Nortek Global HVAC, LLC

Multi Variable Heat Pump
Fresh Air Processing Indoor Unit

Owner's Manual

Heat Pump

Models:

BDFA-22(72)-AK

BDFA-28(96)-AK

- 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

Preface

For correct installation and operation, please read all instructions carefully. Before reading the instructions, please be aware of the following items:

⚠	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible Personal injury or death.
⚠WARNING	DANGER: Failure to comply may result in severe personal injury, property damage and/or death.
⚠CAUTION	CAUTION: Failure to comply may result in personal injury and/or property damage.
NOTICE	NOTICE is used to address practices not related to personal injury.

⚠WARNING
(1). Instructions for installation and use of this product are provided by the manufacturer.
(2). Installation must be performed in accordance with the requirements of NEC and CEC by authorized personnel only.
(3). For safety operation, please strictly follow the instructions in this manual.
(4). During operation, the total capacity of indoor units should not exceed the total capacity of outdoor unit. Otherwise, poor cooling or heating performance may result.
(5). Direct operators or maintainers should keep this manual for future reference.
(6). If this unit malfunctions, please a qualified contractor as soon as possible and provide the following information: ● Content on the nameplate (model, cooling capacity, serial number and manufacture date). ● Malfunction status (before and after malfunction occurred)
(7). Each unit has been strictly tested and proved before shipment. To avoid unit damage or malfunctioning because of improper service, please do not disassemble units by yourself. If you need maintenance or service, please contact a qualified contractor.
(8). All illustrations in this manual are for reference only. Manuals are subject to change by manufacturer without prior notice.
(9). If the supply cord is damaged, it must be replaced by qualified persons in order to avoid a hazard.

This appliance is not intended to be used by persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and knowledge Children are not allowed to play on or near the appliance.

GWP：410A:2087.5

DISPOSAL: Do not dispose this product as unsorted household waste. Special treatment is necessary. Dispose or recycle responsibly.

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1 Safety Precautions

⚠WARNING
(1). Follow this instruction to complete the installation work. Please read this manual carefully before unit startup and service.
(2). Wire size of power cord should be sized correctly. The damaged power cord and connection wire should be replaced by specialized cable.
(3). After connecting the power cord, please affix the electric box cover properly.
(4). Never fail to comply with the nitrogen charge requirements. Charge nitrogen when welding pipes.
(5). Never short-circuit or cancel the pressure switch to prevent unit damage.
(6). Connect the wired controller before energization; otherwise wired controller could be damaged.
(7). Before using the unit, please check if the piping and wiring are correct to avoid water leakage, refrigerant leakage, electric shock, or fire etc.
(8). Do not insert fingers or objects into air outlet/inlet grille.
(9). Open the door and window and keep good ventilation in the room to avoid oxygen deficit when the gas/oil heating equipment is used.
(10). Never start up or shut off the air conditioner by plugging or unplugging the power cord.
(11). Let the unit run for at least five minutes after startup; otherwise it will affect oil return of the compressor.
(12). Do not allow children operate this unit.
(13). Do not operate this unit with wet hands.
(14). Turn off the unit or cut off the power supply before cleaning, otherwise electric shock or injury may occur.
(15). Never spray or flush water towards unit, otherwise malfunction or electric shock may occur.
(16). Do not expose the unit to the wet or corrosive circumstances.
(17). Under cooling mode, please don't set the room temperature too low. Keep the temperature difference between indoor and outdoor unit within 5ºC (9ºF).
(18). User is not allowed to repair the unit. Faulty service may cause electric shock or fire. Please contact a qualified service technician for help.
(19). Before installation, please check if the power supply matches the requirements specified on the nameplate.
(20). Installation should be conducted by dealer or qualified personnel. Please do not attempt to install the unit by yourself. Improper handling may result in water leakage, electric shock or fire etc.
(21). Be sure to use the appropriate accessories and parts to prevent the water leakage, electric shock and fire.
(22). Make sure the unit can be grounded properly and securely to avoid electric shock. Please do not connect the ground wire to gas pipe, water pipe, lightning rod or telephone line.
(23). Connect power to the unit 8 hours before operation. Do not cut off the power when it will not be used for a short period of time, i.e. overnight (to protect the compressor).
(24). If refrigerant leakage occurs during installation, please ventilate immediately. Toxic gas will resuslt if the refrigerant gas meets spark or open flame.

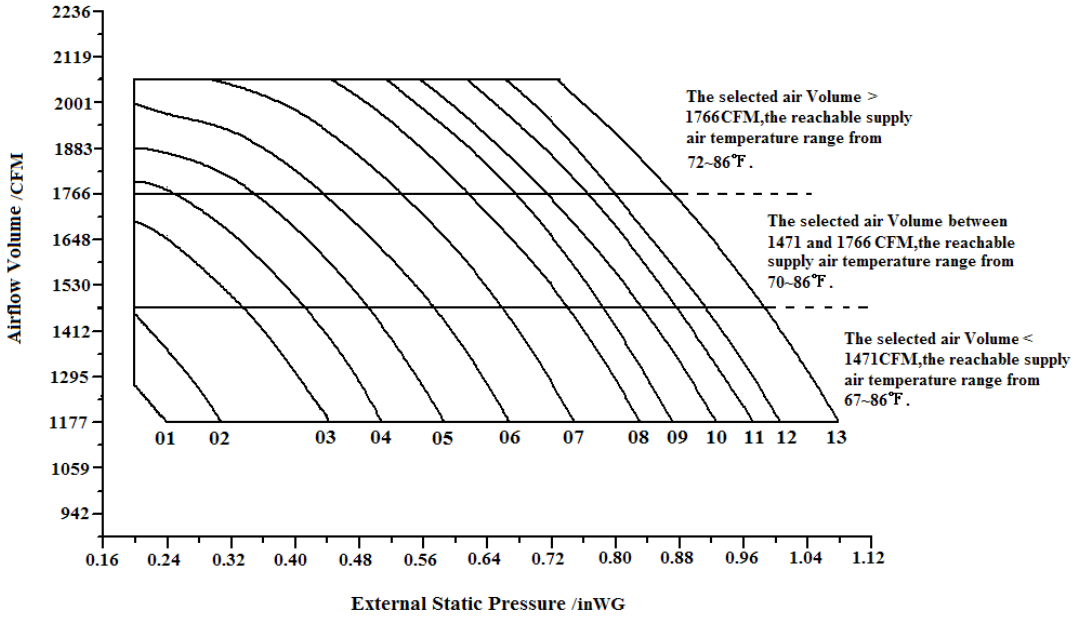
(25). Volatile liquid, such as paint thinner or gasoline will damage the unit appearance. Only use soft cloth with a little mild detergent to clean the outer casing of unit.
(26). If anything abnormal occurs (such as burning smell), please power off the unit and cut off the main power supply, and then immediately contact a licensed contractor. If the problem persists, the unit might be damaged and lead to electric shock or fire.

Manufacturer will not assume responsibility for any personal injury or property loss caused by improper installation, improper debugging, unnecessary repair, or not following the instructions in this manual.

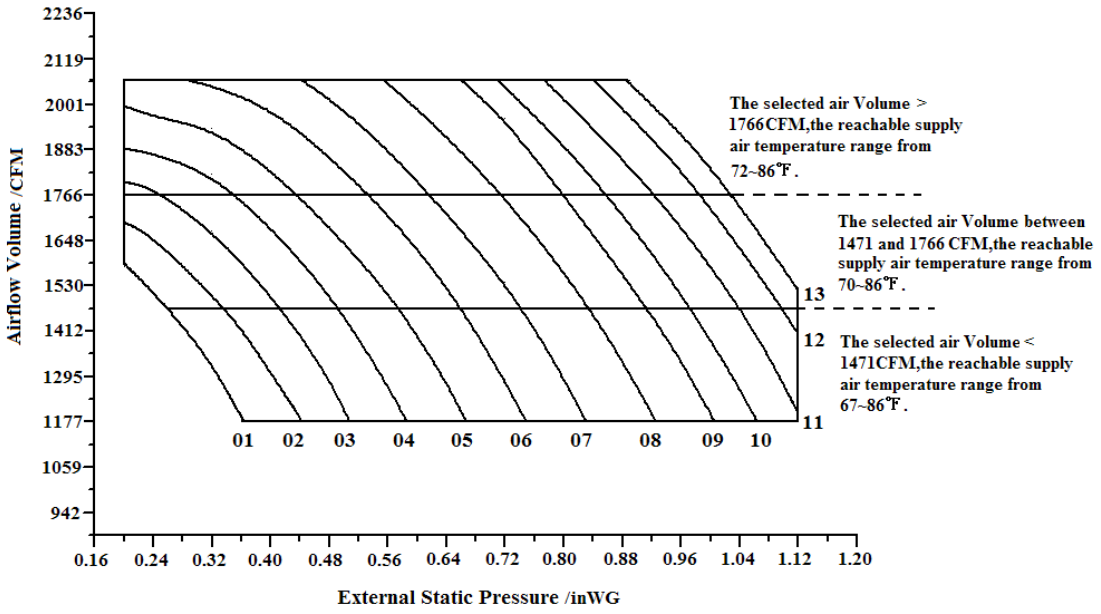
2 Product Introduction

2.1 Unit Introduction

Fresh air series indoor unit is an air processing system that heats/cools fresh air from outdoors and then supplies it to the indoors. When this unit is installed, select the static pressure according to the actual air volume from 1177~2060 CFM. There are 13 static pressure selections. Please refer to the Installation, Debugging and Maintenance Manual for instructions. The blower curves for air volume and static pressure are shown below. The corresponding static pressure is from 1 to 13 for the curve from lower to upper side.



Blower curve for BDFA-22(72)-AK



Blower curve for BDFA-28(96)-AK

NOTICE !

①. The supply air temperature shown in the curve is for tested, rated cooling conditions. The lower the selected air volume, the lower the attainable cooling supply air temperature. Cooling test conditions: indoor 35°C (95°F) DB/ 28°C (82°F) WB, outdoor 35°C (95°F) DB; connection pipe length: 7.5m (24.5 ft), without height difference between units.

