

Installation Instructions

NOTE: Read the entire instruction manual before starting the installation.



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SAFETY CONSIDERATIONS

Installing, starting up, and servicing air-conditioning equipment can be hazardous due to system pressures, electrical components, and equipment location (roofs, elevated structures, etc.).

Only trained, qualified installers and service mechanics should install, start-up, and service this equipment.

Untrained personnel can perform basic maintenance functions such as cleaning coils. All other operations should be performed by trained service personnel.

When working on the equipment, observe precautions in the literature and on tags, stickers, and labels attached to the equipment.

Follow all safety codes. Wear safety glasses and work gloves. Keep quenching cloth and fire extinguisher nearby when brazing. Use care in handling, rigging, and setting bulky equipment.

Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes and current editions of the National Electrical Code (NEC) NFPA 70. In Canada, refer to current editions of the Canadian electrical code CSA 22.1.

Recognize safety information. This is the safety-alert symbol . When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words: DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.



WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.



CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Do not bury more than 36 in. (914 mm) of refrigerant pipe in the ground. If any section of pipe is buried, there must be a 6 in. (152 mm) vertical rise to the valve connections on the outdoor units. If more than the recommended length is buried, refrigerant may migrate to the cooler buried section during extended periods of system shutdown. This causes refrigerant slugging and could possibly damage the compressor at start-up.

GENERAL

These instructions cover the installation, start-up and servicing of the multi-zone outdoor unit connected to up to five indoor fan coil units. For approved combinations, please refer to the Product Data.

PIPING REQUIREMENTS

IMPORTANT: Both refrigerant lines must be insulated separately.

The minimum refrigerant line length between the indoor and outdoor units is 10 ft. (3 m). The following lengths are allowed.

Table 1—Piping Lengths

System size			18K	27K	36K	48K
Piping	Min. Piping Length per each indoor unit	ft (m)	10 (3)	10 (3)	10 (3)	10 (3)
	Standard Piping Length per each indoor unit	ft (m)	25 (7.5)	25 (7.5)	25 (7.5)	25 (7.5)
	Max. outdoor—indoor height difference (OU higher than IU)	ft (m)	32(10)	32(10)	32(10)	32(10)
	Max. outdoor—indoor height difference (IU higher than OU)	ft (m)	49(15)	49(15)	49(15)	49(15)
	Max. height different between indoor units	ft (m)	32(10)	32(10)	32(10)	32(10)
	Max. Length per each indoor unit	ft (m)	66(20)	82(25)	98(30)	98(30)
	Max. Piping Length with no additional refrigerant charge per System (Standard Piping length x No. of Zones)	ft (m)	49(15)	74(22.5)	98(30)	123(37.5)
	Total Maximum Piping Length per system	Ft. (m)	98(30)	147(45)	196(60)	245(75)
	Additional refrigerant charge (between Standard – Max piping length)	Oz/ft (g/m)	0.16(15)	0.16(15)	0.16(15)	0.16(15)
Refrigerant	Gas Pipe Size	in (mm)	3/8*2 (9.52*2)	3/8*2 (9.52*3)	1/2 *1 (12.7*1) + 3/8*3 (9.5*3)	1/2 *2 (12.7*2) + 3/8*3 (9.5*3)
	Liquid Pipe Size	in (mm)	1/4 *2 (6.35*2)	1/4 *3 (6.35*3)	1/4 *4 (6.35*4)	1/4 *5 (6.35*5)
	Refrigerant Type		R410A	R410A	R410A	R410A
	Charge Amount	Lbs (kg)	4.19 (1.9)	6.17 (2.8)	7.94 (3.6)	10.14 (4.6)

NOTE: The refrigerant charge included is adequate for the number of zones multiplied by the maximum piping length per zone with no additional refrigerant.

Table 2—Indoor High Wall

Indoor High Wall	SIZE		9	12	18	24
	Pipe Connection Size – Liquid	in.	1/4"	1/4"	1/4"	3/8"
	Pipe Connection Size – Suction	in.	3/8"	1/2"	1/2"	5/8"

Table 3—Indoor Cassette

Indoor Cassette	SIZE		9	12	18
	Pipe Connection Size – Liquid	in.	1/4"	1/4"	1/4"
	Pipe Connection Size – Suction	in.	3/8"	1/2"	1/2"

Table 4—Indoor Ducted

Indoor Ducted	SIZE		9	12	18	24
	Pipe Connection Size – Liquid	in.	1/4"	1/4"	1/4"	3/8"
	Pipe Connection Size – Suction	in.	3/8"	1/2"	1/2"	5/8"

Table 5—Indoor Floor Console

Indoor Floor Console	SIZE		9	12
	Pipe Connection Size – Liquid	in.	1/4"	1/4"
	Pipe Connection Size – Suction	in.	3/8"	1/2"

Refrigerant Piping:

Line sets to be sized based on the connection size of the indoor unit. Each pipe should be insulated individually.

Conversion Joints:

The outdoor unit may include a package of conversion joints to facilitate installation of various sizes of fan coils. These joints are to be connected to the outdoor unit as needed to match the line set size.

Table 6—Conversion Joints

NUMBER OF ZONES	SIZE	ADAPTOR	QUANTITY
2 zone	18	3/8" – 1/2"	2
3 zone	27	3/8" – 1/2"	3
4 zone	36	3/8" – 1/2"	3
		1/2" – 3/8"	1
5 zone	48	1/2" – 3/8"	2
		1/4" – 3/8"	2
		1/2" – 5/8"	2
		3/8" – 1/2"	3

Table 7—Additional Refrigerant Charge

Unit Size	Number of Zones	Charge oz. (kg.)	Additional Charge Required After ft. (m)	Additional Charge oz./ft. (g/m)	Total Maximum Piping Length ft. (m.)
18	2	67.02 (1.9)	49 (15)	0.16 (15)	98 (30)
27	3	98.76 (2.8)	74 (22.5)	0.16 (15)	147 (45)
36	4	126.98 (3.6)	98 (30)	0.16 (15)	196 (60)
48	5	162.26 (4.6)	123 (37.5)	0.16 (15)	245 (75)

Additional Refrigerant Calculation

Sum Total Liquid Pipe ft. (m) – Additional Charge Required After ft. (m.) x Additional Charge oz./ft. (g/m) 0.16 (15)

NOTES:

If the calculation results in a negative number no additional refrigerant is required.

EXV = Electronic Expansion Device

ELECTRONIC EXPANSION VALVES IN THE OUTDOOR UNIT ARE USED AS METERING DEVICES.

ELECTRICAL DATA

Table 8—High Wall

UNIT SIZE	SYSTEM VOLTAGE	OPERATING VOLTAGE	INDOOR FAN			
	VOLT / PHASE / HZ	MAX / MIN	V-PH-HZ	FLA	HP	W
9	208–230/1/60	253 / 187	208–230/1/60	0.07	0.027	20
12				0.07	0.027	20
18				0.17	0.077	58
24				0.23	0.08	60
30				0.23	0.08	60

Table 9—Ducted

UNIT SIZE	SYSTEM VOLTAGE	OPERATING VOLTAGE	INDOOR FAN		
	VOLT / PHASE / HZ	MAX / MIN	FLA	HP	W
9	208–230/1/60	253 / 187	1.03	0.073	55
12			1.03	0.073	55
18			0.83	0.12	90
24			0.83	0.12	90
36			1.263	0.2	150
48			2.23	0.32	240

Table 10—Cassette

UNIT SIZE	SYSTEM VOLTAGE	OPERATING VOLTAGE	INDOOR FAN			
	VOLT / PHASE / HZ	MAX / MIN	V-PH-HZ	FLA	HP	W
9	208–230/1/60	253 / 187	208–230/1/60	0.146	0.061	46
12				0.146	0.061	46
18				0.146	0.061	46

Table 11—Floor Console

UNIT SIZE	SYSTEM VOLTAGE	OPERATING VOLTAGE	INDOOR FAN			
	VOLT / PHASE / HZ	MAX / MIN	V-PH-HZ	FLA	HP	W
9	208–230/1/60	253 / 187	208–230/1/60	0.21	0.027	20
12				0.21	0.027	20

Table 12—Multi Zone Outdoor Unit

UNIT SIZE	SYSTEM VOLTAGE	OPERATING VOLTAGE	COMPRESSOR	OUTDOOR FAN			MCA	MAX FUSE/CB AMP
	VOLT / PHASE / HZ	MAX / MIN	RLA	FLA	HP	W		
18	208–230/1/60	253 / 187	9.7	3	0.16	50	15	20
27			8.85	3	0.16	120	19	25
36			13.4	3	0.16	120	27	40
48			13.5	3	0.11	85	29	50

*Permissible limits of the voltage range at which the unit will operate satisfactorily.

LEGEND

FLA - Full Load Amps

LRA - Locked Rotor Amps

MCA - Minimum Circuit Amps

RLA - Rated Load Amps



CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

- Wires should be sized based on NEC and local codes.
- Use copper conductors only with a minimum 600 volt rating and 2/64-inch thick insulation.



CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

- Be sure to comply with local codes while running wire from indoor unit to outdoor unit.
- Every wire must be connected firmly. Loose wiring may cause terminal to overheat or result in unit malfunction. A fire hazard may also exist. Therefore, be sure all wiring is tightly connected.
- No wire should be allowed to touch refrigerant tubing, compressor or any moving parts.
- Disconnecting means must be provided and shall be located within sight and readily accessible from the air conditioner.
- Connecting cable with conduit shall be routed through hole in the conduit panel.

All wires must be sized per NEC (National Electrical Code) or CEC (Canadian Electrical Code) and local codes. Use the Electrical Data table MCA (minimum circuit amps) and MOCP (maximum over current protection) to correctly size the wires and the disconnect fuse or breakers respectively.

Per the caution note, use only copper conductors with a minimum 600 volt rating and 2/64-inch thick insulation. The use of BX cable is not recommended.

Recommended Connection Method for Power and Communication -Wiring - Power and Communication Wiring:

The main power is supplied to the outdoor unit. The field supplied 14/3 power/communication wiring from the outdoor unit to indoor unit consists of four (4) wires and provides the power for the indoor unit. Two wires are high voltage AC power; one is communication wiring and the other is a ground wire.

Recommended Connection Method for Power and Communication Wiring (To minimize communication wiring interference)

Power Wiring:

The main power is supplied to the outdoor unit. The field supplied power wiring from the outdoor unit to the indoor unit consists of three (3) wires and provides the power for the indoor unit. Two wires are high voltage AC power and one is a ground wire. To minimize a voltage drop, the factory recommended wire size is 14/2 stranded with a ground.

Communication Wiring:

A separate shielded copper conductor only, with a minimum 600 volt rating and 2/64-inch thick insulation, must be used as the communication wire from the outdoor unit to the indoor unit. Please use a separate shielded 16GA stranded control wire.

DIMENSIONS - INDOOR

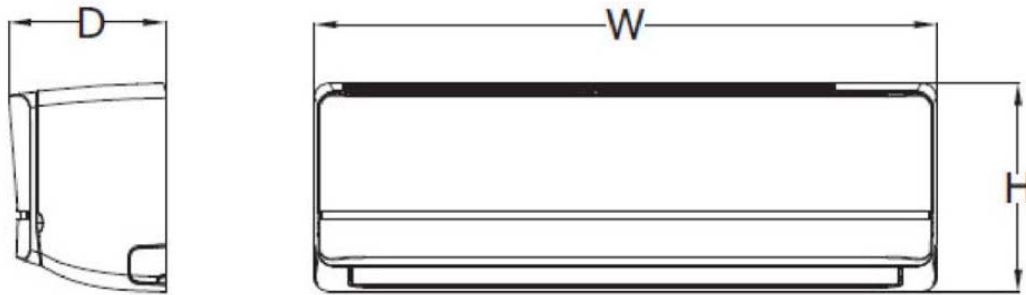


Fig. 1 – High Wall Dimensions

Table 13—High Wall Dimensions

UNIT SIZE	W In. (mm)	D In. (mm)	H In. (mm)	OPERATING WEIGHT Lbs. (kg)
9K/12K	32.9(835)	7.8(198)	11.0(280)	19.2(8.7)
18K	39.0(990)	8.6(218)	12.4(315)	26.5(12.0)
24K	46.7(1186)	10.2(258)	13.4(343)	40.8(18.5)

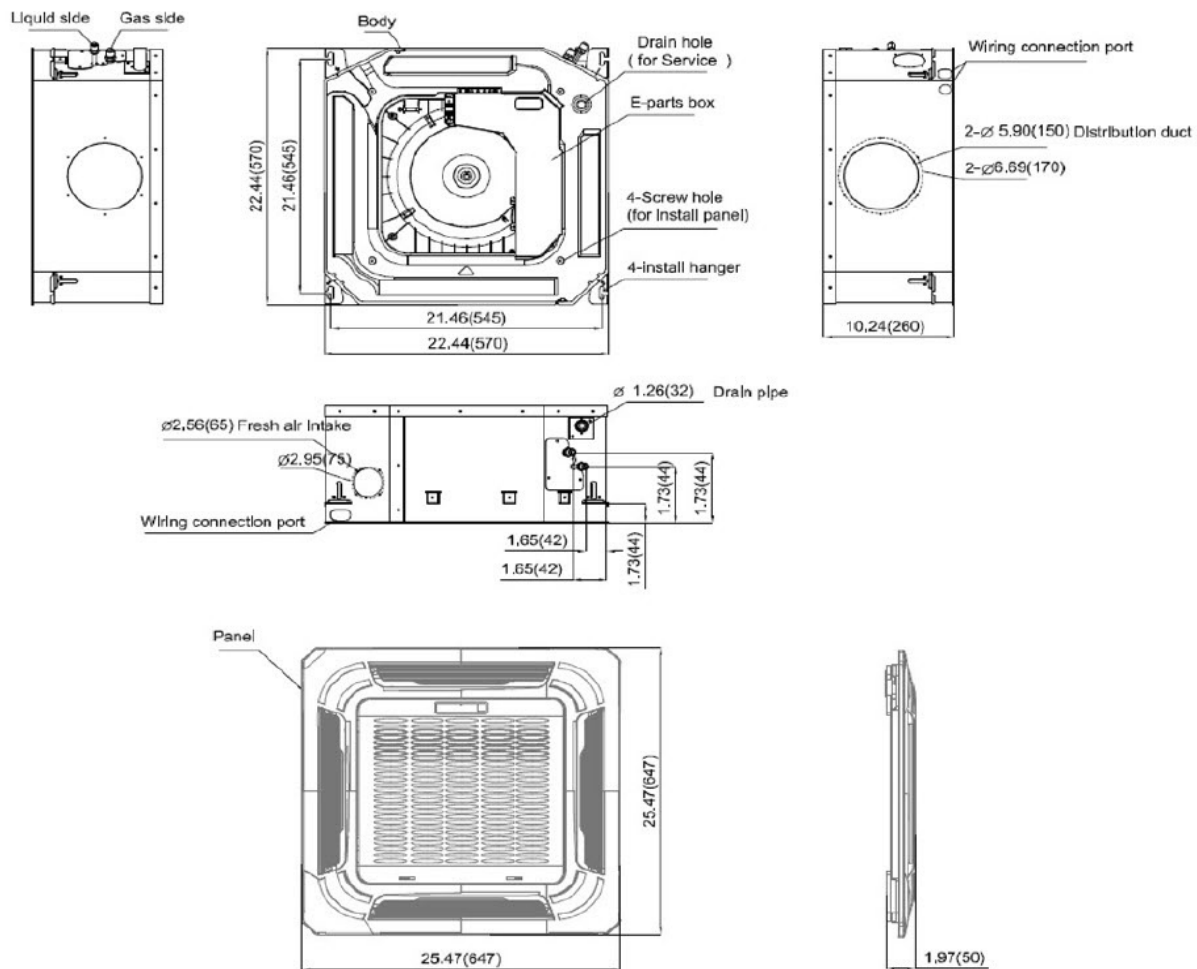


Fig. 2 – Cassette Dimensions

Table 14—Cassette Dimensions

UNIT SIZE		9K		12K		18K	
		BODY	PANEL	BODY	PANEL	BODY	PANEL
Height	in(mm)	10.24 (260)	1.97 (50)	10.24 (260)	1.97 (50)	10.24 (260)	1.97 (50)
Width	in(mm)	22.44 (570)	25.47 (647)	22.44 (570)	25.47 (647)	22.44 (570)	25.47 (647)
Depth	in(mm)	22.44 (570)	25.47 (647)	22.44 (570)	25.47 (647)	22.44 (570)	25.47 (647)
Operating Weight	lbs(kg)	35.27 (16)	5.51 (2.5)	35.27 (16)	5.51 (2.5)	39.68 (18)	5.51 (2.5)

DIMENSIONS - INDOOR (CONTINUED)

