

HEAT CONTROLLER

**INSTALLATION, OPERATION  
& MAINTENANCE MANUAL**

**InverterFlex<sup>®</sup> Series  
Outdoor Ductless Mini-Split  
Heat Pumps**

A-VFH18DA-1

A-VFH24TA-1

A-VFH30QA-1

A-VFH36QA-1

A-VFH42PA-1

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## Caution


- Contact an authorized service technician for repair or maintenance of this unit
- Contact an authorized installer for installation of this unit.
- Installation work must be performed in accordance with local and national electrical codes and standards by authorized personnel only






- Read the follow SAFETY PRECAUTIONS carefully before installation.
- Electrical work must be performed by a licensed electrician. Be sure to use the correct rating of the power cord and main circuit for the model to be installed.
- Incorrect installation due to ignoring the instruction will cause harm or damage.

■ **The seriousness is classified by the following indications.**

 <b>WARNING!</b>	This symbol indicates the possibility of death or serious injury.
 <b>CAUTION!</b>	This symbol indicates the possibility of injury or damage to property.

The items to be followed are classified by the symbols:

	This symbol denotes procedure that is PROHIBITED.
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 <b>WARNING!</b>	
1)	Do not install without an authorized servicer/installer.
2)	Install according to this installation instruction. If installation is defective, it can cause water leakage or electrical shock/fire.
3)	Use the supplied accessories and specified parts for installation.
4)	Install the outdoor unit on a raised concrete pad or blocks to provide a solid, level foundation. In a location with high winds, anchor the unit and provide an air baffle. In snowy areas (for heat pump models), install the outdoor unit on a raised platform higher than drifting snow. Provide snow vents, and awning over the unit.
5)	For electrical work, follow local and national electric codes and these installation instructions. An independent must be used. If defects in the electrical work, will cause electrical shock or fire.
6)	Use the specified cable and connect tightly. Clamp the cable so that no external force will stress the connections. Loose wiring may overheat at the connection points and create a possible fire hazard.
7)	Wiring routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause overheating at connection point of terminal, fire or electrical shock.
8)	When charging the unit, take care not to let air/substances other than the specified refrigerant go into refrigeration circuit. Otherwise, it will cause lower capacity, abnormal high pressure in the refrigeration circuit, explosion and injury. 
9)	Do not modify the length of the power supply cord or use an extension cord, and do not share the single outlet with other electrical appliances. Otherwise, it will cause fire or electrical shock. 
 <b>CAUTION!</b>	
1)	This equipment must be grounded. It may cause electrical shock if grounding doesn't comply with local/national electric codes.
2)	Do not install the unit in a place where leakage of flammable gas may occur. If gas leaks and accumulates near the unit, it may cause fire. 
3)	Provide proper condensate drainage per the installation instructions. If not done properly, condensate can destroy personal property and freeze up in improperly on the unit.

## Inverter Series System Introduction:

The InverterFlex series allows one outdoor unit to match with up to five indoor units, depending on capacity. The model nomenclature of the outdoor unit defines the number of available base valves to connect indoor unit. For example a Tri-zone unit can accept up to 3 zones or three indoor units.

### Outdoor Nomenclature **A-VFH18DA-1**

<b>A</b>	<b>-</b>	<b>V</b>	<b>F</b>	<b>H</b>	<b>18</b>	<b>D</b>	<b>A</b>	<b>-</b>	<b>1</b>
B=INDOOR	DASH	V=INVERTER	FLEX Series	H=HEAT PUMP	CAPACITY KBTU/H	TYPE OF INDOOR UNIT	REVISION LETTER	DASH	0=115V 1=230V
					18	D=Dual (2) Zones T=Tri (3) Zones			
					24	Q=Quad (4) Zones			
					30	P=Penta (5) Zones			
					36				
					42				

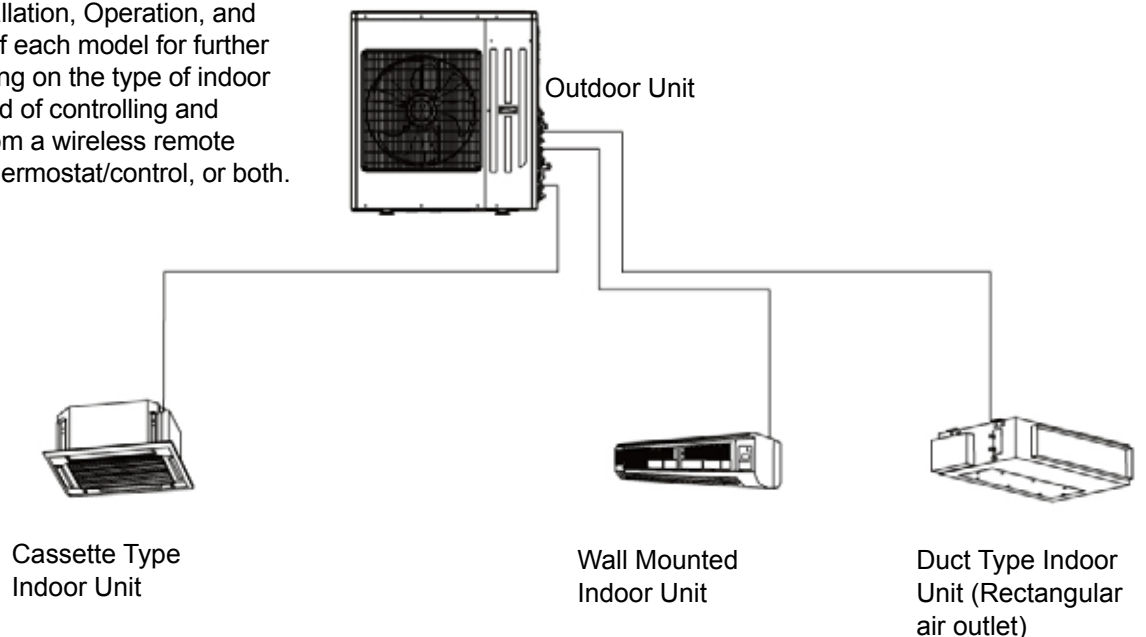
### Indoor Nomenclature **B-VFH09MA-1**

Indoor units available for use with these particular outdoor models use the following nomenclature:

<b>B</b>	<b>-</b>	<b>V</b>	<b>F</b>	<b>H</b>	<b>09</b>	<b>M</b>	<b>A</b>	<b>-</b>	<b>1</b>
B=INDOOR	DASH	V=INVERTER	FLEX Series	H=HEAT PUMP	CAPACITY BTU/H	TYPE OF INDOOR UNIT	REVISION LETTER	DASH	0=115V 1=230V
					09	M=Mini-Split Ductless High Wall C=Ceiling Cassetts			
					12	D=Ducted Air Handler			
					18	U=Universal Mount (Floor Ceiling Mount) F=Floor Mount Console			

A variety of indoor model types can be used with the outdoor unit, including ductless high wall mini-splts, ceiling cassettes, ducted air handlers, floor/ceiling mount, and console units. Refer to the indoor Installation, Operation, and Maintenance manuals of each model for further details. NOTE: Depending on the type of indoor unit selected, the method of controlling and operating it may vary from a wireless remote control to a wired wall thermostat/control, or both.

EXAMPLE OF TRI-ZONE SYSTEM



## Inverter Series System Introduction:

### System Selection:

The total capacity of **ALL** the indoor units can not exceed 150% of the capacity of the outdoor unit. However, we recommend sizing the indoor unit's total capacity to be less than or equal to 100% of the outdoor unit's capacity. If sized beyond 100% of the outdoor unit's capacity, when all the indoor units receive a call for cooling/heating, the entire system will still only be able to achieve the rated capacity of the outdoor unit. The inverter compressor can run at a higher frequency but may not provide full capacity to all indoor units. Sizing above 100% is usually done because one or more indoor units may not be in use the majority of the time.