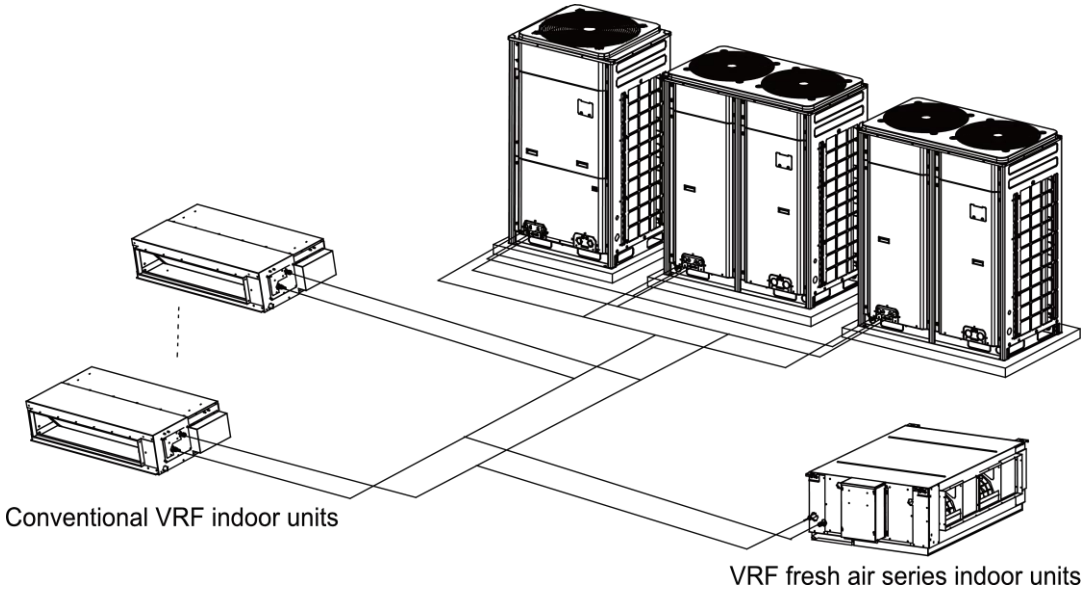
②. The sound level shown on the nameplate is tested under rated condition, which is defaulted as speed 08 under static pressure of 0.80 in WG. The sound level in the highest speed may increase by about 3 dB (A). The noise in the lowest speed may decrease by about 5 dB (A). The recorded sound level of the sample unit is tested in semi-anechoic (semi-soundproof) room. Actual sound value may vary due to ambient sounds or echoes.

There are two connection methods for the fresh air series indoor unit:

(1) If the selected air volume ≤1471 CFM (2500m^3/hr), connect with normal indoor units by blow method, or connect with the fixed outdoor unit as shown in （2）.

Model of Indoor Unit	Model of Outdoor Unit
BDFA-22(72)-AK	Connecting with V5BV-**WMBC series modular outdoor unit: The total capacity of connected fresh air series indoor units and conventional VRF indoor units must be within 50%~100% of the capacity of outdoor unit, of which, the total capacity of connected fresh air indoor units cannot exceed 30% of the capacity of outdoor unit.
BDFA-28(96)-AK	

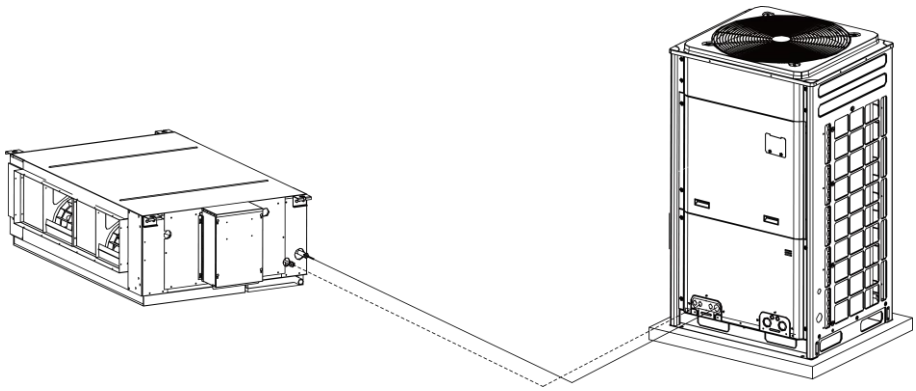
NOTICE ! When fresh air series indoor units and conventional VRF indoor units will be connected, please strictly follow the capacity requirement. The total capacity of connected fresh air indoor units cannot exceed 30% of the capacity of outdoor unit, while the total capacity of indoor units shall be within 50%~100% of the capacity of outdoor unit. Otherwise, the system will perform poorly or may be damaged.



Connection diagram of fresh air series indoor units and conventional VRF indoor units

(2) If the selected air volume ＞1471 CFM (2500m^3/hr), connect the fixed outdoor unit as shown below:

Model of Indoor Unit	Model of Outdoor Unit
BDFA-22(72)-AK	V5BV-72WMBC
BDFA-28(96)-AK	



(3) For example:

1) Select Model BDFA-28(96)-AK. After the unit is installed, the fan static pressure is 0.80 in WG. The required air volume is 1766CFM (3000m^3/hr), the corresponding static line on the blower curve is 09. Since the air volume is more than 1471CFM (2500m^3/hr), select the second fixed connection method, matching V5BV-72WMBC outdoor unit.

2) Select Model BDFA-22(72)-AK. After the unit is installed, the fan static pressure is 0.60 in WG. The required air volume is 1354CFM (2300m^3/hr), the corresponding line on the blower curve is 05. Since the air volume is less than 1471CFM (2500m^3/hr), select the first connection method or the second fixed connection method by matching V5BV-72WMBCoutdoor unit.

2.2 Rated Working Condition

	Indoor Side Condition		Outdoor Side Condition	
	Dry Bulb Temp	Wet Bulb Temp	Dry Bulb Temp	Wet Bulb Temp

Rated Cooling	35°C(95°F)	28°C(82°F)	35°C(95°F)	28°C(82°F)
Rated Heating	7°C(45°F)	6°C(43°F)	7°C(45°F)	6°C(43°F)

2.3 Working Temperature Range

	Outdoor Ambient Dry Bulb
Working Temperature Range	-7°C~45°C (19°F~113°F)

NOTICE ! The default set temperature is 18°C (64°F) in cooling mode and 22°C (72°F) in heating mode. If the user needs to change the temperature setting, please contact qualified service personnel.

2.4 Unit Functions

Unit Functions	Wired Controller WRC1 (Standard accessory)
Cooling Mode	√
Heating Mode	√
Fan Mode	√
Memory Function	√
Timer Function	√
Filter Cleaning Reminding Function	√
Light Function	√

NOTICE !

①. √: included, X: not included.

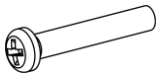
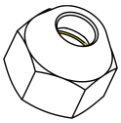
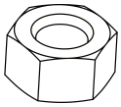
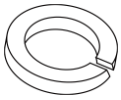
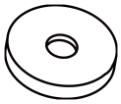
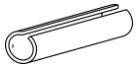
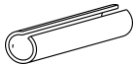
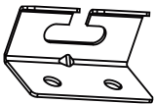
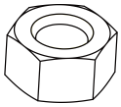
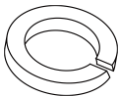
②. Please refer to the user manual of Wired Controller or Remote Controller for function details.

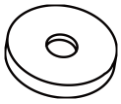
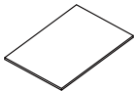
3 Preparations for Installation

NOTICE ! Illustrations are for reference only. Please refer to actual products. Unspecified measure unit is mm/inch.

3.1 Standard Fittings

Please use the supplied standard fittings listed below as instructed.

No.	Name	Graphics	Quantity	Function
1	Wired Controller		1PC	To control the indoor unit
2	M4X25 Screw (Cross recessed small pan head screw)		2 PC	To mount the wired controller
3	Union Nut Sub-assy		1 Set	To be used for connecting the refrigerant pipe
4	M10 Nut (Nut with Washer M10X8)		4 PC	To be used with the hanger bolt for installing the unit.
5	M10 Nut (M10X8.4)		8 PC	To be used with the hanger bolt for installing the unit.
6	M10 Washer (Spring Washer M10X2.6)		4 PC	To be used with the hanger bolt for installing the unit.
7	M10 Washer (M10Xφ 30X 2.5)		4 PC	To be used with the hanger bolt for installing the unit.
8	Insulation		1 PC	To insulate the gas pipe
9	Insulation		1 PC	To insulate the liquid pipe
10	Fastener		8 PC	To fasten the sponge
11	Hanger		4 PC	To mount the indoor unit
12	M8 Nut (M8X6.8)		8 PC	To attach the hook on the cabinet of the unit.
13	M8 Washer (Spring Washer M8X2.1)		8 PC	To secure the hook on the cabinet of the unit.

