Nortek Global HVAC, LLC

DC Inverter U-match Series Duct Type Unit

Owner's Manual

Heat Pump

Indoor Unit	Outdoor Unit
GDU18(5.3)USV2FL	GXH18(5.3)USV4DH
GDU24(7.0)USV2FL	GXH24(7.0)USV4DH
GDU30(8.8)USV2FL	GXH30(8.8)USV4DH
GDU36(10.6)USV2FL	GXH36(10.6)USV4DH
GDU42(12.3)USG2FL	GXH42(12.3)USV4DH
GDU48(14.1)USG2FL	GXH48(14.1)USV4DH

- Please read this owner's manual carefully before operation and retain it for future reference
- Specifications & illustrations subject to change without notice or incurring obligations

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1 Safety Precautions

⚠WARNING	WARNING NOTICE: Failure to comply with warning notice could result in property damage, serious personal injury or death.
⚠CAUTION	CAUTION NOTICE: Failure to comply with caution notice could result in property damage or personal injury.
NOTICE	NOTICE: Failure to comply with notice could result in property damage.

⚠WARNING	
(1).	Instructions for installation and use of this product are provided by the manufacturer.
(2).	Installation must be performed by authorized personnel only.
(3).	Please follow installation instructions as outlined in this manual..
(4).	Use appropriate pipe connection material and appropriate electrical cord as outlined in this manual..
(5).	Installation work must be performed in accordance with local and national wiring standards by authorized personnel only.
(6).	If refrigerant leaks while work is being carried out, ventilate the area. If the refrigerant comes in contact with a flame, it produces toxic gas.
(7).	Do not power on until all installation work is complete.
(8).	During installation, make sure that the refrigerant pipe is attached firmly before you run the compressor. ● Do not operate the compressor with 2-way or 3-way valve open. ● This may cause abnormal pressure in the refrigeration cycle that leads to compressor damage or personal injury
(9).	During the pump-down operation, make sure that the compressor is turned off before you remove the refrigerant piping. ● Do not remove the connection pipe while the compressor is in operation. ● This may cause abnormal pressure in the refrigerant cycle that leads to compressor damage or personal injury.
(10).	When installing the air conditioner, do not mix gases other than the specified refrigerant (R410A) to enter the refrigerant cycle. ● If air or other gas enters the refrigerant cycle, the pressure inside the cycle will rise to an abnormally high value and cause compressor damage or personal injury..
(11).	This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge.
(12).	Children should be supervised to ensure that they do not play with the appliance.
(13).	If the supply cord is damaged, it must be replaced with an appropriately sized cord.

2 Outline of the Unit and Main Parts

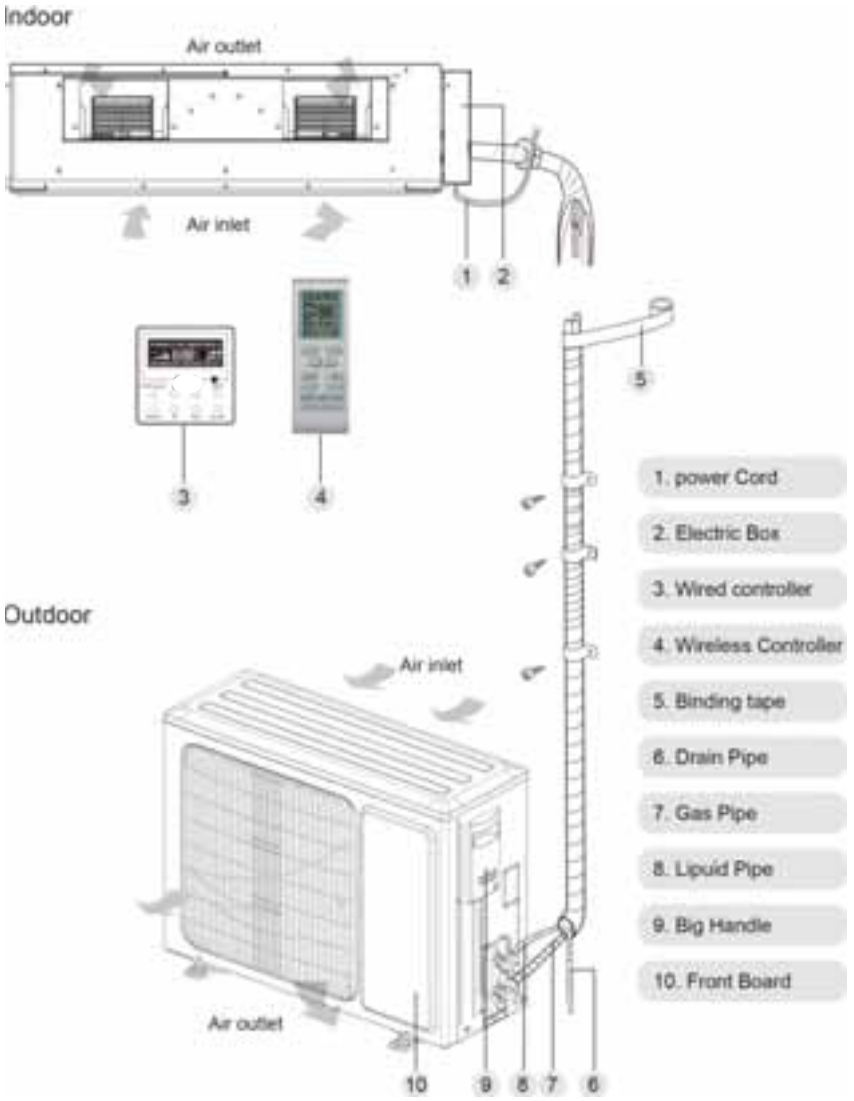


Fig. 2.1

NOTICE	
①.	Installer must properly connect refrigerant pipe, drain pipe, power cord, and ducworkt.
②.	The duct heater is arranged for use with rectangular duct.

3 Pre-Installation Check List

3.1 Standard Accessory Parts

The standard accessory parts listed below are furnished and should be used as described.

Table 3.1

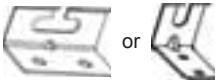
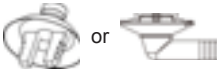
Indoor Unit Accessories				
No.	Name	Appearance	Q'ty	Usage
1	Wired Controller		1	To control the indoor unit
2	Screw		2	To fix the base plate of wired controller to the wall
3	Hanger		4	To fix the indoor unit
4	Nut with Washer		8	To fix the hook on the cabinet of the unit.
5	Nut with Washer		4	To fix the hook on the cabinet of the unit
6	Nut		4	To be used with the hanger bolt for installing the unit
7	Washer		4	To be used with the hanger bolt for installing the unit
8	Insulation		1	To insulate the gas pipe
9	Insulation		1	To insulate the liquid pipe
10	Fastener		4	To fasten the sponge
11	Sponge		2	To insulate the drain pipe
12	Nut		1	To connect liquid pipe
13	Nut		1	To connect gas pipe

Table 3.2

Outdoor Unit Accessories				
No.	Name	Appearance	Q'ty	Usage
1	Drain Plug		1 or 3	To plug the unused drain hole
2	Drainage Connecter		1	To connect with the hard PVC drain pipe

3.2 Selection of the Installation Location

⚠WARNING
①. Check the support structure to verify that it has sufficient load-carrying capacity to support the weight of the unit and it can be securely mounted..
②. Do not install where there is a danger of combustible gas leakage.
③. Do not install the unit near heat source, steam, or flammable gas.
④. Children should be kept away from unit..

Decide the installation location with the customer as follows:

3.2.1 Indoor Unit

(1). Check the support structure to verify that it has sufficient load-carrying capacity to support the weight of the unit.

(2). The air inlet and outlet of the unit should never be blocked so that the airflow can reach every corner of the room.

(3). Leave service space around the unit as required in Fig. 3.1.

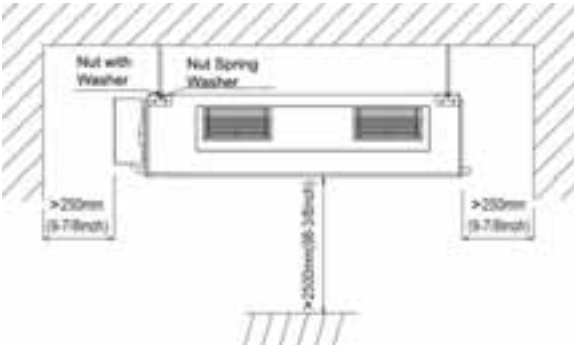


Fig. 3.1

(4). Install the unit where the drain pipe can be easily installed.

(5). The more space that is open above the unit, the easier it will be to service.

3.2.2 Outdoor Unit

⚠WARNING
①. Install the unit where it will not be tilted by more than 5°.
②. The outdoor unit should be securely mounted to withstand high wind..

(1). If possible, do not install the unit where it will be exposed to direct sunlight. (If necessary, install a blind that does not interfere with the air flow.)