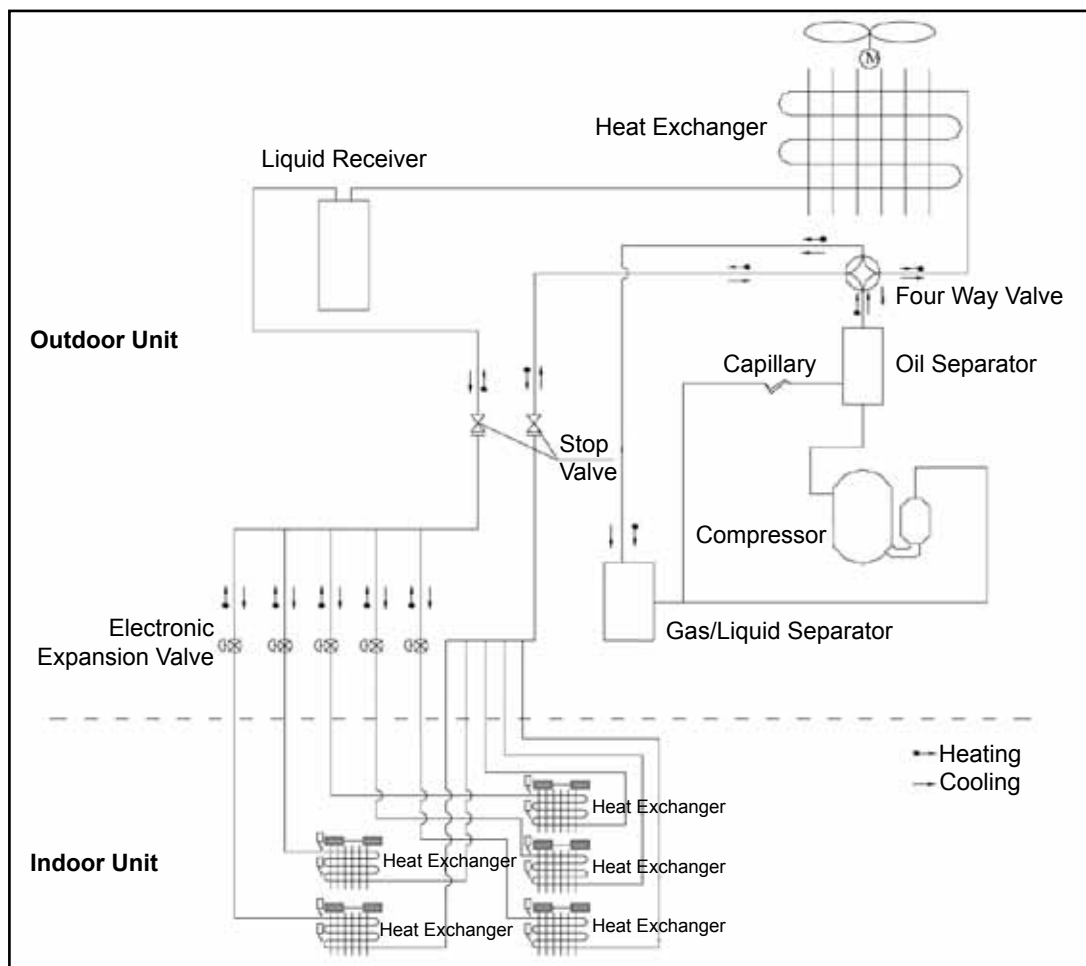
Additionally, the total capacity of all indoor units cannot be less than 50% of the outdoor unit's capacity.

### System Application:

This system is not designed to be a sole source of heat for a home/building. While the units can operate in low ambient conditions, they cannot provide the full rated capacity for heat at low outdoor temperatures. An additional heat source may be required in areas such as the northern USA and Canada during the winter.

This system must be run in modes that do not conflict. For example, one indoor unit cannot be run in cool mode and another indoor unit in heat mode. All indoor units modes must be harmonized for the system to properly operate. The fan mode can run in conjunction with any other mode, while the cooling mode can be run in conjunction with the dehumidification mode. However all other modes must match among the indoor units.

System Schematic



NOTE: The number of indoor units may vary depending on the capacity of the outdoor unit. This is an example of a five (5) zone system.

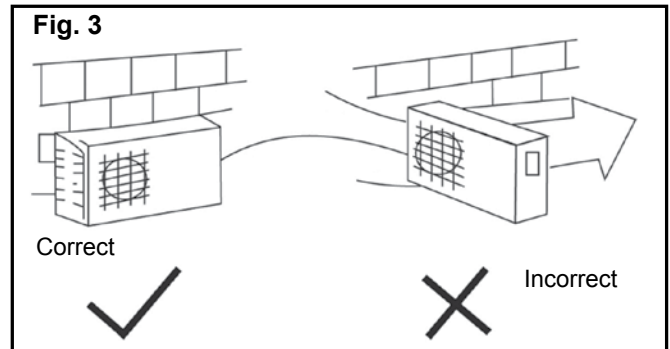
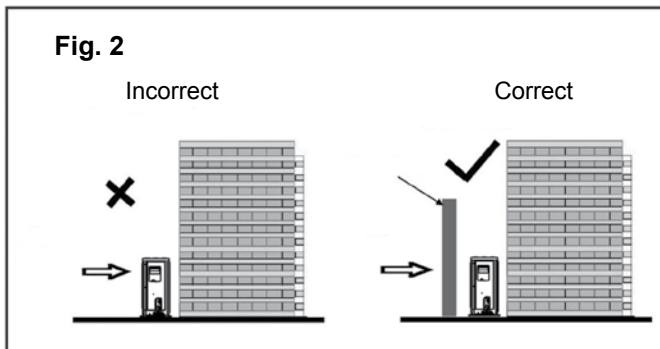
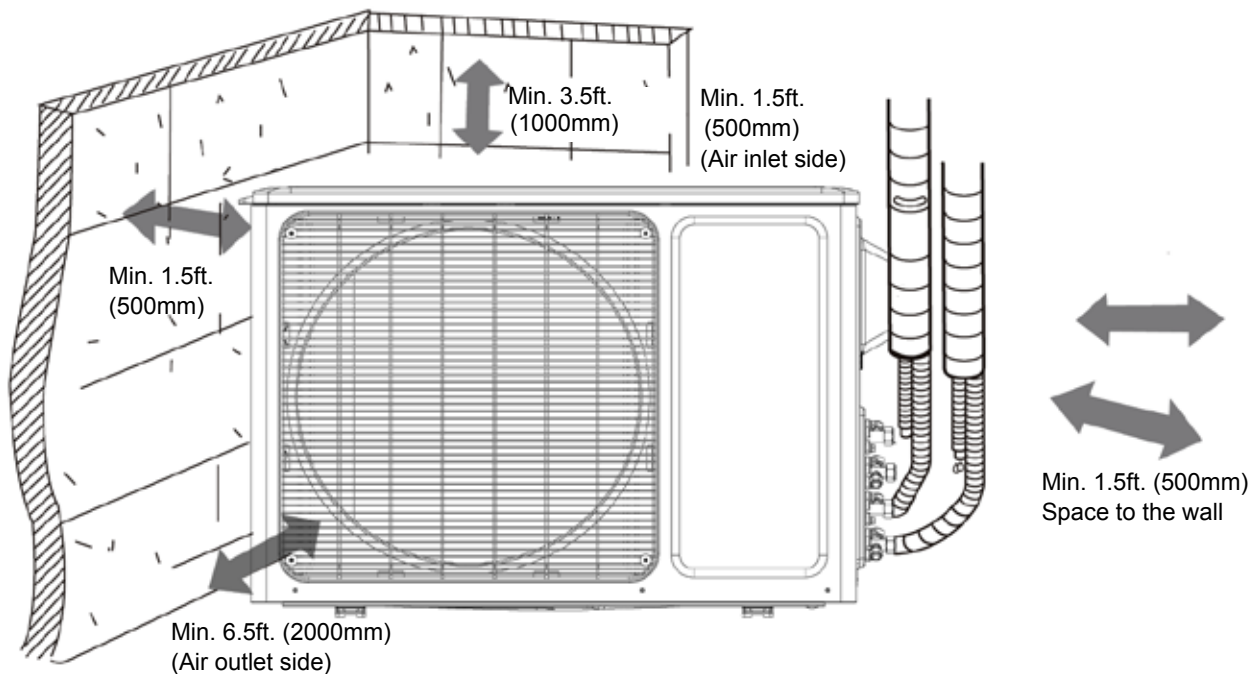
### Selecting installation place

Choose a location that places the outdoor unit as close to the indoor unit as possible. The maximum unit separation and vertical lift (distance compressor is above the evaporator) must be taken into account. Do not exceed allowable refrigerant line lengths.

### Outdoor unit

- Unit must be installed in a location that does not obstruct the airflow and ensures clearance are maintained (Fig. 1)
- If installation location allows the unit to be exposed to strong winds (such as coastal applications), ensure that the unit has a wind barrier. This will assist with preventing strong gusts of wind from entering the unit's cabinet and interfering with the fan operation. (Fig. 2 and Fig. 3)

**Fig. 1**



- Avoid areas where water, snow, or ice may fall from the roof onto the unit.
- In climates where snow is a consideration, locate the unit away from areas prone to drifting.
- Ensure the location of the unit will not be subject to snow drifts, heavy accumulation of snow or leaves or other seasonal debris. If such a location is unavailable, provide an awning for the unit. (Fig. 4 and Fig. 5)

1. An awning can be built over the outdoor unit to prevent direct sunlight, rain exposure, or snowfall.
2. Ensure that the awning does not impede the unit's required clearances or obstruct air flow.