14	M8 Washer (M8Xφ 16X 1.5)		8 PC	To secure the hook on the cabinet of the unit.
15	Sponge of Drain Pipe		2 PC	Wrap the joint of drain pipe

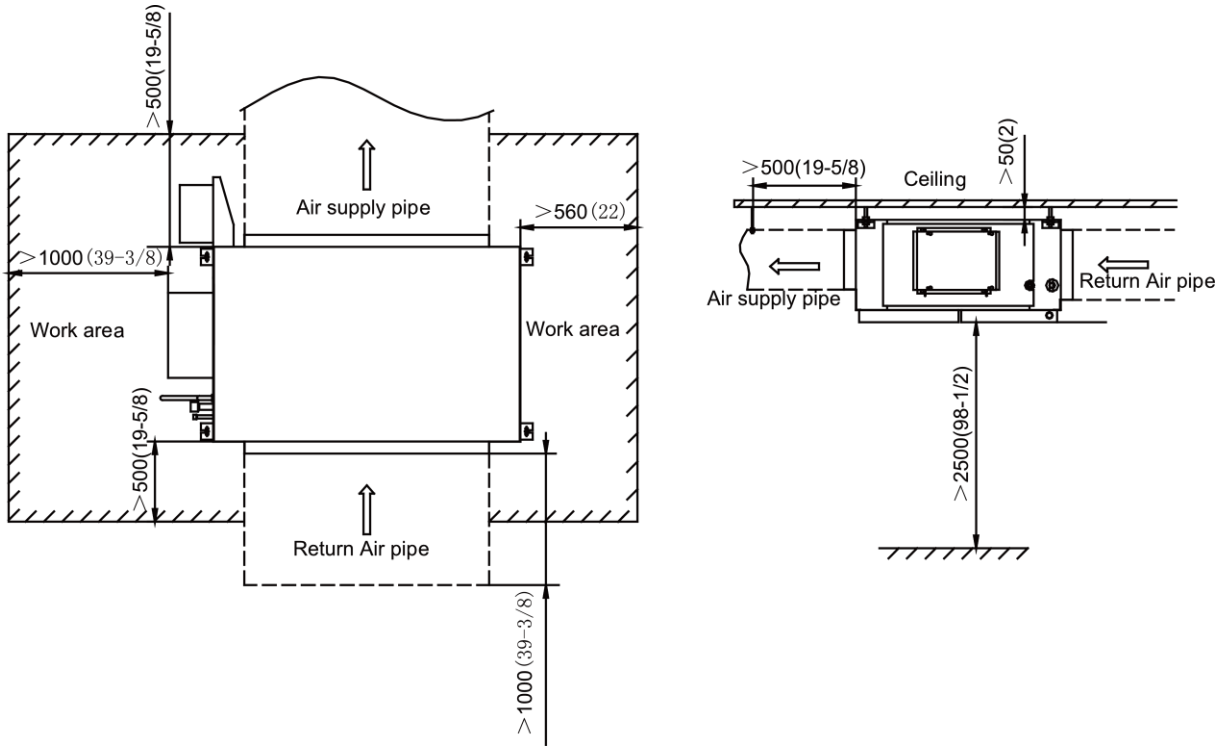
NOTICE ! The fittings listed above are subject to change without notice, please refer to the packing list provided with indoor unit.

3.2 Selecting Installation Location

(1) Appliances should not be accessible to the general public.
(2) The supporting structure to be used must have a sufficient load carrying capacity to support the weight of the unit.
(3) Condensate should flow through drain pipe smoothly.
(4) There must be no obstacle at inlet or outlet to ensure good air circulation.
(5) Install the indoor unit with sufficient clearances for maintenance as described below.
(6) Keep the unit away from heat source, inflammable gas or smoke.
(7) This is a concealed ceiling type unit.

Indoor unit, outdoor unit, power cord and electric wire should stay at least 1m (3feet) from the TV set and radio or electromagnetic interference may occur. (In strong electromagnetic field, the distance may require to be significantly more than 1M (3 ft.)

Unit: mm (inch)



⚠WARNING

(1) The supporting structure to be used must have a sufficient load carrying capacity to support the weight of the unit. Make sure the unit will not shake or fall.
(2) Never expose the unit to direct sunlight or rain. The unit should be protected against dust and strong winds. Follow all local seismic installation requirements.
(3) Try to keep the unit away from combustible, inflammable, corrosive or exhaust gas.
(4) Leave adequate clearance for service to maintain normal operation.
(5) Keep the indoor and outdoor units as close as possible to each to decrease the pipe length and bends.
(6) Never allow children to play on or near the equipment.

3.3 Requirements for Communication Line

NOTICE ! If the unit is installed in or near a strong electromagnetic field, shielded wire must be used for the communication wire between indoor unit and controller. Twisted pair line with shielding function must be used for the communication wire between indoor units and indoor unit to outdoor unit.

3.3.1 Select communication line for indoor unit and wired controller

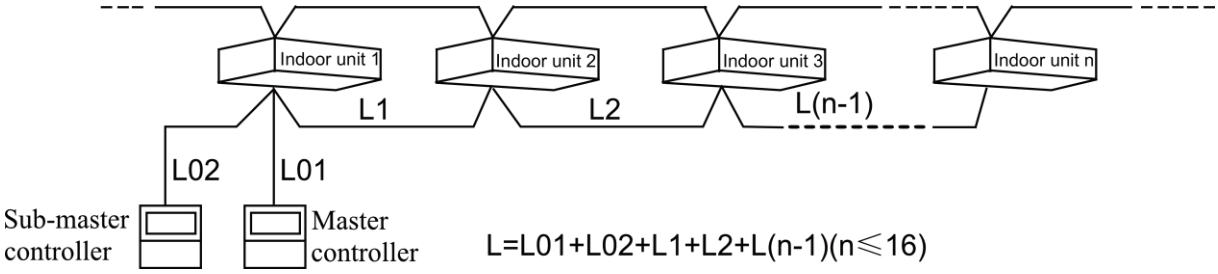


Fig 3.3.1

Material type	Total length of communication line between IDU unit and wired controller L m(feet)	Wire size	Remarks
Light/Ordinary polyvinyl chloride sheathed cord.	L≤250(820-1/5)	2×AWG18~ 2×AWG16	①. Total length of communication line can't exceed 250m (820 feet). ②. The cord shall be Circular cord (the cords shall be twisted together). ③. If unit is installed in or near strong electromagnetic field, use shielded wire.

3.3.2 Select communication line for indoor unit and indoor unit (outdoor unit)

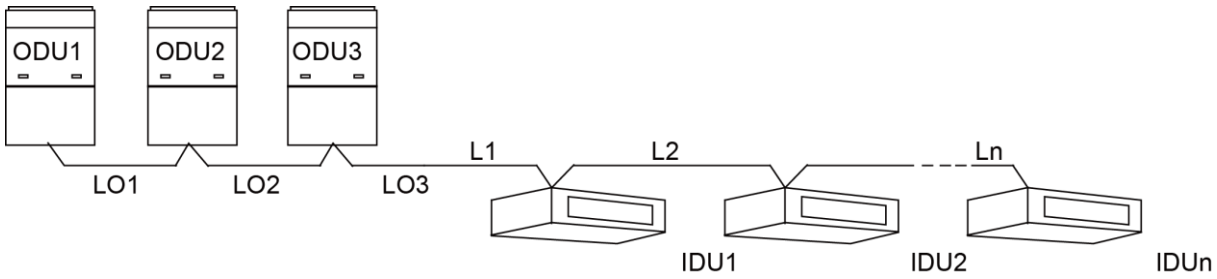


Fig 3.3.2

Material Type	Total Length of Communication Cable between IDU Unit and IDU (ODU) Unit L m(feet)	Wire size	Remarks
Light/Ordinary polyvinyl chloride sheathed cord.	L≤1000(3280-5/6)	≥2×AWG18	①. If the wire diameter is enlarged to 2 ×AWG16, the total communication length can reach 1500m (4920 feet). ②. The cord shall be Circular cord (the cords shall be twisted together). ③. If unit is installed in or near strong electromagnetic field, use shielded wire.

3.4 Wiring Requirements

Power Cord Size and Air Switch Capacity

Model	Power Supply	Minimum Circuit Ampacity (A)	Maximum Overcurrent Protection (A)
BDFA-22(72)-AK	208/230V 1Ph 60Hz	6.3	15
BDFA-28(96)-AK	208/230V 1Ph 60Hz	6.3	15

⚠WARNING
①. Circuit breaker and power cord are selected on the basis of unit's maximum power (max. current).
②. Power cord is based on the working condition where ambient temperature is 40°C (104℉) and multi-core cable with copper conductor(working temperature is 90 °C (194℉), e.g. power cable with YJV cross-linked copper, insulated PE and PVC sheath) is lying on the surface of slot. If working condition is different, please adjust the specification according to national standard.
③. Copper-core cable must be used.
④. The above sectional area is suitable for a maximum distance of 15m (50 feet). If it's over 15m (50 feet), sectional area must be expanded to prevent overload current from burning the wire or causing fire hazard.
⑤. Specification of circuit breaker is based on the working condition where the ambient temperature of circuit breaker is 40°C (104℉). If actual installation condition varies, please adjust the specification according to national standard.
⑥. The air switch should include magnetic trip function and thermal trip function so that system can be protected from short circuit and overload.
⑦. An all-pole disconnect switch having a contact separation of at least 3mm (1/8inch) in all poles should be connected in fixed wiring.

NOTICE !

①. Use copper wire only as unit's power cord. Operating temperature should be within its rated value.

②. If the power cord is more than 15 m (50 feet) long, please proportionally increase the sectional area of power cord to avoid overload.

③. Above selection requirements: Power cord size is based on BV single-core wire (2~4pc) at 40° (104°F) ambient temperature when laying across plastic pipe. Air switch is D type and used at 40°C (104°F). If actual installation condition varies, please lower the capacity according to the specifications of power cord and air switch provided by manufacturer.

④. Install cut-off device near the unit. The minimum distance between each stage of cut-off device should be 3 mm (1/8 inch) (The same for both indoor unit and outdoor unit).

4 Installation Instructions

4.1 Installation of Indoor Unit

4.1.1 Dimensions

Equip with a service port after hanging the unit. For the convenience of maintenance, the service port should be on one side of the electric box and below unit's lower level.

