

**38MGR**  
**Multi—zone Outdoor Unit Ductless System**  
**Sizes 18, 24, 30, 36 and 48**

**Installation Instructions**

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

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**NOTE:** Image for illustration purposes only. Actual model may be slightly different.

## 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 coil cleaning. 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 a 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, the 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.

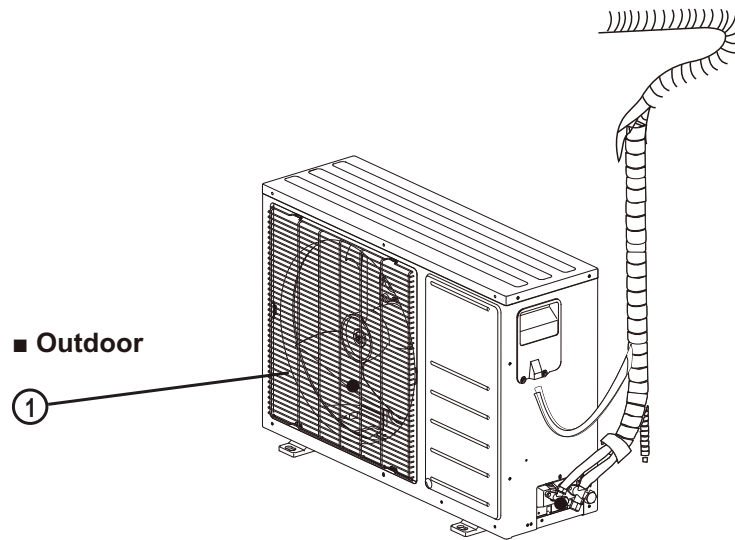
## GENERAL

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, refer to the product data document.

## PARTS LIST

**Table 1—Parts List**

PART NO.	PART NAME	QTY.
1	Outdoor unit	1
—	Literature package including installation instructions and warranty	1
—	Grommet to secure the outdoor unit (helps with vibration prevention during unit operation)	4
—	Drain Joint	1
—	Drain Hose	1
—	Conversion Joints (see Table 4)	—



**Fig. 1 — Parts List**

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**NOTE:**

- If the outdoor unit is higher than the indoor unit, prevent rain from flowing into the indoor unit along the connection pipe by making a downward arc in the connection pipe before it enters the wall to the indoor unit. This ensures that rain drips from the connection pipe before it enters the wall.
- Piping and the interconnecting wiring are field supplied.
- The illustration above is only a sketch. Different models may be slightly different.

The following units are covered in these installation instructions.

**Table 2—Unit Sizes**

SYSTEM TONS	kBTU/h	VOLTAGE — PHASE	OUTDOOR MODEL
1.50	18	208/230—1	38MGRQ18B—3
2	24	208/230—1	38MGRQ24C—3
2.5	30	208/230—1	38MGRQ30D—3
3.00	36	208/230—1	38MGRQ36D—3
4.00	48	208/230—1	38MGRQ48E—3

## SYSTEM REQUIREMENTS

Allow sufficient space for airflow and service of the unit. See Fig. 2 for the required minimum distances between the unit, walls or ceilings.

## 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 3 lists the pipe sizes for the outdoor unit. For the indoor unit pipe sizes refer to the indoor unit installation instructions.

**Table 3—Piping and Refrigerant**

SYSTEM SIZE			18K	24K	30K	36K	48K
Piping	Min. Piping Length per each indoor unit	ft (m)	10 (3)	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)	25 (7.5)
	Max. outdoor—indoor height difference (OU higher than IU)	ft (m)	49 (15)	49 (15)	49 (15)	65 (20)	65 (20)
	Max. outdoor—indoor height difference (IU higher than OU)	ft (m)	49 (15)	49 (15)	49 (15)	65 (20)	65 (20)
	Max. height different between indoor units	ft (m)	32 (10)	32 (10)	32 (10)	32 (10)	32 (10)
	Max. Length per each indoor unit	ft (m)	82 (25)	98 (30)	115 (35)	115 (35)	115 (35)
	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)	123 (37.5)
	Total Maximum Piping Length per system	ft (m)	131 (40)	197 (60)	263 (80)	328 (100)	328 (100)
	Additional refrigerant charge (between Standard – Max piping length)	Oz/ft (g/m)	0.16 (15)	0.16 (15)	0.16 (15)	0.16 (15)	0.16 (15)
	Suction Pipe Size	in (mm)	3/8*2 (9.5*2)	3/8*3 (9.5*3)	1/2*1+3/8*3 (12.7*1+9.5*3)	1/2 *2+3/8*2 (12.7*2+9.5*2)	1/2 *2+3/8*3 (12.7*2+9.5*3)
Refrigerant	Liquid Pipe Size	in (mm)	1/4 *2 (6.3*2)	1/4 *3 (6.3*3)	1/4 *4 (6.3*4)	1/4 *4 (6.3*4)	1/4 *5 (6.3*5)
	Refrigerant Type		R410A	R410A	R410A	R410A	R410A
	Charge Amount	Lbs (kg)	4.41 (2.0)	6.17 (2.8)	6.61 (3.0)	10.14 (4.6)	10.14 (4.6)

**NOTE:** The refrigerant charge included is adequate for the outdoor unit's maximum number of zones multiplied by the standard piping length per zone. For piping runs greater than the "Maximum Piping Length with no additional refrigerant charge per System", see Additional Refrigerant Charge (Table 5).

### 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 includes a package of conversion joints to facilitate installation of the various fan coil sizes. These joints are to be connected to the outdoor unit as needed to match the line set size.

**Table 4—Conversion Joints**

No. of Zones	Size	Adaptor	Qty.
2 zone	18	3/8" -- 1/2"	2
3 zone	24	3/8" -- 1/2"	3
4 zone	30	3/8" -- 1/2"	3
		1/2" -- 3/8"	1
		1/4" -- 3/8"	1
		1/2" -- 5/8"	1
4 zone 5 zone	36	1/2" -- 3/8"	2
	48	1/4" -- 3/8"	2
		1/2" -- 5/8"	2
		3/8" -- 1/2"	3

**Table 5—Additional Refrigerant Charge**

Unit Size	No. 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	70.55 (2.0)	49 (15)	0.16 (15)	131 (40)
24	3	98.76 (2.8)	74 (22.5)	0.16 (15)	197 (60)
30	4	105.82 (3.0)	98 (30)	0.16 (15)	263 (80)
36	4	162.26 (4.6)	123 (37.5)	0.16 (15)	328 (100)
48	5	162.26 (4.6)	123 (37.5)	0.16 (15)	328 (100)

### 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.

Electronic expansion valves in the outdoor unit are used as metering devices.

