



# MULTI F

# MULTI F MAX

## STANDARD WALL-MOUNTED INDOOR UNIT INSTALLATION MANUAL



### **Models:**

LMN079HVT	7 kBtu
LSN090HSV5	9 kBtu
LSN120HSV5	12 kBtu
LMN159HVT	15 kBtu
LSN180HSV5	18 kBtu
LMN249HVT	24 kBtu

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## Do not throw away, destroy, or lose this manual.

Please read carefully and store in a safe place for future reference.

Content familiarity required for proper installation.

The instructions included in this manual must be followed to prevent product malfunction, property damage, injury, or death to the user or other people. Incorrect operation due to ignoring any instructions will cause harm or damage. The level of seriousness is classified by the symbols described below.

A summary list of safety precautions begins on page 3.

IM\_MultiF\_StdWallMount\_HVT\_HSV5\_11\_18

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## TABLE OF SYMBOLS

 <b>DANGER</b>	This symbol indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 <b>WARNING</b>	This symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	This symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
<b>Note:</b>	This symbol indicates situations that may result in equipment or property damage accidents only.
	This symbol indicates an action must not be completed.

## INSTALLATION

### **DANGER**

 **Don't store or use flammable gas / combustibles near the unit.**

*There is risk of fire, explosion, and physical injury or death.*


### **WARNING**

 **Do not install or remove the unit by yourself (end-user). Ask the dealer or an LG trained technician to install the unit.**

*Improper installation by the user will result in water leakage, fire, explosion, electric shock, physical injury or death.*

**For replacement of an installed unit, always contact an LG trained service provider.**

*There is risk of fire, electric shock, explosion, and physical injury or death.*

**The outdoor unit is shipped with refrigerant and the service valves closed.  Do not open service valves on the unit until all non-condensibles have been removed from the piping system and authorization has been obtained from the commissioning agent.**

*There is a risk of physical injury or death.*

 **Do not run the compressor with the service valves closed.**

*There is risk of explosion, physical injury, or death.*

**Periodically check that the outdoor unit is not damaged.**

*There is risk of explosion, physical injury, or death.*


**Replace all control box and panel covers.**

*If cover panels are not installed securely, dust, water and animals will enter the unit, causing fire, electric shock, and physical injury or death.*

**Wear protective gloves when handling equipment. Sharp edges will cause personal injury.**

**Always check for system refrigerant leaks after the unit has been installed or serviced.**



*Exposure to high concentration levels of refrigerant gas will lead to illness or death.*

 **Do not install the unit using defective hanging, attaching, or mounting hardware.**

*There is risk of physical injury or death.*

**Dispose the packing materials safely.**

- Packing materials, such as nails and other metal or wooden parts will cause puncture wounds or other injuries.
- Tear apart and throw away plastic packaging bags so that children will not play with them and risk suffocation and death.

 **Do not install the unit in any location exposed to open flame or extreme heat.  Do not touch the unit with wet hands.**

*There is risk of fire, electric shock, explosion, and physical injury or death*

**Install the unit considering the potential for strong winds or earthquakes.**

*Improper installation will cause the unit to fall, resulting in physical injury or death.*

 **Do not change the settings of the protection devices.**

*If the pressure switch, thermal switch, or other protection device is shorted and forced to operate improperly, or parts other than those specified by LG are used, there is risk of fire, electric shock, explosion, and physical injury or death.*

## INSTALLATION - CONTINUED

### ⚠ WARNING

**If the air conditioner is installed in a small space, take measures to prevent the refrigerant concentration from exceeding safety limits in the event of a refrigerant leak.**

*Consult the latest edition of ASHRAE (American Society of Heating, Refrigerating, and Air Conditioning Engineers) Standard 15. If the refrigerant leaks and safety limits are exceeded, it could result in personal injuries or death from oxygen depletion.*

**Properly insulate all cold surfaces to prevent “sweating.”**

*Cold surfaces such as un-insulated piping can generate condensate that could drip, causing a slippery surface that creates a risk of slipping, falling, and personal injury.*

### ⚠ CAUTION

**Be very careful when transporting the product. Failure to follow these directions will result in minor or moderate physical injury.**

- ⓧ Do not attempt to carry the product without assistance.
- Some products use polypropylene bands for packaging. ⓧ Do not use polypropylene bands to lift the unit.
- Suspend the unit from the base at specified positions.
- Support the unit a minimum of four points to avoid slippage from rigging apparatus.

### Note:

**Properly insulate all cold surfaces to prevent “sweating.”**

*Cold surfaces such as un-insulated piping can generate condensate that will drip and cause a slippery surface condition and/or water damage to walls.*

**When installing the unit in a hospital, mechanical room, or similar electromagnetic field (EMF) sensitive environment, provide sufficient protection against electrical noise.**

*Inverter equipment, power generators, high-frequency medical equipment, or radio communication equipment will cause the air conditioner to operate improperly. The unit will also affect such equipment by creating electrical noise that disturbs medical treatment or image broadcasting.*

ⓧ **Do not use the product for special purposes such as preserving foods, works of art, wine coolers, or other precision air conditioning applications. This equipment is designed to provide comfort cooling and heating.**

*There is risk of property damage.*

ⓧ **Do not make refrigerant substitutions. Use R410A only.**

*If a different refrigerant is used, or air mixes with original refrigerant, the unit will malfunction and become damaged.*

ⓧ **Do not install the unit in a noise sensitive area.**

**When connecting refrigerant tubing, remember to allow for pipe expansion.**

*Improper piping will cause refrigerant leaks and system malfunction.*

ⓧ **Don't store or use flammable gas / combustibles near the unit.**

*There is risk of product failure.*

**Take appropriate actions at the end of HVAC equipment life to recover, recycle, reclaim or destroy R410A refrigerant according to applicable U.S. Environmental Protection Agency (EPA) rules.**

**Periodically check that the outdoor unit is not damaged.**

*There is a risk of equipment damage.*

**Install the unit in a safe location where no one can step on or fall onto it. ⓧ Do not install the unit with defective hanging, attaching, or mounting hardware.**

*There is risk of unit and property damage.*

**Install the drain hose to ensure adequate drainage.**

*There is a risk of water leakage and property damage.*

**Always check for system refrigerant leaks after the unit has been installed or serviced.**

*Low refrigerant levels will cause product failure.*

**The unit is shipped with refrigerant and the service valves closed. ⓧ Do not open service valves on the unit until all non-condensibles have been removed from the piping system and authorization to do so has been obtained from the commissioning agent.**

*There is a risk of refrigerant contamination, refrigerant loss and equipment damage.*

ⓧ **Do not run the compressor with the service valves closed.**

*There is a risk of equipment damage.*

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## WIRING

### ⚠ DANGER

High voltage electricity is required to operate this system. Adhere to the National Electrical Codes and these instructions when wiring.

*Improper connections and inadequate grounding can cause accidental injury or death.*

**Always ground the unit following local, state, and National Electrical Codes.**

---

### ⚠ WARNING

The information contained in this manual is intended for use by an industry-qualified, experienced, certified electrician familiar with the U.S. National Electric Code (NEC) who is equipped with the proper tools and test instruments.

*Failure to carefully read and follow all instructions in this manual can result in personal injury or death.*

**All electric work must be performed by a licensed electrician and conform to local building codes or, in the absence of local codes, with the National Electrical Code, and the instructions given in this manual.**

*If the power source capacity is inadequate or the electric work is not performed properly, it will result in fire, electric shock, physical injury or death.*

**Properly tighten all power connections.**

*Loose wiring will overheat at connection points, causing a fire, physical injury or death.*

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### Note:

⊘ Do not cut, lengthen or shorten the communications and power cable between any dry contact unit and its connected indoor unit. ⊘ Do not install the unit in a location where the communications and power cable cannot be safely and easily connected between the two units. ⊘ Do not allow strain on this cable.

*Poor cable connections can cause equipment malfunction.*

**Turn the power off at the nearest disconnect before servicing the equipment.**

*Electric shock can cause physical injury or death.*

**Properly size all circuit breakers or fuses.**

*There is risk of fire, electric shock, explosion, physical injury or death.*

**Ensure the unit is connected to a dedicated power source that provides adequate power.**

*If the power source capacity is inadequate or the electric work is not performed properly, it will result in fire, electric shock, physical injury or death.*

**Refer to local, state, and federal codes, and use power wires of sufficient current capacity and rating.**

*Wires that are too small will generate heat and cause a fire.*

**Secure all field wiring connections with appropriate wire strain relief.**

*Improperly securing wires will create undue stress on equipment power lugs. Inadequate connections will generate heat, cause a fire and physical injury or death.*

The information contained in this manual is intended for use by an industry-qualified, experienced, certified electrician familiar with the U.S. National Electric Code (NEC) who is equipped with the proper tools and test instruments.

*Failure to carefully read and follow all instructions in this manual can result in equipment malfunction and property damage.*

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## OPERATION

### ⚠ DANGER

- ⊘ Do not provide power to or operate the unit if it is flooded or submerged.

*There is risk of fire, electric shock, physical injury or death.*

**Use a dedicated power source for this product.**

*There is risk of fire, electric shock, physical injury or death.*

- ⊘ Do not operate the disconnect switch with wet hands.

*There is risk of fire, electric shock, physical injury or death.*

---

### ⚠ WARNING

- ⊘ Do not allow water, dirt, or animals to enter the unit.

*There is risk of unit failure, fire, electric shock, physical injury or death.*

- ⊘ Avoid excessive cooling and periodically perform ventilation to the unit.

*Inadequate ventilation is a health hazard.*

- ⊘ Do not touch refrigerant piping during or after operation.

*It can cause burns or frostbite.*

- ⊘ Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts.

*The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.*

**Periodically verify the equipment mounts have not deteriorated.**

*If the base collapses, the unit could fall and cause physical injury or death.*

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### ⚠ CAUTION

- ⊘ To avoid physical injury, use caution when cleaning or servicing the air conditioner.

### Note:

**Clean up the site after installation is finished, and check that no metal scraps, screws, or bits of wiring have been left inside or surrounding the unit.**

- ⊘ Do not use this equipment in mission critical or special-purpose applications such as preserving foods, works of art, wine coolers or refrigeration. This equipment is designed to provide comfort cooling and heating.

**Provide power to the compressor crankcase heaters at least six (6) hours before operation begins.**

*Starting operation with a cold compressor sump(s) will result in severe bearing damage to the compressor(s). Keep the power switch on during the operational season.*

**Periodically verify that the hardware securing the unit has not deteriorated.**

*If the unit falls from its installed location, it can cause property damage, product failure, physical injury or death.*

**If refrigerant gas leaks out, ventilate the area before operating the unit.**

*If the unit is mounted in an enclosed, low-lying, or poorly ventilated area and the system develops a refrigerant leak, it will cause fire, electric shock, explosion, physical injury or death.*

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**Periodically check power cable and connection for damage.**

*Cable must be replaced by the manufacturer, its service agent, or similar qualified persons in order to avoid physical injury and/or electric shock.*

**Securely attach the electrical cover to the unit.**

*Non-secured electrical covers can result in burns or electric shock due to dust or water in the service panel.*

- ⊘ Do not open the inlet grille of the unit during operation.
- ⊘ Do not operate the unit with the panels or guards removed.
- ⊘ Do not insert hands or other objects through the inlet or outlet when the unit is powered.
- ⊘ Do not touch the electrostatic filter, if the unit includes one.

*The unit contains sharp, rotating, hot, and high voltage parts that can cause personal injury and/or electric shock.*

**Ensure no power is connected to the unit other than as directed in this manual. Remove power from the unit before removing or servicing the unit.**

*There is risk of unit failure, fire, electric shock, physical injury or death.*

- 
- ⊘ Do not block the inlet or outlet.

*Unit will malfunction.*

**Securely attach the electrical cover to the indoor unit.**

*Non-secured covers can result in fire due to dust or water in the service panel.*

**Periodically verify the equipment mounts have not deteriorated.**

*If the base collapses, the unit could fall and cause property damage or product failure.*

- ⊘ Do not allow water, dirt, or animals to enter the unit.

*There is risk of unit failure.*

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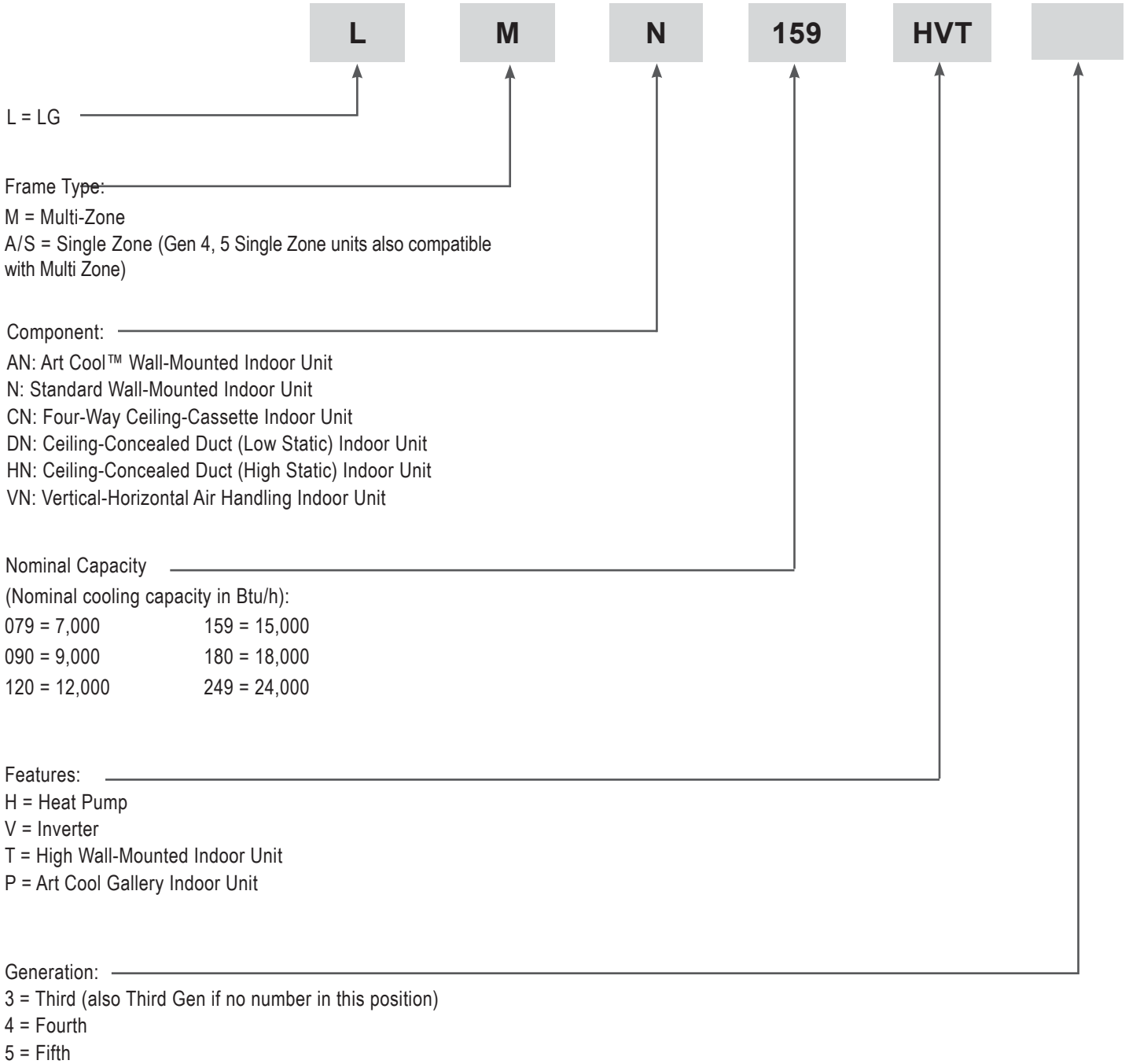


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## Multi F Multi-Zone Systems — Indoor Units

Multi F Standard Wall-Mounted Indoor Unit




- Voltage for all equipment is 208-230V, 60 Hz, 1-phase.
- All indoor units are compatible with wired controllers



## Multi F and Multi F MAX Standard Wall-Mounted Units

This manual describes how to install the LG Multi F and Multi F MAX (Multi Zone) Standard Wall-Mounted Indoor Units (IDU) for Multi F heat pump systems. The table on the next page lists the available models. Refer to LG's Multi F Indoor Unit Engineering Manual for complete detailed engineering data and selection procedures.

### Safety

Safety of personnel is the primary concern during all procedures. Read and understand the safety summary at the front of this manual. Read and understand this installation procedure before beginning installation. Use the appropriate tools and accessories during installation. Plan the work and  do not work alone, if possible. Know how to obtain emergency medical and fire fighting assistance.

### Installation Personnel

This equipment is intended for installation by personnel trained in the required construction, mechanical, electrical, and/or other disciplines.

### WARNING

*Installation work must be performed by trained personnel and in accordance with national wiring standards and all local or other applicable codes. Improper installation can result in fire, electric shock, physical injury, or death.*

### Note:

*Please read all instructions before installing this product. Become familiar with the unit's components and connections, and the order of installation. Incorrect installation can degrade or prevent proper operation.*

## Required Tools (field provided)

- |                             |                    |                     |
|-----------------------------|--------------------|---------------------|
| • Level                     | • Drill            | • Allen wrench      |
| • Screwdriver               | • Flaring tool set | • Gas-leak detector |
| • Electrical lineman pliers | • Tubing cutter    | • Thermometer       |
| • Electric drill            | • Tube/pipe reamer |                     |
| • Hole saw                  | • Torque wrenches  |                     |

## Required Parts (field provided)

- |   |                         |
|---|-------------------------|
| • Connecting cable (power and control)                | • Insulated drain hose  |
| • Pipes - vapor line and liquid line, with insulation | • Additional drain hose |

Figure 1: Multi F Standard Wall-Mounted HVT Indoor Unit.



Figure 2: Multi F Standard Wall-Mounted HSV5 Indoor Unit.



## Included Parts

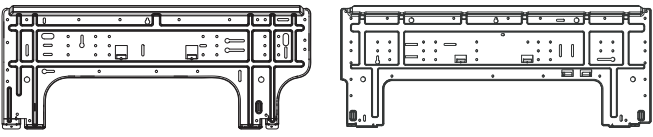
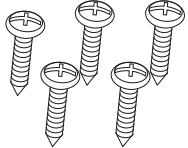
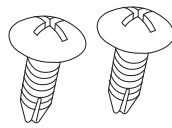

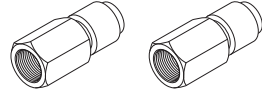


Part	Quantity	Image
Installation Plate	One (1)	 7,000 ~ 15,000 Btu/h Indoor Units    18,000 and 24,000 Btu/h Indoor Units
Type "A" Screws	Five (5)	
Type "B", "C", and "D" Screws (Example image; appearances will vary)	Two (2) Each Type	
Wireless Controller with Holder AKB74955602	One (1)	
Connectors (For use with Multi F Systems)	One (1) Each for $\text{Ø}3/8$ inch $\rightarrow$ $\text{Ø} 1/2$ inch One (1) Each for $\text{Ø}5/8$ inch $\rightarrow$ $\text{Ø} 1/2$ inch One (1) Each for $\text{Ø}1/4$ inch $\rightarrow$ $\text{Ø} 3/8$ inch (All three connectors listed above are included with the 18,000 Btu/h indoor unit; the $\text{Ø}3/8$ inch $\rightarrow$ $\text{Ø} 1/2$ is the only one required for the 24,000 Btu/h indoor unit.)	

Table 1: Multi F Standard Wall-Mounted Indoor Units.

Unit	Model Number	Nominal Capacity	
		Cooling (Btu)	Heating (Btu)
	LMN079HVT	7,000	8,100
	LMN159HVT	14,300	15,600
	LMN249HVT	24,000	25,600
	LSN090HSV5	9,000	10,900
	LSN120HSV5	12,000	13,600
	LSN180HSV5	18,000	21,600

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## R410A Refrigerant



R410A refrigerant has a higher operating pressure in comparison to R22 refrigerant. All piping system materials installed must have a higher resisting pressure than the materials traditionally used in R22 systems.

R410A refrigerant is an azeotrope of R32 and R125, mixed at 50:50. The ozone depletion potential (ODP) is 0.

### **⚠ WARNING**

-  Do not place refrigerant cylinder in direct sunlight. Refrigerant cylinder will explode causing severe injury or death.

### **Note**

- Because R410A is a combination of R32 and R125, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in its gaseous state, its composition changes and the system will not work properly.
-  Do not heat piping more than necessary during installation. Piping will become soft and fail when pressurized.
-  Do not use any piping that has not been approved for use in high-pressure refrigerant systems. Piping wall thickness must comply with the applicable local, state, and federal codes for the 551 psi design pressure of R410A. Inadequate piping will fail when pressurized.

# GENERAL DATA

## Specifications

# MULTI F MULTI F MAX

Table 2: Multi F Multi Zone Standard Wall-Mounted Indoor Unit Specifications.

Model Name	LMN079HVT	LSN090HSV5	LSN120HSV5	LMN159HVT	LSN180HSV5	LMN249HVT
Nominal Cooling Capacity (Btu/h) <sup>1</sup>	7,000	9,000	12,000	14,300	18,000	24,000
Nominal Heating Capacity (Btu/h) <sup>1</sup>	8,100	10,900	13,600	15,600	21,600	25,600
<b>Operating Range</b>						
Cooling (°F WB)	57-77					
Heating (°F DB)	59-81					
<b>Fan</b>						
Type	Cross Flow					
Motor Output (W) x Qty.	30 x 1			60 x 1		
Motor/Drive	Brushless Digitally Controlled / Direct					
Airflow Rate CFM (H/M/L)	254 / 204 / 148	268 / 218 / 169	282 / 233 / 177	314 / 268 / 184	558 / 438 / 353	597 / 452 / 367
<b>Unit Data</b>						
Refrigerant Type <sup>2</sup>	R410A					
Refrigerant Control	Electronic Expansion Valve (EEV)					
Power Supply V, Ø, Hz <sup>3</sup>	208-230, 1, 60					
Rated Amps (A)	0.4					
Sound Pressure Level ±3 dB(A) (H/M/L) <sup>4</sup>	35 / 31 / 26	36 / 32 / 27	38 / 34 / 29	42 / 38 / 32	44 / 38 / 34	46 / 41 / 36
Dimensions (W x H x D, in.)	32-15/16 x 12-1/8 x 7-7/16				39-9/32 x 13-19/32 x 8-9/32	
Net Unit Weight (lbs.)	18.3			25.6		
Shipping Weight (lbs.)	23.4			32.2		
Power Wiring / Communications Cable (No. x AWG) <sup>5</sup>	4 x 18					
Heat Exchanger (Row x Column x Fin / inch) x Number	(2 x 23 x 22) x 1				(2 x 16 x 20) x 1	
<b>Pipe Size</b>						
Liquid (in.)	1/4					
Vapor (in.)	3/8			1/2		
<b>Connection Size</b>						
Liquid (in.)	1/4			3/8		1/4
Vapor (in.)	3/8			5/8		1/2
Drain O.D. / I.D. (in.)	27/32, 5/8					

<sup>1</sup>Nominal capacity is rated 0 ft. above sea level with corresponding refrigerant piping length in accordance with standard length of each outdoor unit and a 0 ft. level difference between outdoor and indoor units. All capacities are net with a combination ratio between 95 – 105%.

Nominal cooling capacity rating obtained with air entering the indoor unit at 80°F dry bulb (DB) and 67°F wet bulb (WB) and outdoor ambient conditions of 95°F dry bulb (DB) and 75°F wet bulb (WB).

Nominal heating capacity rating obtained with air entering the indoor unit at 70°F dry bulb (DB) and 60°F wet bulb (WB) and outdoor ambient conditions of 47°F dry bulb (DB) and 43°F wet bulb (WB).

<sup>2</sup>This unit comes with a dry helium charge.