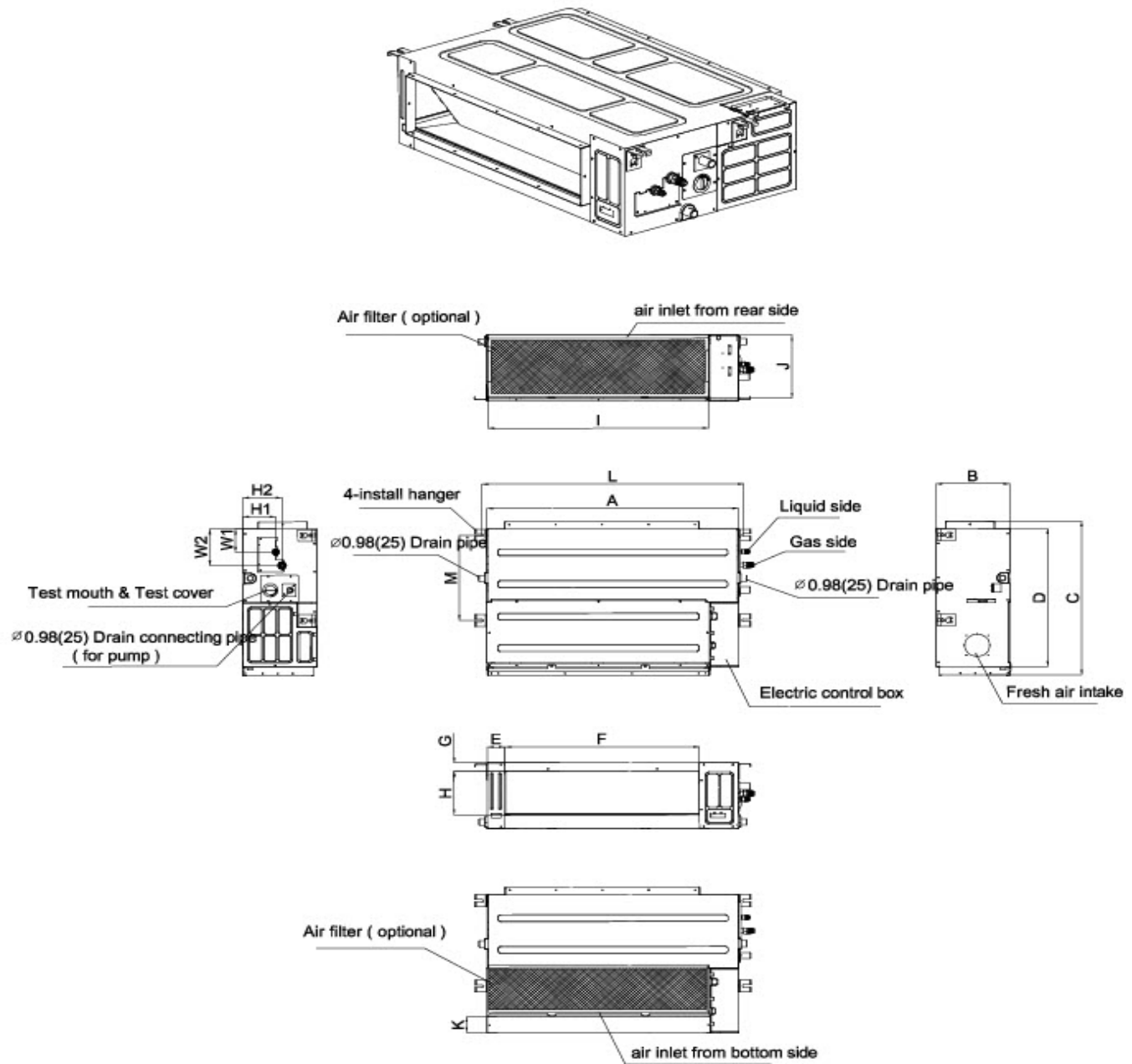


Fig. 3 – Ducted Dimensions

Table 15—Ducted Dimensions

SIZE	OUTLINE DIMENSIONS in(mm)				AIR OUTLET OPENING SIZE in(mm)				AIR RETURN OPENING SIZE in(mm)			HANGAR BRACKETS in(mm)		REFRIGERANT PIPE LOCATIONS in(mm)				OPERATING WEIGHT Lbs. (kg) in(mm)
	A	B	C	D	E	F	G	H	I	J	K	L	M	H1	H2	W1	W2	
9	27.6 (700)	8.2 (210)	25 (635)	22.4 (570)	2.5 (65)	19.4 (493)	1.3 (35)	4.6 (119)	23.4 (595)	7.8 (200)	3.1 (80)	29.1 (740)	13.8 (350)	4.7 (120)	5.6 (143)	3.7 (95)	5.9 (150)	39.90 (18.1)
12	27.6 (700)	8.2 (210)	25 (635)	22.4 (570)	2.5 (65)	19.4 (493)	1.3 (35)	4.6 (119)	23.4 (595)	7.8 (200)	3.1 (80)	29.1 (740)	13.8 (350)	4.7 (120)	5.6 (143)	3.7 (95)	5.9 (150)	39.90 (18.1)
18	36.2 (920)	8.2 (210)	25 (635)	22.4 (570)	2.5 (65)	19.4 (493)	1.3 (35)	4.6 (119)	32.0 (815)	7.8 (200)	3.1 (80)	37.8 (960)	13.8 (350)	4.7 (120)	5.6 (143)	3.7 (95)	5.9 (150)	50.7 (23)
24	36.2 (920)	10.6 (270)	25 (635)	22.4 (570)	2.5 (65)	19.4 (493)	1.3 (35)	7.0 (179)	32.0 (815)	10.2 (260)	0.7 (20)	37.8 (960)	13.8 (350)	4.7 (120)	5.6 (143)	3.7 (95)	5.9 (150)	57.32 (26)

DIMENSIONS - INDOOR (CONTINUED)

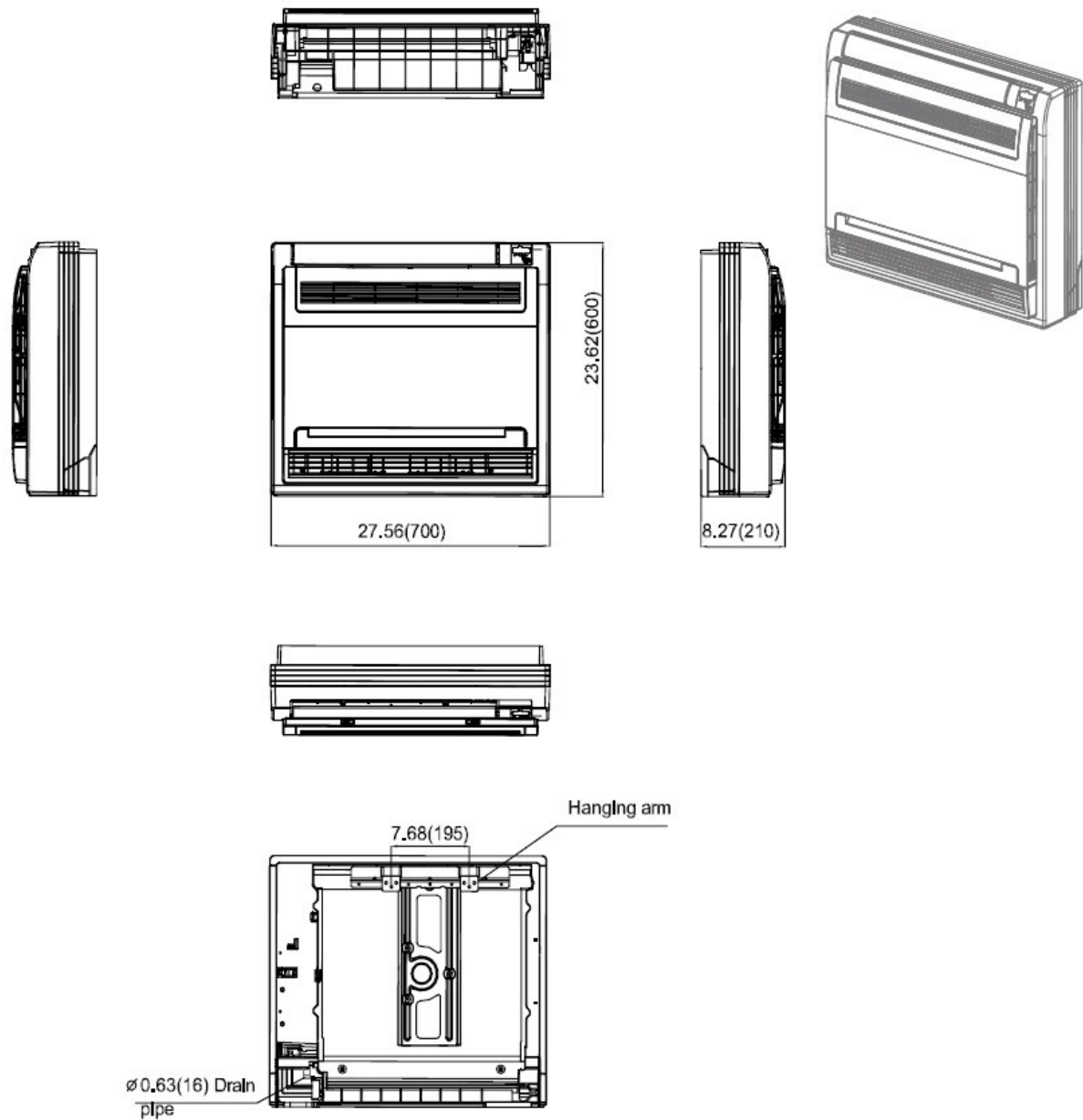


Fig. 4 – Floor Console Dimensions

Table 16—Floor Console Dimensions

UNIT SIZE		9	12
Height	in (mm)	8.27 (210)	8.27 (210)
Width	in (mm)	27.56 (700)	27.56 (700)
Depth	in (mm)	23.62 (600)	23.62 (600)
Operating Weight	Lbs. (kg)	32.41 (14.7)	32.41 (14.7)

DIMENSIONS - OUTDOOR

Table 17— Dimensions

UNIT SIZE		18	27	36	48
Height	in (mm)	27.56(700)	31.89(810)	31.89(810)	36.93(1369)
Width	in (mm)	33.27(845)	37.20(945)	37.20(945)	53.9(938)
Depth	in (mm)	12.60(320)	15.55(395)	15.55(395)	15.43(392)
Weight – Net	lbs (kg)	114.63(52)	154.76(70.2)	169.75(77)	255.50(115.9)

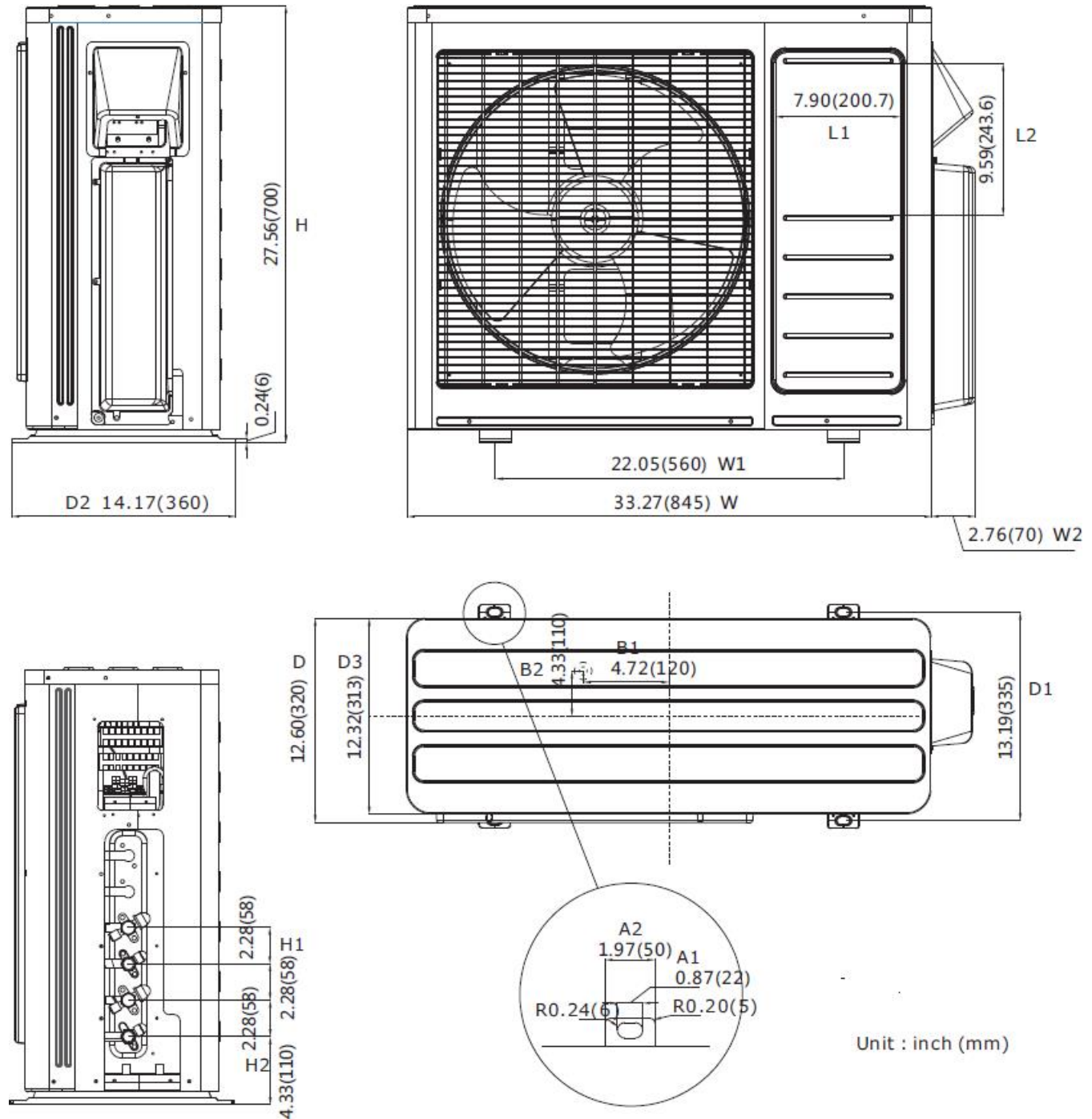


Fig. 5 – Outdoor Dimensions Size 18

NOTE: No master valves available on Size 18K.

DIMENSIONS - OUTDOOR (CONTINUED)

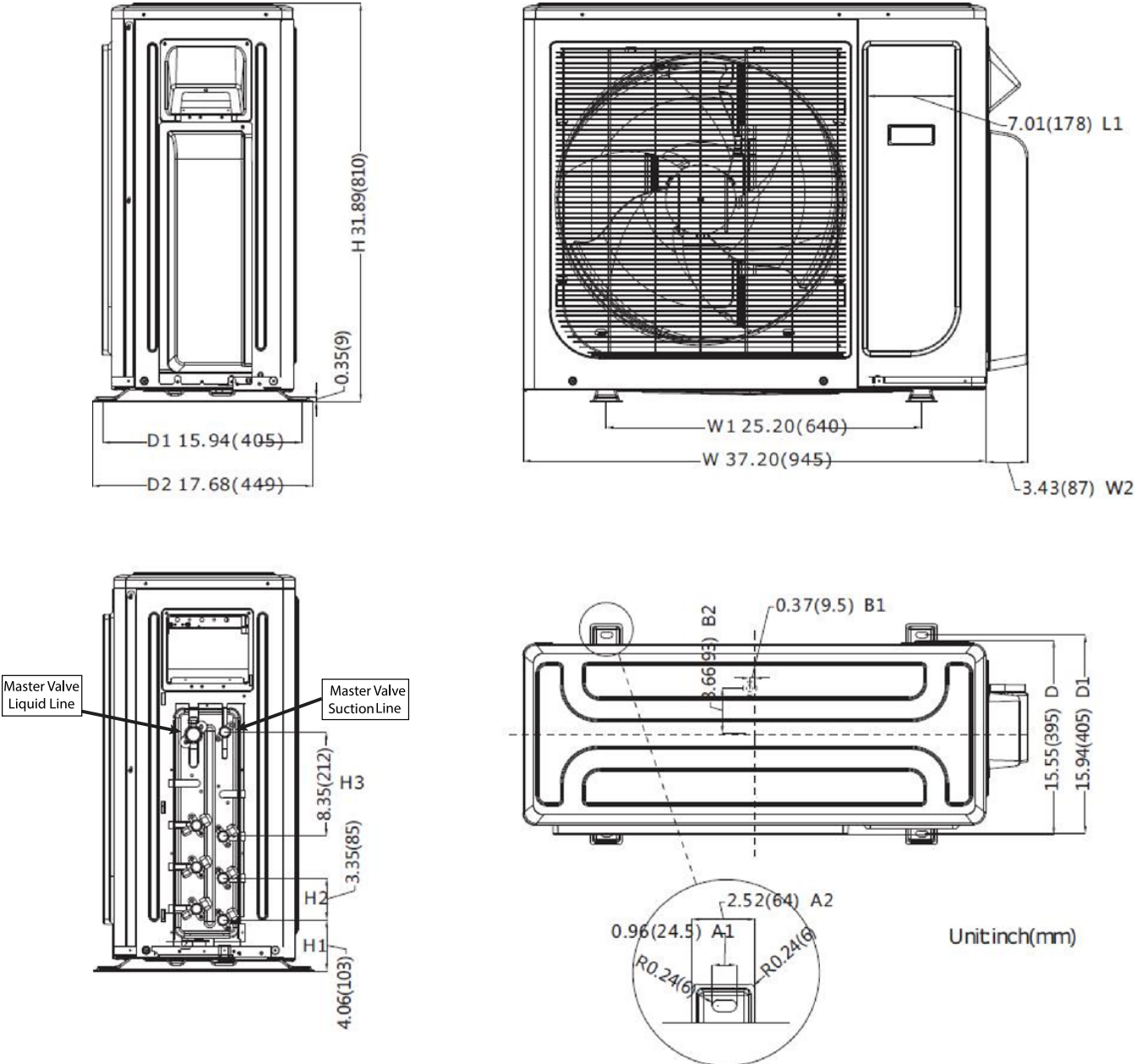


Fig. 6 – Outdoor Dimensions Size 27

DIMENSIONS - OUTDOOR (CONTINUED)

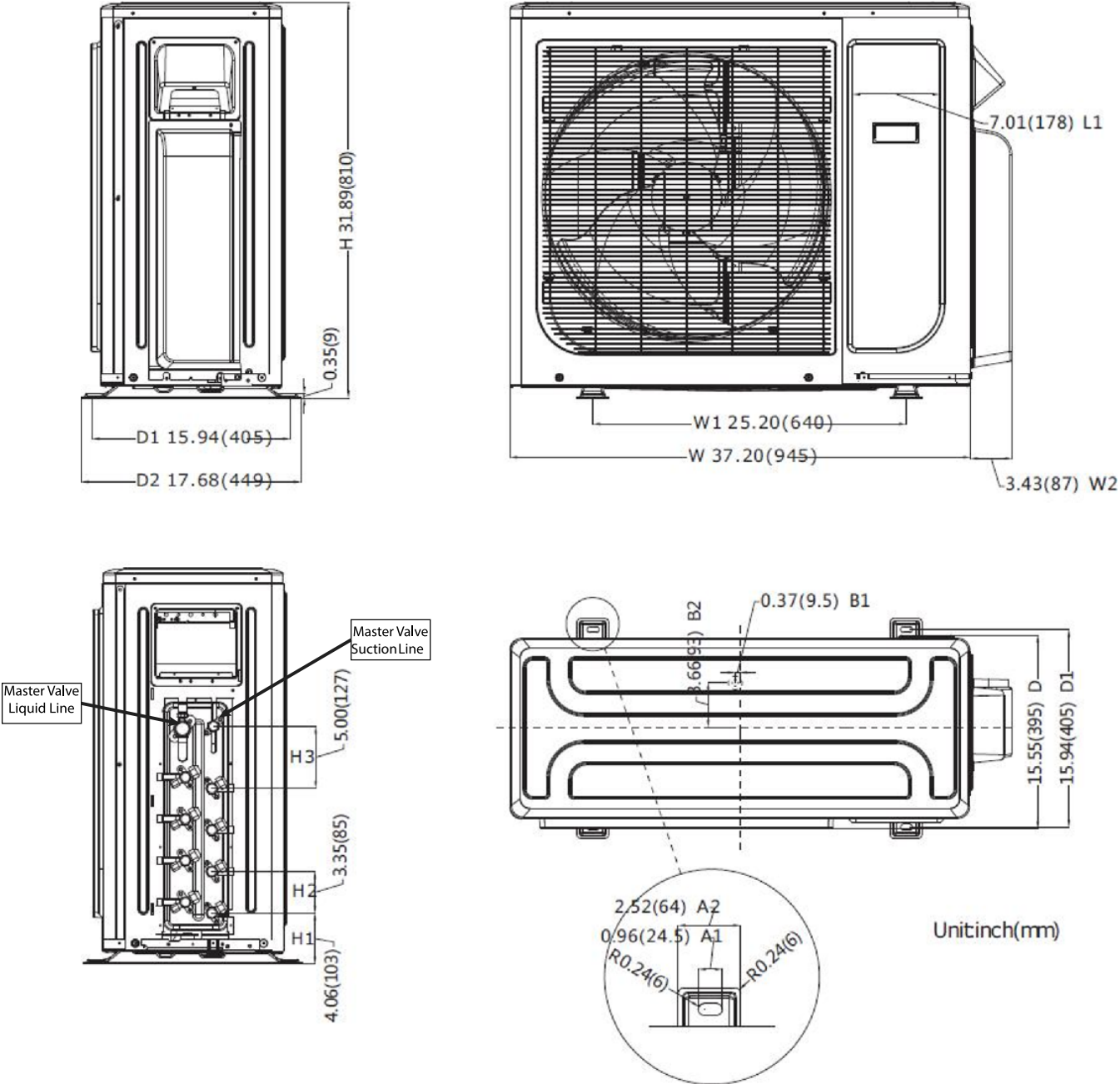


Fig. 7 – Outdoor Dimensions Size 36

DIMENSIONS - OUTDOOR (CONTINUED)