### **Wiring**

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, only stranded copper conductors with a 600 volt rating and double insulated copper wire must be used. 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 the 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 voltage drop, the factory recommended wire size is 14/2 stranded with a ground.

##### **Communication Wiring:**

A separate shielded stranded copper conductor only, with a 600 volt rating and double insulated copper wire, must be used as the communication wire from the outdoor unit to the indoor unit. Please use a separate shielded 16GA stranded control wire.



## **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 double insulated copper wire.



## **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 the indoor unit to the outdoor unit.
- Every wire must be connected firmly. Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also exist. Therefore, ensure all wiring is tightly connected.
- No wire should be allowed to touch the 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 a hole in the conduit panel.

## DIMENSIONS – OUTDOOR

Table 6—Dimensions

UNIT SIZE		18	24	30	36	48
Height	in (mm)	27.6 (703)	31.89 (810)	31.89 (810)	52.48 (1333)	52.48 (1333)
Width	in (mm)	33.27 (845)	37.24 (946)	37.24 (946)	41.14 (1045)	41.14 (1045)
Depth	in (mm)	13.19 (335)	15.20 (386)	15.20 (386)	14.96 (380)	14.96 (380)
Weight—Net	lbs (kg)	105.8 (48)	149.9 (68)	156.5 (71)	223.8 (101.5)	223.8 (101.5)

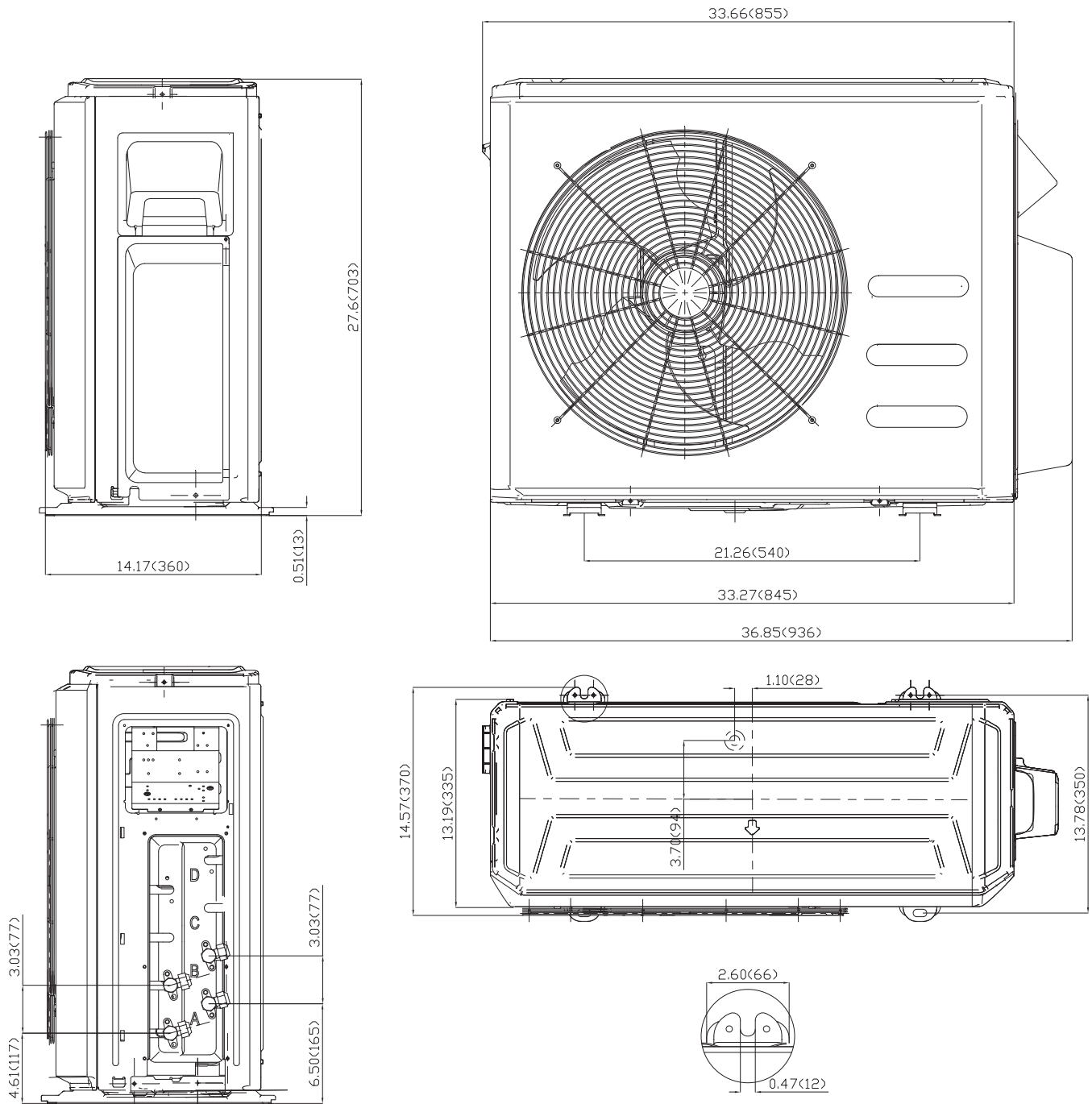
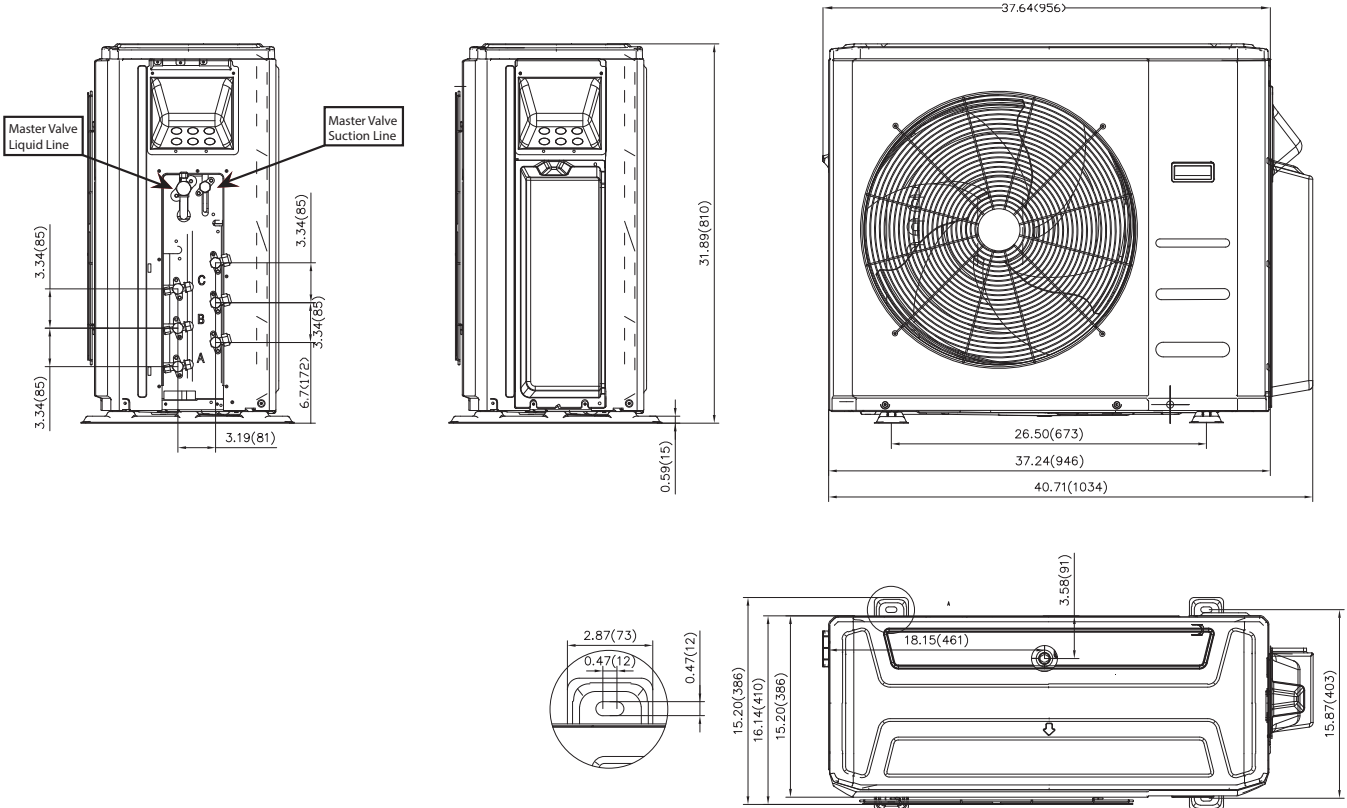