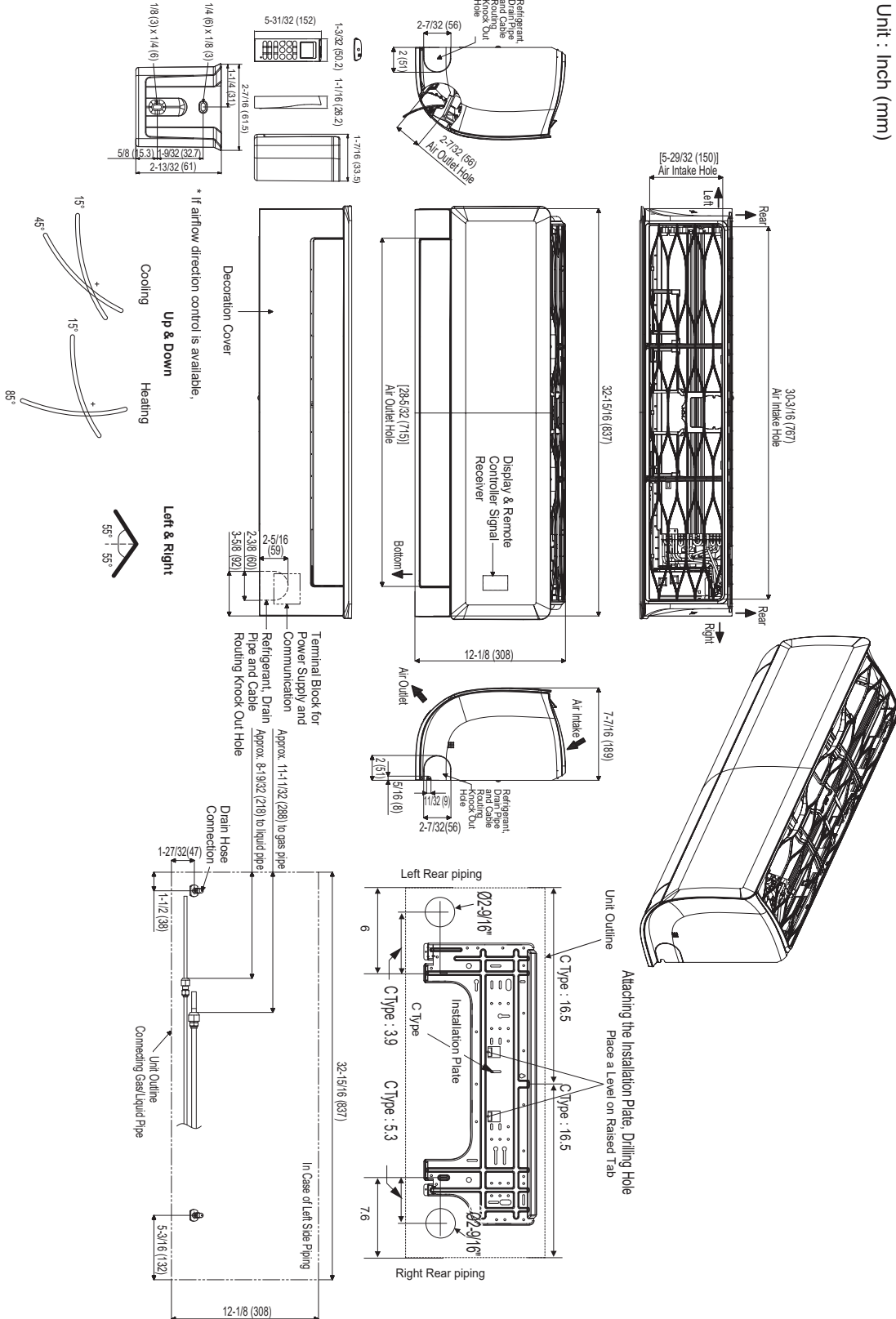
<sup>3</sup>Acceptable operating voltage: 187V-253V.

<sup>4</sup>Sound pressure levels are tested in an anechoic chamber under ISO Standard 3745 and are the same in both cooling and heating mode. These values can increase due to ambient conditions during operation.

<sup>5</sup>All power wiring / communications cable to the IDUs be minimum 18 AWG, 4-conductor, stranded, shielded or unshielded (if shielded, must be grounded to chassis at ODU only) and must comply with applicable local and national codes.

Figure 3: LMN079HVT, LSN090HSV5, LSN120HSV5, and LMN159HVT Dimensions.

Unit : Inch (mm)



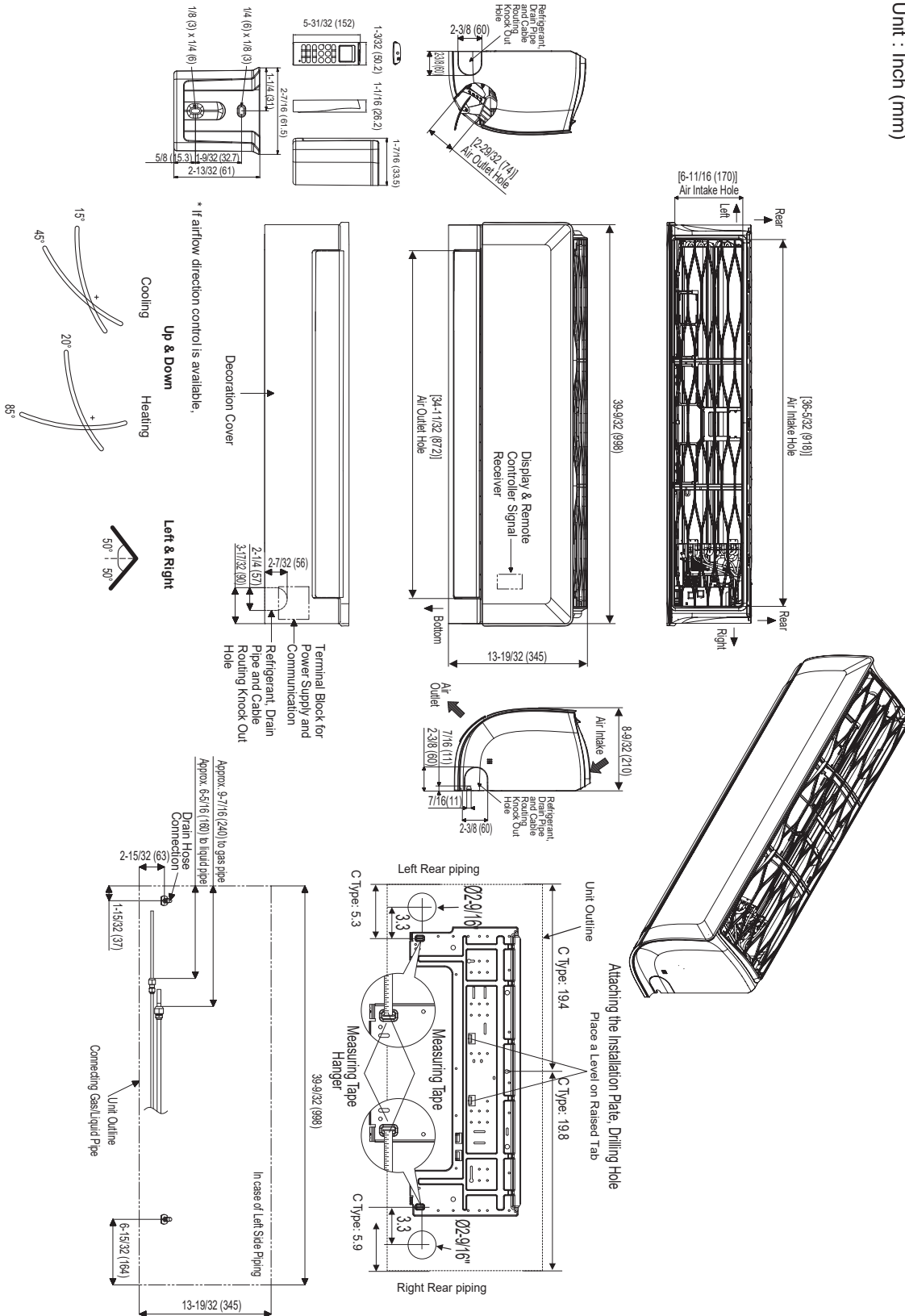
# GENERAL DATA

## Dimensions

# MULTI F MULTI F MAX

Figure 4: LSN180HSV5 and LMN249HVT Dimensions.

Unit : Inch (mm)



Multi F Standard Wall-Mounted Indoor Unit

Figure 5: Multi F Standard Wall-Mounted Indoor Unit Refrigerant Flow Diagram (9HVT and HSV5).

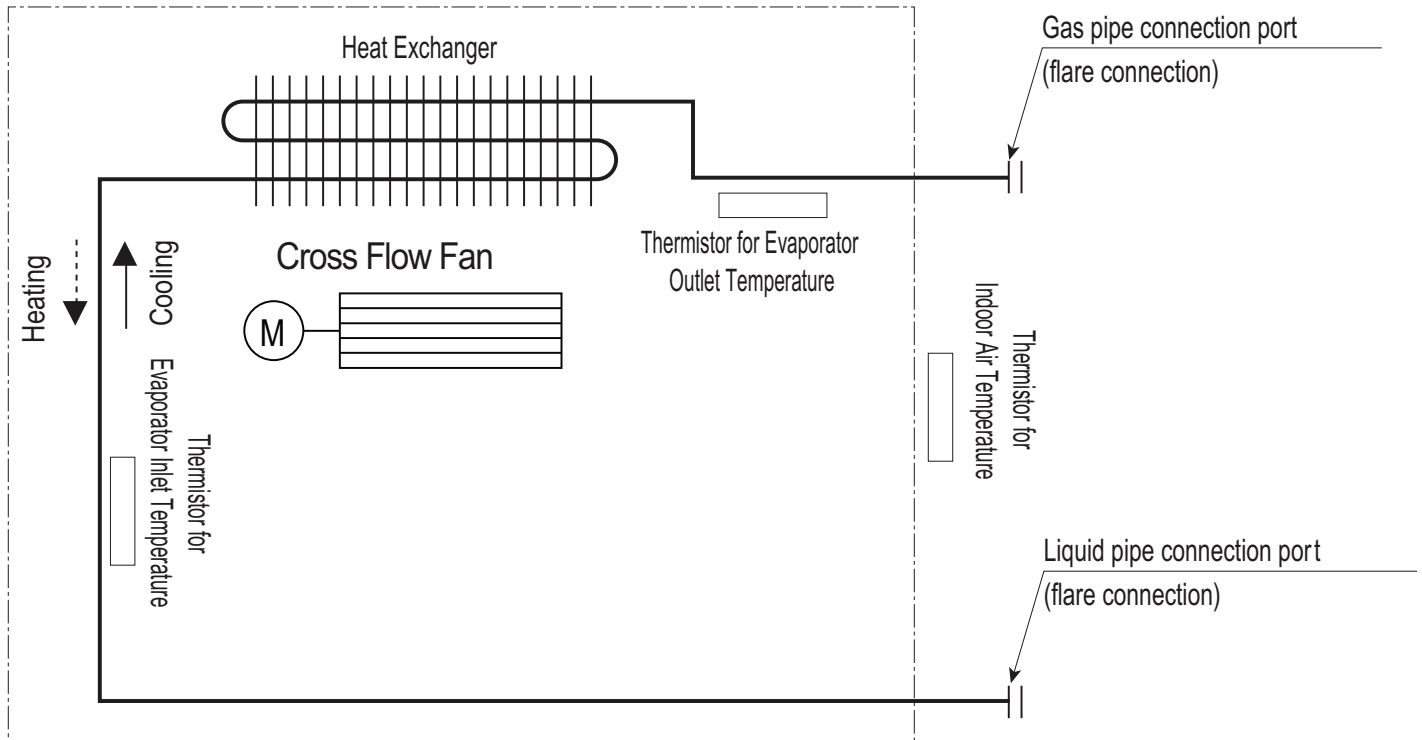


Table 3: Multi F Standard Wall-Mounted Indoor Unit Refrigerant Pipe Sizes.

Model No.	Vapor (inch)	Liquid (inch)
LMN079HVT	Ø3/8	Ø1/4
LSN090HSV5		
LSN120HSV5		
LMN159HVT		
LSN180HSV5	Ø1/2	
LMN249HVT		

Table 4: Multi F Standard Wall-Mounted Indoor Unit Refrigerant Pipe Connections.

Model No.	Vapor (inch)	Liquid (inch)
LMN079HVT	Ø3/8	Ø1/4
LSN090HSV5		
LSN120HSV5		
LMN159HVT		
LSN180HSV5	Ø5/8	Ø3/8
LMN249HVT	Ø1/2	Ø1/4

Table 5: Multi F LSNxxxHSV5 Standard Wall-Mounted Indoor Unit Thermistor Details.

Description	PCB Connector
Indoor Air Temperature Thermistor	CN-TH1
Evaporator Inlet Temperature Thermistor	
Evaporator Middle Temperature Thermistor	CN-TH2
Evaporator Outlet Temperature Thermistor	
Water Level Sensor (Optional)	CN-TH3

Table 6: Multi F LMNxxxHVT Standard Wall-Mounted Indoor Unit Thermistor Details.

Description	PCB Connector
Indoor Air Temperature Thermistor	CN-TH1
Evaporator Inlet Temperature Thermistor	
Evaporator Outlet Temperature Thermistor	CN-TH2
Water Level Sensor (Optional)	CN-TH3

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## Unpack and Inspect for Freight Damage

### ⚠ CAUTION

Shipping and net weights of the wall-mounted units are listed in the specifications table. To help avoid injury to personnel and damage to the unit, use two people when carrying a unit by hand.

### Note:

- Shipping and net weights of the ceiling cassette units are listed in the specification tables in the beginning of this manual. To help avoid damage to the unit, use at least two people when carrying a unit by hand.
- Before opening the shipping container, check the container labeling to verify the unit received is the correct unit. Verify the unit capacity, type, and voltage. Refer to the "Unit Nomenclature" chart in the beginning of this manual.
- After opening, if the unit is damaged, repack the unit as it was shipped to you. **RETAIN ALL PACKING MATERIALS.** In general, freight damage claims will be denied if the original packing materials are not retained for the claims adjustor to inspect. Contact your supervisor on how to proceed with filing a freight claim and to order a replacement unit.
- To avoid damaging the indoor unit, Ⓞ do not unpack the unit and remove the protective materials until it is ready to install. Before unpacking, carefully move the packaged unit to a work area near the installation location.

1. Before opening the shipping container, verify that the correct unit is present as described in the Note above.
2. Place the box on a solid surface right side up.
3. Cut the white reinforced nylon straps.
4. Open the top of the box and fold back all four flaps.
5. Remove the protective cardboard / Styrofoam® top sheet and place to the side.
6. The walls and top panels are not attached to the bottom of the box. Lift the cardboard carton by the flaps and remove the box walls and top and place it to the side.
7. Remove the moisture barrier plastic bonnet.
8. Check the unit nameplate data and model number. Verify the unit voltage and capacities are correct before proceeding.
9. Locate and retain the included parts located in the box.
10. Using two people, carefully lift the unit and inspect for freight damage. Ⓞ DO NOT lift by the refrigerant piping or drain pipe stub. Lift by the frame only. If damage is found, repack the unit as it was received in the original container.



## Location Selection

### Note:

Follow required best practices when choosing a location for the Standard Wall-Mounted Indoor Units (IDU).

### **⚠ DANGER**

To avoid the possibility of fire, **do not install the unit in an area where combustible gas will generate, flow, stagnate, or leak. Failure to do so will cause serious bodily injury or death. Before beginning installation, read the safety summary at the beginning of this manual.**

Select a location for installing the wall-mounted indoor unit (IDU) that meets the following conditions:

- Do's**
- Ensure that the wall is solid and has enough structural strength to bear the weight of the installation plate and indoor unit.
  - Include enough space for service access.
  - Place the unit in a location where drainage can be obtained easily and to minimize the length of the condensate drain piping; include space for drainage to ensure condensate flows properly out of the unit when it is in cooling mode.
  - Place the unit in a location where air circulation will not be blocked; keep proper distances from ceilings, doorways, floor, walls, etc.
  - Place the unit in a location where operating sound from the unit will not disturb occupants--place the unit where noise prevention is taken into consideration
  - Ensure there is sufficient space from the ceiling and floor.
  - Use a level indicator to ensure the unit is installed on a level plane.
  - Use a stud finder to locate studs easily, preventing unnecessary damage to the wall.
  - Locate the indoor unit in a location where it can be easily connected to the outdoor unit / branch distribution unit.

### **⊘ Don'ts**

- **Do not install the unit where it will be subjected to direct thermal radiation from other heat sources.**
- **Do not install the unit in a location where acidic solution and spray (sulfur) are often used.**
- **Do not use the unit in environments where oil, steam, or sulfuric gas are present.**
- **Do not install additional ventilation products on the chassis of the unit.**
- **Avoid installing the unit near high-frequency generator sources.**
- **Do not install the unit near a doorway.**
- **Do not install the unit near a heat or steam source, or where considerable amounts of oil, iron powder, or flour are used. These materials will generate condensate, cause a reduction in heat exchanger efficiency, or malfunction of the condensate drain. If this is a potential problem, install a ventilation fan large enough to vent out these materials.**

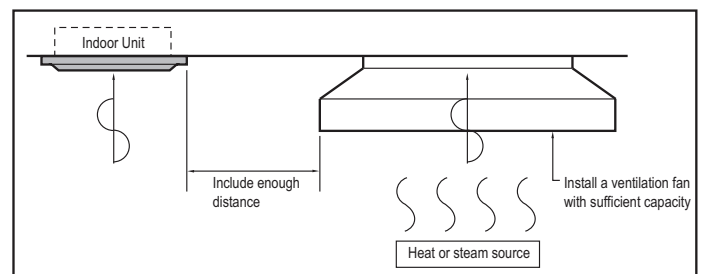
### **⚠ WARNING**

The unit must not be installed where sulfuric acid and flammable or corrosive gases are generated, vented into, or stored. There is risk of fire, explosion, and physical injury or death.

### Note:

The unit will be damaged, will malfunction, and / or will not operate as designed if installed in any of the conditions listed.

Figure 6: Installing Near a Heat or Steam Source.



# INSTALLATION

## Location Selection / Required Clearances

**MULTI F**  
**MULTI F MAX**

**Note:**

- Indoor units (IDUs) must not be placed in an environment where the IDUs will be exposed to harmful volatile organic compounds (VOCs) or in environments where there is improper air make up or supply or inadequate ventilation. If there are concerns about VOCs in the environment where the IDUs are installed, proper air make up or supply and/or adequate ventilation must be provided. Additionally, in buildings where IDUs will be exposed to VOCs, consider a third party factory-applied epoxy coating to the fan coils for each IDU where the entire coil is dipped, not sprayed.
- If the unit is installed near a body of water, the installation parts are at risk of corroding. Appropriate anti-corrosion methods must be taken for the unit and all installation parts.

**Installing in an Area Exposed to Unconditioned Air**

In some installation applications, areas (floors, walls) in some rooms will be exposed to unconditioned air (room will be above or next to an unheated garage or storeroom). To countermeasure:

- Verify that carpet is or will be installed (carpet will increase the temperature by three degrees).
- Add insulation between the floor joists.
- Install radiant heat or another type of heating system to the floor.

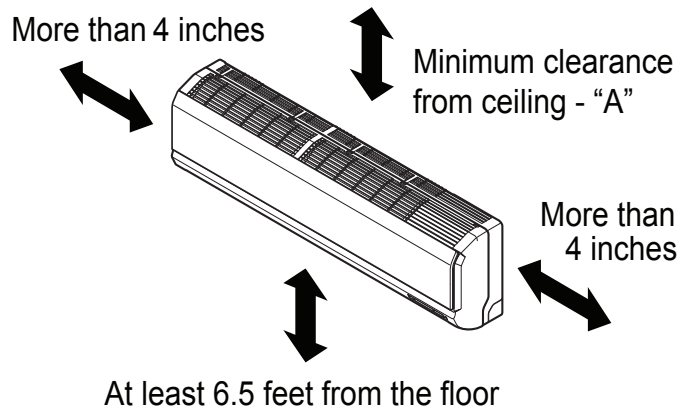
**Required Clearances**

The figure at right and table below list required clearance distances around a typical installed wall-mounted unit.

Table 7: Standard Wall Mount Indoor Unit Ceiling Clearances.

"A" Ceiling Clearance (inches)	Indoor Unit Model(s)
5	LMN079HVT, LMN159HVT, LSN090HSV5, LSN120HSV5
8	LSN180HSV5, LMN249HVT

Figure 7: Standard Wall Mount Indoor Unit Clearance Requirements.



Multi F Standard Wall-Mounted Indoor Unit

## General Guidelines — HVT and HSV5 Wall-Mounted Indoor Units

Wall-mounted indoor units have several options on how the piping and wiring can be routed (see figure at right). Whichever way the piping and wiring are routed out of the indoor units, the mounting wall on which the indoor unit is installed must be strong and solid enough to protect it from vibration.

- Mount the installation plate on the wall using the Type “A” screws. If mounting the unit on concrete, consider using anchor bolts.
- Always mount the installation plate horizontally. Measure the wall and mark the center line using thread and a level.

### ⚠ WARNING

- Mounting hardware must be securely installed to prevent the chassis falling from its installation location. There is risk of injury or property damage from falling equipment.
- When choosing a location for the wall mount plate, be sure to take into consideration routing of wiring for power outlets within the wall. Touching wiring can cause serious bodily injury or death.
- Installation work must be performed by trained personnel and in accordance with all local or other applicable codes. There is risk of injury to personnel from incorrect installation.

### Note:

- Ensure the unit is properly installed. Incorrectly installed units can result in degraded performance or an inoperative unit / system.
- Mounting hardware must be securely installed to prevent the chassis falling from its installation location. There is risk of property damage from falling equipment.
- Use a level indicator to ensure the installation plate and chassis are installed on a level plane.
- If the unit is installed near a body of water, certain components are at risk of being corroded. Appropriate anti-corrosion methods must be taken for the unit and all components.

## Drilling the Piping Hole in the Wall

Follow all piping clearance recommendations.

1. Using a 2-9/16 to 2-5/8 inch hole core drill bit (depending on indoor model type), drill a hole at either the right or left side of the wall mounting, pre-chosen following installation guidelines and application needs.
  - The slant of the hole must be 3/16” to 5/16” from level with the slant being upward on the indoor unit side and downward on the outdoor unit side.
2. Finish off the newly drilled hole as shown with bushing and sleeve covering to prevent damage to the insulation and piping.

Figure 8: Choice of Piping / Wiring Routes.

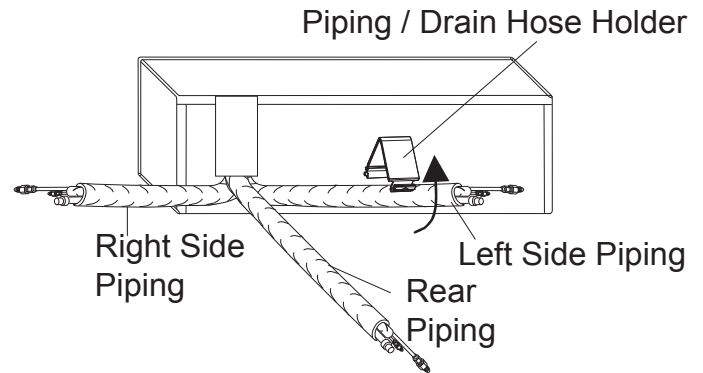
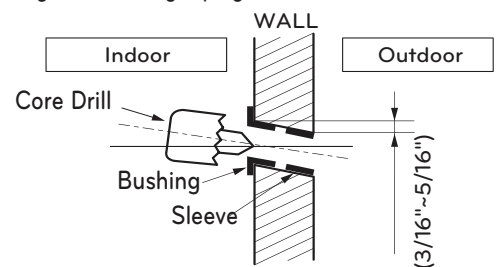


Figure 9: Drilling Piping Hole.



# INSTALLATION

## Preparing for Installation

# MULTI F MULTI F MAX

### Mounting the Installation Plate to the Wall

#### ⚠ WARNING

- Mounting hardware must be securely installed to prevent the frame falling from its installation location. There is risk of personnel injury from falling equipment.
- When choosing a location for the wall mount plate, take into consideration routing of wiring for power outlets within the wall. Contacting wiring can cause serious bodily injury or death.
- Use caution when drilling holes through the walls for the purposes of piping connections. Power wiring can cause serious bodily injury or death.
- Installation work must be performed by trained personnel and in accordance with all local or other applicable codes. There is risk of injury to personnel from incorrect installation.

#### Note:

- Mounting hardware must be securely installed to prevent the frame falling from its installation location. There is risk of property damage from falling equipment.
- Select the location carefully. Unit must be anchored to a strong and solid wall to prevent unnecessary vibration, and to securely hold the installation place and the weight of the frame.
- Ensure the unit is properly installed. Incorrectly installed units can result in degraded performance or an inoperative unit/system.
- Use a level indicator to ensure the installation plate and chassis are installed on a level plane.
- If the unit is installed near a body of water, certain components are at risk of being corroded. Appropriate anti-corrosion methods must be taken for the unit and all components.