3. The awning should be at least 2 ft. (0.6m) away from the top of the unit's housing.
- Ensure free flow of air into and out of the unit. All air inlet/outlets should be free of obstructions such as walls and shrubs. Minimum clearances should be maintained. (Fig. 1)
  - During heating and defrost modes (heat pump models only), the condensate should be properly drained away from the unit. • Do not locate two or more units in any way that will block discharge air from one unit to another. Be certain that hot air from one unit will not blow into a nearby unit to prevent recirculation or discharge air. (Fig. 6)

Fig. 4

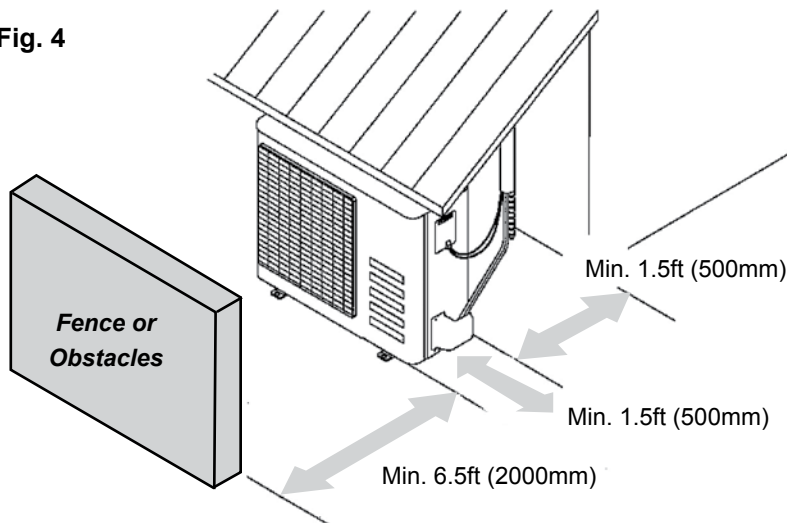


Fig. 5

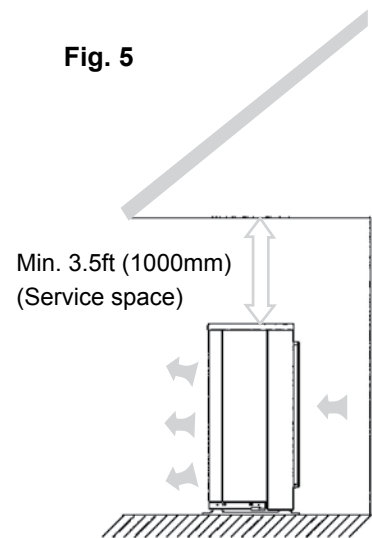
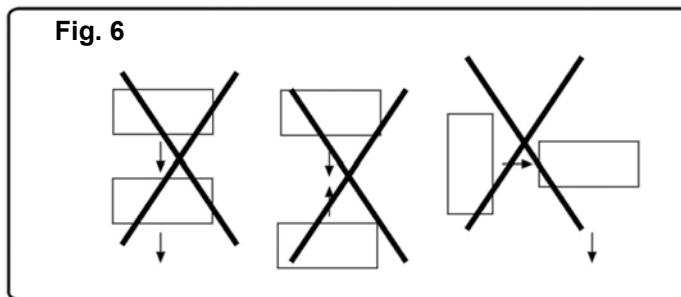


Fig. 6



## Rooftop installation

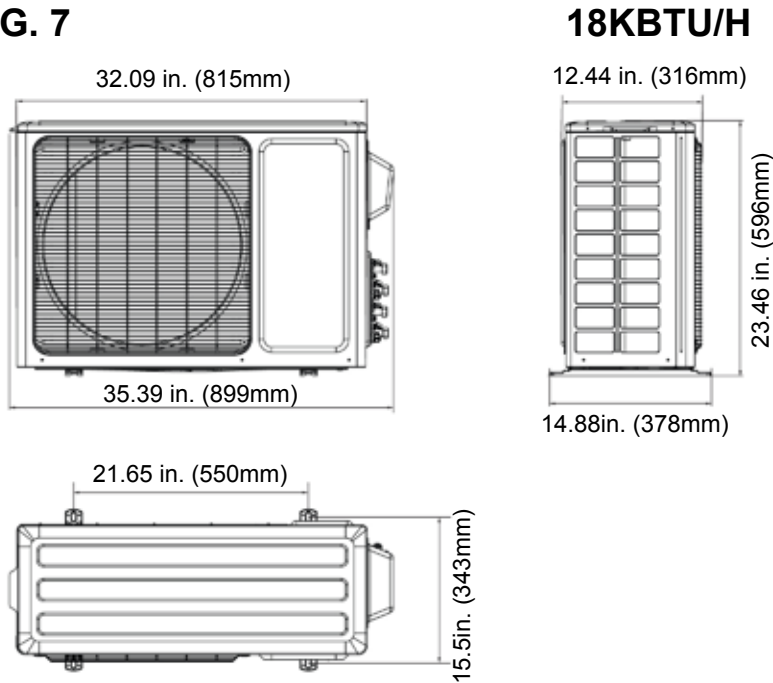
- If the outdoor unit is installed on a roof structure, be sure to level the unit.
- Ensure the roof structure and anchoring method are adequate for the unit location.
- Consult local codes regarding rooftop mounting.
- If the outdoor unit is installed on roof structures or external walls, excessive noise and vibration may result, and may also be considered a non-serviceable installation.
- Oil traps must be made in the refrigerant line set (every 10 ft.) when the outdoor unit is located above the indoor unit.

### Outdoor Unit Installation

- Install the outdoor unit on a rigid base (such a concrete slab) to prevent increasing noise level and vibration.
- Use a raised concrete pad or concrete blocks to provide a solid, level surface. Securely anchor the unit down with bolts.

- In a snowy area, slab should be higher than drifting snow.
- See outdoor installation location information on pages 6 and 7 for more details and required clearances.

**FIG. 7**



### Anchoring outdoor unit

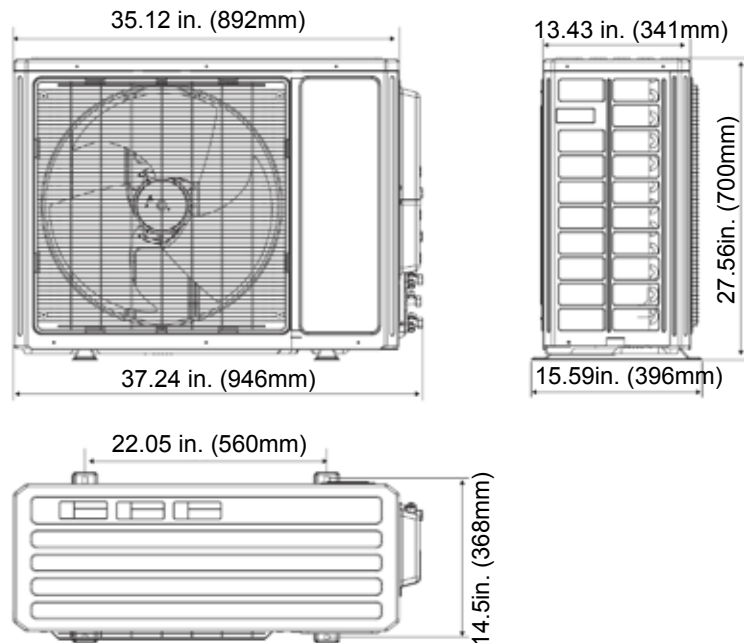
Anchor the outdoor unit to the concrete slab with lag bolts or similar size, may vary by model.

**NOTE:** Lag bolts are field provided and do not come with the unit.

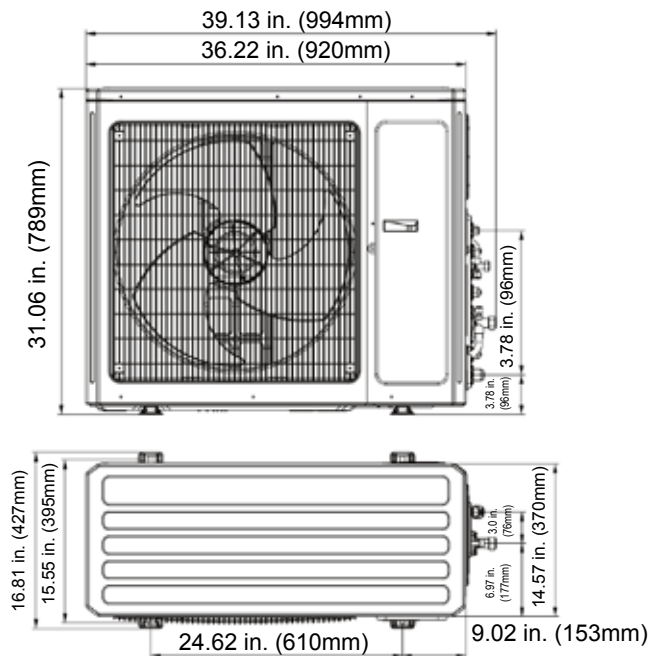
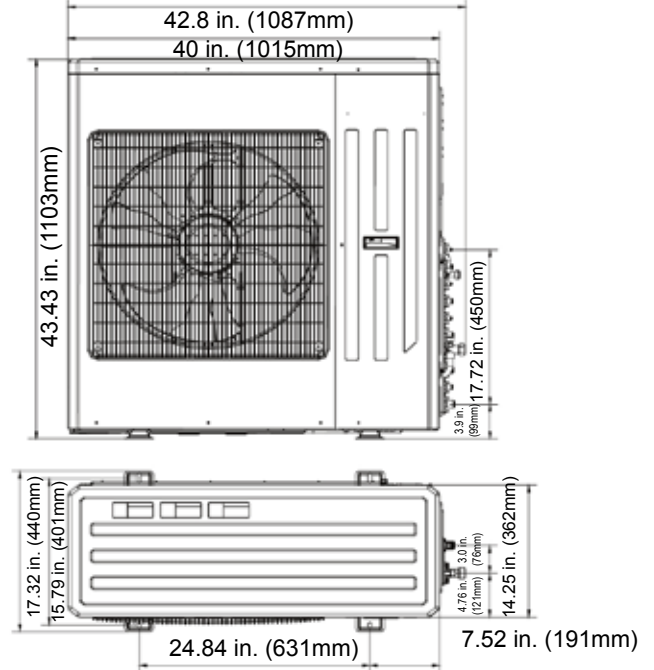
Refer to unit's mounting footprint for mounting hole locations (Fig. 7 - 10)