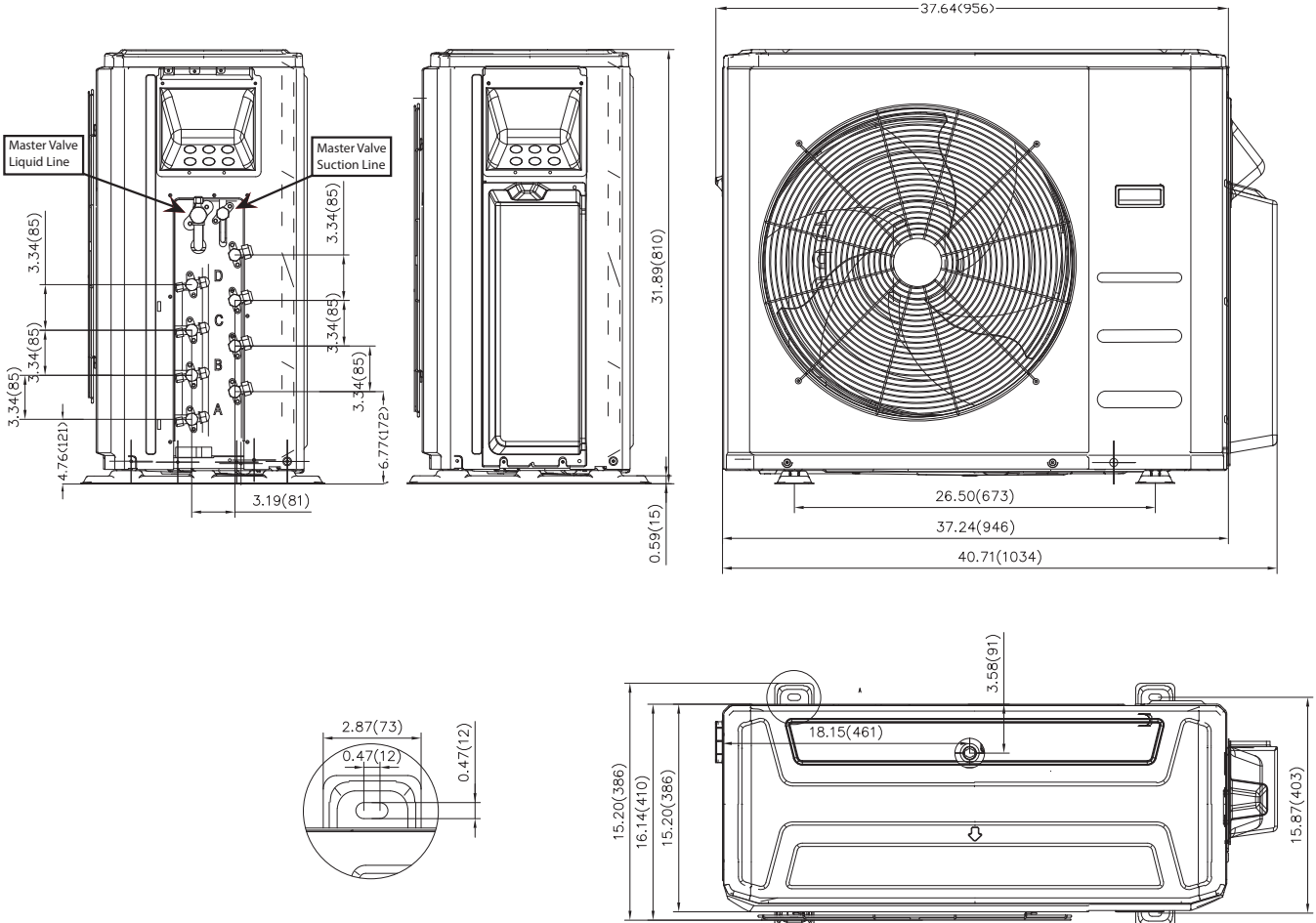
Fig. 2 — Outdoor Dimensions Size 18

**NOTE:** Master valves are not available on the size 18 unit.

**DIMENSIONS – OUTDOOR (CONTINUED)**



**Fig. 3 – Outdoor Dimensions Size 24**



**Fig. 4 – Outdoor Dimensions Size 30**

DIMENSIONS - OUTDOOR (CONTINUED)

