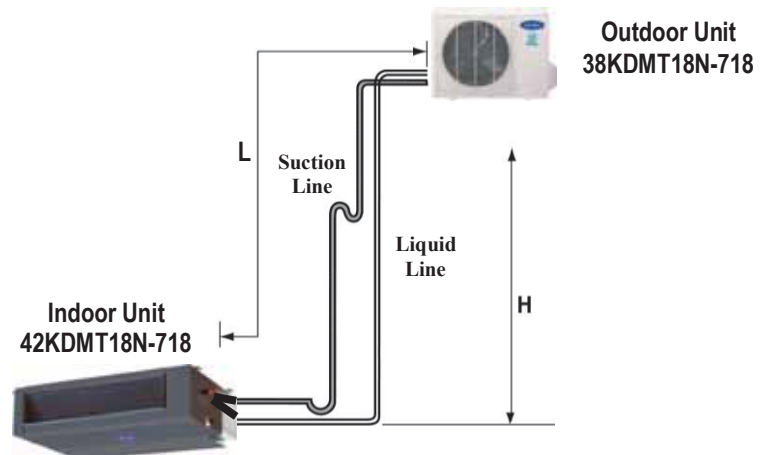
Meters		Suction line diameter	Liquid line diameter
L	H		
20	10	1/2" (12.7 mm)	1/4" (6.35 mm)



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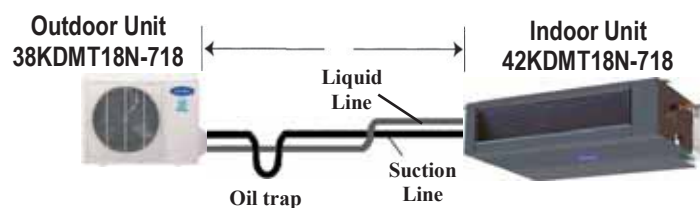
Meters		Suction line diameter	Liquid line diameter
L	H		
20	10	1/2" (12.7 mm)	1/4" (6.35 mm)



(C) OUTDOOR UNIT ON THE SAME LEVEL AS INDOOR UNIT:

An oil trap is preferred to be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.

Meters		Suction line diameter	Liquid line diameter
L			
20		1/2" (12.7 mm)	1/4" (6.35 mm)



CONNECTING REFRIGERANT PIPING LINES - System Model 53KDMT24N-718

USE OF REFRIGERANT PIPING LINES

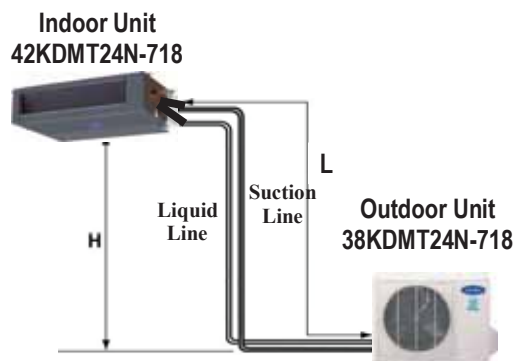
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 H = Maximum vertical distance between outdoor and indoor units.

(A) OUTDOOR UNIT BELOW INDOOR UNIT :

Slop tubing towards the outdoor unit with a fall of at least (6mm) to (305mm).

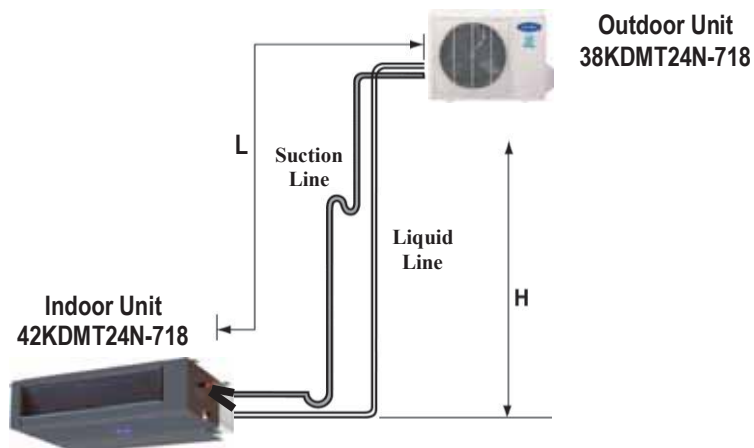
Meters		Suction line diameter	Liquid line diameter
L	H		
20	10	5/8" (15.9 mm)	3/8" (9.52 mm)



(B) OUTDOOR UNIT ABOVE INDOOR UNIT :

- If height is less than or equal 4 meters, one oil trap must be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.
- If height is more than 4 meters, more than one oil trap must exist at the suction line, the first one will be at the suction line near to the indoor unit and the following one will be 4 meters from the first one and so on.

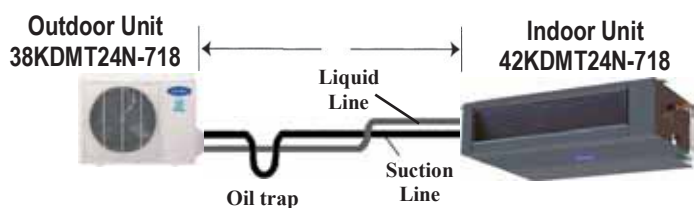
Meters		Suction line diameter	Liquid line diameter
L	H		
20	10	5/8" (15.9 mm)	3/8" (9.52 mm)



(C) OUTDOOR UNIT ON THE SAME LEVEL AS INDOOR UNIT:

An oil trap is preferred to be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.

Meters		Suction line diameter	Liquid line diameter
L			
20		5/8" (15.9 mm)	3/8" (9.52 mm)



CONNECTING REFRIGERANT PIPING LINES - System Model 53KDMT30N-718

USE OF REFRIGERANT PIPING LINES

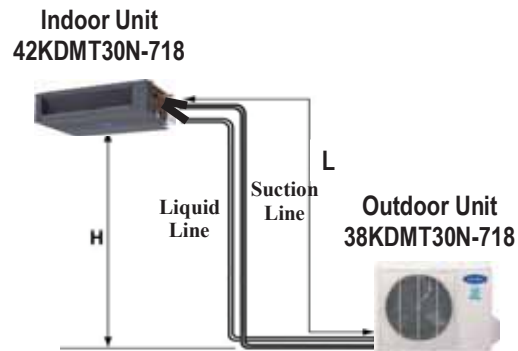
The following data refers to the use of refrigerant piping lines of diameters equivalent to that use in units where :

L = Maximum length of refrigerant piping lines between outdoor and indoor units.
 H = Maximum vertical distance between outdoor and indoor units.

(A) OUTDOOR UNIT BELOW INDOOR UNIT :

Slop tubing towards the outdoor unit with a fall of at least (6mm) to (305mm).

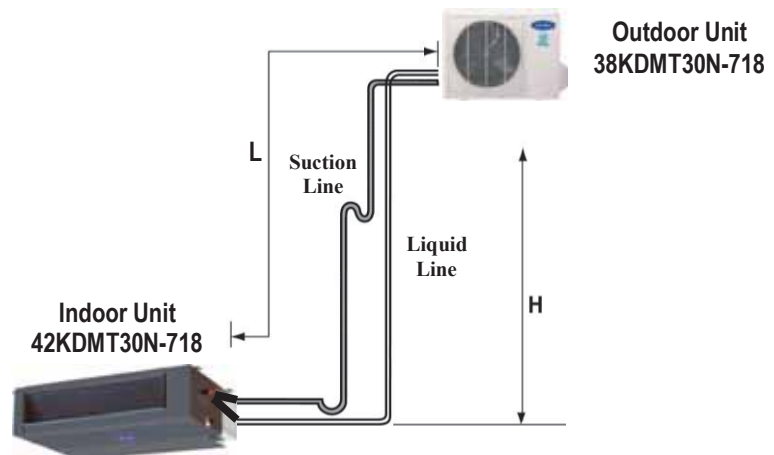
Meters		Suction line diameter	Liquid line diameter
L	H		
25	10	3/4" (19.05 mm)	3/8" (9.52 mm)



(B) OUTDOOR UNIT ABOVE INDOOR UNIT :

- If height is less than or equal 4 meters, one oil trap must be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.
- If height is more than 4 meters, more than one oil trap must exist at the suction line, the first one will be at the suction line near to the indoor unit and the following one will be 4 meters from the first one and so on.

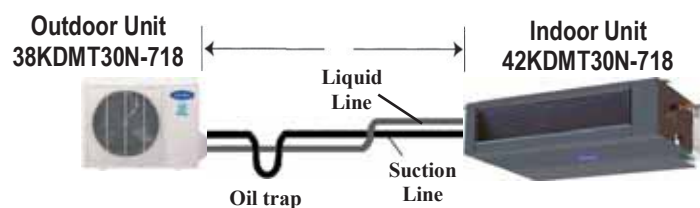
Meters		Suction line diameter	Liquid line diameter
L	H		
25	10	3/4" (19.05 mm)	3/8" (9.52 mm)



(C) OUTDOOR UNIT ON THE SAME LEVEL AS INDOOR UNIT:

An oil trap is preferred to be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.

Meters		Suction line diameter	Liquid line diameter
L			
25		3/4" (19.05 mm)	3/8" (9.52 mm)



CONNECTING REFRIGERANT PIPING LINES - System Model 53KDMT36N-718T

USE OF REFRIGERANT PIPING LINES

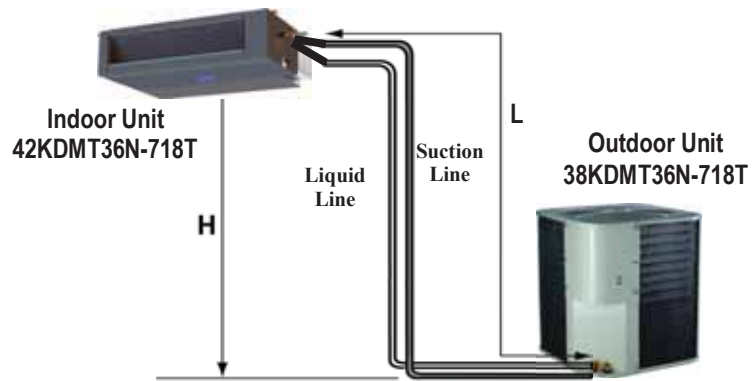
The following data refers to the use of refrigerant piping lines of diameters equivalent to that use in units where :

L = Maximum length of refrigerant piping lines between outdoor and indoor units.
 H = Maximum vertical distance between outdoor and indoor units.

(A) OUTDOOR UNIT BELOW INDOOR UNIT :

Slop tubing towards the outdoor unit with a fall of at least (6mm) to (305mm).

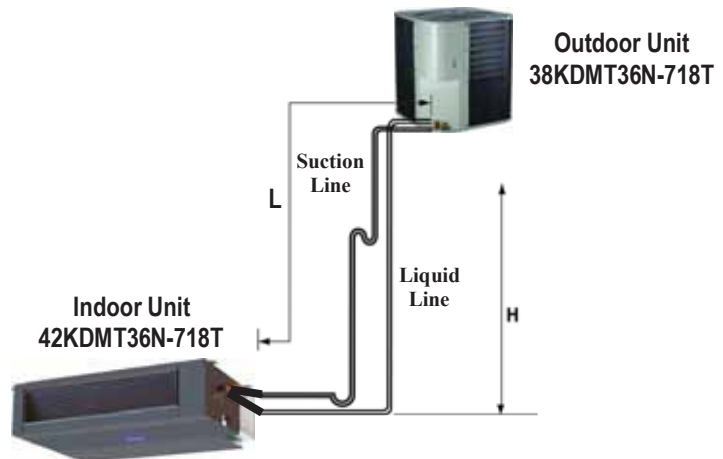
Meters		Suction line diameter	Liquid line diameter
L	H		
30	15	3/4" (19.05 mm)	3/8" (9.52 mm)



(B) OUTDOOR UNIT ABOVE INDOOR UNIT :

- If height is less than or equal 4 meters, one oil trap must be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.
- If height is more than 4 meters, more than one oil trap must exist at the suction line, the first one will be at the suction line near to the indoor unit and the following one will be 4 meters from the first one and so on.

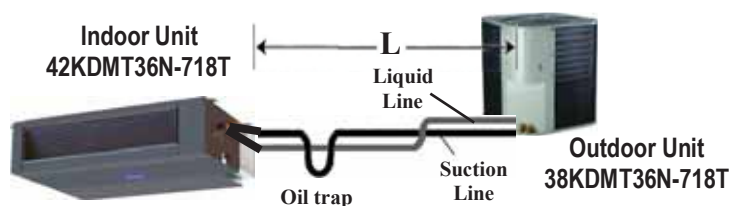
Meters		Suction line diameter	Liquid line diameter
L	H		
30	15	3/4" (19.05 mm)	3/8" (9.52 mm)



(C) OUTDOOR UNIT ON THE SAME LEVEL AS INDOOR UNIT :

An oil trap is preferred to be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.

Meters	Suction line diameter	Liquid line diameter
L		
30	3/4" (19.05 mm)	3/8" (9.52 mm)



CONNECTING REFRIGERANT PIPING LINES - System Model 53KDHT42N-518T

USE OF REFRIGERANT PIPING LINES

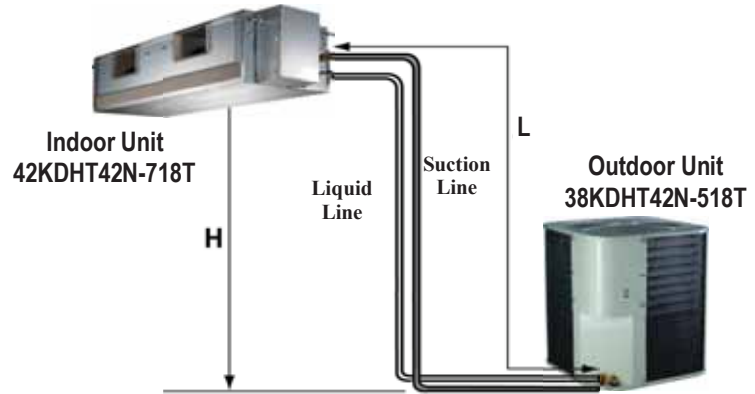
The following data refers to the use of refrigerant piping lines of diameters equivalent to that use in units where :

L = Maximum length of refrigerant piping lines between outdoor and indoor units.
 H = Maximum vertical distance between outdoor and indoor units.

(A) OUTDOOR UNIT BELOW INDOOR UNIT :

Slop tubing towards the outdoor unit with a fall of at least (6mm) to (305mm).

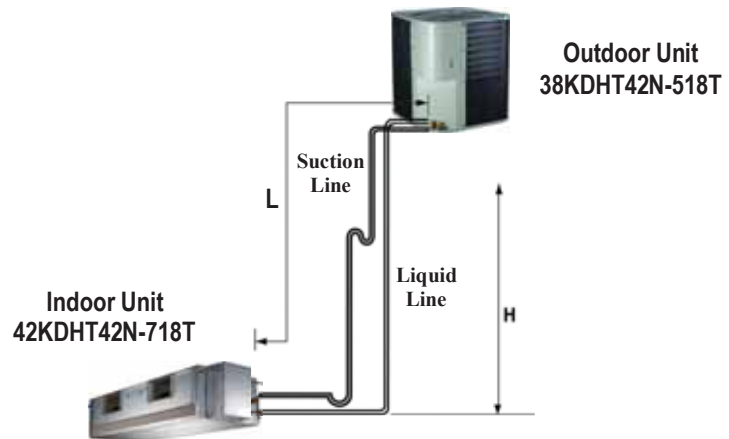
Meters		Suction line diameter	Liquid line diameter
L	H		
30	15	7/8" (22 mm)	3/8" (9.52 mm)



(B) OUTDOOR UNIT ABOVE INDOOR UNIT :

- If height is less than or equal 4 meters, one oil trap must be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.
- If height is more than 4 meters, more than one oil trap must exist at the suction line, the first one will be at the suction line near to the indoor unit and the following one will be 4 meters from the first one and so on.