Follow the procedure below and general best practices when mounting the indoor unit's installation plate to a wall.

1. The wall mounted indoor unit is shipped with the installation plate attached to its back. To remove, unscrew the one (1) screw that holds the installation plate to the back of the indoor unit. See the installation plate diagrams below.
2. Always mount the installation plate horizontally. Align the centerline using a leveling tool. Measure the wall and mark the centerline.
3. Attach the installation plate to the wall following the measurements and marks. Mount the installation plate on the wall using the factory-supplied Type "A" screws. If mounting the unit on a concrete wall, use field-supplied anchor bolts. Use a level to ensure the plate is level.
4. Observe all rear piping clearances when drilling into the wall.

Figure 12: Installation Plate for LMN079HVT, LMN159HVT, and LSN090-120HSV5 Indoor Units.

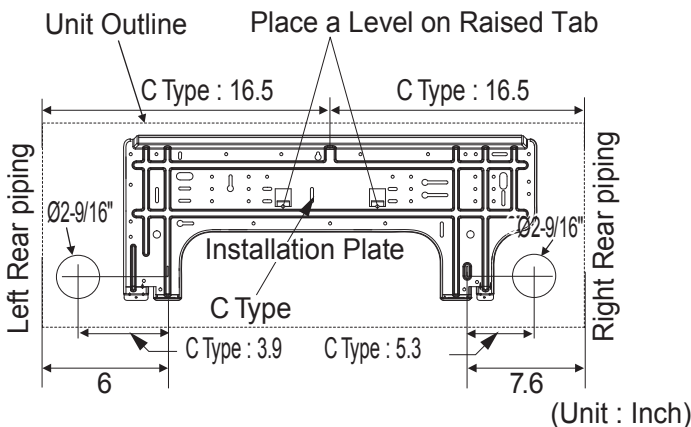


Figure 10: General Wall Mount Indoor Unit Installation Plate—Side View (Example Only. Appearances Will Vary Depending on Model).

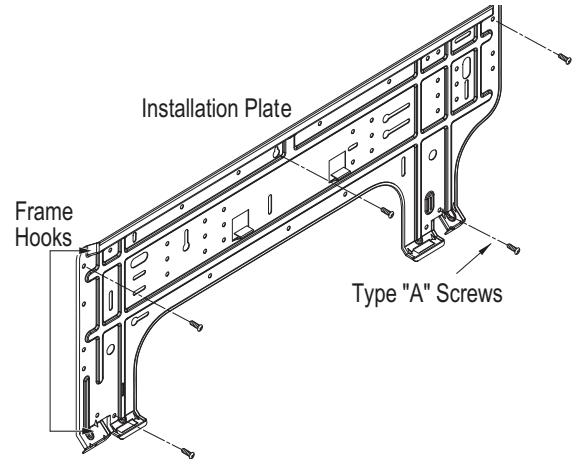


Figure 11: Installation Plate Attaching Screw Placement (Example Only. Appearances and Placement Will Vary Depending on Model).

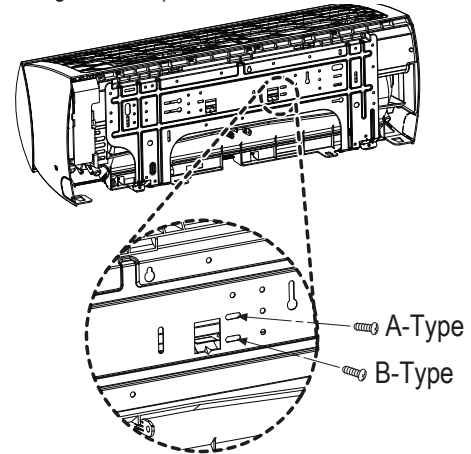
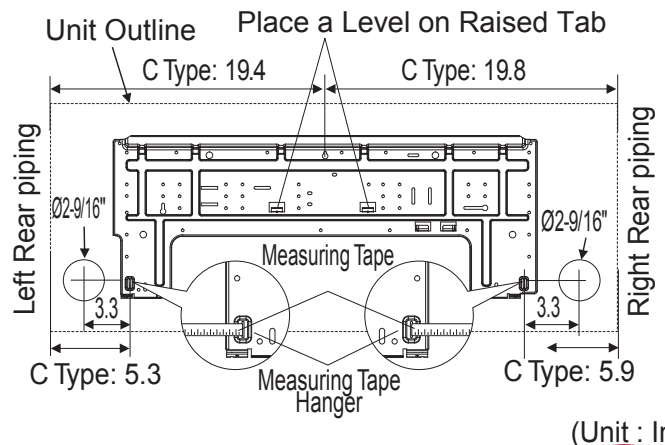


Figure 13: Installation Plate for LSN180HSV5 and LMN249HVT Indoor Units.



### Removing the Indoor Unit Bottom Cover — HVT Wall-Mounted Indoor Units

To access the indoor unit piping port connections, terminal block, and to make the indoor unit installation procedure easier, it is recommended that the bottom cover be removed first.

1. Fully open the front panel.
2. At the bottom panel of the indoor unit, unsnap the latches that cover the screws. Number of screws on the panel will differ by indoor unit model.
3. Using a Phillips head screwdriver, remove the screws from the bottom panel of the indoor unit and set aside for re-installation.
4. Remove the bottom panel, being careful not to scratch the main horizontal vane. Set aside the bottom panel to re-install after all procedures are complete.

Figure 14: Latch over Screws on Indoor Unit Bottom Panel.



Figure 15: Remove Screws from Bottom Panel.



Figure 16: Remove Bottom Panel.



# INSTALLATION

## Preparing for Installation

# MULTI F MULTI F MAX

### Removing the Indoor Unit Bottom Cover — HSV5 Wall-Mounted Indoor Units

To access the indoor unit piping port connections, terminal block, and to make the indoor unit installation procedure easier, it is recommended that the bottom cover be removed first.

1. Unsnap the bottom cover at its top left and right sides (Location 1).
2. Unsnap each of the three (3) or four (4) small C-hooks located in the middle of the bottom cover (Location 2). Number of C-hooks present depends on model of indoor unit.
3. Lift the three (3) to four (4) hinges on the bottom cover up and out of the channels molded to the left, right, and middle of the indoor unit (Location 3). Number of hinges present depends on model of indoor unit.
4. Set aside the bottom cover to re-install after all procedures are complete.

Figure 17: Removing the HSV5 Bottom Cover.

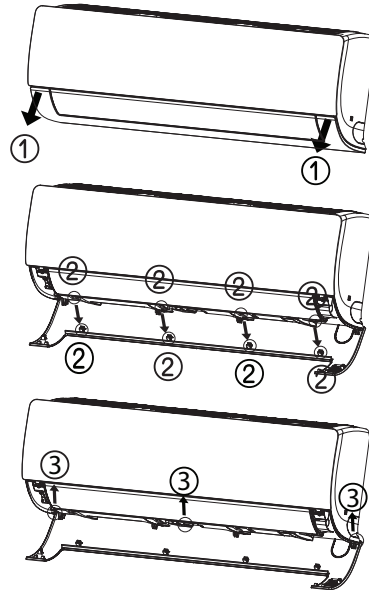


Figure 18: Removing the HSV5 Bottom Cover (Appearances Will Vary Depending on Indoor Unit Model).

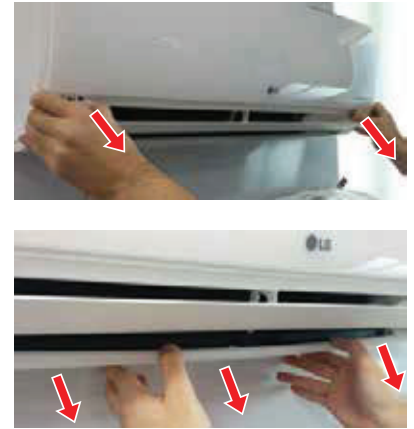


Figure 20: Bottom Cover with Top and Middle Unsnapped, Front View (Appearances Will Vary Depending on Indoor Unit Model).

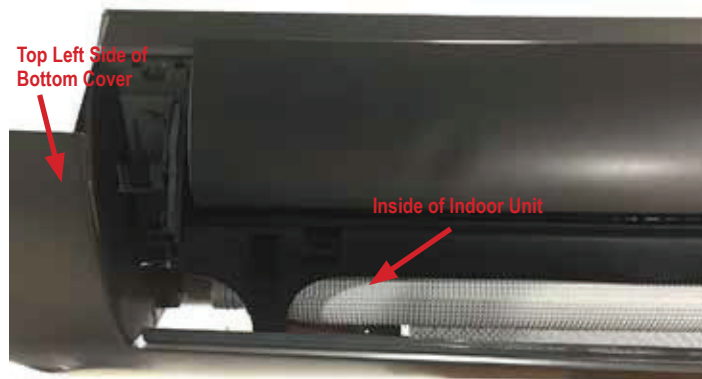
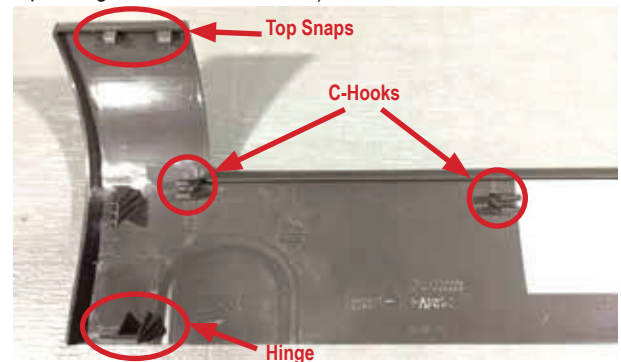


Figure 19: Back of Bottom Cover Completely Removed from Indoor Unit (Appearances Will Vary Depending on Indoor Unit Model).



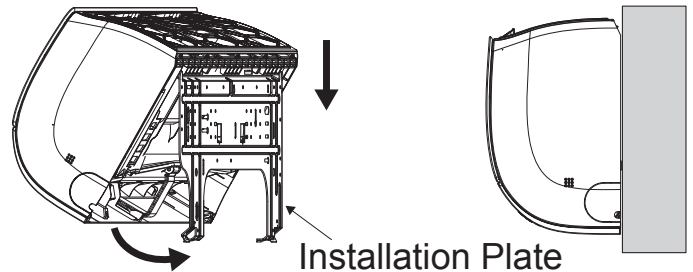
Figure 21: Close Up of Bottom Cover Connections (Appearances Will Vary Depending on Indoor Unit Model).



## Mounting the Indoor Unit to the Installation Plate — HVT and HSV5 Wall-Mounted Indoor Units

1. Position the indoor unit onto the upper portion of the installation plate.
2. Engage the hooks at the top of the indoor unit with the upper edge of the installation plate (number of hooks depends on model type).
3. Ensure the hooks are properly seated on the installation plate by shaking the indoor unit left and right.

Figure 22: Attaching the Indoor Unit to the Installation Plate.

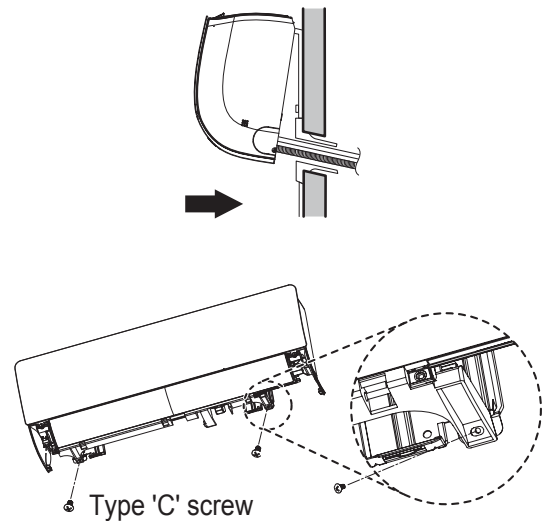


### Note:

Permanently secure the indoor unit to the wall **ONLY AFTER** all other tasks such as Refrigerant Piping Connections, Drain Piping Connections, Electrical Connections, and Final Installation Procedures are complete. See next page for steps on how to prepare for piping and electrical connections.

4. Carefully guide the refrigerant piping and drain piping through the access hole.
5. Push the bottom of indoor unit towards the installation plate to anchor to the wall.
  - Press the lower left and right sides of the unit against the installation plate until the hooks engage into their slots.
  - A clicking sound will be heard as the bottom of the indoor unit attaches to the installation plate successfully.
  - Pay attention to the positioning of the piping through the wall.

Figure 23: Finishing Indoor Unit Installation to the Wall Plate (Example).



6. Finish the installation by completely securing the indoor unit to the installation plate using the factory-supplied screws (screw placement will vary depending on indoor unit model).

### ⚠ WARNING

The indoor unit can fall from the wall if it is not properly installed and secured to the installation plate. Falling indoor units can cause bodily injury or death.

### Note:

- To avoid a gap between the indoor unit and the wall, ensure the screws are correctly and fully secured to the installation plate.
- To prevent condensate from forming due to an inflow of outdoor air, before indoor unit installation is finished, completely seal the piping access hole in the wall.

# INSTALLATION

## Indoor Unit Connections

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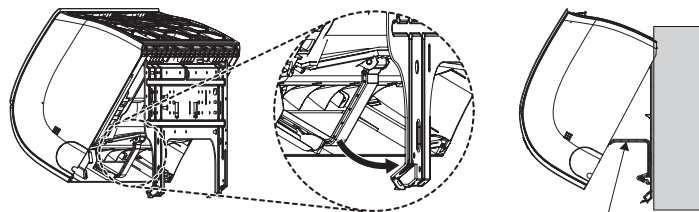
### Preparing for Piping / Electrical Connections

1. To prepare the indoor unit for piping and electrical installation, disengage bottom on indoor unit from installation plate by reversing Steps 6, 5, and 4 from the previous procedure, if those procedures have been performed.
2. Unsnap the piping / drain hose holder (L-bracket) out from the indoor unit frame. Prop it open between the indoor unit frame and installation plate to separate the bottom of the indoor unit from the wall. This will allow for more working space.

Figure 24: L-bracket Closed (Appearances Will Vary Depending on Indoor Unit Model).



Figure 25: Mounting the Indoor Unit on Installation Plate.



Piping / Drain Hose Holder

Figure 26: L-bracket Open (Appearances Will Vary Depending on Indoor Unit Model).



### Note:

- Go to the *Electrical Installation* section of this manual for information on electrical wiring to the indoor unit.
- After all Refrigerant Piping and Electrical Connection procedures are complete, snap the L-bracket closed, and secure the indoor unit to the installation plate as detailed in Steps 5 and 6 in "Mounting the Indoor Unit to the Installation Plate".

### Positioning the Indoor Unit Piping / Electrical Connections

Wall-mounted indoor units have several options on how the piping and wiring can be routed (see figure at right). Installation is pre-chosen following installation guidelines and application needs.

1. Unsnap the piping / drain hose holder (L-bracket) out from the indoor unit as described above.
2. Remove the piping port cover.
3. Position the piping by unfolding and bending the piping slowly downward first as shown, then to the left or right as shown.
4. Secure piping with the piping holder if appropriate.

Figure 27: Choice of Piping / Wiring Routes.

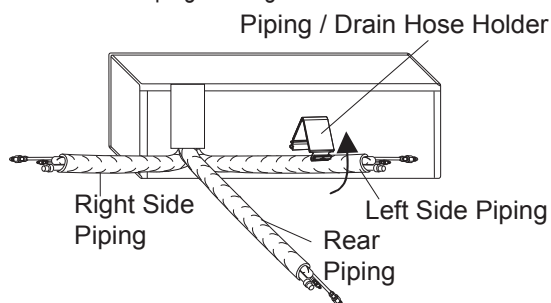
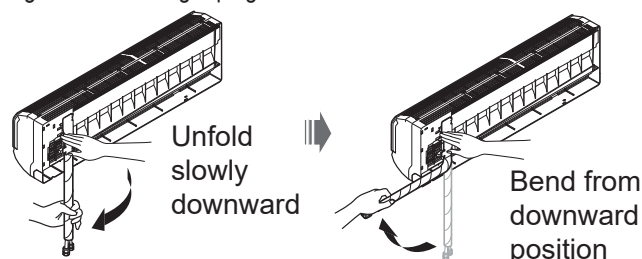


Figure 28: Bending Piping at Rear of Indoor Unit.

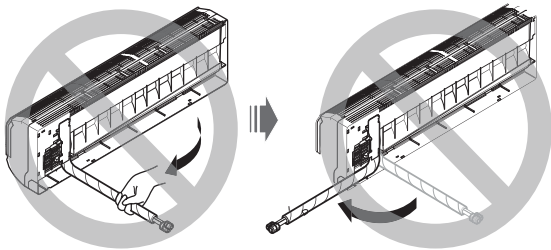




### Note:

- Do not bend the piping directly backwards or to the left or right sides without bending it downward first; this will damage the indoor unit piping.
- Do not forcibly press the refrigerant piping onto the bottom frame or the front grille; this will damage the indoor unit piping and / or indoor unit frame.
- Ensure the piping is straight. Do not kink the piping; this will damage the indoor unit and piping.

Figure 29: Improper Piping Bending.



### Piping Installation When Piping is on the Left Side

### Note:

- See the Electrical System Installation section for information on how to connect the communication / connection (power) cable from the outdoor unit.
- For left-side piping, it is recommended that the communication / power connections are complete before starting the piping connections.

1. Insert drain hose on left (feature will differ depending on model of indoor unit).
2. Align the center of the refrigerant piping and corresponding connection as shown on the next page.
3. Place a couple of drops of refrigerant oil on outside of the flare before assembling. Do not add any contaminants. Tighten the flare nut initially by hand.
4. Finish tightening the flare nut with a torque wrench until the wrench clicks. Follow torque guidelines in the "Tightening the Flare Nuts" procedure later in this section.

### Note:

When tightening the flare nut with a torque wrench, ensure the direction for tightening follows the arrow on the wrench.

5. Bundle the refrigerant piping, drain hose, and communication / connection (power) cable together. Ensure that the drain hose is located at the bottom of the bundle.
  - If using a conduit for the power wiring / communications cable, see the next page.

### Note:

Positioning the drain hose at the top of the bundle can cause condensate to overflow from the drain pan in the inside of the indoor unit.

Figure 30: Keep Piping Straight; Avoid Kinks.

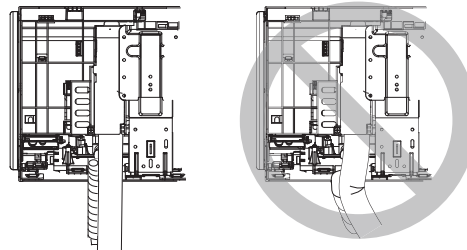
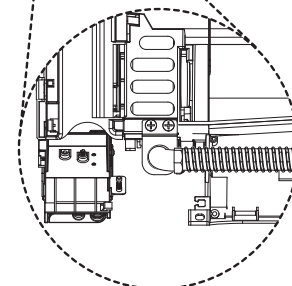
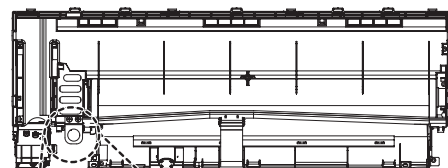
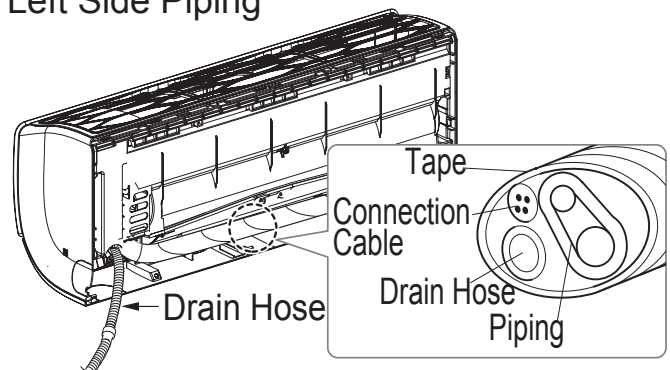


Figure 31: Piping Installation When Piping is on the Left Side.

### Left Side Piping



# INSTALLATION

## Indoor Unit Connections

MULTI F  
MULTI F MAX

### Piping Installation When Piping is on the Right Side

#### Note:

See the *Electrical System Installation* section for information on how to connect the communication / connection (power) wiring from the outdoor unit.

1. Align the center of the refrigerant piping and corresponding connection as shown.
2. Place a couple of drops of refrigerant oil on outside of the flare before assembling. ⚠ Do not add any contaminants. Tighten the flare nut initially by hand.
3. Finish tightening the flare nut with a torque wrench until the wrench clicks. Follow torque guidelines in the "Tightening the Flare Nuts" procedure later in this section.

#### Note:

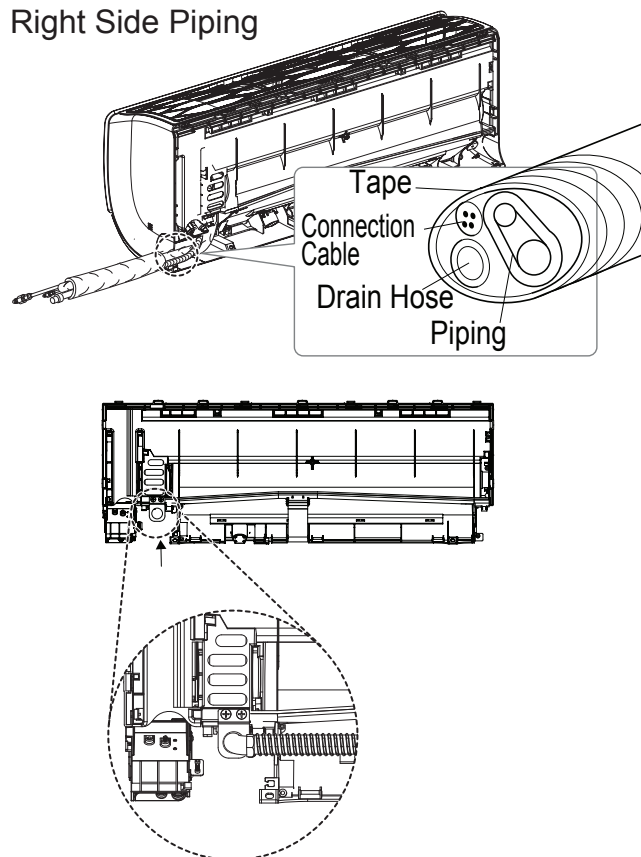
When tightening the flare nut with a torque wrench, ensure the direction for tightening follows the arrow on the wrench.

4. Bundle the refrigerant piping, drain hose, and communication / connection (power) cable together. Ensure that the drain hose is located at the bottom of the bundle.
  - If using a conduit for the power wiring / communications cable, see below.

#### Note:

Positioning the drain hose at the top of the bundle can cause condensate to overflow from the drain pan in the inside of the indoor unit.

Figure 32: Piping Installation When Piping is on the Right Side.



### Using a Conduit for Indoor Unit Wiring / Cable Installation

#### Note:

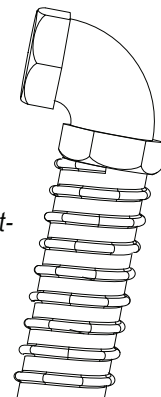
Use a liquidtight 3/4 inch elbow connector for flexible conduit.

1. Prop indoor unit away from wall bracket.
2. Guide communication / connection (power) cable insulation into the conduit.

#### Note:

- Check local, state, and federal codes when choosing a conduit size.
  - For systems with wiring greater than 130 feet, see the "Communication / Connection (Power) Cable Specifications from Outdoor Unit to Indoor Unit" in the *Electrical System Installation* section for information.
3. Attach conduit using the liquidtight 3/4 inch elbow connector.
  4. Reassemble the indoor unit properly onto the wall bracket.
  5. If conduit is not used, see pages in this section for refrigerant piping, condensate drain, power wiring / communication cable bundling information.
  6. To protect the piping, condensate drain, and conduit from the elements, add a lineset cover from the indoor access hole to the outdoor unit.

Figure 33: Liquidtight 3/4 Inch Elbow Connector Attached to Flexible Conduit.



### Bundling

If a conduit or piping set cover is not used on the connection from the outdoor unit to the interior, bundle both separately insulated refrigerant pipes, the drain hose, and outdoor unit to indoor unit communication / connection (power) cable together with wide vinyl tape.