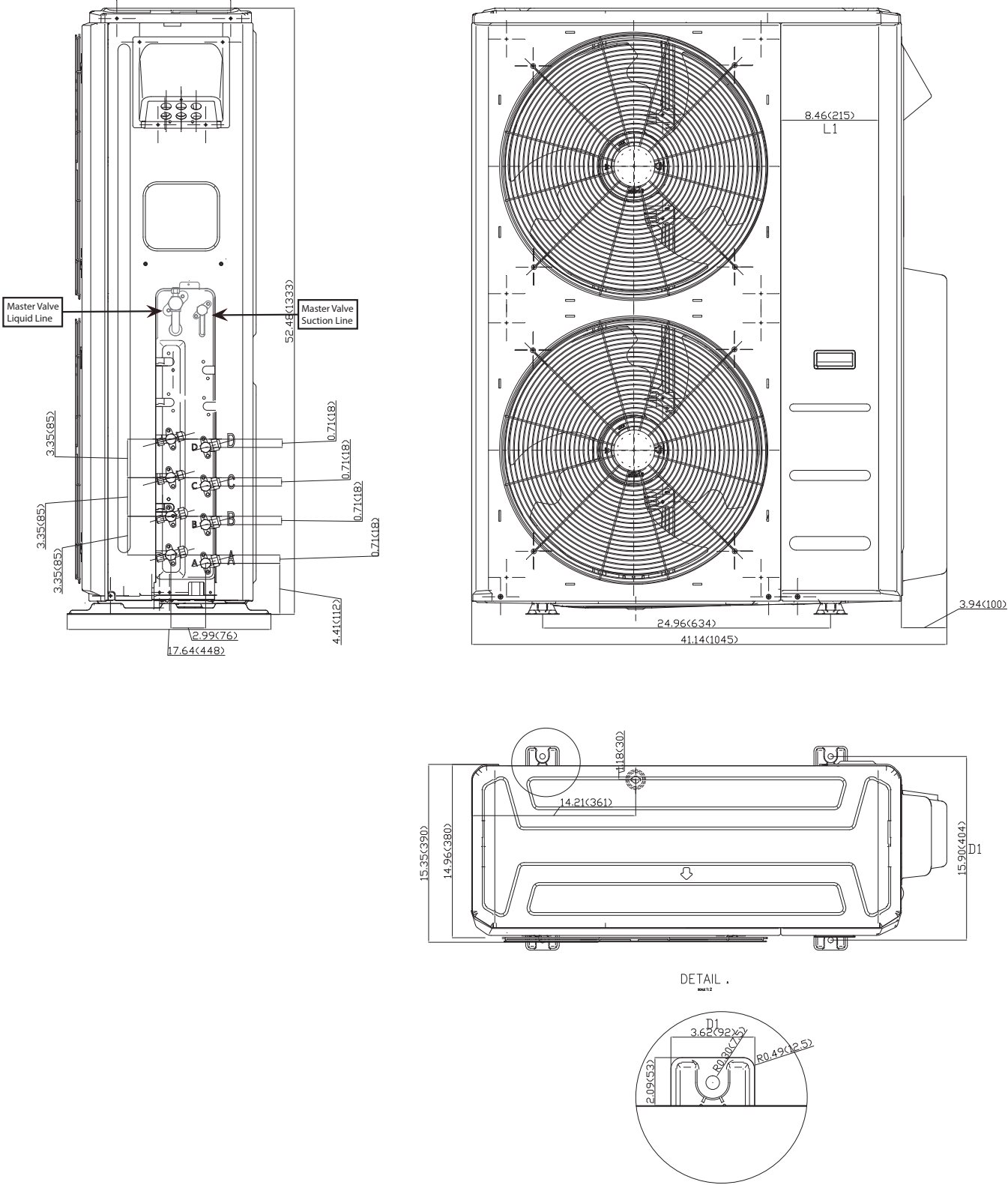


Fig. 5 – Outdoor Dimensions Size 36



DIMENSIONS - OUTDOOR (CONTINUED)