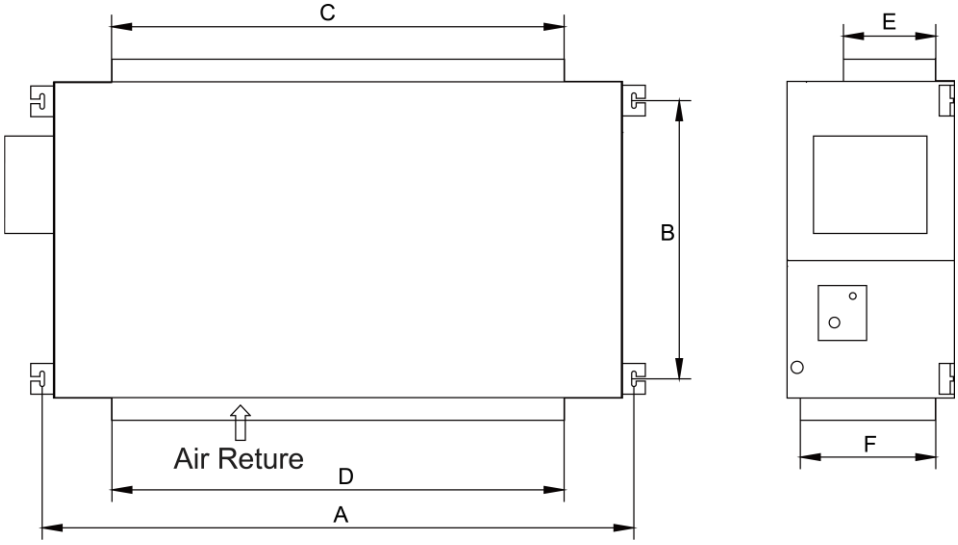


Fig 4.1.1

Umit: mm (inch)

Model	A	B	C	D	E	F
BDFA-22(72)-AK	1353 (53-1/4)	632 (24-7/8)	992(39)	1150 (45-1/4)	192 (7-1/2)	327 (12-7/8)
BDFA-28(96)-AK	1353 (53-1/4)	632 (24-7/8)	992(39)	1150 (45-1/4)	192 (7-1/2)	327 (12-7/8)

4.1.2 Drill Bolt Holes and Install Bolts

(1) Cut out the installation paper pattern (cardboard template) according to the hook installation dimension of unit. Place the installation paper pattern on the installation area as shown in Fig. 4.1.2. Drill holes according to the 4 spots on the paper pattern. The diameter of hole should match the diameter of expansion bolt, about 60mm (2-3/8inch) to 70mm (2-3/4inch) depth, as shown in Fig. 4.1.3.

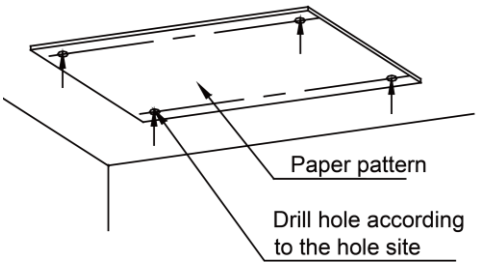


Fig 4.1.2

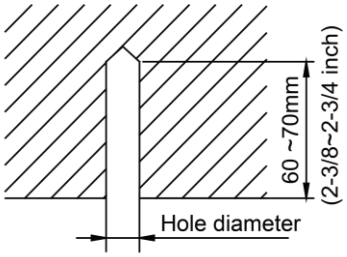


Fig 4.1.3

(2) Insert the expansion bolt M10 into the hole and drive the iron nail into the bolt, as shown in Fig 4.1.4.

NOTICE ! The length of bolt can be based on the height of the unit. Bolts are field supplied.

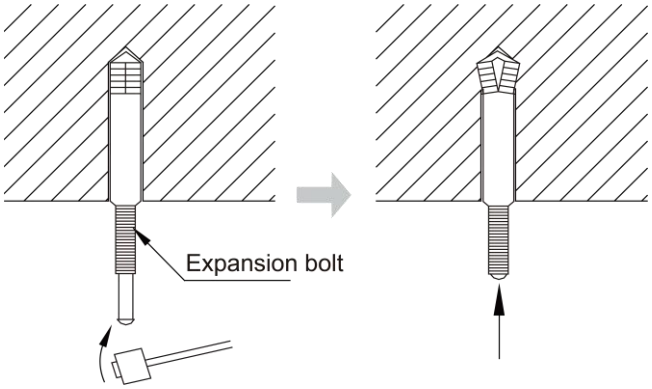


Fig 4.1.4

4.1.3 Lift the Unit

Lift up the unit to the ceiling and secure it on the bolt. Use specialized nut to secure the unit.

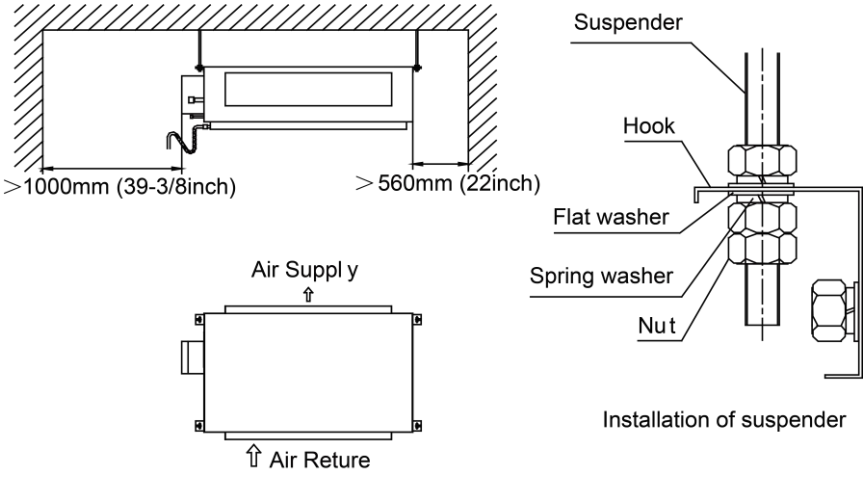


Fig 4.1.5

NOTICE !

①. Before installing the air handler, please complete installation of all pipes (connection pipe, drain pipe) and wires (wired controller wire, connection wire of IDU and ODU) that need to be connected to the indoor unit.

②. Punch holes on the ceiling (air return opening or air outlet). Ceiling may have to be reinforced to make it level and to prevent vibration.

③. If the ceiling is not strong enough, you can install a beam bracket in a corner and secure the unit on the beam.

4.1.4 Horizontal Alignment

After the indoor unit is installed, remember to check to make sure it is level in every direction. It should be level from front to back and slope 1% from left to right, toward the drain, as shown in Fig. 4.1.6.

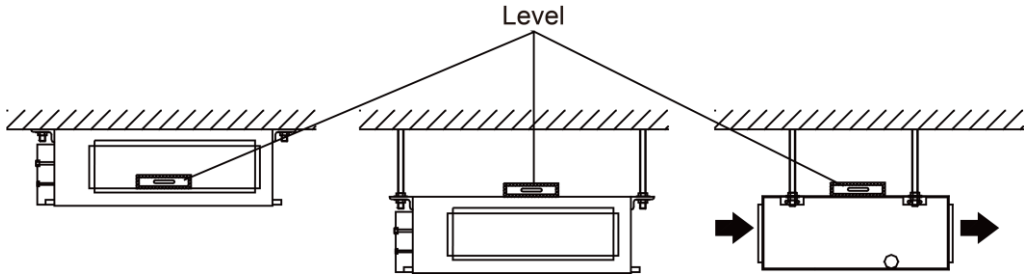


Fig 4.1.6

4.2 Refrigerant Pipe Connection

(1) Align the flaring port of copper pipe to the center of screwed joint and tighten the flaring nut tight by hand.

(2) Use a torque wrench to tighten up the flaring nut as shown in Fig. 4.2, until the wrench clicks.

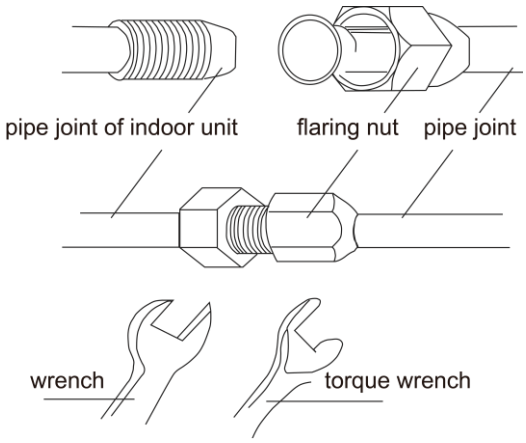


Fig 4.2

Torque for tightening nut

Pipe diameter (mm/inch)	Torque (N·m)
φ 6.35(1/4)	15~30
φ 9.52(3/8)	35~40
φ 12.7(1/2)	45~50
φ 15.9(5/8)	60~65

(3) Use pipe bender when bending the pipe to avoid bending at too small of an angle.

(4) Wrap the connection pipe and joint with sponge and then secure it with tape.

4.3 Drainage Pipe Installation and Drainage System Testing

4.3.1 Installation of Drain Pipe

NOTICE !

①. The drain pipe should be as short as possible and slope downward at least 1%~2% so that condensate can drain out easily.

②. The diameter of drainage hose should be larger than or equal to the diameter of drainage pipe joint.

③. Install the drain pipe according to the following diagram and apply insulation to the drainage pipe. Improper installation will lead to water leakage.

④. Normal hard PVC pipe can be used as drain pipe. When connecting the pipe, insert the end of PVC pipe into the drain hole and then tighten it up with a drain hose and cable tie. Do not use adhesives to connect drain hole and drain hose.

⑤. When the drain pipe is used for several units, the position of the pipe should be about 100mm (4 in) lower than the drain hole of each equipment. In this case, use thicker pipe.

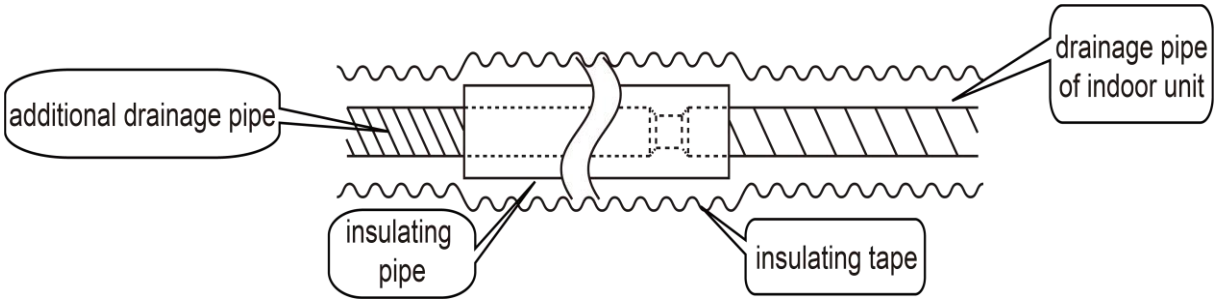


Fig 4.3.1

4.3.2 Drainage pipe installation

(1) Insert the drain hose into the drain hole and tighten it with tape, as shown in Fig 4.3.2.