1. Both piping must be fully and separately encased in insulation material: Overlap the field installation piping insulation material and the indoor unit piping insulation material.
2. Bind together the two pipes, using vinyl tape. Make sure there are no gaps during the binding.
3. Be sure the cutting line is placed upward.
4. Wrap the rear piping section with narrow vinyl tape.
5. Continue to wrap the indoor unit pipe as connected to the outdoor connection pipe.
6. Using a wider vinyl tape, bundle the piping and drain hose together.
  - Tape must be sufficient to cover the piping in order to fit into the rear piping housing area at the back of the indoor unit.

### Note:

- Always include insulation on all refrigerant and drain piping to ensure condensate does not form and cause damage to walls, floors, etc.
- For systems with wiring greater than 130 feet, see the "Communication / Connection (Power) Cable Specifications from Outdoor Unit to Indoor Unit" in the Electrical System Installation section for information.

Figure 34: Bundling the Connection Components (From Outdoor Unit to Indoor Unit).

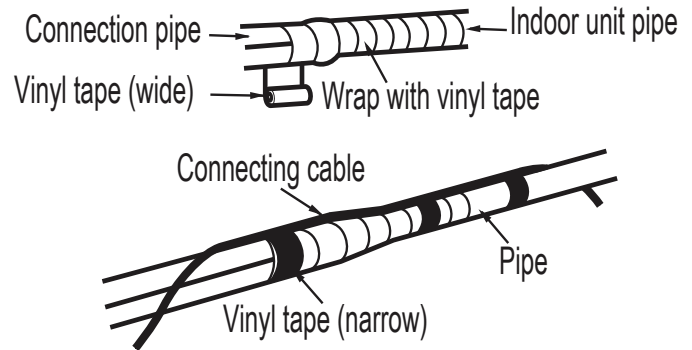
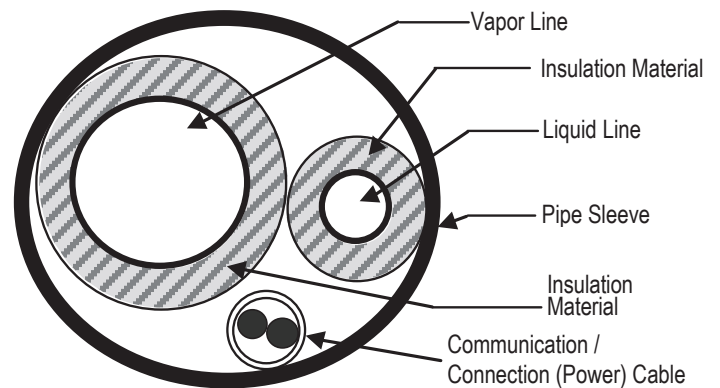


Figure 35: Cutaway of Proper Pipe and Cable Bundling.



# INSTALLATION

## Flaring Procedure

# MULTI F MULTI F MAX

### Flaring Procedure

One of the main causes of refrigerant leaks is a defective connection. For LG HVAC systems, the installer needs to know how perform flared connections successfully.

#### Note:

- During installation, it is imperative to keep the piping system free of contaminants and debris such as copper burrs, slag, or carbon dust.
- Do not use kinked pipe caused by excessive bending in one specific area on its length.

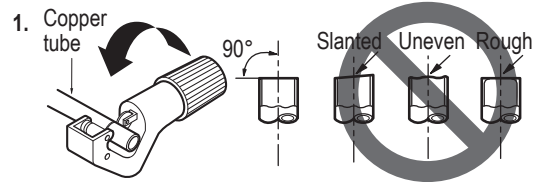
### Flaring Procedure

#### Note:

When selecting flare fittings, always use a 45° fitting rated for use with high pressure refrigerant R410A. Selected fittings must also comply with local, state, or federal standards.

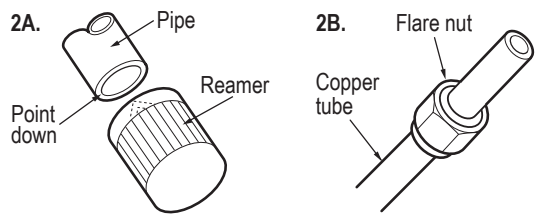
#### 1. Cut the pipe to length.

- Measure the distance between the indoor unit and the outdoor unit.
- Cut the pipes a little longer than measured distance.



#### 2A. Remove the burrs.

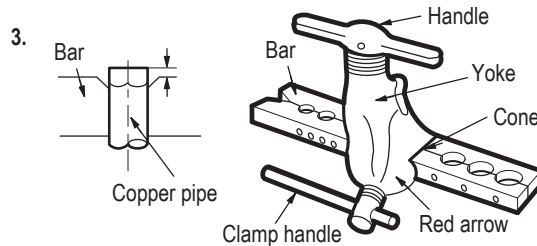
- Completely remove all burrs from pipe ends.
- When removing burrs, point the end of the copper pipe down to avoid introducing foreign materials in the pipe.



#### 2B. Slide the flare nut onto the copper tube.

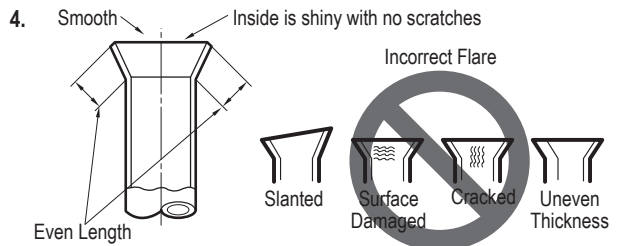
#### 3. Flaring the pipe end.

- Use the proper size flaring tool to finish flared connections as shown.
- ALWAYS create a 45° flare when working with R410A.

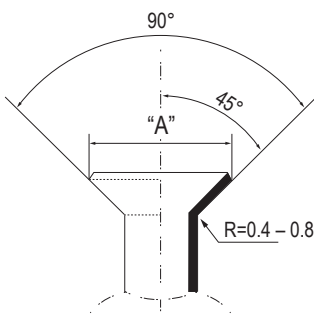


#### 4. Carefully inspect the flared pipe end.

- Compare the geometry with the figure to the right
- If the flare is defective, cut it off and re-do procedure.
- If flare looks good, blow the pipe clean with dry nitrogen.



Dimensions of the Flare.



Flared Connection Dimensions / Tightening Torque.

Pipe Size (in. O.D.)	Outside Diameter (mm)	"A" Dimension (mm [in.])
1/4	6.35	~ 9.1 (11/32 - 23/64)
3/8	9.52	~ 13.2 (1/2 - 33/64)
1/2	12.7	~ 16.6 (41/64 - 21/32)
5/8	15.88	~ 19.7 (49/64 - 25/32)
3/4	19.05	-

**Tightening the Flare Nuts**

Tightening Torque for Flare Nuts.

Pipe Size (in. O.D.)	Outside Diameter (mm)	Tightening Torque (ft-lbs.)
1/4	6.35	13.0 - 18.0
3/8	9.52	24.6 - 30.4
1/2	12.7	39.8 - 47.7
5/8	15.88	45.4 - 59.3
3/4	19.05	71.5 - 87.5

1. When connecting the flare nuts, coat the flare (outside only) with polyvinyl ether (PVE) refrigeration oil only.

**Note:**

- ⊘ Do not use polyolyester (POE) or any other type of mineral oil as a thread lubricant. These lubricants are not compatible with the PVE oil used in this system and create oil sludge leading to equipment damage and system malfunction.
- ⊘ Do not add any contaminants inside the refrigerant piping.

2. Initially hand tighten the flare nuts using three (3) or four (4) turns.
3. To finish tightening the flare nuts, use both a torque wrench and a backup wrench.
4. After all the piping has been connected and the caps have been tightened, check for refrigerant gas leaks.

**Loosening the Flare Nuts**

Always use two (2) wrenches to loosen the flare nuts.

# INSTALLATION

## Outdoor Unit to Indoor Unit Connections

# MULTI F MULTI F MAX

### Multi F with LGRED Outdoor Unit to Indoor Unit Piping Connections

#### Note:

##### Avoid Pipe Damage

- When routing field-provided piping, avoid damaging the outdoor unit from excessive vibration.
- Properly insulate the liquid and gas lines separately up to the point of connection at the unit frame.
- See table below for Multi F with LGRED outdoor unit connection types.

⊘ Correctly route the piping so it does not make contact with mounting bolts. Allow room for field installation.

Table 8: Multi F with LGRED Outdoor Unit Piping Connections.

Outdoor Unit Piping Connections	LMU180HHV	LMU240HHV	LMU300HHV
Liquid Line Connection (in., OD) x Qty.	Ø1/4 x 2	Ø1/4 x 3	Ø1/4 x 4
Vapor Line Connection (in., OD) x Qty.	Ø3/8 x 2	Ø3/8 x 3	Ø3/8 x 4

Figure 36: Multi F with LGRED Outdoor Unit Refrigerant Pipe Connections (LMU360HHV shown as example).

Multi F with LGRED Outdoor Unit (18, 24, 30kBtu/h)

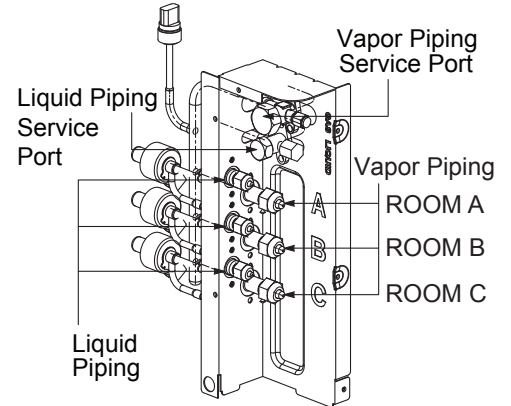


Table 9: Indoor Unit Pipe Sizes.

Indoor Unit Capacity	Vapor Line Piping Size (in., OD)	Liquid Line Piping Size (in., OD)
7,000 Btu/h	Ø3/8	Ø1/4
9,000 Btu/h		
12,000 Btu/h		
15,000 Btu/h		
18,000 Btu/h	Ø1/2	
24,000 Btu/h		

Table 11: Indoor Unit Piping Connections.

Indoor Unit Capacity	Vapor Line Conn. (in., OD)	Liquid Line Conn. (in., OD)
7,000 Btu/h	Ø3/8	Ø1/4
9,000 Btu/h		
12,000 Btu/h		
15,000 Btu/h		
18,000 Btu/h Wall-Mounted and Vertical Air Handling Units	Ø5/8	Ø3/8
18,000 Btu/h Low Static Duct and Four-Way Cassette Units	Ø1/2	Ø1/4
24,000 Btu/h	Ø1/2	Ø1/4

#### Note:

Connection sockets (included as a factory-supplied accessory with the indoor units) will need to be used when piping the indoor units to the outdoor unit. See tables above and below for indoor unit piping connection and connection socket dimensions. See the follow page for the connection socket installation procedure.

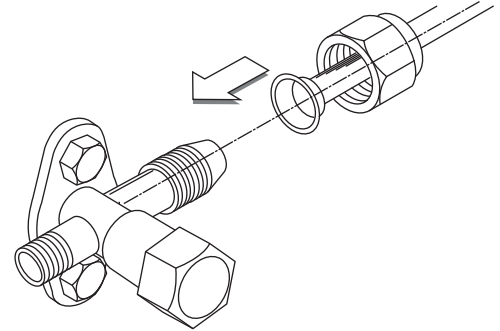
Table 10: Connection Socket Dimensions.

Indoor Unit Capacity	Vapor (in., OD)		Liquid (in., OD)	
	A	B	A	B
18,000 Btu/h Wall-Mounted and Vertical Air Handling Units	Ø3/8 → Ø1/2, Ø1/2 → Ø5/8		Ø1/4 → Ø3/8	
18,000 Btu/h Low Static Duct and Four-Way Cassette Units	Ø3/8 → Ø1/2		N/A	
24,000 Btu/h	Ø3/8 → Ø1/2		N/A	

### Installing Field Piping to the Outdoor Unit Piping Connections

1. Verify the outdoor unit service ports are closed.
2. Remove the caps on the outdoor unit piping connections.
3. Connect the gas piping first to ROOM A, then to ROOM B, then to ROOM C, in that order. Number of connections will differ depending on outdoor unit.
4. Tighten each gas piping connection individually following the "Tightening the Flare Nuts" procedure earlier in this section.
5. Connect the liquid piping first to ROOM A, then to ROOM B, then to ROOM C, in that order. Number of connections will differ depending on outdoor unit.
6. Tighten each liquid piping connection individually following the "Tightening the Flare Nuts" procedure earlier in this section.

Figure 38: Close Up of the Field Piping to the Outdoor Unit Piping Connection.



### Using the Connection Socket

Some indoor units require the use of a connection socket when piping the indoor units to the outdoor unit. (See previous page for information.) The connection sockets are included as a factory-supplied accessory with the indoor units. To install:

1. Align the center of the piping sections as seen in the diagrams at right and below.
2. Follow the "Tightening the Flare Nuts" procedure earlier in this section.
3. When all piping installation has been completed, perform the triple leak / pressure and evacuation tests (see the Final Installation Procedures Section in the Multi F / Multi F MAX Outdoor Unit Installation Manual), verify that the system does not have any leaks, and then fully insulate all joints / connections.

Figure 37: Connection Socket Installation.

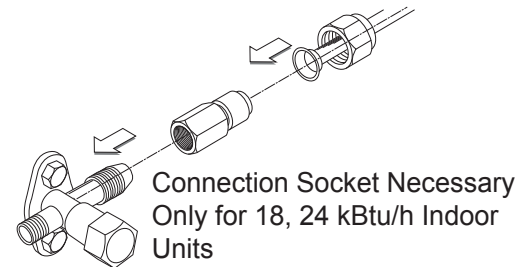


Figure 39: Connection Socket Diagram, External View.

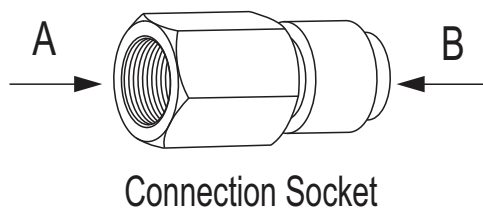
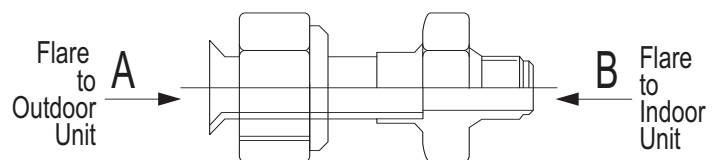


Figure 40: Connection Socket Diagram, Internal View.



# INSTALLATION

## Outdoor Unit to Indoor Unit Connections

# MULTI F MULTI F MAX

### Multi F MAX with LGRED Outdoor Unit System Piping Connections

#### Note:

##### Avoid Pipe Damage

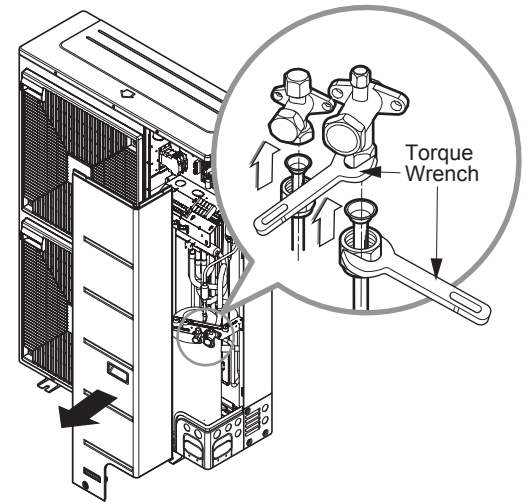
- When routing field-provided piping, avoid damaging the outdoor unit from excessive vibration.
- Properly insulate the liquid and gas lines separately up to the point of connection at the unit frame.
- See table below for Multi F MAX outdoor unit connection types.

⊘ Correctly route the piping so it does not make contact with mounting bolts. Allow room for field installation.

Table 12: Multi F MAX with LGRED Outdoor Unit Piping Connections.

Outdoor Unit Piping Connections	LMU360HHV, LMU420HHV
Liquid Line Connection (in., OD) x Qty.	Ø3/8 x 1
Vapor Line Connection (in., OD) x Qty.	Ø3/4 x 1

Figure 41: Multi F MAX with LGRED Outdoor Unit Refrigerant Pipe Connections.



#### Branch Distribution to Indoor Unit Piping Connections

- Install indoor unit liquid and vapor refrigerant pipes (and connection wiring) to the appropriate branch distribution ports.
- Clearly note on the indoor unit's refrigerant piping (liquid, vapor) which branch distribution port it is connected to (A, B, C, D).

Table 13: Branch Distribution Unit Piping Connections.

Branch Distribution Unit	Refrigerant Connections Pipe Size (in.)		Connectable Indoor Unit Capacity (Btu/h)
	Liquid	Vapor	
PMBD3620	Ø1/4 x 2	Ø3/8 x 2	7,000, 9,000, 12,000, 15,000, 18,000, 24,000
PMBD3630	Ø1/4 x 3	Ø3/8 x 3	7,000, 9,000, 12,000, 15,000, 18,000, 24,000
PMBD3640	Ø1/4 x 4	Ø3/8 x 4	7,000, 9,000, 12,000, 15,000, 18,000, 24,000
PMBD3641	Ø1/4 x 4	Ø3/8 x 3	7,000, 9,000, 12,000, 15,000, 18,000, 24,000 (A, B, C)
		Ø1/2 x 1	36,000 (D)

Figure 42: Branch Distribution Ports to Indoor Units -- Side View.

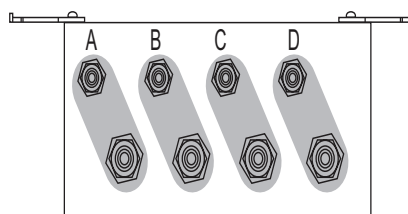
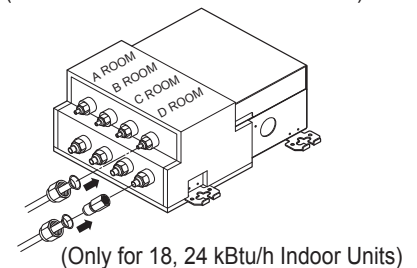


Figure 43: Branch Distribution Piping Connections.

Multi F MAX with LGRED Outdoor Units (36, 42 kBtu/h)  
(Branch Distribution Unit: PMBD3640)



(Branch Distribution Unit: PMBD3641)

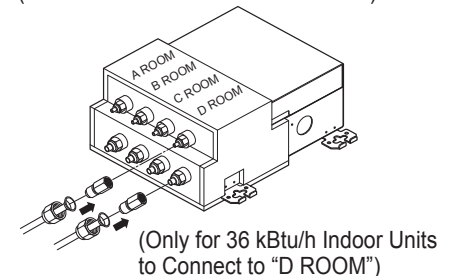




Table 14: Indoor Unit Pipe Sizes.

Indoor Unit Capacity	Vapor Line Piping Size (in., OD)	Liquid Line Piping Size (in., OD)
7,000 Btu/h	Ø3/8	Ø1/4
9,000 Btu/h		
12,000 Btu/h		
15,000 Btu/h		
18,000 Btu/h	Ø1/2	
24,000 Btu/h		

### Note:

Connection sockets (included as a factory-supplied accessory with the indoor units) will need to be used when piping the indoor units to the branch distribution unit. The connection sockets for 36k indoor units are factory supplied with the branch distribution units. See tables above and below for indoor unit piping connection and connection socket dimensions. See below and the follow page for the connection socket installation procedure.

Table 15: Indoor Unit Piping Connections.

Indoor Unit Capacity	Vapor Line Conn. (in., OD)	Liquid Line Conn. (in., OD)
7,000 Btu/h	Ø3/8	Ø1/4
9,000 Btu/h		
12,000 Btu/h		
15,000 Btu/h		
18,000 Btu/h Wall-Mounted and Vertical Air Handling Units	Ø5/8	Ø3/8
18,000 Btu/h Low Static Duct and Four-Way Cassette Units	Ø1/2	Ø1/4
24,000 Btu/h	Ø1/2	Ø1/4

Table 16: Connection Socket Dimensions.

Indoor Unit Capacity	Vapor (in., OD)		Liquid (in., OD)	
	A	B	A	B
18,000 Btu/h Wall-Mounted and Vertical Air Handling Units	Ø3/8 → Ø1/2, Ø1/2 → Ø5/8		Ø1/4 → Ø3/8	
18,000 Btu/h Low Static Duct and Four-Way Cassette Units	Ø3/8 → Ø1/2		N/A	
24,000 Btu/h	Ø3/8 → Ø1/2		N/A	

### Installing Field Piping to the Branch Distribution Unit Piping Connections

1. Remove any caps, etc., that will be on the branch distribution unit.
2. Tighten each piping connection individually following the "Tightening the Flare Nuts" procedure later in this section.
3. When all piping installation has been completed, perform the triple leak / pressure and evacuation tests (see the Final Installation Procedures Section in the Multi F / Multi F MAX Outdoor Unit Installation Manual), verify that the system does not have any leaks, and then fully insulate all joints / connections.

### Using the Connection Socket

Some indoor units require the use of a connection socket when piping the indoor units to the branch distribution unit. (See previous page and below for information.) The connection sockets are included as a factory-supplied accessory with the indoor units, or in the case of the 36k indoor unit, it is factory supplied with the branch distribution units. To install:

1. Remove any caps, etc., that will be on the branch distribution unit.
2. Align the center of the piping sections as seen in the diagram at right.
3. Tighten each piping connection individually following the "Tightening the Flare Nuts" procedure earlier in this section.
4. When all piping installation has been completed, perform the triple leak / pressure and evacuation tests (see the Final Installation Procedures Section in the Multi F / Multi F MAX Outdoor Unit Installation Manual), verify that the system does not have any leaks, and then fully insulate all joints / connections.

Figure 45: Connection Socket Diagram, External View.

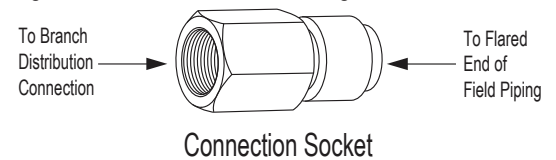
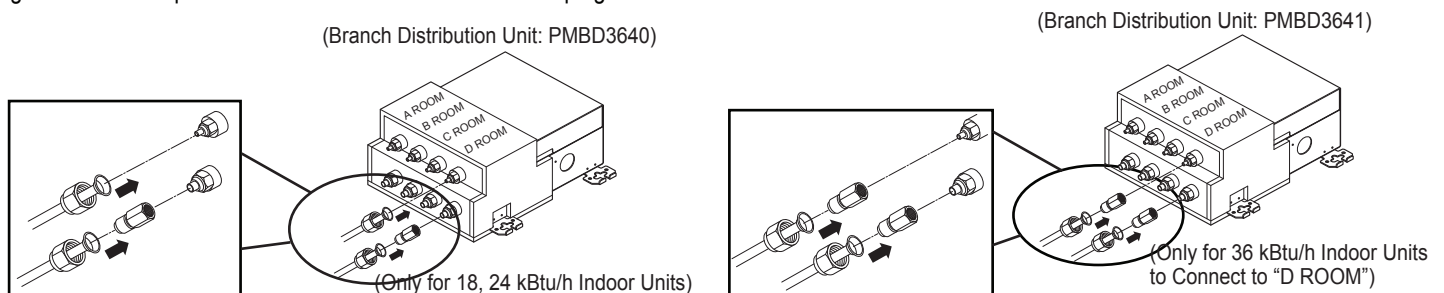


Figure 44: Close Up of Branch Distribution to Indoor Unit Piping Connections.



# INSTALLATION

## Outdoor Unit to Indoor Unit Connections

**MULTI F**  
**MULTI F MAX**

Figure 46: Socket Connection.