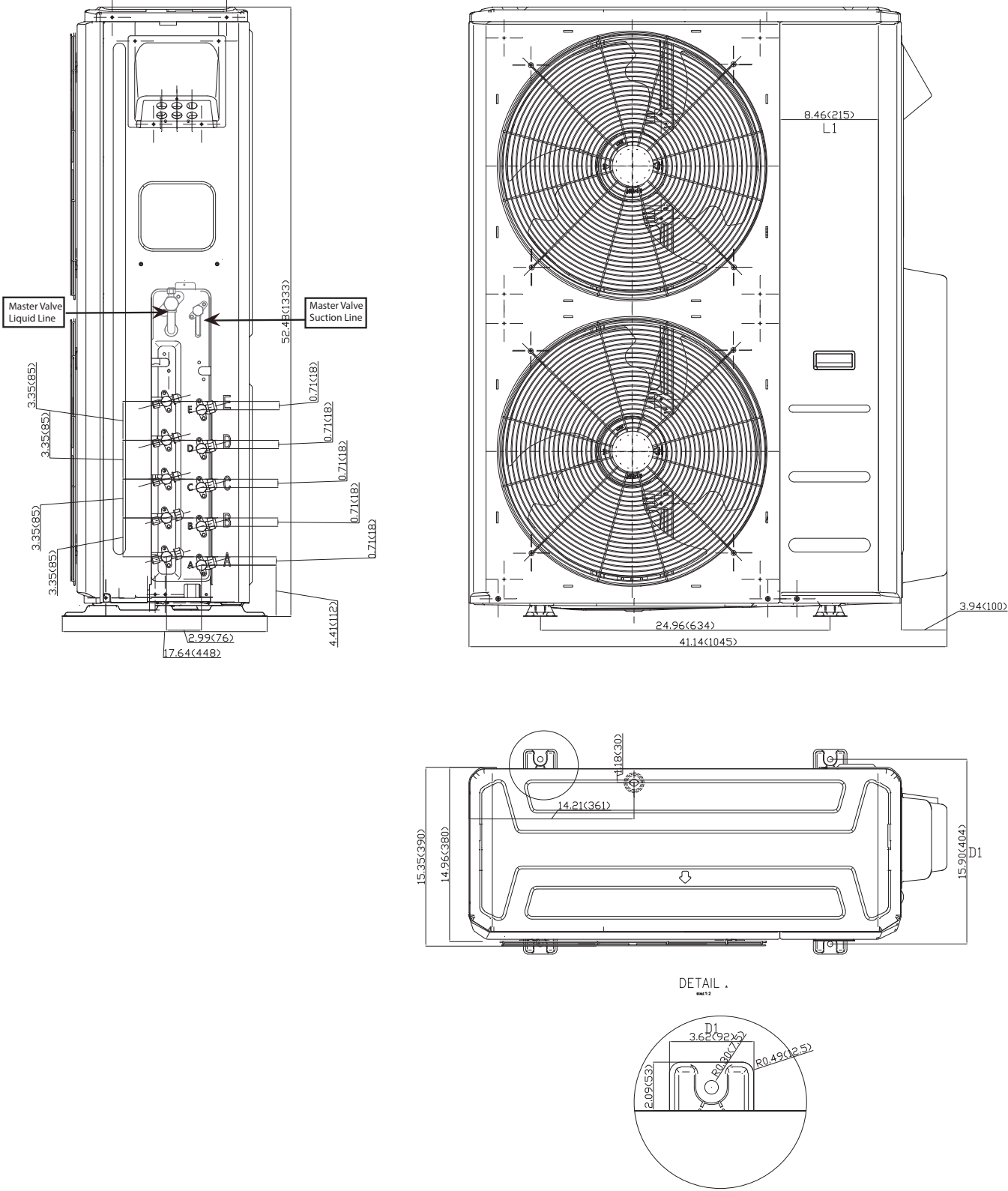


Fig. 6 – Outdoor Dimensions Size 48

CLEARANCES – OUTDOOR

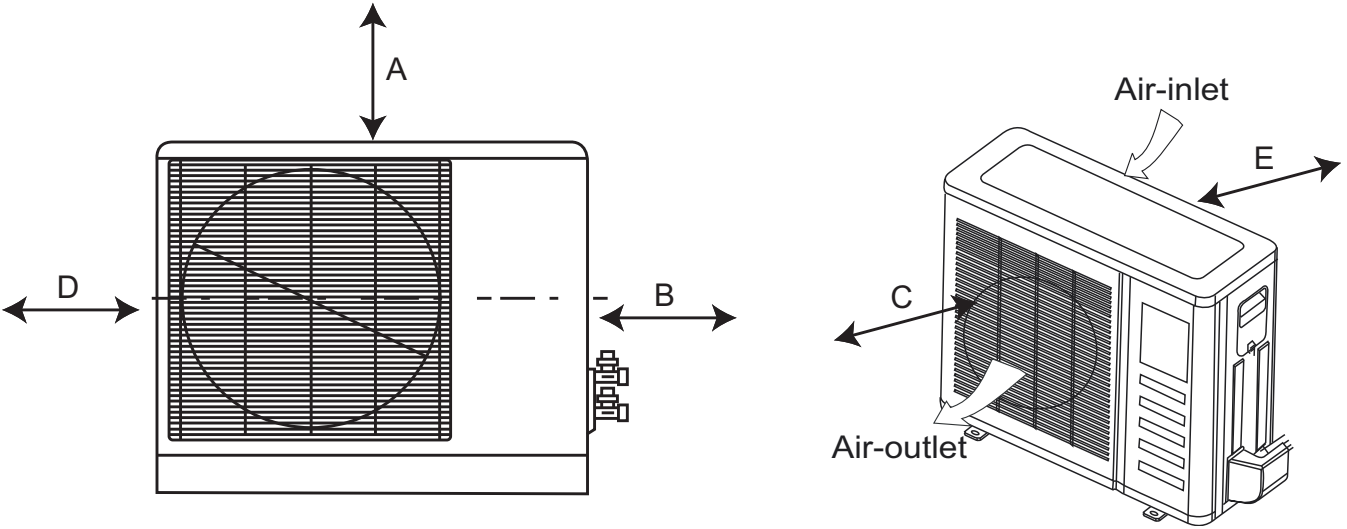


Fig. 7 – Clearances Outdoor

Table 7— Clearances Outdoor Values

UNIT	MINIMUM VALUE in. (mm)
A	24 (609)
B	24 (609)
C	24 (609)
D	4 (101)
E	6 (152)

**NOTE:** Outdoor Unit must be mounted at least 2in (50mm) above the maximum anticipated snow depth.

## INSTALLATION GUIDE

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

## INSTALLATION TIPS

**Ideal installation locations include:**

### Outdoor Unit

- A location which is convenient to installation and not exposed to strong winds.
- 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. 7.
- Do not install the indoor or outdoor units in a location with special environmental conditions. For those applications, contact your Ductless representative.

## OUTDOOR UNIT INSTALLATION

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

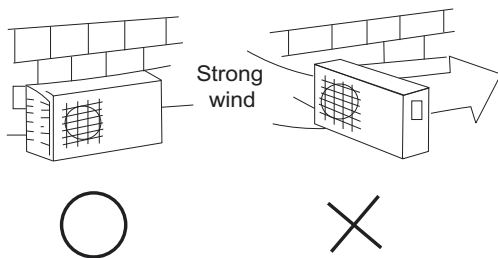
**CAUTION**

**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.



**Fig. 8 – High Wind Installation**

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## MAKE REFRIGERANT PIPING CONNECTIONS (OUTDOOR UNIT)

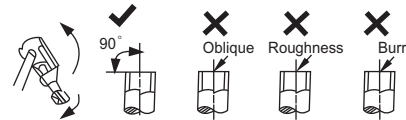
**IMPORTANT:** Use refrigeration grade tubing **ONLY**. No other type of tubing may be used. Use of other tubing types **will void** the manufacturer's warranty.

### Piping Guide:

- Do not open service valves or remove protective caps from tubing ends until all the connections are made.
- Bend the 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. Remove the service connection, if provided with the unit.



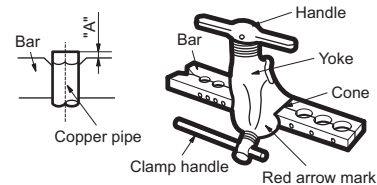
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**Fig. 9 – Cut the Pipe**

5. Remove all the burrs from the cut cross section of the pipe avoiding any burrs inside the tubes.
6. Remove the flare nuts attached to the indoor and outdoor units.
7. Install the correct size flare nut onto the tubing and make a flare connection. Refer to Table 8 for the flare nut spaces.