**FIG. 8**


**24KBTU/H, 30KBTU/H**

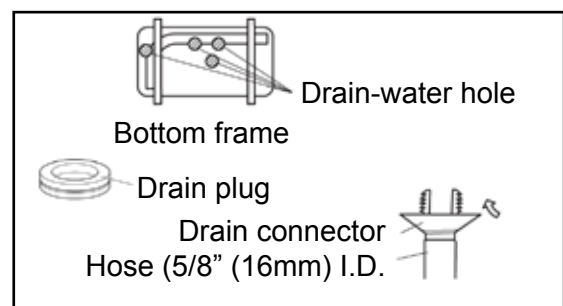




**FIG. 9 36KBTU/H****FIG. 10 42KBTU/H**

## Condensate Drainage

- **For heat pump models only.** 
- Condensate and defrosted water created by the unit operating in heat mode should be routed and drained away from the unit.
- Parts needed for condensate drainage are not factory supplied; they are commercially available.
- Fit the rubber washer onto the drain connector, then insert the drain connector into the hole on the base pan of the outdoor unit. Secure into place. (Fig. 11)
- Connect a locally purchased drain hose. Install hose to the hose barb end of the drain connector.
- Route the hose to drain location away from the unit.
- Repeat for each hole on the base of the unit, as needed.

**Fig. 11**

# Refrigerant Line Set Installation

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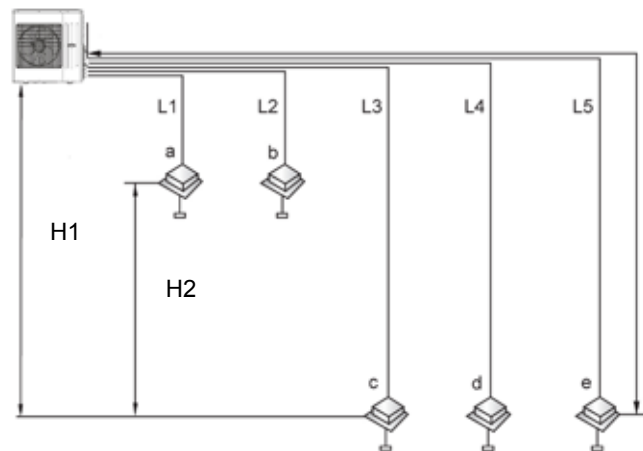
## Refrigerant Line Set Installation

1. Purchase line sets through a Heat Controller distributor with consideration of the minimum and maximum line lengths. (Page 11)
2. Both liquid and suction lines to be insulated.
3. Connections are made via flare nuts.
4. The number of bends and length of refrigerant lines determine the pressure drop which affects capacity and efficiency of the system, as well as oil return. Minimize the length and number of bends when possible during installation.
5. Minimum line set length must be maintained, even if the installation does not require it. Extra length that is unnecessary can be coiled up near the outdoor unit (Do not to block air inlets/outlets).
6. Choose a location that places the outdoor unit as close to the indoor unit as possible to minimize line set lengths.
7. Use only clean, refrigerant grade tubing suitable for R-410A.
8. Avoid installing refrigerant lines on wet/rainy days.
9. Always keep tube ends sealed until the final connections are to be made.
10. If line sets are being made at the time of installation, rather than being purchased, be sure to:
  - Remove burrs from cut ends of the tubing
  - Use tube benders to prevent kinking.
  - Ensure tube cuts are square in relation to the end of the tube.
  - Use the proper diameter tube and flare nut sizes recommended by the manufacturer.
- Insulate both lines with Amraflex or equivalent with a wall thickness of at least 3/8".
- Use copper tubing suitable to withstand pressures for R-410A refrigerant. We recommend a minimum wall thickness of 0.027 in. (0.7mm).
11. The tube size should always be the same diameter as the connections provided at the of the indoor unit.

**Note:** On some models, a reducer or an expander may be shipped with the outdoor unit in order to adapt the line set connection to the proper size to mate with the indoor unit's connection. Be sure to check for these parts, should you discover that the outdoor units service valve sizes differ from the indoor unit's connections. If this part is shipped with the outdoor unit, then it is required to be used.
12. Up sizing/downsizing the refrigerant lines/connections can result in inadequate oil return to the compressor or excessive refrigerant return and will void the warranty.
13. Do not over torque the connections, excessive force can break the flare nut.
14. When routing the line set between the outdoor and indoor units:
  - A. Support the tubing adequately to avoid sags that can trap the oil.
  - B. Isolate the tubing so it does not transmit noise from vibration into the structure of the building.
  - C. Avoid sharp edges that could cut the tubes.
  - D. Trap rises every 10 ft. (5-7m) with a 'p' trap, when outdoor unit mounted above the indoor unit.

# Refrigerant Line Set Installation

## Allowable Length and Height of Line Set



$L_x$  = Length of line set  
from farthest indoor unit

For systems with only **one indoor unit**, the maximum line set length ( $L_x$ ) is:

Outdoor Model	Maximum Length ( $L_x$ )	Max. Elevation Between Outdoor & Indoor Unit ( $H_1$ )
A-VFH18/24/30	32.8ft (10m)	24.6ft (7.5m)
A-VFH36/42	82ft (25m)	49.2ft (15m)

For systems with **more than one indoor unit**, the entire system must pass **BOTH** requirements below.

Maximum Length Requirement based on Indoor Unit Capacity:

Indoor Model	Maximum Length
B-VFH09	49.2ft (15m)
B-VFH12	65.6ft (20m)
B-VFH18/24	82ft (25m)

Total Allowable Length based on Outdoor Unit Capacity:

Outdoor Model	Zoning Based on Actual Number of Indoor Units Installed (See Note 2)				Max. Elevation Between Indoor & Outdoor ( $H_1$ )	Max. Elevation Difference Between each Indoor Unit ( $H_2$ )
	Dual Zone (L1+L2)	Tri-Zone (L1+L2+L3)	Quad Zone (L1+L2+L3+L4)	Penta Zone (L1+L2+L3+L4+L5)		
A-VFH18/24/30	98.4ft (30m)	172.25ft (52.5m)	229.6ft (70m)	N/A	24.6 ft (7.5m)	24.6 ft (7.5m)
A-VFH36/42	104.9ft (32m)	157.5ft (48m)	209.9ft (64m)	262.5ft (80m)	49.2 ft(15m)	

## Refrigerant Line Set Installation

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### Single Zone Example:

An Outdoor A-VFH18 is installed with (1) B-VFH09 indoor unit. The line set must not exceed 32.8ft (10m) and the indoor unit must not be more than 24.6 ft(7.5m) higher than the outdoor unit.

### Multi-Zone Example:

An outdoor A-VFH36 is installed with (1) B-VFH18 and (2) B-VFH09 indoor units. Based on the Indoor requirement, the 18K indoor unit's line set can't exceed 82ft (25m) and each 9K indoor units' line set can't exceed 49.2ft (15m). This puts the total system length (L1+L2+L3) at:  $82\text{ft (25m)} + 49.2\text{ft (15m)} + 49.2\text{ft (15m)} = 180\text{ft (54.9m)}$ . However using the total allowable length requirement, we see that an A-VFH36 Tri-Zone system can't exceed 157.5ft (48m). Therefore, we must reduce the line set length to some or all of the indoor units. To ensure that the allowable total length requirement is met, let's reduce the line set for the B-VFH18 unit to 75ft (22.9m) and the B-VFH09 units to 40ft (12.2m) each. Now the total length (L1+L2+L3) requirement is met, as the total =  $75\text{ft (22.9m)} + 40\text{ft (12.2m)} + 40\text{ft (12.2m)} = 155\text{ft (47.2m)}$ , which is less than the total allowable length of 157.5ft (48m) for an A-VFH36 Tri-Zone system.

### Notes:

1. The Max. Allowable Elevation H1 and H2 must also be maintained.
2. The Zoning is based on the actual number of indoor units installed. An outdoor A-VFH42 is capable of having up to (5) indoor units installed with a max. total line set length of 262.5ft (80m), however if the application is zoned using only (2) indoor heads, the max. total line set length is reduced to 104.9ft (32m) as the actual application is a dual zoned system.

## Refrigerant Line Set Installation

Due to the mix and match nature of the InverterFlex™ system, reducing and/or expansion flare connection subassemblies are provided with some models to accommodate for the different flare connections sizes between indoor and outdoor units.

The subassemblies provided accommodate for most typical applications, however the installing contractor may need to purchase additional subassemblies for certain applications.