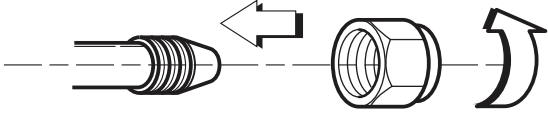
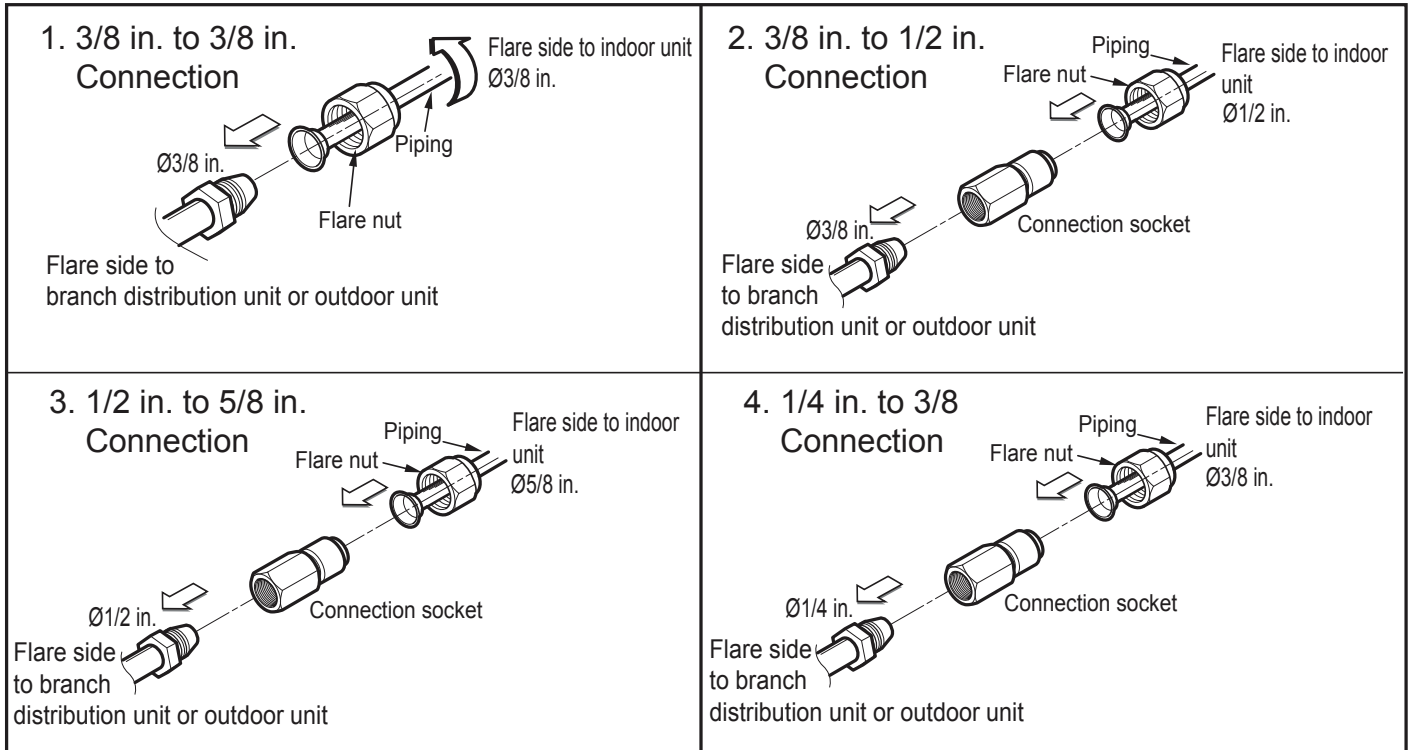


Figure 47: Possible Outdoor Unit or Branch Distribution Unit to Indoor Unit Connections.



**Indoor Unit Condensate Drain Hose Installation**

**Note:**

Refer to the diagrams below and follow proper installation and the position of the drain hose along the refrigerant piping installation path to avoid leaks. After the drain hose is set in place, always follow with leak / pressure testing and deep evacuation procedures of the refrigerant piping to be sure all refrigerant piping is properly installed. Re-check and retest as necessary.

- Wall-mounted indoor units have a factory-provided flexible pipe (27/32" O.D./ 5/8" I.D.) to drain condensate water. The flexible pipe connects to field-provided drain pipe. Use materials that comply with local codes for drain pipe and insulation.
- Remove the drain plug on left or right side depending on the piping installation. Insert the drain hose on the left side when left side piping is used; install the drain hose on the right side when right side piping is used.
- Drain hose is routed from the indoor unit through the structure (wall) to the outdoor. It must slope at an angle where it is higher at the indoor unit and lower toward the outdoor area, thereby letting gravity push any condensation down and out.
- The drain hose might need to be extended so that condensate can be properly routed away. Connect the flexible drain pipe with a round clamp. If the flexible drain pipe is not installed properly, water will leak from the connection.
- Install the flexible drain pipe as straight as possible; sharp angles will cause the pipe to deteriorate and will crack over time.
- Insert the drain hose >2 inches so it won't pull out of the field-supplied drain pipe.
- ⚠ Avoid piping the drain hose as shown in the diagrams in the figure on the next page. These methods are incorrect and can cause leaks at the indoor unit site.

Figure 48: Flexible Drain Hose Connection.



Clamp the Flexible Drain Hose Connection

Figure 49: Correct Slope Angle for Drain Hose.

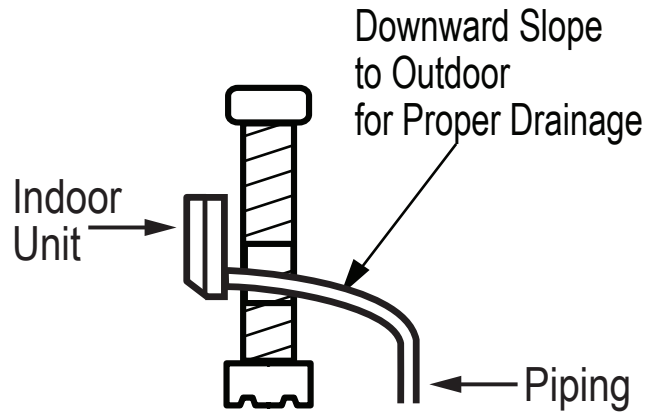


Figure 50: HVT and HSV5 Outdoor Unit Drain Hose Extension.

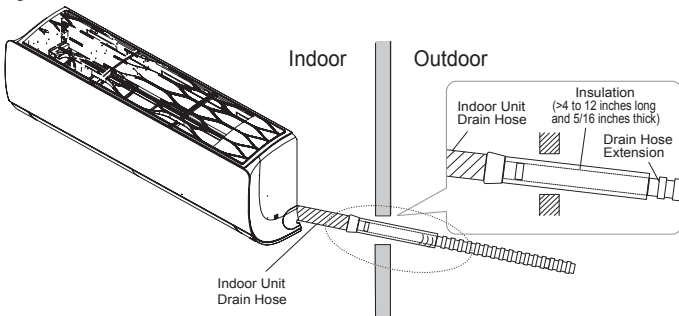
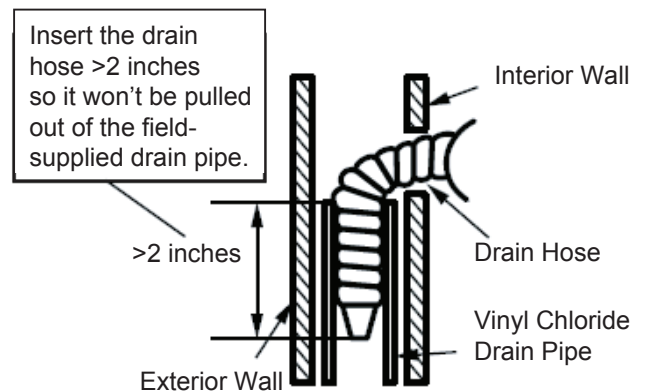


Figure 51: Inserting the Drain Hose >2 inches Into the Field-Supplied Drain Pipe.

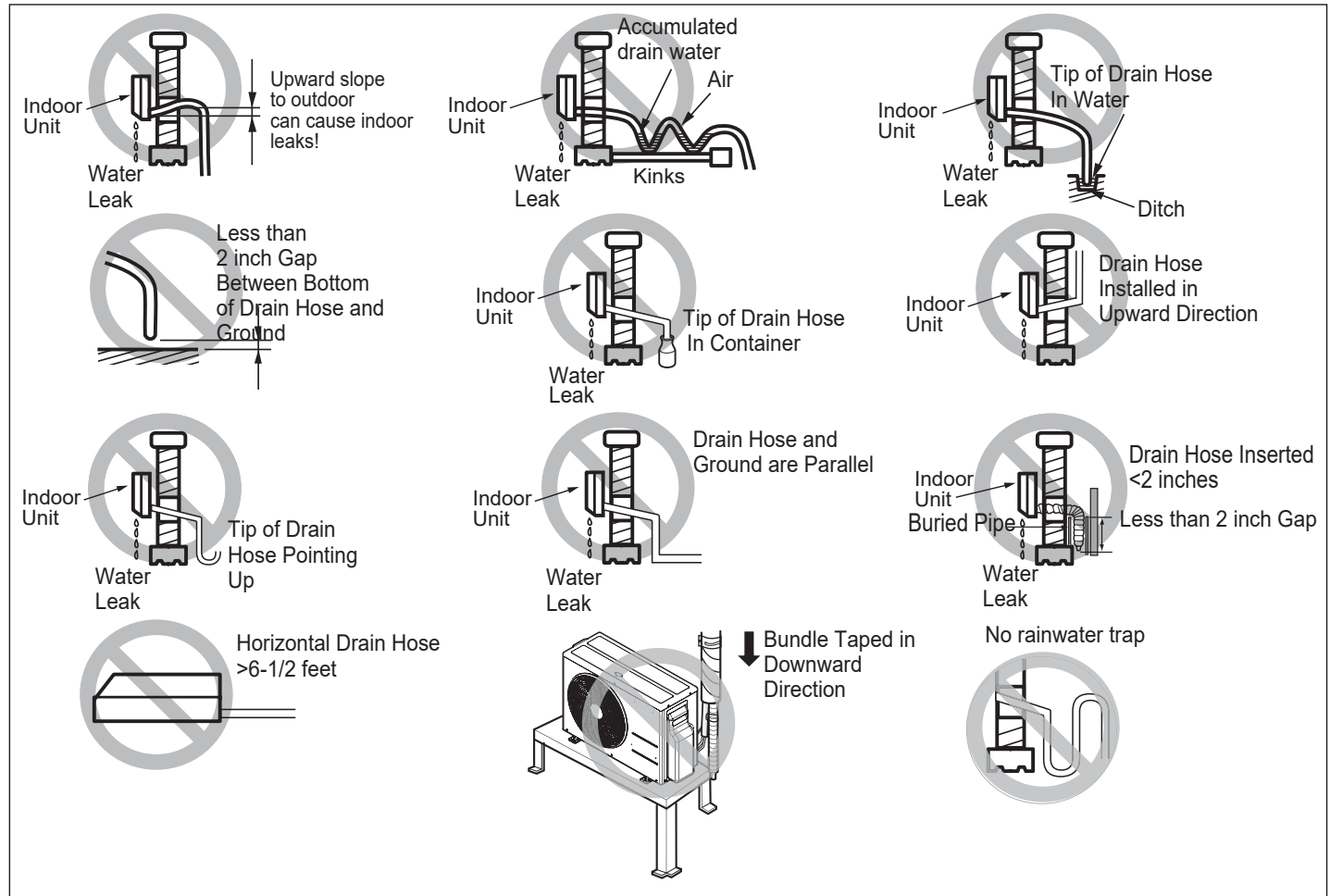


# INSTALLATION

## Condensate Drain Hose Installation

**MULTI F**  
**MULTI F MAX**

Figure 52: Incorrect Slope Angles for the Drain Hose.



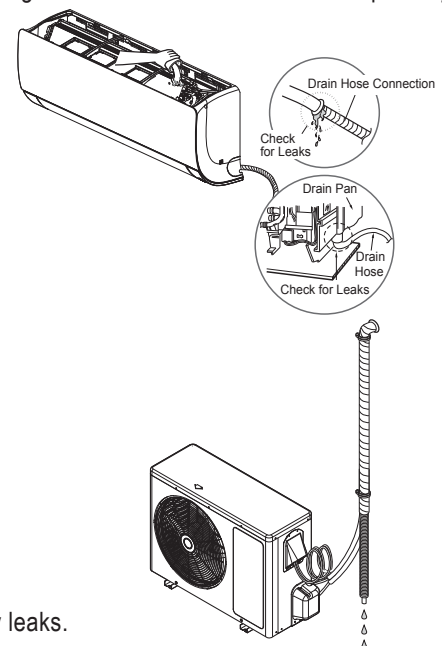
### Drain Hose Insulation

1. The drain hose and extension must be properly insulated to ensure condensation will not damage walls, floors, etc. Foamed polyethylene or equivalent of at least 5/16 inches thick is required.
2. Overlap the insulation at the connection of the field-installed piping and the indoor unit piping. Tape together so that no gaps exist.
3. Secure insulation to the rear piping housing section with vinyl tape.
4. Bundle the piping and drain hose with tape where they meet at the back of the indoor unit frame. Position the drain hose at the bottom of the bundle (positioning the drain hose at the top of the bundle will cause the drain pan to overflow inside the indoor unit).

### Checking the Indoor Unit Drain Hose for Leaks

1. Pour a glass of water on the evaporator.
2. Verify that the water flows appropriately through and out of the drain hose without any leaks.

Figure 53: Checking for Leaks at the Indoor Unit. Example Only; Systems Will Vary.



## Refrigerant Piping System Insulation

All refrigerant piping from the outdoor unit to the indoor units / branch distribution units must be insulated correctly for safety and usage. Refrigerant piping, Y-branch connections, field-provided isolation ball valves (if present), service valves, and elbows must be properly and completely insulated using closed cell pipe insulation (up to the indoor unit piping connections). To prevent heat loss / heat gain through the refrigerant piping, all refrigerant piping including liquid lines and vapor lines must be insulated separately. Insulation must be a minimum 1/2 inches thick, and thickness will need to be increased based on ambient conditions and local codes. Table on next page lists minimum wall thickness requirements for Ethylene Propylene Diene Methylene (EPDM) insulation.

Inside the outdoor unit, maximum pipe temperature is 248°F and minimum pipe temperature is -40°F. For field insulation of refrigerant piping between outdoor units and indoor units, consider the following pipe temperature ranges for an operating heat pump system:

- Heating mode refrigerant temperature ranges: Liquid = 75-118°F; High Pressure Vapor = 95-220°F
- Cooling mode refrigerant temperature ranges: Liquid = 75-118°F; Low Pressure Vapor = 40-90°F

All insulation joints must be glued with no air gaps. Insulation material must fit snugly against the refrigeration pipe with no air space between it and the pipe. Ⓞ Do not allow insulation passing through pipe hangers, inside conduit, and/or sleeves to be compressed. Protect insulation inside hangers and supports with a second layer. All pipe insulation exposed to the sun and outdoor elements must be properly protected with PVC, aluminum vapor barrier, or alternatively placed in a weather-resistant enclosure such as a pipe rack with a top cover; and meet local codes.

### Note:

Follow local codes when selecting EPDM insulation wall thickness. Thickness in the table is based on heat conductivity of 0.61 Btu/in/h/ft<sup>2</sup>/°F.

### Minimum Refrigerant Pipe Ethylene Propylene Diene Methylene (EPDM) Insulation Wall Thickness Requirements

Table 17: Insulation Guidelines for Typical and Special Circumstances.

Classification / Piping O.D.		Air-conditioned location		Non-air conditioned location	
		1. Typical Conditioned Location	2. Special Conditioned Location	3. Typical Unconditioned Location	4. Special Unconditioned Location
Liquid pipe	ø1/4 inches	1/2 inches	1/2 inches	1/2 inches	1/2 inches
	ø3/8 inches				
	≥ø1/2 inches				
Vapor pipe	ø3/8 inches	1/2 inches	3/4 inches	3/4 inches	1 inch
	ø1/2 inches				
	ø5/8 inches				
	ø3/4 inches				

#### 1. Typical Air-Conditioned Location

A building plenum or space that contains conditioned air that does not exceed 80°F DB. When piping passes through an indoor area where the indoor unit operates, such as an apartment, classroom, office, mall, hospital, etc.

#### 2. Special Air-Conditioned Location

1. When the location is air conditioned, but there is severe temperature/humidity difference due to high ceilings.
  - Church, auditorium, theater, lobby, etc.
2. When the location is air conditioned, but internal temperature/humidity are high.
  - Bathroom, swimming pool, locker room, etc.

### 3. Typical Unconditioned Location

When piping passes through an indoor area where the indoor unit does not operate, such as a hallway, dormitory, or school, etc. An unconditioned space inside a building.

### 4. Special Unconditioned Location: If conditions 1 and 2 below are present.

1. An unconditioned space or plenum of a building.
2. An area where there is an elevated humidity level.

### 5. Additional Insulation for Indoor Units Will be Required in Humid Environments.

The air conditioner factory insulation has been tested according to "ISO Conditions with Mist," and it satisfies the requirements. If the system has been operating for a long time in a high humidity environment (dew point temperature: more than 73°F), condensate is likely to form. If this happens, install 3/8 inch thick EPDM insulation that is plenum-rated with a heat-resistance factor of more than 248°F.

## Installing Refrigerant Piping Insulation

### ⚠ WARNING

Ensure all refrigerant piping is insulated. Exposed refrigerant piping will cause burns if touched.

Wrap all refrigerant and condensate piping including field-provided isolation ball valves and flexible pipe connection kits provided by LG. All pipes must be insulated and each pipe must be separately wrapped. Any exposed piping will generate condensate or will cause burns if touched. Sufficiently insulate all cold surfaces to prevent moisture forming.

Ensure insulation material fits snugly against the refrigeration pipe with no air space between the pipe surface and the surrounding insulation.

Protect insulation inside hangers and supports with a second insulation layer. Ensure insulation on all pipe passing through pipe hangers, inside conduit, and/or sleeves is not compressed.

Glue all insulation joints with no air gaps between insulation segments, and between insulation segments and the unit case. Ensure insulation material fits snugly against the refrigeration pipe with no air space between it and the pipe. All pipe insulation exposed to the sun and outdoor elements must be properly protected with PVC, aluminum vapor barrier, or alternatively placed in a weather-resistant enclosure such as a pipe rack with a top cover; and must meet local codes. Pay special attention to insulating the pipes installed in a ceiling plenum.

### Note:

- Do not insulate gas and liquid pipes together as this can result in pipe leakage and malfunction due to extreme temperature fluctuations.
- Always properly insulate the piping. Insufficient insulation will result in condensation, reduced heating/cooling performance, etc. Also, if the pipes aren't insulated properly, condensation could potentially cause damage to building finishes. Pay special attention to insulating the pipes installed in the ceiling plenum.
- Fully insulate the piping connections.

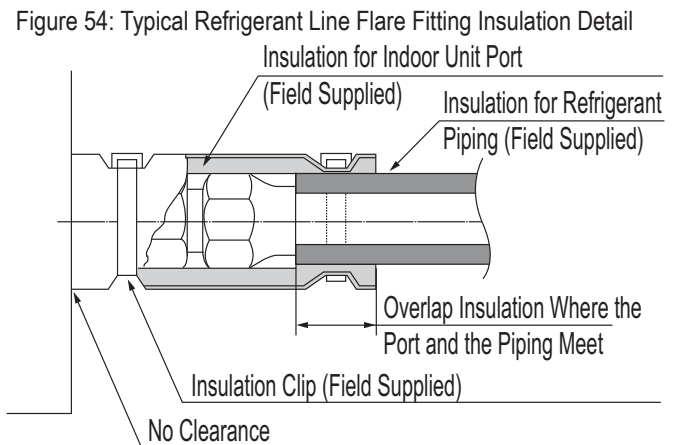
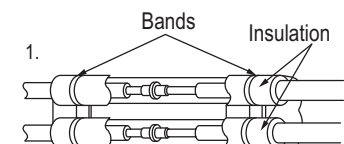


Figure 55: Insulating the Piping.



**⚠ WARNING**

- All power wiring (line voltage) and communication cable installation must be performed by trained service providers working in accordance with all local, state, and National Electrical Code (NEC) / UL / ETL federal regulations related to electrical equipment and wiring, and following the manufacturer product diagrams, requirements, and instructions in this manual. Electric shock can cause physical injury or death.
- Be sure that main power to the unit is completely off before proceeding. Follow all safety and warning information outlined at the beginning of this manual. Failure to do so will cause electric shock and bodily injury.
- Install a main shutoff switch or circuit breaker that interrupts all power sources simultaneously (circuit breaker must be resistant to electromagnetic currents). Be sure that the circuit breaker or some other emergency power cutoff device is in place before any power wiring is done to the system. Failure to do so will cause bodily injury or death.
- ⚡ Never touch any power lines or live cables before all power is cutoff to the system. To do so will cause bodily injury or death.
- Power wiring and communication cable sizes must comply with all applicable federal, state, and local codes. Undersized wiring will lead to unacceptable voltage at the unit and will cause a fire, which will cause bodily injury or death.
- Properly ground the outdoor unit, indoor units, and branch distribution units. Ground wiring must always be installed by a trained technician. Ground wiring is required to prevent accidental electrical shock during current leakage, which will cause bodily injury or death.
- Verify that the circuit breaker is set to OFF before installing the wiring system. Electric shock can cause physical injury or death.
- Install appropriately sized breakers / fuses / overcurrent protection switches and wiring in accordance with local, state, and National Electrical Code regulations related to electrical equipment and wiring, and following the instructions in this manual. Using an oversized breaker or fuse will result in electric shock, physical injury or death.
- ⚡ Do not connect ground wire to refrigerant, gas, or water piping; to lightning rods; to telephone ground wiring; or to the building plumbing system. Failure to properly provide a NEC-approved earth ground can result in electric shock, fire, physical injury or death.

**Note:**

- Consider ambient conditions (temperature, direct sunlight, inclement weather, etc.) when selecting, installing, and connecting the power wiring.
- Properly ground the outdoor unit, indoor units, and branch distribution units. Ground wiring must always be installed by a trained technician. Improperly grounded wire can cause communication problems from electrical noise, and motor current leakage.
- Install appropriately sized breakers / fuses / overcurrent protection switches and wiring in accordance with local, state, and NEC regulations related to electrical equipment and wiring, and following the instructions in this manual. Generated overcurrent will include some amount of direct current. Using an oversized breaker or fuse will result in equipment malfunction and property damage.
- ⚡ Do not connect ground wire to refrigerant, gas, or water piping; to lightning rods; to telephone ground wiring; or to the building plumbing system. Failure to properly provide a NEC-approved earth ground can result in property damage and equipment malfunction.
- ⚡ Do not operate the air conditioning system until the refrigerant piping installation is complete. Operating the system before refrigerant piping is finalized will damage the compressor.

# WIRING

## Power Wiring / Communication Cable Connections

# MULTI F MULTI F MAX

### Power Wiring / Communication Cable Connections

Best practice dictates using solderless ring or fork terminals at all power wiring and communication cable terminations. Use copper bearing ring or fork terminals; ⓧ do not use galvanized or nickel plate over steel. Use appropriate crimping tool to attach the ring or fork terminals at all power wiring and control cable terminations.

#### To Install a Ring or Fork Terminal:

1. Trim the wiring with wire cutters or pliers, then strip the insulation to expose the strand wiring to about 3/8 inches.
2. Using a ring terminal fastener or pliers, securely clamp a ring terminal to each stripped wire end.

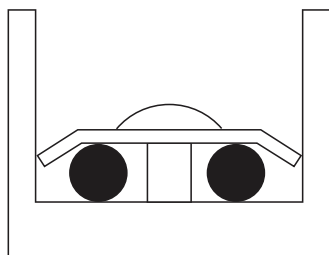
#### To Connect the Wiring to the Terminals:

1. Remove the JIS terminal screws from the (outdoor unit, branch distribution unit, or indoor unit) terminal plate with a JIS screwdriver. (See information about LG terminal connections on the next page.)
2. Position the ring terminal around the terminal, place the terminal screw in the ring, and tighten to the terminal plate using a JIS screwdriver.
  - Firmly attach the wire; secure in a way to prevent external forces from being imparted to the terminal block.
  - Use an appropriately sized JIS screwdriver for tightening the terminals.
  - ⓧ Do not over tighten the connections; over tightening will damage the terminals.

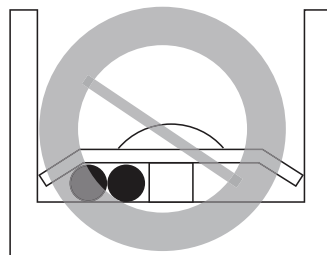
If ring terminals or fork terminals are not available, then:

- ⓧ Do not terminate different gauge wires to the power terminal block. (Slack in the wiring will generate heat.)
- When terminating wires of the same thickness, follow the instructions demonstrated in the figures below.