(2). Install the outdoor unit in a place where it will be free from dirt or rain as much as possible.

(3). Install the outdoor unit where it is convenient to connect the indoor unit.

(4). Install the outdoor unit where the condensate water can be drained out freely during heating operation. Do not place animals and plants in the path of the warm air.

(5). Select a location where noise and vibration will be tolerated.

(6). Check the support structure to verify that it has sufficient load-carrying capacity to support the weight of the unit. Mount the unit securely to reduce vibration noise. .

(7). Provide the space shown in Fig. 3.2, so that the air flow is not blocked. Also for efficient operation, leave three of four directions of peripheral constructions open.

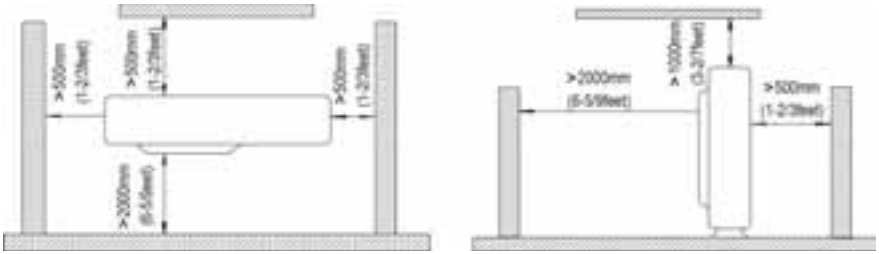


Fig. 3.2

3.3 Pipe Connection Requirement

⚠CAUTION
The maximum length of the connection pipe is listed in the table below. Do not place the units where the distance exceeds the maximum length of the connection pipe.

Table 3.3

Item / Model	Size of Fitting Pipe mm (inch)		Max. Pipe Length m (feet)	Max. Height Difference between Indoor Unit and Outdoor Unit m (feet)	Drainage pipe(Outer Diameter × wall thickness) mm (inch)
	Liquid	Gas			
GDU18(5.3)USV2FL GXH18(5.3)USV4DH	6(1/4)	12.7(1/2)	20(65-1/2)	15(49-1/4)	Φ30X1.5 (Φ1-1/8 X 0.06)
GDU24(7.0)USV2FL GXH24(7.0)USV4DH	9.5(3/8)	16(5/8)	30(98-1/2)	15(49-1/4)	Φ20X1.2 (Φ3/4 X 0.05)
GDU30(8.8)USV2FL GXH30(8.8)USV4DH	9.5(3/8)	16(5/8)	30(98-2/5)	15(49-1/5)	Φ20X1.2 (Φ3/4 X 6/125)
GDU36(10.6)USV2FL GXH36(10.6)USV4DH	9.5(3/8)	16(5/8)	30(98-1/2)	15(49-1/4)	Φ20X1.2 (Φ3/4 X 0.05)
GDU42(12.3)USG2FL GXH42(12.3)USV4DH	9.5(3/8)	16(5/8)	50(164)	30(98-2/5)	Φ20X1.2 (Φ3/4 X 6/125)
GDU48(14.1)USG2FL GXH48(14.1)USV4DH	9.5(3/8)	16(5/8)	50(164)	30(98-1/2)	Φ20X1.2 (Φ3/4 X 0.05)

Notes:

① The connection pipe should be insulated with proper water-proof material.

② The pipe wall thickness shall be 0.5~1.0mm (0.02~0.04 inch) and the pipe wall shall be able to withstand the pressure of 6.0MPa (870psig). The shorter the connecting pipe, the better the cooling and heating effect.

3.4 Electrical Requirement

Electric Wire Size and Fuse Capacity.

Table 3.4

Indoor Units	Power Supply	Fuse Capacity	Minimum Circuit Ampacity	Maximum Overcurrent Protection
	V/Ph/Hz	A	A	A
GDU18(5.3)USV2FL	208/230V ~ 60Hz	5	1	15
GDU24(7.0)USV2FL	208/230V ~ 60Hz	5	2	15
GDU30(8.8)USV2FL	208/230V ~ 60Hz	5	2	15
GDU36(10.6)USV2FL	208/230V ~ 60Hz	5	3	15
GDU42(12.3)USG2FL	208/230V ~ 60Hz	5	3	15
GDU48(14.1)USG2F	208/230V ~ 60Hz	5	5	15

Table 3.5

Outdoor Units	Power Supply	Fuse Capacity	Minimum Circuit Ampacity	Maximum Overcurrent Protection
	V/Ph/Hz	A	A	A
GXH18(5.3)USV4DH	208/230V ~ 60Hz	5	17	25
GXH24(7.0)USV4DH	208/230V ~ 60Hz	5	24	40
GXH30(8.8)USV4DH	208/230V ~ 60Hz	5	24	40
GXH36(10.6)USV4DH	208/230V ~ 60Hz	5	29	45
GXH42(12.3)USV4DH	208/230V ~ 60Hz	5	31	50
GXH48(14.1)USV4DH	208/230V ~ 60Hz	5	45	70

Notes:

①. The fuse is located on the main board.

②. Install the disconnect device with a contact gap of at least 3mm (1/8inch) in all poles nearby the units (Both indoor unit and outdoor unit).The appliance must be positioned so that the plug is accessible.

③. Use 2 pieces of power cord of 0.75mm^2 (AWG18) as the communication lines between indoor and outdoor unit, with their longest lengths of 50m (164 feet). Please select the appropriate line length per the actual installation conditions. The communication lines cannot be twisted together. For the unit (≤30k), it's recommended to use 8m (26feet) long communication line.

④. Take 2 pieces of power cord of 0.75mm^2 (AWG18) as the communication lines

between the wired controller and the indoor unit, with their longest lengths of 30m (98-1/2 feet). Please select the appropriate line length per the actual installation conditions. The communication lines cannot be twisted together. It's recommended to use 8m (26 feet) long communication line.

⑤. The wire size of the communication line should be no less than 0.75mm^2 (AWG18). It's recommended to take 0.75mm^2 (AWG18) power cords as the communication line.

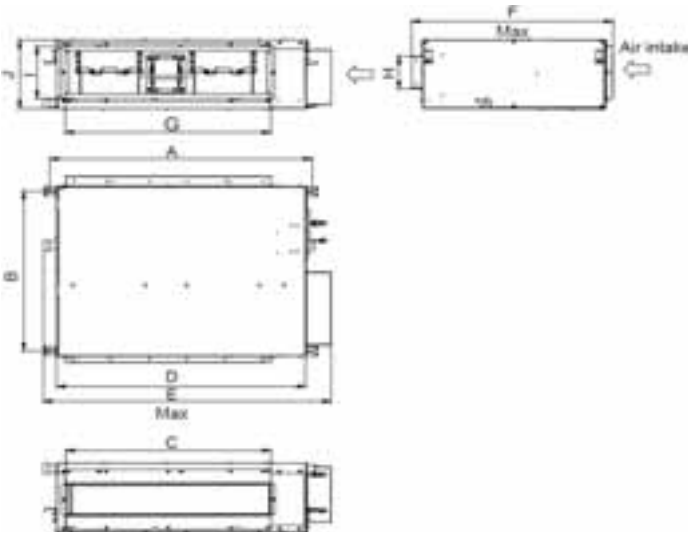
4 Installation of the Unit

4.1 Installation of the Indoor Unit

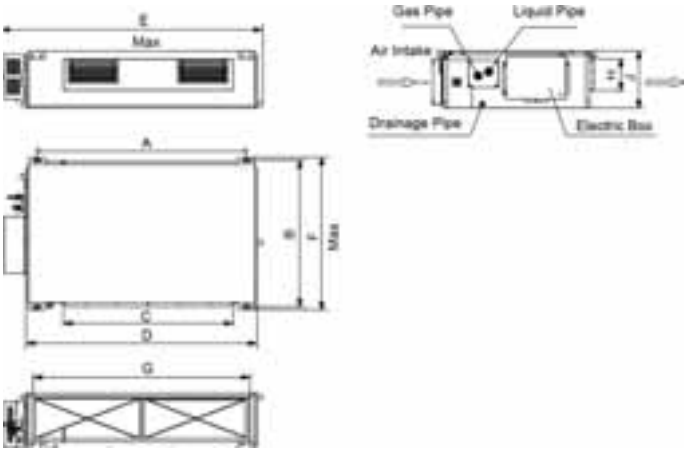
4.1.1 Indoor unit dimension

⚠WARNING
①. Verify that the installation location has sufficient load-carrying capacity to support five (5) times the weight of the indoor unit. Mount on surface that will not amplify sound or vibration..
②. If the unit is not mounted securely, the indoor unit may fall and cause injuries.
③. If the job is done with the panel frame only, there is a risk that the unit will come loose.