### A-VFH Outdoor Liquid-Gas Connection Sizes



Liquid Connections	18K	24K	30K	36K	42K
A	1/4" (6.35mm)	1/4" (6.35mm)	1/4" (6.35mm)	1/4" (6.35mm)	1/4" (6.35mm)
B	1/4" (6.35mm)	1/4" (6.35mm)	1/4" (6.35mm)	1/4" (6.35mm)	1/4" (6.35mm)
C	n/a	1/4" (6.35mm)	1/4" (6.35mm)	1/4" (6.35mm)	1/4" (6.35mm)
D	n/a	n/a	1/4" (6.35mm)	3/8" (9.52mm)	1/4" (6.35mm)
E	n/a	n/a	n/a	n/a	3/8" (9.52mm)
Gas Connections	18K	24K	30K	36K	42K
A	3/8" (9.52mm)	3/8" (9.52mm)	3/8" (9.52mm)	3/8" (9.52mm)	3/8" (9.52mm)
B	3/8" (9.52mm)	3/8" (9.52mm)	3/8" (9.52mm)	3/8" (9.52mm)	3/8" (9.52mm)
C	n/a	3/8" (9.52mm)	3/8" (9.52mm)	1/2" (12.7mm)	1/2" (12.7mm)
D	n/a	n/a	3/8" (9.52mm)	5/8" (15.9mm)	1/2" (12.7mm)
E	n/a	n/a	n/a	n/a	5/8" (15.9mm)

### B-VFH Indoor Liquid-Gas Connection Sizes

Indoor Unit	Liquid	Gas
B-VFH09MA-1	1/4" (6.35mm)	1/2" (12.7mm)
B-VFH12MA-1		5/8" (15.9mm)
B-VFH18MA-1		3/8" (9.52mm)
B-VFH12CA-1		1/2" (12.7mm)
B-VFH18CA-1		5/8" (15.9mm)
B-VFH24CA-1		3/8" (9.52mm)

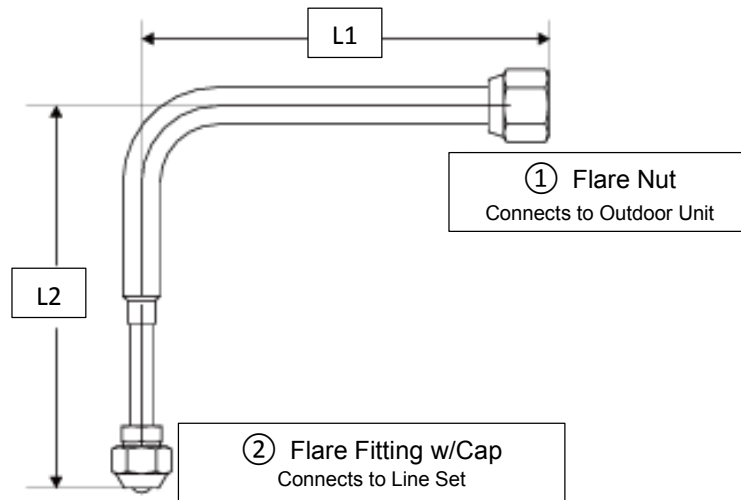
Subassemblies for  
VFH42PA-1 Outdoor

A-VFH36QA-1 and A-  
Units:

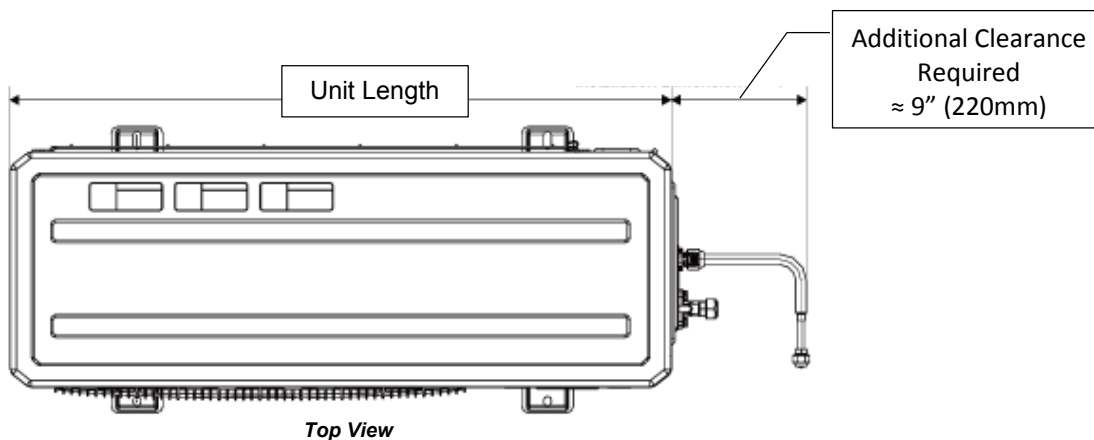
The A-VFH36QA-1 and A-VFH42PA-1 outdoor units come with a set of copper elbow subassemblies with a female flare nut x male flare fitting.

Part #	Flare Nut Size ①	Flare Fitting ②	Length L1	Length L2
06654110	1/4" (6.35mm)	3/8" (9.52mm)	3.11" (79mm)	3.5" (88mm)
06654111	1/2" (12.7mm)	3/8" (9.52mm)	4.45" (113mm)	4.65" (118mm)
06654112	1/2" (12.7mm)	5/8" (15.9mm)	4.45" (113mm)	4.85" (123mm)
06654113	3/8" (9.52mm)	1/4" (6.35mm)	4.37" (111mm)	5.55" (141mm)
06654114	5/8" (15.9mm)	3/8" (9.52mm)	6.92" (176mm)	6.50" (165mm)
06654120	5/8" (15.9mm)	1/2" (12.7mm)	6.92" (176mm)	5.24" (133mm)
06554121*	3/8" (9.52mm)	1/2" (12.7mm)	4.37" (111mm)	3.74" (95mm)

**\*Note:** This subassembly only comes with the A-VFH42PA-1 model.



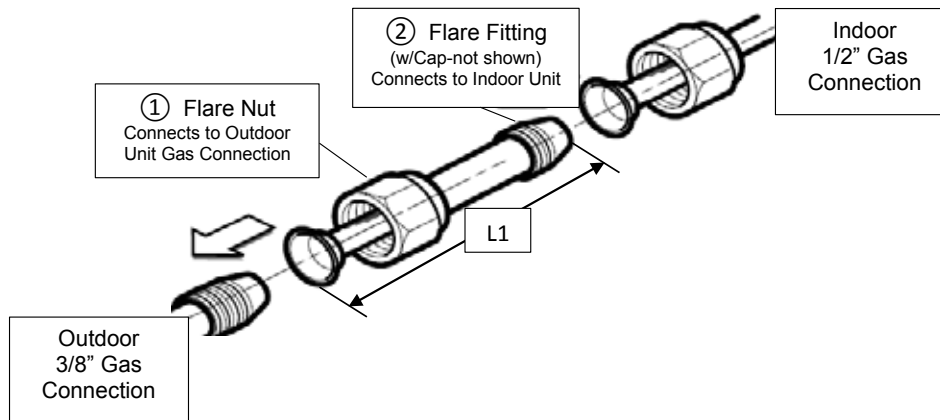
**IMPORTANT:** Due to the use of these subassemblies on the connections of the outdoor unit, please be sure to accommodate for about 9" (220mm) of clearance from the side of the unit where the refrigerant lines attach.



**Subassemblies for A-VFH24TA-1, A-VFH30QA-1 Outdoor Units:**

For models A-VFH24TA-1 and A-VFH30QA-1, two (2) subassemblies consisting of a straight piece of copper with a female flare nut x male flare fitting, are provided to connect any indoor units that have 1/2" (12.7mm) gas connections with the outdoor unit's 3/8" (9.52mm) gas connections.

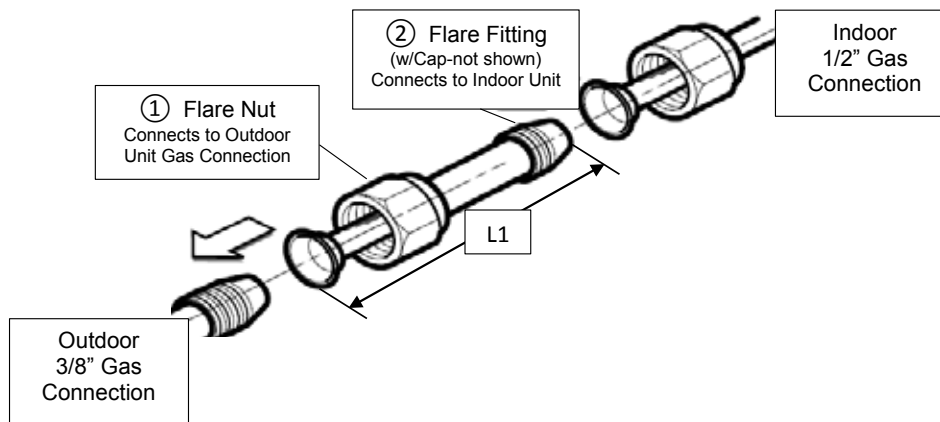
Part #	Flare Nut Size ①	Flare Fitting ②	Length L1
06643008	3/8" (9.52mm)	1/2" (9.52mm)	5.28" (134mm)



### Subassemblies for Indoor Units:

Model B-VFH18MA-1 comes with one (1) subassembly consisting of a straight piece of copper with a female flare nut x male flare fitting, are provided to connect with the outdoor unit's 3/8" (9.52mm) gas connections.