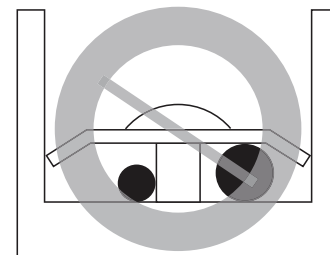
Figure 59: Proper and Improper Power Wiring Connections.



Terminate multiple power wires of the same gauge to both sides.



ⓧ Do not terminate two wires of one side.



ⓧ Do not terminate different gauge wires to a terminal block.

### ⚠ WARNING

If power wires are not properly terminated and firmly attached, there is risk of fire, electric shock, and physical injury or death.

#### Note:

- ⓧ Never apply line voltage power to the communications cable terminal block. If contact is made, the PCBs will be damaged.
- Always include some allowance in the wiring length when terminating. Firmly attach the wiring or cable, but provide some slack to facilitate removing the electrical panels while servicing, and to prevent external forces from damaging the terminal block.
- ⓧ Never ground the shield of the communications cable to the indoor unit frame or other grounded entities of the building. Ground the communications cable shield only at the outdoor unit. Improperly grounding this cable can cause communications errors.

Figure 57: Close up of a Typical Ring Terminal.

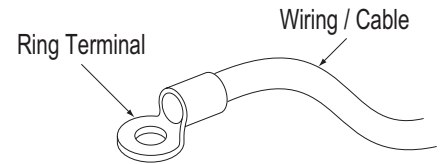


Figure 58: Adding a Ring Terminal to the Wiring.

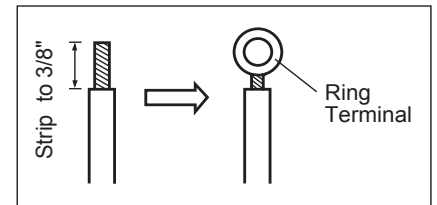
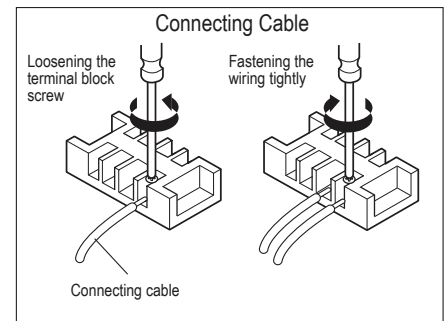


Figure 56: Tightening the Ring Terminal to the Terminal Plate.



● :Copper Wire



## LG Terminal Connections

LG uses a “JIS” type of screw for all terminals; use a JIS screwdriver to tighten and loosen these screws and avoid damaging the terminal. ⚠ Do not over tighten the connections — over tightening will damage the terminals — but firmly and securely attach the wiring in a way to prevent external forces from being imparted to the terminal block.

### Note:


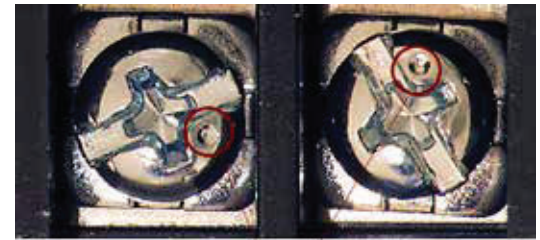
- The terminals labeled “GND” are NOT ground terminals. The terminals labeled  ARE ground terminals.
- Polarity matters. Always connect “A” to “A” and “B” to “B.”
- Always create a wiring diagram that contains the exact sequence in which all the indoor units and branch distribution units (Multi F MAX with LGRED systems only) are wired in relation to the outdoor unit.
- ⚠ Do not include splices or wire nuts in the communication cable.

Figure 60: JIS Screws.



JIS DIMPLES

## Power Supply / Power Wiring Specifications

- Multi F and Multi F MAX with LGRED systems operate at 1Ø, 208-230V, 60Hz, and power is wired to the outdoor unit only. The outdoor unit will supply power to the indoor units and the branch distribution units (Multi F MAX with LGRED systems only) through the communication / connection (power) cable (indoor units and branch distribution units draw minimum power). See the Multi F Outdoor Unit Installation Manual for information.
- Select power supply wire type and size based on NEC and local codes. Maximum voltage fluctuation  $\pm 10\%$  of the nameplate rated value.
- Properly ground the outdoor unit / indoor units / branch distribution units per NEC and local codes.
- Ground wire must be longer than the common power / communication wires.
- Connect the wiring firmly so the wires cannot be easily pulled out.
- Refer to the inside of the chassis cover or control cover for circuit and terminal block diagrams.
- Always match color codes of each wire and follow wiring diagram.
- ⚠ Do not install power wiring to the outdoor unit and the communication / connection (power) cable to the indoor unit in the same conduit. Use separate conduits.

## WARNING

- Always have a trained service provider properly ground the outdoor unit. If the outdoor unit is not properly grounded, there is a risk of electric shock, physical injury, or death.
- Provide a circuit breaker between the power source and the outdoor unit. Failure to do so will cause bodily injury or death.

### Communication / Connection (Power) Cable Specifications

- Multi F with LGRED Systems:

- Communication / connection (power) cable from the outdoor unit to the indoor unit for lengths up to 130 feet must use a minimum of 18 AWG, four (4) conductor, stranded, shielded or unshielded (if shielded, it must be grounded to the chassis of the outdoor unit only), and must comply with applicable local and national codes.
- When the communication / connection (power) wires between the indoor unit and outdoor unit is GREATER THAN 130 feet, use:
  - A two (2) conductor wire for power (for each indoor unit).
  - A two (2) conductor wire for communication / ground (for each indoor unit).
  - Separate the power AT LEAST two (2) inches away from the communication / ground wire (for each indoor unit).
  - All wiring is still minimum 18 gauge, stranded, shielded, or unshielded as cited above (for each indoor unit).

- Multi F MAX with LGRED Systems:

- All communication / connection (power) cable from the outdoor unit to the branch distribution unit(s) must be a minimum of 16 AWG, four (4) conductor, stranded, shielded or unshielded (if shielded, it must be grounded to the chassis of the outdoor unit only), and must comply with applicable local and national codes.
- Communication / connection (power) cable from the branch distribution unit(s) to the indoor units for lengths up to 130 feet must use a minimum of 18 AWG, four (4) conductor, stranded, shielded or unshielded (if shielded, it must be grounded to the chassis of the outdoor unit only), and must comply with applicable local and national codes.
- When the communication / connection (power) wires between the branch distribution unit and indoor unit is GREATER THAN 130 feet, use:
  - A two (2) conductor wire for power (for each indoor unit).
  - A two (2) conductor wire for communication / ground (for each indoor unit).
  - Separate the power AT LEAST two (2) inches away from the communication / ground wire (for each indoor unit).
  - All wiring is still minimum 18 gauge, stranded, shielded, or unshielded as cited above (for each indoor unit).

- Insulation material as required by local code.
- Rated for continuous exposure of temperatures up to 140°F.
- Firmly attach the cable; provide slack but secure in a way to prevent external forces from being imparted on the terminal block.
- Wiring must be completed without splices.

### Note:

- Use a conduit for the communications / connection (power) cable from the outdoor unit to the indoor units and branch distribution unit(s). Electrical interference may cause product malfunction.
- Never ground the shield of the communications cable to the indoor unit frame or other grounded entities of the building. Ground the communications cable shield only at the outdoor unit. Improperly grounding this cable can cause communications errors.
- The communications / connection (power) cable from the outdoor unit to the indoor units / branch distribution unit(s) must be separated and isolated from power wiring to the outdoor unit, computers, radio and television broadcasting facilities, as well as medical imaging equipment. Electrical interference may cause product malfunction.

Figure 61: Typical Multi F / Multi F MAX with LGRED Outdoor and Indoor / Branch Distribution Unit Wiring and Communications Cable Diagram For Wiring Lengths Up to 130 Feet.

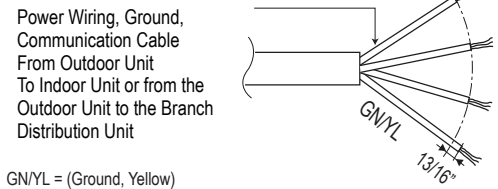
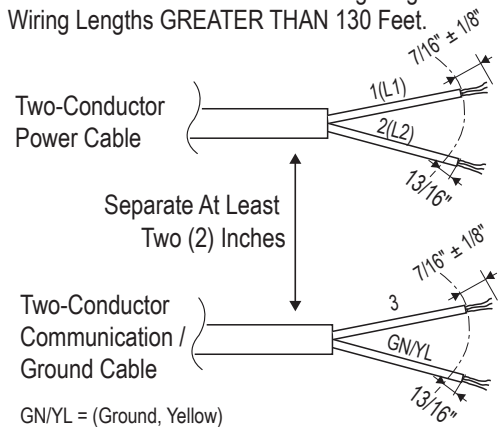


Figure 62: Multi F with LGRED Outdoor Unit to Indoor Unit, and Multi F MAX with LGRED Branch Distribution Unit to Indoor Unit Wiring Diagram for Wiring Lengths GREATER THAN 130 Feet.



# MULTI F MULTI F MAX

# WIRING

## Communication / Connection Cable Specifications

Figure 63: Typical Multi F with LGRED System General Power / Communications System Schematic When Wiring is Less Than 130 Feet.

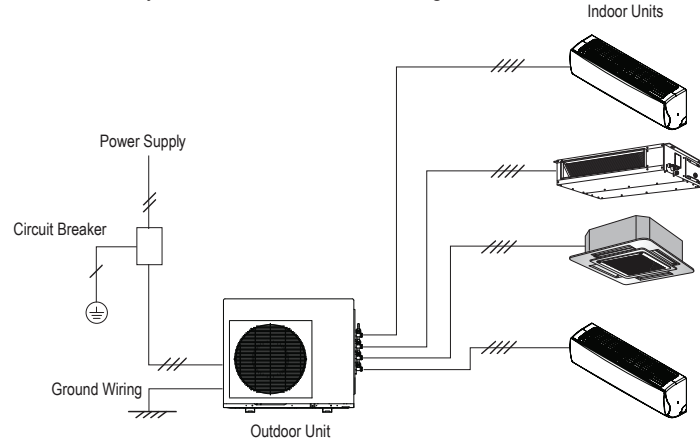


Figure 64: Typical Multi F MAX with LGRED System General Power / Communications System Schematic When Wiring is Less Than 130 Feet.

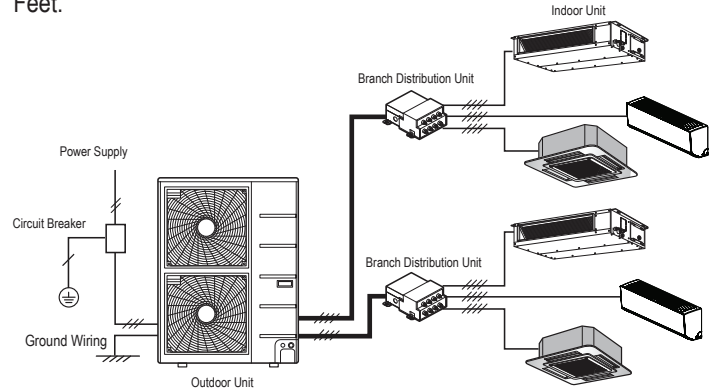


Figure 65: Schematic of a Multi F with LGRED System When the Wiring is GREATER THAN 130 Feet.

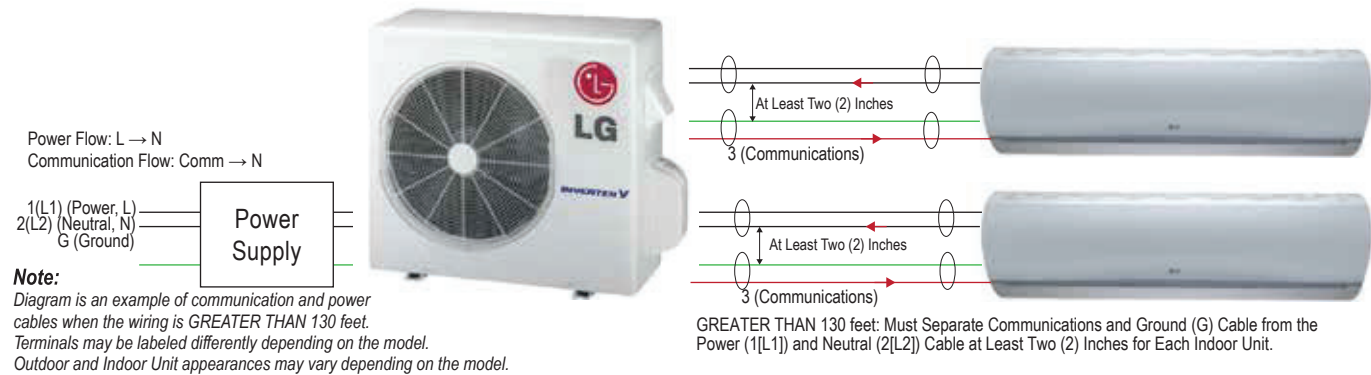
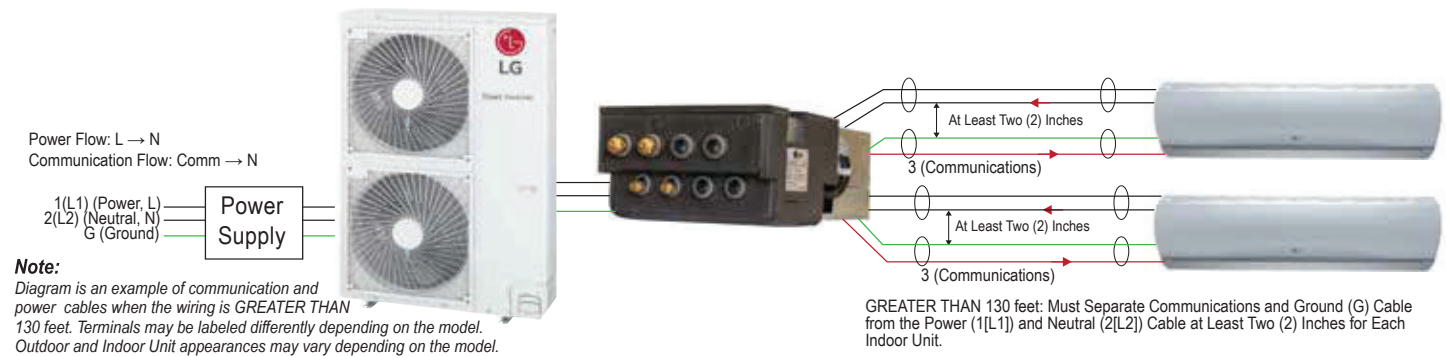


Figure 66: Schematic of a Multi F MAX with LGRED System When the Wiring is GREATER THAN 130 Feet.



### Controller Options

Wall-mounted indoor units include a wireless handheld remote controller (Model No. AKB74955602), but optional LG-supplied wired controllers are available. After all wiring is connected to the indoor and outdoor units, test the accompanying remote controllers for performance. As always, follow all safety warnings and notes when operating the units using the remote controller. Additionally, all of the Multi F / Multi F MAX outdoor units can use the following controllers when accompanied with the PI 485 VNet Accessory:

- AC Smart
  - ACP
  - BACnet®
  - LonWorks®
- BACnet® is a registered trademark of ASHRAE  
LonWorks® is a registered trademark of Echelon Corporation.*

### Communication Cables From Indoor Units to Remote Controllers

- Communication cable from indoor unit to remote controller(s) is to be 22 AWG, 3-conductor, twisted, stranded, unshielded. Wiring must comply with all applicable local and national codes.
- If using the LG Controller / Extension cable and the length needs to be further extended, the LG Extension Kit (sold separately) must be used. A maximum of four (4) kits (up to 165 feet) can be used.
- Remote controllers have hardwired connections: SIG - 12V - GND (Comm.) terminals.
- Indoor unit controller connections depend on type of indoor unit being installed. Some indoor units use terminal block connections; other indoor units use Molex connections. See diagrams below for the two options. Refer to the wiring diagram schematic found in the indoor unit itself, or to the indoor unit wiring diagrams in the Engineering Manuals for more information.
- ⚠ NEVER splice, cut, or extend cable length with field provided cable. Always include enough cable to cover distance between the indoor unit and the remote controller.
- Set the indoor unit operating parameters using DIP switches, or by setting up the remote controller. Refer to the indoor unit installation manuals for more details.

Figure 67: One Example of Indoor Unit to Zone Controller Connection.

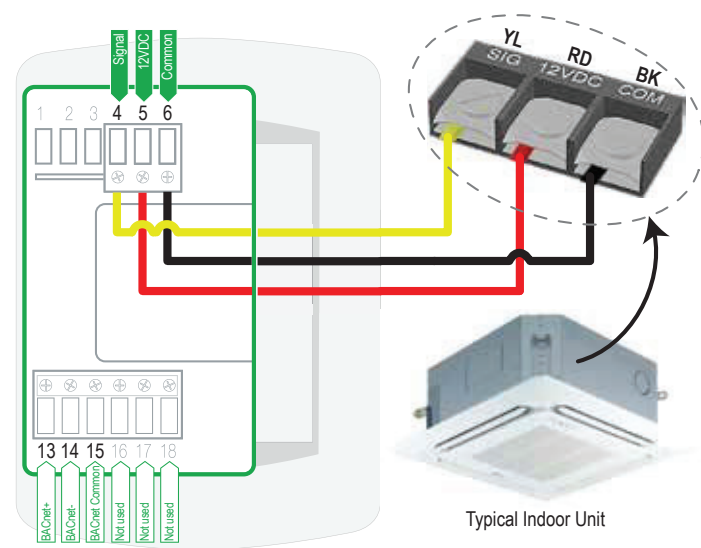
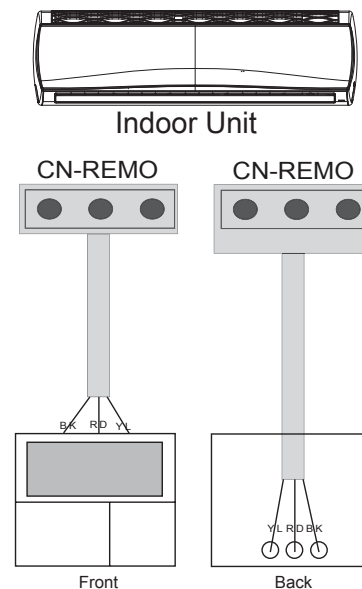


Figure 68: Another Example of Indoor Unit to Zone Controller Connection.



### Note:

Cable connected to Zone Controller is the factory default connection.

## Communication Cables Between Multiple Indoor Units Operating as a Group (Group Control)

If any indoor units were specified to operate in unison:

- Before running cable, decide which indoor unit will be the “Master.” The other indoor units in that group will be designated as “Slave(s).” The zone controller will be connected to the “Master.”
- Set the pertinent DIP switch at each indoor unit to identify the Master and Slave(s). On wall mounted indoor unit models, set the assignment using the handheld remote controller.
- Use a daisy chain configuration and connect all of the group’s indoor units together starting at the “Master” unit.
- ⚠ NEVER splice, cut, or extend cable length with field provided cable. Always include enough cable to cover distance between all components.

### For indoor units with hardwired connections SIG - 12V - GND (Comm.) terminals:

- From the controller to the master indoor unit, use 22 AWG, 3-conductor, twisted, stranded, unshielded. All wiring must comply with all applicable local / national codes.
- From the master indoor unit to the slave indoor unit(s), daisy chain using 22 AWG, 3-conductor, twisted, stranded, unshielded. All wiring must comply with all applicable local / national codes.
- (⚠ Do not attach wire to 12VDC terminal to the slave indoor units). All wiring must comply with all applicable local and national codes.
- ⚠ NEVER splice, cut, or extend cable length; always include enough cable to cover distance between all components.

### For indoor units with CN-REMO connections:

Use one (or multiple) Group Control Kit(s) (sold separately) containing extension and Y-splitter cables. Use one (1) group control cable kit for each indoor unit in the group except for the last indoor unit. ⚠ NEVER splice, cut, or extend cable length with field provided cable.

### Note:

- Cable connected to zone controller is the factory default connection.
- Indoor unit connections depend on indoor unit type.

### General Specifications

- Wired remote controllers can be connected to all indoor unit types.
- Wireless controllers can be used in conjunction with wired remote controllers.
- A dry contact unit can be connected with a central controller simultaneously.
  - The master indoor unit is recognized by the dry contact unit and the central controller.
  - Group Control only available for indoor units manufactured after February 2009.
  - The central controller can control indoor units after setting the address of the master indoor unit only.
  - Slave indoor unit cannot be individually controlled by central controller.
  - Slave indoor unit will operate like master indoor unit.
- If an error occurs with the indoor unit, the error will be displayed on the wired remote controller.
- The following functions are available with group control:
  - Selection of operation options (operation/mode/set temperature)
  - Control of air flow rate (High/Medium/Low)

Figure 69: Example of Indoor Unit Group to Zone Controller Connections (Sig-12V-GND [Comm.] Terminal).

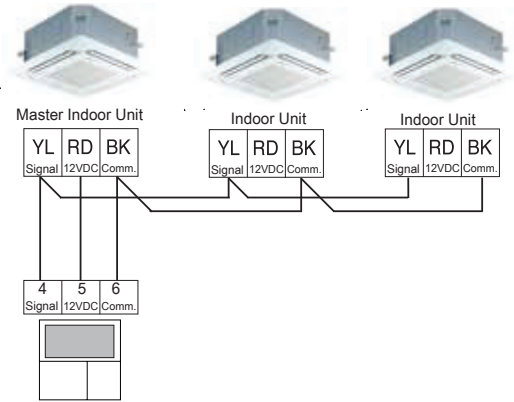


Figure 70: Example of Indoor Unit Group to Zone Controller Connections (CN-REMO).

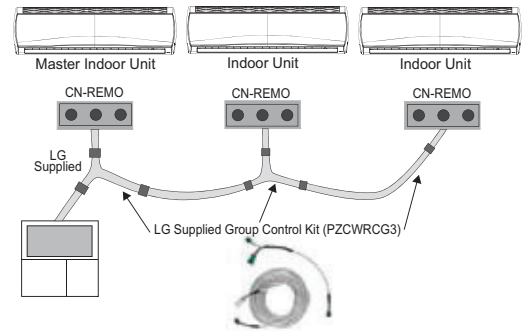


Table 18: Accessories for Some Group Control Applications.

Accessory	Model Number	Image
Wired Remote Group Control Cable Assembly, Required for connecting multiple indoor units to a control group	PZCWRCG3	
Wired Remote/Wired Remote Extension Cable, Required for extending the distance between indoor units or remote controllers in a control group	PZCWRC1	

### Connecting the Power Wiring / Communication Cable - HVT Indoor Units

#### ⚠ WARNING

- Verify that main power to the unit is completely off before proceeding with these steps as there is a risk of electrical shock, bodily injury, and / or death.
- Follow all safety and warning information outlined at the beginning and throughout this manual. Failure to do so will cause electrical shock, bodily injury, and / or death.

#### Note:

- Follow all safety and warning information outlined at the beginning and throughout this manual. Failure to do so will cause unit failure.
- Connect the communication / connection (power) cable to the indoor unit by matching the terminals on the outdoor unit control board. Verify the color of the wires at the outdoor unit, along with the terminal numbers, match those for the indoor unit.
- Images are representative; actual appearance will vary.
- Refer to the circuit diagram on the indoor unit bottom cover.

#### HVT Indoor Unit Wiring Installation Procedure

1. The front panel must already be opened, and the bottom panel must already be removed. If not, fully open the front panel. The control cover can be accessed on the bottom right side of the front of the indoor unit.
2. At the bottom panel of the indoor unit, unsnap the latches that cover the screws. Number of screws on the panel will differ by indoor unit model.
3. Using a Phillips head screwdriver, remove the screws from the bottom panel of the indoor unit and set aside for re-installation.
4. Remove the bottom panel, being careful not to scratch the main horizontal vane. Set aside the bottom panel to re-install after all procedures are complete.
5. Remove the control cover on the bottom right side of the front of the indoor unit by detaching the screw. Set the screw and the control cover aside for re-installation.

Figure 71: Latch over Screws on Indoor Unit Bottom Panel.



Figure 72: Remove Screws from Bottom Panel.



Figure 73: Remove Bottom Panel.