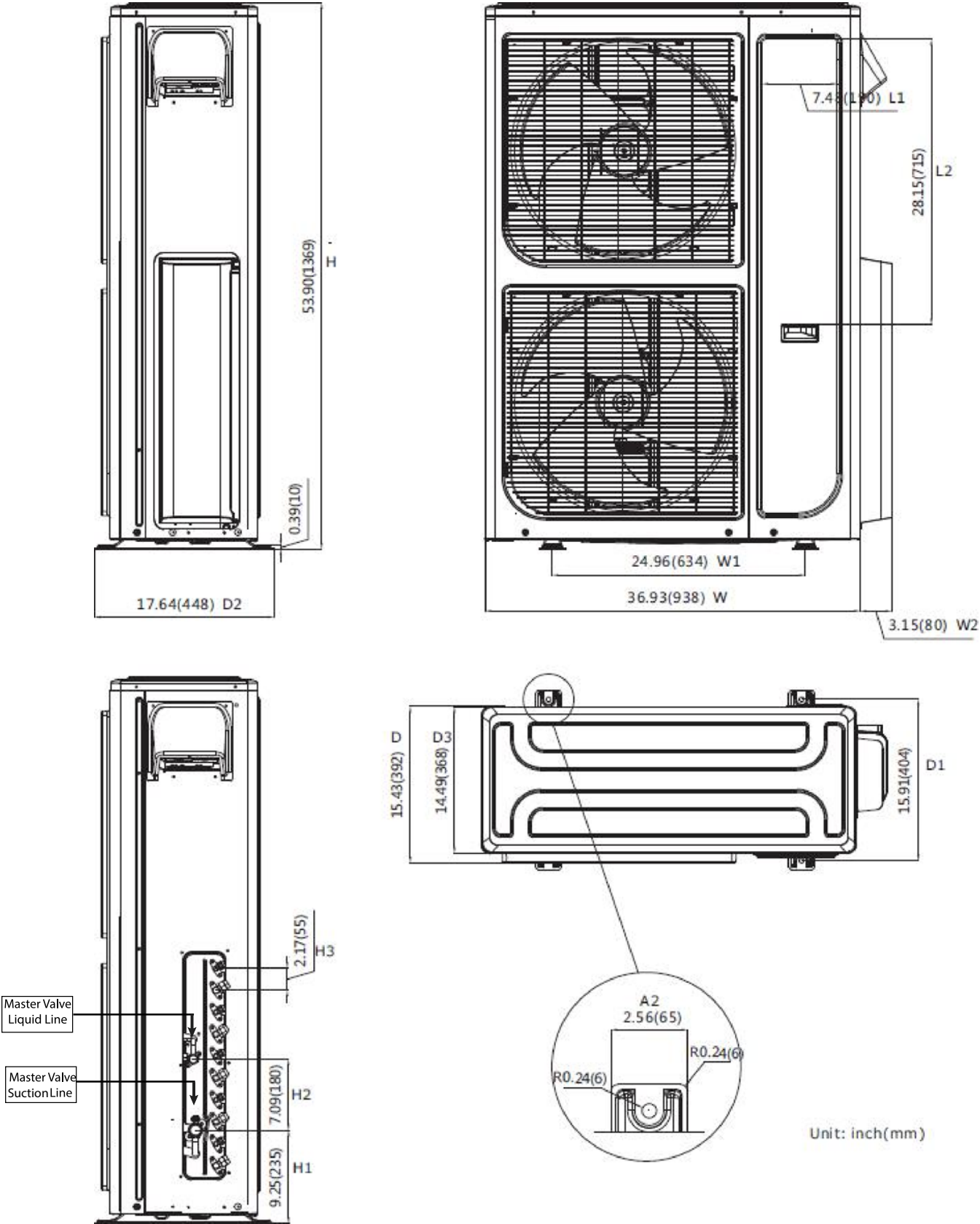


Fig. 8 – Outdoor Dimensions Size 48

CLEARANCES - INDOOR

NOTE: Allow sufficient space for airflow and unit servicing. See Fig. 9 through 14 for minimum required clearances.

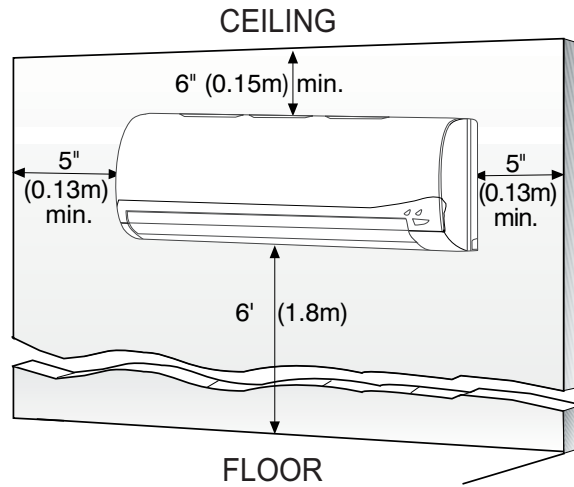
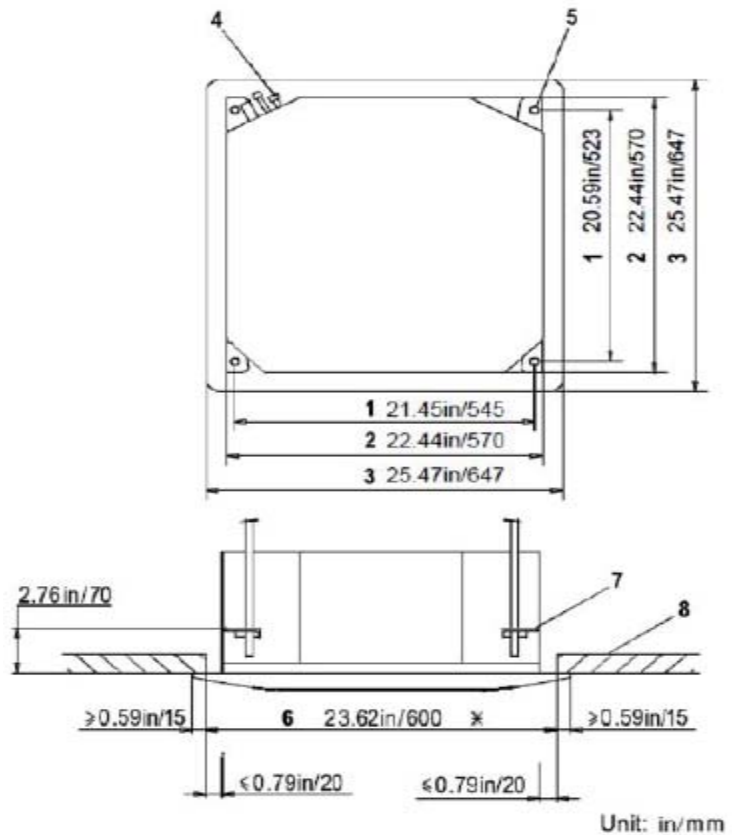
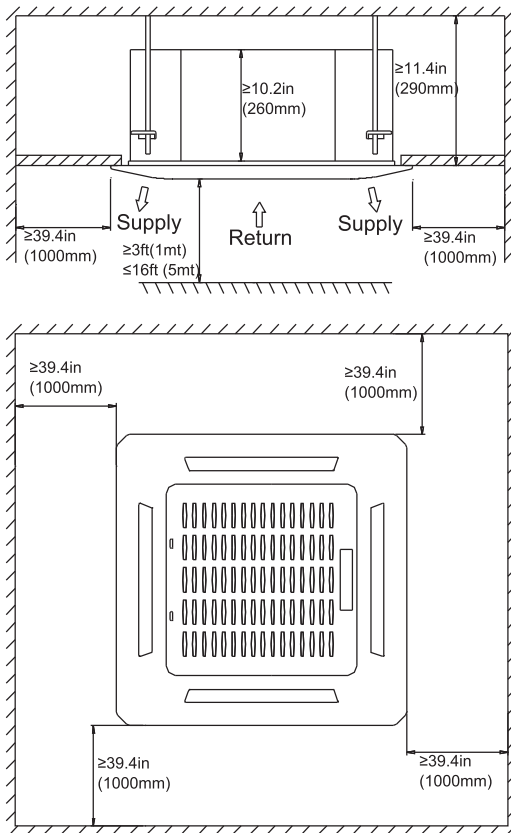


Fig. 9 – High Wall Clearance



- 1 Installation hook pitch dimensions
- 2 Indoor unit dimensions
- 3 Decoration panel dimensions
- 4 Refrigerant piping
- 5 Installation hook (× 4)
- 6 Ceiling opening dimensions
- 7 Hanger bracket
- 8 False ceiling

Fig. 10 – Cassette Unit Clearance

CLEARANCES - INDOOR (CONTINUED)

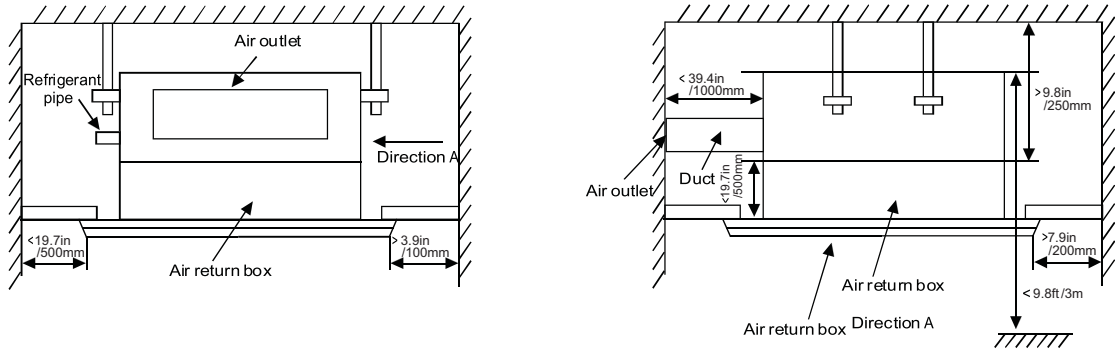


Fig. 11 – Ducted Clearance

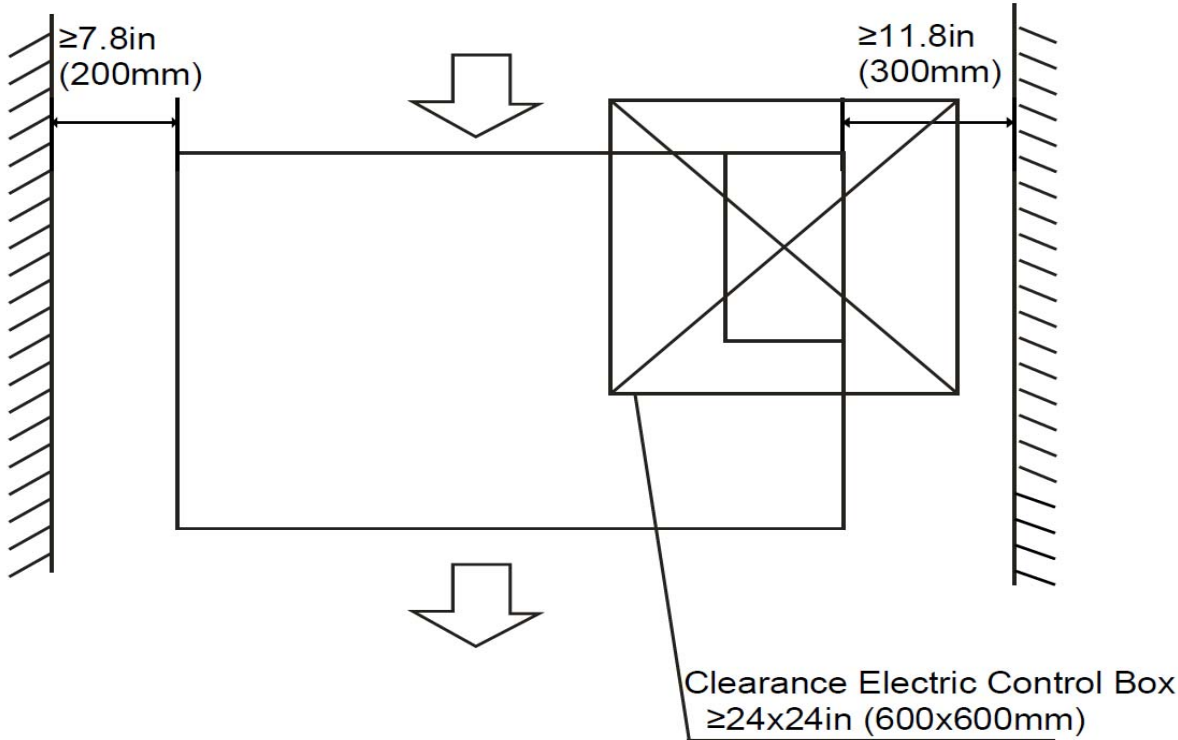


Fig. 12 – Ducted Clearance

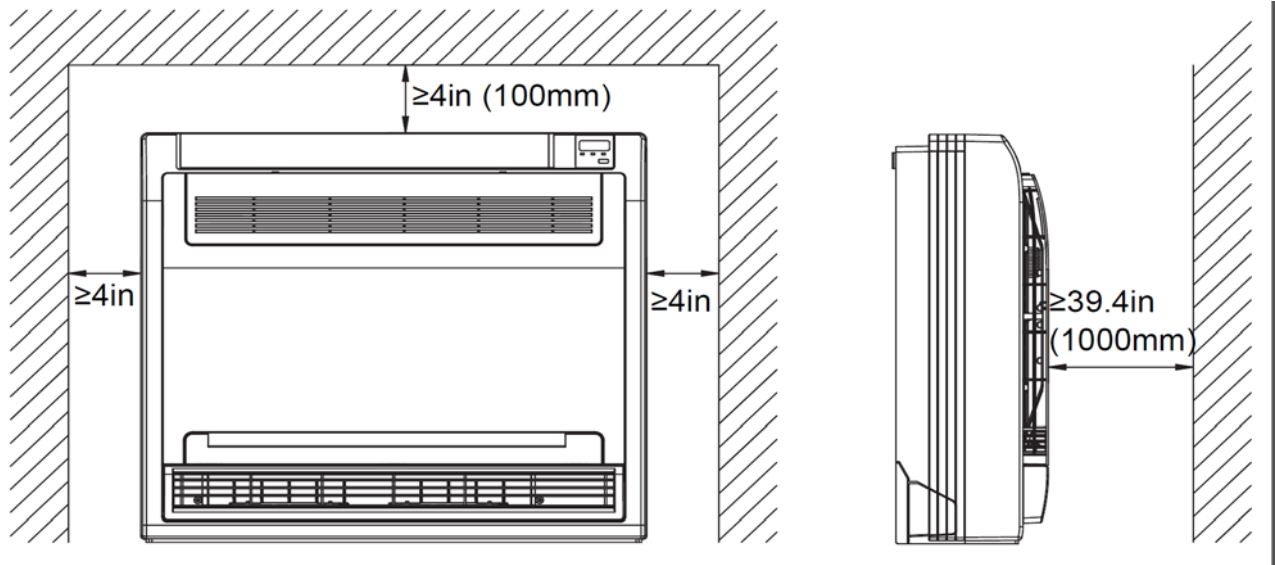


Fig. 13 – Floor Console Clearances

CLEARANCES - OUTDOOR

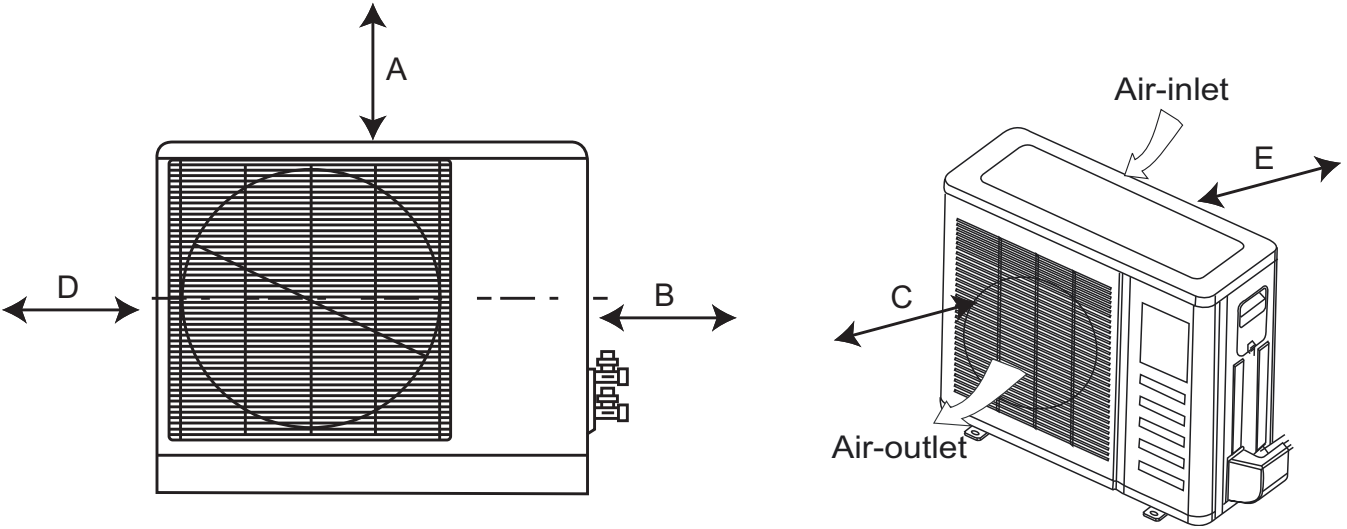


Fig. 14 – Clearances Outdoor

Table 18— Clearances Outdoor Values

UNIT	MINIMUM VALUE in. (mm)
A	24 (609)
B	24 (609)
C	24 (609)
D	4 (101)
E	4 (101)

INSTALLATION GUIDE

Up to five fan coil units can be connected to one outdoor unit. Refer to the Product Data for approved combinations.

Ideal installation locations include:

Each Indoor Unit

- A location where there are no obstacles near inlet and outlet area.
- A location which can bear the weight of indoor unit.
- Do not install indoor units near a direct source of heat such as direct sunlight or a heating appliance.
- A location with the appropriate clearances (see Fig. 9 - 13).

Outdoor Unit

- A convenient location for the installation that is not exposed to strong wind. If unit is exposed to strong winds it is recommended that a field-fabricated wind baffle be used.
- A location which can bear the weight of outdoor unit and where the outdoor unit can be mounted in a level position.
- A location which provides appropriate clearances (see Fig. 14).
- Do not install the indoor or outdoor units in a location with special environmental conditions. For those applications, contact your Sales Representative.

INSTALLATION TIPS

Ideal installation locations include:

Indoor Unit

- A location where there are no obstacles near inlet and outlet area.
- A location which can bear the weight of indoor unit.
- Do not install indoor units near a direct source of heat such as direct sunlight or a heating appliance.
- A location which provides appropriate clearances as outlined in Fig. 9 - 13.