(2) Tighten the pipe clamp, with the distance between screw nut and hose smaller than 4mm (1/8 in).

①. Metal clamp(accessory)

②. Drain hose(accessory)

(3) Use sealing plate to insulate the pipe clamp and hose, as shown in Fig 4.3.3.

①. Metal clamp(accessory)

②. Thermal sponge(accessory)

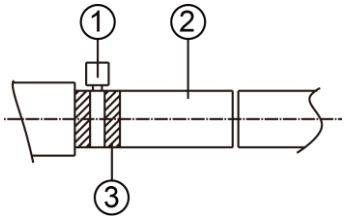


Fig 4.3.2

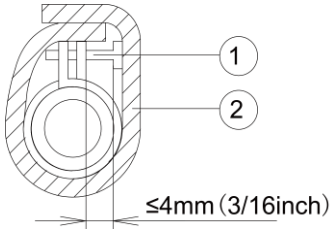


Fig 4.3.3

(4) When connecting several drain pipes, follow the instruction as shown in Fig 4.3.4.

Choose the drain collecting pipe that matches unit capacity.

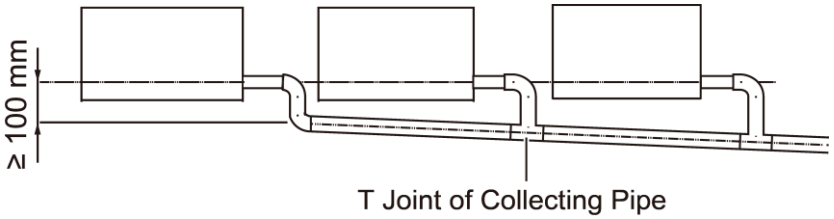


Fig 4.3.4

(5) For indoor units that have high pressure at the outlet of drain pipe, use water-sealed joint.

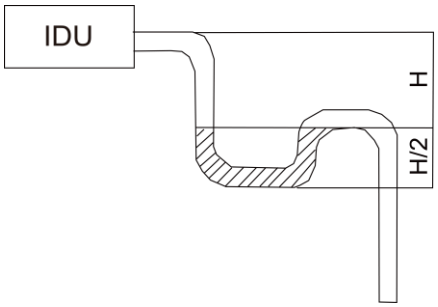


Fig 4.3.5

(6) Install the trap as shown in Fig 4.3.6.

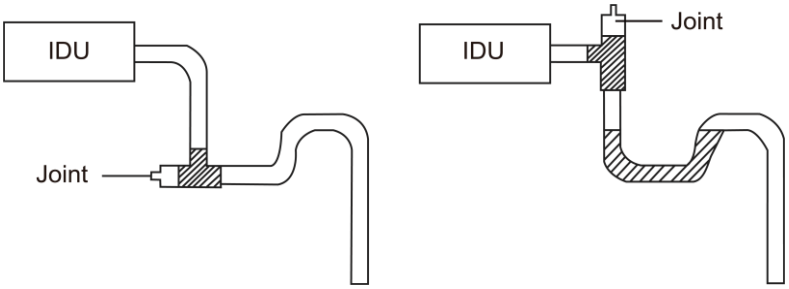


Fig 4.3.6

(7) Install one trap for each unit.

(8) Sufficient clearance should be maintained for access to trap for service and cleaning.

(9) The horizontal pipe can be connected to vertical pipe in the same level; please select the connection way as shown in the following.

Fig. 4.3.7: Connection of drainage pipe joints

Fig. 4.3.8: Connection of downspout elbow

Fig. 4.3.9: Inserting pipe connection

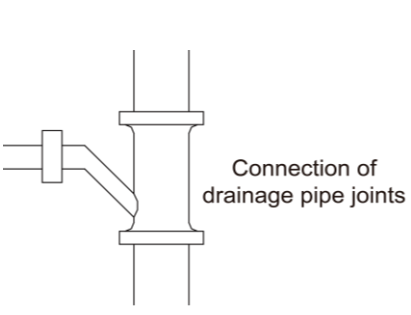


Fig 4.3.7

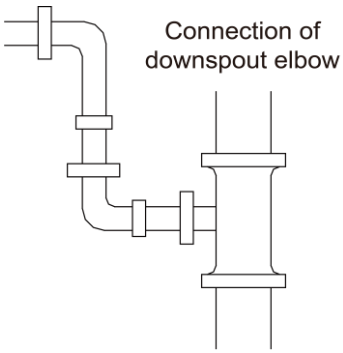


Fig 4.3.8

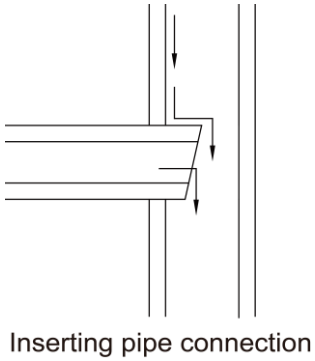


Fig 4.3.9

(10) The installation height of drain lifting pipe should be less than 850mm (33 inch). The downward slope of raising pipe should be at least 1%~2%. If the raising pipe is vertical, the raising height must be less than 800mm (32inch).

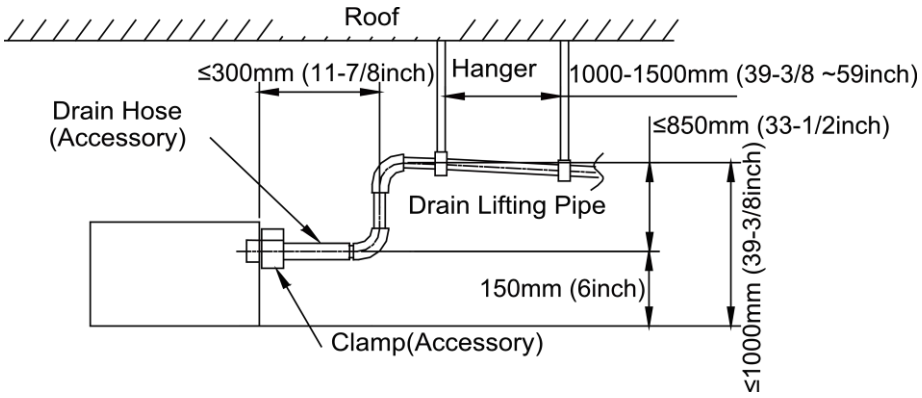


Fig 4.3.10

(11) Drain pipes should have a downward slope of at least 1%~2%. To prevent pipes from sagging, install hanger bracket at intervals of 1000~1500mm (39~59inch).

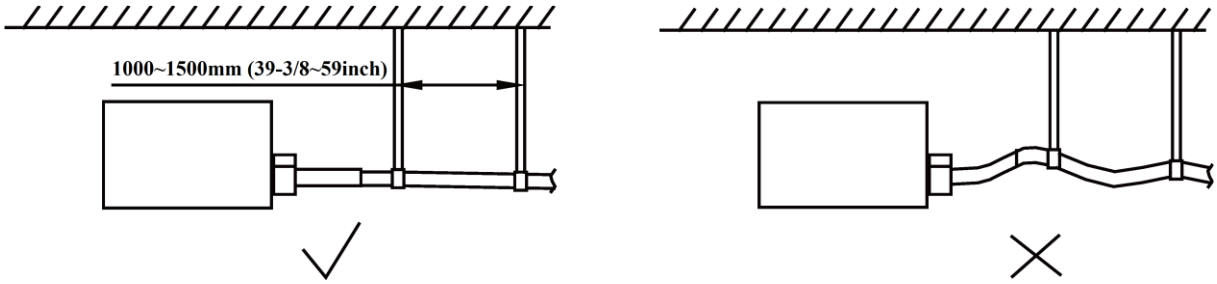


Fig 4.3.11

4.3.3 Test of Drainage System

(1) Please test drainage system after electric work is finished. Add approximately 1L (1 qt) purified water to drain pan from air vent. Be careful not to splash the water over the electrical components (e.g. water pump, etc.).

(2) During the test, check the drainage joint for leakage.

(3) It's strongly recommend to do the drain test before ceiling decoration.

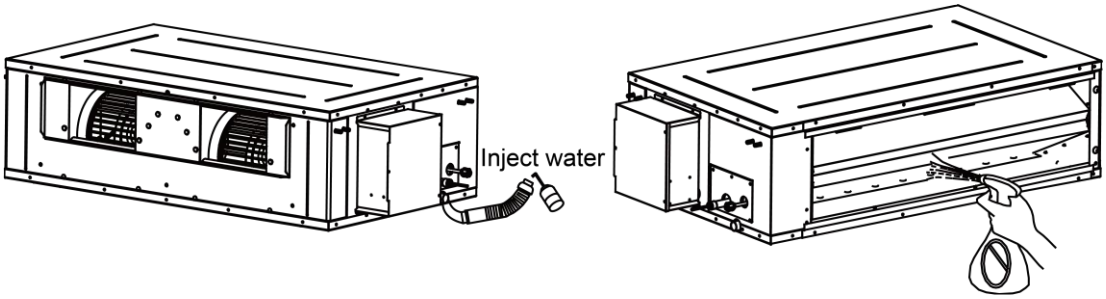


Fig 4.3.12

4.4 Installation of Air Duct

NOTICE !

①. There should be insulating layer on air-out duct, air-return duct and fresh air duct to avoid heat loss and moisture. Attach a nail on the air duct and then add thermal sponge with a layer of tin. Fasten it with a nail cover and then seal the junction with tin tape. You can also use other materials that have good insulation value.

②. Each air-out duct and air-return duct should be secured on a pre-made board with iron frame. The junction of air duct should be sealed well in order to prevent air leakage.