For the units: GDU18(5.3)USV2FL



For the units: GDU24(7.0)USV2FL ~ GDU42(12.3)USG2FL



For the units: GDU48(14.1)USG2F

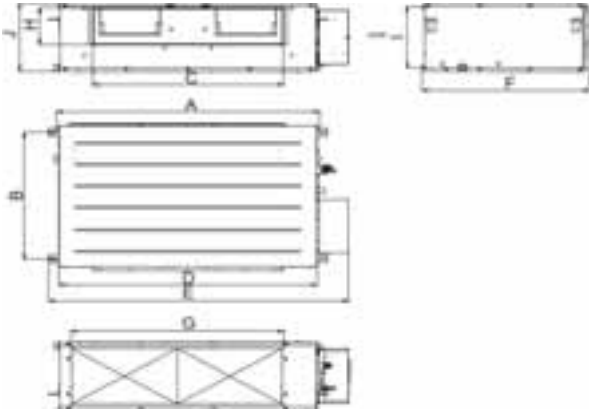


Fig. 4.1

Table 4.1 Unit: mm (inch)

Item / Model	A	B	C	D	E	F	G	H	I	J
GDU18(5.3)USV2FL	945 (37-1/4)	618 (24-3/8)	738 (29)	892 (35-1/8)	1037 (40-7/8)	721 (28-3/8)	738 (29)	125 (4-7/8)	203 (8)	266 (10-1/2)
GDU24(7.0)USV2FL	1101 (43-3/8)	517 (20-3/8)	820 (32-1/4)	1159 (45-5/8)	1279 (50-3/8)	558 (22)	1002 (39-1/2)	160 (6-1/4)	235 (9-1/4)	268 (10-1/2)
GDU30(8.8)USV2FL										
GDU36(10.6)USV2FL	1011 (39-3/4)	748 (29-1/2)	820 (32-1/4)	1115 (43-7/8)	1226 (48-1/4)	775 (30-1/2)	979 (38-1/2)	160 (6-1/4)	231 (9-1/8)	290 (11-3/8)
GDU42(12.3)USG2FL										
GDU48(14.1)USG2FL	1177 (46-3/8)	646 (25-3/8)	852 (33-1/2)	1150 (45-1/4)	1340 (52-3/4)	750 (29-1/2)	953 (37-1/2)	190 (7-1/2)	316 (12-1/2)	350 (13-3/4)

4.1.2 Drilling Holes for Bolts and Installing the Bolts

Using the installation template, drill holes for bolts (four holes) (Fig. 4.2).

4.1.3 Installing the Suspension Bolts

(1). Install the bolts to the ceiling at a place strong enough to hang the unit. Mark the bolt positions from the installation template. With a concrete drill, drill four 12.7mm (1/2inch) diameter holes (Fig. 4.3).

(2). Insert the anchor bolts into the drilled holes, and drive the pins completely into the anchor bolts with a hammer (Fig. 4.4).

(3). Install the hanger to the unit (Fig. 4.5).

(4). Pass the unit hangers over the bolts installed to the ceiling and install the unit with the special nut (Fig. 4.6).

Fig.4.2

Fig.4.3

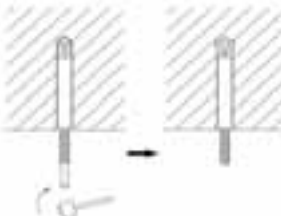


Fig.4.4

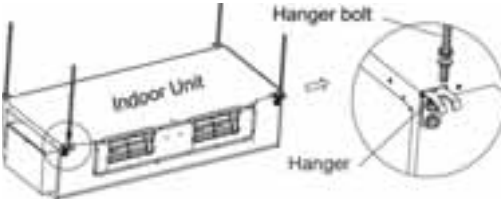


Fig.4.5

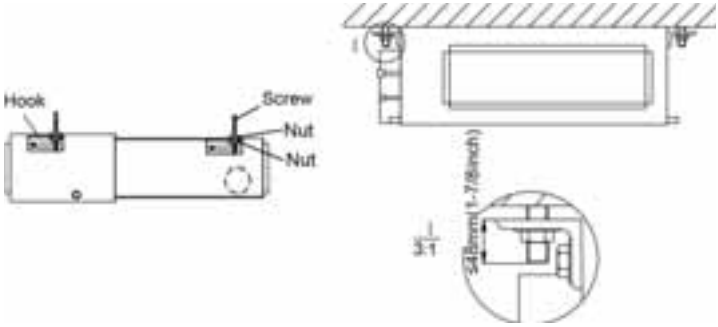


Fig.4.6

4.1.4 Leveling

The water level test must be done after installing the indoor unit to make sure the unit is level, as shown below.

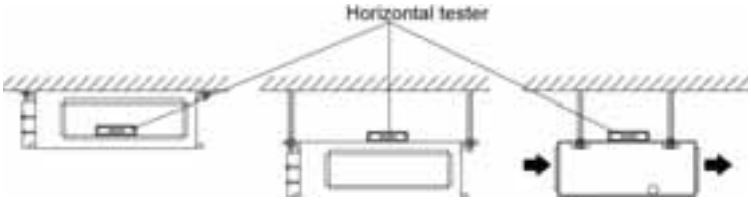


Fig. 4.7

4.2 Installation of the Outdoor Unit

⚠WARNING
①. Install the unit where it will not be tilted by more than 5°.
②. During installation, if the outdoor unit has to be exposed to strong wind, it must be fixed securely.

4.2.1 Outdoor unit dimension

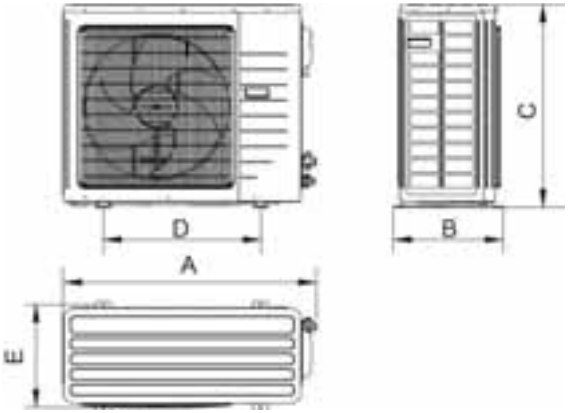


Fig. 4.8

Table 4.2 Unit: mm (inch)

Item / Model	A	B	C	D	E
GXH18(5.3)USV4DH	955(37-5/8)	396(15-5/8)	700(27-1/2)	560(22)	360(14-1/8)
GXH24(7.0)USV4DH	980(38-5/8)	427(16-3/4)	790(31-1/8)	610(24)	395(15-1/2)
GXH30(8.8)USV4DH					
GXH36(10.6)USV4DH	1107(43-5/8)	440(17-3/8)	1100(43-1/4)	631(24-7/8)	400(15-3/4)
GXH42(12.3)USV4DH	958(37-3/4)	412(16-1/4)	1349(53-1/8)	572(22-1/2)	376(14-3/4)
GXH48(14.1)USV4DH					

4.2.2 Condensate Drainage of the Outdoor Unit (for the heat pump unit only) (Fig. 4.9)

(1). It is required to install a drain pipe for the outdoor unit to drain condensate water during heating operation (only for the heat pump unit).

(2). All holes, with the exception of the drain pipe hole, should be plugged so as to avoid water leakage (only for the heat pump unit).

(3). Installation Method: Insert the pipe joint into the φ25mm (1inch) hole located at the base plate of the unit and then connect the drain pipe to the pipe joint.

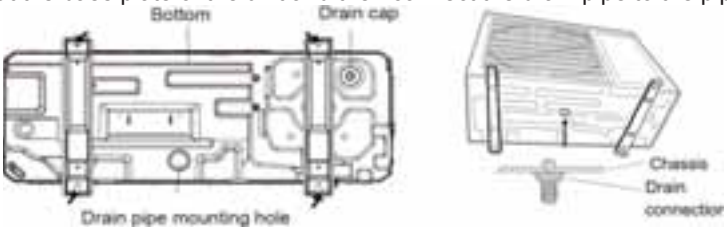


Fig. 4.9

4.3 Installation of the Connection Pipe

4.3.1 Flare Process

(1). Cut the connection pipe with pipe cutter and remove the burrs.

(2). Hold the pipe downward to prevent cuttings from entering the pipe.

(3). Remove the flare nut from the stop valve on the outdoor unit. Get another flare nut from the accessory bag for the indoor unit. Insert pipe through flare nuts. Flare the connection with a flaring tool.

(4). Check if the flare part is spread evenly and there are no cracks (see Fig. 4.10).

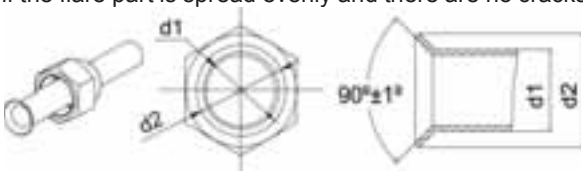


Fig. 4.10

4.3.2 Bending Pipes

(1). Extend the pipe by hand. Be careful not to crimp it.