Outdoor Unit

- A location which is convenient to installation and not exposed to strong wind.
- A location which can bear the weight of the outdoor unit and where the outdoor unit can be mounted in a level position.
- A location with appropriate clearances as outlined in Fig. 14.
- Do not install the indoor or outdoor units in a location with special environmental conditions. For those applications, contact your Ductless Split representative.

HIGH WALL INDOOR UNIT INSTALLATION

INSTALL MOUNTING PLATE

The mounting plate will look like one of the following figures (15 - 17) depending on the model size:

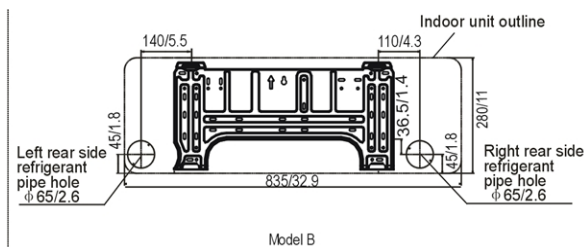


Fig. 15 - Mounting Plate - Model sizes 09, 12

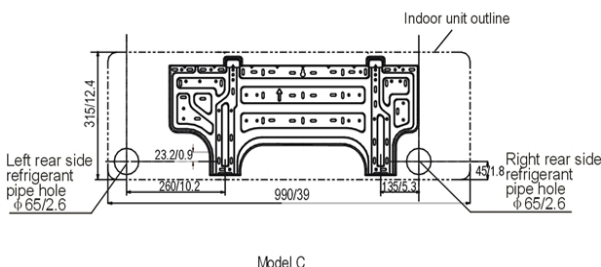


Fig. 16 - Mounting Plate - Model size 18

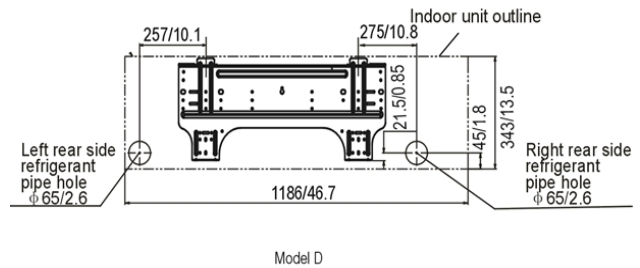


Fig. 17 - Mounting Plate - Model sizes 24, 30

1. Carefully remove the mounting plate, which is attached to the back of the indoor unit.
2. The mounting plate should be located horizontally and level on the wall. All minimum spacings shown in Fig. 9-13 and 15 should be maintained.
3. If the wall is block, brick, concrete or similar material, drill .2" (5 mm) diameter holes and insert anchors for the appropriate mounting screws.
4. Attach the mounting plate to the wall.

DRILL HOLE IN WALL FOR INTERCONNECTING PIPING, DRAIN AND WIRING

Refrigerant Line Routing

The refrigerant lines may be routed in any of the four directions shown in Fig. 19.

For maximum serviceability, it is recommended to have refrigerant line flare connections and the drain connections on the outside of the wall that the fan coil can be mounted on.

If the piping is going through the back:

1. Use the mounting plate to determine the pipe hole position. Drill pipe hole diameter per values given in Fig. 15 through 17. The outside pipe hole is 1/2-in. (13 mm) min. lower than inside pipe hole, so it slants slightly downward (see Fig. 18).

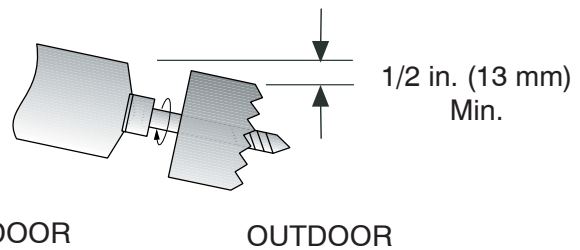


Fig. 18 - Drill Holes

If the piping is going through the right or left side:

1. Use a small saw blade to carefully remove the corresponding plastic covering on the side panel and drill the appropriate size hole where the pipe is going through the wall.

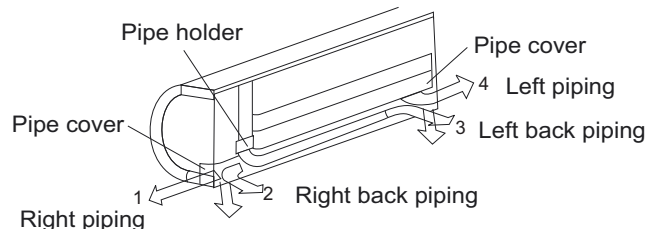


Fig. 19 - Piping Locations

INSTALL ALL POWER, INTERCONNECTING WIRING, AND PIPING TO INDOOR UNIT

1. Run interconnecting piping and wiring from the outdoor unit to the indoor unit.
2. Run interconnecting cable through the hole in the wall (outside to inside).
3. Lift the indoor unit into position and route the piping and the drain through the hole in the wall (inside to outside). Fit the interconnecting wiring into the back side of the indoor unit.
4. Put an upper claw at the back of the indoor unit on the upper hook of the Mounting Plate. Move the indoor unit from side to side to ensure it is securely hooked.
5. Open the front cover of the indoor unit and remove the field wiring terminal block cover.
6. Pull the interconnecting wire up from the back of the indoor unit and position in close to the terminal block on the indoor unit.
7. Push the lower part of the indoor unit up on the wall, then move the indoor unit from side to side, up and down to ensure it is hooked securely (see Fig. 20).

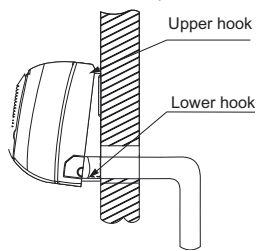
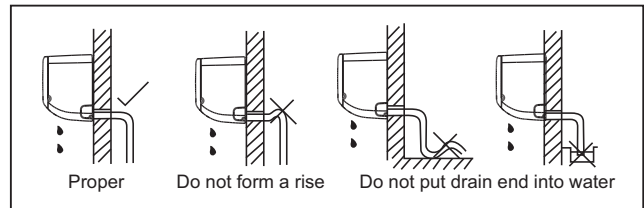


Fig. 20 – Indoor Unit Installation

A07347a

8. Connect wiring from the outdoor unit per connection diagram.
9. Replace the field wiring cover and close the front cover of the indoor unit.

10. Connect the refrigerant piping and the drain line outside of the indoor unit. Complete the pipe insulation at the flare connection then fasten piping and wiring to the wall as required. Completely seal the hole in the wall.
11. Connect the drain line. The drain line must not have a trap anywhere in its length, must pitch downwards, and must be insulated up to the outside wall (see Fig. 21).



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Fig. 21 – Proper Drain Hose Installation

NOTE: For proper orientation of the refrigerant piping, electrical cable and drain lines, refer to Fig. 22.

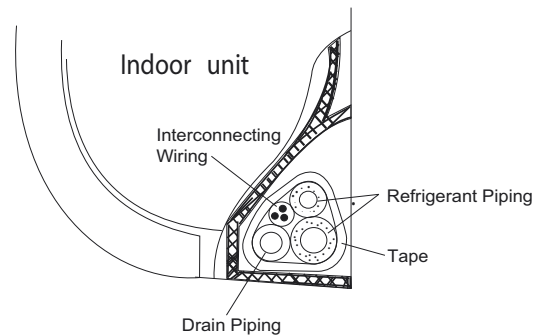


Fig. 22 – Proper Orientation

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CASSETTE INDOOR UNIT INSTALLATION

Select install location of the indoor unit

1. Obstructions should be removed from the indoor unit's intake or outlet vents so the air can flow throughout the room.
2. Make sure the installation is in accordance with the requirements of the required clearances on the schematic diagram.
3. Select a location that can withstand 4 times the weight of the indoor unit and would not increase the operating noise.
4. Ensure the unit is level.
5. Select a location where condensated coagulated water can drain easy connect easy with the outdoor unit.
6. Ensure there is enough space for care and maintenance. Ensure the height between the indoor unit and ground is $\geq 3\text{ft. (1m)}$ or $\leq 16\text{ft (5m)}$.
7. When installing the steeve bolt, check if the install place can withstand a weight 4 times of the unit's. If not, reinforce before installation. Refer to the install cardboard to determine where the location should be reinforced.

IMPORTANT: To guarantee the good performance, the unit must be installed by professional personnel according to this instruction.

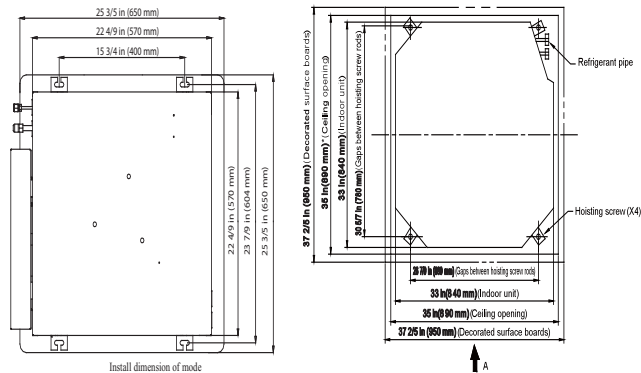


Fig. 23 – Dimension of ceiling opening and location of the hoisting screw (M10)

IMPORTANT: The drilling of holes in the ceiling must be performed by professional personnel.

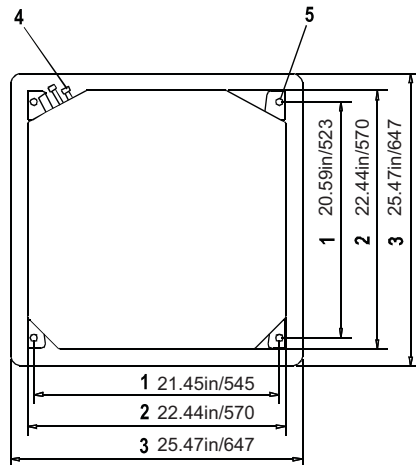
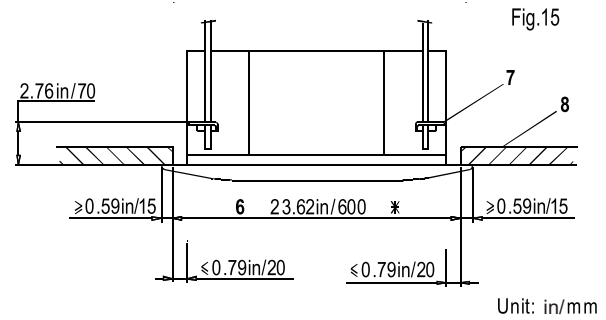
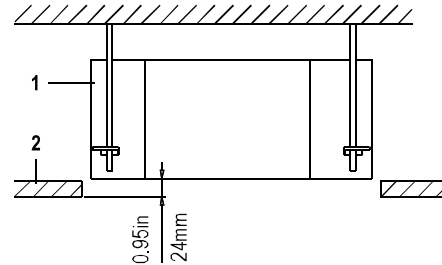


Fig. 24 – Drilling Holes



Unit: in/mm

Fig. 25 – Drilling Holes



- 1 Indoor unit
- 2 False ceiling

Fig. 26 – Drilling Holes

NOTE: Installation is possible with a ceiling dimension of 23.62 in. (600mm) (marked with *). However, to achieve a ceiling-panel overlapping dimension of 0.59 in. (15mm), the spacing between the ceiling and the unit should be 0.79 in. (20mm) or less. If the spacing between the ceiling and the unit is over 0.79 in. (20mm), attach sealing material in the part or recover the ceiling.

INDOOR UNIT MAIN BODY INSTALLATION

Installation is possible with a ceiling dimension of 23.62 in. (600mm) (marked with *). However, to achieve a ceiling-panel overlapping dimension of 0.59 in. (15 mm), the spacing between the ceiling and the unit should be 0.79 in. (20mm) or less. If the spacing between ceiling and the unit is over 0.79 in. (20mm), attach sealing material in the part or recover the ceiling.

1. Prepare the ceiling opening needed for installation where applicable (for existing ceilings).
 - a. Create the ceiling opening required for installation. From the side of the opening to the casing outlet, implement the refrigerant and drain piping and wiring for the remote controller (unnecessary for wireless type). Refer to each piping or wiring section.
 - b. After creating an opening in the ceiling, it may be necessary to reinforce the ceiling beams to keep the ceiling level and to prevent it from vibrating. Consult the builder for details.
2. Install the installation hooks. Use either a M8 or M10 size bolt.
 - a. Use expansible hooks, sunken anchors or other field supplied parts to reinforce the ceiling in order to bear the weight of the unit.
 - b. Adjust the clearance from the ceiling before proceeding further. Installation example see Fig. 27.

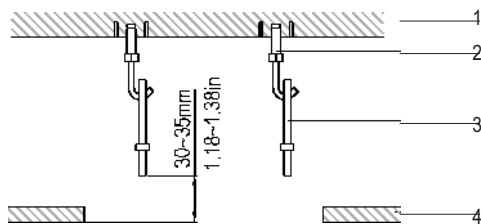


Fig. 27 – Installation Clearances

- (1.) Ceiling slab
- (2.) Expansible hook (optional)
- (3.) Installation hook (optional)
- (4.) False ceiling

NOTE: For other installation than standard installation, contact your dealer for details.

INDOOR UNIT INSTALLATION

When installing optional accessories, review the list of optional accessories in the installation manual. Depending on the field conditions, it may be easier to install optional accessories before the indoor unit is installed (except for the decoration panel). However, for existing ceiling, install the fresh air inlet component kit and branch duct before installing the unit.

1. Install the indoor unit temporarily.
 - a. Attach the hanger bracket to the suspension bolt. Be sure to fix it securely by using a nut and washer from the upper and lower sides of the hanger bracket.
 - b. Securing the hanger bracket (see Fig. 28).

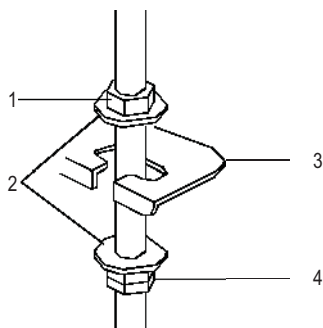


Fig. 28 – Secure the Hanger bracket

- (1.) Nut (field supply)
 - (2.) Washer (field supply)
 - (3.) Hanger bracket
 - (4.) Double nuts (field supply, tighten)
2. Secure the paper pattern for installation (for new ceilings only).
 - The paper pattern for installation corresponds with the measurements of the ceiling opening. Consult the builder for details.
 - The center of the ceiling opening is indicated on the paper pattern for installation.
 - After removing the packaging material from the paper pattern for installation, attach the paper pattern to the unit with the attached screws (see Fig. 29).

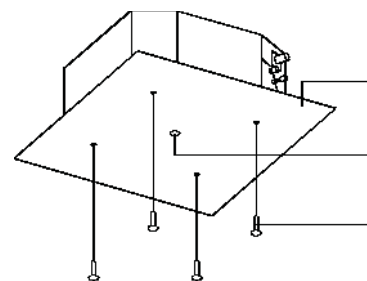


Fig. 29 – Attach Screws

- (1.) Paper pattern for installation (on some models)
 - (2.) Center of the ceiling opening
 - (3.) Screws (supplied with the decoration panel)
3. Adjust the unit to the right position for installation. Refer to the chapter “Preparations Before Installation”.
 4. Check if the unit is horizontally leveled.
 - a. Do not install the unit tilted. The indoor unit is equipped with a built-in drain pump and float switch. (If the unit is tilted against the direction of the condensate flow (the drain piping side is raised), the float switch may malfunction and cause water to drip).
 - b. Check if the unit is leveled at all four corners with a water level or a water-filled vinyl tube (see Fig. 30).

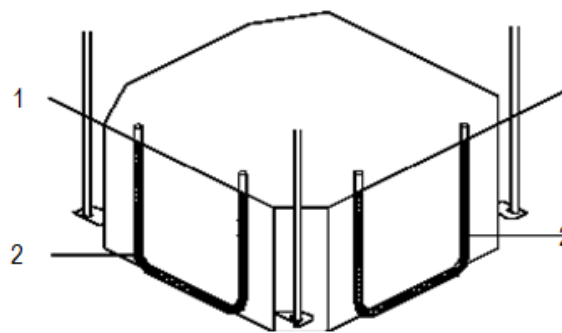


Fig. 30 – Ensure Unit is level

- (1.) Water level
- (2.) Vinyl tube

DRAIN PIPING WORK

Drain Piping Installation

Install the drain piping as shown in Fig. 31 and take steps to eliminate condensation. Improperly rigged piping could lead to leaks and eventually wet furniture and belongings.

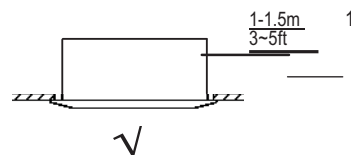


Fig. 31 – Drain Piping Installation

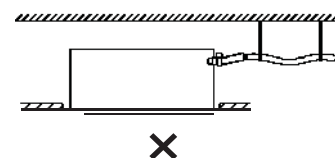


Fig. 32 – Hanging Bar

- (1.) Hanging bar
- (2.) $\geq 1/100$ gradient

Install the Drain Pipes

- Keep piping as short as possible and slope it downwards at a gradient of at least 1/100 so that air may not remain trapped inside the pipe.
- Keep pipe size equal to or greater than that of the connecting pipe (PVC pipe, nominal diameter 0.79 in. (20mm)) /, outside diameter 0.98 in. (25mm).
- Push the drain hose as far as possible over the drain socket, and tighten the metal clamp securely.

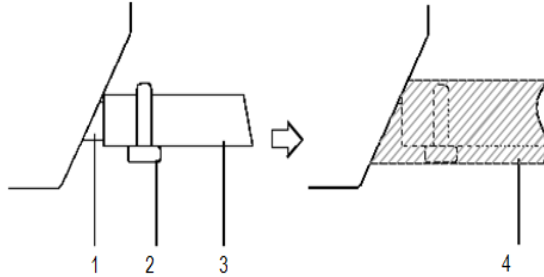


Fig. 33 – Push the drain hose

5. Remove the paper pattern for installation (for new ceiling only).

- (1.) Drain socket (attached to the unit)
- (2.) metal clamp
- (3.) Drain hose
- (4.) Insulation (field supply)

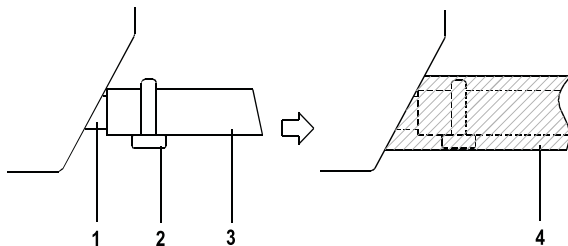
- a. Insulate the drain hose inside the building.
- b. If the drain hose cannot be sufficiently set on a slope, fit the hose with drain raising piping (field supply).
- c. Ensure the heat insulation work is executed on the following 2 spots to prevent any possible water leakage due to dew condensation:
 - (1.) Indoor drain pipe
 - (2.) Drain socket.

DRAINAGE HOSE

IMPORTANT: Observe all local sanitary codes when installing condensate drains.