**Table 8—Flare Nut Spacing**

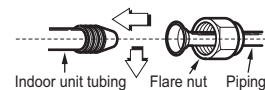
OUTER DIAM. (mm)	A (mm)	
	Max.	Min.
Ø1/4" (6.35)	0.05 (1.3)	0.03 (0.7)
Ø3/8" (9.52)	0.06 (1.6)	0.04 (1.0)
Ø1/2" (12.7)	0.07 (1.8)	0.04 (1.0)
Ø5/8" (15.88)	0.09 (2.2)	0.08 (2.0)



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**Fig. 10 – Flare Nut Spacing**

8. Apply a small amount of refrigerant oil to the flare connection on the tubing.
9. Align the center of the pipes and/or the service valve.



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**Fig. 11 – Align Pipe Center**

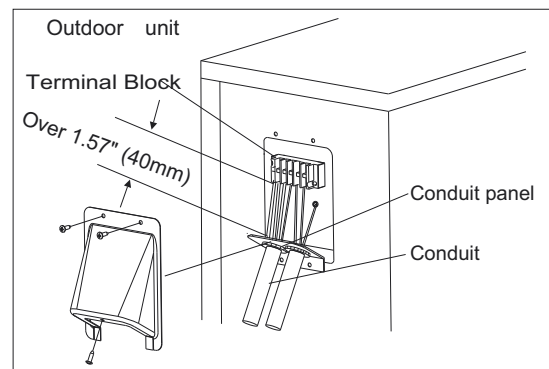
10. Connect both the liquid and gas piping to the indoor unit.
11. Tighten the flare nut using a torque wrench as specified in Table 9.
12. Complete the installation.

**Table 9—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)	24 to 31	32.5 to 42.0
Ø1/2" (12.7)	37 to 46	50.1 to 62.3
Ø5/8" (15.88)	50 to 60	67.7 to 81.3

## INSTALL ALL POWER AND INTERCONNECTING WIRING TO OUTDOOR UNIT

1. Mount the outdoor power disconnect.
2. Run power wiring from the main box to the disconnect per NEC and local codes.
3. Remove the field wiring cover (if available) from the unit by loosening the screws.
4. Remove the caps on the conduit panel.
5. Connect the conduit to the conduit panel (see Fig. 12).
6. Properly connect both the power supply and control lines to the terminal block per the connection diagram.
7. Ground the unit in accordance with NEC and local electrical codes.
8. Use the lock nuts to secure the conduit.
9. Reinstall the field wiring cover.



**Fig. 12 — Field Wiring**

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## 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 the terminal to overheat or result in unit malfunction. A fire hazard may also exist. Therefore, ensure all wiring is tightly connected.
- No wire should be allowed to touch the 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.

## ELECTRICAL DATA

**Table 10—Multi-zone Outdoor Unit**

UNIT SIZE	SYSTEM VOLTAGE	OPERATING VOLTAGE	COMPRESSOR	OUTDOOR FAN			MCA	MOCP
	VOLT / PHASE / HZ	MAX / MIN*	RLA	FLA	HP	W		
18	208-230/1/60	253 / 187	10	0.74	0.07	50	18	25
24			15	0.9	0.16	120	25	35
30			19	1.3	0.16	120	30	45
36			21	1.0x2	0.11	85	35	50
48			21	1.0x2	0.11	85	35	50