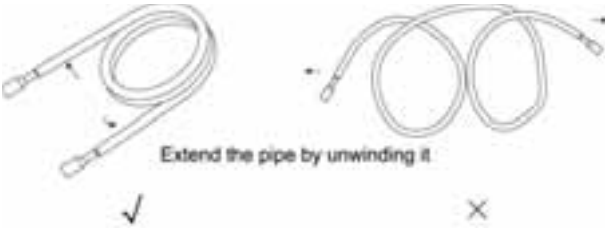


Fig. 4.11

(2). Do not bend the pipes in an angle more than 90°.

(3). When pipes are repeatedly bent or stretched, the material will weaken making it more likely to break. Do not bend or stretch the pipes more than three times.

(4). For best results, cut insulation before bending, as shown in fig. 4.12. Bend pipe as needed and secure insulation with tape.

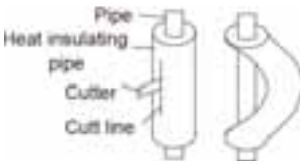


Fig. 4.12

⚠CAUTION
①. To prevent breaking of the pipe, avoid sharp bends. Bend the pipe with a radius of curvature of 150mm (5-7/8inch) or more.
②. If the pipe is bent repeatedly at the same place, it will break.

4.3.3 Connecting the Pipe at the Indoor Unit Side

Detach the caps and plugs from the pipes.

⚠CAUTION
①. Be sure to attach the pipe on the indoor unit correctly. Center the flare nut on the fitting before tightening. Do not force the nut to turn or the threads will be damaged and the system will leak.
②. Do not remove the flare nut until the connection pipe is to be connected so as to prevent dust and impurities from coming into the pipe system.

Centering the pipe against port on the indoor unit and turn the flare nut with your hand.

⚠CAUTION
Hold the torque wrench at its grip, keeping it in the right angle with the pipe as shown in Fig. 4.13, in order to tighten the flare nut correctly.

When the flare nut is tightened properly by your hand, use a torque wrench to finish tightening it.

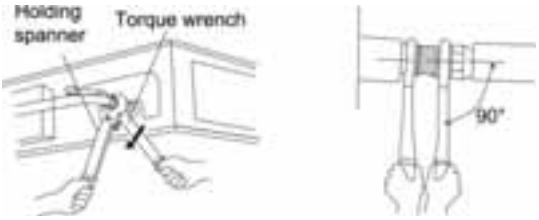


Fig. 4.13

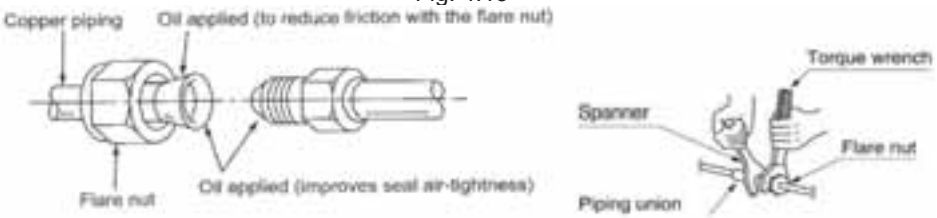


Fig. 4.14

Table 4.3 Flare nut tightening torque

Pipe Diameter	Tightening Torque
6mm (1/4inch)	15~30N·m (11~22ft.-lb.)
9.5mm (3/8inch)	35~40N·m (26~29ft.-lb.)
12.7mm (1/2inch)	45~50N·m (33~37ft.-lb.)
16mm (5/8inch)	60~65N·m (44~48ft.-lb.)

⚠CAUTION
Be sure to connect the gas pipe after connecting the liquid pipe completely.

4.3.4 Connecting the Pipe at the Outdoor Side Unit

Tighten the flare nut of the connection pipe at the outdoor unit valve connector. The tightening method is the same as that as at the indoor side.

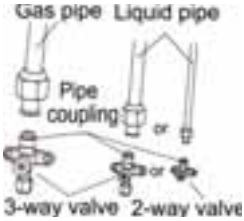


Fig. 4.15

4.3.5 Checking the Pipe Connections for Gas Leaks

For both indoor and outdoor unit, be sure to check the joints for gas leaks with a gas leakage detector.

4.3.6 Heat Insulation on the Pipe Joints (Indoor Side Only)

Attach coupler heat insulation (large and small) to the pipe connections.

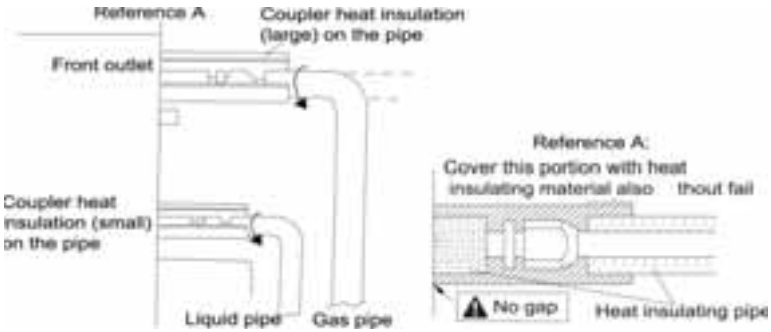


Fig. 4.16

4.3.7 Liquid Pipe and Drain Pipe

(1). If the outdoor unit is installed lower than the indoor unit (See Fig. 4.17)

1). A drain pipe should terminate above ground level without being submersed into water. All pipes must be attached to the wall with clamps.

2). Wrap tape around pipe starting at the bottom and working up.

3). All pipes must be bound together by tape and attached to wall with clamps.

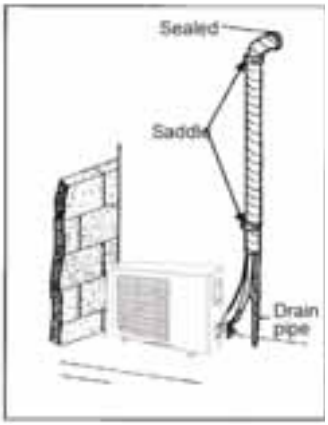


Fig. 4.17

(2). If the outdoor unit is installed higher than the indoor unit (See Fig. 4.18)

1). Wrap tape from the lower end working up..

2). All pipes must be bound and taped together. A trap must be installed to prevent water from returning to the room.

3). Attach all pipes to the wall with clamps.

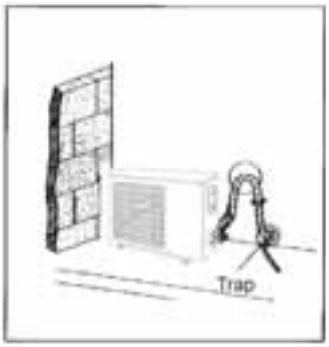


Fig. 4.18

4.4 Vacuum and Gas Leakage Inspection

⚠CAUTION
Do not purge the air with refrigerants but use a vacuum pump to vacuum the installation! There is no extra refrigerant in the outdoor unit for air purging!

4.4.1 Vacuum

(1). Remove the caps of the liquid valve, gas valve and also the service port.

(2). Connect the hose at the low pressure side of the manifold valve assembly to the service port of the unit's gas valve. The gas and liquid valves should be kept closed in case of refrigerant leak.

(3). Connect the hose used for evacuation to the vacuum pump.

(4). Open the switch at the lower pressure side of the manifold valve assembly and start the vacuum pump. The switch at the high pressure side of the manifold valve assembly should be kept closed, otherwise evacuation would fail.

(5). The evacuation duration depends on the unit's capacity, generally, 20 minutes for the 18k units, 30 minutes for the 24k/36k units, 45 minutes for the 48k units. Verify that the pressure gauge at the low pressure side of the manifold valve assembly reads -1.0MPa (145psig). If it doesn't, it indicates there is leak somewhere. If that is the case, close the switch fully, and stop the vacuum pump.

(6). Wait for some time to see if the system pressure can remain unchanged, 3 minutes for the 18k/24k units, 10 minutes for the 36k/48k units. During this time, the reading of the pressure gauge at the low pressure side cannot be larger than 0.005MPa (0.72psig).

(7). Slightly open the liquid valve and let some refrigerant into the connection pipe to balance the pressure inside and outside of the connection pipe, so that air will not come into the connection pipe when removing the hose. Note that the gas and liquid valve can be opened fully only after the manifold valve assembly is removed.

(8). Replace the caps of the liquid valve, gas valve and service port.