- Route the power wiring / communications (connection) cable through the bottom of the indoor unit (through a knockout panel) to the terminal block.
- Using a JIS screwdriver, connect the cable terminals to the terminal block. Ensure wire color and terminal number of the indoor unit matches those of the outdoor unit. Refer to the wiring diagram on the inside of the cover.
- Choice of the cable path out of the indoor unit and to the outdoor unit depends on refrigerant piping / drain hose installation: left side piping, following back of indoor unit; right side piping, through the knockout hole; or rear piping.

Figure 74: Indoor Unit Knockout.



Figure 75: Indoor Unit Terminal Block with Ground Cable (Example Only).



### Note:

- Each wire must be securely attached to the terminal block.
- Ground cable must be longer than the other wires.
- Secure the cable onto the control board using a cable tie.
- Use a conduit to protect the cable / refrigerant piping from the indoor unit to the outdoor unit.

### Cable Installation When Piping is on the Left Side:

- Insert the communication / connection (power) cable through the bottom of the indoor unit.
- Connect the terminals to the terminal block.
- Secure the cable onto the terminal block with the cable retainer.
- Secure the refrigerant piping, drain hose, and communication / connection (power) cable together using cable ties and conduit, or by the bundling method.

### Note:

*Position the drain hose at the bottom. Positioning the drain hose at the top of the bundle can cause condensate to overflow from the drain pan in the inside of the indoor unit.*

### Cable Installation When Piping is on the Right Side:

- Connect the terminals to the terminal block.
- Secure the cable onto the terminal block with the cable retainer.
- Secure the refrigerant piping, drain hose, and communication / connection (power) cable together using cable ties and conduit, or by the bundling method.

### Note:

- *Position the drain hose at the bottom. Positioning the drain hose at the top of the bundle can cause condensate to overflow from the drain pan in the inside of the indoor unit.*
- *For more information on conduits or the bundling method, see the Refrigerant Piping Connection section.*

- Reattach the control cover using the screw.

# WIRING

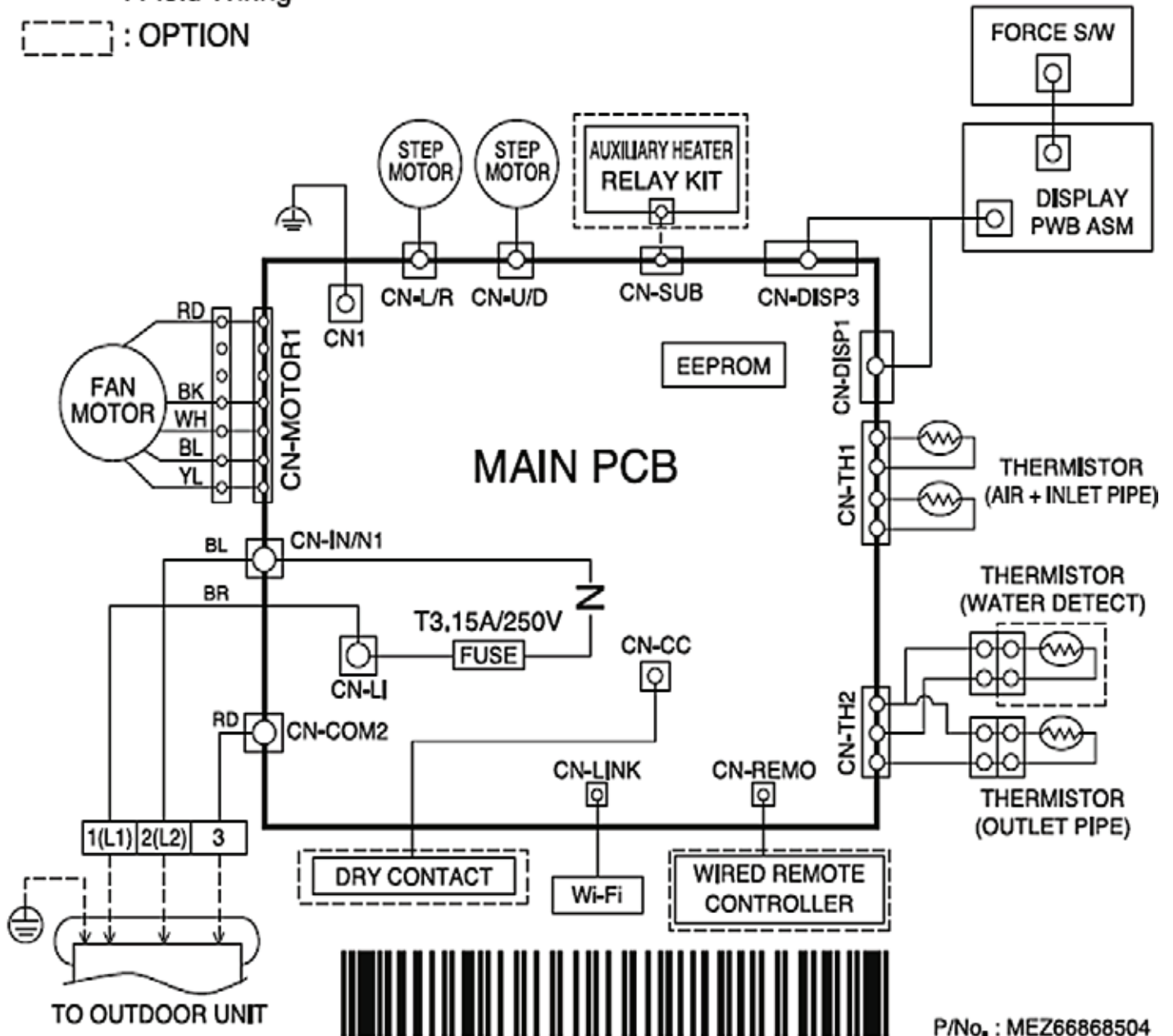
## Indoor Unit Electrical Connections

# MULTI F MULTI F MAX

Figure 76: LMN079HVT, LMN159HVT, LMN249HVT Indoor Unit Wiring Diagram.

- : Factory Wiring
- - - : Field Wiring
- ⋯ : OPTION

USE COPPER SUPPLY WIRE



P/No. : MEZ66868504



Multi F Standard Wall-Mounted Indoor Unit



Figure 77: Connecting the Power Wiring / Communication Cable to the HVT Indoor Unit Terminal Block - Front View.

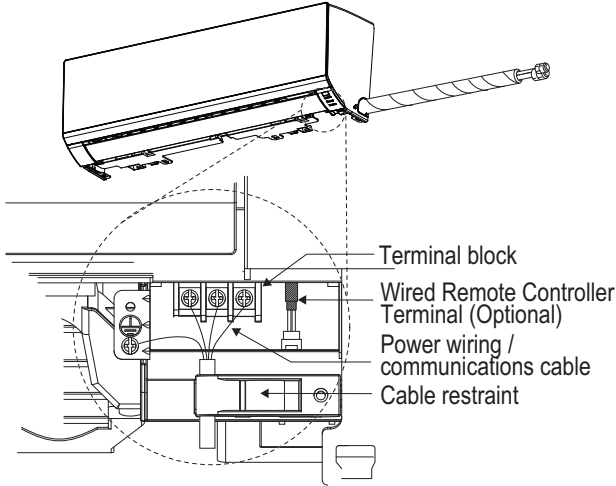


Figure 78: Connecting the Power Wiring / Communication Cable to the HVT Indoor Unit Terminal Block - Back View.

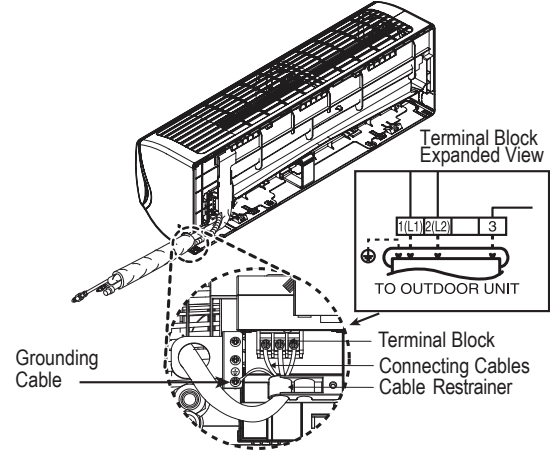


Figure 79: Indoor Unit to Outdoor Unit / Branch Distribution Unit Terminal Connections—LMN079HVT and LMN159HVT.

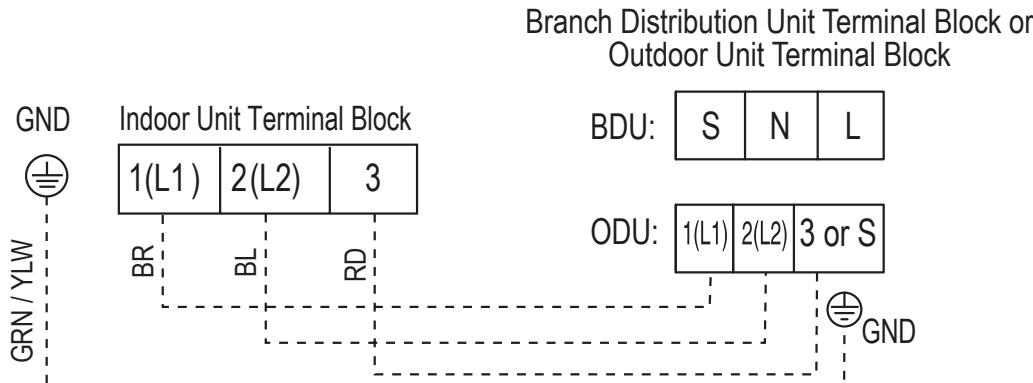
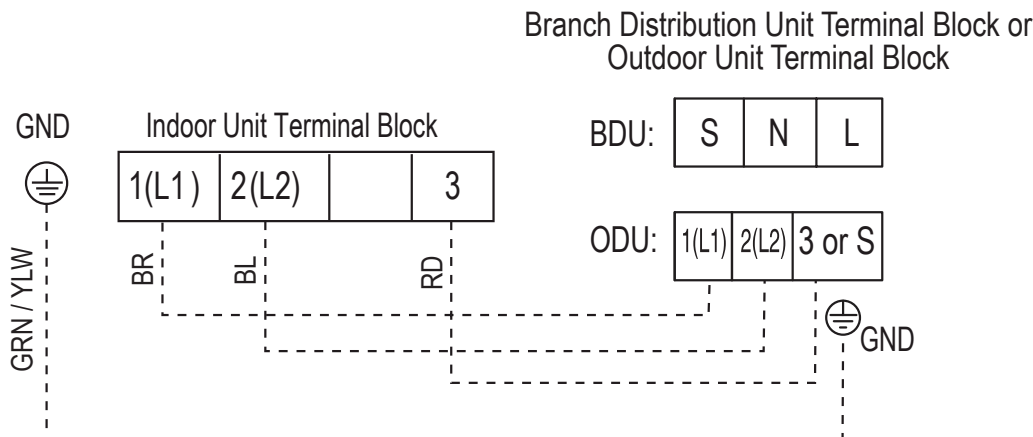


Figure 80: Indoor Unit to Outdoor Unit / Branch Distribution Unit Terminal Connections—LMN249HVT.



# WIRING

## Indoor Unit Electrical Connections

# MULTI F MULTI F MAX

### Connecting the Power Wiring / Communication Cable - HSV5 Indoor Units

#### ⚠ WARNING

- Verify that main power to the unit is completely off before proceeding with these steps as there is a risk of electrical shock, bodily injury, and / or death.
- Follow all safety and warning information outlined at the beginning and throughout this manual. Failure to do so will cause electrical shock, bodily injury, and / or death.

#### Note:

- Follow all safety and warning information outlined at the beginning and throughout this manual. Failure to do so will cause unit failure.
- Connect the communication / connection (power) cable to the indoor unit by matching the terminals on the outdoor unit control board. Verify the color of the wires at the outdoor unit, along with the terminal numbers, match those for the indoor unit.
- Images are representative; actual appearance will vary.
- Refer to the circuit diagram on the indoor unit bottom cover.

#### HSV5 Indoor Unit Wiring Installation Procedure

1. The bottom panel must have already been removed. If it hasn't been removed, unsnap the bottom cover at its top left and right sides (Location 1).
2. Unsnap each of the three (3) or four (4) small C-hooks located in the middle of the bottom cover (Location 2). Number of C-hooks present depends on model of indoor unit.
3. Lift the three (3) to four (4) hinges on the bottom cover up and out of the channels molded to the left, right, and middle of the indoor unit (Location 3). Number of hinges present depends on model of indoor unit.
4. Set aside the bottom cover to re-install after all procedures are complete.
5. Terminal block is located at the front bottom-right—hand side of the indoor unit. To access the terminals, unscrew the metal control cover screw (if applicable), and raise the metal control cover.
6. Using a JIS screwdriver, connect the cable terminals to the terminal block. Ensure wire color and terminal number of the indoor unit matches those of the outdoor unit. Refer to the wiring diagram on the inside of the bottom cover.

#### Note:

- Each wire must be securely attached to the terminal block.
- Ground cable must be longer than the other wires.
- Secure the cable onto the control board using a cable tie.
- Use a conduit to protect the cable / refrigerant piping from the indoor unit to the outdoor unit.

Figure 81: Steps to Removing the Bottom Cover.

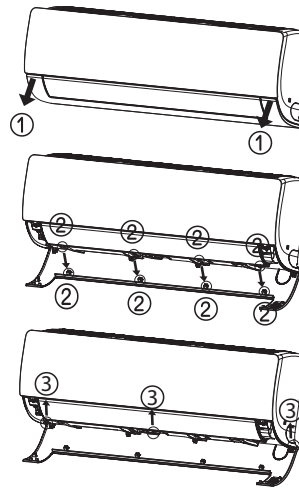


Figure 82: Removing the Bottom Cover (Appearances Will Vary Depending on Indoor Unit Model).



Figure 83: Location of the Indoor Unit Terminal Block.

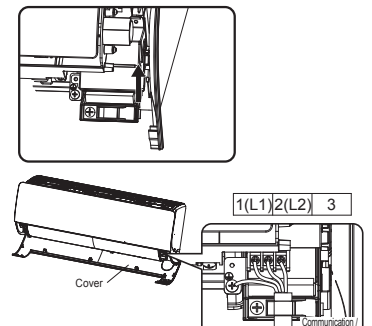
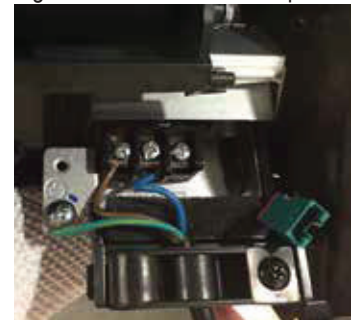


Figure 84: Terminal Cover Down.



Figure 85: Terminal Cover Up.



### Connecting Indoor Unit Electrical Wiring, continued.

7. Choice of the cable path out of the indoor unit and to the outdoor unit depends on refrigerant piping / drain hose installation:  
left side piping, following back of indoor unit; right side piping, through the knockout hole; or rear piping.

#### Cable Installation When Piping is on the Left Side:

- Insert the communication / connection (power) cable through the bottom of the indoor unit,
- Connect the terminals to the terminal block.
- Secure the cable onto the terminal block with the cable retainer.
- Secure the refrigerant piping, drain hose, and communication / connection (power) cable together using cable ties and conduit, or by the bundling method.

#### Note:

Position the drain hose at the bottom. Positioning the drain hose at the top of the bundle can cause condensate to overflow from the drain pan in the inside of the indoor unit.

#### Cable Installation When Piping is on the Right Side:

- Connect the terminals to the terminal block.
- Secure the cable onto the terminal block with the cable retainer.
- Secure the refrigerant piping, drain hose, and communication / connection (power) cable together using cable ties and conduit, or by the bundling method.

#### Note:

Position the drain hose at the bottom. Positioning the drain hose at the top of the bundle can cause condensate to overflow from the drain pan in the inside of the indoor unit.

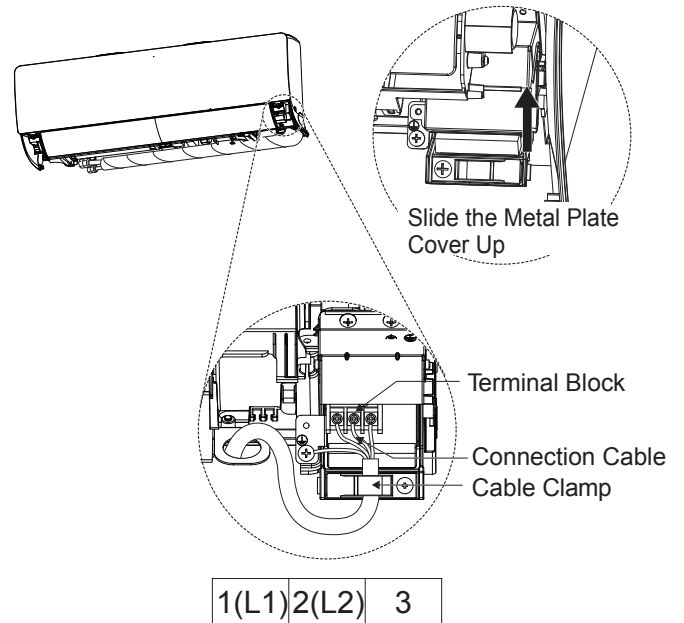
#### Note:

For more information on conduits or the bundling method, see the Refrigerant Piping Connection section.

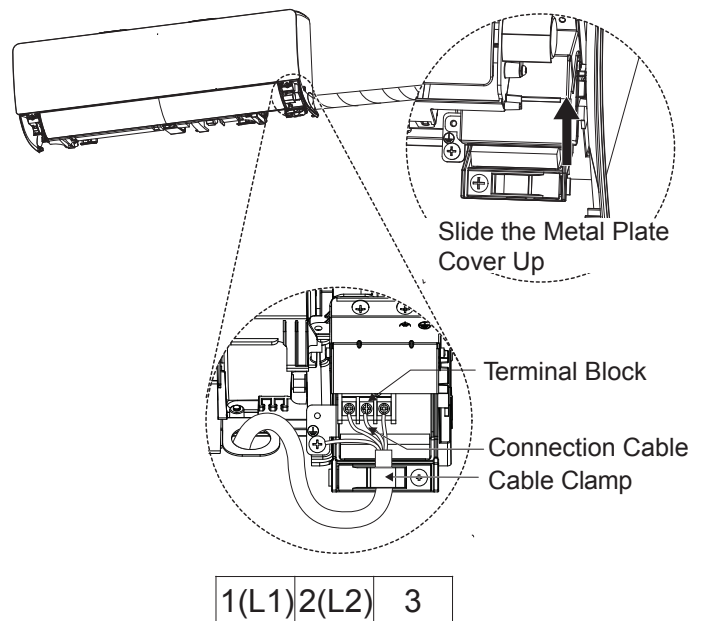
8. Reattach the metal control cover using the screw (if applicable).

Figure 86: Cable / Refrigerant Piping / Drain Hose Installation Options.

### Wiring When Piping is on the Left Side



### Wiring When Piping is on the Right Side

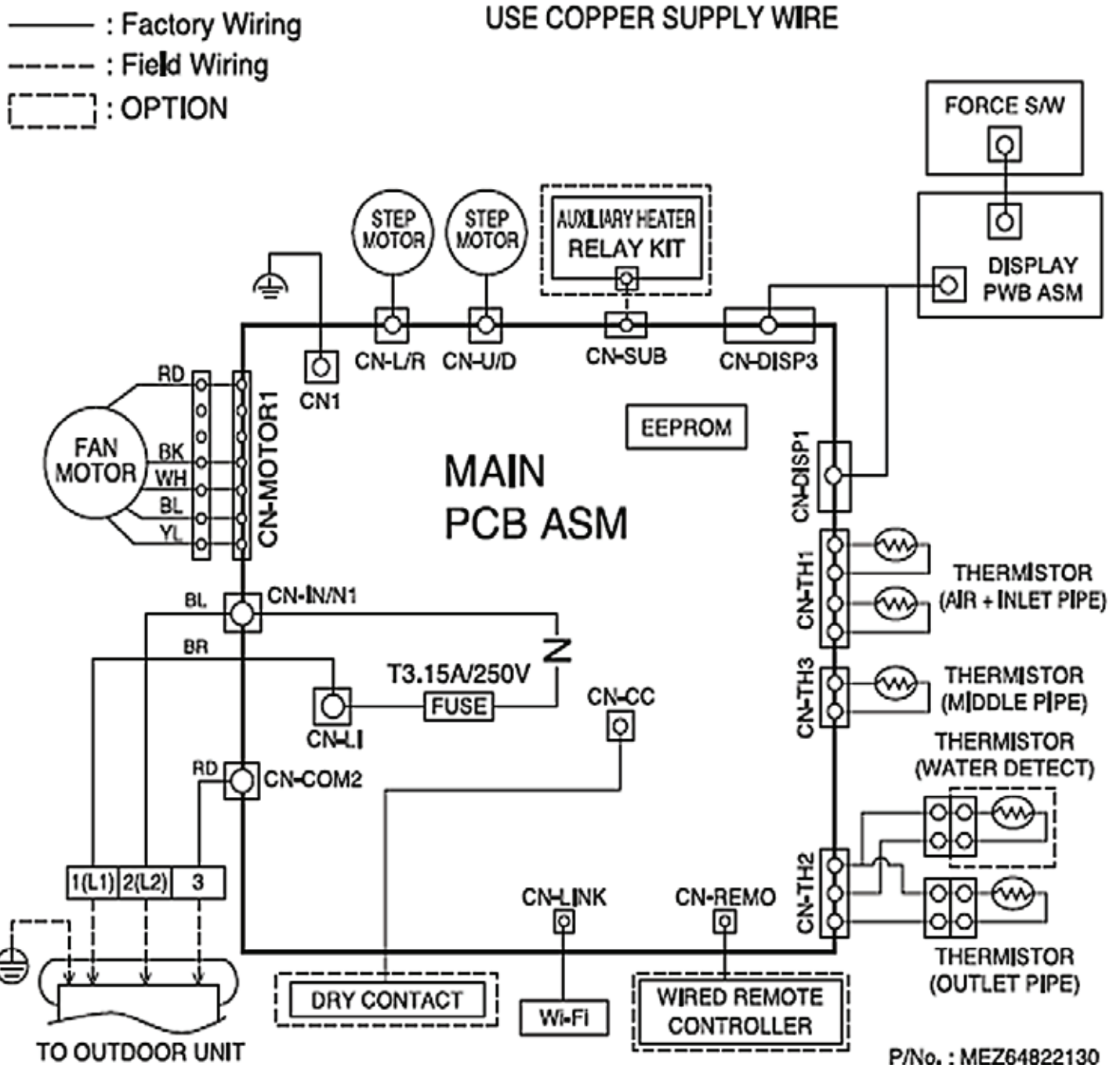


# WIRING

## Indoor Unit Electrical Connections

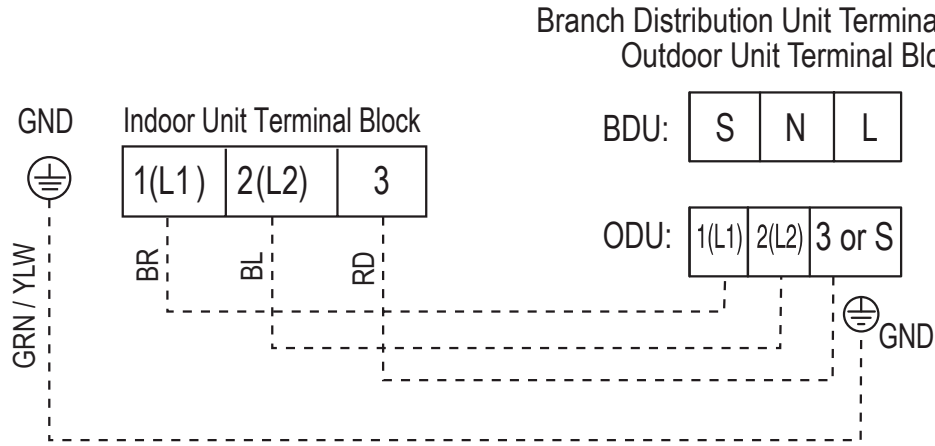
# MULTI F MULTI F MAX

Figure 87: LSN090HSV5, LSN120HSV5, LSN180HSV5 Indoor Units Wiring Diagram.