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

### LEGEND

FLA - Full Load Amps

MCA - Minimum Circuit Amps

MOCP - Maximum Over Current Protection

RLA - Rated Load Amps

CONNECTION DIAGRAMS

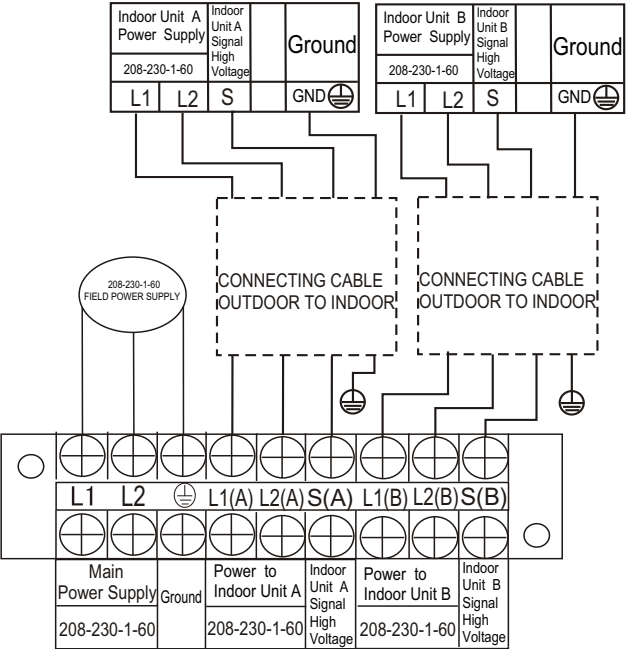


Fig. 13 – Connection Diagram Size 18K 2 Zone

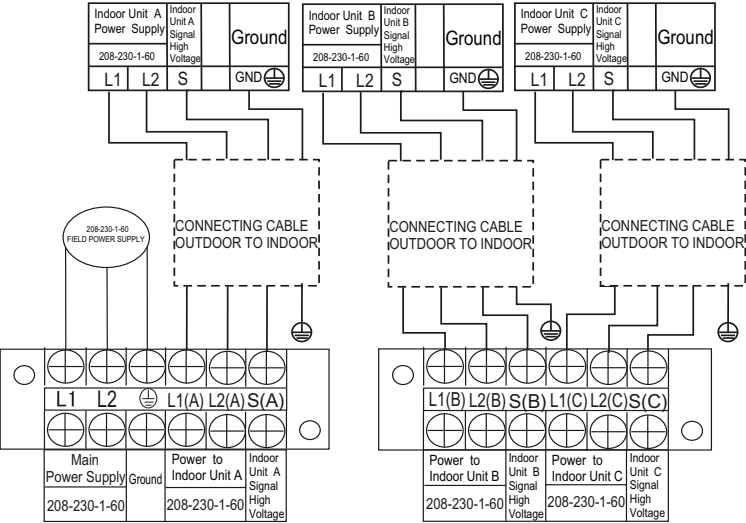


Fig. 14 – Connection Diagram Size 24K 3 Zone

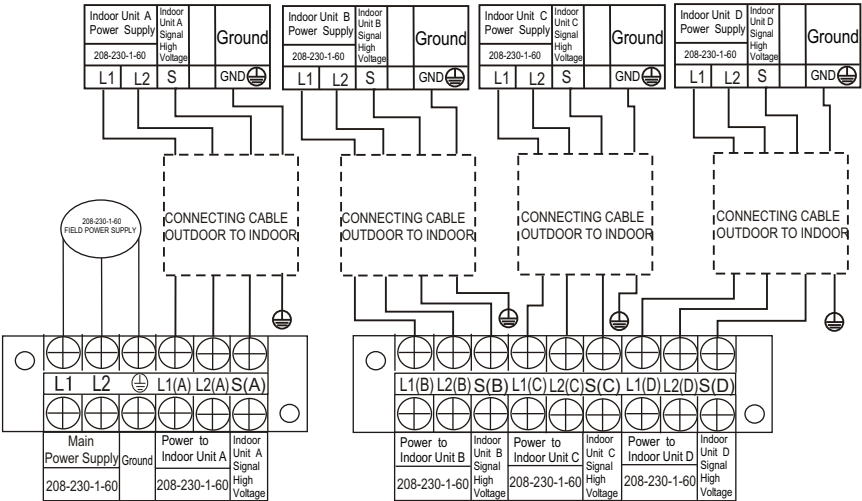


Fig. 15 – Connection Diagram Size 30K 4 Zone

CONNECTION DIAGRAMS (CONTINUED)

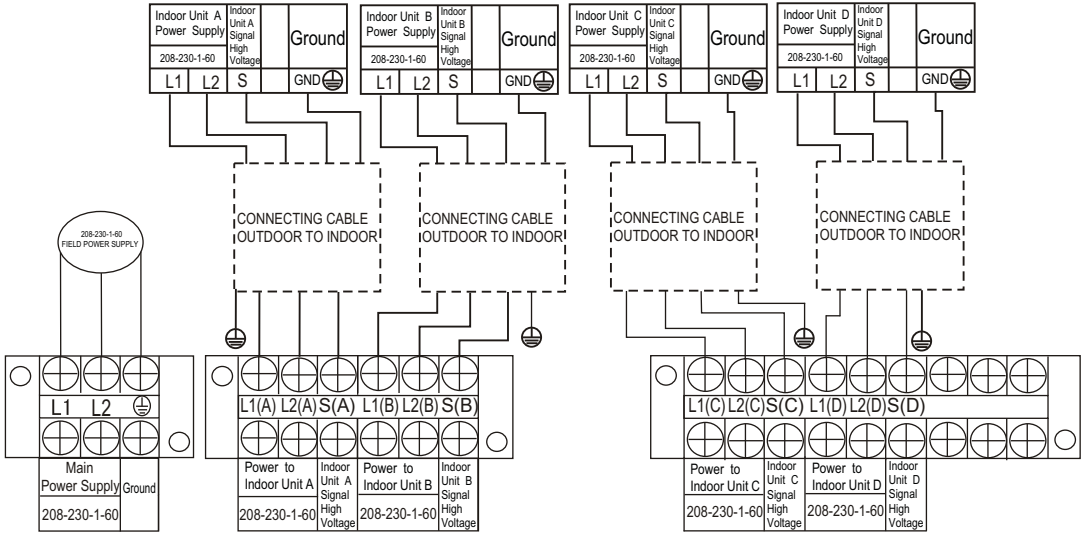


Fig. 16 – Connection Diagram Size 36K 4 Zone

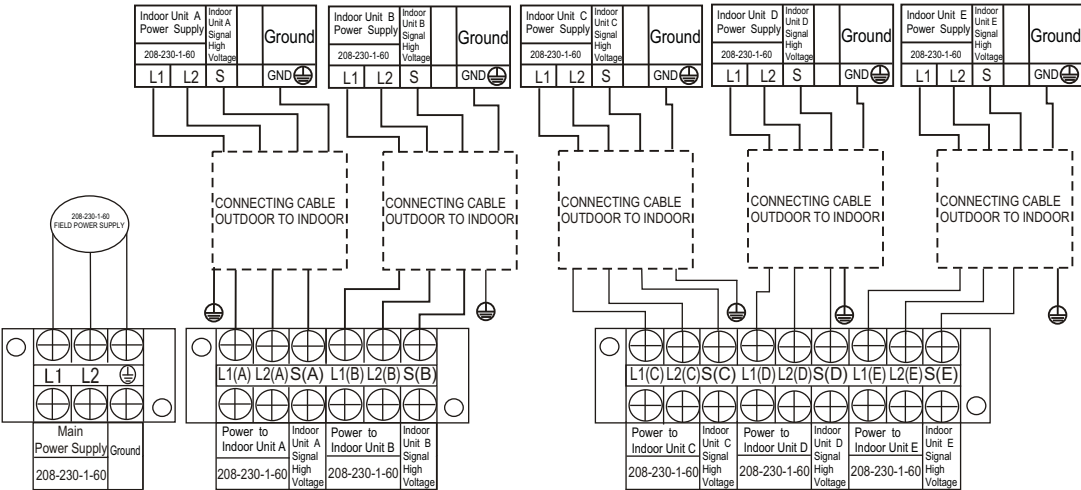


Fig. 17 – Connection Diagram Size 48K 5 Zone

## DRAIN CONNECTIONS

Install drains must meet local sanitation codes.

### Install the outdoor unit drain joint

Fit the seal into the drain joint, then insert the drain joint into the base pan hole of the outdoor unit. Rotate 90° to securely assemble them. Connect the drain joint with an extension drain hose to avoid condensate from draining off the outdoor unit during the heating mode.

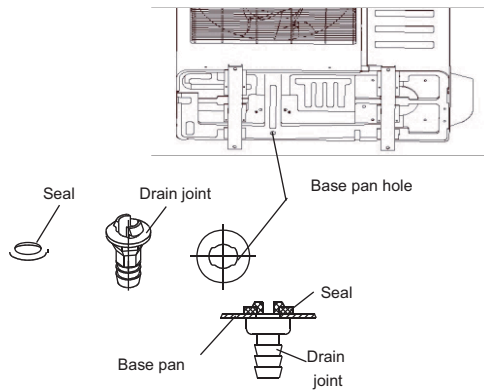


Fig. 18 — Drain Joint

Images are for illustration purposes only.