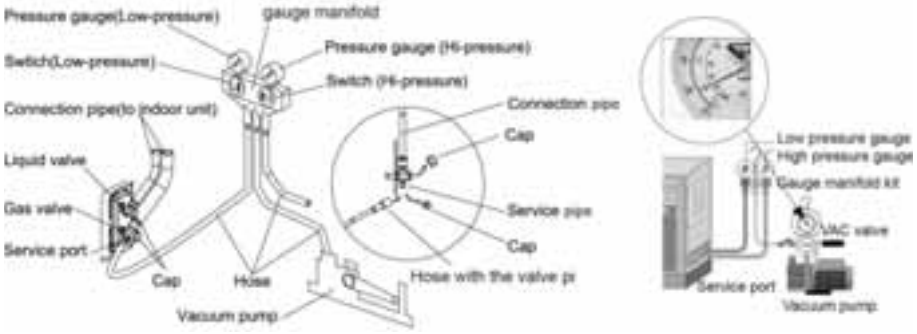


Fig. 4.19

Note: For the large-sized unit, it has the service port for both the gas valve and the liquid valve. During evacuation, it is possible to connect two hoses of the manifold valve assembly to two service ports to quicken the evacuating speed.

4.4.2 Additional Charge

Refrigerant suitable for a piping length of 7.6m (25feet) is charged in the outdoor unit at the factory. When the piping is longer than 7.6m (25feet), additional charging is necessary.

For the additional amount, see Table 4.4.

Table 4.4

Item / Model	Additional Refrigerant Amount for Extra Pipe
18k	45g per 1.5m (1.6 ounce per 5 feet)
24k~48k	90g per 1.5m (3.2 ounce per 5 feet)

When the height difference between the indoor unit and outdoor unit is more than 10m (33 feet), an oil bend should be employed for every 6m (20 feet).

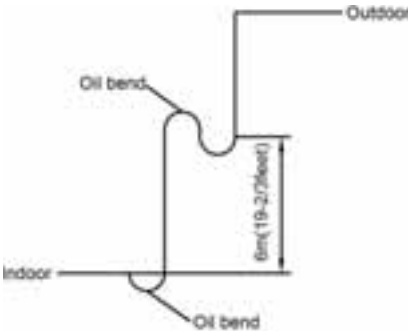


Fig. 4.20

4.5 Installation of the Drain Hose

4.5.1 Installation of Drain Piping

⚠CAUTION
Install the drain hose in accordance with the instructions in this installation manual and keep the area warm enough to prevent condensation. Problems with the piping may lead to water leaks.

(1). Install the drain hose with downward gradient (1/50 to 1/100) and no risers or traps are used for the hose (Fig. 4.21).

(2). Be sure there is no crack or leak on the drain hose to avoid the formation of air pocket (Fig. 4.21).

(3). When the hose is long, install supporters (Fig. 4.22).

(4). Always use a drain hose which has been insulated properly.

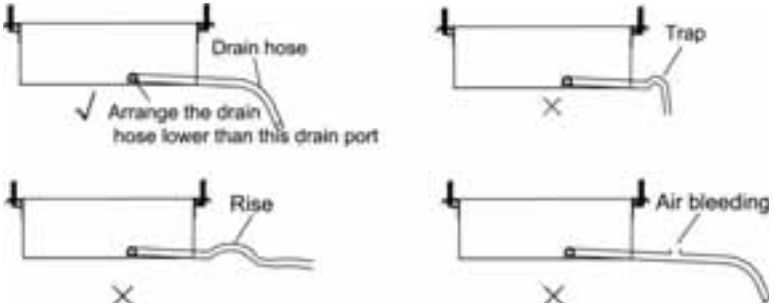


Fig. 4.21

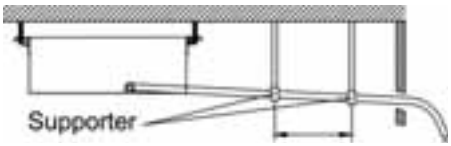


Fig. 4.22

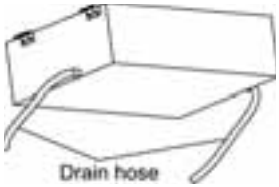


Fig. 4.23

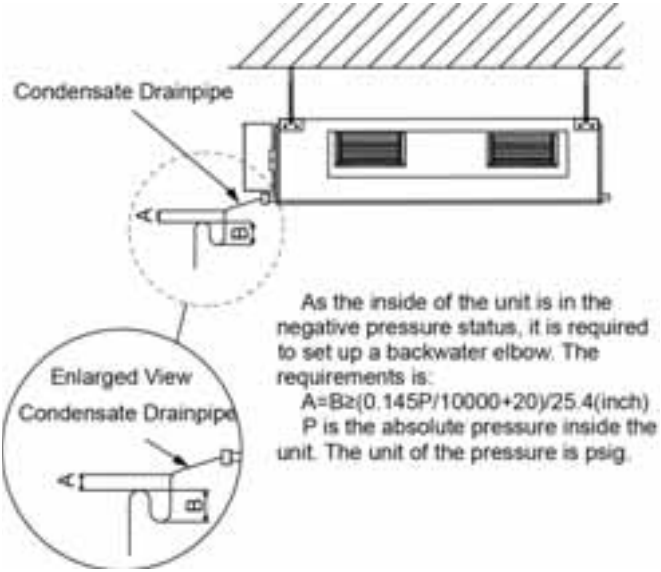


Fig. 4.24

(5). Use a suitable drain hose, and see Table 3.3 for size.

(6). There is a drain port on both the left and right sides. Select the drain port to match your installation (Fig. 4.23).

(7). When the unit is shipped from the factory, the drain port is defaulted to be the one on the left side (electric box side), the port on right side has been plugged.

(8). When using the drain port on the right side of the unit, reinstall the drain cap to the left side drain port (Fig. 4.25).

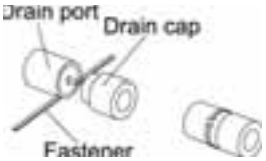


Fig. 4.25

⚠CAUTION

Always check that the drain cap is installed on the unused drain port and is fastened with the nylon fastener. If the drain cap is not installed, or is not sufficiently fastened by the nylon fastener, water may drip during the cooling operation.

(9). Be sure to insulate where the drain port and the drain hose are connected (Fig. 4.26).

(10). The unused drain port also should be insulated properly (Fig. 4.27).

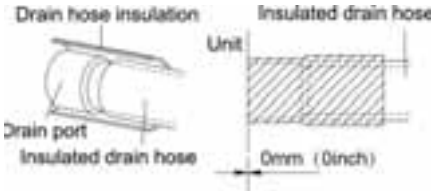


Fig. 4.26

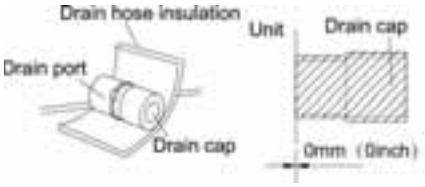


Fig. 4.27

(11). There is adhesive tape on one side of the insulation so that after removing the protective paper over it the insulation can be directly attached to the drain hose.

(12). Considerations for the unit with the condensate pump:

1). There is only one drain port on units with condensate pump. The drain hose must be connected there.

2). See Table 3.3 for the size of the drain port of the unit with the condensate pump.

3). For the unit with the condensate pump, two drain ports at the bottom are plugged with drain caps. After the installation of the drain hose, these two

drain ports also need to be insulated properly as described above.

4). The drain hose for the unit with the condensate pump should be arranged as shown in the figure below.

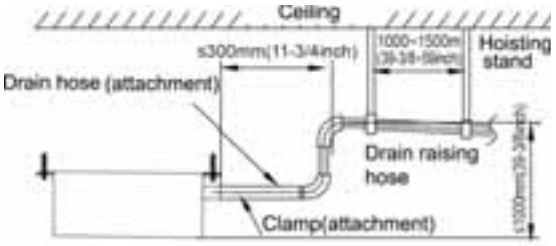


Fig. 4.28

- The vertical height of the drain hose should be 75mm (3inch) or less to reduce unnecessary pressure on drain pump.

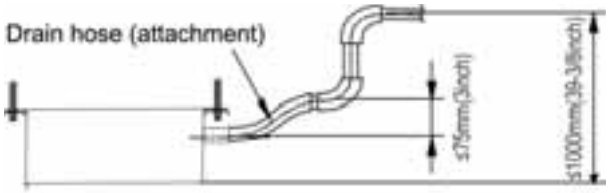


Fig. 4.29

- When multiple drain hoses are used, they should be installed as shown in Fig. 4.30.

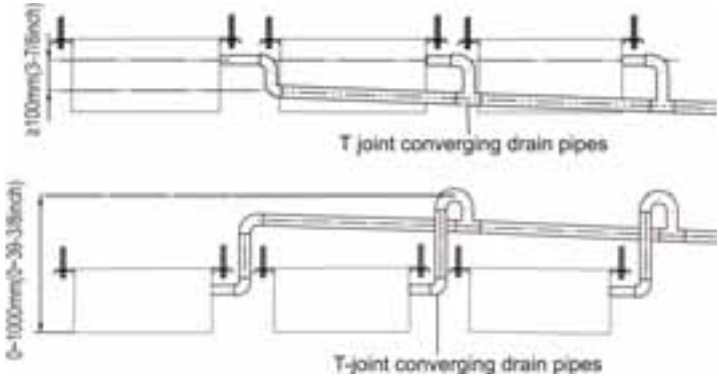


Fig. 4.30

4.5.2 Testing of Drain Piping

After piping work is finished, check if drainage flows smoothly.