Multi F Standard Wall-Mounted Indoor Unit

Figure 88: Indoor Unit to Outdoor Unit / Branch Distribution Unit Terminal Connections—LSN090HSV5, LSN120HSV5 and LSN180HSV5.



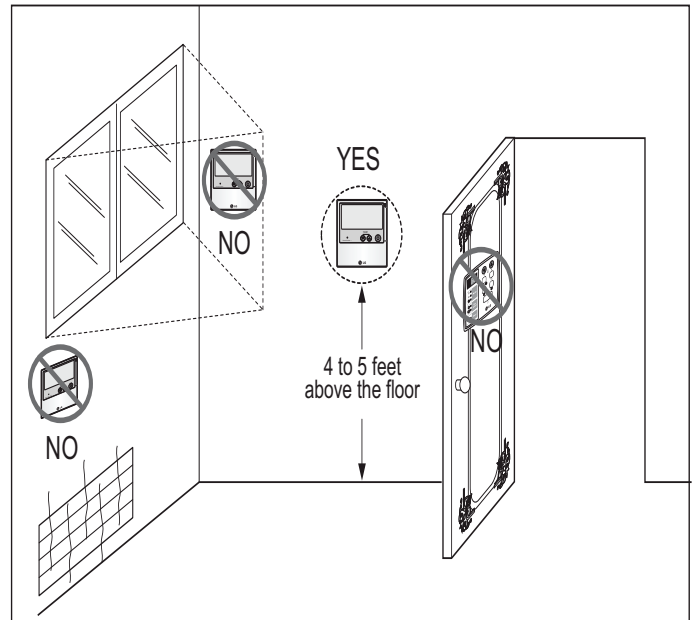
### Wired Controller Installation

Wall indoor units can be used with various wired controllers (optional; sold separately). Wired controllers include a sensor to detect room temperature. To maintain comfort levels in the conditioned space, the wired controller must be installed in a location away from direct sunlight, high humidity, and where it could be directly exposed to cold air. Controller must be installed four (4) to five (5) feet above the floor where its display can be read easily, in an area with good air circulation, and where it can detect an average room temperature.

⊘ Do not install the remote controller where it can be impacted by the following:

- Drafts or dead spots behind doors and in corners
- Hot or cold air from ducts
- Radiant heat from sun or appliances
- Concealed pipes and chimneys
- Uncontrolled areas such as an outside wall behind the remote controller

1. Pull communications cable between the controller handy box (if used) and the indoor unit.
2. Store a minimal amount of cable in the handy box. Any additional cable must be coiled and stored near the indoor unit control panel.
3. If additional cable length is needed, communication cable from the indoor unit to the remote controller(s) is to be 22 AWG, 3-conductor, twisted, stranded, unshielded. Wiring must comply with all applicable local and national codes. If using the LG Controller / Extension cable and the length needs to be further extended, the LG Extension Kit (sold separately) must be used. A maximum of four (4) kits (up to 165 feet) can be used.
4. If the cable between a zone controller and the indoor unit is too long, ⊘ do not cut. Coil any spare communications cable, tie-wrap it, and leave it next to the indoor unit location.



### Wall-Mounted Sensor Installation

Proper indoor unit operation depends on the location of the room sensor, if a room sensor is installed in addition to, or to use in place of a controller. A good location will protect the sensor from direct sunlight and external local sources of water vapor, and air flow. If no mounting height was specified by the building designer, place the handy box approximately four (4) to five (5) feet above the finished floor.

- It could be necessary to use a handy box that is sized in metric units, depending on the sensor model. Check with your LG representative to verify which size of handy box is needed for the sensor in question.
- Communication cable from the indoor unit to the controller(s) is to be 22 AWG, 3-conductor, twisted, stranded, unshielded. Wiring must comply with all applicable local and national codes. If using the LG Controller / Extension cable and the length needs to be further extended, the LG Extension Kit (sold separately) must be used. A maximum of four (4) kits (up to 165 feet) can be used.
- Maintain at least the minimum distance required between the communications cable and power wiring. The minimum required space between the two depends on the voltage of the power wiring.

### Note:

- ⊘ Do not route power wiring and communications cables in the same conduit. Routing power wiring and communications cables together will cause communication errors and unit malfunction.
- ⊘ Do not cut the quick-connect plugs off or adjust the length of the cable. Keep the communications cable away from high voltage wires and electromagnetic field (EMF) producing equipment. Performing these actions will cause communication errors and unit malfunction.

### Reattaching the Indoor Unit Panels - HVT

Reattach the indoor unit front and bottom panel after all other installation procedures are complete.

1. If ON, shut power OFF to the system. If it hasn't already, reattach the control cover with its screw.
2. Reattach the bottom panel to the indoor unit, carefully aligning the panel using the rear tabs. Tap the panel gently to verify it engages at the bottom.
3. Using a Phillips screwdriver, reattach the screws to the bottom panel.
4. After the screws are in place, re-snap the latches over the screws.
5. Shut the front panel. Tap the panel gently to verify it is fully shut.

Figure 89: Reattaching the Bottom Panel.



Figure 90: Reattaching the Screws on the Bottom Panel.



Figure 91: Reattaching the Screws on the Bottom Panel.



### Reattaching the Indoor Unit Bottom Cover - HSV5

Reattach the indoor unit bottom cover after all other installation procedures are complete.

1. If ON, shut power OFF to the system.
2. At the bottom of the bottom cover, insert the three (3) to four (4) hinges into the channels molded to the left, right, and middle of the indoor unit (Location 1). Number of hinges present depends on model of indoor unit.
3. After all hinges are secure, match the three (3) or four (4) small C-hooks located in the middle of the bottom cover (Location 2) to their sockets on the indoor unit. (Number of C-hooks present depends on model of indoor unit.) On the outside of the bottom cover, securely snap the C-hooks in place at each location using the heel of the palm.
4. Match the snaps at the top left and right sides of the bottom cover to their sockets, and push to lock the bottom cover to the indoor unit (Location 3).
5. Verify the bottom cover is securely installed by pushing the bottom cover to the indoor unit at all attachment locations.

#### Note:

To prevent bending the bottom cover (and subsequent damage), assemble the bottom cover correctly.

Figure 92: Close Up of Bottom Cover Connections (Appearances Will Vary Depending on Indoor Unit Model).

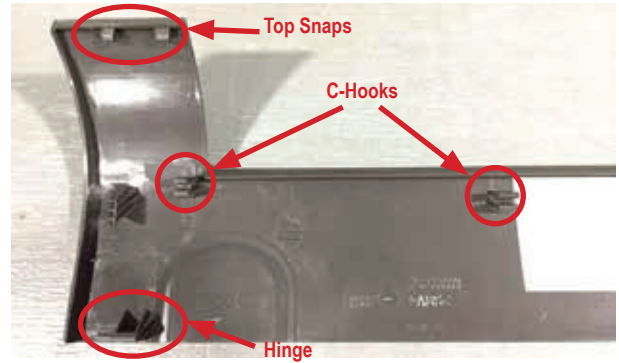


Figure 93: Inserting the Bottom Cover Hinges into the Indoor Unit Channels (Step 2).

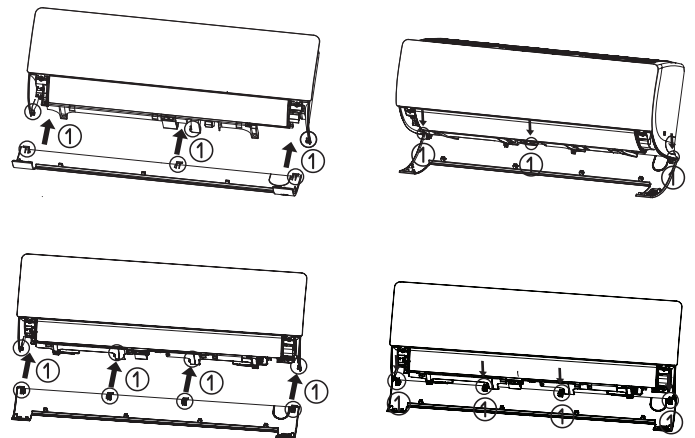


Figure 94: Securing the Bottom Cover C-hooks to the Indoor Unit Sockets (Step 3).

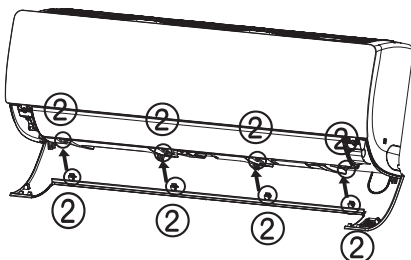


Figure 95: Snapping the Top Left and Right Sides (Step 4).

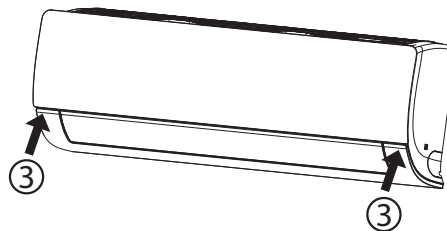
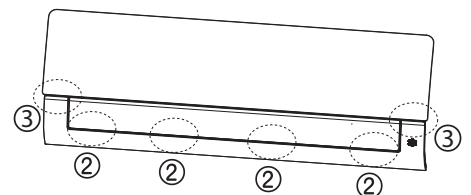


Figure 96: Checking that All Attachment Locations Are Secure (Step 5).





### Air Filter Disassembly and Assembly - HSV5

#### Air Filter Disassembly

1. Turn power off to the system.
2. Find the handles located at the top-front of the air filter molded into the plastic frame support.
3. Lift handles slightly up and out to remove the air filter.

Figure 97: Disassembling the Air Filter (Appearances Will Vary Depending on Indoor Unit Model).

2. Lifting the Air Filter by the Handles.



3. Disassembling the Air Filter.



#### Air Filter Assembly

1. Turn power OFF to the system.
2. Holding the air filter by its handles, match the hooks and grooves on the air filter to the hooks and grooves at the top-back of the indoor unit. (Number of hooks and grooves present depends on model of indoor unit.)
3. Match the air filter bars and grooves to the grooves and hooks at the top-front of the indoor unit.
4. Use thumbs to gently snap the air filter to the indoor unit where the top-front bars, grooves, and hooks are located.
5. Check the sides of the front grille to verify the air filter is assembled correctly.
6. Turn power back on to the system.

Figure 98: Assembling the Air Filter (Appearances Will Vary Depending on Indoor Unit Model).

2. Matching Hooks to Top-Back Grooves.



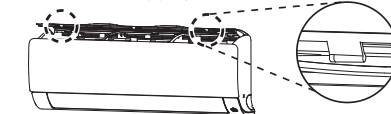
- Three (3) Top-Back Hooks to Grooves.



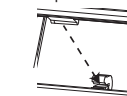
- Four (4) Top-Back Hooks to Grooves.



3. Location of Two (2) Top-Front Bars.



- Example of Indoor Unit Hook to Air Filter Groove.



4. Securing the Air Filter on the Indoor Unit.



5. Checking the Sides for Correct Air Filter Assembly.



#### Note:

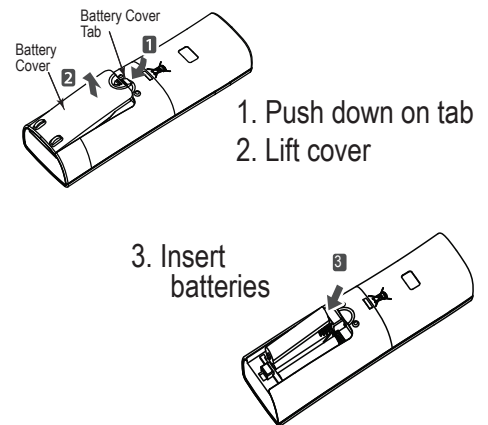
- It is easier to assemble and disassemble the air filter if standing on a ladder looking down at the top of the indoor unit.
- Do not bend the air filter; this damages it.
- If the air filter is not assembled correctly, dust and other substances will enter the indoor unit.

### Installing Batteries into the Handheld Remote Controller

For information on using the handheld remote controller, refer to its owner's manual.

1. The remote controller needs two AAA (1.5V) batteries for operation. Remove the battery cover from the back of the remote controller by pushing downward on the tab at the top of the battery cover, and then lift up to remove.
  - Align batteries by the (+) and (-) sides.
  - The interior battery compartment of the remote controller will have clear markings for the (+) and (-) placement.
2. Insert the two new batteries.
3. Verify that the batteries have clicked into the compartment and are firmly engaged with the contacts on either side of them.
4. Reattach the back cover of the remote controller.
5. Proceed with powering on the remote controller and use as needed. Remove the batteries if system won't be used for an extended time.

Figure 99: Installing the Remote Controller Batteries.



### Troubleshooting Using Error Codes

Refer to the table below for error codes that are generated from the indoor units (see the Multi F / Multi F MAX Outdoor Unit Installation Manual for outdoor unit error codes). These codes are the most common. Your particular system might generate additional codes not listed here. Please contact LG Support if you see these types of errors and a simple power cycle has not corrected the issue.

#### Error Codes

- Indicate different types of unit failures, assists in self-diagnosis and to track the frequency of occurrence.
- Error codes are displayed on indoor unit LEDs, wired remote controllers, the outdoor unit PCB, and through the SIMS app and LG Monitoring View (LGMV) diagnostic software. Also, check the wired remote controller display first for error codes if present.
- If two or more errors occur simultaneously, the lower error code number is displayed first.
- After the error is resolved, the error code does not display.

### Decoding the Error Display

The first and second number on the LED indicates error number. Example: 21 = LED1 (Green light) 2x blink, LED2 (Red light) 1x blink.

#### Error Code Nomenclature Definitions

- MICOM: Non-volatile memory chip where unit setup information is stored.
- EEPROM: Non-volatile memory chip where device identification, size, and factory defined default component operating parameters are stored.

Table 19: Multi Zone Wall-Mounted Indoor Unit Error Codes

Error Code	Description	Number of Times Indoor Unit LEDs Blink	
		LED 2	LED 1
1	Indoor unit room temperature sensor error	-	1X
2	Indoor unit inlet pipe sensor error	-	2X
4	Float switch error (optional)	-	4X
5	Communication error between indoor unit and outdoor units	-	5X
6	Indoor unit outlet pipe sensor error	-	6X
9	Indoor unit EEPROM error	-	9X
10	Indoor unit BLDC motor fan lock	1X	-
12	Indoor unit middle pipe sensor error	1X	2X

# TROUBLESHOOTING

## Error Codes

# MULTI F MULTI F MAX

### Troubleshooting Using Error Codes - Continued

Table 20: Multi F / Multi F MAX with LGRED Outdoor Unit Error Codes

Error Code	Description	No. of Times Outdoor Unit LEDs Blink	
		LED 1 = Green	LED 2 = Red
21	DC Peak (IPM Fault); Compressor DC voltage was too high	1X	2X
22	Current Transformer2 (CT2) error; Alternating current (AC) input too high	2X	2X
23	DC Link Low Volt	3X	2X
25	AC Low/High Volt	5X	2X
26	DC Comp Position Error (not providing rotation), Locking	6X	2X
27	PSC Fault; Current to inverter compressor between AC and DC converter circuit too high	7X	2X
28	Inverter compressor DC voltage is too high	8X	2X
29	Inverter compressor amperage is too high	9X	2X
31	Current-to-current transformer (CT) thermistor is too low	1X	3X
32	Inverter Compressor Discharge Pipe (D-Pipe) Overheat	2X	3X
40	CT Sensor Error; Thermistor is disconnected or shorted out	-	4X
41	D-Pipe Sensor INV is disconnected or shorted out	1X	4X
44	Outdoor Air Sensor is disconnected or shorted out	4X	4X
45	Middle thermistor of outdoor unit condenser coil is disconnected or shorted out	5X	4X
46	Outdoor unit suction line thermistor is disconnected or shorted out	6X	4X
48	Outdoor unit coil outlet (liquid line) thermistor is disconnected or shorted out	8X	4X
53	Communication failure from outdoor unit to indoor unit	3X	5X
60	Outdoor unit printed circuit board (PCB) EEPROM check sum error	-	6X
61	Outdoor unit condenser coil temperature is too high	1X	6X
62	Outdoor unit inverter compressor PCB heat sink temperature is too high	2X	6X
63	Condenser coil pipe thermistor temperature is too low	3X	6X
65	Heat sink thermistor has disconnected or has shorted out	5X	6X
67	Outdoor brushless direct current (BLDC) fan motor lock error	7X	6X

Refer to Service Manuals posted on [www.lghvac.com](http://www.lghvac.com) for a full description of all error codes and workarounds.

# MULTI F MULTI F MAX

# INSTALLATION CHECKLIST

PAGE 1 of 2

System ID No.: \_\_\_\_\_ Indoor Unit ID.: \_\_\_\_\_

Checked by: \_\_\_\_\_ Date: \_\_\_\_\_ Signature: \_\_\_\_\_

## Major Component Rough-In

Description	Check
The unit was connected properly per local code and the product installation procedures.	
All literature and bagged accessories have been removed from the fan discharge (ducted and cassette model indoor units).	
All indoor units and branch distribution unit(s) (Multi F MAX with LGRED only) are installed, properly supported, and located indoors in a non-corrosive environment.	

## Piping Material, Components, and Insulation

Description	Check
Multi-zone duct-free split systems: ACR copper piping rated at the system working pressure was used.	
LG Y-branch fitting was used per manufacturer's recommendations.	
All refrigerant pipes and valves were insulated separately. Insulation is positioned up against the walls of the indoor units and branch distribution units (Multi F MAX with LGRED only). No gaps shown. Insulation was not compressed at clamps and hangers.	

## Brazing Practices

Description	Check
Use medical grade dry nitrogen for purging during brazing (constant 3 psig while brazing).	
15% silver brazing material only.	

## Refrigerant Piping

Description	Check
You must have in your possession a copy of the "As-Designed" LATS Multi V piping tree diagram. BEFORE ANY FIELD PIPE SIZE OR LENGTH CHANGES ARE MADE, PROPOSED CHANGES MUST BE FORWARDED TO THE DESIGN ENGINEER SO THAT THEY CAN INPUT THE CHANGES INTO LATS and RE-ISSUE A NEW LATS MULTI V PIPING TREE DIAGRAM. Installer must receive change authorization from the design engineer, because any change made requires the review of the entire tree diagram and verification that the change did not impact the size of piping segments in other parts of the system.	
All pipe materials were properly stored, capped, and clean. All burrs were removed after cutting and pipe ends were reamed before brazing.	
During refrigerant pipe installation, for each segment of pipe, a record was made of the pipe length (including expansion loops, offsets, double-back sections), and sizes, as well as the quantity and type of elbows used.	
Expansion loops, coils or other acceptable measures are provided where necessary to absorb temperature-change based pipe movement.	
A torque wrench and backup wrench were used to tighten all flare connections.	
The back side of all flares were lubricated with a small drop of PVE refrigeration oil before tightening flare fittings.	
Ensure all field made flares are 45°. Use factory-supplied flare nuts only.	
Pipe segments and Y-branch fittings are secured to the structure using a combination of fixed and floating clamps, and all wall penetrations were sleeved.	
Pipe insulation was not compressed at any point.	
Y-branch fittings were properly INSTALLED per details provided in the Multi F / Multi F MAX with LGRED Outdoor Unit Installation Manual.	
Y-branch fittings were properly SUPPORTED per details provided in the Multi F / Multi F MAX with LGRED Outdoor Unit Installation Manual.	
No oil traps, solenoid valves, sight glasses, filter driers, or any other unauthorized refrigerant specialties were present.	
(Optional) High quality R410A rated full port ball valves with a Schrader port were used at all indoor units and at will in the refrigerant piping network. (Recommended for serviceability.)	

# INSTALLATION CHECKLIST

# MULTI F MULTI F MAX

PAGE 2 of 2

System ID No.: \_\_\_\_\_ Indoor Unit ID.: \_\_\_\_\_

Checked by: \_\_\_\_\_ Date: \_\_\_\_\_ Signature: \_\_\_\_\_

## Condensate Pump / Drain Installation

Description	Check
Condensate piping installed correctly on indoor units. Material used is acceptable under local code. Insulated as necessary to prevent condensation.	
All condensate vertical risers are equal to or less than 27-1/2" from the bottom of the indoor unit.	
Indoor units with condensate pumps were level. Units with gravity drains were level or slightly canted toward the drain connection and are supported properly. Pumped condensate drain lines were properly connected (no traps, and connect to the top surface of the main drain line).	
Multi F / Multi F MAX with LGRED outdoor unit gravity condensate drain line was connected and routed where it properly drains away or, if installed in a mechanical room, was connected and properly routed to a drain terminal.	
All condensate lines were properly insulated to prevent condensation.	

## Power Wire and Communications Cables

Description	Check
Ground wire was installed and properly terminated at the unit.	
Power wiring was connected to a single phase 208-230V source.	
The power supplied was clean with voltage fluctuations within specifications. ( $\pm 10\%$ of nameplate).	
Power wiring to the Multi F / Multi F MAX with LGRED outdoor unit was field supplied, solid or stranded, and installed per all local, state, and NEC requirements.	
For Multi F with LGRED Systems <ul style="list-style-type: none"> <li>When the wiring length is up to 130 feet, communication / connection (power) wiring from the outdoor unit to the indoor unit is minimum 18 gauge, four-conductor, stranded, shielded or unshielded. If shielded, must be grounded to chassis at the outdoor unit only.</li> <li>When the wiring length is GREATER THAN 130 feet, communication / connection (power) wiring from the outdoor unit to the indoor unit is minimum 18 gauge, stranded, shielded or unshielded. If shielded, must be grounded to chassis at the outdoor unit only. Use a two (2) conductor wire for power; use a two (2) conductor wire for communication / ground. Separate the power AT LEAST two (2) inches away from the communication / ground wire.</li> </ul>	
For Multi F MAX with LGRED Systems <p>All power wiring / communication cable to be minimum 16 AWG from the Multi F MAX with LGRED outdoor unit to the BD unit stranded, shielded or unshielded (if shielded, it must be grounded to the chassis of the outdoor unit only), and must comply with applicable local and national codes.</p> <ul style="list-style-type: none"> <li>When the wiring length is up to 130 feet, communication / connection (power) wiring from the BD unit to the indoor unit is minimum 18 gauge, four-conductor, stranded, shielded or unshielded. If shielded, must be grounded to chassis at the outdoor unit only.</li> <li>When the wiring length is GREATER THAN 130 feet, communication / connection (power) wiring from the BD unit to the indoor unit is minimum 18 gauge, stranded, shielded or unshielded. If shielded, must be grounded to chassis at the outdoor unit only. Use a two (2) conductor wire for power; use a two (2) conductor wire for communication / ground. Separate the power AT LEAST two (2) inches away from the communication / ground wire.</li> </ul>	
Power wiring to the outdoor unit and communication / connection (power) cable from the outdoor unit to the indoor units or branch distribution units (Multi F MAX with LGRED only) were separated per manufacturer's guidelines. These cannot be run in the same conduit.	
Communications / connection (power) cable were run in the same conduit (outdoor unit to indoor unit or branch distribution unit [Multi F MAX with LGRED only] as provided in the product installation manual.	
Proper communications cable was used between each indoor unit and its zone controller where applicable. No cables were spliced and no wire nuts are present.	
Communication type RS-485-BUS type.	
Used appropriate crimping tool to attach ring or fork terminals at all power wiring and control cable terminations.	
Only LG-supplied Y-cables were used between grouped indoor units, if applicable.	

Multi F Standard Wall-Mounted Indoor Unit

For further technical materials such as submittals, engineering manuals, service manuals, and catalogs, visit [www.lghvac.com](http://www.lghvac.com).

**Who to call for assistance**

Freight Damage and Unit Replacements	Your LG Manufacturer Representative
Missing Parts	Your LG Manufacturer Representative
Freight Damage and Unit Replacements	Your LG Manufacturer Representative
Received Wrong Indoor Unit Model	Your LG Manufacturer Representative
Installation, Startup, and Commissioning Technical Assistance	1-888-865-3026

**For warranty information, visit [www.lghvac.com](http://www.lghvac.com).**

*Inverter*



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[www.lghvac.com](http://www.lghvac.com)

LG Customer Information Center, Commercial Products  
1-888-865-3026 USA  
Follow the prompts for commercial A/C products and parts.

IM\_MultiF\_StdWallMount\_9HVT\_HSV5\_11\_18  
Supersedes: IM\_MultiF\_StdWallMount\_11\_15  
IM-Multi-F\_StdWallMount-03-15