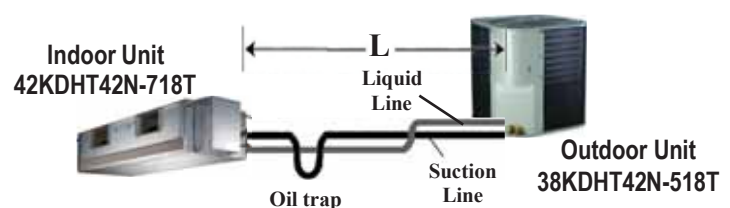
Meters		Suction line diameter	Liquid line diameter
L	H		
30	15	7/8" (22 mm)	3/8" (9.52 mm)



(C) OUTDOOR UNIT ON THE SAME LEVEL AS INDOOR UNIT:

An oil trap is preferred to be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.

Meters	Suction line diameter	Liquid line diameter
L		
30	7/8" (22 mm)	3/8" (9.52 mm)



CONNECTING REFRIGERANT PIPING LINES - System Model 53KDHT48N-518T

USE OF REFRIGERANT PIPING LINES

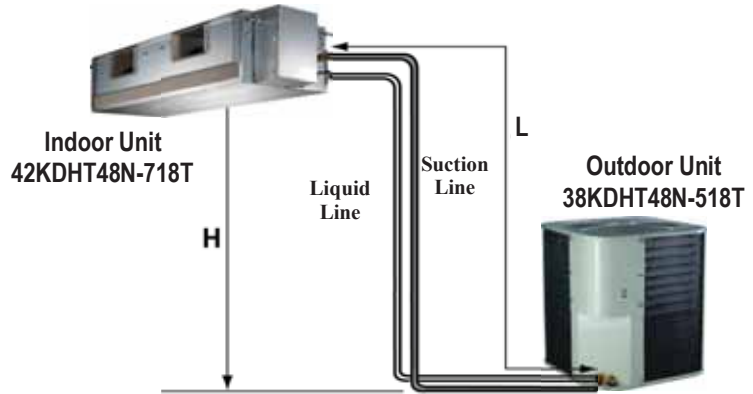
The following data refers to the use of refrigerant piping lines of diameters equivalent to that use in units where :

L = Maximum length of refrigerant piping lines between outdoor and indoor units.
 H = Maximum vertical distance between outdoor and indoor units.

(A) OUTDOOR UNIT BELOW INDOOR UNIT :

Slop tubing towards the outdoor unit with a fall of at least (6mm) to (305mm).

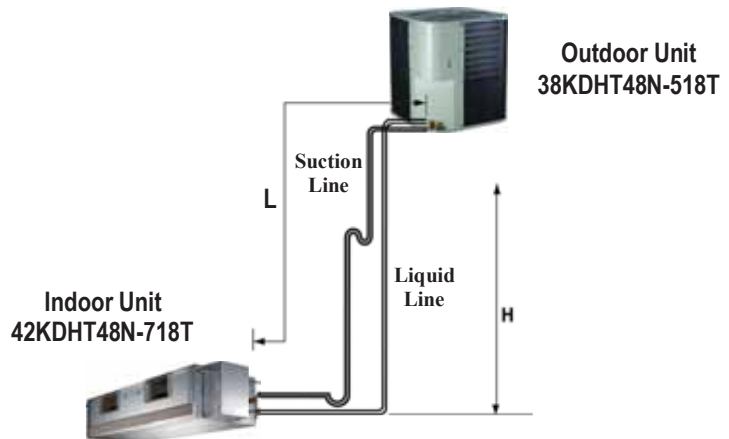
Meters		Suction line diameter	Liquid line diameter
L	H		
30	15	7/8" (22 mm)	3/8" (9.52 mm)



(B) OUTDOOR UNIT ABOVE INDOOR UNIT :

- If height is less than or equal 4 meters, one oil trap must be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.
- If height is more than 4 meters, more than one oil trap must exist at the suction line, the first one will be at the suction line near to the indoor unit and the following one will be 4 meters from the first one and so on.

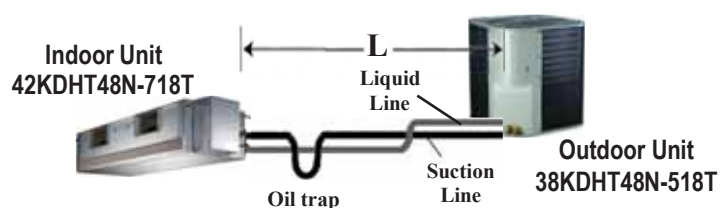
Meters		Suction line diameter	Liquid line diameter
L	H		
30	15	7/8" (22 mm)	3/8" (9.52 mm)



(C) OUTDOOR UNIT ON THE SAME LEVEL AS INDOOR UNIT:

An oil trap is preferred to be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.

Meters	Suction line diameter	Liquid line diameter
L		
30	7/8" (22 mm)	3/8" (9.52 mm)



CONNECTING REFRIGERANT PIPING LINES - System Model 53KDHT60N-518T

USE OF REFRIGERANT PIPING LINES

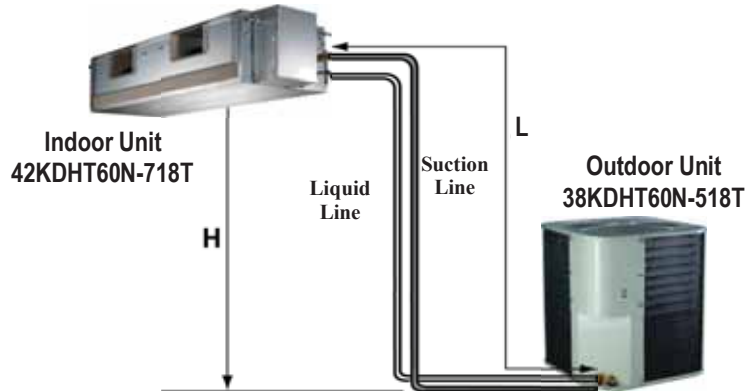
The following data refers to the use of refrigerant piping lines of diameters equivalent to that use in units where :

L = Maximum length of refrigerant piping lines between outdoor and indoor units.
 H = Maximum vertical distance between outdoor and indoor units.

(A) OUTDOOR UNIT BELOW INDOOR UNIT :

Slop tubing towards the outdoor unit with a fall of at least (6mm) to (305mm).

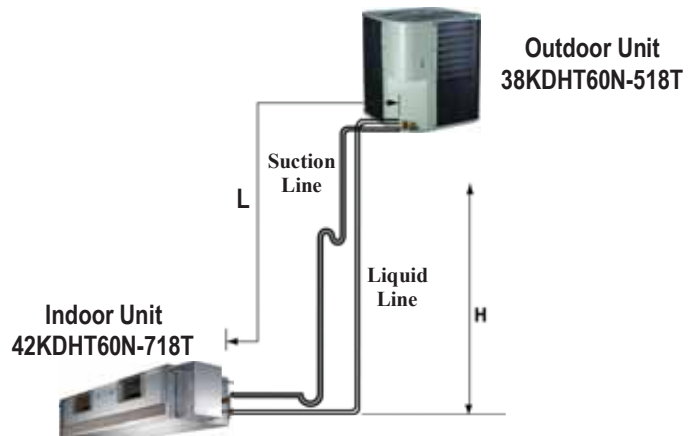
Meters		Suction line diameter	Liquid line diameter
L	H		
30	15	7/8" (22 mm)	3/8" (9.52 mm)



(B) OUTDOOR UNIT ABOVE INDOOR UNIT :

- If height is less than or equal 4 meters, one oil trap must be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.
- If height is more than 4 meters, more than one oil trap must exist at the suction line, the first one will be at the suction line near to the indoor unit and the following one will be 4 meters from the first one and so on.

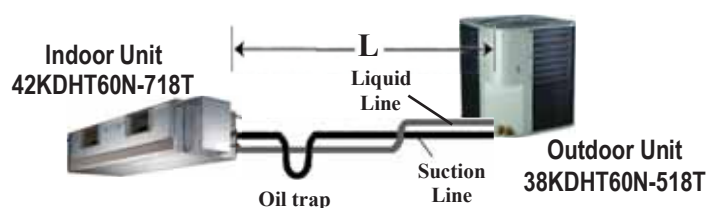
Meters		Suction line diameter	Liquid line diameter
L	H		
30	15	7/8" (22 mm)	3/8" (9.52 mm)



(C) OUTDOOR UNIT ON THE SAME LEVEL AS INDOOR UNIT:

An oil trap is preferred to be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.

Meters	Suction line diameter	Liquid line diameter
L		
30	7/8" (22 mm)	3/8" (9.52 mm)



CONNECTING REFRIGERANT PIPING LINES - System Model 53KDHT72N-518T

USE OF REFRIGERANT PIPING LINES

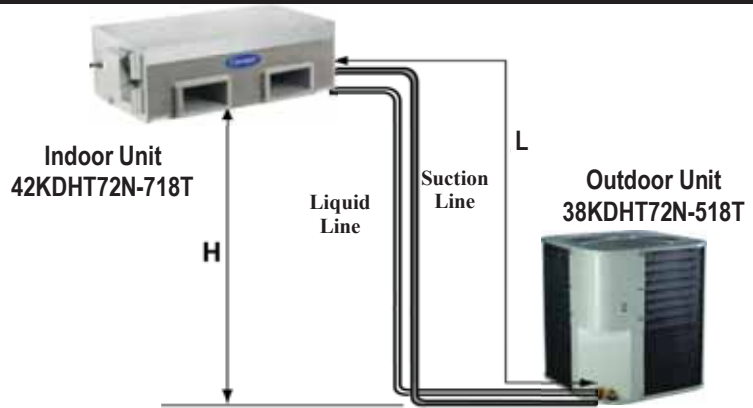
The following data refers to the use of refrigerant piping lines of diameters equivalent to that use in units where :

L = Maximum length of refrigerant piping lines between outdoor and indoor units.
 H = Maximum vertical distance between outdoor and indoor units.

(A) OUTDOOR UNIT BELOW INDOOR UNIT :

Slop tubing towards the outdoor unit with a fall of at least (6mm) to (305mm).

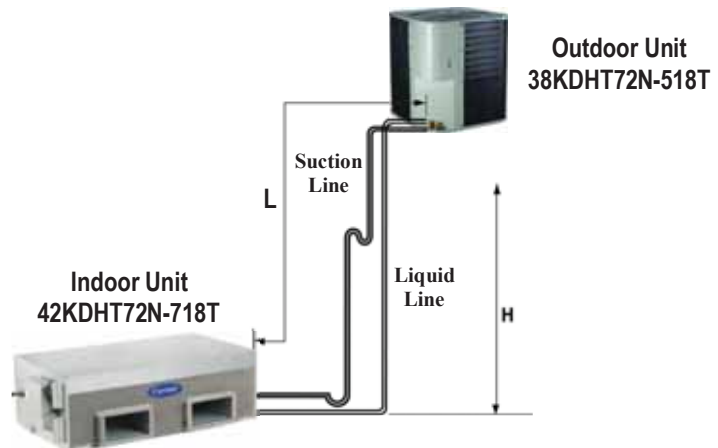
Meters		Suction line diameter	Liquid line diameter
L	H		
40	15	7/8" (22 mm)	1/2" (12.7 mm)



(B) OUTDOOR UNIT ABOVE INDOOR UNIT :

- If height is less than or equal 4 meters, one oil trap must be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.
- If height is more than 4 meters, more than one oil trap must exist at the suction line, the first one will be at the suction line near to the indoor unit and the following one will be 4 meters from the first one and so on.

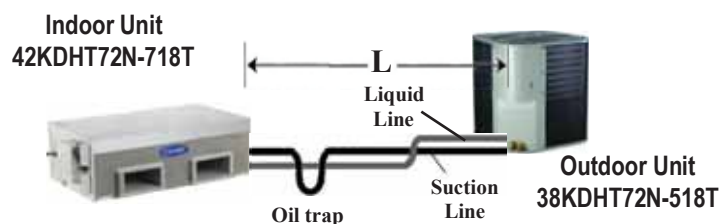
Meters		Suction line diameter	Liquid line diameter
L	H		
40	15	7/8" (22 mm)	1/2" (12.7 mm)



(C) OUTDOOR UNIT ON THE SAME LEVEL AS INDOOR UNIT:

An oil trap is preferred to be at the suction line at the base of suction riser near the Indoor unit to facilitate oil return to the compressor to ensure efficiency of compressor mechanical parts.

Meters	Suction line diameter	Liquid line diameter
L		
40	7/8" (22 mm)	1/2" (12.7 mm)



CONNECTING REFRIGERANT PIPING LINES

18.4 REFRIGERANT CHARGE

- (1) The outdoor unit is factory supplied with refrigerant charge for use with refrigerant piping lines of length 5 meters.
- (2) For refrigerant piping lines of length more than 5 meters, add in the field extra amount of refrigerant charge as per below table :

System Model	Extra Amount of Refrigerant / Meter
53KDMT12N-718	15 gram/meter
53KDMT18N-718	15 gram/meter
53KDMT24N-718	20 gram/meter
53KDMT30N-718	15 gram/meter
53KDMT36N-718T	20 gram/meter
53KDHT42N-518T	20 gram/meter
53KDHT48N-518T	20 gram/meter
53KDHT60N-518T	20 gram/meter
53KDHT72N-518T	20 gram/meter

Examples :

For system Model 53KDMT18N-718

For 10 meter lines, refrigerant added = $(10 - 5) \times 15 = 75$ grams.

For 20 meter lines, refrigerant added = $(20 - 5) \times 15 = 225$ grams.

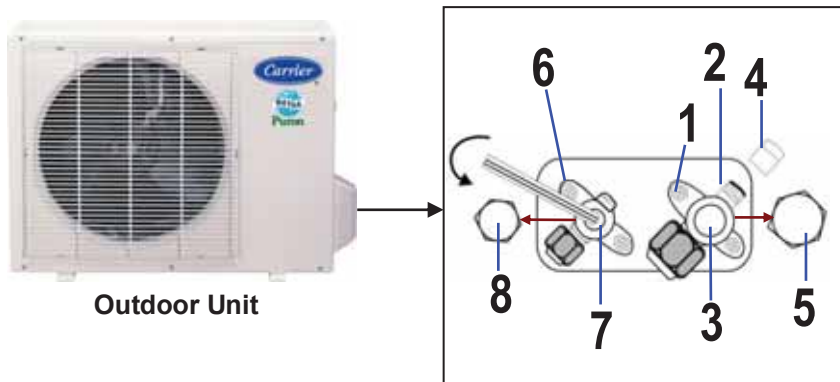
18.4.1 NOTES



- Refrigerant overcharge may cause a serious trouble of compressor.
- Refrigerant undercharge may cause reduction of system performance.
- Refrigerant cannot be charged until all field electrical wiring has been completed.
- Refrigerant may only be charged after performing leak testing and air purging using vacuum pump.
- When charging the system, care shall be taken that the maximum permissible refrigerant charge is never exceeded to protect the compressor against liquid hammer.
- Charging with an unsuitable refrigerant may cause explosions and accidents, so always ensure that R410A refrigerant is charged.