Part #	Flare Nut Size ①	Flare Fitting ②	Length L1
06643008	3/8" (9.52mm)	1/2" (9.52mm)	5.28" (134mm)



### Indoor Units also come with Additional Flare Nuts for ease of installation:

Per the chart below, each indoor model comes with one (1) or two (2) flare nuts in the sizes shown.

Indoor Unit	Flare Nut	
	B-VFH09MA-1	1/4" (6.35mm)
B-VFH12MA-1		
B-VFH18MA-1		5/8" (15.9mm)
B-VFH12CA-1		3/8" (9.52mm)
B-VFH18CA-1		1/2" (12.7mm)
B-VFH24CA-1	3/8" (9.52mm)	N/A

## Leak Test, Evacuation & Release of Refrigerant

### WARNING

*It is illegal to discharge refrigerant into the atmosphere. Use proper reclaiming methods and equipment when working on the refrigerant containing parts of the unit. Service should be performed by a QUALIFIED service agency and certified technicians.*

The condensing unit is supplied with a R-410A factory charge—see rating plate and outdoor unit for exact amount. Charge must be added for interconnecting tubing. See Field Charging Section of this manual.

The unit's service valves are shipped in the closed position and should not be opened until final connections and evacuation are completed.

**The recommended procedure for leak test, evacuation, and release of refrigerant is outlined below:**

1. Complete the final piping connections to the indoor and outdoor units using line sets equipped with flare fittings.
2. Connect a charging manifold to the service ports provided at the service valves.
3. Pressurize the lines and evaporator with nitrogen and leak check all connections with soap bubbles. Repair as necessary any faulty joints. If brazing is required be sure to RELEASE THE NITROGEN FIRST. Re-test as needed.
4. Connect a vacuum pump to the manifold center connection, start the pump and open the manifold valves.
5. Evacuate to 500 microns or less for a minimum of 30 minutes. Close the manifold valves and shut off the pump. Note the vacuum reading and wait 15 minutes. Take a new vacuum reading. A reading of 800 microns or higher indicates the presence of moisture or a leak.
6. Repair as necessary and repeat steps 3, 4 & 5.
7. Confirm that manifold valves are closed and disconnect the vacuum pump.
8. Remove the caps from the services valves. Open the valves to the fully 'back-seat' position. Replace service valve caps and tighten.

## Electrical Precautions

### CAUTION

1. Refer to the unit's rating plate for power supply voltage. Ensure adequate electrical supply is available.
2. Ensure the air conditioner is properly grounded.
3. Connect wiring to the unit according to the electrical diagram located on the unit.
4. All wiring must comply with local and national electrical codes and be installed by a qualified electrician.
5. An individual branch circuit must be available.
6. Properly size the HACR breaker/fuse based on nameplate data.
7. Improper connections and inadequate grounding can cause injury or death.
8. Connect all wiring tightly. Loose wiring may cause overheating at connection points and create a possible fire hazard.
9. Match terminal strip numbers/labels and colors between indoor and outdoor wiring. Erroneous wiring may cause fire/shock.
10. Always use strain reliefs and outdoor cable cover to protect wiring.



## Unit Wiring

### WARNING

- Before performing any electrical work, ensure all power is off. Electrical shock may occur.
- All outdoor unit's capacitor's to discharge otherwise electrical shock hazard may occur.
- Ensure the unit is properly grounded.

### ELECTRICAL WIRING AND SUPPLY VOLTAGE:

All electrical wiring must be done according to local codes. Additionally installations in the USA, must conform to the current National Electric Code (NEC) and Installations in Canada must conform to current Canadian Electric Code (CEC). Nameplate data indicates the operating voltage, phase, ampacity, maximum over current protection, and minimum voltage.

The contractor is to provide an individual branch circuit for over current protection for the unit as required by code. Some codes may require a disconnect between the indoor and outdoor unit. Run power supply wiring through a weatherproof disconnect box and conduit to the unit connection. Disconnects are required to be within sight and easy reach of the unit (usually within 3 feet). Circuit breakers and disconnect switches should be properly sized based on the required codes and the unit's nameplate requirements. (Fig.12)

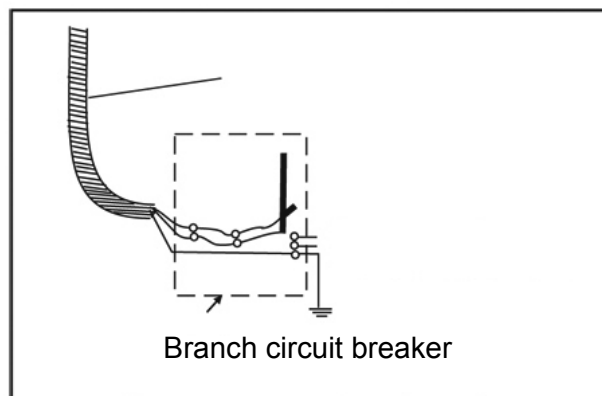
Check the unit wiring diagram for the number of conductors required. Ensure that the proper AWG (gauge) and type of wired is used to comply with code and the unit's nameplate. Route neatly and protect from sharp edges and damage.

Inadequate wiring and/or improper electrical supply will likely result in failure of the compressor and other electrical components and voids the warranty.

Model	BTUH/H	18	24	30	36	42
POWER (outdoor)	PHASE	1 Phase	1 Phase	1 Phase	1 Phase	1 Phase
	VOLT	208/230VAC	208/230VAC	208/230VAC	208/230VAC	208/230VAC
CIRCUIT BREAKER/FUSE (A)		20	30	45	45	50

**NOTE:** Subject to change. Always refer to unit's nameplate.

Fig. 12



## Electrical Work

### Outdoor unit power and communication cable wiring

1. Remove the electrical control cover from the outdoor unit (Fig. 13).
2. Connect power supply wires to the outdoor unit's terminal strip (Fig. 14-19).
3. Connect the communication cable from the indoor unit to the outdoor unit's terminal strip on the left side. Repeat for each indoor unit (Fig. 14-19).
4. Connect the ground wire of the communication cable to the ground terminal (Fig. 14-19).
5. To prevent water from entering in the unit, form a loop in the cable (Fig. 13).
6. Insulate any unused conductors with electrical tape, so that they do not touch any other exposed electrical or metal parts.
7. Replace the electrical control cover that was removed in Step 1.

Fig. 13

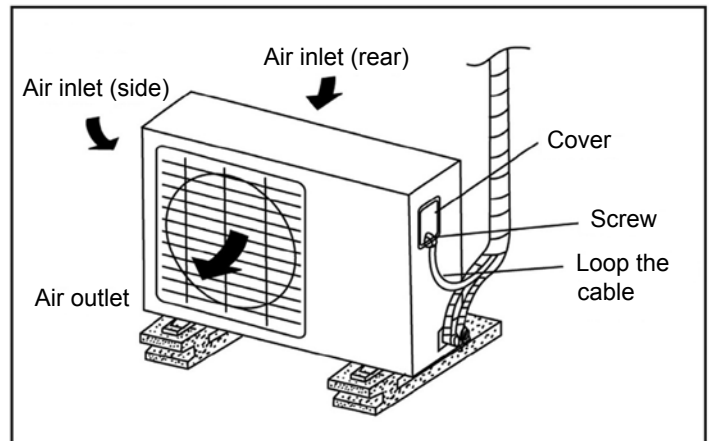
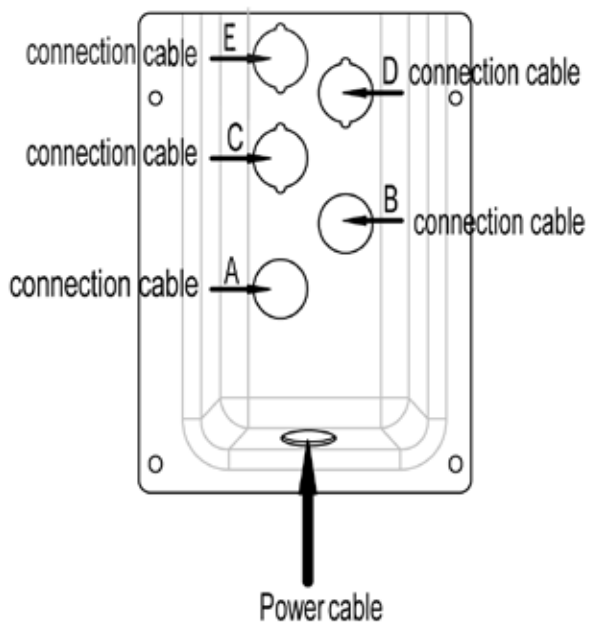


Fig. 14



1. The power cable should be placed in the hole under connection cable cover.
2. If connecting two indoor units, the connection cable should be placed in hole A and hole B.
3. If connecting three indoor units, the connection cable should be placed in hole A, B and C.
4. If connecting four indoor unit, the connection cable should be placed in hole A, B, C and D.
5. If connecting five indoor units, the connecting cables should be places in holes A, B, C, D and E.