As shown in the figure, add approximately 1 liter/quart of water slowly into the drain pan and check drainage flow during COOL running.

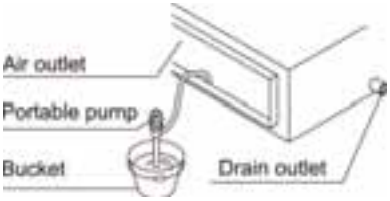


Fig. 4.31

4.6 Installation of the Duct

4.6.1 Dimensions of the Supply Air Outlet/Return Air Inlet

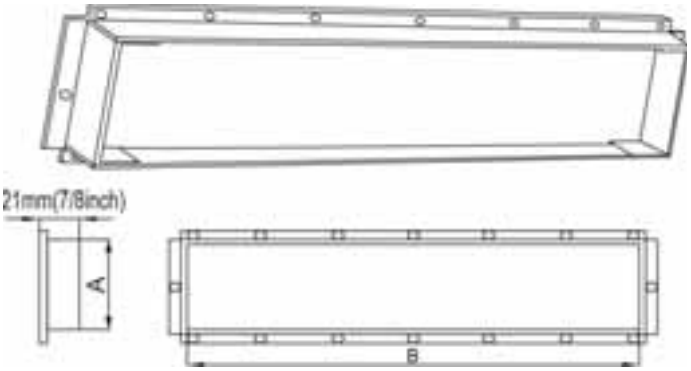


Fig. 4.32 Supply Air Outlet

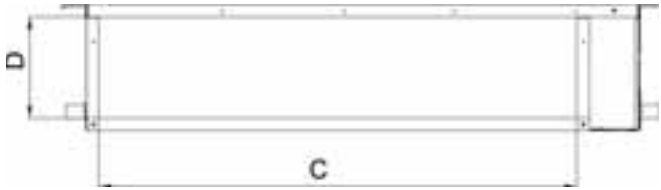


Fig. 4.33 Return Air Inlet

Table 4.5

Unit: mm (inch)

Item / Model	Supply Air Outlet		Return Air Inlet	
	A	B	C	D
GDU18(5.3)USV2FL	123(4-7/8)	736(29)	710(28)	166(6-1/2)
GDU24(7.0)USV2FL	158(6-1/4)	818(32-1/4)	994(39-1/8)	195(7-5/8)
GDU30(8.8)USV2FL	158(6-1/4)	818(32-1/4)	994(39-1/8)	195(7-5/8)
GDU36(10.6)USV2FL	158(6-1/4)	818(32-1/4)	1000(39-3/8)	206(8-1/8)
GDU42(12.3)USG2FL	158(6-1/4)	818(32-1/4)	1000(39-3/8)	206(8-1/8)
GDU48(14.1)USG2FL	190(7-1/2)	850(33-1/2)	940(37)	286(11-1/4)

4.6.2 Installation of the Supply Air Duct

(1). Installation of the Rectangular Duct.

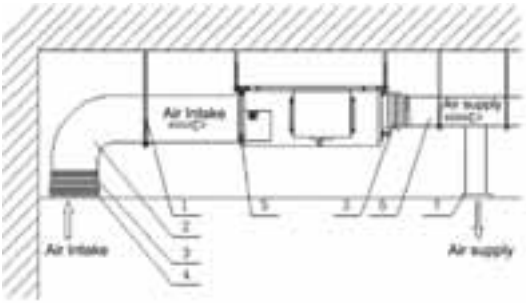


Fig. 4.34

Table 4.6 Installation of the rectangular duct

No.	Name	No.	Name
1	Hanger	5	Filter
2	Air Intake Pipe	6	Main Air Supply Pipe
3	Canvas Air Pipe	7	Air Supply Outlet
4	Air Intake		

⚠CAUTION
①. The maximum length of the duct means the maximum length of the supply air duct plus the maximum length of the return air duct.
②. The duct is rectangular and connected with the air inlet/outlet of the indoor unit. At least one air outlet should remain open at all times.

Bottom Return Air Installation only for the 18k Units.

(2). The default installation location of the rectangular flange is at the back and the return air cover plate is at the bottom, as shown in Fig. 4.35.

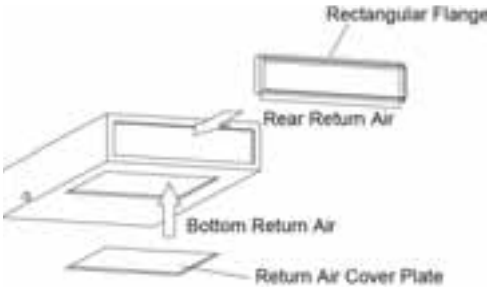


Fig. 4.35

(3). If bottom return air is desired, just switch positions of the rectangular flange and the return air cover plate.

(4). Connect the return air duct to the return air outlet of the unit with rivets ,then

connect the return air louver. For convenience, to adjust the height of the return air outlet, a cutting of canvas duct can be used.

(5). More noise is likely to be produced in the bottom return air mode than the back return air mode, so it is suggested to install a silencer and a static pressure box to minimize the noise.

(6). The installation method can be chosen by considering the conditions of the building and maintenance etc, as shown in Fig. 4.36.

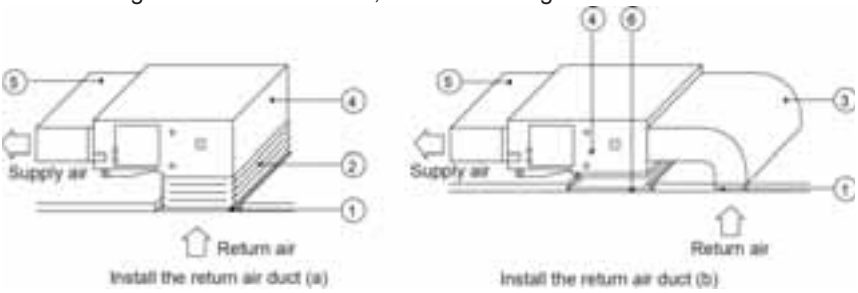


Fig. 4.36

Table 4.7 Installation of the return air duct

No.	Name	No.	Name
1	Return Air Inlet (with filter)	4	Indoor unit
2	Canvas Duct	5	Supply Air Duct
3	Return Air Duct	6	Grille

4.7 Electrical Wiring

4.7.1 Wiring Precautions

⚠WARNING
①. Before obtaining access to terminals, all supply circuits must be disconnected.
②. The rated voltage of the unit is as shown as Table 3.4 and Table 3.5.
③. Before turning on, verify that the voltage is within the 187~252V range (for single phrase units).
④. Always use a dedicated branch circuit and install a dedicated receptacle to supply power to the air conditioner.
⑤. Use a dedicated branch circuit breaker and receptacle matched to the capacity of the air conditioner.
⑥. The dedicated branch circuit breaker is installed in the permanent wiring. Always use a circuit that can trip all the poles of the wiring and has an isolation distance of at least 3mm (1/8inch) between the contacts of each pole.

⑦. Perform wiring work in accordance with standards so that the air conditioner can be operated safely.
⑧. Install a dedicated circuit breaker in accordance with the related laws and regulations and standards.

⚠CAUTION
①. The power source capacity must be the sum of the air conditioner current and the current of other electrical appliances.
②. When the voltage is low, the air conditioner will not run properly. Supply voltage will need to be adjusted.

4.7.2 Electrical Wiring

(1). For solid core wiring (Fig. 4.37)

1). Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation about 25mm (1inch).

2). Using a screwdriver, remove the terminal screw(s) on the terminal board.

3). Using pliers, bend the solid wire to form a loop suitable for the terminal screw.

4). Shape the loop wire properly, place it on the terminal board and tighten securely with the terminal screw using a screwdriver.

(2). For strand wiring (Fig. 4.37)

1). Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation about 10mm (3/8inch).

2). Using a screwdriver, remove the terminal screw (s) on the terminal board.

3). Using a round terminal fastener or pliers, securely clamp a round terminal to each stripped wire end.

4). Position the round terminal wire, and replace and tighten the terminal screw with a screwdriver (Fig. 4.38).