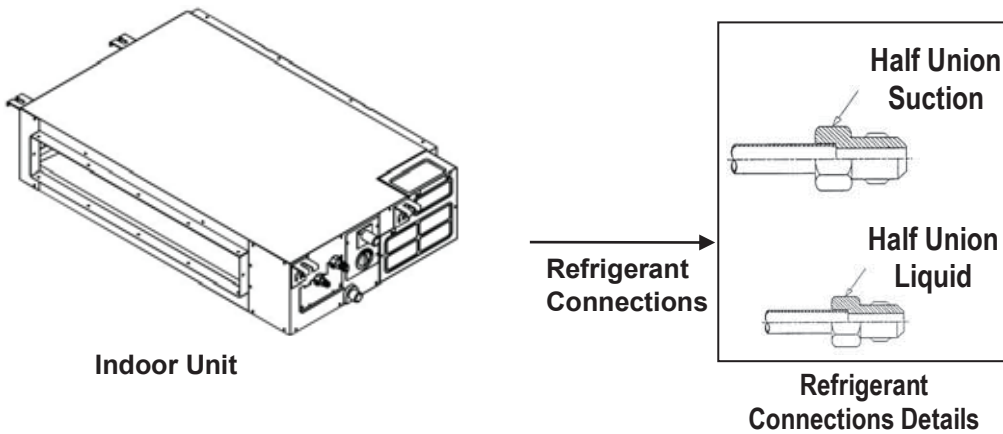
CONNECTING REFRIGERANT PIPING

18.5 DESCRIPTION OF REFRIGERANT CONNECTIONS OF OUTDOOR UNIT



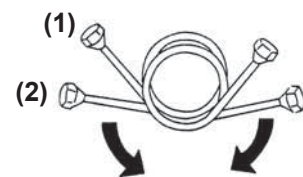
- | | |
|-----------------------------------|------------------------------------|
| (1) Suction flare valve. | (2) Suction service valve. |
| (3) Suction port to open & close. | (4) Cap for suction service valve. |
| (5) Cap for Suction port. | (6) Liquid flare valve. |
| (7) Liquid port to open & close. | (8) Cap for liquid port. |

18.6 DESCRIPTION OF REFRIGERANT CONNECTIONS OF INDOOR UNIT



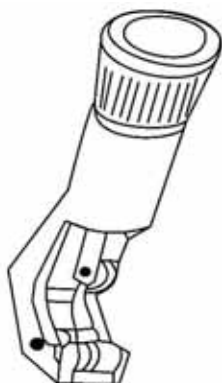
18.7 DESCRIPTION OF REFRIGERANT CONNECTIONS OF REFERIGERANT PIPING LINES

- (1) Suction piping line
- (2) Liquid piping line

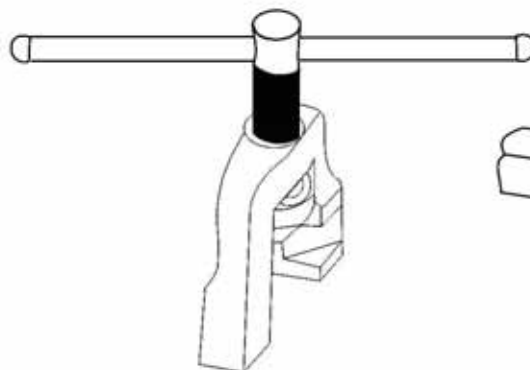


18.8 CUTTING AND FLARING TOOLS

Make sure that have the required tools available before preparing refrigerant piping lines



Pipe Cutter



Flare Tool

CONNECTING REFRIGERANT PIPING LINES

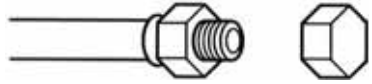
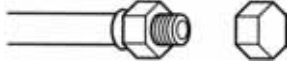
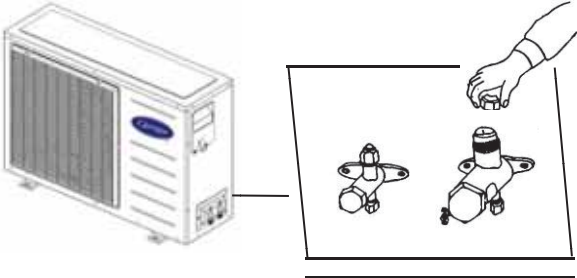





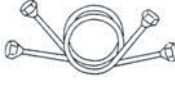
18-9 STEPS OF PREPARING REFRIGERANT PIPING LINES BEFORE CONNECTIONS

(IN CASE OF NOT USING THE OPTIONAL FACTORY REFRIGERANT PIPING LINES WITH THE FLARE NUTS)

<p>STEP (1): Cutting refrigerant piping lines</p> <ul style="list-style-type: none"> Remove protective caps from copper pipe ends. Position tube end downwards, cut the pipe to the required length with a pipe cutter. <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">NOTE</div> <ul style="list-style-type: none"> Take care to ensure that the cut edge remains at a 90° angle with the side of pipe, and refer to the illustrations for examples of edges cut correctly and incorrectly. 	<p style="text-align: center;">Pipe Cutter</p>																																									
<p>STEP (2): Removing burrs at the ends of refrigerant piping lines with a reamer</p> <p>This process is important and should be done carefully to make a good flare and to prevent any suction leaking out.</p> <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">NOTE</div> <p>When reaming, hold the pipe end downward and be sure that no copper scraps fall into the pipe.</p>	<p>1: Connection pipes 2: Reamer</p>																																									
<p>STEP (3): Flaring the Piping</p> <ul style="list-style-type: none"> Use flare tool to flare ends of both suction and liquid piping lines and then slide a flare nut on to the tube and modify the flare. <div style="border: 1px solid black; padding: 2px; margin: 5px 0;">NOTES</div> <ol style="list-style-type: none"> 1) Good flare should have the following properties : <ul style="list-style-type: none"> Inside surface is glossy and smooth. Edge is smooth and must not have any burrs or imperfections. Tapered sides are of uniform length. 2) Be sure to apply a sealing cap or waterproof tape to prevent dust or water from getting into the refrigeration piping lines before they are used. <ol style="list-style-type: none"> 3) Avoid incorrect flaring, which results in damaged or cracked or inclined with uneven thickness surface. 	<p style="text-align: center;">Flare tool Refrigerant Piping Flare Nut</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th rowspan="2"></th> <th colspan="2" style="text-align: center;">Ø</th> <th rowspan="2">A (+0 ± -0.4)</th> </tr> <tr> <th style="text-align: center;">Inch</th> <th style="text-align: center;">mm</th> </tr> </thead> <tbody> <tr> <td rowspan="6" style="text-align: center; vertical-align: middle;">Recommend</td> <td style="text-align: center;">1/4"</td> <td style="text-align: center;">6.35 mm</td> <td style="text-align: center;">9.1 mm</td> </tr> <tr> <td style="text-align: center;">3/8"</td> <td style="text-align: center;">9.52 mm</td> <td style="text-align: center;">13.2 mm</td> </tr> <tr> <td style="text-align: center;">1/2"</td> <td style="text-align: center;">12.7 mm</td> <td style="text-align: center;">16.6 mm</td> </tr> <tr> <td style="text-align: center;">5/8"</td> <td style="text-align: center;">15.88 mm</td> <td style="text-align: center;">19.7 mm</td> </tr> <tr> <td style="text-align: center;">3/4"</td> <td style="text-align: center;">19.05 mm</td> <td style="text-align: center;">22.87 mm</td> </tr> <tr> <td style="text-align: center;">7/8"</td> <td style="text-align: center;">22.22 mm</td> <td style="text-align: center;">26.02 mm</td> </tr> </tbody> </table> <table style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">×</td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;">×</td> </tr> <tr> <td>×</td> <td></td> <td></td> <td>×</td> </tr> <tr> <td>×</td> <td></td> <td></td> <td>×</td> </tr> <tr> <td>×</td> <td></td> <td></td> <td>×</td> </tr> </table>		Ø		A (+0 ± -0.4)	Inch	mm	Recommend	1/4"	6.35 mm	9.1 mm	3/8"	9.52 mm	13.2 mm	1/2"	12.7 mm	16.6 mm	5/8"	15.88 mm	19.7 mm	3/4"	19.05 mm	22.87 mm	7/8"	22.22 mm	26.02 mm	×			×	×			×	×			×	×			×
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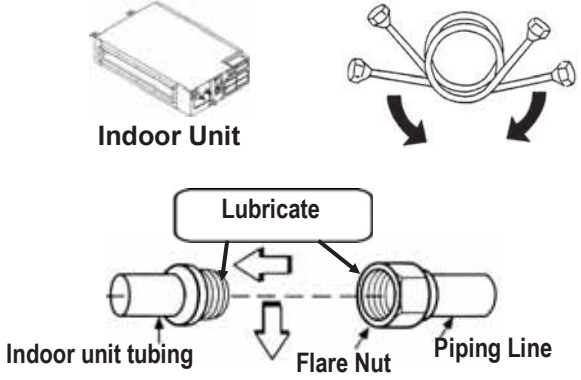
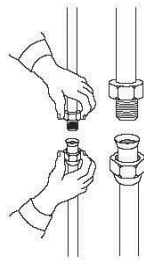
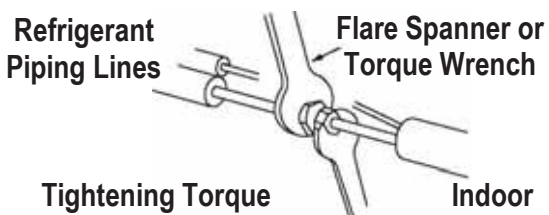
CONNECTING REFRIGERANT PIPING LINES

STEPS OF PREPARING REFRIGERANT PIPING LINES BEFORE CONNECTIONS

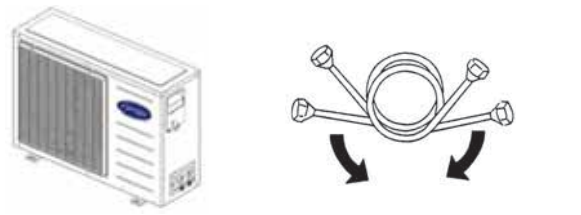


<p>STEP (4): Removing protective plastic nuts of suction and liquid connections of indoor units.</p> <p>NOTES</p> <ul style="list-style-type: none"> Do not remove protective plastic nuts from the indoor unit until refrigerant piping lines are ready for connections. 	<p>Suction line In indoor unit</p>  <p>Liquid line In indoor unit</p> 
<p>STEP (5): Removing protective plastic nuts of suction and liquid connections of outdoor unit.</p> <p>NOTES</p> <ul style="list-style-type: none"> Do not remove protective plastic nuts from the outdoor unit until refrigerant piping lines are ready for connection. It is easier to remove protective plastic nuts from the outdoor unit before being installed on the wall support. 	
<p>STEP (6): Mounting flare nuts on the ends of refrigerant piping</p> <ul style="list-style-type: none"> Mount suction flare nut (large nut) on the end of suction refrigerant piping line. Mount liquid flare nut (small nut) on the other side of liquid refrigerant piping line. 	<p>Liquid Piping Line</p>  <p>Suction Piping Line</p>  
<p>STEP (7): Mounting flare nuts on the other ends of refrigerant piping lines</p> <ul style="list-style-type: none"> Mount Suction flare nut (Large nut) on the other end of suction refrigerant piping line. Mount liquid flare nut (Small nut) on the other end of liquid refrigerant piping line. 	<p>Liquid Line</p>  <p>Suction Line</p>   <p>Refrigerant Piping Lines After Connecting Flare Nuts from Both Sides</p>

CONNECTING REFRIGERANT PIPING

18-10 STEPS OF CONNECTING REFRIGERANT PIPING LINES TO INDOOR UNIT

<p>Connecting suction and liquid piping lines respectively with suction and liquid half unions of indoor unit.</p> <p>A. Lubricate flare nuts of suction and liquid piping line end and the threads of the suction and liquid half unions of indoor unit with anti-freeze oil. This is effective for reducing refrigerant leaks.</p>	 <p>Indoor Unit</p> <p>Lubricate</p> <p>Indoor unit tubing</p> <p>Flare Nut</p> <p>Piping Line</p>																																
<p>B. For proper connection, align the centers of suction union pipe and flare pipe straight with each other, then finger tighten several turns the flare nut tightly at first to obtain a smooth match.</p>	 <p>Indoor Unit Piping</p> <p>Refrigerant Piping Lines</p>																																
<p>C. Then hold the union side with a double-ended wrench and tighten the flare nut by applying the tightening torque indicated in the table. Be careful not to damage the flare nut threads.</p> <p>NOTES</p> <p>a. Insufficient tightening torque will cause refrigerant leaks.</p> <p>b. Over tightening the torque will damage the tube flaring and cause refrigerant leaks.</p>	 <p>Refrigerant Piping Lines</p> <p>Flare Spanner or Torque Wrench</p> <p>Tightening Torque</p> <p>Indoor Side</p> <table border="1" data-bbox="821 1220 1300 1456"> <thead> <tr> <th colspan="2">Flare Nut</th> <th colspan="2">Tightening Torque</th> </tr> <tr> <th>inch</th> <th>Mm</th> <th>N.M</th> <th>Kgf - cm</th> </tr> </thead> <tbody> <tr> <td>1/4"</td> <td>6.35</td> <td>15-20</td> <td>150-200</td> </tr> <tr> <td>3/8"</td> <td>9.52</td> <td>31-35</td> <td>310-350</td> </tr> <tr> <td>1/2"</td> <td>12.7</td> <td>50-55</td> <td>500-550</td> </tr> <tr> <td>5/8"</td> <td>15.88</td> <td>70.76</td> <td>700-760</td> </tr> <tr> <td>3/4"</td> <td>19.05</td> <td>70.76</td> <td>700-760</td> </tr> <tr> <td>7/8"</td> <td>22.22</td> <td>70-76</td> <td>700-760</td> </tr> </tbody> </table>	Flare Nut		Tightening Torque		inch	Mm	N.M	Kgf - cm	1/4"	6.35	15-20	150-200	3/8"	9.52	31-35	310-350	1/2"	12.7	50-55	500-550	5/8"	15.88	70.76	700-760	3/4"	19.05	70.76	700-760	7/8"	22.22	70-76	700-760
Flare Nut		Tightening Torque																															
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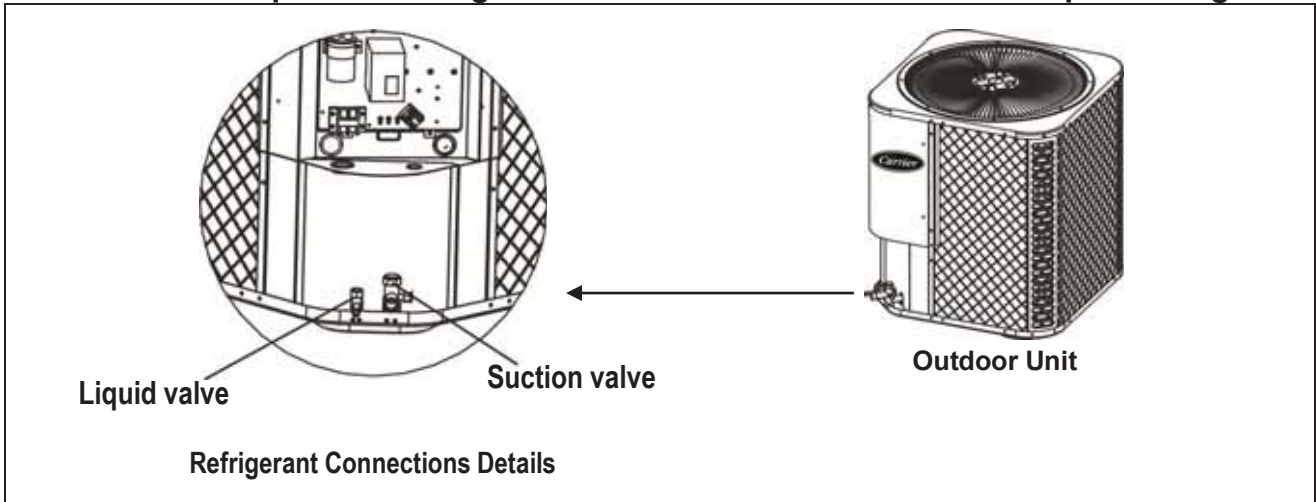
18-11 STEPS OF CONNECTING REFRIGERANT PIPING LINES TO OUTDOOR UNIT

<ul style="list-style-type: none"> Connecting the other ends of suction and liquid piping lines respectively with suction and liquid flare valves of the outdoor unit. Repeat steps (A), (B), (C) when connecting refrigerant piping lines to the flare valve of the outdoor unit. 	
<p>(1)</p> <p>Fingers tighten several turns the flare nuts tightly of first to obtain a smooth match</p> 	<p>(2)</p> <p>Tighten flare nuts with adjustable wrench or torque wrench.</p> 

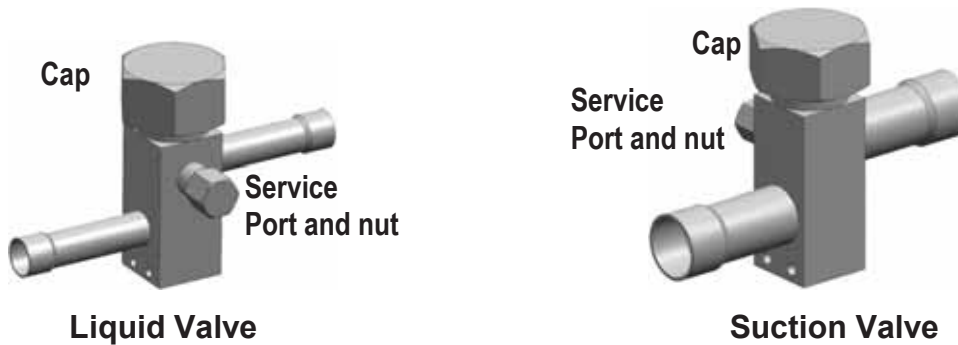
CONNECTING REFRIGERANT PIPING LINES

18.12 CONNECTING REFRIGERANT PIPING TO OUTDOOR UNIT TOP DISCHARGE

18.12.1 Description of Refrigerant Connections of Outdoor Unit Top Discharge



Stop Valve Operation Introduction



1. Opening Service Valve

- (A) Remove the cap and turn the valve counter clock-wise with the hexagon wrench
- (B) Turn it until the shaft stops. Do not apply excessive force to the stop valve. Doing so may break the valve body, as the valve is not a backseat type. Always use the special tool.
- (C) Make sure to tighten the cap securely.