1. Install the drain hose.

- The drain hose diameter should be equal or bigger than the connection pipe's. (The diameter of the polythene pipe: Outer diameter 1 in. (25 mm) Surface thickness ≥ 0.06 in. (1.5 mm).
- The drain hose should be short and the drooping gradient should be less than 1/100 to prevent the formation of an air bubble. If the drain hose does not have enough of a drooping gradient, a drain raising pipe should be added.
- To prevent a bend in the drain hose, the distance between the hoisting stand should be 3 to 5 ft. (1 to 1.5 m) (see Fig. 34).



- 1 Drain socket (attached to the unit)
- 2 metal clamp
- 3 Drain hose
- 4 Insulation (field supply)

Fig. 34 – Drain Hose

- Use the drain hose and clamp attached. Insert the drain hose into the drain vent, and then tighten the clamp.
- Entwine the big sponge on the clamp of drain hose to insulate heat.
- Heat insulation should be applied to the indoor drain hose.

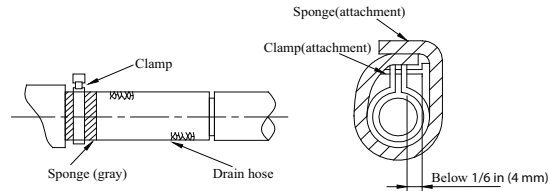
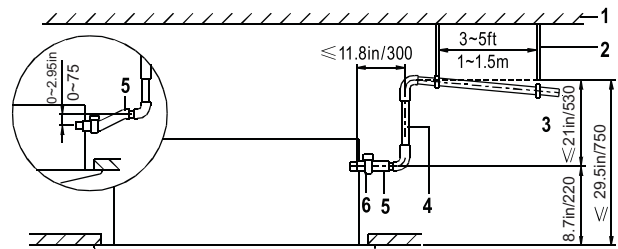


Fig. 35 – Drain Hose

NOTE: Drain Setup pipe

- The install height of the drain raising pipe should be less than 21 in. (530 mm).
- The drain raising pipe should form a right angle with the unit, and distance to unit should not be beyond 11.81 in. (300mm).



Unit: in/mm

- 1 Ceiling slab
- 2 Hanger bracket
- 3 Adjustable range
- 4 Drain raising pipe
- 5 Drain hose
- 6 Metal clamp

Fig. 36 – Drain Setup Pipe

INSTRUCTION

The slant gradient of the attached drain hose should be within 3 in. (75 mm) so that the drain hole does not have to endure unnecessary outside force.

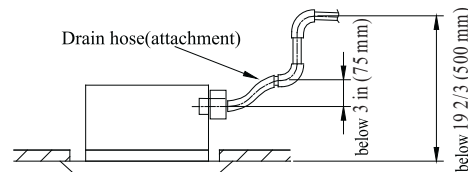
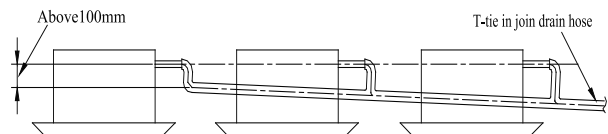


Fig. 37 – Slant gradient

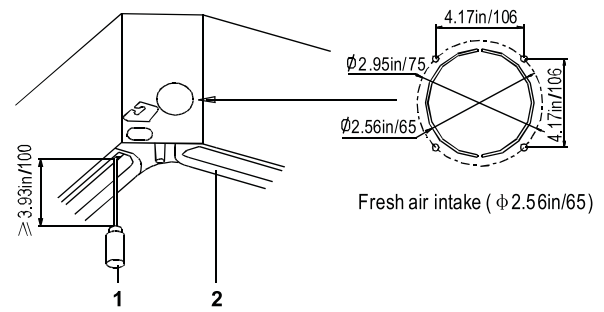
1. Install the drain hose according to the following process if several drain hoses join together.



The specs of the selected join drain hose should fit the running capacity of the unit.

Fig. 38 – Slant gradient

2. Check the smoothness of the drain after the installation.
3. Check the drain state by immitting 36 3/5 in. 3 (600 cc) water slowly from the outlet vent or test hole.
4. Check the drain in the state of refrigerating after installing the electric circuit.



Unit: in/mm

Fig. 39 – Drain

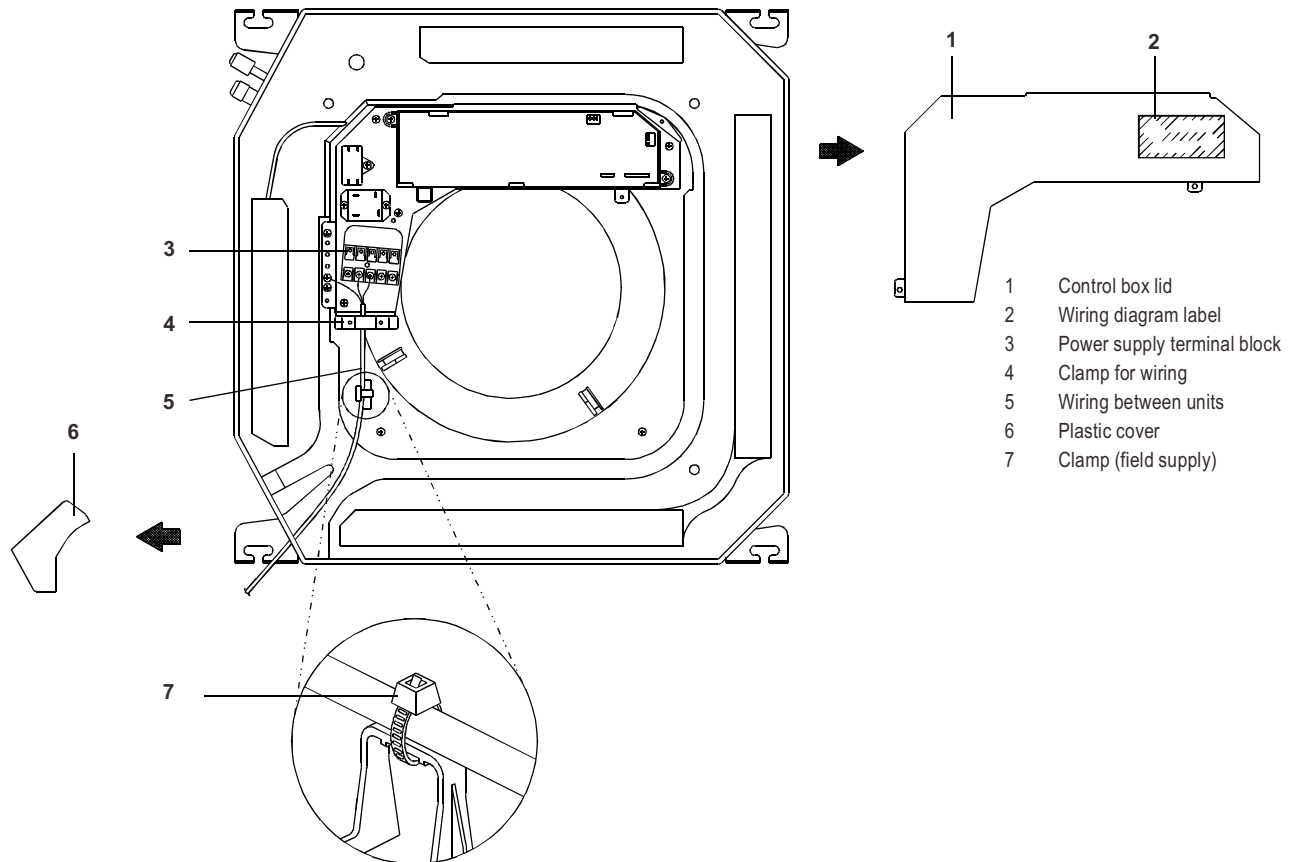
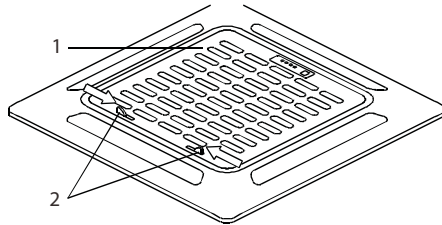


Fig. 40 – Cassette

INSTALLATION OF THE DECORATION PANEL

Detach the intake grill

1. Slide the two grille hooks toward the middle of the decoration panel.



- 1 Intake grille
- 2 Grille hook

Fig. 41 – Intake Grille

2. Open the intake grille and remove.

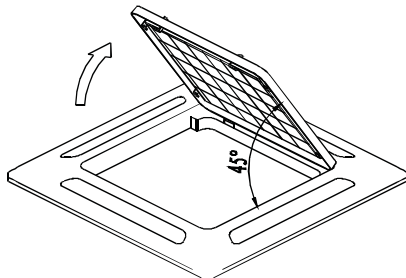
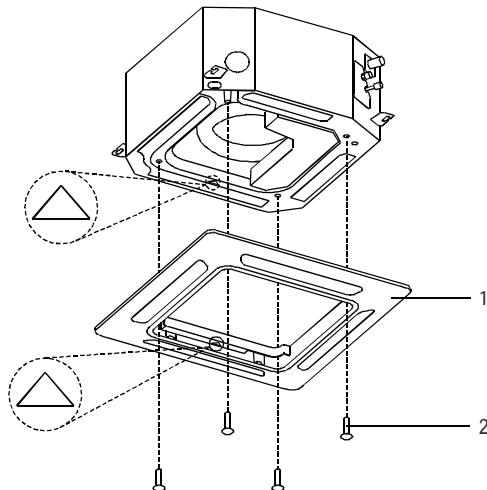


Fig. 42 – Open Intake Grille

Install the decoration panel

1. Align the indicate " " on the decoration panel to the indicate " " on the unit.
2. Attach the decoration panel to the unit with the supplied screws as shown in Fig. 43.



- 1 Decoration panel
- 2 Screws (M5)(supplied with the panel)

Fig. 43 – Attach the Decoration Panel

3. After installing the decoration panel, ensure that there is no space between the unit body and decoration panel. Otherwise air may leak through the gap and cause dewdrop (see Fig. 44).

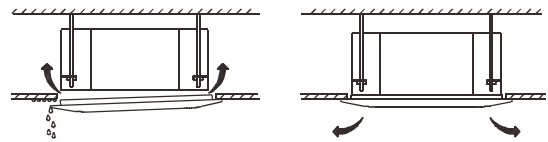


Fig. 44 – Eliminate space

4. Mount the intake grille. Ensure that the buckles at the back of the grille are properly seated in the groove of the panel.

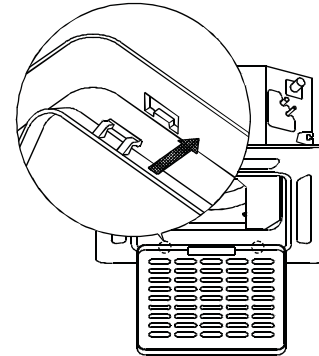


Fig. 45 – Mount the intake grille

5. Connect the two wires of the decoration panel to the mainboard of the unit.

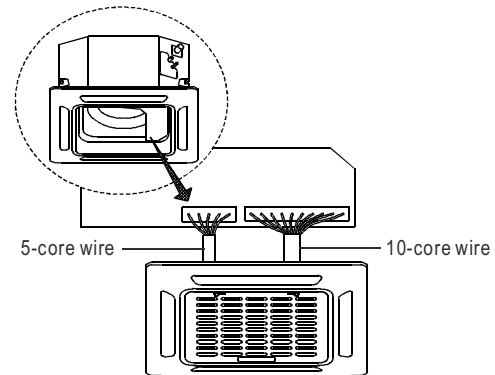


Fig. 46 – Connect two wires

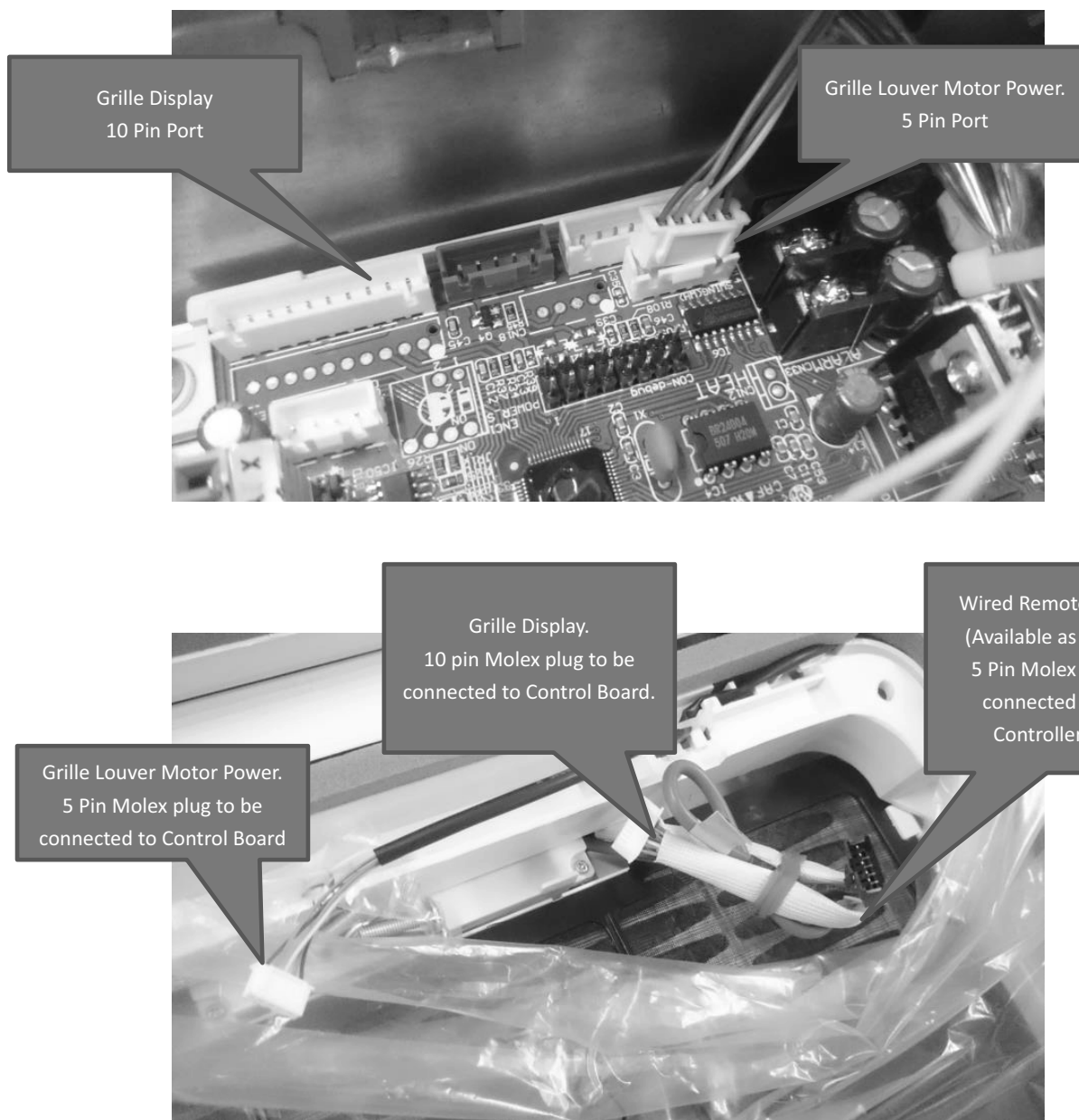


Fig. 47 – Panel Cassette

6. Fasten the control box lid with 2 screws.

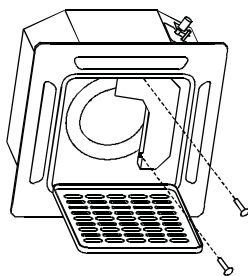


Fig. 48 – Fasten the control box lid

7. Close the intake grille, and close the 2 grille hooks.

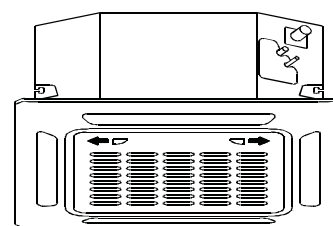


Fig. 49 – Close the intake grille

TEST OPERATION

Ensure the control box lids are closed on the indoor and outdoor units. After finishing the construction of refrigerant piping, drain piping, and electric wiring, conduct test operation accordingly to protect the unit.

Test operation after installing decoration panel

1. Open the gas side stop valve.
2. Open the liquid side stop valve.
3. Electrify crank case heater for 6 hours.
4. Set to cooling operation with the remote controller and start operation by pushing ON/OFF button.

5. Check the following points. If there is any malfunction, resolve it according to the chapter "Troubleshooting" in the owner's manual.

Owners Manual

The indoor unit

- Whether the switch on the remote controller works well.
- Whether the buttons on the remote controller works well.
- Whether the air flow louver moves normally.
- Whether the room temperature is adjusted well.
- Whether the indicator lights normally.
- Whether the temporary buttons work well.
- Whether there is vibration or abnormal noise during operation.
- Whether the drainage flows smoothly.

The outdoor unit

- Whether there is vibration or abnormal noise during operation.
- Whether the generated wind, noise, or condensed of by the air conditioner negatively impact the neighborhood.
- Whether any of the refrigerant is leaked.

6. Turn off the main power supply after operation.

IMPORTANT: A protection feature prevents the air conditioner from being activated for approximately 3 minutes when it is restarted immediately after shut off.

DUCTED INDOOR UNITS INSTALLATION

INSTALLATION OF THE INDOOR DUCTED UNIT

Requirements on the Installation Location

1. Ensure the hanger is strong enough to withstand the weight of the unit.
2. The drainage pipe is easy for connection.
3. No obstacle is in the inlet/outlet and the air circulation is in good condition.
4. Ensure the installation space is left for access to maintenance.
5. It should be far away from where there is a heat source, leakage of any inflammable, explosive substances, or smog.
6. It is the ceiling type unit (concealed in the ceiling).
7. The power cords and connection lines of the indoor and outdoor units must be at least 1m away from the TV set or radio to avoid the image interference and noise (even if 1m is kept, the noise may be produced due to the strong electromagnetic wave).

Installation of the Indoor Ducted Unit

1. Insert the M10 expansion bolt into the hole, then knock the nail into the bolt. Refer to the Outline Dimension Drawings of the Indoor Unit for the distance between holes and see Fig. 50 for the installation of the expansion bolt.

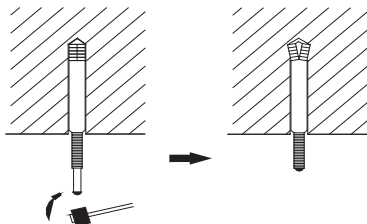


Fig. 50 – Expansion Bolt

2. Install the hanger on the indoor unit (see Fig. 51).

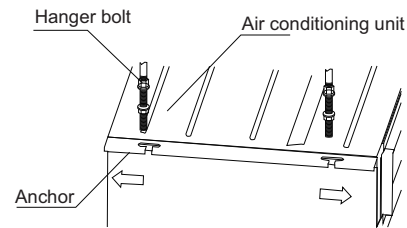


Fig. 51 – Hanger Bolt

3. Install the indoor unit on the ceiling, as shown in Fig. 52.

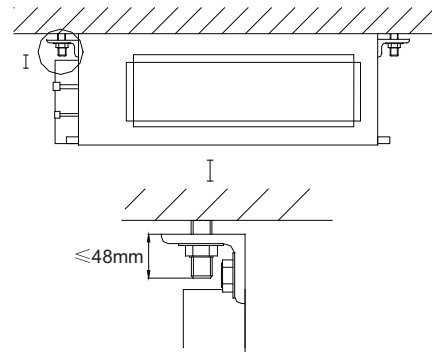


Fig. 52 – Install the indoor unit

CAUTION

- Prior to the installation, make a good preparation for all piping (refrigerant pipe, drain pipe) and wiring (wires of the wired controller, wires between the indoor and outdoor unit) of the indoor unit to make the further installation much easier.
- If there is an opening in the ceiling, its better to reinforce it to keep it flat and prevent it from vibrating. Consult the user and builder for more details.
- If the strength of the ceiling is not strong enough, a beam made of angle iron can be used and then secure the unit on it.
- If the indoor unit is not installed in the air conditioning area, please use sponge around the unit to prevent condensing. The thickness of the sponge depends on the actual installation environment.