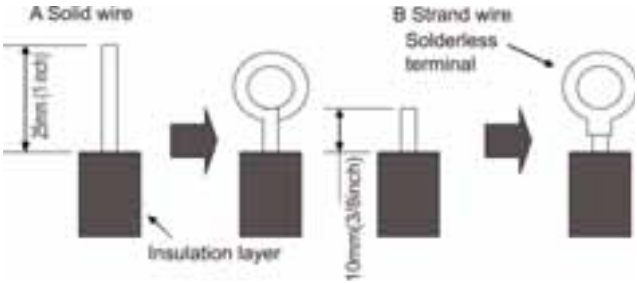


Fig. 4.37

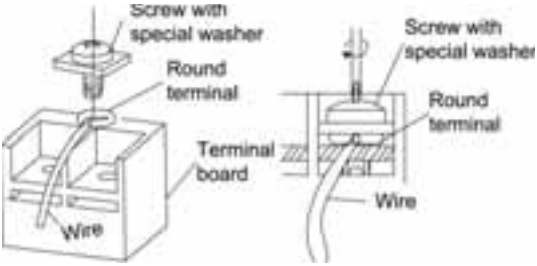


Fig. 4.38

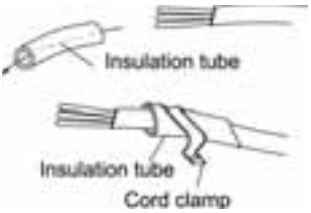


Fig. 4.39

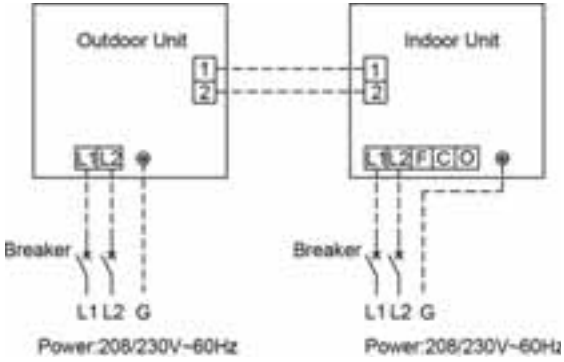
(3). How to fix connection cord and power cord with cord clamp

After passing the connection cord and power cord through the insulation tube, fasten it with the cord clamp (Fig. 4.39).

⚠WARNING
①. Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.
②. Match the terminal block numbers and connection cord colors with those of the indoor unit side. Improper wiring may damage the electric parts.
③. Connect the connection cords firmly to the terminal block. Improper installation may cause a fire.
④. Always fasten the outside covering of the connection cord with cord clamps. (If the insulator is not clamped, electric short may occur.)
⑤. Always connect the ground wire.

(4). Electric wiring between the indoor and outdoor units

Single-phase units (18k-24k)



Single-phase units (36k-48k)

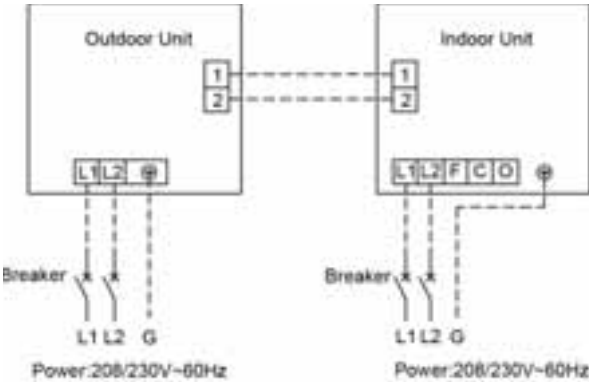


Fig. 4.40

(5). Electric wiring of indoor unit side

Remove the electric box cover from the electric box sub-assy and then connect the wire.

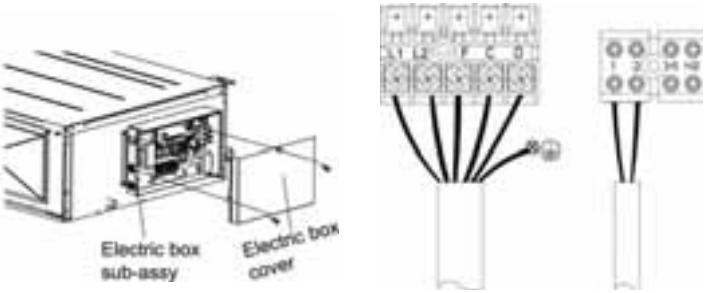


Fig. 4.41

The F, C, O connect to the COMMOM, CLOSE and OPEN terminal of the fresh air valve respectively.

⚠CAUTION
①. The power cord and the wire of the fresh air valve are high-voltage, while the communication cord and connection wire of the wired controller are low-voltage. They should run separately to protect against electromagnetic interference.
②. The high-voltage and low-voltage lines should pass through the rubber rings at different electric box covers.
③. Do not bundle the connection wire of the wired controller and the communication cord together, or arrange them in parallel, otherwise improper operation would occur.

④.	The high-voltage and low-voltage lines should be fixed separately and securely, with internal big clamps for the former and small clamps for the latter.
⑤.	Tighten the indoor/outdoor connection cord and power cord respectively on the terminal boards with screws. Faulty connection may cause a fire.
⑥.	If the indoor unit connection cord (to the outdoor unit) and power supply are wired incorrectly, the air conditioner may be damaged.
⑦.	Connect the indoor unit connection cord properly based on the corresponding marks as shown in Fig. 4.40.
⑧.	Ground both the indoor and outdoor units by attaching a ground wire.
⑨.	Unit shall be grounded in compliance with the applicable local and national codes.

(6). Electric wiring of outdoor unit side

NOTICE! **When connecting the power supply cord, make sure that the phase of the power supply matches with the exact terminal board. If not, the compressor will rotate backward and be damaged.**

Remove the big handle (18k~30k) /front board (36k~48k) of the outdoor unit and insert the end of the communication cord and the power cable into the terminal board.

Single phase:

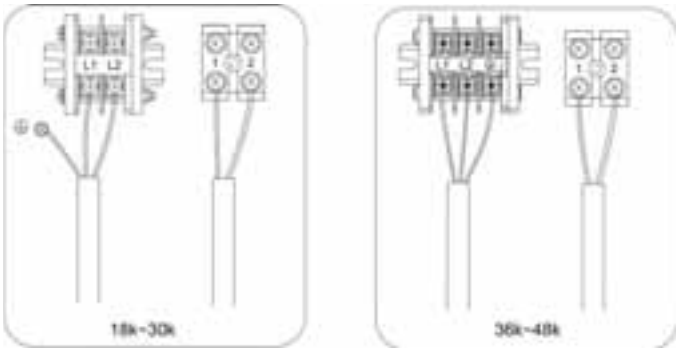


Fig. 4.42

Power lines should go along the right side plate. Communication lines between indoor and outdoor units also should go along the right side plate and kept away from power lines.

5 Installation of Controllers

Refer to the Installation Manual of the controller for more details.

6 Testing

6.1 Trial Operation and Testing

(1). The meaning of error codes as shown below:

Table 6.1

Number	Error code	Error	Remarks
1	E1	Compressor high pressure protection	
2	E2	Indoor anti-freeze protection	
3	E3	Compressor low pressure protection, refrigerant lack protection and refrigerant colleting mode	
4	E4	Compressor high discharge temperature protection	
5	E6	Communication error	
6	E8	Indoor fan motor error	
7	E9	Full water protection	
8	F0	Indoor ambient temperature sensor error	
9	F1	Evaporator temperature sensor error	
10	F2	Condenser temperature sensor error	
11	F3	Outdoor ambient temperature sensor error	
12	F4	Discharge temperature sensor error	
13	F5	Temperature sensor error of wired controller	
14	C5	Capacity code error	
15	EE	Outdoor memory chip error	
16	PF	Electric box sensor error	
17	H3	Compressor overload protection	
18	H4	Overloading	
19	H5	IPM protection	
20	H6	DC fan motor error	
21	H7	Drive desynchronizing protection	
22	HC	PFC protection	
23	Lc	Activation failure	
24	Ld	Compressor phase sequence protection	
25	LE	Compressor stalling protection	
26	LF	Power protection	
27	Lp	Indoor and outdoor mismatch	
28	U7	4-way valve direction changing protection	

29	P0	Drive reset protection	
30	P5	Over-current protection	
31	P6	Communication error between main control and drive	
32	P7	Drive module sensor error	
33	P8	Drive module over temperature protection	
34	P9	Zero passage protection	
35	PA	AC current protection	
36	Pc	Drive current error	
37	Pd	Sensor connecting protection	
38	PE	Temperature drift protection	
39	PL	Bus low voltage protection	
40	PH	Bus high voltage protection	
41	PU	Charge loop error	
42	PP	Input voltage abnormality	
43	ee	Drive memory chip error	

NOTICE! **When the unit is connected with the wired controller, the error code will be simultaneously shown on it.**

(2). Error Indicating Lamps on the Panel of the Duct Type Unit.