## 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 following procedure is followed. Always break a vacuum with dry nitrogen.

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

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. 19).
2. Connect the charge hose to the vacuum pump.
3. Open (fully) the low side of the manifold gage (see Fig. 20).
4. Start the vacuum pump.
5. Evacuate using either the deep vacuum or the triple evacuation method.
6. After the evacuation is complete, fully close the low side of manifold gage and stop the vacuum pump operation.
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 the charge connection of the low side service valve.
9. Securely tighten the service valves caps.

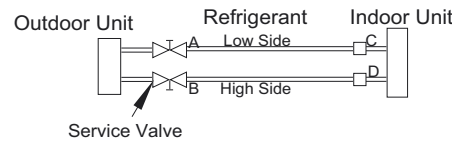


Fig. 19 — Service Valve

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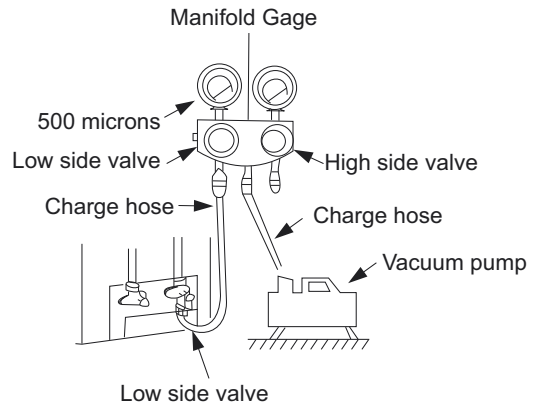


Fig. 20 — Manifold

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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. 21).

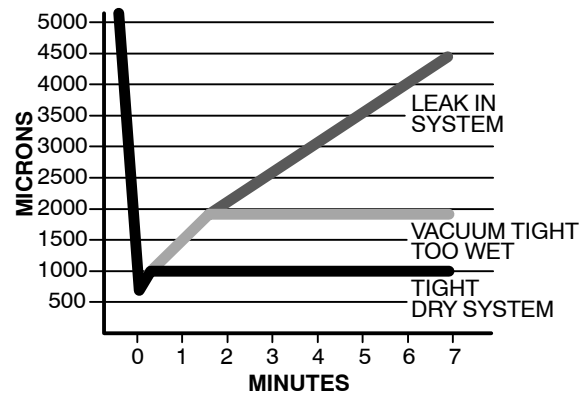


Fig. 21 — Deep Vacuum Graph

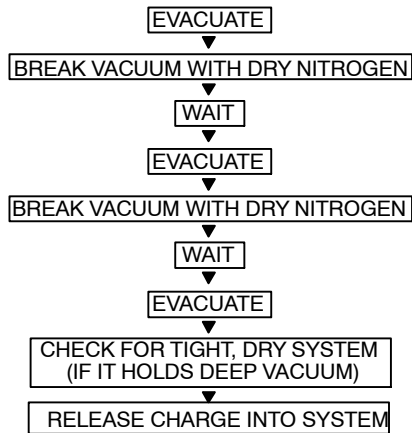
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### **Triple Evacuation Method**

The triple evacuation method should only be used when the 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. 22 and proceed as follows:

1. Pump the system down to 28 in. of mercury and allow the pump to continue operating for an additional 15 minutes.
2. Close the service valves and shut off the vacuum pump.
3. Connect a nitrogen cylinder and regulator to the system and open until the system pressure is 2 psig.
4. Close the service valve and allow the system to stand for 1 hr. During this time, the dry nitrogen can diffuse throughout the system absorbing moisture.
5. Repeat this procedure as indicated in Fig. 22. The system will then be free of any contaminants and water vapor.



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**Fig. 22 — Triple Evacuation Method**

### **Final Tubing Check**

**IMPORTANT:** Ensure the factory tubing on both the 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 the feeder tubes are secure and tight.

## **START-UP**

### **Test Operation**

Perform a test operation after completing a gas leak and electrical safety check. See the indoor unit installation instructions and owner's manual for additional start up information.

### **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 the tubes to the outside wall, when possible.
5. Seal the hole through which the cables and tubing pass.

### **OUTDOOR UNIT**

1. Are there unusual noises or vibrations during operation?

**Explain the Following Items to the Customer (with the aid of the Owner's Manual):**

2. Explain care and maintenance.
3. Present the installation instructions to the customer.



## OUTDOOR UNIT DIAGNOSTIC GUIDES

For ease of service, the systems are equipped with a diagnostic code display LED on both the indoor and outdoor units. The outdoor diagnostic is displayed on the outdoor unit microprocessor board. There may be a few error codes displayed in the indoor unit that might relate to the outdoor unit's problems. If possible, always check the diagnostic codes displayed on the indoor unit first.

In standby, the LED displays “— —”.

In the compressor operation, the LED displays the running frequency.

In the defrosting mode, the LED displays “dF” or alternative displays between the running frequency and “dF” (each appears for 0.5s).

During the compressor pre-heating cycle, the LED displays “PH” or alternative displays between the running frequency and “PH”(each appears for 0.5s).

During the oil return process, the LED displays “RO” or alternative displays between the running frequency and “RO”(each appears for 0.5s).

In the low ambient cooling mode, the LED displays “LC” or alternative displays between the running frequency and “LC” (each appears for 0.5s).

In the forced cooling mode, the LED displays “FC” or alternative displays between the running frequency and “FC” (each appears for 0.5s).

When PFC module protection occurs three times within 15 minutes, the LED displays “E6” or alternative displays between the running frequency and “E6” (each appears for 0.5s).

In protection or malfunction, the LED displays an error code or a protection code.

The diagnostic codes displayed on the outdoor units are listed on Table 11.

**Table 11—Outdoor Unit Error Display**

OUTDOOR UNIT DISPLAY	LED STATUS	INDOOR UNIT DISPLAY
E0	Outdoor EEPROM malfunction	F4
E2	Communication malfunction between indoor and outdoor units	E1
E3	Communication malfunction between IPM board and outdoor main board	— —
E4	Open or short circuit of outdoor temperature sensor (T3、T4、T5、T2B)	F2/F1/F3/F6
E5	Voltage protection	P1
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
P1	High pressure protection	P2
P2	Low pressure protection	P2
P3	Current protection of compressor	F0
P4	Temperature protection of compressor discharge	— —
P5	High temperature protection of condenser	— —
P6	IPM module protection	P0