2. Closing Service valve

- Remove the cap and turn the valve clockwise with the hexagon wrench.
- Securely tighten the valve until the shaft contacts the main body seal.

Make sure to tighten the cap securely. For the tightening torque, refer to the table below.



CAUTION

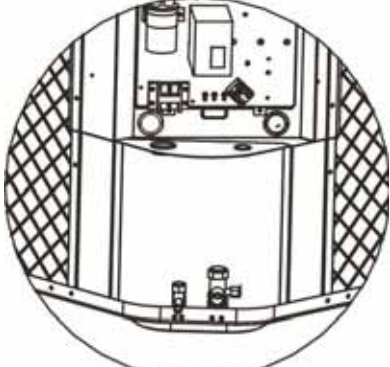
Always use a charge hose for service port connection.

After tightening the cap, check that no refrigerant leaks are present.

CONNECTING REFRIGERANT PIPING LINES

CONNECTING REFRIGERANT PIPING TO OUTDOOR UNIT TOP DISCHARGE

18.12.2 Steps of Refrigerant Piping Lines Preparation Before Connections

<p>STEP (1): Removing protective plugs of suction and liquid valves of outdoor unit.</p> <p>NOTES</p> <ul style="list-style-type: none">• Do not remove protective plugs from the outdoor unit until refrigerant piping lines are ready for connection to outdoor unit valves.	
--	--

18.12.3 Precautions During Brazing of Piping Lines To Service Valves

- ❑ Precautions should be taken to prevent heat damage to service valve by wrapping a wet rag around it as shown in below fig. Also, protect all painted surfaces, insulation, during brazing. After brazing cool joint with wet rag.
Valve can be opened by removing the plunger cap and fully inserting a hex wrench into the stem and backing out counter-clockwise until valve stem just touches the chamfered retaining wall.
- ❑ All outdoor unit connections are copper-to-copper and should be brazed with a phosphorous-copper alloy material such as Silfos-5 or equivalent. DO NOT use soft solder.
- ❑ The outdoor units have reusable service valves on both the suction and liquid connections. Serious service problems can be avoided by taking adequate precautions to assure an internally clean and dry system.

CAUTION

Dry nitrogen should always be supplied through the tubing while it is being brazed, because the temperature required is high enough to cause oxidation of the copper unless an inert atmosphere is provide. The flow of dry nitrogen should continue until the joint has cooled. Always use a pressure regulator and safety valve to insure that only low pressure dry nitrogen is introduced into the tubing. Only a small flow is necessary to displace air and prevent oxidation.

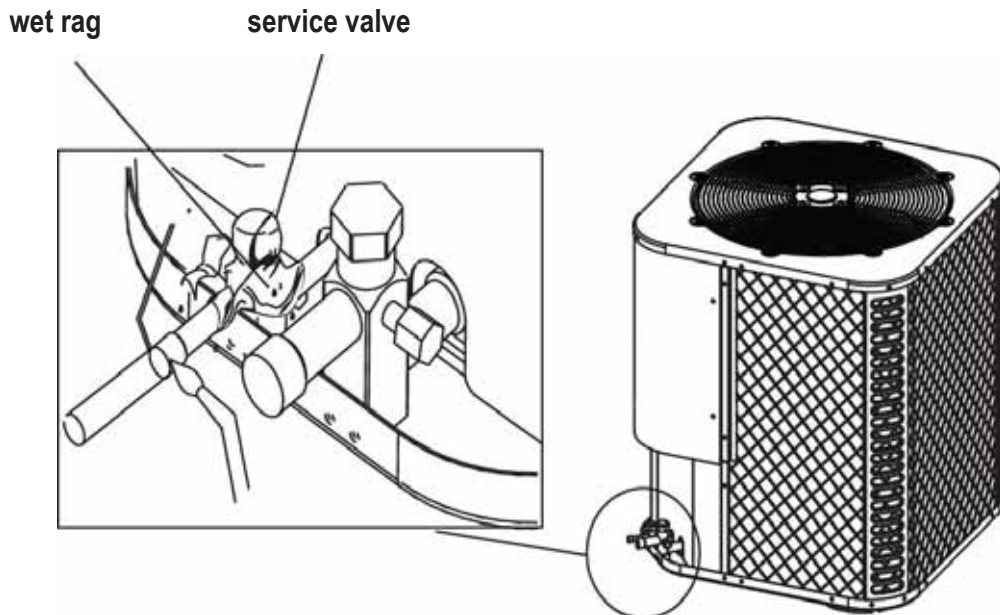
CONNECTING REFRIGERANT PIPING

CONNECTING REFRIGERANT PIPING TO OUTDOOR UNIT TOP DISCHARGE

18.12.4 Steps of Connecting Refrigerant Piping Lines To Outdoor Unit

Connecting the other ends of suction and liquid piping lines respectively with suction and liquid valves of outdoor unit

1. Remove the cap and Schrader core from both the liquid and suction service valve service ports at the outdoor unit. Connect low pressure nitrogen to the liquid line service port.






2. Braze the liquid line to the liquid valve at the outdoor unit. Be sure to wrap the valve body with a wet rag. Allow the nitrogen to continue flowing.
3. Protect the suction valve with a wet rag and braze the suction line connection to the outdoor unit. The nitrogen flow should be exiting the system from the suction service port connection. After this connection has cooled, remove the nitrogen source from the liquid fitting service port.
4. Replace the Schrader core in the liquid and suction valves.
5. Leak test all refrigerant piping connections including the service port flare caps to be sure they are leak tight. **DO NOT OVER TIGHTEN** (between 40 and 60 inch -lbs. maximum).

CONNECTING REFRIGERANT PIPING LINES

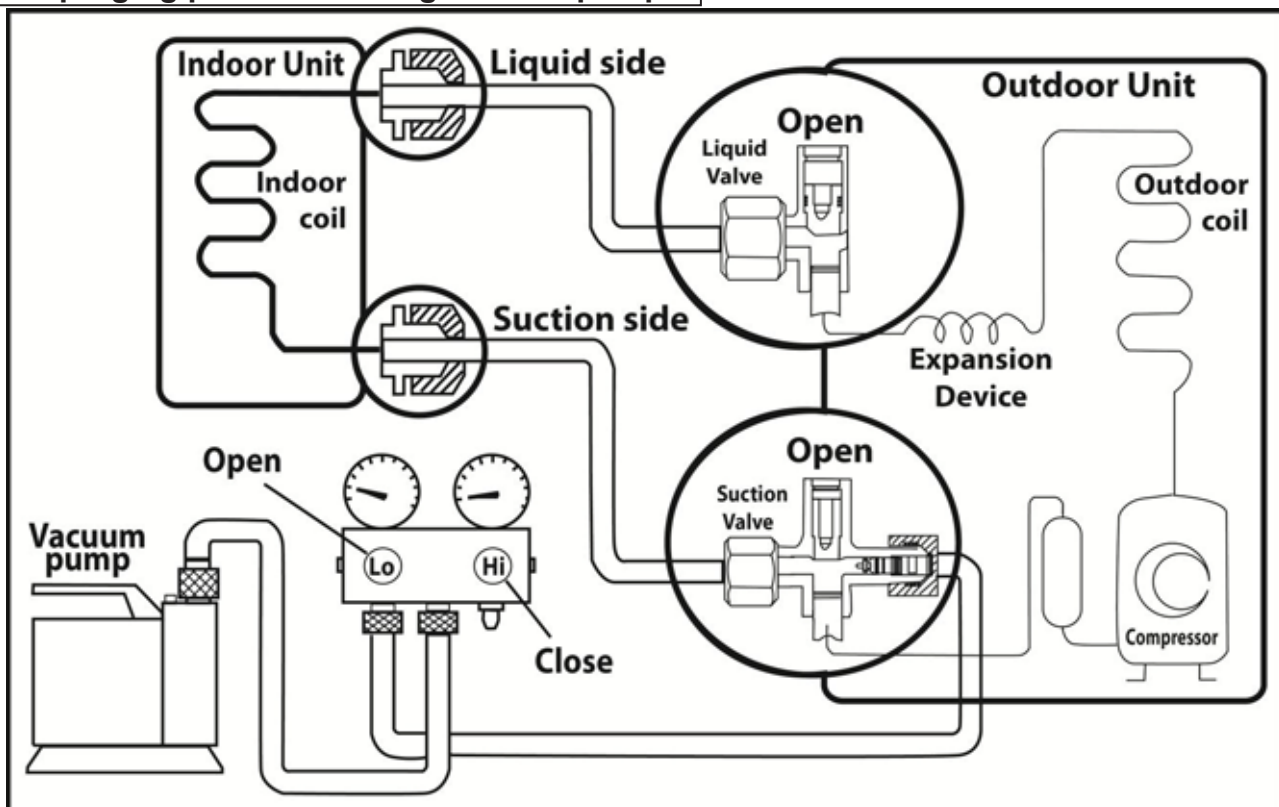
18.13 AIR PURGING OF INDOOR UNIT AND REFRIGERANT PIPING LINES USING VACUUM PUMP

NOTES

	NEVER use the unit refrigerant to purge the connecting pipes and indoor unit.
	NEVER use the system compressor as a vacuum pump.
	For the vacuum pump, check oil is filled up to the specified line of the oil gauge.

- The air in the indoor unit and in the refrigerant piping must be purged. If air remains in the refrigeration piping, it will have undesirable effects as indicated below :
 - Pressure in the system rises.
 - Operating current rises.
 - Cooling efficiency drops.
 - Moisture in the refrigerant circuit may freeze and block capillary tubing.
 - Water may lead to corrosion of parts in the refrigeration system.
- Be sure, using a torque wrench to tighten the service port cap (after using the service port), so that it prevents the suction leakage from the refrigeration cycle.
- No additional refrigerant charge has been provided in outdoor unit for air purge.

Air purging procedure using vacuum pump



Air purging procedure using vacuum pump

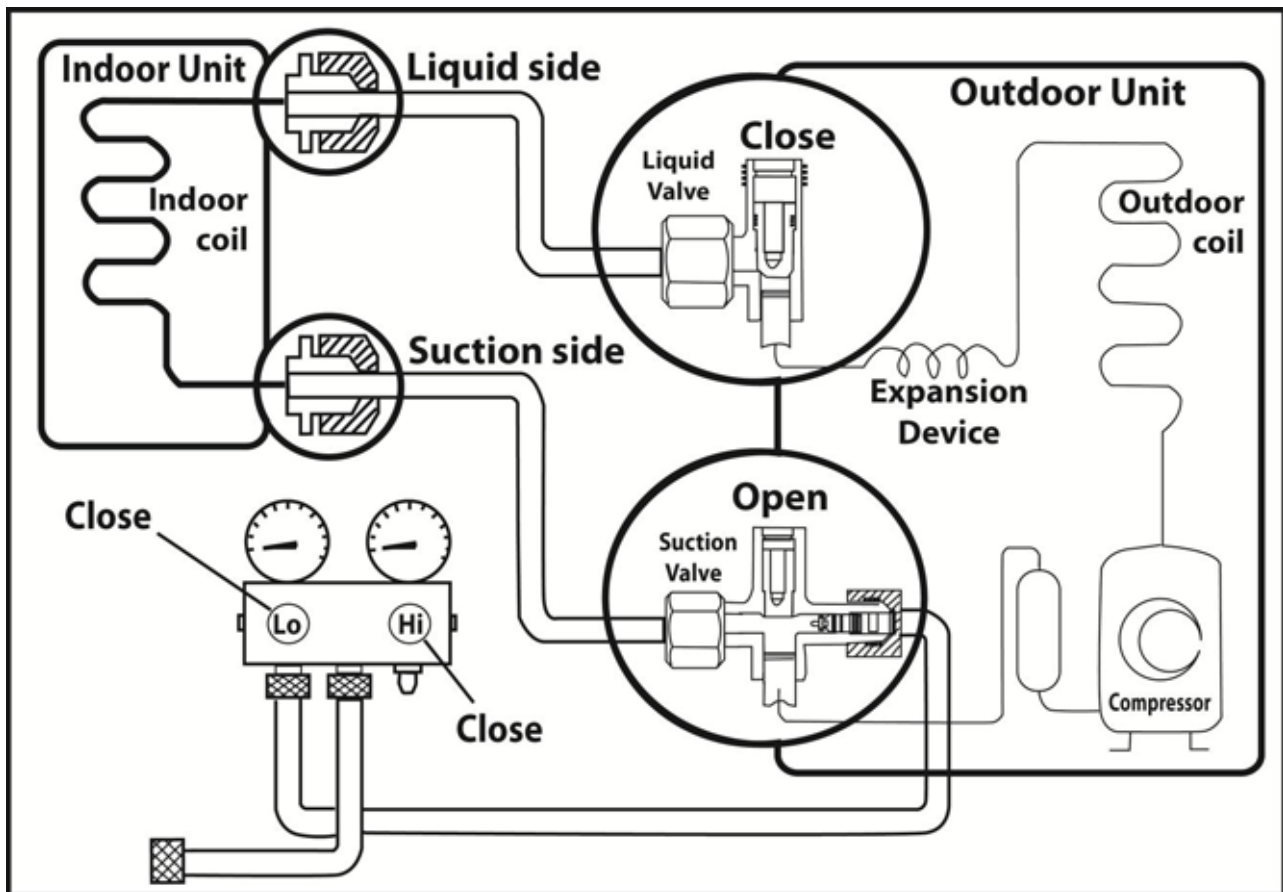
- Connect the vacuum pump to the charge set's centre hose.
- Evacuate for approximately one hour.
- Confirm that the gauge needle has moved toward -0.1 Mpa (-76 cmHg) [vacuum of 4 mmHg or less].
- Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- Disconnect the charge hose from the vacuum pump.
- Vacuum pump oil, if the vacuum pump oil becomes dirty or depleted, replenish as needed.