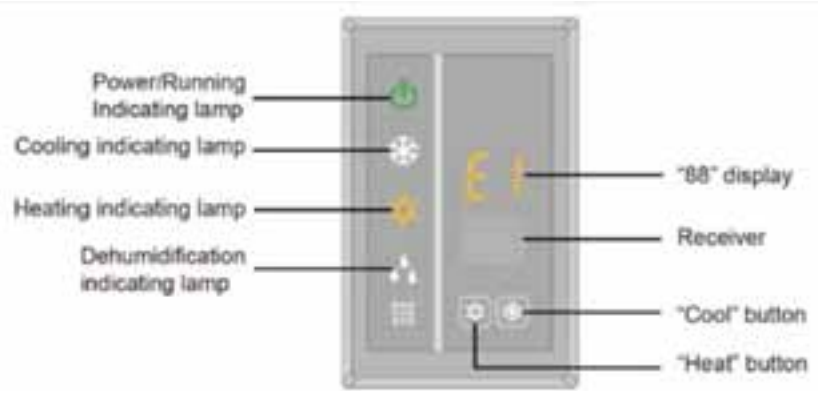


Fig. 6.1

6.2 Working Temperature Range

Table 6.2

Test Condition	Indoor Side		Outdoor Side	
	DB(°C/℉)	WB(°C/℉)	DB(°C/℉)	WB(°C/℉)
Nominal Cooling	26.7(80.0)	19.4(67.0)	35.0(95.0)	23.9(75.0)
Nominal Heating	21.1(70.0)	15.6(60.0)	8.33(47.0)	6.11(43.0)
Rated Cooling	26.7(80.0)	19.4(67.0)	46.1(115.0)	23.9(75.0)
Low Temp. Cooling	19.4(67.0)	13.9(57.0)	-18.0(0)	–
Rated Heating	26.7(80.0)	–	23.9(75.0)	18.3(65.0)
Low Temp. Heating	20.0(68.0)	–	-18.0(0)	-

Notes:

①. The design of this unit conforms to the requirements of ARI 210/240-2008 standard.

②. The air volume is measured at the relevant standard external static pressure.

③. Cooling (heating) capacity stated above is measured under nominal working conditions corresponding to standard external static pressure. The parameters are subject to change with the improvement of products, in which case the values on nameplate shall prevail.

7 Unit Function

7.1 Setting Double Indoor Room Sensors

This series of ducted air-conditioning unit has two indoor room sensors. One is located at the air intake of the indoor unit and the other one is located inside the wired controller.

User can select one from the two indoor room sensors on the basis of the engineering requirement.

(Refer to the section of wire controller instructions for detailed operation.)

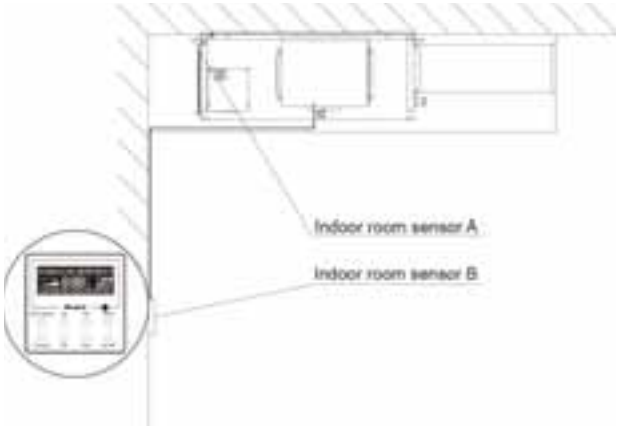


Fig. 7.1

7.2 Checking of Outdoor Ambient Temperature

The outdoor ambient temperature can be checked on the wired controller for the convenience of users before going out. (Refer to the section of wire controller instructions for detailed operation.)

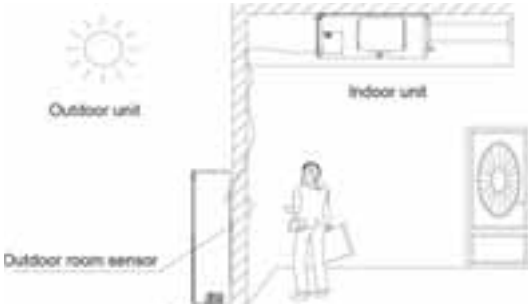


Fig. 7.2

7.3 Fresh Air Control

Fresh air controls regulate the amount of fresh air brought in from outside. The function helps to create a healthier environment by improving the indoor air quality (IAQ). It can also help to regulate electricity usage by the controlling the amount of outside air used. This can be regulated through the wired controller. The function can be set at any time, go into effect at any time, and features very simple operation. (Refer to the section of wire controller instructions for detailed operation.)

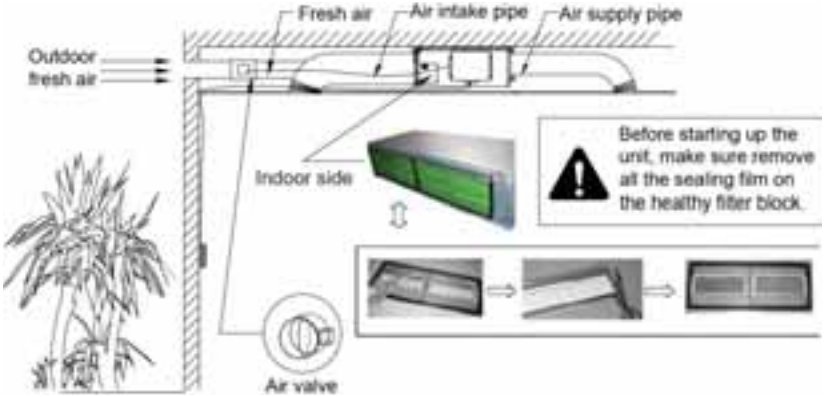


Fig. 7.3

8 Troubleshooting and Maintenance

8.1 Troubleshooting

If your air-conditioning unit malfunctions or has an operational failure, please first check the following points before repair:

Failure	Possible Reasons
The unit cannot be started.	①. The power supply is not connected. ②. Electrical short of air-conditioning unit causes tripping of the circuit breaker. ③. The operating keys are locked. ④. The control loop has failed.
The unit operates for a while and then stops.	①. The condenser air flow is blocked. ②. The control loop experienced a failure. ③. Cooling operation is selected when the outdoor ambient temperature is above 46.1°C (115℉).

Poor cooling effect.	①. The air filter is dirty or blocked. ②. There is heat source or too many people inside the room. ③. The door or window is open. ④. There is obstacle at the air intake or outlet. ⑤. The set temperature is too high. ⑥. There is refrigerant leakage. ⑦. The room sensor has malfunctioned..
Poor heating effect.	①. The air filter is dirty or blocked. ②. The door or window is not firmly closed. ③. The set room temperature is too low. ④. There is refrigerant leakage. ⑤. The outdoor ambient temperature is lower than -5°C (23℉). ⑥. Control loop has experienced a failure.

Once the above listed possible reasons have been eliminated, please turn off the air conditioner and call for a qualified service technician. Only qualified service techs should repair the unit.

8.2 Routine Maintenance

Only a qualified service person is allowed to perform maintenance.

Disconnect power before servicing the unit.

Do not use hot water above 50°C (122℉) for cleaning air filters and outside panels.

NOTICE
①. Do not operate the air conditioner without the filter; otherwise dust would enter the unit.
②. Do not remove the air filter except for cleaning. Unnecessary handling may damage the filter.
③. Do not clean the unit with gasoline, benzene, paint thinner, polishing powder or liquid insecticide, otherwise it would cause discoloration and deformation of the unit.

WARNING! Clean indoor unit with damp (not wet) cloth. Do not get indoor unit wet due to the risk of electrical shock or fire.

Increase the frequency of cleaning if the unit is installed in a room where the air is extremely dirty. (You can begin by cleaning the filter every six months, then increase frequency as necessary.)

If filter becomes too clogged to be cleaned, change the air filter. (An extra air filter can be ordered with the air conditioner.)

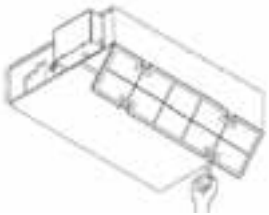
(1). Removing the air filter from the duct.

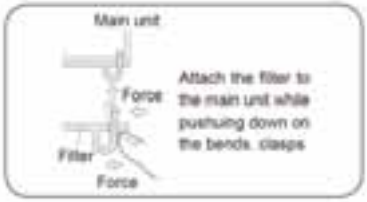
(2). Cleaning the air filter.

Remove dust from the air filter using a vacuum cleaner and gently rinse them in

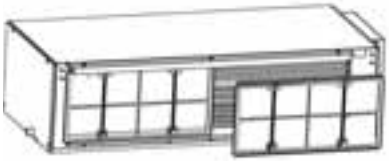
cool water. Do not use detergent or hot water to avoid filter shrinking or deforming. After cleaning dry them in the shade.

18k:





24k~48k:



Press the return air inlet filter downward against the guide groove sponge and take it off along the arrow direction. There are two return air inlet filters.

(3). Replace the air filter.

Specifications & illustrations subject to change without notice or incurring obligations.

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