INDOOR DUCTED UNIT HORIZONTAL CHECK

After the installation of the indoor unit, its horizontality must be checked to make sure the unit keeps a horizontal fore and aft and maintains an inclination of 5° toward the drain pipe right and left, as shown in Fig. 53.

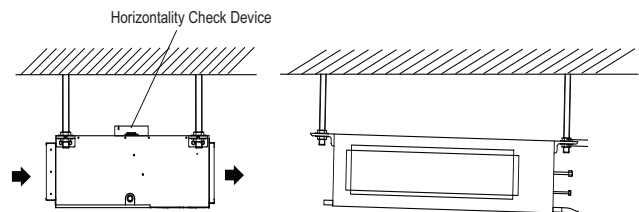


Fig. 53 – Horizontal check device

AIR SUPPLY DUCT INSTALLATION

1. Installation of the Rectangular Air Supply Duct

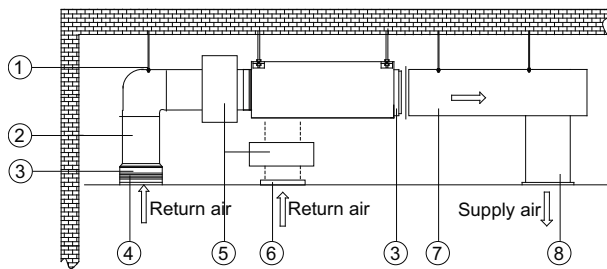


Fig. 54 – Installation of Air Duct Supply

Table 19—Air Duct

NUMBER	NAME	NUMBER	NAME
1	Hanger	5	Plenum Box
2	Return Air Duct	6	Filter Screen
3	Canvas Duct	7	Main Air Supply Duct
4	Return Air Heat	8	Air Supply Outlet

INSTALL THE ROUND AIR SUPPLY DUCT

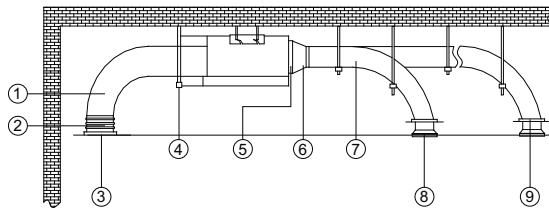


Fig. 55 – Air supply duct

Table 20—Air Duct

NUMBER	NAME	NUMBER	NAME
1	Return Air Duct	6	Transition Duct
2	Canvas Duct	7	Air Supply Duct
3	Return Air Louver	8	Diffuser
4	Hanger	9	Diffuser Joint
5	Air Supply Duct		

ROUND AIR SUPPLY DUCT INSTALLATION STEPS

1. Pre-install the outlet of the round duct on the transition duct and then secure it with the tapping screw.
2. Place the transition duct to the air outlet of the unit and secure it with a rivet.
3. Connect the outlet to the duct and then tighten them with tape. Other installation details are not covered herein.



CAUTION

- The max. length of the duct means the max. length of the air supply duct plus the max. length of the return air duct.
- The duct is either rectangular or round and connected with the air inlet/outlet of the indoor unit. Among all air supply outlets, at least one should remain open. As for the round duct, it needs a transition duct of which the size should match with the air supply of the unit. After the fitting of the transition duct, it is best to keep the round duct 32 ft. (10m) away from the corresponding diffuser.

ADJUST AIR INLET

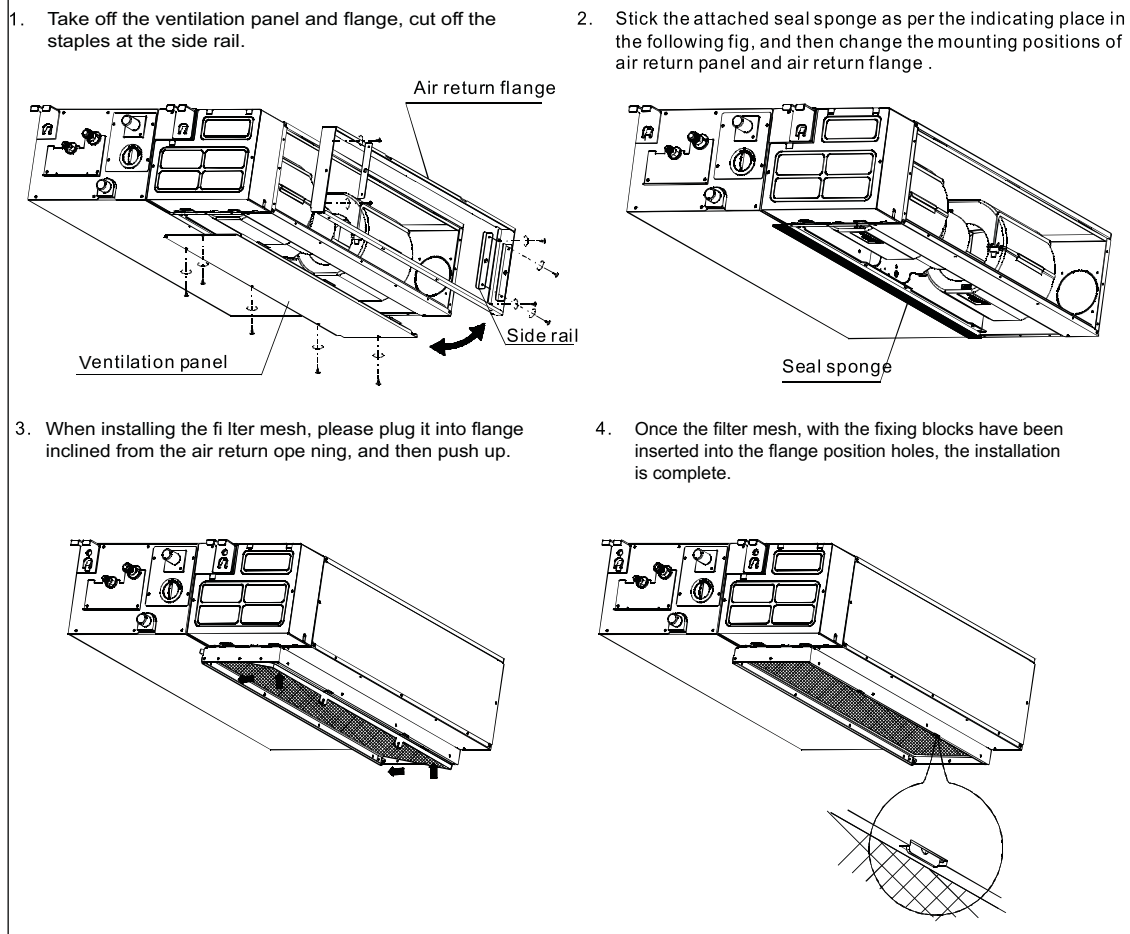


Fig. 56 – Air Supply Outlet

RETURN AIR DUCT INSTALLATION

1. The default installation location of the rectangular flange is in the back and the return air cover plate in the bottom as shown in Fig. 57.

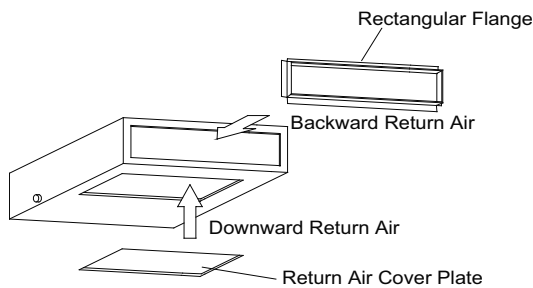


Fig. 57 – Return Air Duct

2. If the downward return air is desired, just change the place of the rectangular flange and the return air cover plate.
3. Connect one end of the return air duct to the return air outlet of the unit by rivets and the other to the return air louver. For the sake of the convenience to freely adjust the height, a cutting of canvas duct will be helpful, which can be reinforced and folded by 8# iron wire.
4. More noise is likely to be produced in the downward return air mode than the backward return air mode. We suggest installing a muffler and a plenum box to minimize the noise.
5. The installation method can be chosen with considering the conditions of the building and maintenance etc. (see Fig. 58).

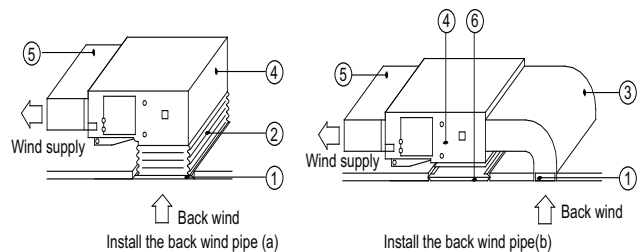


Fig. 58 – Return Air Duct

Table 21—Air Duct

NUMBER	NAME	NUMBER	NAME
1	Return Air Louver (with the filter screen)	4	Indoor Unit
2	Canvas Duct	5	Air Supply Duct
3	Return Air Duct	6	Access Grille

CONDENSATE PIPE INSTALLATION

1. The condensate pipe should keep a inclination angle of 5 ~ 10°, to facilitate the drainage of the condensate water. And the joints of the condensate pipe should be insulated by the insulation material to prevent condensing (see Fig. 59).

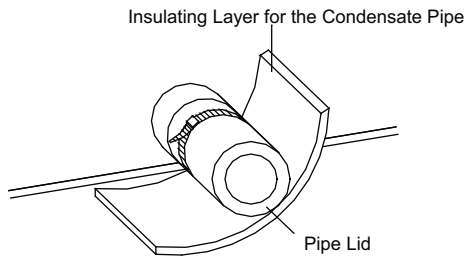


Fig. 59 – Thermal Insulation of the Condensate Pipe

2. There is a condensate outlet on both the left and right sides of the unit. Once one is confirmed for use, the other should be clogged by a rubber plug, bundled by the binding wire and insulated by the insulation material to avoid water leakage.
3. The right outlet is defaulted to be clogged with a plug.

IMPORTANT: No water leakage is allowed on the joint of the condensate pipe.

DESIGN OF THE DRAIN PIPE

1. The drain pipe should always be kept an inclination angle ($>1/100$) to avoid water from gathering.
2. During the connection of the drain pipe and device, do not impose excessive force on the pipe on one side of the device. Additionally the pipe should be secured closely to the device.
3. The drain pipe can be the ordinary hard PVC pipe which can be purchased locally. During the connection, inset the end of the PVC pipe to the drain outlet, then tighten it with the drain hose and binding wire. Never connect the drain outlet and the drain hose with adhesive.
4. When the drain pipe is used for multiple devices, the public section of the pipe should be 4 in. (100 mm) lower than the drain hole of each device and it is better to use the much thicker pipe for such a purpose.

DRAIN PIPE INSTALLATION

1. The diameter of the drain pipe should be larger than or equal to that of the refrigerant pipe (PVC pipe, outer diameter: 1 in. (25 mm), wall thickness ≥ 0.06 in. (1.5 mm).
2. The drain pipe should be as short as possible and with at least a 1/100 degree of slope to avoid forming air pockets.
3. If the proper degree of slope of the drain pipe is not allowed, a lift pipe should be installed.
4. A distance of .9 ft.~6.6 ft. (1.5 m~2 m) should be kept between the hangers to avoid the drain hose from making a turn.

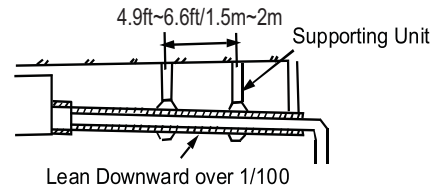


Fig. 60 – Slope Degree

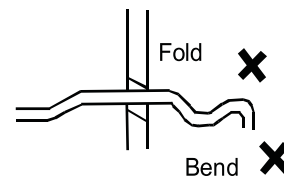


Fig. 61 – Slope Degree

5. Insert the drain hose into the drain hole and tighten it with clamps.
6. Wrap the clamps with large amount of sponge for thermal insulation.
7. The drain hose inside the room also should be insulated.

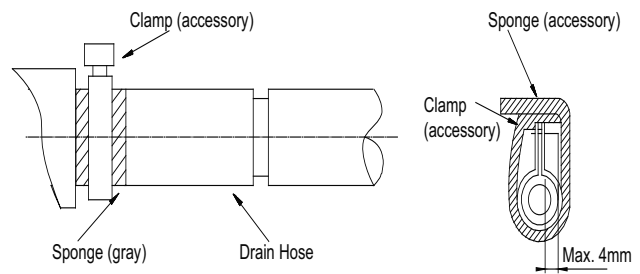


Fig. 62 – Drain Hose Insulation

FAN PERFORMANCES (DUCTED UNITS)

Static pressure curve (static pressure deducted)



Table 22—FAN PERFORMANCES

CODE	0	1	2	3	4	MAX STATIC PRESSURE
Sizes 9 & 12	0.00	0.04	0.08	0.12	0.16	0.18
Sizes 18 & 24	0.04	0.10	0.16	0.22	0.28	0.40
Sizes 36 & 48	0.08	0.14	0.20	0.26	0.32	0.40
			Default Setting			