③. The design and construction of air duct should comply with national requirements.

④. Manufacturer suggests the air-return duct to be more than 150mm (6inch) away from the wall. Add a filter to the air-return opening.

⑤. Please consider noise- and vibration dampening for the design and construction of air duct. For quieter conditions air duct openings should be installed in areas away from living or working spaces. For example, do not install an air return directly above a desk or sitting area.

4.4.1 Installation of Air-out Duct

(1) Installation of the Rectangular Duct

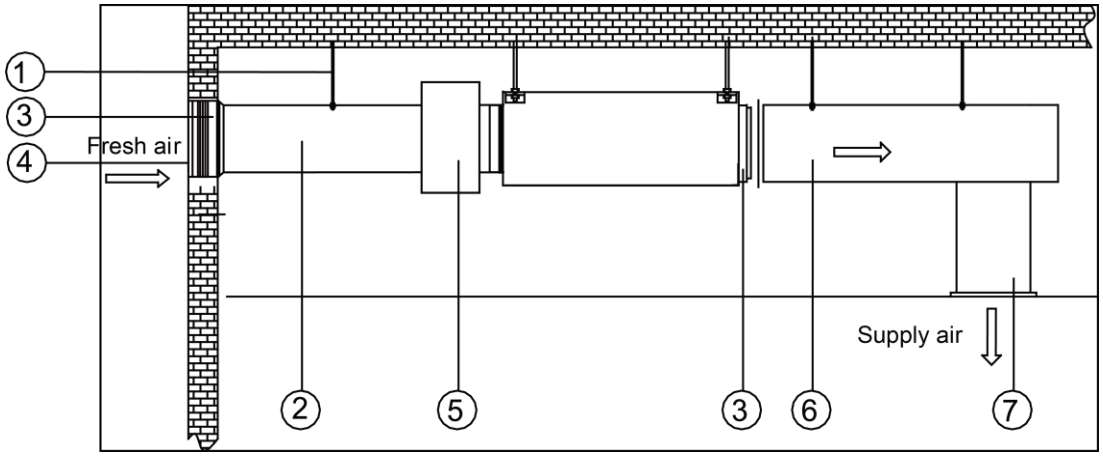


Fig 4.4.1

No.	Name	No.	Name
1	Hanger Rod	5	Static Pressure Box
2	Fresh Air Duct	6	Main Supply Air Duct
3	Canvas Duct	7	Supply Air Outlet
4	Fresh Air Inlet		

(2) Installation of Circular Duct

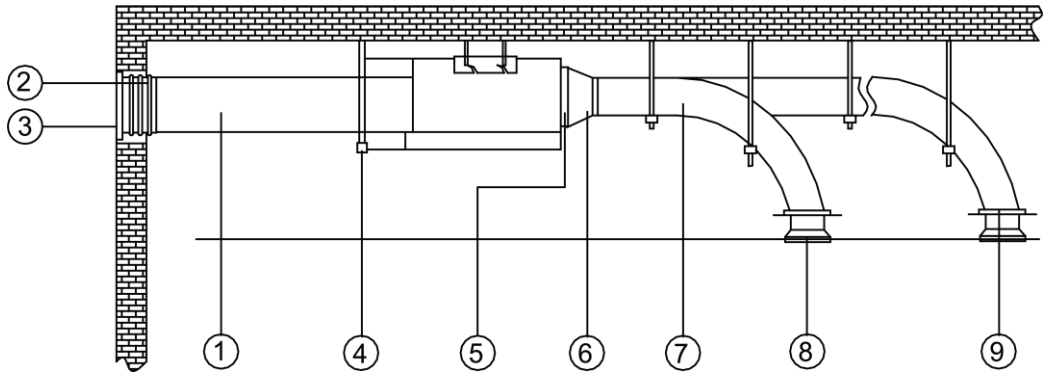


Fig 4.4.2

No.	Name	No.	Name
1	Fresh Air Duct	6	Transition Pipe
2	Canvas Duct	7	Supply Air Duct
3	Fresh Air Blinds	8	Diffuser
4	Hanger Rod	9	Diffuser Connector
5	Supply Air Outlet		

4.4.2 Shape and Size of Air-outlet and Air-return Opening

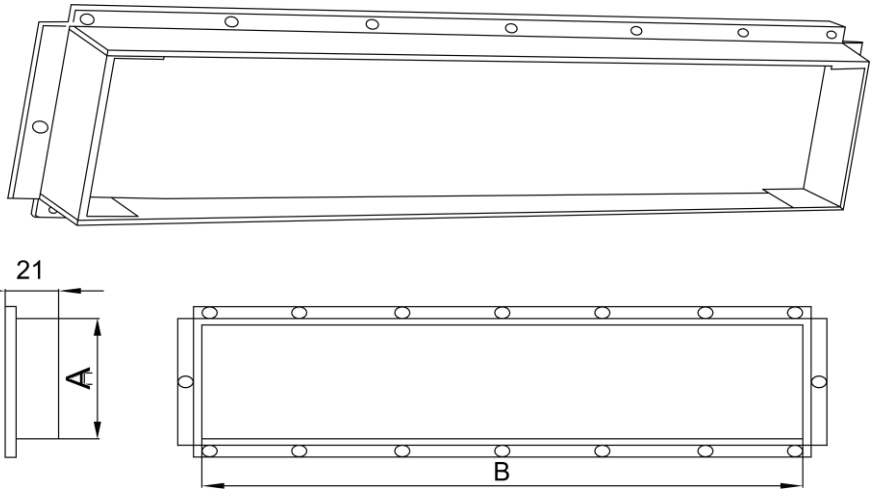


Fig 4.4.3 Air Outlet

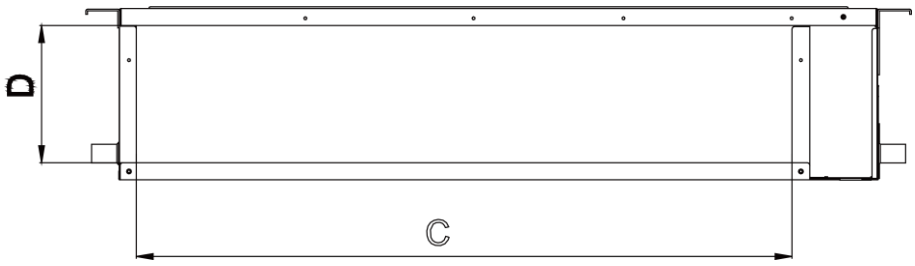


Fig 4.4.4 Air-Return Opening

Umit: mm (inch)

Model	Size of Air Outlet		Size of Air –returen Opening	
	A	B	C	D
BDFA-22(72)-AK	192(7-1/2)	992(39)	1150(45-1/4)	327(12-7/8)
BDFA-28(96)-AK	192(7-1/2)	992(39)	1150(45-1/4)	327(12-7/8)

4.5 Installation of Wired Controller

Please refer to User Manual of Wired Controller for the installation details.

NOTICE !

When installation is finished, the unit must be tested and debugged before operation. Please refer to Instruction Manual of ODU for auto addressing and debugging details.

5 Wiring Work

⚠WARNING
(1) Wiring should conform to national standards. All the parts, materials, electric work should be in accordance with local codes.
(2) Rated voltage and exclusive power supply should be used.
(3) Power cord should be securely attached. Never pull on the power cord.
(4) Wire size of power cord should be sufficient. A damaged power cord or connecting wire should be replaced by approved cable.
(5) All the electrical work should be performed by professional personnel as per local law, regulation and this manual.
(6) Connect the unit to the dedicated grounding device. Make sure the unit is grounded securely.
(7) Air switch and circuit breaker is required to be set. Air switch should have both magnetic trip and thermal trip functions so as to protect the unit when short-circuit or overload occurs. D-type breaker should be used.
(8) Wiring diagram attached to the unit should be followed.
(9) Before obtaining access to terminals, all supply circuits must be disconnected.
(10) If units are type I electrical appliances, they must be reliably grounded.
(11) Ground resistance must be in accord with requirements of local standard.
(12) The green-yellow wire within units is the ground wire. Do not use it for other purposes. Nor should it be cut off or secured by tapping screws. Otherwise, it may cause electric shock.
(13) Power supply at user side must have reliable ground terminal. Do not connect ground wire to the following places: ①. Water pipe. ②. Gas pipe. ③. Drainage pipe. ④. Other places that are considered by professionals as unreliable.
(14) Power cord and communication wire should be separated, with a distance of more than 200mm (8inch). Otherwise, system's communication may malfunction.

5.1 Connection of Wire and Patch Board Terminal

(1) Single wire connection (as shown in Fig. 5.1.1)

1) Strip about 25mm (1inch) insulation of the wire end with stripping tool.

2) Remove the wiring screws on the terminal board.

3) Shape the tail of wire into ring with needle nose pliers. Ring should match the size of the terminal screw.

1) Use the screwdriver to tighten the terminal.

(2) Stranded wire connection (as shown in Fig. 5.1.2)

1) Strip about 10mm (3/8inch) insulation of the end with wire stripper.

2) Remove the wiring screws on terminal board.

3) Insert the wire into the ring tongue terminal and tighten with crimping tool.

4) Use the screwdriver to tighten the terminal.

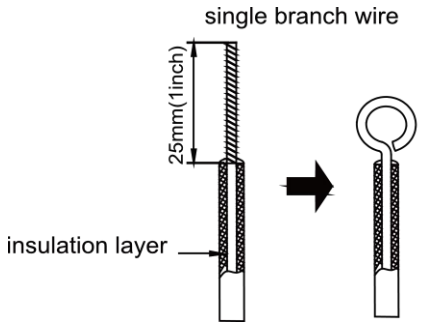


Fig 5.1.1

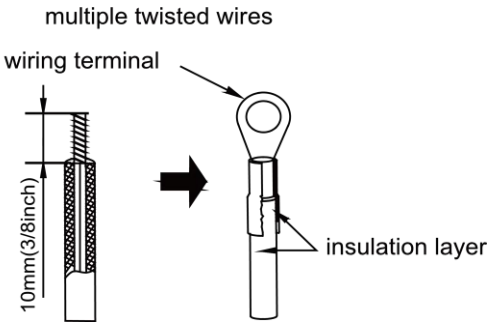


Fig 5.1.2

5.2 Power Cord Connection

⚠WARNING

All indoor units must have a dedicated power supply so that they can be powered ON/OFF at the same time.