# Electrical Work

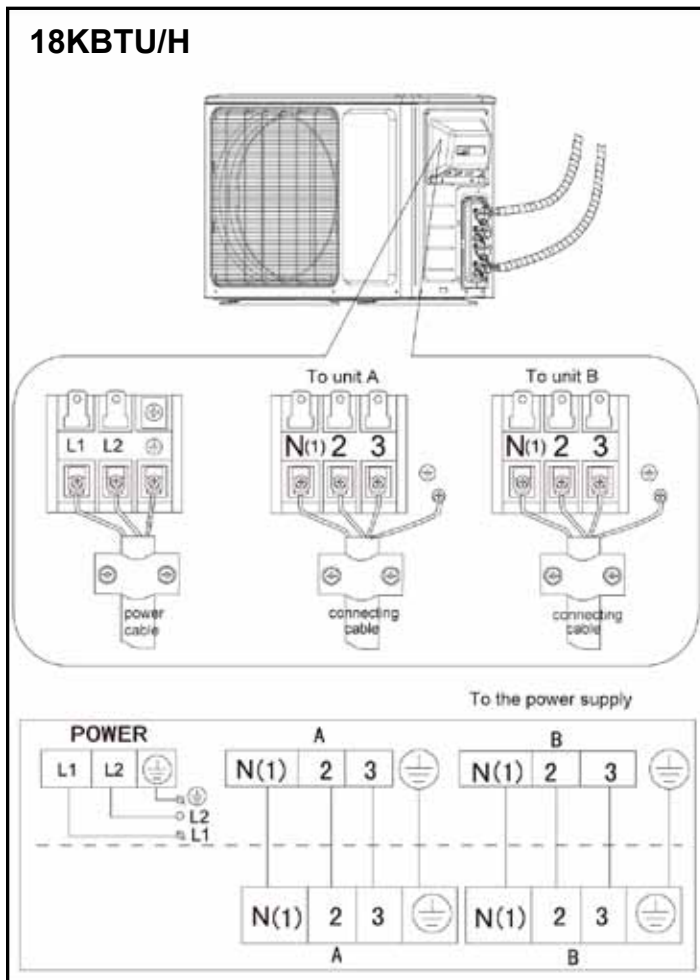


Fig. 15

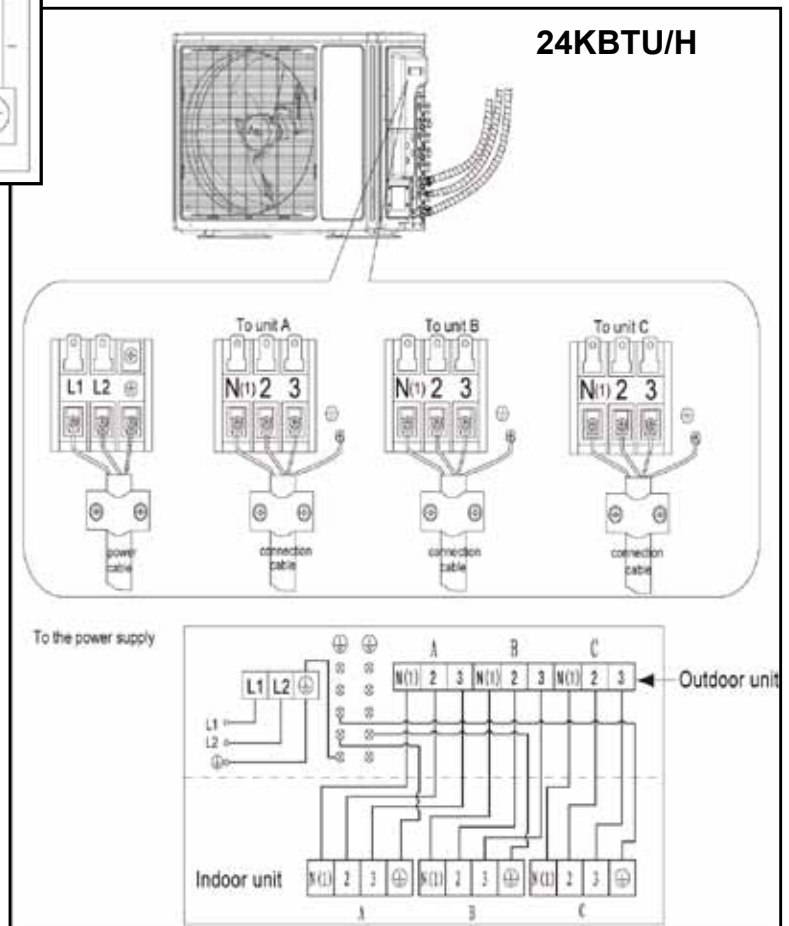


Fig. 16

# Electrical Work

Fig. 17

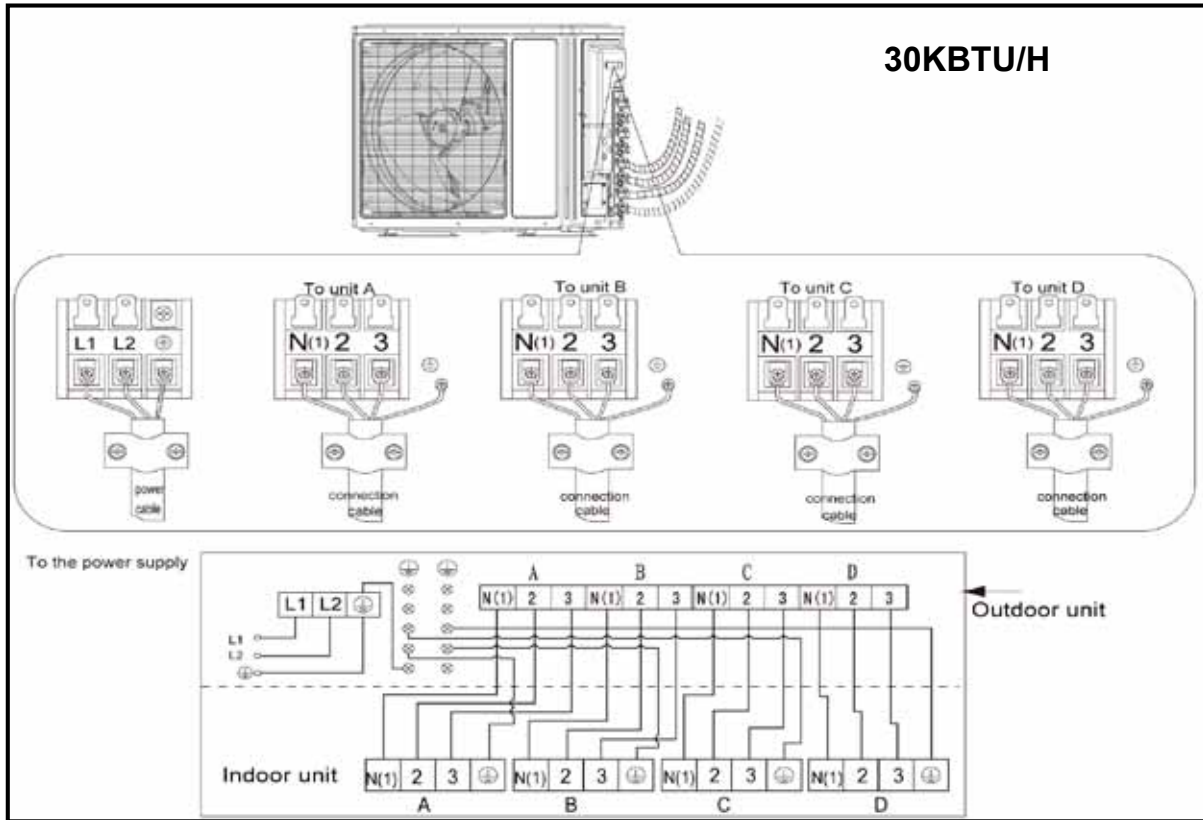
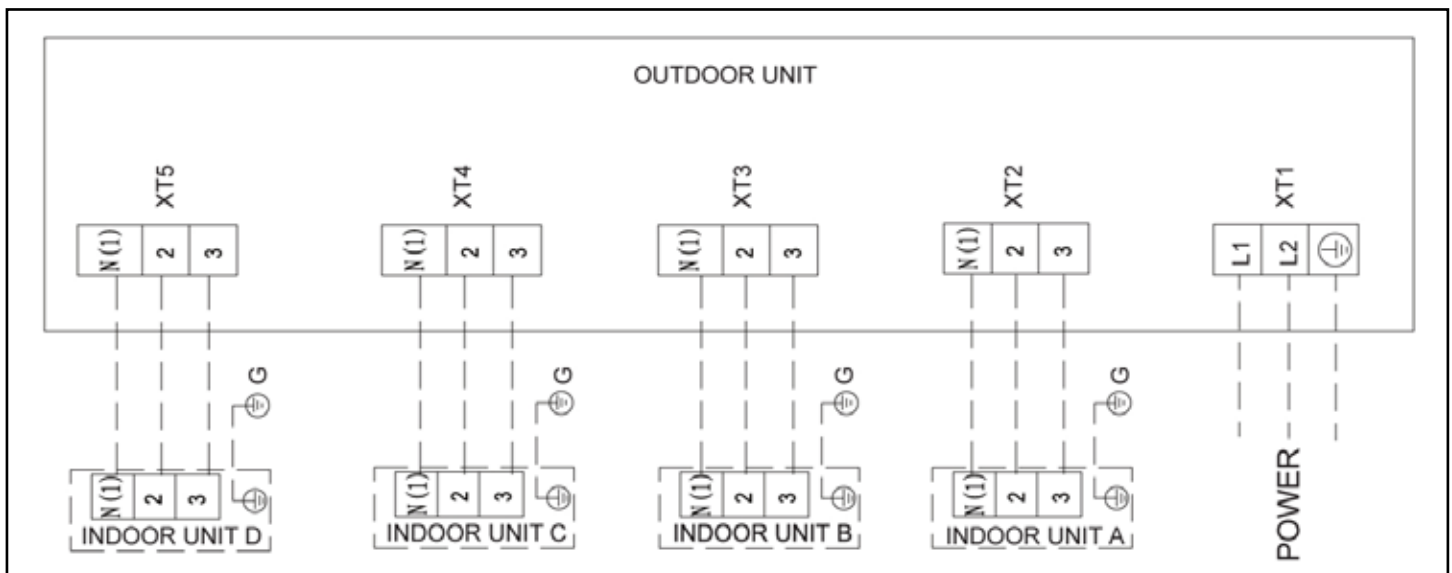