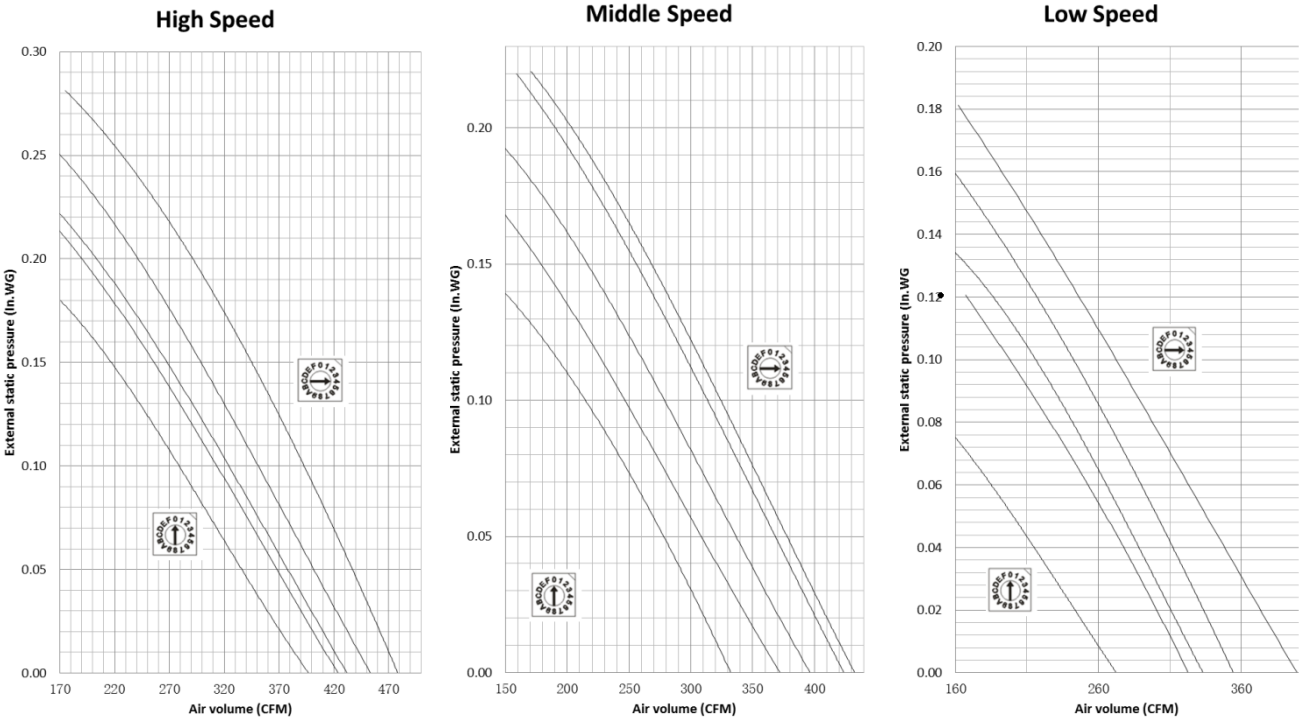


Fig. 63 – 9K and 12K

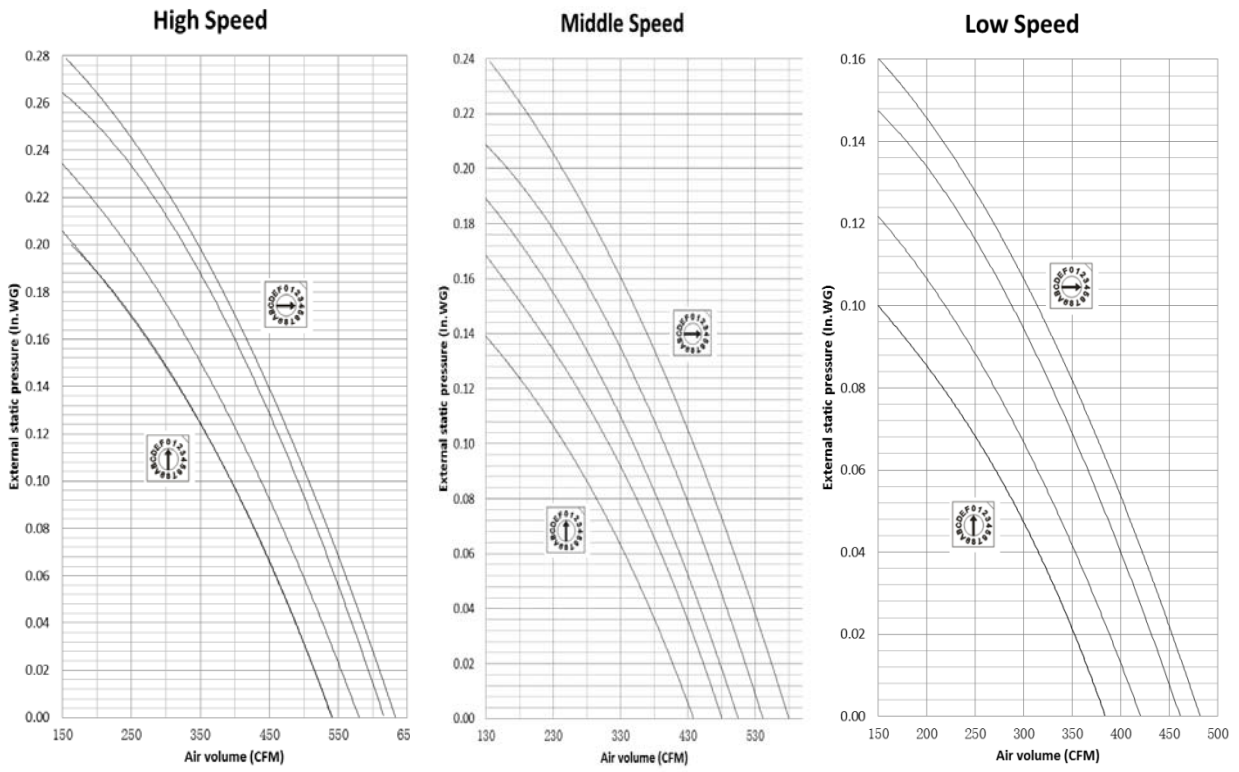


Fig. 64 – 18K

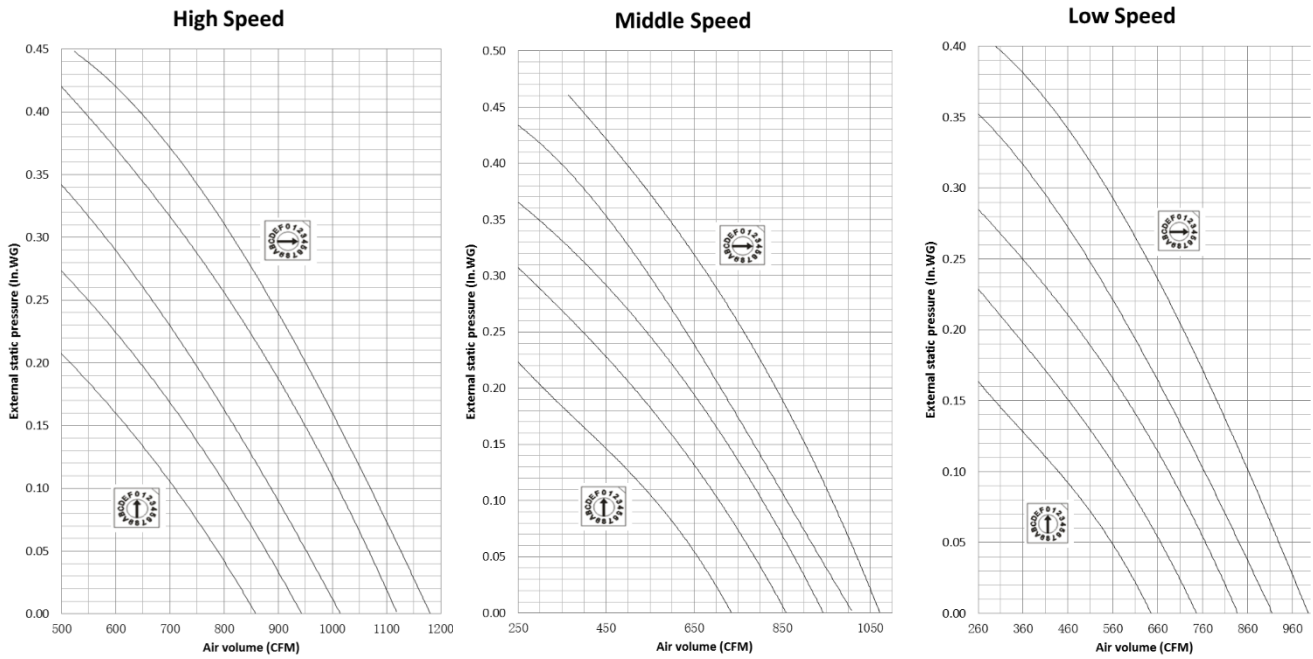


Fig. 65 – 24K

FLOOR CONSOLE INDOOR UNIT INSTALLATION

Follow these key steps when selecting a location for the unit.

- Select a place where cool air can be distributed throughout the room.
- Select a place where condensation water is easily drained away.
- Select a site that can handle the weight of the indoor unit.
- Select a place which has easy access for maintenance.

Indoor unit

The indoor unit should be sited in a place where:

1. The restrictions for the installation specified in the indoor unit installation drawings are met.
2. Both the air intake and exhaust have clear paths.
3. The unit is not in the path of direct sunlight.
4. The unit is away from a heat or steam source.
5. There is no source of machine oil vapour (this may shorten indoor unit life).
6. Cool (warm) air is circulated throughout the room.
7. The unit is away from electronic ignition type fluorescent lamps (inverter or rapid start type) as they may shorten the remote controller range.
8. The unit is at least 3.28 ft. (1 m) away from any television or radio set (unit may cause interference with the picture or sound).

CAUTIONS FOR INSTALLATION WHERE AIR CONDITIONER TROUBLE IS LIABLE TO OCCUR

- Do not install in areas with or near an abundance of oil.
- Do not install in areas with an acid base area.
- Do not install in areas with an irregular electrical supply.

Location for securing the installation panel

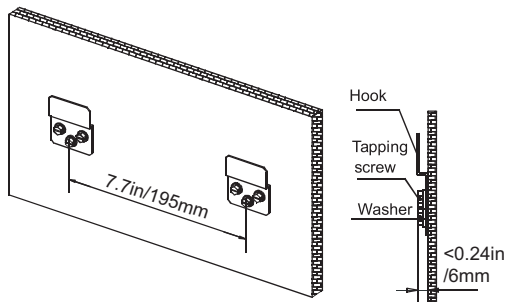


Fig. 66 – Schematic Drawing of Hooks

REFRIGERANT PIPING

Use the following steps to connect the refrigerant pipe.

1. Drill a hole (3") in diameter) for piping and electrical routing.
2. The location of the hole is different depending on which side of the pipe is taken out.
3. For piping, see *Connecting the Refrigerant Pipe*, under Indoor Unit Installation (1).
4. Allow space around the pipe for a easier indoor unit pipe connection.



CAUTION

The suggested shortest pipe length is 8.2 ft. (2.5 m) to avoid noise from the outdoor unit and vibration. (Mechanical noise and vibration may occur depending on how the unit is installed and the environment in which it is used).

See the installation manual for the outdoor unit for the maximum pipe length.

BORING A WALL HOLE AND INSTALLING WALL EMBEDDED PIPE

- For walls containing metal frame or metal board, be sure to use a wall embedded pipe and wall cover in the feed-through hole to prevent water leakage.
- Be sure to caulk the gaps around the pipes with caulking material to prevent water leakage.

1. Bore a feed-through hole of 3" in the wall so it has a down slope toward the outside.
2. Insert a wall pipe into the hole.
3. Insert a wall cover into wall pipe.

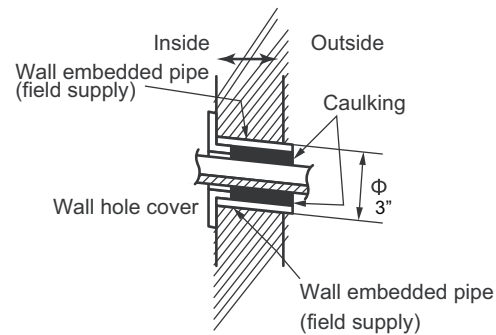


Fig. 67 – Wall Embedded Pipe

4. After completing refrigerant piping, wiring, and drain piping, caulk pipe hole gap with putty.

DRAIN PIPING

1. Use commercial rigid polyvinyl chloride pipe general VP 20 pipe, outer diameter 1 in. (26 mm), inner diameter 4/5 in. (20 mm) for the drain pipe.
2. The drain hose (outer diameter 5/7 in. (18 mm) at connecting end, 8 2/3 in. (220 mm) long) is supplied with the indoor unit. Prepare the drain pipe picture below position.
3. The drain pipe should be inclined downward so that water flows smoothly without any accumulation. (Should not be a trap.)
4. Insert the drain hose to this depth so it will not be pulled out of the drain pipe.
5. Insulate the indoor drain pipe with insulation material to prevent condensation.
6. Remove the air filters and pour some water into the drain pan to check the water flows smoothly.

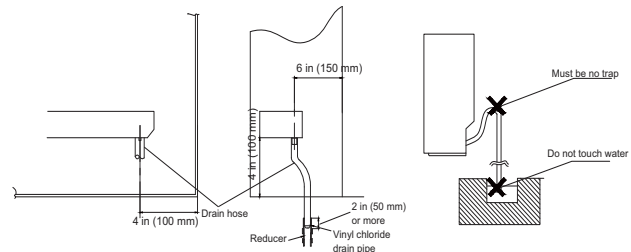


Fig. 68 – Trap

INSTALLING THE INDOOR UNIT

1. Preparation

- Open the front panel, remove the 4 screws and dismount the front grille while pulling it forward.

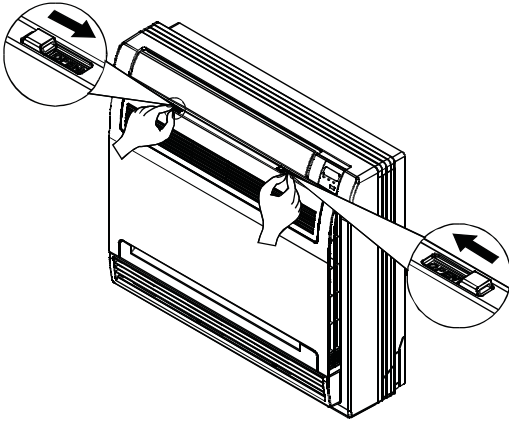


Fig. 69 – Remove the screws

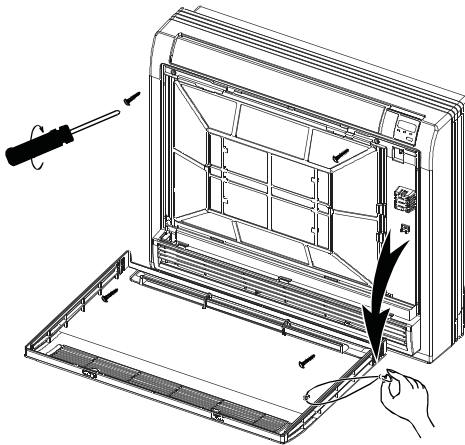


Fig. 70 – Remove the screws

- Follow the arrows to disengage the clasps on the front case to remove it.
- Follow the procedure below when removing the slit portions.

For Moldings

- Remove the pillars. Remove the slit portions on the bottom frame using nippers.

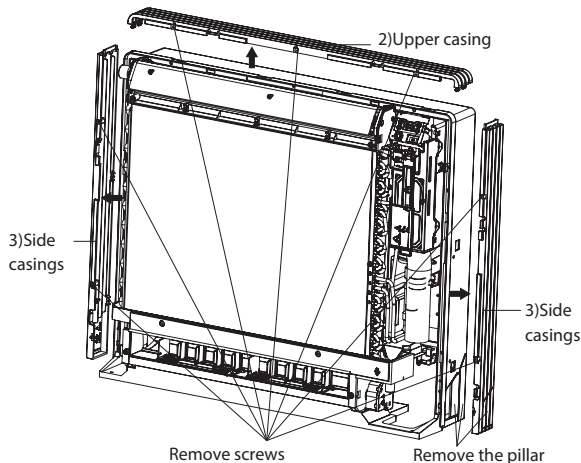


Fig. 71 – Remove the screws

For Side Piping

- Remove the pillars.
 - Remove the screws.
 - Remove the upper casing (2 tabs).
 - Remove the left and right casings (2 tabs on each side).
 - Remove the slit portions on the bottom frame and casings using nippers.
 - Return by following the steps in reverse order (3>2>1).

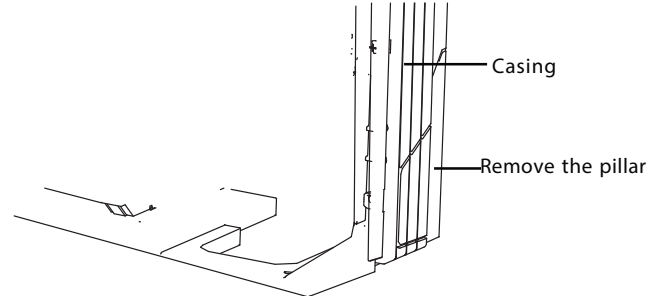


Fig. 72 – Remove the pillar

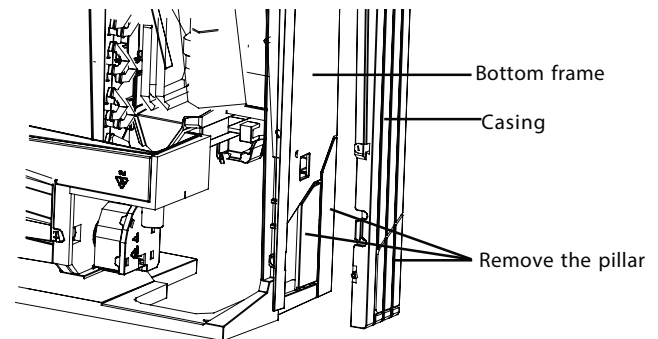


Fig. 73 – Remove the pillar

2. Installation

- Secure using 6 screws for floor installations. Do not forget to secure to the rear wall.
- For wall installations, secure the mounting plate using 5 screws and the indoor unit using 4 screws.

The mounting plate should be installed on a wall which can support the weight of the indoor unit.

- Temporarily secure the mounting plate to the wall, make sure that the panel is completely level, and mark the boring points on the wall.
- Secure the mounting plate to the wall with screws.

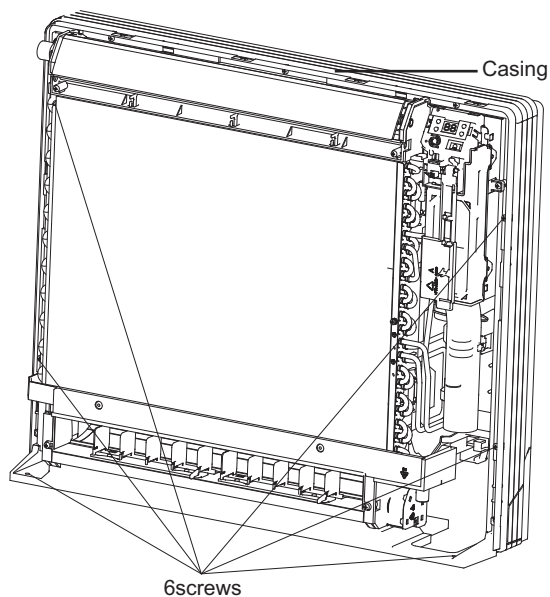


Fig. 74 – Floor Installation

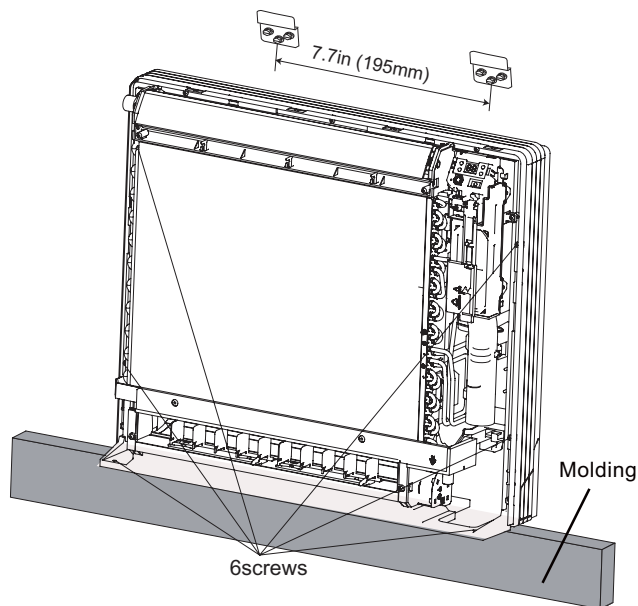


Fig. 75 – Wall Installation

- (3.) Once refrigerant piping and drain piping connections are complete, fill in the gap of the through hole with putty. A gap can lead to condensation on the refrigerant pipe, and drain pipe, and the entry of insects into the pipes.
- (4.) Attach the front panel and front grille in their original positions once all connections are complete.

OUTDOOR UNIT INSTALLATION

1. Use a rigid base to support unit in a level position.
2. Locate outdoor unit and connect piping and wiring.



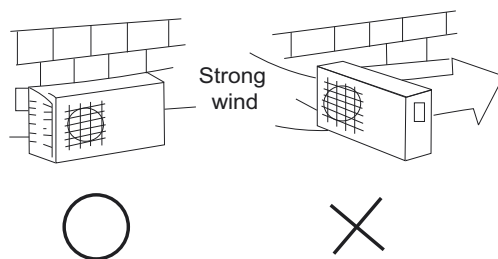
CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Excessive torque can break flare nut depending on installation conditions.

NOTE: Install the outdoor unit on a rigid base to reduce noise levels and vibration. Determine the optimal air outlet direction to prevent discharged air from being blocked. If the installation site is exposed to strong winds such as a coastal areas, ensure the fan's proper operation by installing the unit lengthwise along the wall or use dust or shield plates. If the unit needs to be suspended, the installation bracket should comply with the suspension requirements in the installation bracket diagram. The installation wall should be solid brick, concrete or the same intensity construction, or take steps to reinforce and dampen the support. The connection between the bracket and the wall as well as the bracket and the air conditioner should be firm, stable and reliable. Ensure there is no obstacle which may block the radiating air.



A07350

Fig. 76 – High Wind Installation

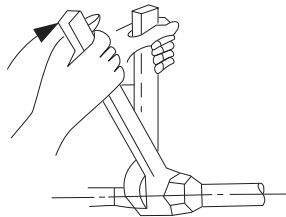
Piping Connections to Outdoor Unit

IMPORTANT: Use refrigeration grade tubing only. No other tubing type may be used. Use of other tubing types will void the manufacturer's warranty. Ensure there is enough piping to cover the required length between the outdoor and indoor unit. Only use piping suitable for high side pressure for both high and low side connections.

Piping Guide:

- Do not open service valves or remove protective caps from tubing ends until all the connections are made.
- Bend tubing with bending tools to avoid kinks and flat spots.
- Keep the tubing free of dirt, sand, moisture, and other contaminants to avoid damaging the refrigerant system.
- Avoid sags in the suction line to prevent the formation of oil traps. Insulate each tube with minimum 3/8-in. (10 mm) wall thermal pipe insulation. Inserting the tubing into the insulation before making the connections saves time and improves installation quality.
 1. The unit is equipped with multiple pairs of service valves. Each pair is clearly marked (color and letter) to identify the indoor unit circuits. In the outdoor unit wiring area, each indoor unit interconnecting terminal block is marked (letter) the same as the corresponding pair of service valves. The indoor units must be piped and wired in matched sets (A to A; B to B, etc.).
 2. It is not required to use all of the available fan coil connections if the application does not require them at the current time. The system can be expanded at any time.

3. Conversion joints are supplied with the outdoor unit. They are required for certain fan coil combinations. These joints are to be connected to the outdoor unit as needed to match the line set size.
4. Cut tubing with tubing cutter.
5. Install correct size flare nut onto tubing and make flare connection.
6. Apply a small amount of refrigerant oil to the flare connection on the tubing.
7. Properly align tubing in with service valve (conversion joint).
8. Tighten flare nut and finish installation using two wrenches as shown in Fig. 77.