CONNECTING REFRIGERANT PIPING LINES

18.14 PUMPING DOWN (RE-INSTALLATION)

INTRODUCTION

- Pumping down means collecting all the refrigerant in the system back into the outdoor unit.
- Pumping down must be actuated before disconnection of pipes, to avoid loss of refrigerant suction.
- Pumping down is used when the system is moved to another installation location or when the system is repaired.



Pumping down Procedure

- (1) Confirm that both the liquid and suction valves are set to the open position.
 - Remove the valve stem caps and confirm that the valve stems are in the open position.
 - Be sure to use a hexagonal wrench to operate the valve stems.
- (2) Operate the system for 10 to 15 minutes.
- (3) Stop operation and wait for 3 minutes, then connect the charging set to the service port of the suction valve. Connect the charging hose with the push pin to the suction service port.
- (4) Air purging of the charging hose.
 - Open the low-pressure valve on the charge set slightly to purge air from the charging hose.
- (5) Set the liquid valve to the close position.
- (6) Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0.1MPa.
- (7) Immediately set the suction valve to the closed position.
 - Do this quickly so that the gauge ends up indicating 0.3 to 0.5Mpa.
- (8) Disconnect the charging set, and mount the liquid and suction valves stem nuts and service port caps. Use a torque wrench to tighten the service port cap to a torque of 1.8 kg.m (18 N.m)
 - Be sure to check for refrigerant leakage.

CONNECTING REFRIGERANT PIPING LINES

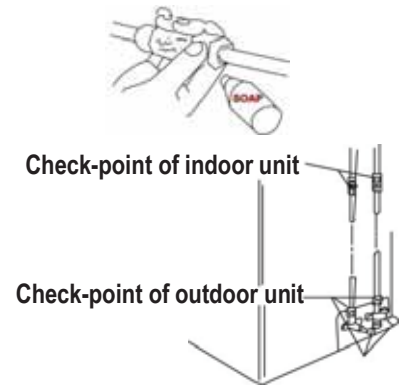
18.15 REFRIGERANT LEAK CHECK

After connecting the refrigerant piping lines with both outdoor and indoor units check the joints for refrigerant leak by using one of the following methods :-

(1) Soapy water method

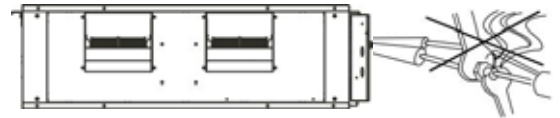
Apply soapy water or a liquid detergent on, the indoor unit connections or outdoor unit connections by a soft brush to check for refrigerant leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage and must be repaired.

(2) Refrigerant leak electronic detector method.



Note :

Avoid disconnecting refrigerant piping connections after they have been tightened to avoid refrigerant leaks.

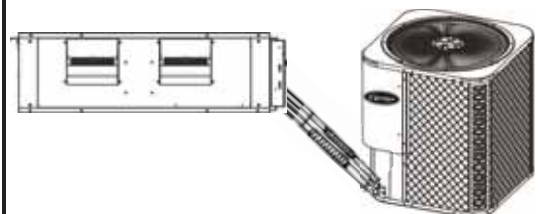
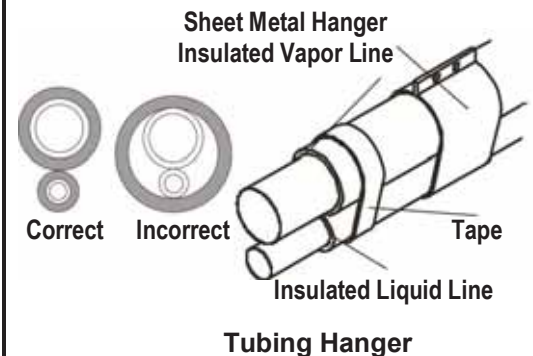


18.16 INSULATING REFRIGERANT PIPING LINES

- To conserve energy and prevent wet floors due to condensation, the suction and liquid piping lines must be well insulated with a proper insulation material.
- The thickness of the insulation should be a minimum of 12.7 mm.
- Tape and suspend the refrigerant piping lines as shown. Do not allow tube metal – to – metal contact
- Care must also be taken to isolate the refrigerant piping lines to minimize sound transmission from the system to the structure.
- The insulation you select must have good insulation characteristic, be easy to use, resist age and not easily absorb moisture.
- Finally wrap the pipes and pipes joints with insulation and tighten this with tape without exerting too much pressure on the insulation.

CAUTION:

- After a pipe has been insulated, never try to bend it into a narrow curve, as this way will cause the pipe to break or crack.
- Repair and cover any possible cracks in the insulation
- Avoid dripping due to insufficient insulation of piping.



18.17 RELEASING REFRIGERANT CHARGE ON TO THE SYSTEM.

- Open both the suction and liquid valves by removing the plunger cap and with a hex wrench back out counter-clockwise until valve stem just touches the chamfered retaining wall.

Replace plunger cap finger tight, then tighten an additional 1/12 turn (1/2 hex flat). Cap must be replaced to prevent leaks.



WARNING :-

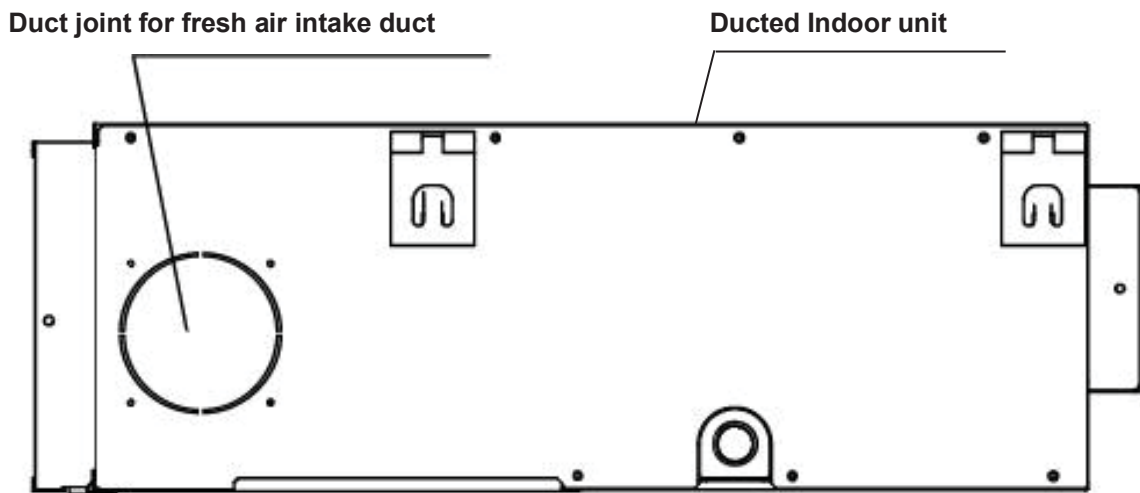
Never attempt to repair any brazed connections while the system is under pressure. Personal injury could result.

19. INSTALLATION OF FRESH AIR INTAKE DUCT FOR DUCTED INDOOR UNIT – MEDIUM STATIC PRESSURE

The ducted indoor unit - medium static pressure is fitted with a built-in fresh air intake knock out panel (from both sides) that can be utilized to introduce fresh air into the room.

This helps prevent the building of stale air and enhances air quality in working environments and enclosed applications without natural fresh air supply.

Location of fresh intake air knock out :



Dimensions of fresh air intake knock out :

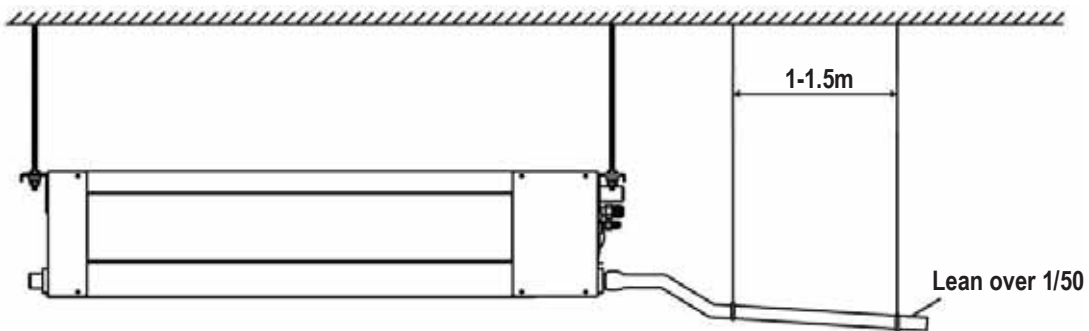
Ducted Indoor Unit Model	
42KDMT 12 – 18 – 24K	42KDMT 30 – 36
<p>Ø 90mm 80 mm 80 mm</p>	<p>Ø 125mm Ø 160mm</p>

20. INSTALLATION OF DRAIN LINE OF INDOOR UNIT

20-1 Installation of drain line of ducted indoor unit without drain pump

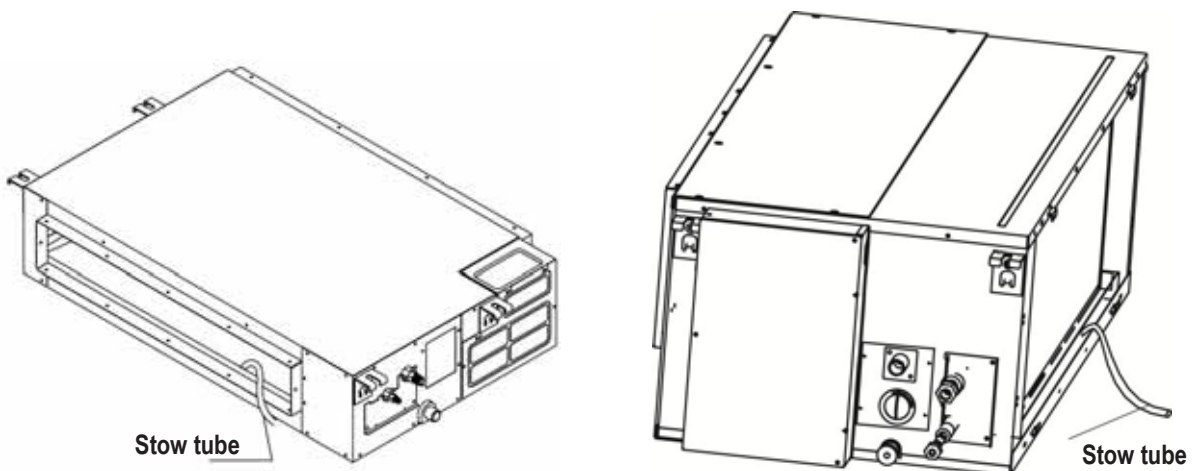
20-1-1 Instructions :

- ❑ You can use a polyethylene tube as the drain pipe (out-dia.29-31mm, in-dia.25mm). The drain pipe is field supplied.
- ❑ To prevent water from flowing backwards into the air conditioner while the air conditioner stops, the drain pipe must be sloped down toward outdoor (outlet-side) at a degree of over $1/50$. Also avoid any bulge or water deposit.
- ❑ Do not drag the drain pipe violently when connecting to prevent the body from being pulled. Meanwhile, one support point should be set every 1~1.5m to prevent the drainpipe from yielding. Or you can tie the drain pipe with the connecting pipe to fix it.
- ❑ In the case of prolonged drain pipe, you had better tighten its indoor part with a protection tube to prevent it from loosening.
- ❑ The end of the drain pipe should be over 50mm higher than the ground or the bottom of the drainage chute, and do not immerse it in water. If you discharge the water directly into sewage, be sure to make a U-form aqua seal by bending the pipe up to prevent the smelly gas entering the house through the drain pipe.



20-1-2 Drainage test

- ❑ Check whether the drain pipe is unhindered.
- ❑ New built house should have this test done before paving the ceiling.



20-1-3 Steps for drainage test

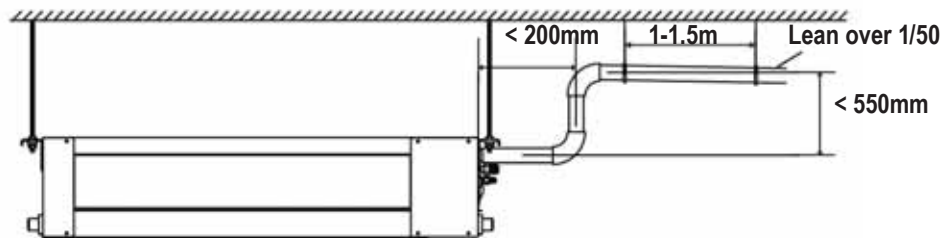
- ❑ Remove the test cover, and stow water of about 2000 ml to the water receiver through the stow tube, check whether the drain pipe is unhindered.

INSTALLATION OF DRAIN LINE OF INDOOR UNIT

20-2 Installation of drain line of ducted indoor unit with Optional drain pump

20-2-1 Instructions :

- ❑ You can use a polyethylene tube as the drain pipe (out-dia.29-31mm, in-dia.25mm).
The drain pipe is field supplied.
- ❑ To prevent water from flowing backwards into the air conditioner while the air conditioner stops, the drain pipe must be sloped down toward outdoor (outlet-side) at a degree of over 1/ 50. Also avoid any bulge or water deposit.
- ❑ Do not drag the drainpipe violently when connecting to prevent the body from being pulled. Meanwhile, one support point should be set every 1~1.5m to prevent the drain pipe from yielding. Or you can tie the drain pipe with the connecting pipe to fix it.
- ❑ In the case of prolonged drainpipe, you had better tighten its indoor part with a protection tube to prevent it from loosing.
- ❑ If the outlet of the drain pipe is higher than the body's pump joint, the pipe should be arranged as vertically as possible. And the lift distance must be less than 200mm, otherwise the water will overflow when the air conditioner stops. (Only available for the unit with pump.)
- ❑ The end of the drain pipe should be over 50mm higher than the ground or the bottom of the drainage chute, and do not immerse it in water. If you discharge the water directly into sewage, be sure to make a U-form aqua seal by bending the pipe up to prevent the smelly gas entering the house through the drain pipe.

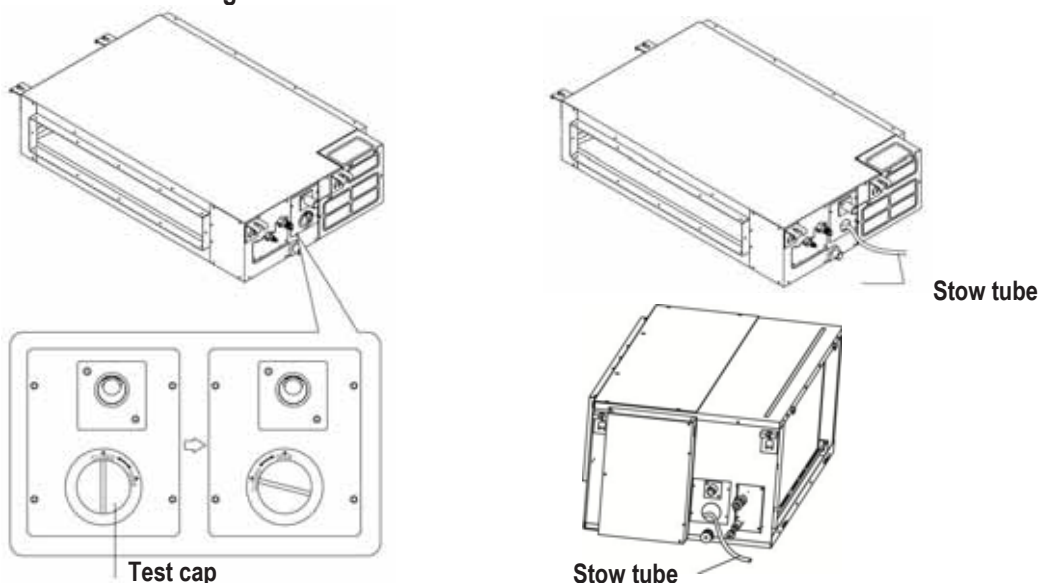


20-2-2 Drainage test

- ❑ Check whether the drain pipe is unhindered.
- ❑ New built house should have this test done before paving the ceiling.