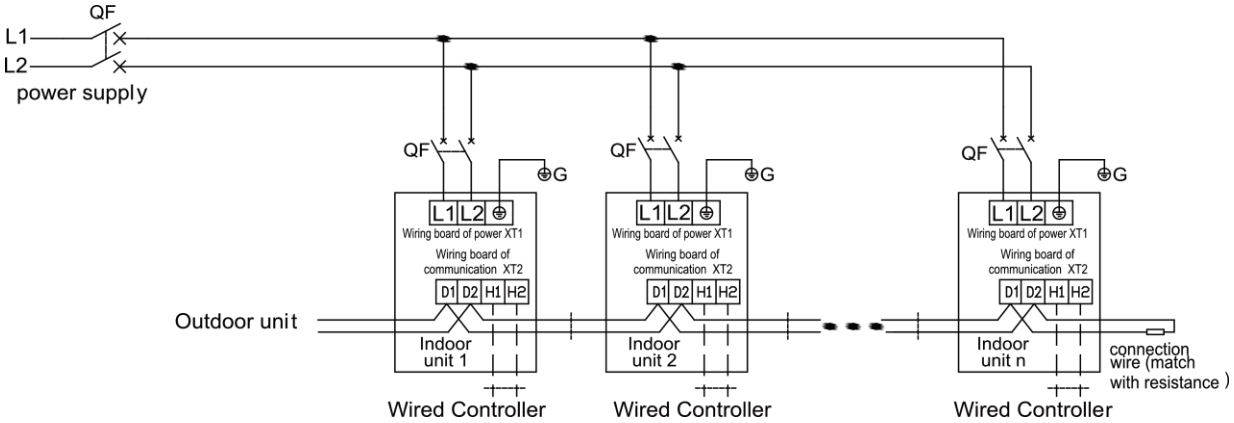


Fig 5.2.1

For units with single-phase power supply.

(1) Detach the electric box lid.

(2) Lead the power cord through the wiring holes.

(3) Connect the power cord to terminal “L1, L2,⏚” .

(4) Secure the power card with wiring clamp.

5.3 Connection of Communication Line of IDU and ODU

(1) Detach the electric box lid.

(2) Lead the Communication cable through the wiring holes.

(3) Connect the communication wire to terminal D1 and D2 of indoor 4-bit wiring board, as shown in Fig. 5.3.1.

(4) Secure the communication cable with clamp of electric box.

(5) For more reliable communication, be sure to connect the terminal resistor to the most downstream IDU of the communication bus (terminal D1 and D2), as shown in Fig. 5.3.2, terminal resistor is provided with each ODU.

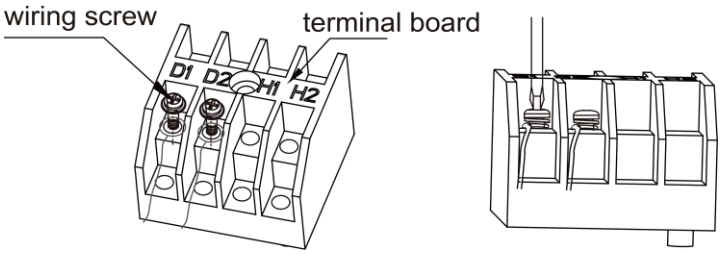


Fig 5.3.1

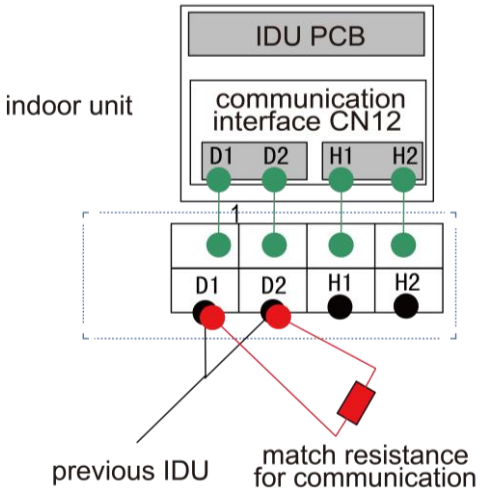


Fig 5.3.2

5.4 Connect Communication Wire of Wired Controller

(1) Open electric box cover of indoor unit.

(2) Lead the communication wire through the rubber ring.

(3) Connect the communication wire to terminal H1 and H2 of indoor 4-bit wiring board.

(4) Secure the communication wire with wire clip on the electric box.

(5) Wiring instructions of remote receiving light board and wired controller:

1) Fig 5.4.1 shows the installation of wired controller.

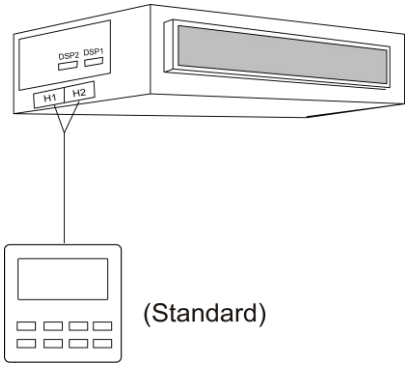


Fig 5.4.1

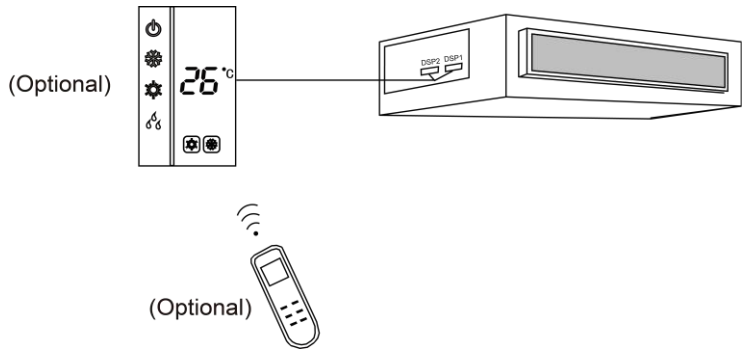


Fig 5.4.2

2) Fig 5.4.2 shows the installation of remote controller.
3) Wired controller and receiving light board can be used on the same unit. When operating through a remote controller, both wired controller and the receiving light board can receive the signals, as shown in Fig. 5.4.3.

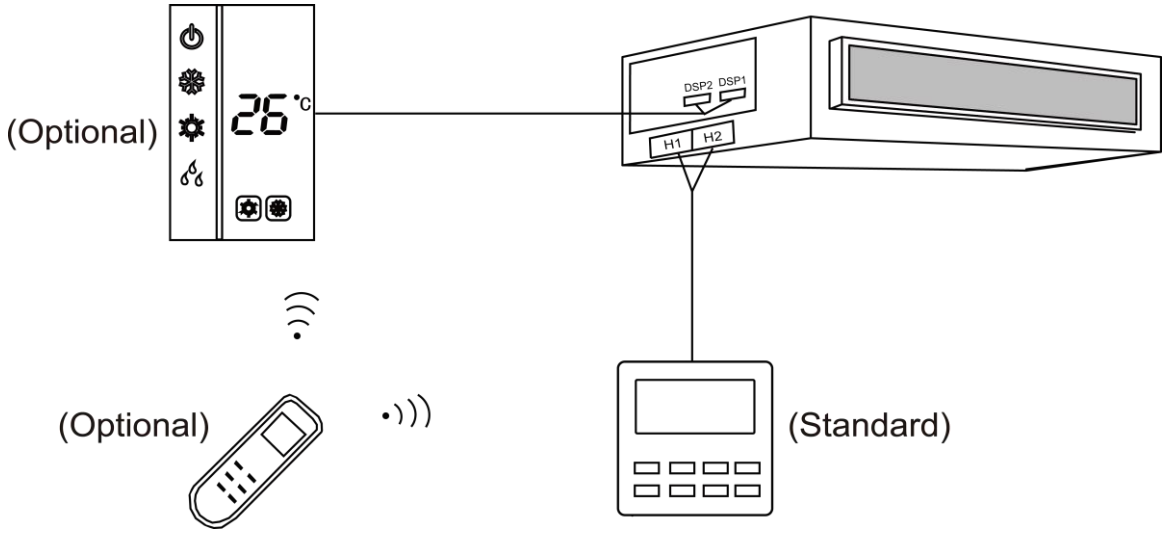


Fig 5.4.3

5.5 Connection of Wired Controller and Indoor Units Network

(1) Communication wire of indoor unit to outdoor unit (or indoor unit) is connected to D1, D2.
(2) Wired controller is connected to H1, H2.
(3) One indoor unit can connect two wired controllers. One must be set as master and one as slave.
(4) One wired controller can control 16 indoor unit in maximum at the same time (as shown in Fig. 5.5)