A07354

Fig. 77 – Tighten Flare Nut
Table 23— Tightening Torque

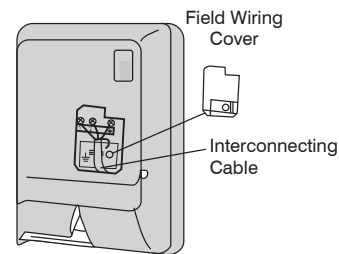
Pipe Diameter Inch (mm)	Tightening Torque	
	Ft-lb	N-m
Ø1/4" (6.35)	10 to 13	13.6 to 17.6
Ø3/8" (9.52)	23 to 31	32.5 to 42.0
Ø1/2" (12.7)	37 to 46	50.1 to 62.3
Ø5/8" (15.88)	60 to 60	67.7 to 81.3

INSTALL ALL POWER AND INTERCONNECTING WIRING TO OUTDOOR UNIT

1. Mount outdoor power disconnect.
2. Run power wiring from main box to disconnect per NEC and local codes.
3. Remove field wiring cover (if available) from unit by loosening screws.
4. Remove knockouts.
5. Connect the conduit to the conduit panel.
6. Properly connect both power supply and control lines to terminal block per the connection diagram.
7. Ground unit in accordance with NEC and local electrical codes.
8. Use lock nuts to secure conduit.
9. Reinstall field wiring cover.

INSTALL ALL POWER, INTERCONNECTING WIRING, AND PIPING TO INDOOR UNIT.

1. Run interconnecting piping and wiring from outdoor unit to each indoor unit (in matched pairs).
2. Pass interconnecting cable through hole in wall (outside to inside).
3. Lift indoor unit into position and route piping and drain through hole in wall (inside to outside). Fit the interconnecting wiring into back side of indoor unit.
4. Open front cover of indoor unit and remove field wiring terminal block cover (see Fig. 78).



A08279

Fig. 78 – Field Wiring Cover

5. Pull interconnecting wire up from back of indoor unit and position in close to the terminal block on indoor unit.
6. Push bottom of indoor unit onto mounting plate to complete wall mount.
7. Connect wiring from the outdoor unit per the connection diagram.

NOTE: Polarity of power wires must match original connection on outdoor unit.

8. Replace field wiring cover and close front cover of indoor unit.
9. Connect refrigerant piping and drain line outside of indoor unit. Refer to *Piping Connections to Outdoor Unit* section for proper installation of flare connections. Complete pipe insulation at flare connection then fasten piping and wiring to the wall as required. Completely seal the hole in the wall.
10. Repeat steps 1 through 10 for each indoor unit.

SYSTEM VACUUM AND CHARGE

⚠ CAUTION

UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Never use the system compressor as a vacuum pump.

Refrigerant tubes and indoor coil should be evacuated using the recommended deep vacuum method of 500 microns. The alternate triple evacuation method may be used if the procedure outlined below is followed. Always break a vacuum with dry nitrogen.

NOTE: All units have a Master Suction and Liquid Line Service Valve (excluding the 18,000 BTU unit).

1. Completely tighten the flare nuts A, B, C, D, E. Fully open all circuits service valves, connect the manifold gage charge hose to the charge port of the low side Master service valve to evacuate all circuits at the same time (see Fig. 79).
2. Connect the charge hose to the vacuum pump.
3. Open (fully) the low side of the manifold gage (see Fig. 80).
4. Start the vacuum pump.
5. Evacuate using either deep vacuum or triple evacuation method.
6. After the evacuation is complete, fully close the low side of manifold gage and stop operation of vacuum pump.
7. The factory charge contained in the outdoor unit is good for up to 25 ft. (8 m) of line length. For refrigerant lines longer than 25 ft. (8 m), add refrigerant, up to the allowable length, as specified in the System Requirements section.
8. Disconnect the charge hose from charge connection of the low side service valve.
9. Securely tighten caps of service valves.

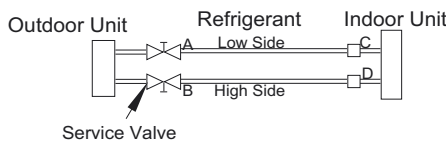


Fig. 79 – Service Valve

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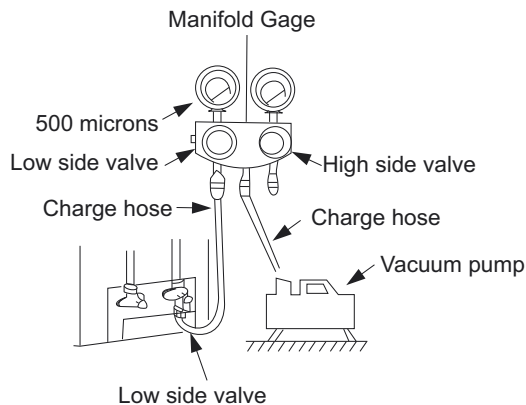


Fig. 80 – Manifold

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Deep Vacuum Method

The deep vacuum method requires a vacuum pump capable of pulling a vacuum of 500 microns and a vacuum gage capable of accurately measuring this vacuum depth. The deep vacuum method is the most positive way of assuring a system is free of air and liquid water (see Fig. 81).

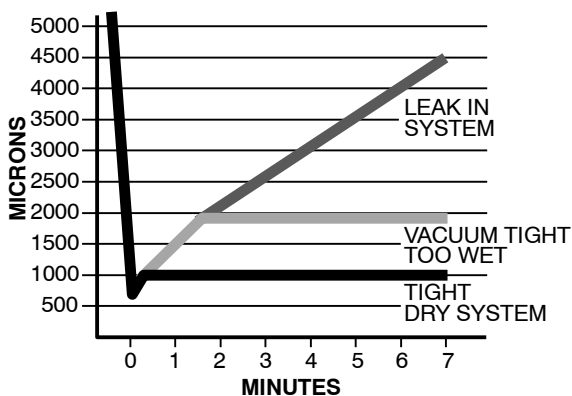


Fig. 81 – Deep Vacuum Graph

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Triple Evacuation Method

The triple evacuation method should only be used when vacuum pump is only capable of pumping down to 28 in. of mercury vacuum and system does not contain any liquid water.

Refer to Fig. 82 and proceed as follows:

1. Pump system down to 28 in. of mercury and allow the pump to continue operating for an additional 15 minutes.
2. Close service valves and shut off vacuum pump.
3. Connect a nitrogen cylinder and regulator to system and open until system pressure is 2 psig.
4. Close service valve and allow system to stand for 1 hr. During this time, dry nitrogen will be able to diffuse throughout the system absorbing moisture.
5. Repeat this procedure as indicated in Fig. 82. System will then be free of any contaminants and water vapor.

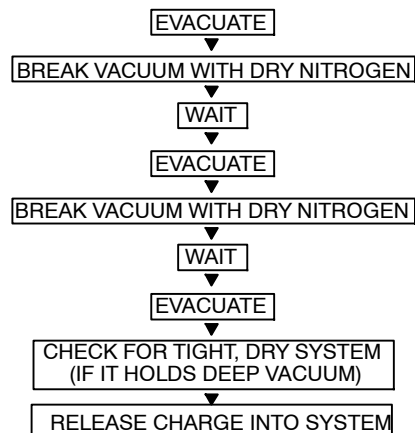


Fig. 82 – Triple Evacuation Method

A95425

Final Tubing Check

IMPORTANT: Check to be certain the factory tubing on both indoor and outdoor unit has not shifted during shipment. Ensure tubes are not rubbing against each other or any sheet metal. Pay close attention to feeder tubes, making sure wire ties on feeder tubes are secure and tight.

START-UP

Test Operation

Perform test operation after completing gas leak and electrical safety check.

1. Push the “ON/OFF” button on Remote Control to begin testing.

NOTE: A protection feature prevents the air conditioner from being activated for approximately 3 minutes.

2. Push MODE button, select COOLING, HEATING, FAN mode to check if all functions work correctly.

SYSTEM CHECKS

1. Conceal the tubing where possible.
2. Ensure the drain tube slopes downward along its entire length.
3. Ensure all tubing and connections are properly insulated.
4. Fasten tubes to the outside wall, when possible.
5. Seal the hole through which the cables and tubing pass.

INDOOR UNIT

1. Do all Remote Control buttons function properly?
2. Do the display panel lights work properly?
3. Does the air deflection louver function properly?
4. Does the drain work?

OUTDOOR UNIT

1. Are there unusual noises or vibrations during operation?

Explain The Following Items To Customer With The Aid Of The Owner's Manual:

1. How to turn air conditioner on and off; selecting COOLING, HEATING and other operating modes; setting a desired temperature; setting the timer to automatically start and stop air conditioner operation; and all other features of the Remote Control and display panel.
2. How to remove and clean the air filter.
3. How to set air deflection louver.
4. Explain care and maintenance.
5. Present the Owner's Manual and installation instructions to customer.

CONNECTION DIAGRAMS

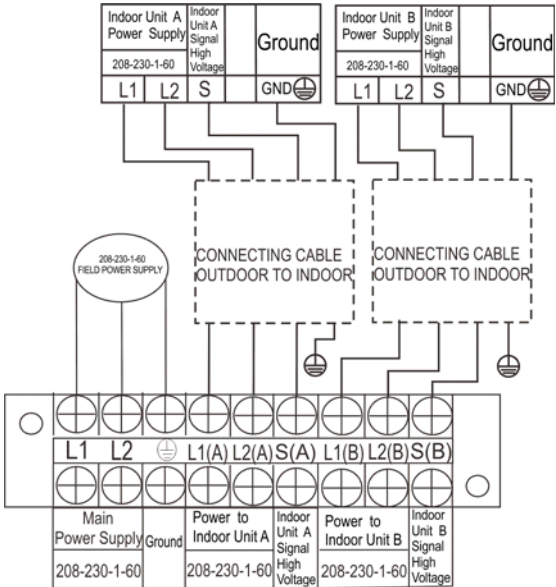


Fig. 83 – Connection Diagram Size 18

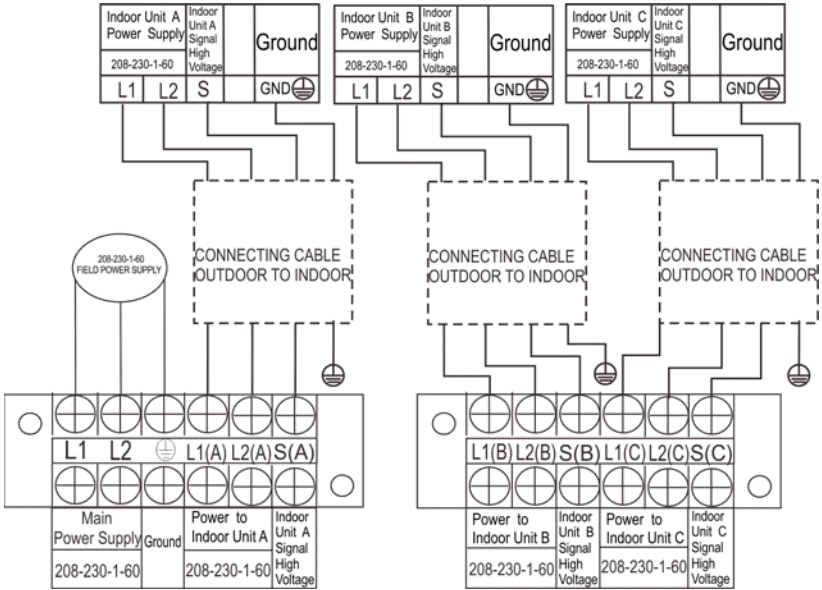


Fig. 84 – Connection Diagram Size 27

CONNECTION DIAGRAMS (CONT)

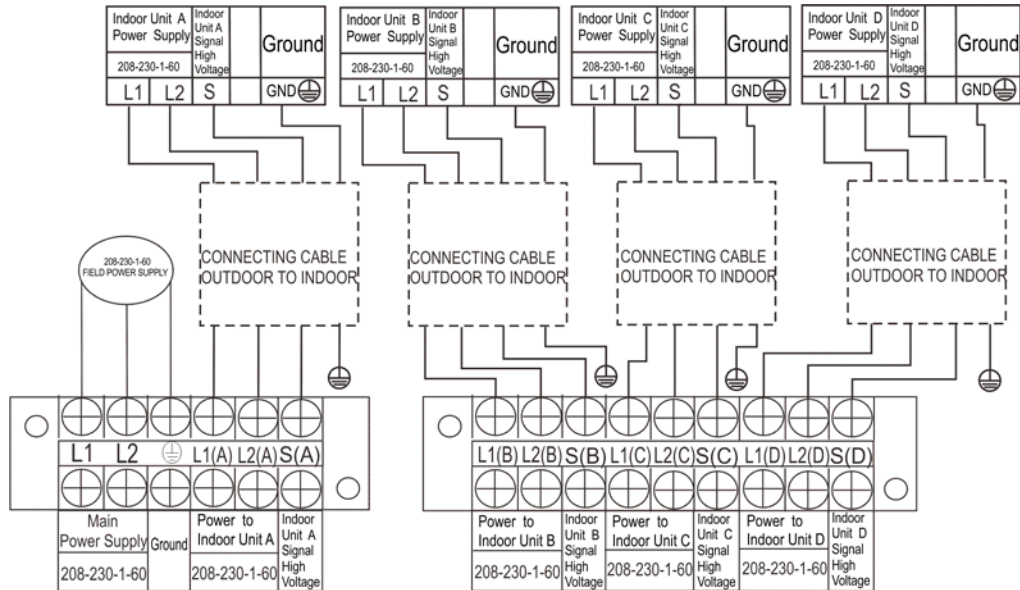


Fig. 85 – Connection Diagram Size 36

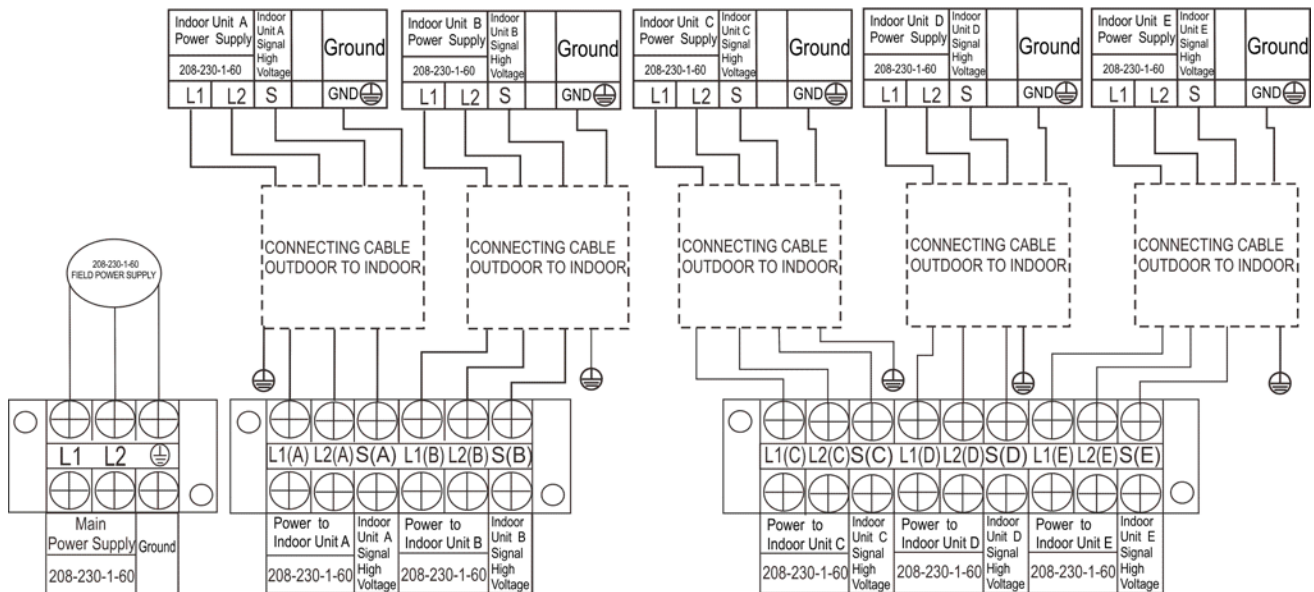


Fig. 86 – Connection Diagram Size 48

Notes:

1. Do not use thermostat wire for any connection between indoor and outdoor units.
2. All connections between indoor and outdoor units must be as shown. **The connections are sensitive to polarity and will result in a fault code.**

Table 24—Indoor Unit Error Display

OPERATION LAMP	TIMER LAMP	DISPLAY	LED STATUS
☆1 time	X	E0	Indoor unit EEPROM error
☆ 2 times	X	E1	Communication malfunction between indoor and outdoor units.
☆4 times	X	E3	Indoor fan speed has been out of control
☆5 times	X	E4	Indoor room temperature sensor T1 open circuit or short circuit
☆6 times	X	E5	Evaporator coil temperature sensor T2 open circuit or short circuit
☆7 times	X	EC	Refrigerant leakage detection
☆8 times	X	EE	Water – level alarm malfunction
☆1 time	O	F0	Current overload protection
☆2 times	O	F1	Open circuit or short circuit of outdoor ambient temperature sensor T4
☆3 times	O	F2	Open circuit or short circuit of condenser coil temperature sensor T3
☆4 times	O	F3	Open circuit or short circuit of Compressor discharge temperature sensor T5
☆5 times	O	F4	Outdoor unit EEPROM error
☆6 times	O	F5	Outdoor fan speed has been out of control
☆7 times	O	F6	T2B sensor error
☆8 times	O	F7	Lifting – panel communication error
☆9 times	O	F8	Lifting – panel malfunction
☆10 times	O	F9	Lifting – panel is not closed
☆1 time	☆	P0	IPM malfunction
☆2 times	☆	P1	Over voltage or over low voltage protection
☆3 times	☆	P2	High temperature protection of compressor top
☆4 times	☆	P3	Outdoor low temperature protection
☆5 times	☆	P4	Inverter compressor drive error
☆6 times	☆	P5	Mode conflict
☆7 times	☆	P6	Compressor low – pressure protection
☆8 times	☆	P7	Outdoor IGBT temperature sensor error

O (light) X (off) ☆ (flash)

OUTDOOR UNIT DIAGNOSTIC GUIDES

This unit has on-board diagnostics. Error codes are displayed on the wired remote controller and the outdoor unit microprocessor board with colored LED lights. The table below explains the error codes on both.

Table 25—Outdoor Unit Error Display

DISPLAY	LED STATUS	IDU Error	IDU Error
E0	Outdoor EEPROM malfunction	F4	E6
E2	Communication malfunction between indoor and outdoor units	E1	E2
E3	Communication malfunction between IPM board and outdoor main board	—	—
E4	Open or short circuit of outdoor temperature sensor (T3、T4、T5、T2B)	F2	E6
E5	Voltage protection	P1	P0
E6	PFC module protection	—	—
E8	Outdoor fan speed has been out of control (Only for DC fan motor models)	F5	—
E9	Wrong wiring connection of 24K indoor unit	—	—
F1	No A Indoor unit coil outlet temp. sensor or connector of sensor is defective	—	—
F2	No B Indoor unit coil outlet temp. sensor or connector of sensor is defective	—	—
F3	No C Indoor unit coil outlet temp. sensor or connector of sensor is defective	—	—
F4	No D Indoor unit coil outlet temp. sensor or connector of sensor is defective	—	—
F5	No E Indoor unit coil outlet temp. sensor or connector of sensor is defective	—	—
F6	No F Indoor unit coil outlet temp. sensor or connector of sensor is defective	—	—
P0	Temperature protection of compressor top	P2	P3(P1)
P1	High pressure protection	—	—
P2	Low pressure protection	—	—
P3	Current protection of compressor	—	—(P2)
P4	Temperature protection of compressor discharge	—	—
P5	High temperature protection of condenser	—	—
P6	IPM module protection	P0	E5