20-2-3 Steps for drainage test

- (1) Remove the test cover (Rotate the test cover to opening up), and stow water of about 2000 ml to the water receiver through the stow tube.



- (2) Turn on the power, and operate the air conditioner under the "COOLING" mode.
Listen to the sound of the drain pump.
Check whether the water is discharged well (a lag of 1min is allowed before discharging, according to the length of the drain pipe), and check whether water leaks from the joints.
- (3) Stop the air conditioner, turn off the power, and reset the test cover to its original position.

21. CONNECTING ELECTRICAL WIRING

21-1 ELECTRICAL WIRING BETWEEN ELECTRICAL POWER SUPPLY AND CIRCUIT BREAKER OF AIR CONDITIONER

WARNING



All electrical connections between electrical power supply and circuit breaker of air conditioner are the responsibility of the customer and must be done by a qualified electrical technician according to national electrical wiring regulations to avoid fire due to short-circuiting.

(A) Operating Voltage

The operating voltage of electrical power supply should be within the limits of voltage mentioned on unit nameplate data.

(B) Electrical kWh Counter KWH

The capacity of electrical kWh counter should be larger than the operating currents required for air conditioner(s) and any other electrical domestic appliances in use simultaneously from the same supply.

(C) Electrical Distribution Box

The installation of electrical distribution box after the electrical KWH counter is necessary to properly distribute the electrical loads.

The electrical distribution box should be equipped with circuit breakers according to the electrical loads.

For each installed air conditioner, a separate circuit breaker with its own overload should be installed on the electrical distribution box.

(D) Operation On / Off Circuit Breaker

- The installation of two pole automatic circuit breaker is necessary to operate the air conditioner.
- The circuit breaker must be installed to be far away from any flammable materials (curtains...etc.).
- The circuit breaker must be suitable for air conditioner as the table " ELECTRICAL DATA " Page (68)
- Do not use operation ON / OFF circuit breakers except the approved models for use with air conditioners.

(E) Electrical Cable

- Do not use electrical connection cables except the approved for use with air conditioners.
- The power cable should be a complete unit, without extensions.
- The power cable size must be suitable for the air conditioner with length up to 10 meter. See table " ELECTRICAL DATA " page (68).

(F) Electrical Wiring

- a. Make ground connection prior to any other electrical connections in accordance with the electrical codes.
- b. Ensure that mains supply connection is made through a switch that disconnects all poles, with contact gap of at least 3 mm.
- c. Avoid slack connections of the electrical cords when connected to the terminal blocks of indoor and outdoor units. These slack connections lead to voltage drop and unit malfunctions.

CONNECTING ELECTRICAL WIRING

21-2 ELECTRICAL WIRING BETWEEN INDOOR UNIT, OUTDOOR UNIT AND CIRCUIT BREAKER OF AIR CONDITIONER

WARNING



All electrical works including selection, installation of circuit breaker of air conditioner and all electrical connections between the outdoor unit, indoor unit and circuit breaker are the responsibility of the qualified installer and must be done according to national electrical wiring regulations to avoid fire due to short circuiting.

- Both of the outdoor and indoor units leave the factory with complete internal electrical wiring. Do not change any internal electrical wiring of both units.
- It is very important before making the electrical connections between the indoor, outdoor units, and the power supply, to pay attention to the following safety instructions:

(A) Operating Voltage

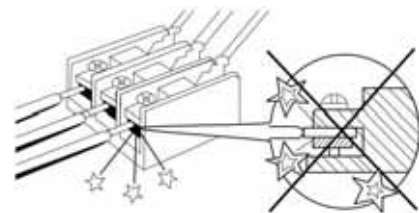
The operating voltage of electrical power supply should be within the limits of voltage mentioned on unit nameplate data shown on the indoor and outdoor units of the air conditioner.

(B) Field Electrical Connection Cables

- * Do not use electrical connection cables except the approved one for use with air conditioners.
- * Each cable should be a complete unit, without extensions.
- * Do not use extension cables, if extension cables are needed, use terminal block.

(C) Electrical Connections

- Electrical connections must be performed in compliance with national and local wiring codes and standards.
- Check that the electrical connections between the terminal blocks of indoor and outdoor units are in accordance with the wiring diagrams and caution field electrical wiring contained in the manual. Miswiring may cause malfunction of the system and an electric shock.
- Do not connect wires when power is ON.
- Make ground connection prior to any other electrical connections in accordance with the electrical local codes.
- Make electrical connections between outdoor and indoor units prior to proceeding to mains supply connection.
- Before proceeding with the unit connection to the mains supply locates live L and neutral N, then make connections as shown in the wiring diagram.
Be sure that the live and neutral wire connected respectively to the Live (L) and the Neutral (N) terminals of terminal block of outdoor units.
- Ensure that mains supply connection is made through a switch that disconnects all poles, with contact gap of at least 3 mm.
- Avoid slack connections of the electrical cables when connected to the terminal blocks of indoor and outdoor units. and also to circuit breaker These slack connections lead to voltage drop and unit malfunctions. Every wire must be connected firmly.



CONNECTING ELECTRICAL WIRING

21-3 ELECTRICAL DATA

Split System	Starting Current (Note 1)	System Power Supply	Electrical Consumption								Circuit Breaker
			Cooling								
Model			35 °C *		43 °C **		46 °C ***		52 °C ****		
Cool Only	Amp	V/Ph/Hz	Amp	Watt	Amp	Watt	Amp	Watt	Amp	Watt	Amp
53KDMT12N-718	30	220-240 / 1 / 50	4.7	1105	5.3	1235	5.6	1285	6.1	1383	16
53KDMT18N-718	44	220-240 / 1 / 50	6.6	1475	7.5	1690	7.9	1771	8.6	1952	20
53KDMT24N-718	57	220-240 / 1 / 50	9.0	1977	10.2	2275	10.7	2387	11.6	2611	25
53KDMT30N-718	85	220-240 / 1 / 50	14.9	3075	16.5	3503	17.1	3662	18.3	3980	32
53KDMT36N-718T	100	220-240 / 1 / 50	13.8	3080	16.3	3659	17.2	3876	19.0	4310	40
53KDHT42N-518T	45	380-420 / 3 / 50	5.4	3217	6.3	3801	6.6	4020	7.2	4458	25
53KDHT48N-518T	60	380-420 / 3 / 50	7.0	4065	7.9	4658	8.3	4879	9.0	5323	25
53KDHT60N-518T	66	380-420 / 3 / 50	8.4	4915	9.5	5540	9.9	5913	10.7	6454	25
53KDHT72N-518T	78	380-420 / 3 / 50	10.1	5840	10.4	6525	8.5	7209	12.6	7500	25

NOTES

1. Starting Current duration is usually less than 1 Second.

2. Operating Conditions.

* @ 35°C db outdoor temperature :
27/19°C db/wb Indoor Temperature. High air flow of indoor unit

** @ 43°C db outdoor temperature :
27/19°C db/wb Indoor Temperature. High air flow of indoor unit

*** @ 46°C db outdoor temperature :
29/19°C db/wb Indoor Temperature. High air flow of indoor unit

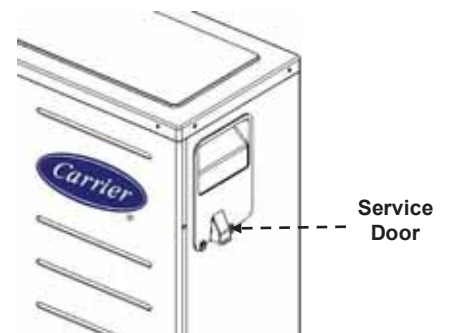
**** @ 52°C db outdoor temperature :
32/23°C db/wb Indoor Temperature. High air flow of indoor unit

CONNECTING ELECTRICAL WIRING

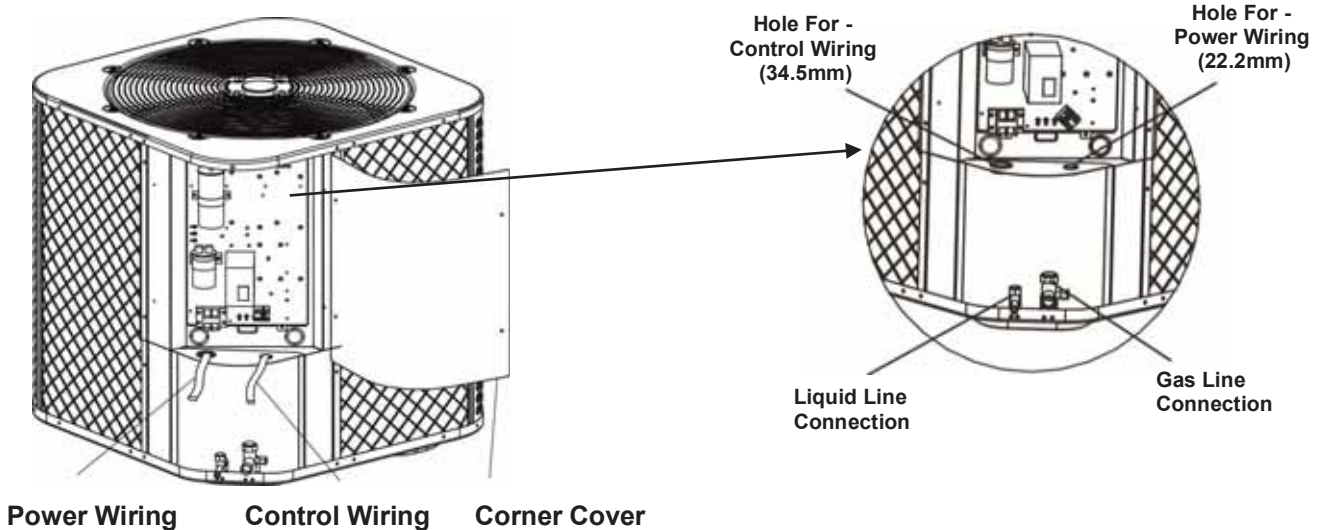
21-4 ELECTRICAL CONNECTING TO OUTDOOR UNIT

21.4.1 Description of Electrical Connections of Side Discharge Outdoor Unit

1. Remove the screw fixing service door.
And remove from unit.
2. Connect power cable to electrical box of outdoor unit
as per caution - field electrical wiring.
3. Connect control cable to electrical box of outdoor unit
as per caution - field electrical wiring.
4. Route wires from disconnect through openings provided
and into the unit electrical box.



21.4.2 Description of Electrical Connections of Top Discharge Outdoor Unit



1. Remove the screws at the side of the corner cover. Slide corner cover down and remove
from unit.
2. Connect power cable to electrical box of outdoor unit as per caution - field electrical wiring.
3. Connect control cable to electrical box of outdoor unit as per caution - field electrical wiring.
4. Route wires from disconnect through power wiring openings provided and into the unit
electrical box.

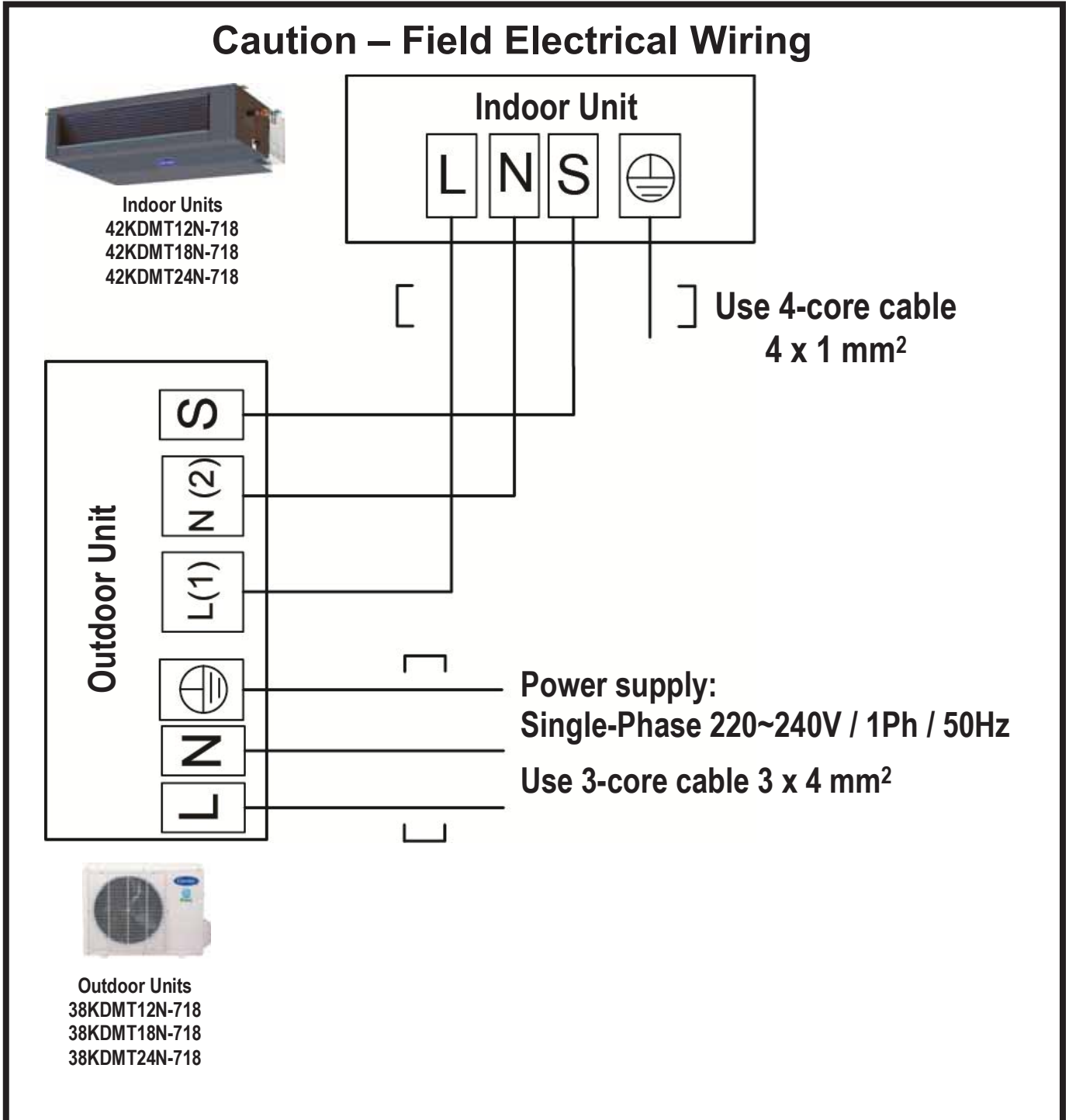
CONNECTING ELECTRICAL WIRING

21-5 Ducted Split Systems – Medium Static Pressure Cool Only – 220-240V / 1 Ph / 50Hz