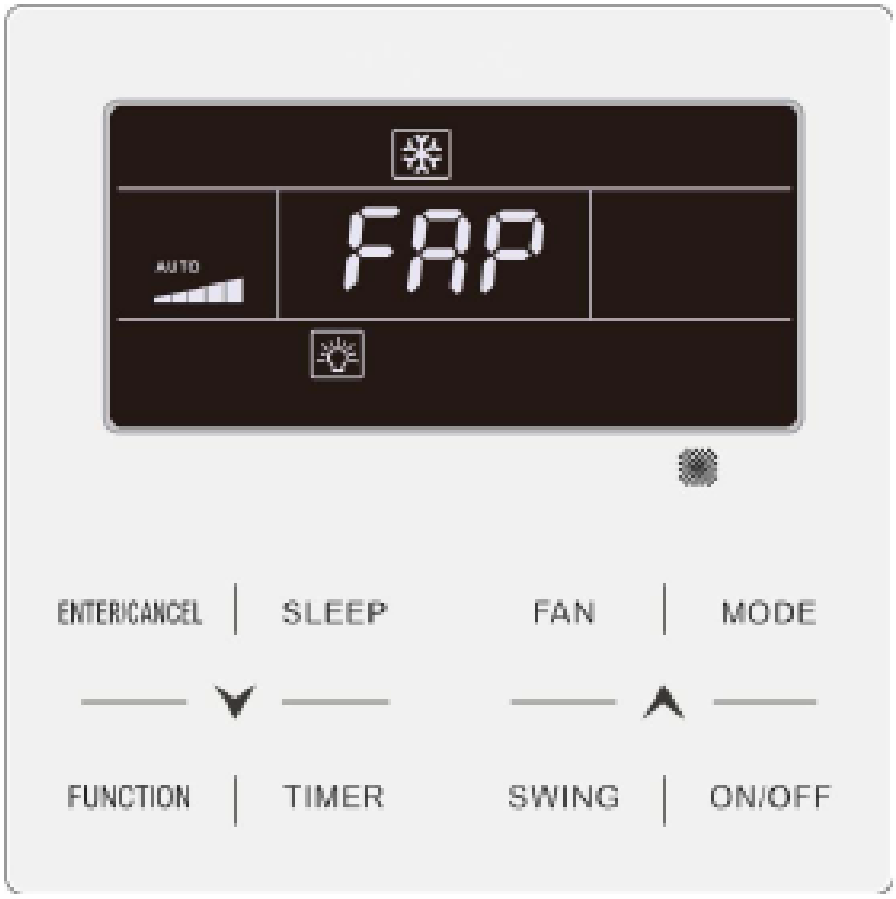
NOTICE !

①. The indoor units must be the same type if they are controlled by a single wired controller. Fresh air indoor unit cannot share the same wired controller with other types of VRF indoor unit.

②. When the indoor unit is controlled by two wired controllers, the addresses of the two

wired controllers should have different address settings. Address 1 is for main controller; Address 2 is for slave controller. Detailed setting please refer to the instruction manual of wired controller.

③. If connecting the fresh air indoor unit with wired controller for operation, fresh air indoor unit code “FAP” will be displayed as shown below. For specific operation methods, please refer to instruction manual of wired controller.



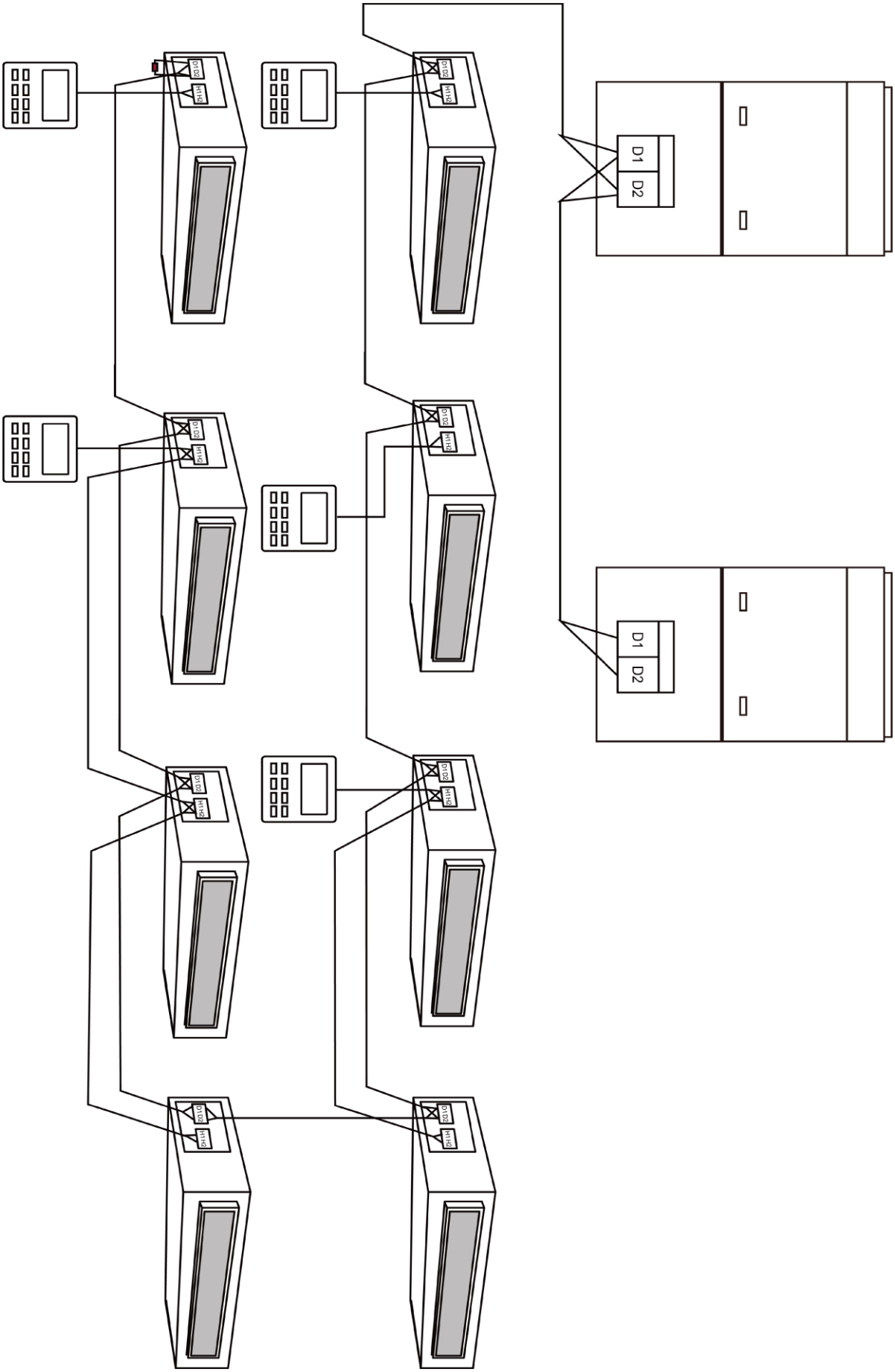


Fig 5.5

6 Routine Maintenance

⚠WARNING
(1) Turn off the unit and cut off the main power supply when cleaning the air conditioner to avoid electric shock or injury.
(2) Use a ladder or other stable platform when cleaning the unit.
(3) Do not clean the unit with hot water whose temperature is higher than 45°C (113°F) to prevent fading or warping.
(4) Do not dry the filters over open flame to avoid warping.
(5) Clean the filter with a damp cloth dipped in mild detergent.
(6) Please contact a qualified service technician if there is a malfunction.

6.1 Cleaning of Filter

(1) Remove the filters from inlet of IDU. Use a vacuum cleaner to remove dust. If the filters are dirty, wash them with warm water and mild detergent, and dry the filters in the shade.
(2) If the unit is used in a very dusty environment, please clean it more frequently (about every two weeks.)

6.2 Preseason Maintenance

(1) Check if the air inlet and air outlet of indoor and outdoor unit are blocked.
(2) Check if securely grounded.
(3) Check if all the power cords and communication cables are securely connected.
(4) Check if any error code displayed after turning on power.

6.3 Post-Seasonal Maintenance

(1) Set the unit in fan mode for half a day on a sunny day to dry the inner parts of unit.
(2) When the unit won't be used for a long period of time, please turn off power supply to save energy. The characters on the wired controller screen will disappear after turning off the power supply.

7 Table of Error Codes for Indoor Unit

Error Code	Content	Error Code	Content	Error Code	Content
L0	Indoor Unit Error	L9	Quantity Of Group Control Indoor Units Setting Error	dL	Outlet Air Temperature Sensor Error
L1	Indoor Fan Protection	LA	Indoor Units Incompatibility Error	d8	Water Temperature Sensor Error
L2	E-heater Protection	LH	Low Air Quality Warning	d9	Jumper Cap Error
L3	Water Full Protection	LC	Outdoor-Indoor Incompatibility Error	dA	Indoor Unit Network Address Error
L4	Power Supply Overcurrent Protection	d1	Indoor Unit Circuit Board Error	dH	Wired Controller Circuit Board Error
L5	Anti-freezing Protection	d3	Ambient Temperature Sensor Error	dC	Capacity DIP Switch Setting Error
L7	No Master Indoor Unit Error	d4	Inlet Pipe Temperature Sensor Error	dE	Indoor Unit CO2 Sensor Error
L8	Power Insufficiency Protection	d6	Outlet Pipe Temperature Sensor Error	C0	Communication Error
db	Special Code: Project Debugging Code	d7	Humidity Sensor Error	AJ	Filter Cleaning Reminding

8 Troubleshooting

If your air conditioner is not working, check the following before calling for service help:

Phenomenon	Troubleshooting
The unit won't start	①. Power supply is not connected ②. Circuit breaker tripping caused by electrical short ③. Input voltage is too low ④. Operation button is off ⑤. Control loop error
The unit runs for a short while, then stops.	①. There is obstacle in front of condenser ②. Control loop error ③. Trying to operate in cooling mode when outdoor ambient temperature is higher than 43℃(109℉)
Poor cooling effect	①. The filter is dirty or blocked ②. Too heavy heat load of room (e.g. too many people) ③. Door or windows are open ④. Air inlet or outlet of IDU are blocked ⑤. Thermostat setting is too high or refrigerant leaks ⑥. Room temperature sensor malfunction
Poor heating effect	①. The filter is dirty or blocked ②. Door or windows are open ③. Thermostat setting is too low ④. Refrigerant leak ⑤. Outdoor ambient temperature is lower than -5℃(23℉) ⑥. Control circuit error
Indoor fan doesn't start up during heating	①. Tube temperature sensor is improperly positioned ②. Tube temperature sensor is not inserted properly ③. Tube temperature sensor wire is broken or short circuited ④. Capacitor short circuit

NOTICE !

If air conditioner still fails to work normally after checking and handling as described above, please stop using it immediately and contact local service center for assistance.

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