Fig. 18

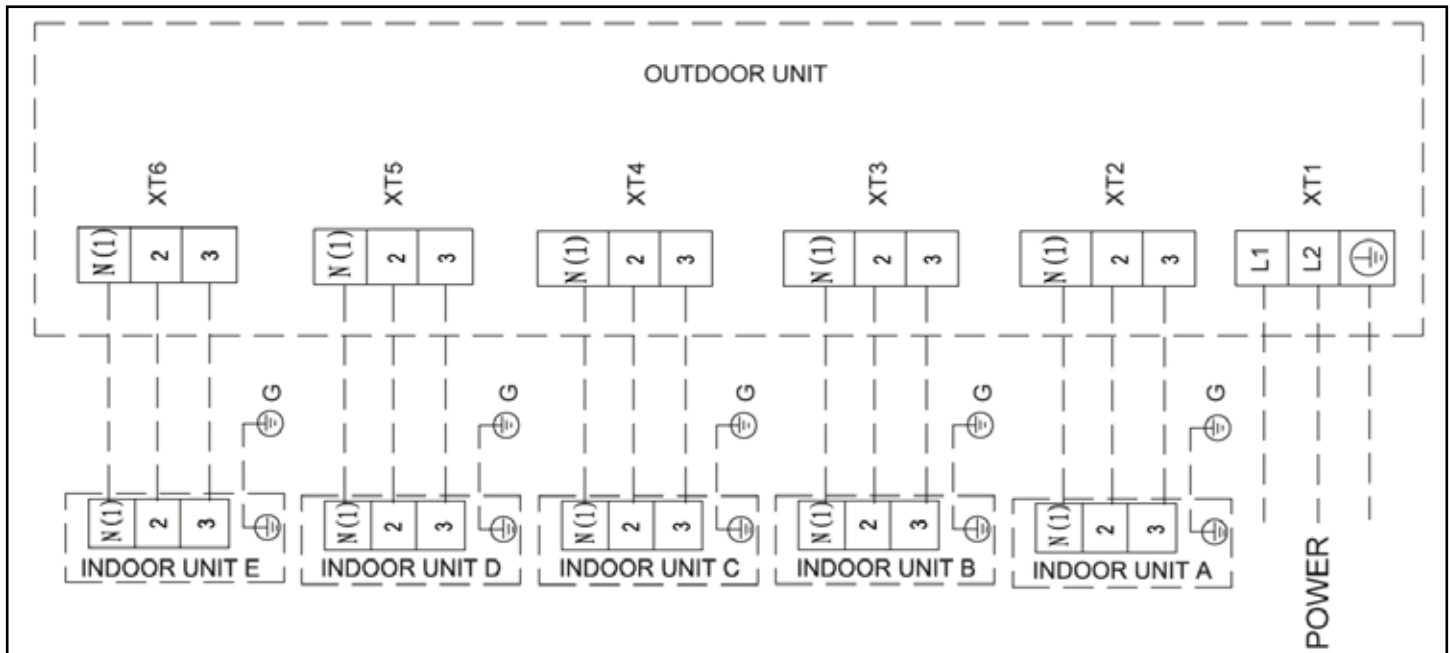
36KBTU/H



## Electrical Work

Fig. 19

42KBTU/H



## Field Charging

Unit performance, efficiency, and life depends, to a large extent, on a proper system charge. Time spent on getting the charge right at start-up will payoff in the long run. Operating conditions such as voltage, air flow, evaporator coil size, and indoor and outdoor temperature and humidity all have an effect on the system pressures and superheat conditions.

Units are factory charged before shipment. See rating plate on outdoor unit for exact amount.

These units should be critically charged to ensure proper performance. Some systems may require additional charging of refrigerant, depending on line set lengths. If the total line set length is less than the amount in the table below, no additional

refrigerant is needed.

If the total length or refrigerant lines for all models is greater than the amount shown in the chart, additional refrigerant is needed.

### 18 - 30 KBTU/H Units

Additional Refrigerant Charge = sum of additional line length\* ft (m) times 0.22 oz/ft (20g/m).

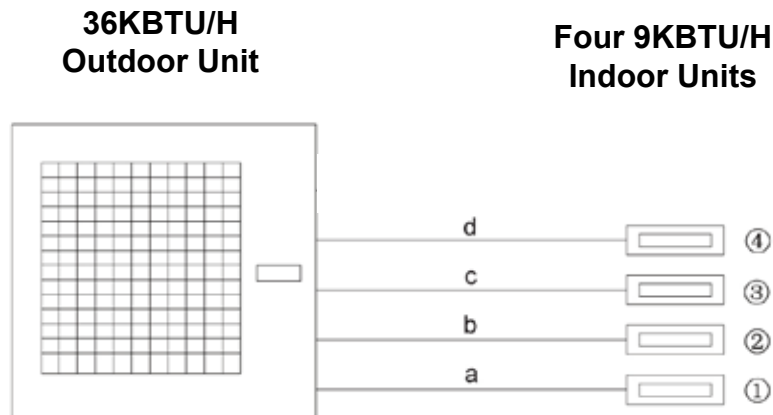
### 36 - 42 KBTU/H Systems

Additional Refrigerant Charge = sum of additional line length\* ft (m) times 0.24 oz/ft (22g/m).

\*Additional line length is the sum of all the line sets for all indoor units subtracted from the total allowable length shown in the table.

KBTU/H	Total allowable length (for all indoor units)
18	32.8 ft. (10m)
24	98 ft. (30m)
30 / 36	131 ft. (40m)
42	166 ft. (50m)

## Field Charging Example



OUTDOOR UNIT	INDOOR UNIT	LINE SET/LENGTH
36KBTU/H	① 9KBTU/H	a / 30 ft (9m)
	② 9KBTU/H	b / 35 ft (10.6m)
	③ 9KBTU/H	c / 40 ft (12.2m)
	④ 9KBTU/H	c / 50 ft (15.2m)

$$\begin{aligned}
 \text{Total length of refrigerant line set} &= a + b + c + d \\
 &= 30' (9\text{m}) + 35' (10.6\text{m}) + 40' (12.2\text{m}) + 49' (15.2\text{m}) \\
 &= \mathbf{154 \text{ ft (47m) total}}
 \end{aligned}$$

The allowable line length for a 36KBTU/H unit is 131 ft (40m) as shown on the table on page 17. The total line set length for the example installation is 154 ft (47m) which is greater than the allowable length, so additional refrigerant is required.

To calculate the additional refrigerant needed, multiply the additional line length by .024 oz/ft (20g/m) for a 36KBTU/H unit. To get the additional line length, subtract the allowable line length from the total system line length.

### CALCULATION EXAMPLE:

Total system line length 154 ft (47m) minus the allowable line length 131 ft (40m) = 23 ft (7m)

To determine the additional refrigerant, the additional line length 23 ft (7m) is multiplied by 0.24 oz/ft (20g/m) = 5.5 oz (154g)

In this example, 5.5 oz (156g) of additional refrigerant is needed for a complete charge.

## Final Inspection

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Do a visual inspection of the entire installation. Complete any final steps and clean up the work areas.

Ensure that all units—indoor and outdoor—are working properly.

### **IMPORTANT!**

All panels must be installed, main power turned on and wiring, refrigerant lines, and condensate drain lines properly connected before operating the unit.

Operation of the unit will depend on the setting of the thermostat on the indoor unit. Refer to the indoor unit's manual for operating instructions.

Review the system and controls with the homeowner

Ensure that the homeowner is provided with all manuals, warranty card, receipt and any additional documentation that might be available or required.

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Due to ongoing product improvements, specifications and dimensions are subject to change and correction without notice or incurring obligations. Determining the application and suitability for use of any product is the responsibility of the installer. Additionally, the installer is responsible for verifying dimensional data on the actual product prior to beginning any installation preparations.

Incentive and rebate programs have precise requirements as to product performance and certification. All products meet applicable regulations in effect on date of manufacture; however, certifications are not necessarily granted for the life of a product.

Therefore, it is the responsibility of the applicant to determine whether a specific model qualifies for these incentive/rebate programs.

## HEAT CONTROLLER

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