53KDMT12N-718

53KDMT18N-718

53KDMT24N-718



NOTE

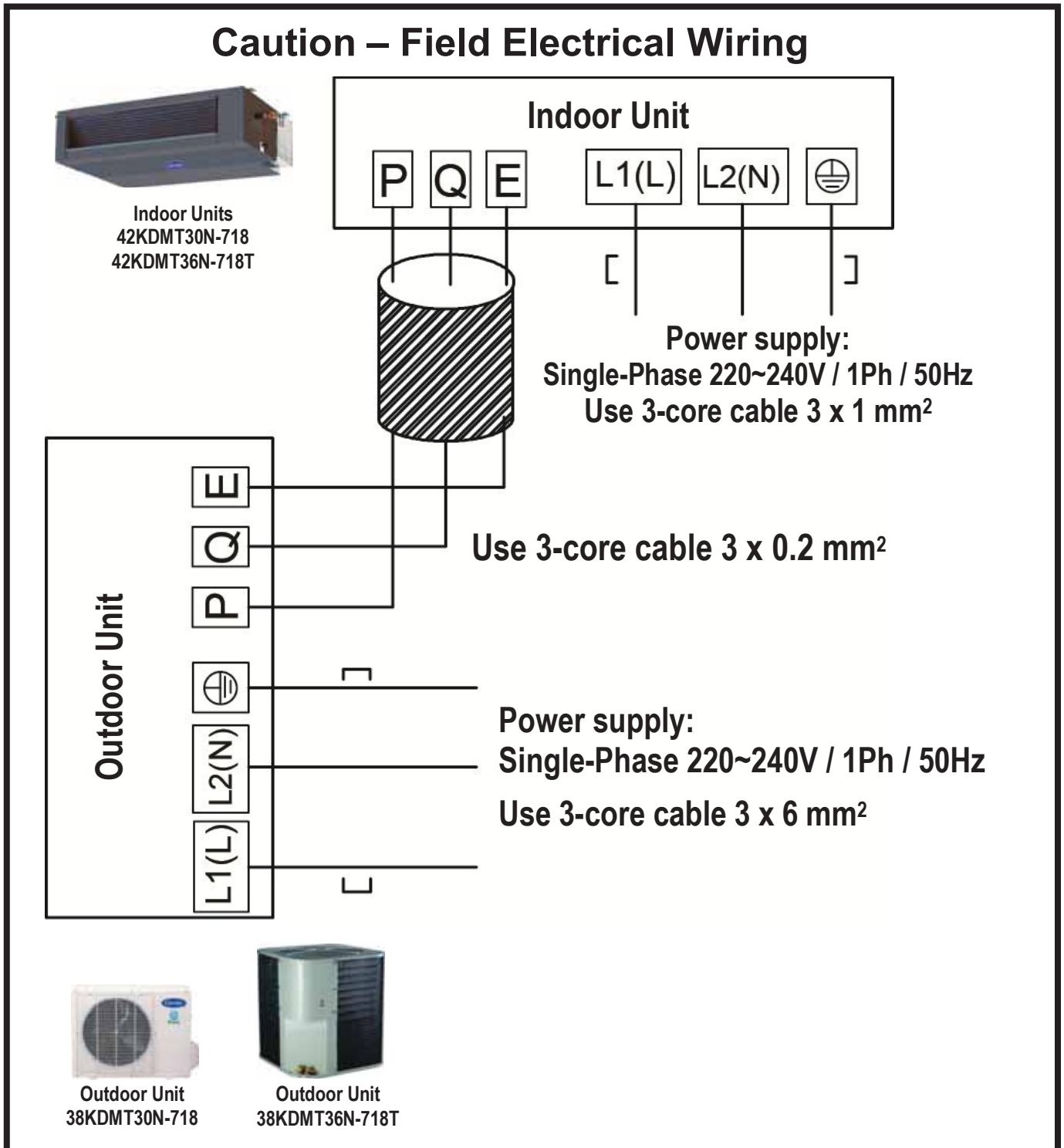
Refer to wiring diagrams and stickers-caution field electrical wiring stucked inside the outdoor and indoor units.

CONNECTING ELECTRICAL WIRING

21-6 Ducted Split Systems – Medium Static Pressure Cool Only – 220-240V / 1 Ph / 50Hz

53KDMT30N-718

53KDMT36N-718T



NOTE

Refer to wiring diagrams and stickers-caution field electrical wiring stucked inside the outdoor and indoor units.

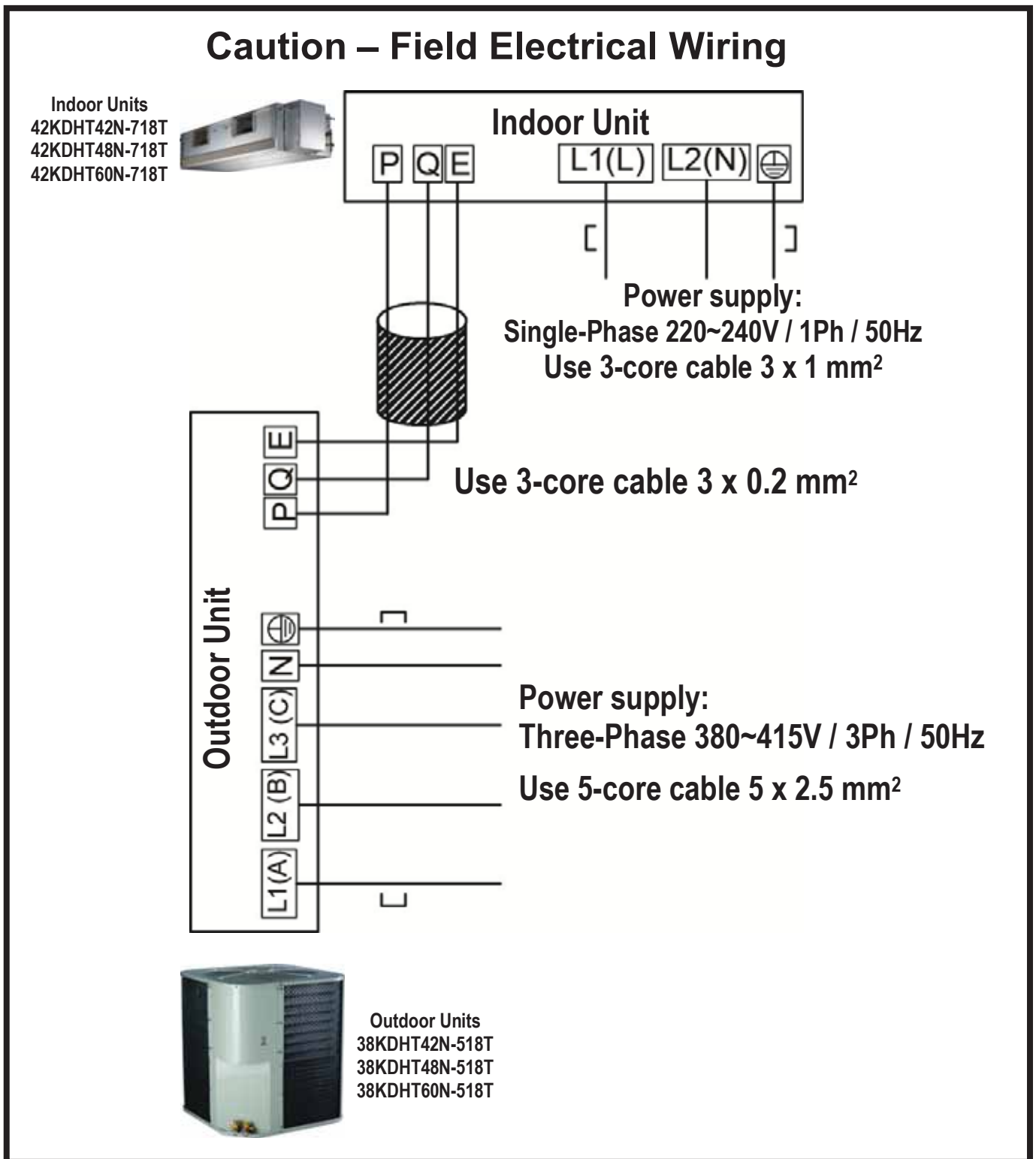
CONNECTING ELECTRICAL WIRING

21-7 Ducted Split Systems – High Static Pressure Cool Only – 380-415V / 3 Ph / 50Hz

53KDHT42N-518T

53KDHT48N-518T

53KDHT60N-518T



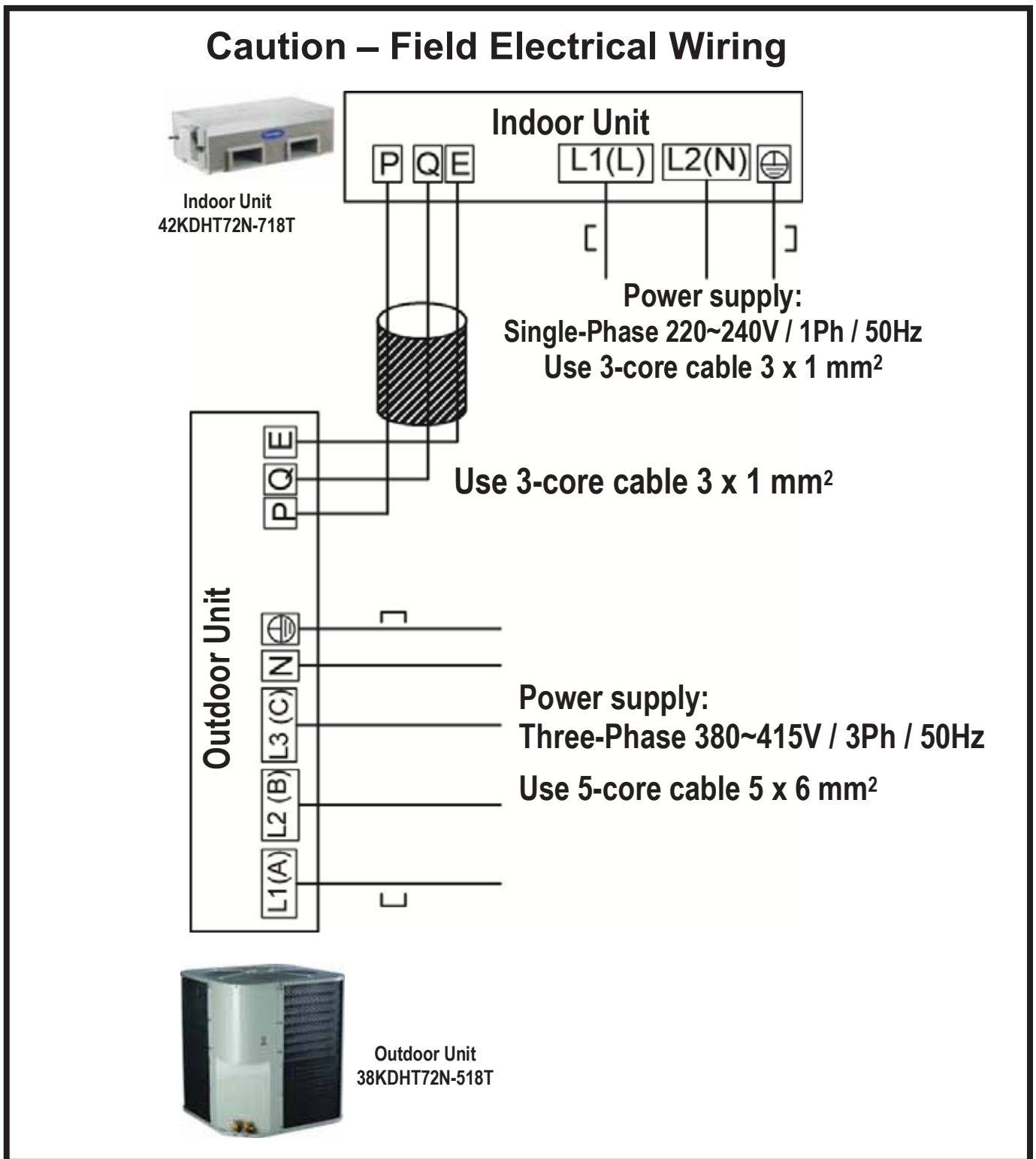
NOTE

Refer to wiring diagrams and stickers-caution field electrical wiring stuck inside the outdoor and indoor units.

CONNECTING ELECTRICAL WIRING

21-8 Ducted Split Systems – High Static Pressure
Cool Only – 380-415V / 3 Ph / 50Hz

53KDHT72N-518T



NOTE

Refer to wiring diagrams and stickers-caution field electrical wiring stucked inside the outdoor and indoor unit.

22. SETTING OF SWITCHES

Switch ENC1 : For Setting Cooling Capacity of Indoor Unit

- Switch ENC1 of the PCB of indoor unit is factory used to set the cooling capacity of indoor unit as per the unit model

Indoor unit models : 12K – 18K – 24K – 30K – 36K – 42K – 48K – 60K										Indoor unit model : 72K				
ENC1										ENC1				
CODE	3	4	5	7	8	C	9	A	B	Code	0	1	2	3
POWER	≤ 35	36-53	54-71	72-90	91-105	106-120	121-140	141-160	≥ 161	POWER	8HP	10HP	12HP	14HP
FACTORY SETTING	ACCORDING TO RELATED MODEL.									Factory Setting	According to related model			
Ducted Indoor Unit Model	ENC1 Factory Setting													
	Code	Setting												
42KDMT12N-718	3													
42KDMT18N-718	4													
42KDMT24N-718	5													
42KDMT30N-718	7													
42KDMT36N-718T	8													
42KDHT42N-718T	C													
42KDHT48N-718T	9													
42KDHT60N-718T	B													
42KDHT72N-718T	1													

Example : Ducted split system 53KDMT12N-718
Switch ENC1 is factory set at code 3, Cooling Capacity ≤ 35 i.e ≤ 3.5 Kw

SETTING OF SWITCHES (Cont.)

Switch ENC2 : for Setting Static Pressure Range of Indoor Unit

- Switch ENC2 of the PCB of indoor unit is factory used to set the Setting Static Pressure Range of indoor unit as per the unit model.
- Switch ECN2 : can be use in the field to adjust static pressure as per project requirement (Static pressure / Air flow).

Indoor unit models : 12K – 18K – 24K – 30K – 36K – 42K – 48K – 60K								Indoor unit model : 72K					
FOR SETTING STATIC PRESSURE								For Setting Static pressure					
ENC2								ENC2					
CODE	0	1	2	3	4	5	6	Code	0	1	2	3	4
STATIC PRESSURE(PA)	0	1-10	11-20	21-30	31-40	41-50	51-60	Static pressure	0-50	51-80	81-120	121-150	>150
ENC2								Factory Setting		<input checked="" type="checkbox"/>			
CODE	8	9	A	B	C	D	E						
STATIC PRESSURE(PA)	71-80	81-90	91-100	101-110	111-120	121-130	131-140						
Ducted Indoor Unit Model		ENC2 Factory Setting						Ducted Indoor Unit Model		ENC2 Factory Setting			
		Code	Setting					Code	Setting				
42KDMT12N-718		3						42KDHT72N-718T	1				
42KDMT18N-718		3											
42KDMT24N-718		3											
42KDMT30N-718		4											
42KDMT36N-718T		4											
42KDHT42N-718T		5											
42KDHT48N-718T		5											
42KDHT60N-718T		5											

Example : Ducted split system 53KDMT18N-718
Switch ENC2 is factory set at code 3, Static Pressure Range 21 ~ 30 Pascal

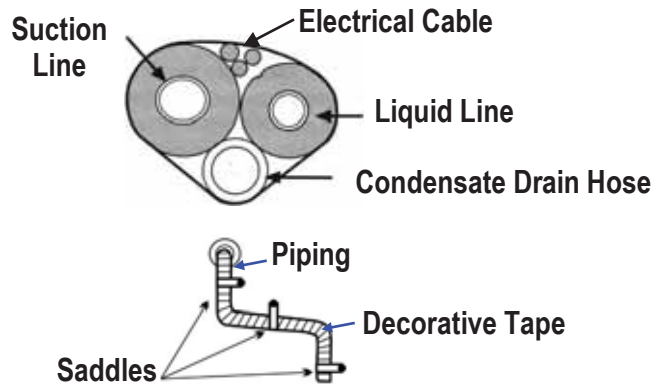
23. FINISHING INSTALLATION

FINISHING STEPS OF INSTALLATION

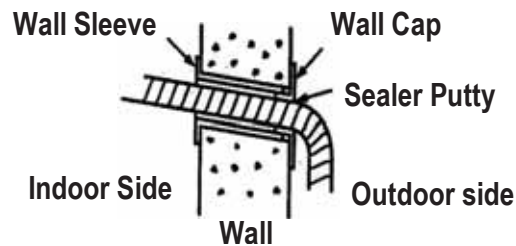
(1) Tie together refrigerant piping, condensate drain hose, electrical cables.

Form the refrigerant piping in the required direction and bind the condensate drain hose, electrical cables together with vinyl tape.

- The condensate drain hose should be always at the bottom of lump to assure smooth drainage.
- The lump must be of circular shape.
- Fix piping with pipe clamps and check that any pipe vibrations cannot be transmitted to the building structure.



(2) Fill the gap between the outside wall pipe hole and the piping with sealing wall sleeve, wall cap and sealer so that rain and wind cannot enter.



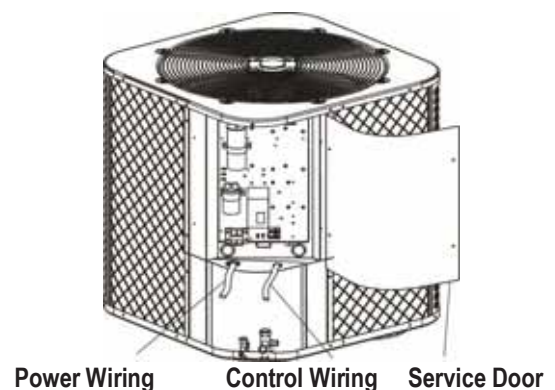
(3) After completion of electrical wiring to the outdoor unit:

- Fasten the electrical cables with the cable clamp.
- Install again the service door.

Side Discharge – Outdoor Unit



Top Discharge – Outdoor Unit



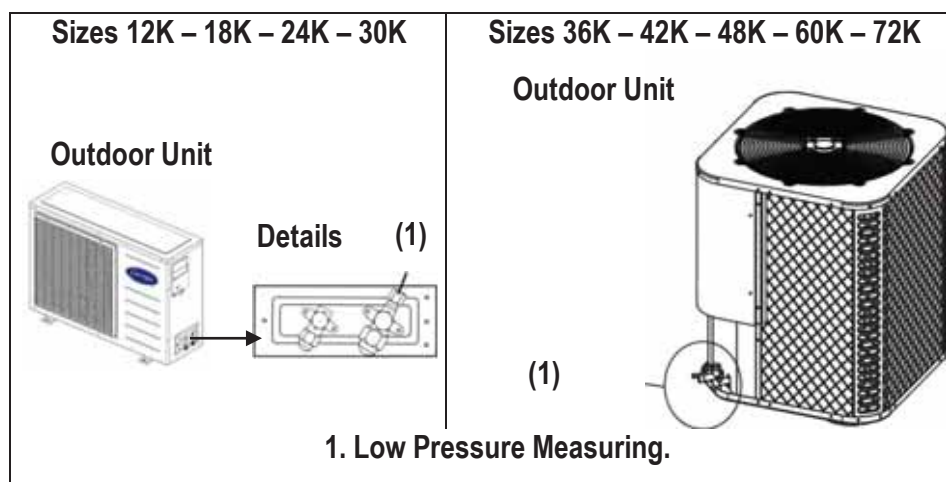
24. TEST RUNNING

24.1 NOTES

- Operate testing running after completion of connecting refrigerant piping lines, drain line and electrical wiring and refrigerant leak test.
- Operate test running after mounting air filters, and front panel of indoor unit.

24.2 STEPS FOR COOLING TEST RUNNING

- Move circuit breaker to ON position.
- Operate the system for cooling operation at high fan speed by using wired control.
- After system operation becomes stabilized:
 - Measure low pressure to check correct refrigerant charge. (See figure & table)
 - Measure total Amps consumed by the system.
 - Measure System working voltage.



System Cooling Test Running									
SYSTEM MODEL	53KDMT12N-718			53KDMT18N-718			53KDMT24N-718		
AMBIENT TEMP °C	35	46	52	35	46	52	35	46	52
LOW PRESSURE PSI	136	145	150	142	148	151	135	145	150.5
TOTAL AMPS	4.7	5.6	6.1	6.6	7.9	8.6	9.0	10.7	11.6
SYSTEM MODEL	53KDMT30N-718			53KDMT36N-718T			53KDHT42N-518T		
AMBIENT TEMP °C	35	46	52	35	46	52	35	46	52
LOW PRESSURE PSI	140	147	151	134	146	152.5	138	151	158
TOTAL AMPS	14.9	17.1	18.3	13.8	17.2	19.0	5.4	6.6	7.2
SYSTEM MODEL	53KDHT48N-518T			53KDHT60N-518T			53KDHT72N-518T		
AMBIENT TEMP °C	35	46	52	35	46	52	35	46	52
LOW PRESSURE PSI	140	150	155	129.5	140	146	130.5	140	165.9
TOTAL AMPS	7.0	8.3	9.0	8.4	9.9	10.7	10.1	11.7	12.6

NOTE

- Readings for system models 53KDMT 12 – 18 – 24 – 30 – 36 at 230 volt and 27 °C return air to indoor unit and high speed of indoor unit motor.
- Readings for system models 53KDHT 42 – 48 – 60 – 72 at 400 volt and 27 °C return air to indoor unit and high speed of indoor unit motor.

25. AFTER INSTALLATION CHECK LIST

25.1 INDOOR UNIT	
a. The selection of installation location is adequate.	<input type="checkbox"/>
b. The air filters are installed correctly.	<input type="checkbox"/>
c. The duct is installed securely.	<input type="checkbox"/>
25.2 OUTDOOR UNIT	
a. The selection of installation location is adequate.	<input type="checkbox"/>
b. The mounting support of outdoor unit is solidly mounted and leveled in horizontal & vertical direction.	<input type="checkbox"/>
c. The outdoor unit is fixed with the wall mounting support or floor mounting support.	<input type="checkbox"/>
d. The service door and its fixing screw are replaced.	<input type="checkbox"/>
25.3 REFRIGERANT PIPING LINES CONNECTIONS	
a. The refrigerant piping lines diameters are adequate with system model.	<input type="checkbox"/>
b. The insulation is wrapped on the coupling connections.	<input type="checkbox"/>
c. The air purge using vacuum pump is properly done.	<input type="checkbox"/>
d. The refrigerant piping lines are tested for refrigerant leakage.	<input type="checkbox"/>
e. The suction and liquid service valves in outdoor unit are open.	<input type="checkbox"/>
f. The cap nuts for flare valves are properly tightened.	<input type="checkbox"/>
25.4 CONDENSATE DRAIN LINE CONNECTIONS	
a. The condensate drain line from indoor unit is gradually inclined downwards to the outside.	<input type="checkbox"/>
b. The condensate water flow smoothly.	<input type="checkbox"/>
25.5 ELECTRICAL CONNECTIONS	
a. The operating voltage electrical power supply is in the voltage range shown on the unit's nameplates.	<input type="checkbox"/>
b. The sizes of electrical connection cords are adequate according to system model.	<input type="checkbox"/>
c. The size and type of unit circuit breaker are adequate according to system model.	<input type="checkbox"/>
d. The electrical wiring connections between power supply, outdoor unit, indoor unit and circuit breaker are adequate.	<input type="checkbox"/>
e. All fields electrical wiring connections are tightened and secured.	<input type="checkbox"/>
f. The earth wire is connected to the ground.	<input type="checkbox"/>

AFTER INSTALLATION CHECK LIST

25.6 FINISHING INSTALLATION

- a. The refrigerant piping lines, electrical cables and condensate drain hose are lumped together. The drain hose is at the bottom of the lump.
- b. The wall passage hole is properly sealed.

25.7 TESTING RUNNING

- a. The cooling cycle is tested
At least one complete cooling cycle of unit operation is observed.
- b. There is no any abnormal noise or vibration from the outdoor unit during operation.
- c. There is no any abnormal noise or vibration from the indoor unit during operation.
- d. The wired controller operates correctly

25.8 CUSTOMER GUIDANCE

- a. The correct operation of the air conditioner has been explained to the customer including the following points:
- Starting and stopping method
 - Operation mode adjustment
 - Temperature adjustment
 - Fan speed adjustment
 - Timer functions
 - Other control functions of wired controller
 - Filter removal and cleaning and replacement
- b. The owner's and installation manuals have been given to the customer.

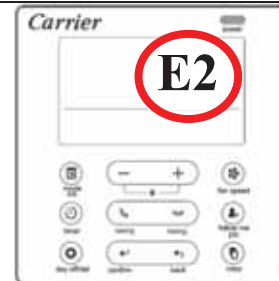
26. SELF DIAGNOSTIC FUNCTION FOR MALFUNCTIONS DETECTION



The electronic printed circuit board in the indoor unit is equipped with smart self diagnostic function which automatically stops the operation of the air conditioner in case of a malfunction.

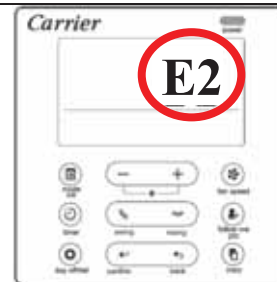
When the system is on and in a malfunction, Error Code is shown on the wired controller display to refer to malfunction reason for easy fast service and maintenance.

Wired controller used with models :
12K – 18K – 24K – 30K – 36K – 42K – 48K – 60K



Malfunction Reason	Malfunction Code
Outdoor unit malfunction (Phase reversal error or phase loss)	E0
Indoor and Outdoor communication malfunction	E1
Room temperature sensor (Open or short circuit)	E2
Indoor coil temperature sensor (Open or short circuit)	E3
Outdoor temperature sensor or coil temperature sensor (Open or short circuit) or High pressure protection	E5
Indoor PCB (EEPROM malfunction)	E7
Indoor DC motor out of control	E8
Water-level alarm malfunction (with optional drain pump)	EE
Other malfunction	EF

Wired controller used with model : 72K



Malfunction Reason	Malfunction Code
Mode conflict	E0
Indoor and Outdoor communication malfunction	E1
Room temperature sensor (Open or short circuit)	E2
Indoor coil first pipe temperature sensor (Open or short circuit)	E3
Indoor coil second pipe temperature sensor (Open or short circuit)	E4
Indoor DC motor out of control (check display panel for error fan protection)	
Indoor PCB (EEPROM malfunction)	E7
Outdoor unit malfunction (Phase reversal error or phase loss or other malfunction)	Ed
Water-level alarm malfunction (with optional drain pump)	EE

NOTES

- 1- Prior to the malfunction repair, disconnect the electrical mains supply by moving the circuit breaker to OFF position.
- 2- After repairing the malfunction, connect the electrical main supply by moving the circuit breaker to ON position and operate the air conditioner by using wired room controller.

SELF DIAGNOSTIC FUNCTION FOR MALFUNCTIONS DETECTION



The electronic printed circuit board in the indoor unit is equipped with smart self diagnostic function which automatically stops the operation of the air conditioner in case of a malfunction.

When the system is on and in a malfunction, Error Code is shown on the display & receiver panel to refer to malfunction reason for easy fast service and maintenance.



Display & receiver panel used with models :
12K – 18K – 24K – 30K – 36K – 42K – 48K – 60K

MALFUNCTION REASON	LED OPERATION	LED TIMER	LED DEF/FAN	LED ALARM	DISPLAY DIGITAL TUBE
Indoor and Outdoor communication malfunction	☆	X	☆	X	E1
Room temperature sensor (open or short circuit)	X	☆	X	X	E2
Indoor coil temperature sensor (open or short circuit)	☆	X	X	X	E3
Outdoor temperature sensor or coil temperature sensor (Open or short circuit) or (Phase reversal error or phase loss)	☆	☆	☆	☆	E6
Indoor PCB (EEPROM malfunction)	☆	☆	X	X	E7
Water-level alarm malfunction (with optional drain pump)	X	X	X	☆	E8
Indoor DC motor out of control	X	☆	X	☆	Eb
Refrigerant Leak or any malfunction leads to stopping of compressor operation	☆	X	X	☆	EC

Display & receiver panel used with model : 72K

MALFUNCTION REASON	LED OPERATION	LED TIMER	LED DEF/FAN	LED ALARM	DISPLAY DIGITAL TUBE
Mode conflict					E0
Indoor and Outdoor communication malfunction					E1
Room temperature sensor (Open or short circuit)					E2
Indoor coil first pipe temperature sensor (Open or short circuit)					E3
Indoor coil second pipe temperature sensor (Open or short circuit)					E4
Indoor DC motor out of control					E6
Indoor PCB (EEPROM malfunction)					E7
Outdoor unit malfunction (Phase reversal error or phase loss)					Ed
Water-level alarm malfunction (with optional drain pump)					EE

☆ = Flash at 5Hz

X = OFF

NOTES

- 1- Prior to the malfunction repair, disconnect the electrical mains supply by moving the circuit breaker to OFF position.
- 2- After repairing the malfunction, connect the electrical main supply by moving the circuit breaker to ON position and operate the air conditioner by using wired room controller.

SELF DIAGNOSTIC FUNCTION FOR MALFUNCTIONS DETECTION



The electronic printed circuit board in the outdoor unit is equipped with smart self diagnostic.

When the system is on and in a malfunction, Leds Status of Printed Circuit Board will refer to malfunction reason for easy fast service and maintenance.

Leds Status of Printed Circuit Board (PCB) of Side Discharge Outdoor Unit Model 38KDMT12N-718		
No.	Malfunction Reason	LED (red)
1	Indoor and Outdoor communication malfunction	flash 5 times
2	Normal operation	on

Leds status of Printed Circuit Board (PCB) of Side Discharge Outdoor Units Models 38KDMT18N-718 & 38KDMT24N-718 & 38KDMT30N-718		
No.	Malfunction Reason	LED (red)
1	Indoor and Outdoor communication malfunction	flash 5 times
2	Outdoor coil temperature sensor (open or short circuit)	flash 2 times
3	Normal operation	on

Leds status of Printed Circuit Board (PCB) of Top Discharge Outdoor Unit Model 38KDMT36N-718T				
No.	Malfunction Reason	LED 2 (green)	LED 3 (yellow)	LED 4 (red)
1	Normal operation	on	off	off
2	Stand by	off	on	off
3	Communication error	off	flash	flash
4	High pressure protection	flash	flash	off
5	Low pressure protection	flash	off	flash

Leds status of Printed Circuit Board (PCB) of Top Discharge Outdoor Units Models 38KDHT42N-518T & 38KDHT48N-518T & 38KDHT60N-518T				
No.	Malfunction Reason	LED 2 (green)	LED 3 (yellow)	LED 4 (red)
1	Normal operation	on	off	off
2	Stand by	off	on	off
3	Default phase	off	off	flash
4	Phase sequence error	off	flash	off
5	Communication error	off	flash	flash
6	High pressure protection	flash	flash	off
7	Low pressure protection	flash	off	flash
8	Disconnect suction pipe sensor compressor	on	off	on
9	Outdoor temperature sensor	flash	off	off
10	Outdoor coil temperature sensor	off	off	on
11	Do not install plug CN2	off	off	flash

Error code status of Printed Circuit Board (PCB) of Top Discharge Outdoor Unit Model 38KDHT72N-518T		
No.	Malfunction Reason	Error Code
1	Phase reversal error or phase loss	E1
2	Power Error	E4
3	Outdoor coil temperature sensor (open or short circuit)	E5
4	High pressure protection	P0
5	Low pressure protection	P1
6	Current Protection	P4
7	Outdoor coil temperature sensor (Failure)	P6
8	COOL Run	oN

NOTES

- 1- Prior to the malfunction repair, disconnect the electrical mains supply by moving the circuit breaker to OFF position.
- 2- After repairing the malfunction, connect the electrical main supply by moving the circuit breaker to ON position and operate the air conditioner by using wired room controller.

